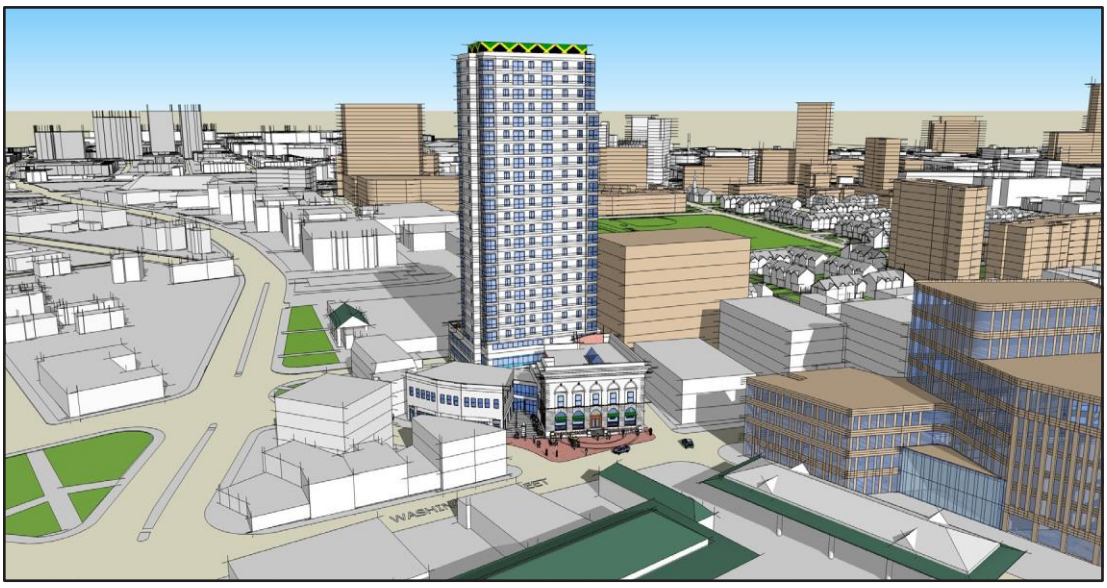
Project Notification Form

Including Transportation Impact Analysis

Submitted Pursuant to Article 80 of the Boston Zoning Code

RIO GRANDE DUDLEY SQUARE

ROXBURY, MASSACHUSETTS MAY 26, 2017



Submitted to:

BOSTON PLANNING AND DEVELOPMENT AGENCY
One City Hall Square
Boston, MA 02201

Submitted by:

RIO GRANDE DUDLEY SQUARE, LLC

Prepared by:

STULL AND LEE, INC.

In Association with:

BEVCO ASSOCIATES
MCCLURG TRAFFIC

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Rio Grande Dudley Square, LLC

451 Blue Hill Avenue, Suite 4 Dorchester, Massachusetts 02121 (617) 799-8661 (617) 298-3609 fax

May 26, 2017

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

Dear Director Golden:

In accordance with Article 80B of the Boston Zoning Code, the Rio Grande Dudley Square LLC is pleased to submit the attached Expanded Project Notification Form (EPNF) for large project review of the $144 million Rio Grande project that will be built in the Dudley Square Business District. The project is comprised of approximately 285,253 gross square feet and includes three components as indicated below:

- The 25-story Guscott tower will serve as the new construction component that will be built on the existing parking lot on the site.
- The existing Bank Building will be renovated for future commercial, retail, and entertainment uses.
- The existing Buff Bay Building will be renovated and continue to be used as a commercial office building.

The two existing buildings are currently under lease agreements with a variety of commercial tenants who plan to remain post-construction. The project site is owned by the Proponent, and is bounded by Washington Street to the south, Shawmut Avenue to the North, Marvin Street to the East, and Roxbury Street to the West.

The Rio Grande project involves the construction of a 25-story residential and commercial tower that will include 165 residential market and affordable rental units, 46 market-rate and affordable condominium units, one floor of residential amenity space, two floors of commercial space of approximately 28,000 gsf, and approximately 10,000 gsf of ground-floor retail. The project will exceed the requirements of the City of Boston's *Inclusionary Development Policy* with the designation of 20% of the residential units as affordable.

The Rio Grande project's location directly across the street from the MBTA's Dudley Station, one of the largest transportation hubs in the public transit system, will reduce the amount of parking required to support the project based on the increasing preference of residential and commercial tenants to utilize public transit, and other non-vehicular modes of travel including biking or walking to their jobs and homes. Therefore, the Guscott Tower will serve as a national model of the transformative and catalytic impacts of *Transit-Oriented Development Projects* that are located in densely-populated urban areas. Given the size and configuration of the project site, the Proponent is evaluating several options for off-site parking that is located within walking distance of the project site and it is anticipated that the parking will serve the needs of the project as well as public demand for parking in Dudley Square. These options include existing surface parking lots along with a vacant parcel that, if acquired, is being contemplated as the location for a newly-constructed public/private parking garage.

The project will also generate a substantial amount of economic benefits, including contract opportunities for Minority/Woman-Owned Business Enterprises, construction jobs, commercial office and retail jobs, and additional revenue for the existing retail establishments in Dudley Square.

We look forward to working with the BPDA to advance the Rio Grande Project through the Article 80 review process.

Sincerely,

Lisa J. Guscott
President and CEO

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APPENDICES

1.0 PROJECT SUMMARY

1.1 Project Identification

Project Name:	Rio Grande Dudley Square LLC 2343 Washington Street Boston, MA 02119
Location:	The Project site is located in the Dudley Square Commercial District, Roxbury Neighborhood of the City of Boston. The site has frontage on three streets: Washington Street to the south-west, Shawmut Street to the north-west and Marvin Street to the north-east.
Proponent:	The Rio Grande Dudley Square LLC. 451 Blue Hill Avenue, Suite 4 Boston, MA 02121-4305 (617) 799 8661 Mr. Cecil Guscott Ms. Lisa Guscott
Architects/Permitting Consultants	Stull and Lee, Inc. 103 Terrace Street, 2nd Floor Boston, MA 02120 (617) 426-0406 Mr. M. David Lee, FAIA Mr. Thomas Maistros, Jr. RA
Development Consultant	Thomas Welch & Associates 22 Hawthorne Street, Suite #3 Boston, MA 02119 (617) 733 4878 Mr. Thomas F. Welch
Marketing Consultant	Byrne/McKinney 607 Boylston Street, Suite 603 Boston, MA 02116 (617) 617 223 1408 MS. Pamela McKinney
Transportation Consultant:	McClurg Traffic 81 Oakley Road Belmont, MA 02478 (617) 484-6137 Mr. Andrew McClurg, AICP CTP
Wind Consultant	Gradient Wind Engineering, Inc. 127 Walgreen Road Ottawa, Ontario K0A 1L0 (613) 836 0934 Mr. Vincent Ferraro, PE
Public Process, Permitting and Project Manager	BEVCO Associates 202 West Seldon Street Boston, MA 02126 (617) 438 2767 Ms. Beverley Johnson

Financial Partners	AFL/CIO Housing Investment Trust 10 Post Office Square, Suite 800 Boston, MA 02109 (617) 821 8435 Thomas P. O'Malley Eisenberg Consulting 4 Ashford Road Newton Centre, MA 02459 (617) 901 3378 Mr. Charles Eisenberg
Zoning Attorney	Nixon Peobody 100 Summer Street Boston, MA 02110 (617) 755 1689 Ms. Ruth Silman, Esq.
Residential Marketing Consultant	Prime Real Estate 1428 Dorchester Avenue Dorchester, MA 02125 (617)620 8519 Mr. Rickie Thompson Caldwell Banker Real Estate Brokerage 137 Newbury Street Boston, MA 02116 (617) 699 5878 Ms. Deborah Bernat
Structural Engineer	Goldstein Milano, LLC 125 main Street Reading, MA 01867 (781) 670-9930 Mr. Brent Goldstein, PE
Mechanical, Plumbing & Fire Protection Engineer:	Norian/Siani Engineering Inc. 241 Crescent Street Waltham, MA 02453 (781) 398-2250 Mr. Sergio Siani, PE
Construction:	Janey Co/Gilbane, Inc. 236 Huntington Avenue Boston, MA 02115 (617) 267 6200 Mr. Gregory Janey Mr. Ryan Hutchins
Environmental Engineers:	Doyle Engineering, Inc. 14 Spring Street, First Floor Waltham, MA 02451 (781) 850 2731 Mr. William Doyle, PE
Geotechnical Engineer	Geocomp Consulting, INC. 125 Nagog Park Acton, MA 01720 Ms. Margela Shirley, EIT

1.2 Project Description

1.2.1 Project Site

The Rio Grande Tower (the "Project") will be located at 2343-2345 Washington Street in the Roxbury Neighborhood of Boston (Figure 1.1). The project will occupy much of the block bordered by Washington, Roxbury and Marvin Streets and Shawmut Avenue. Existing buildings on the site to remain and are part of the project are the former Roxbury Institute for Savings Building, and the former Boston Consolidated Gas Company Building. A surface parking lot supporting the 2343-2345 Washington Street building completes the site. The combined parcel has a total area of approximately 34,220 square feet (Figure 1.2). The project site is in the Dudley Square Commercial District, an important commercial and cultural center for the Roxbury community. To the southwest is 37-51 Roxbury Street, a mixed use residential/commercial building.

To the northwest across Shawmut Avenue is the US Post Office and Madison Park Village. To the northeast across Marvin Street are the offices for Central Boston Elder Services and to the south-east across Washington Street is the MBTA Dudley Terminal bus station and the newly constructed City of Boston Bolling Municipal Building utilized primarily for the Boston School Department.

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Figure 1-1 Locus Map

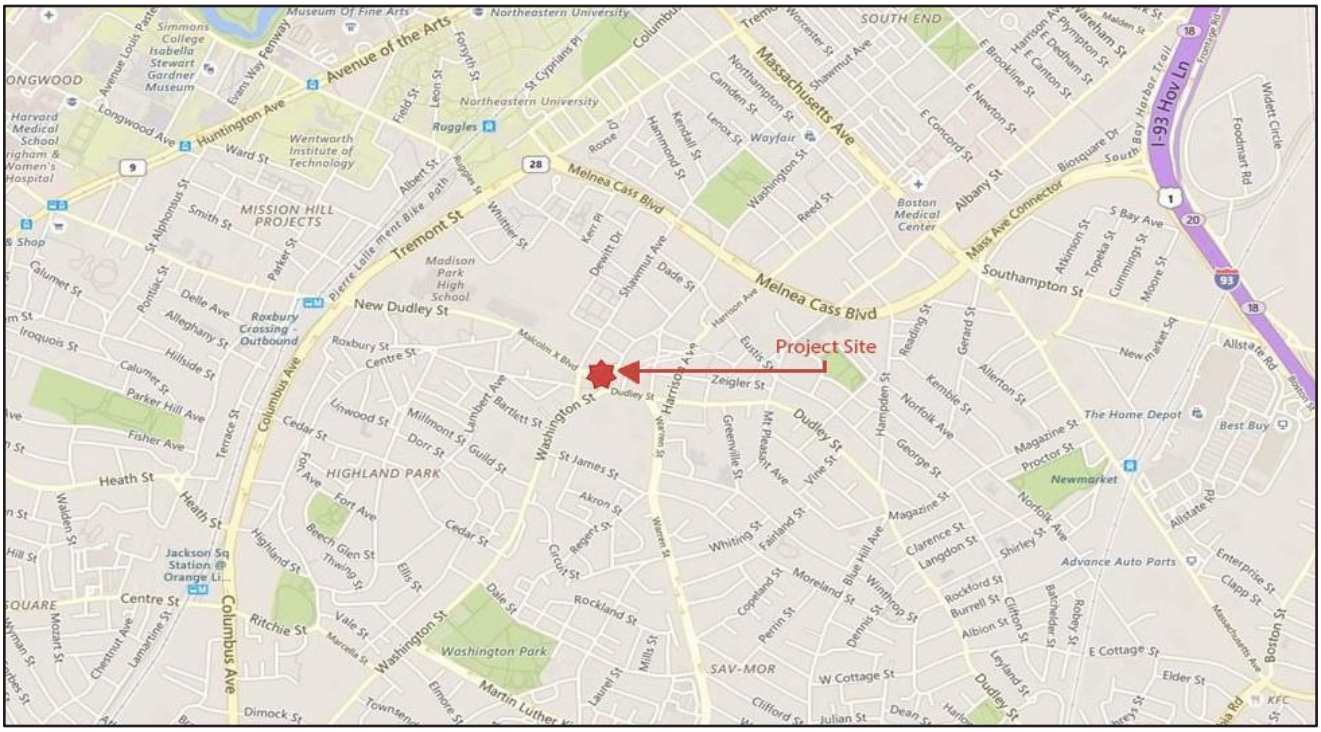


Figure 1-2 Context Plan

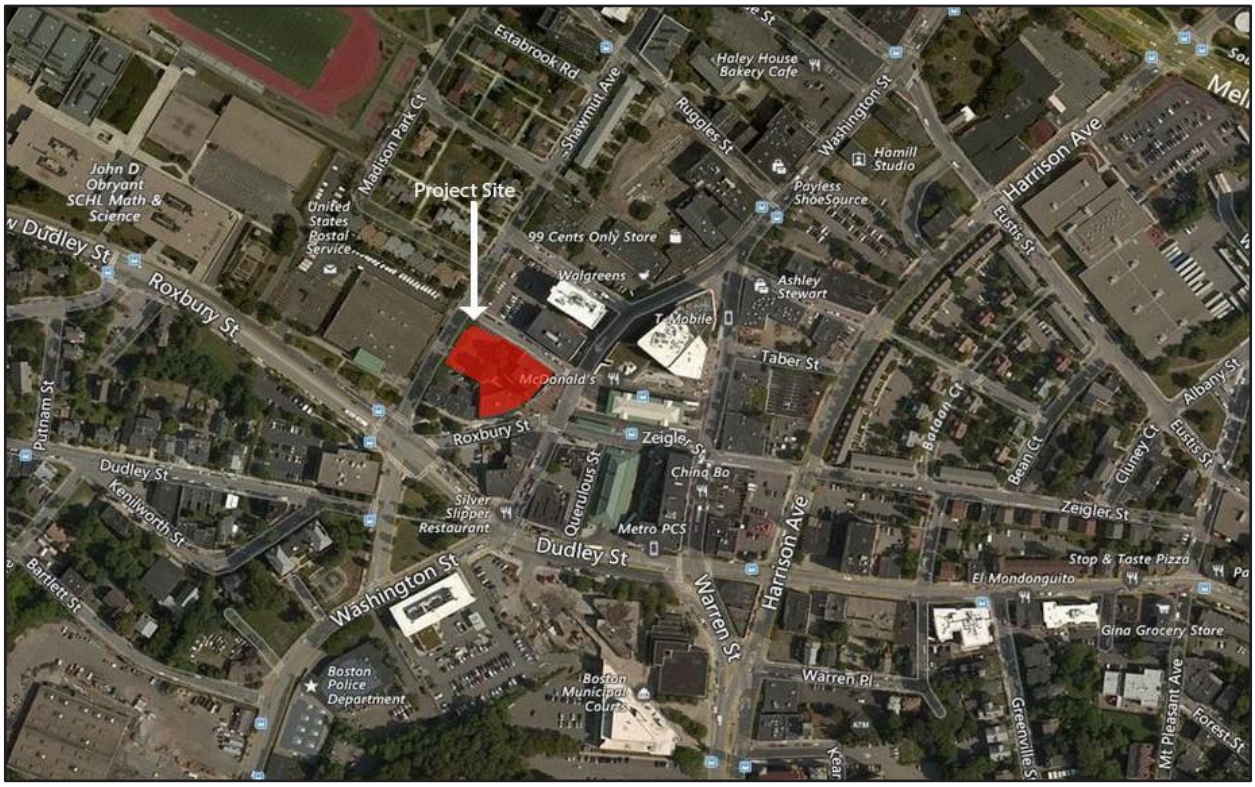


Figure 1-3 Context Aerial

1.2.2 Project Background

Dudley Square, long the business and cultural hub of the Roxbury neighborhood and until the early 60's, one of the busiest commercial districts in the Commonwealth, is now enjoying a resurgence of interest. New capital investment in the area, most notably the new district police station, the Central Boston Elder Services residential and office buildings and the acclaimed Bolling Municipal Building containing multiple city services and retail space is breathing new life into this vital city crossroads.

The Project Proponents have lived and owned property in the area for decades. They knew this area in its heyday, witnessed it decline and now see the opportunity to capitalize on its resurgence. The proponent, Long Bay Management L.L.C. owns two iconic structures, the former Boston Consolidated Gas Building and The Roxbury Institute for Savings Building which they have combined with an adjacent surface parking lot to create the project site.

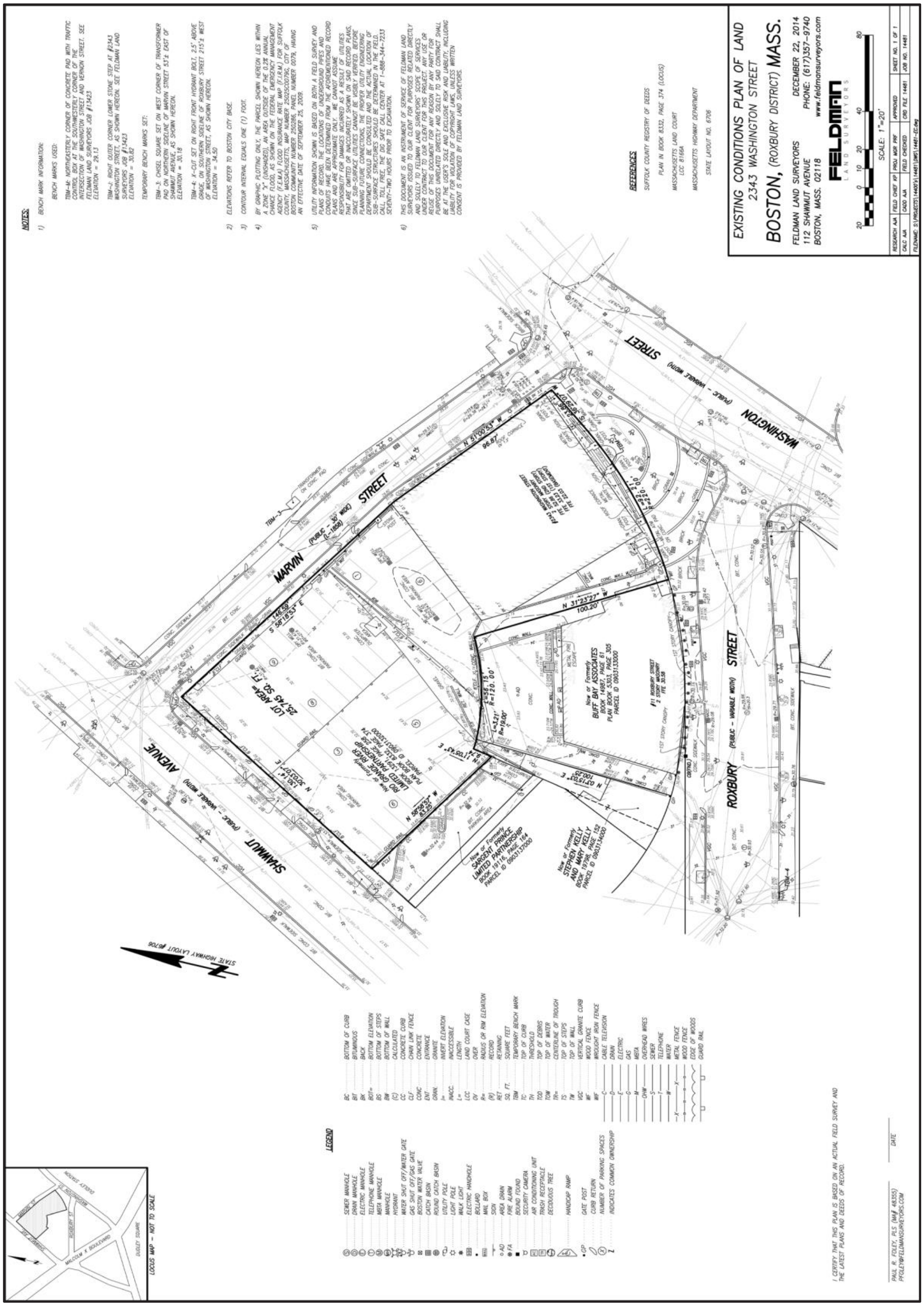
The Proponent retained Stull and Lee, Incorporated as the lead architects to design a mixed- use complex that retains the two existing buildings and incorporates them into a composition which includes a 25-story residential tower on the surface parking site.

Envisioned as a transit oriented development project, it is planned to conform to the objectives established in the Roxbury Neighborhood Plan and Article 50 of the Boston Zoning Code.

The ultimate goal is to contribute to the revitalization of this historically important city neighborhood hub with new residents, shopping, business and entertainment uses symbolized by a striking hi-rise addition to the city's skyline.

It is anticipated that the Project will also be an economic development boost for current and future community based businesses beginning with a substantial number of construction jobs and then upon completion, adding hundreds of new residents, office workers and visitors to the area's customer base.

Figure 1-4 Survey Plan



1.2.3 Context Photographs

Figure 1-5 Roxbury Institute of Savings

Figure 1-6 Buff Bay Building (Former Consolidated Gas Company Building)

Figure 1-7 View of Washington Street looking North - Dudley Station and Billing Building

Figure 1-8 View of Washington Street looking South – Roxbury Savings in Center/Ferdinand Building or Left

Figure 1-9 View of Roxbury Savings Parking Lot From Shawmut Avenue and Marvin Street

Figure 1-10 View looking South on Shawmut Ave - Roxbury Savings Parking Lot on Left/US Post Office on Right

Figure 1-11 View of 37 Roxbury St. looking Northeast from Shawmut Ave/Roxbury St

Figure 1-12 Washington Street looking Northwest at Boston Elder Services

1.2.4 Proposed Development

The Proponent plans to develop a mixed-use retail, office and residential complex. The former Roxbury Institute for Savings Building and the former Boston Consolidated Gas Building are contributing structures to the Dudley Station Historic District and are key components of the project. In addition to these two structures a third component of the project is a new 25 story primarily residential tower to be constructed on an existing surface parking lot.

The Project will be the first mixed-use tower constructed in the Dudley Square Business District. The project will have a transformative impact in achieving the physical and economic revitalization goals of the Roxbury Strategic Master Plan, the BPDA's ongoing Dudley Planning Initiative, and the Mayor of Boston's Housing Initiative, relative to constructing transit-oriented development projects that are comprised of taller buildings in densely-populated neighborhoods to meet housing demand. The project's location directly across the street from Dudley Station, one of the major transportation hubs in the Massachusetts Bay Transportation Authority (MBTA's) public transit system, will provide convenient transportation for residential and commercial tenants of the tower and the two existing buildings.

Figure 1-13 Aerial View of Rio Grande Dudley Square from Southeast

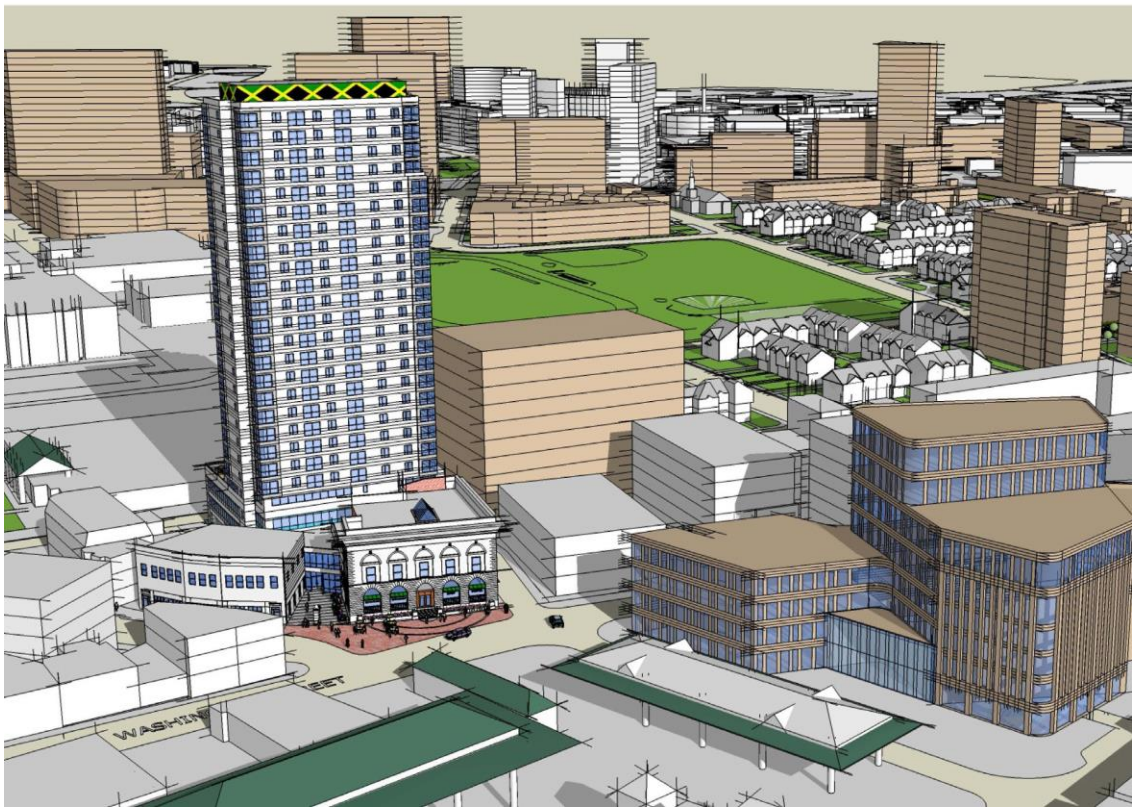


Table 1-1 Approximate Project Dimensions

Project Element	Dimension
Project Site	34,300 SF
Residential Space (High-rise)	211 units/ 207,998 G.S.F.
Retail Space	+/- 26,059 G.S.F.
Commercial	+/- 28,208 G.S.F.
Parking	3 Spaces [The remainder of the parking will be located off site in close proximity]
Total Building Area	285,253 SF
Open Space	6,088 SF
Building Height (maximum)	282'-6"

Table 1-2 Development Program

Retail

Buff Bay Building (Consolidated Gas Building)..... 9,214 G.S.F.
Roxbury Savings Bank Building..... 14,149 G.S.F.
Ground Floor Retail (Tower Building)..... 2,696 G.S.F.
Lobbies/Common Area - Lobbies and Atrium, etc. ..... 12,620G.S.F.

Commercial Office

New Tower Office Space, Floors 2 and 3..... 28,208 G.S.F.
Management Office

Residential (Rental)

60 2-BR's (AVG. 900 S.F.)
60 1-BR's (AVG. 676 S.F.)
15 Studios (AVG. 471 S.F.)
30 Micro Units (AVG. 341 S.F.)
Sub-Total - 165 Units

Residential (Condominium)

28 2-BR's (AVG. 900 S.F.)
18 1-BR's (AVG. 676 S.F.)
Sub-Total - 46 Units

Total (211 Units)..... 207,998 G.S.F.

Residential Amenity Space (4th Fl)..... 10,368 G.S.F.

Total Gross Square Footage..... 285,253 G.S.F.

1.2.5 Public Benefits

1.2.5.1 Neighborhood Revitalization

The Dudley Square Business District which has long been the center of Boston's African American and Caribbean American communities, is undergoing a remarkable renaissance. New capital investments in civic facilities including the Area B Police Station, and the Bolling Municipal Building, coupled with transportation improvements including the Silver Line Bus Rapid Transit service have signaled the commitment of the City of Boston and the Commonwealth of

Massachusetts to the physical and economic revitalization of Roxbury and the Dudley Station area in which the project falls.

Additionally, the sustained investments of local community development corporations who are active in the area, coupled with private investments, is laying the groundwork for a substantial level of investment by private investors. Toward this end, the Rio Grande project will help to create an investment environment for a larger scale of development that will establish Dudley Square as a major destination for work, housing, shopping and entertainment. Taking full advantage of its robust Transit Oriented Development potential, the new residential tower and associated retail and office space will provide a visual urban design exclamation point on the city's skyline.

Just as importantly, offering residences in the proposed tower at multiple price points will provide new options for long time Roxbury residents who want to remain in the neighborhood as well as for empty-nesters and young professionals, who want to live in close proximity to commercial, institutional and cultural resources. Additionally, the project's introduction of well over 200 new residences, and more than 60,000 S.F. of new and renovated retail, entertainment, and office space will add extensive street activity and amenities that will benefit and complement the ongoing revitalization of the neighborhood.

Figure 1-14 Bolling Municipal Building/Dudley Station

1.2.5.2 Micro Units/Affordable Housing

The Project will help advance the City's housing goals by creating 165+/- new rental apartment and 46 condominium units that will serve Bostonians with a broad range of incomes. The development program will include affordable apartments expanding housing opportunities for Roxbury residents. The Micro units will provide apartments targeted toward young professionals whose active life styles do not require traditional one or two bedroom units.

The development also includes approximately 26 units designated as workforce housing affordable to households making between 75 and 100% of area median income. The development of one and two bedroom units will also include market rate housing targeting working professionals, and young married couples starting families. A breakdown of current affordability assumptions is provided in Table 1.15 below.

Figure 1-15 Project Affordability Analysis

Total Rental Units	165		
Total Condo Units	46		
Total Project Units	211		
MassHousing Req. (Rental only)	20%	33	(23 @ 70% and 10 @ 80%)
City IDP Req. - Rental	13%	21	@ 70% of AMI
City IDP Req. - Condos	13%	6	(2 @ 70% of AMI and 4 @ 100% of AMI)

Rental Units	Unit Count	Avg. Unit SF	Total Net SF	Avg. Rent Per Unit	Total Annual Rent	Rent Per SF	Avg. Rent Per SF
Affordable @ 80% AMI	10	653	6,525	$ 1,402	$ 168,240	$ 25.78	$ 2.15
Affordable @ 70% AMI	30	710	21,295	$ 1,283	$ 461,748	$ 21.68	$ 1.81
Total (Affordable Rental Units)	**40**	**696**	**27,820**	**$ 1,312**	**$ 629,988**	**$ 22.65**	**$ 1.89**

Condo Units	Unit Count	Avg. Unit SF	Total Net SF	Sale Price Per Unit	Total Sale Price	Sales Price Per SF
Affordable Low @ 70% AMI	2	936	1,871	$ 179,600	$ 359,200	$ 191.98
Affordable Middle @ 100% AMI	4	936	3,742	$ 277,100	$ 1,108,400	$ 296.21
Total (Affordable Condo Units)	**6**	**936**	**5,613**	**$244,600**	**$ 1,467,600**	**$261.46**

Total Affordable Units	**46**

Notes: The number of affordable rental units required has been rounded-up to 34 for this pro forma.

1.2.5.3 Smart Growth/Transit-Oriented Development

The redevelopment of this site into an attractive mixed-use development will complement the evolving Dudley Square shopping district. With 14,500 gross square feet of local service retail use catering primarily to walk-in traffic and with the residents being provided direct access to mass transit, the project will generate fewer vehicle trips than the traditional mixed-use development. At this juncture, the Proponent is exploring several options to provide off-site parking within walking distance of the project site to support the needs of the project, including a vacant parcel, that if acquired, would be used to build a public/private parking garage that will be available to meet public parking demand. As previously mentioned, the proximity to local bus routes, and the Orange Line subway system will encourage walking and the use of public transit as a means of transport and support sustainable design and Transit-Oriented Development/ Smart Growth objectives.

1.2.5.4 Increased Employment

The Project will include approximately 28,000 square feet of commercial office space contributing to an increase in the number of daily workers in Dudley Square as a result of the Boston Scholl Department's relocation to the Bolling Municipal Building. This new office area will bring as many as 250 additional workers to the Square.

Figure 1-16 Silverline Bus Stop on Washington Street

1.2.5.5 New Property Tax Revenue

The Project's zoning and tax structure will be approved under Chapter 121A establishing the annual tax payment to the City. These payments are expected to contribute a level of tax revenue that is appropriate for a transformative project of this scale and magnitude.

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1.2.5.6 Open Space: urban pocket park/atrium/roof gardens

The Project will utilize an existing corridor located-between the Buff Bay and Roxbury Savings Bank Buildings to create a pocket park/gateway to the office lobby. This publicly accessible open space will total approximately 7,250 square feet and will add vitality to Washington Street and Dudley Square.

The Project will also create a covered atrium connecting the pocket park and Marvin Street and a protected entrance to the expanded ground floor retail, the commercial office lobby and the residential lobby (accessible primarily from Marvin Street).

1.2.5.7 Public Realm/Complete Streets – streetscape improvements

The City of Boston Public Works Department and Boston Transportation Department are developing plans to incorporate the City's Complete Street guidelines along Washington Street. The proposed Project provides the opportunity to extend this effort to Marvin Street and Shawmut Avenue

dramatically improving the pedestrian environment. This can have a particularly beneficial impact on Marvin Street that current has very narrow sidewalks.

1.2.5.8 Summary of Public Benefits

In summary, public benefits include:

- The Project will be certifiable under the U.S. Green Council's Leadership in Energy and Environmental Design (LEED) system.
- The Project will generate annual tax payments in accordance with 1 121A agreement.
- The Project will provide approximately six (6) affordable condominium and 54 rental units exceeding the City's Inclusionary Housing Guidelines.
- The Project will rejuvenate a series of underutilized, retail buildings that will further support the adjacent shopping area.
- Create significant contract opportunities for Minority/Women-owned Business Enterprises.
- The Project will create approximately 750 construction jobs and will comply with the City of Boston standards for Boston resident and minority hiring.
- An improved public realm along Washington Street, Shawmut Avenue and Marvin Street Streets replacing and widening deteriorated sidewalks designed in conformance with the City's Complete Street guidelines.
- Create a new pocket park creating an open space amenity to be enjoyed by both existing and new residents,

1.2.6 Community Engagement

The Proponent has a long history in the Dudley Square neighborhood, both as children growing up in the area, and as adults who established a successful business enterprise which they have operated for over 20 years, Therefore, the Proponent has been committed to a full community participation process ever since the project was envisioned. In order to achieve the goal of broad community engagement, the Proponent met with representatives of key community and civic groups, along with elected officials. During the course of these meetings, the team met with over 15 community-based groups and based on the neighborhood response to the project, over 20 letters of support were provided. A copy of these letters is attached to the EPNF. The proponent looks forward to further engaging with the Impact Advisory Group (IAG) and other community representatives during the Article 80 review process.

At the conclusion of the public comment period the Proponent hopes to present the final concept including any additional modifications recommended by the BPDA/City agencies, to the BPDA Board in late Summer of 2017.

1.3 Consistency with Zoning

The subject property is on the north side of Washington Street and also has frontage on Marvin and Shawmut Avenue. It is comprised of a combined land area of approximately 34,220 square feet.

Address	Parcel Number	Area
2343-2345 Washington Street	0903132000	25,725 SF
11-29 Roxbury Street	0931332000	8,475 SF

Zoning for the site is defined in Article 50 of the Boston Zoning Code, the Roxbury Neighbor- hood District. The parcels comprising the site are in the Dudley Square Economic Development Area Subdistrict with a Boulevard Planning Overlay Design Review designation as shown on Map 6A/6B.

The Proposed Development is for a mixed-use building with the uses allowed as-of-right under the Code. Dimensional relief will be required with the primary variances being for Maximum Floor Area Ratio and Height.

The Project is also within a Boulevard Planning Overlay District. As stated in Section 50-37 of the Code, the BPDs are an acknowledgment of the significance of major boulevards as the entryways to Roxbury's neighborhoods. As gateways to the residential areas they establish a design image and are focal points for the surrounding neighborhoods. Within the BPDs, special design review requirements and design guidelines apply as set forth in Subsection 50-38.1, Section 50-39, and Section 50-40, and screening and buffering requirements apply as set forth in Section 50-41.

The Proponent understands the City has undertaken long term planning for Shawmut Avenue including managing the Right-of-way to allow incorporation of bike-tracks. The Proponent will work with City agencies including the BPDA and BTD to utilize the Boulevard Planning Overlay design process to incorporate boarder planning goals and the Proposed developments specific requirements (including wider sidewalks and required curb cuts.

The Proponent will seek approval of the Project through the Article 80 Development Review Process - Large Project Review. If approved, the Project will seek variances for dimensional and parking requirements.

It is also anticipated that the zoning review process can best be managed through the Commonwealth's M.G.L.C. 121A regulations pertaining to new urban redevelopment projects. The City and project proponents believe this will be the best way to expedite project approvals while ensuring a thorough community participation.

Table 1-3 Zoning Table and Potential Variances

	Zoning Requirement	Proposed
Maximum F.A.R.	2.0	8.4
Maximum Building Height	55 Feet	282.5'
Minimum Lot Area	None	34,200 SF
Min, Usable Open Space	None	6,088 SF (app)
Minimum Lot Width	None	120 Feet +/-
Minimum Frontage	None	207 Feet +/-
Minimum Front Yard	None	0"
Minimum Side Yard	None	N/A
Minimum Rear Yard	20 Feet	N/A
Off-Street Parking (Condominiums)	1 Spaces/Unit	.75 Spaces/Unit
Off-Street Parking (Rentals)	1 Space/Unit	.3 Spaces/Unit
Off-Street Parking (Commercial)	1 Spaces/1,000SF	.75 Spaces/Unit
Off-Street parking (Retail)	2 Spaces/1,000SF	0
Off-Street Loading	1 Bay	1 Bay

1.4 Legal Information

1.4.1 Legal Judgments Adverse to the Proposed Project

The Proponent is not aware of any legal judgments in effect or legal actions pending that are adverse to the Project.

1.4.2 History of Tax Arrears on Property

The Proponent does have a history of tax arrears on a property owned within the City of Boston but has made payments through tax year 2016. The Proponent is making arrangements to bring all Proponent Properties with titles controlled by the City of Boston current.

1.4.3 Evidence of Site Control/Nature of Public Easements

The site is composed of multiple parcels with owned by Buff Bay Associates (11-29 Roxbury Street) and Rio Grand River Limited Partnership (2343-2345 Washington Street).

The Proponent is not aware of any public or private easements that traverse the site.

1.5 Public Agencies

The following is a list of state and local agencies from which permits or other actions are expected to be required:

Table 1-4 Public Agency Review

Agency Name	Permit / Approval
STATE	
Massachusetts Water Resources Authority	Sewer Use Discharge Permit (by BWSC)
LOCAL	
Boston Civic Design Commission	Determination to Review
Boston Redevelopment Authority	Zoning variance recommendations Article 80 Compliance
Boston Water and Sewer Commission	Sewer Use Discharge Permit; Site Plan Approval; Sewer Extension/ Connection Permit; Stormwater Connection
City of Boston Inspectional Services Department	Building and Occupancy Permits
Boston Public Improvement Commission	Street and Sidewalk Occupation Permits; Specific Repair Plan
Boston Board of Appeals	Variance Approvals
Boston Parks and Recreation Commission	Review and Approval
Boston Interagency Green Building Committee	Climate Change Resiliency Checklist
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan
Boston Accessibility Commission	Accessibility Checklist

1.6 Schedule

Construction is expected to begin in the Spring of 2018 and will be completed for occupancy in 24 months (Spring 2020).

1.7 Project Design

1.7.1 Design Objectives

The Rio Grande design objective offers a dynamic new residential option in the heart of Roxbury, Boston's most enduring African American neighborhood. Seizing upon new energy in Dudley Square as a result of the city's investment in the Bolling Municipal Building, including a mix of vital city services, community facilities and retail activity, the Rio Grande concept feeds upon and leverages the energy that complex brings to Dudley Square.

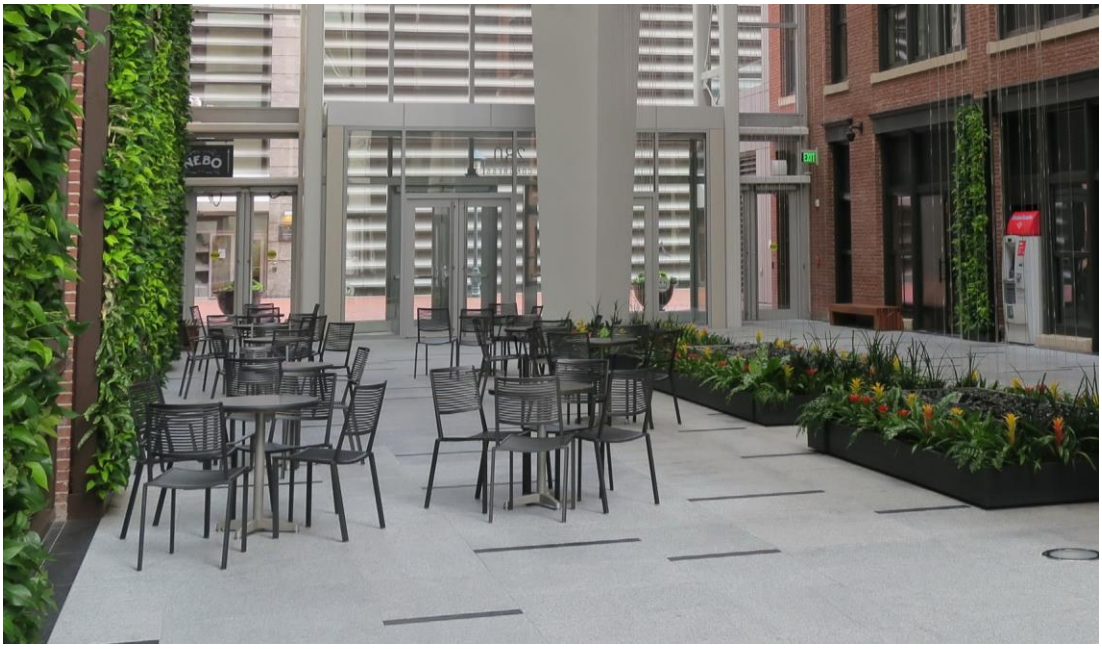
Figure 1-17 Bolling Office Building

In addition to the 25-story residential tower, the Rio Grande design incorporates two historically significant structures, the Roxbury Institute for Savings and the former Boston Consolidated Gas Building into a harmonious composition linked by a glazed two-story atrium.

Figure 1-18 Illustration of Renovated Roxbury Savings Bank/Buff Bay Building looking West

The ground floor levels of the Buff Bay and the Savings Bank Building will feature active retail uses, restaurants and cafes on Washington Street opposite Dudley Terminal, one of the busiest transit hubs in the MBTA system. The two banks located in the Savings Bank building currently will be relocated around the corner to Marvin Street. This allows more active uses like restaurants, cafes, shops and stores to take advantage of the widened sidewalk space and higher visibility Washington and Roxbury Streets provide.

Figure 1-19 Analogues for Washington Street/Rio Grande Pocket Park



The upper levels of the Boston Consolidated Gas Company and the Roxbury Institute for Savings Building along with floors two and three of the new tower will be designated for office use including the possibility of some "edgy" incubator office space in the Bank Building.

Figure 1-20 Analogues for Rio Grande Commercial Office Space

The ultimate objective is to offer long term residents looking to downsize but remain in the Roxbury community along with young professionals who wish to move into an ethnically diverse transit orientated neighborhood in close proximity via multiple modes to downtown Boston, The Boston Medical Center, Northeastern University and the Longwood Medical Area, a high quality residential option at a reasonable price point.

1.7.2 Design Summary

The design takes full advantage of a current surface parking lot which is an underutilized asset in the neighborhood. The tower component will be erected on that parcel which allows it to be set back from Washington Street thus minimizing the visual impact of the tower on the integrity of the two iconic structures previously mentioned.

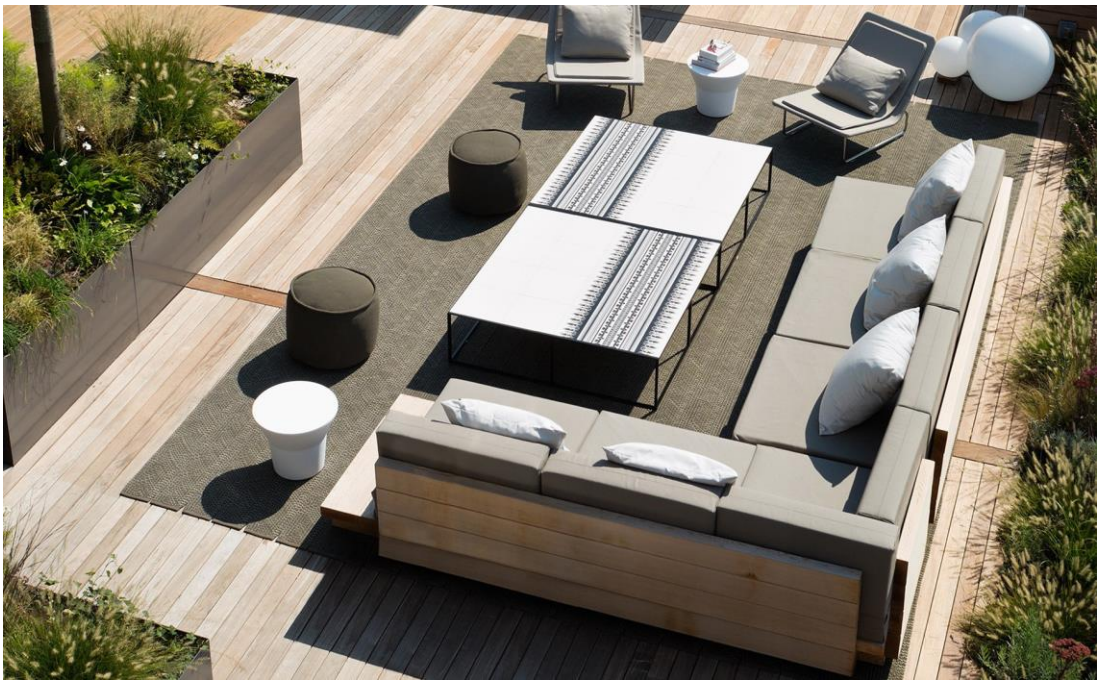
The residential lobby, entered from Marvin Street, the banks relocated to Marvin Street and the two levels of commercial office space will feature substantial amounts of glassy curtain wall. The upper residential floors will be a combination of rain screen components glass and some precast concrete elements.

Figure 1-21 View of Proposed Commercial Office Entrance/Pocket Park

At the fourth floor (amenity level) of the tower, an accessible roof deck offers a pleasant out-door feature to be utilized during the warmer months.

Figure 1-22 Proposed Residential Roof Deck

Figure 1-23 Roof Deck Analogue



Though a series of subtle projections, material changes and setbacks, the tower is designed to maximize visual interest while carefully managing construction costs and sustainability objectives.

1.7.3 Design Exhibits

Figure 1-24 Site/First Floor Plan

Figure 1-25 First Floor Plan

Figure 1-26 Second Floor Plan - Commercial Office

Figure 1-27 Third Floor Plan – Commercial Office

Figure 1-28 Residential Amenities/Fourth Floor Plan

Figure 1-29 Typical Apartment Floor Plan

Figure 1-30 Typical Condominium Floor Plan

Figure 1-31 View of Project looking West

Figure 1-32 Building Elevation – Washington Street

Figure 1-33 Building Elevation – Shawmut Avenue

Figure 1-34 Building Elevation -Marvin Street

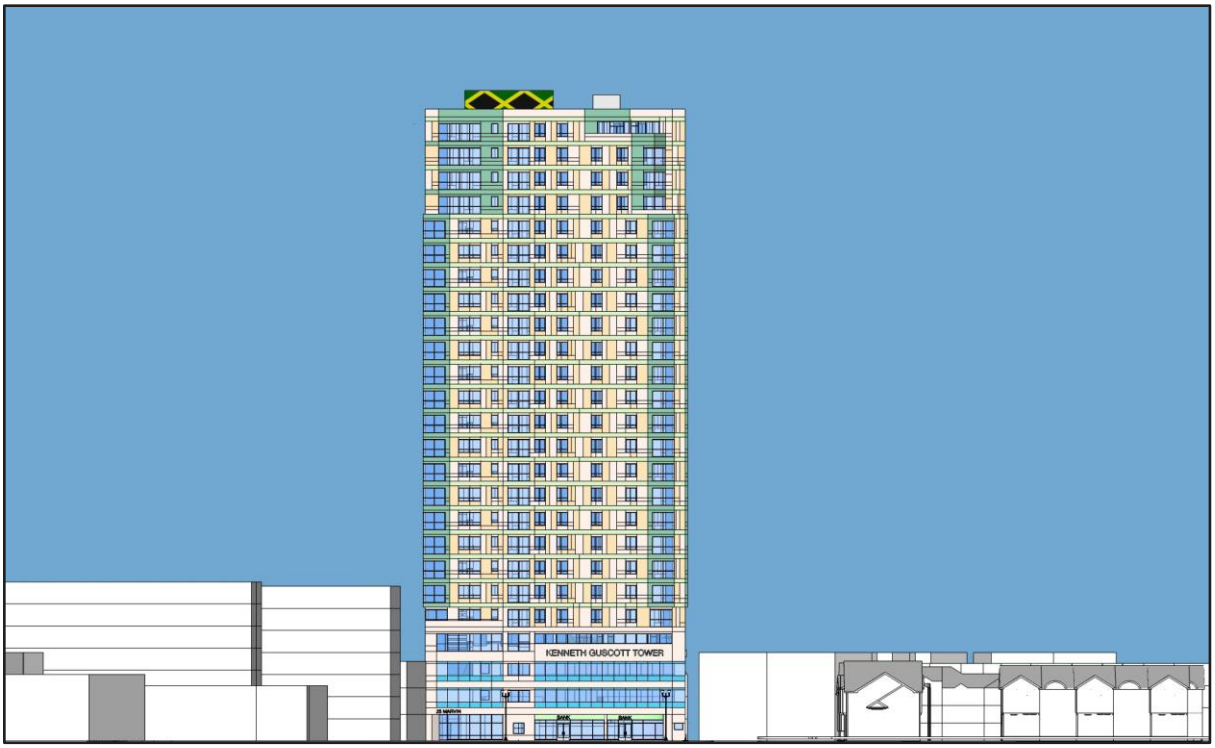
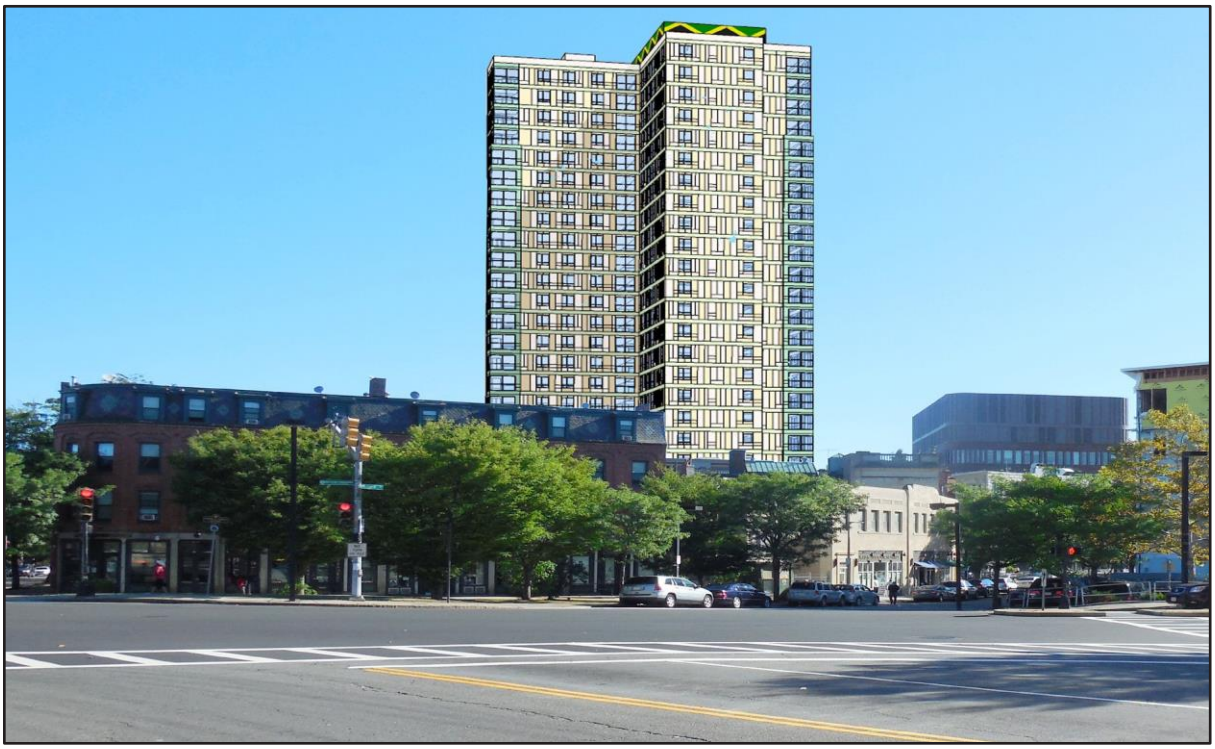


Figure 1-35 Building Elevation from Malcolm X Blvd.

Figure 1-36 View From Washington Street Looking South

Figure 1-37 View From Malcolm X Blvd Looking North



2.0 ASSESSMENT OF DEVELOPMENT REVIEW COMPONENTS

Article 80 of the Code specifies that the BRA may require a Scoping Determination that defines studies to be prepared by the Proponent to determine the direct or indirect impact to the environment reasonably attributable to a proposed project. The development review components include transportation, environmental protection, urban design, historic resources, and infrastructure systems. Where potential for direct or indirect impacts exist, design measures are required to mitigate the impacts, to the extent economically feasible. The following is an assessment of the potential impacts that could be attributed to the Project and proposed mitigation measures.

2.1 Transportation

2.1.1 Project Description & Site Access

Rio Grande is a proposed mixed commercial/residential project situated in Dudley Square in Roxbury, on a site bounded by Washington St., Roxbury St., Shawmut Ave. and Marvin St.

At present, the only vehicular access to the site is a pair of driveways on Shawmut St. that serve a small parking lot. It is proposed that site access will be reconfigured by closing the northern driveway and slightly adjusting the location of the southern driveway, as shown in Figure 2.1.

Figure 2-1

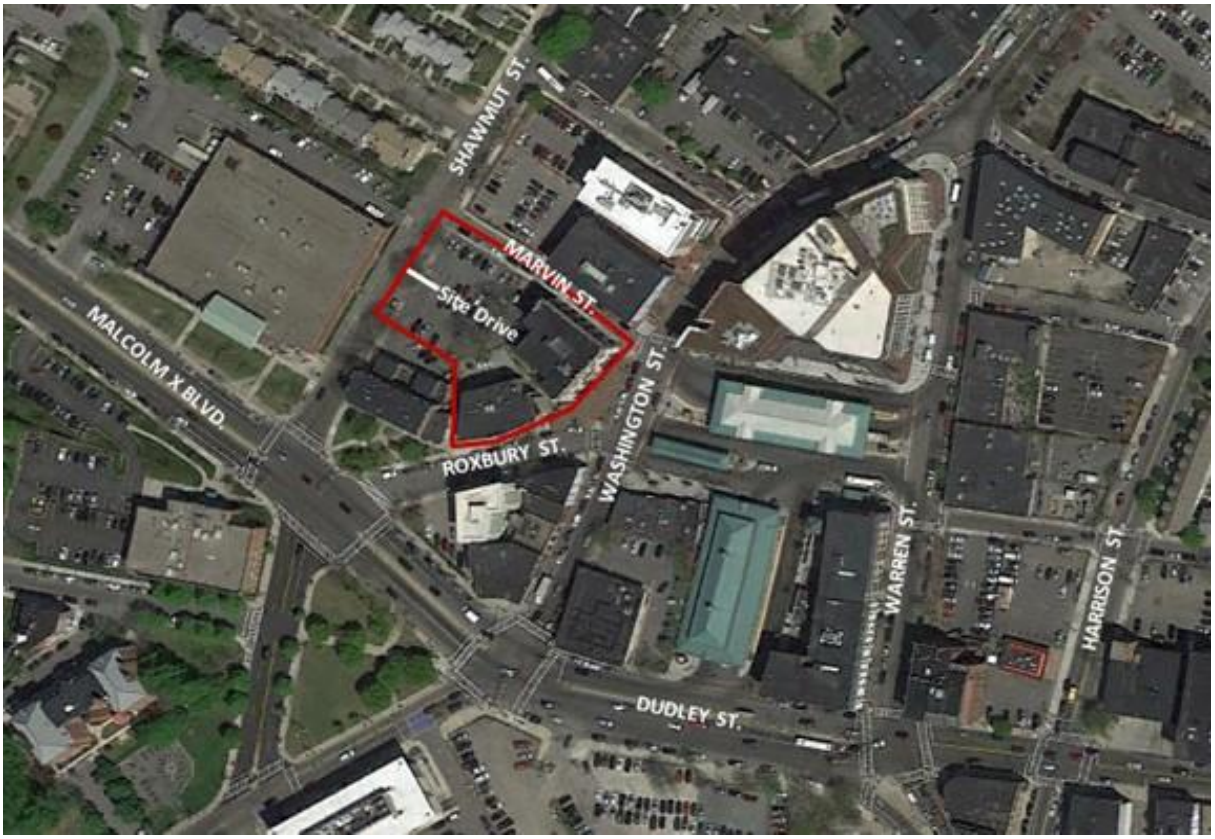


Figure 2.2 Project Program

Table 1-2 Project Program

Buff Bay Building – Basement (unoccupied)…..... 4,607 S.F.
Ground Floor Retail……4,607 S.F.
Second Floor Retail……4,607 S.F.
Roxbury Savings Basement (unoccupied)…..7,604 S.F.
Ground Floor Retail……7,604 S.F.
Second Floor Retail……6,545 S.F.
Tower Basement (unoccupied)……14,292 S.F.
Ground Floor Retail……2,531 S.F.
Ground Floor Misc. Uses……11,012 S.F.
Commercial Office……28,208 S.F.
Residential-(211 units)……220,606 S.F.
Residential Amenity Space (4th Fl).....10,368 S.F.

2.1.2 Parking

The development site currently includes a paved and landscaped parking area providing approximately 40 private spaces utilized by the businesses in 2343-2345 Washington Street and 11-29 Roxbury Street. This parking lot will be removed and replaced with the new office/residential high-rise element of the proposed project.

The size of the site makes underground parking cost prohibitive. Six (6) spaces are proposed on site and will be used for short term parking and deliveries.

While the site has very good access to mass transit, marketing studies have established dedicated parking is needed for the Project. The proposed count and allocation of off-street parking is based on the following allowances by use type:

Use Type	Spaces/Unit	# Units	Spaces
Condominiums	1 Spaces/Unit	46	46
Rentals	0.4 Space/Unit	165	66
Commercial	0.75 Spaces/1,000SF	28	21
		Total	133

The Proponent has identified several potential locations proximate to the site for these spaces. The goal is to finalize a site selection over the coming months as the development review process advances.

2.1.3 Transportation System

2.1.3.1 Study Area

The study intersections, shown in Figure 2-2 below, are as follows.

2.1.3.1.1 Washington St. / Vernon St.
2.1.3.1.2 Shawmut Ave. / Malcolm X Blvd.
2.1.3.1.3 Washington St. / Malcolm X Blvd. / Dudley St.
2.1.3.1.4 Warren St. / Dudley St.
2.1.3.1.5 Harrison Ave. / Dudley St.

Figure 2.3 Study Area

[1] Per Pat Hoey, Boston Transportation Department, Sept. 22 2016

2.1.3.2 Public Streets

The intersections of Washington St., Malcolm X Blvd./Dudley St., Warren St. and Harrison Ave. comprise Dudley Square, the historic center of Roxbury. The pattern of streets – converging from downtown and the South End, Jamaica Plain, Forest Hills, Mattapan and Dorchester – and the presence of the MBTA station are integral to Dudley Square's role as the heart of the community.

2.1.3.3 Intersections

1. Washington St. / Vernon St. Along the short one-way southbound stretch of Washington St. from Warren St. to Dudley St., Vernon St. approaches eastbound at a signalized intersection. Washington St. has two lanes; Vernon St. has one. There is parking on both sides of both streets.
2. Shawmut Ave. / Malcolm X Blvd / Roxbury St. Shawmut Ave. is one-way southbound on the north side of the intersection, with a three-lane approach to Malcolm X Blvd., and no parking at the intersection on the south side of the intersection Shawmut Ave. is two-way; its northbound approach has one left-turn lane and one lane for right turns onto either Malcolm X Blvd. or Roxbury St. Malcolm X Blvd. has two lanes in each direction, and a five-foot wide concrete median. There is parking on the westbound approach, and there are bus stops on both the westbound departure and the eastbound approach. Roxbury St. is one-way away from the intersection, leading to Washington St. opposite Dudley Square Station.
3. Washington St. / Malcolm X Blvd. / Dudley St. Washington St. is one-way southbound on the north side of the intersection, with a two-lane approach. On the south side of the intersection Washington St. is two-way; its northbound approach has two right-turn lanes. (North bound left turns are not allowed, as they can be accomplished by turning onto northbound Shawmut Ave. and left at the Malcolm X intersection.) Malcolm X Blvd. turns into Dudley St. at Washington St.; both approaches have two lanes.
4. Warren St. / Dudley St. Intersections 4 and 5 result from Dudley St. crossing just north of the point where Warren St. and Harrison Ave. diverge, Dudley St. forming the northern leg of the triangle. On the Warren St. eastbound approach, Dudley St. has two thru lanes as well as exclusive left- and right-turn lanes. Westbound, Dudley St. has one thru and one thru/right lane. Westbound left turns from Dudley St. to Warren Ave. are not allowed, but can be accomplished by turning left at Harrison Ave. North of the intersection, Warren St. is one-way north. Thus Warren St. southbound can only be reached via right turn from Dudley St. eastbound. The Warren St. northbound approach to the intersection has one left, one thru and one channelized right turn lane. There is parking on the northbound and eastbound approaches.
5. Harrison Ave. / Dudley St. Harrison Ave. has one approach lane in the northbound and southbound directions, from which all turns are possible. There is parking on the northbound approach. Dudley St. has two lanes in each direction: on the eastbound approach, one thru/right and one left-turn-only lane; and on the westbound approach, one thru/right and one thru/left lane.

2.1.4 Access Plan Methodology

To accurately assess the transportation and parking impacts of the proposed project, the following aspects were analyzed.

- Vehicular traffic operations
- Project parking program
- Transit service availability and projected usage
- Bicycle usage

On the basis of this analysis, appropriate measures are proposed to ensure that the project has minimal or positive impacts on the transportation system and the local public realm.

This Access Plan follows a standard method to assess the transportation impacts of the pro- posed project. Existing conditions are compared to two alternative future scenarios: a No- Build scenario, which takes into account traffic that will be generated by planned but not yet operational land development, and a Build scenario, in which the proposed project is also considered.

The impacts of the project, detailed in the Build Scenario, are projected through a four-step process:

- Trip Generation
- Mode Split
- Trip Distribution
- Route Assignment

2.1.5 Existing Conditions

The conditions of traffic movement in Dudley Square fluctuate from day to day and hour to hour. For purposes of planning, the Boston Transportation Department has requested that a single snapshot of traffic volumes in the Square be used as a basis for analysis. The BTD there- fore provided the Synchro files for analysis of existing conditions. For the same reason, the counts of pedestrian and bicycle traffic volumes shown in Figs. 2.8, 2.9, 2.11, 2.12, 2.13 and 2.14 are taken from the BTD's Dudley Square Design Project.[2]

2.1.7.1 Vehicular Traffic.

Figures 2.4 and 2.5 show existing-condition traffic volumes in the AM and PM peak hours, respectively.

[2]**https://www.boston.gov/departments/transportation/dudley-square-design-project**

Figure 2.4 Existing AM Peak-hour Vehicular Traffic Volumes

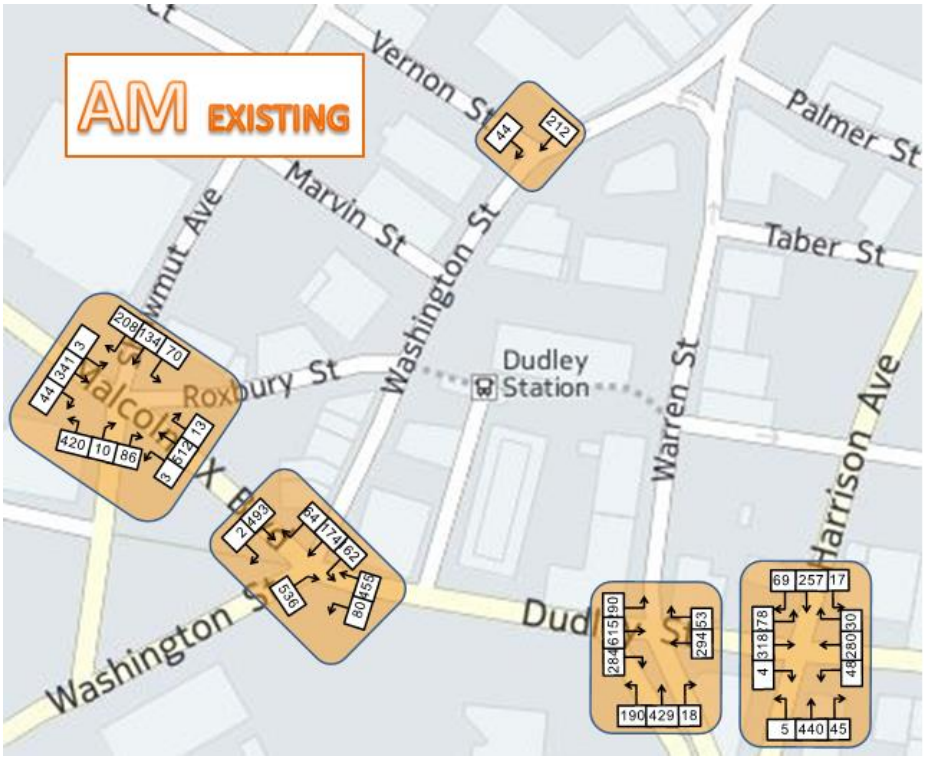
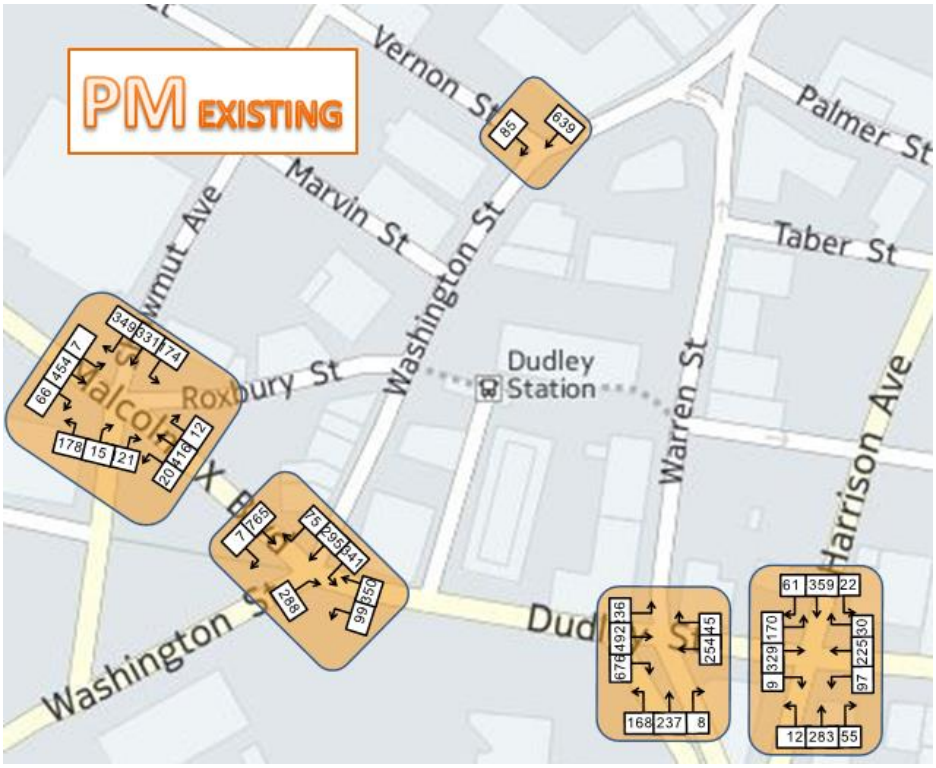


Figure 2.5 Existing PM Peak-hour Vehicular Traffic Volumes



2.1.6 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). Intersection geometry – numbers of turning lanes, lane lengths, and widths – is incorporated into the operations analysis.

Level of service (LOS) is measured in terms of letter grades from A to F, representing average delays as shown in Table 2.2. LOS A indicates minimum traffic delay, while LOS F represents the worst (unacceptable) condition, with significant traffic delay.

Table 2.2 Level of Service Criteria, Delay in Seconds per Vehicle

LOS	Average Delay in seconds
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80
Source: 2000 Highway Capacity Manual, Transportation Research Board.	

Table 2.3 shows the results of capacity analysis at the study intersections under existing conditions.

Table 2.3 Existing AM and PM Peak-hour Delay and Level of Service

	AM Peak Hour		PM Peak Hour	
INTERSECTION	**Delay**	**LOS**	**Delay**	**LOS**
Washington St./Vernon St.	**3.1**	**A**	**4.3**	**A**
Washington St. Southbound	3.4	A	4.4	A
Vernon St. Eastbound	0.6	A	3.6	A
Malcolm X Blvd./Shawmut Ave.	**59.6**	**E**	**64.0**	**E**
Shawmut Ave. Southbound	56.2	E	61.9	E
Malcolm X Blvd. Eastbound	45.8	D	96.7	F
Shawmut Ave. Northbound	101.8	F	67.4	E
Malcolm X Blvd. Westbound	29.7	C	29.0	C
Malcolm X Blvd./Washington St./Dudley St.	**88.4**	**F**	**75.1**	**E**
Washington St. Southbound	43.4	D	52.3	D
Malcolm X Blvd. Eastbound	16.6	B	55.2	E
Washington St. Northbound	184.0	F	110.3	F
Dudley St. Westbound	88.6	F	123.0	F
Dudley St./Warren St.	**24.6**	**C**	**15.3**	**B**
Dudley St. Eastbound	12.1	B	5.7	A
Warren St. Northbound	44.4	D	44.1	D
Dudley St. Westbound	27.7	C	19.5	B
Dudley St./Harrison Ave.	**27.2**	**C**	**23.8**	**C**
Harrison Ave. Southbound	25.4	C	32.0	C
Dudley St. Eastbound	18.2	B	3.6	A
Harrison Ave. Northbound	22.9	C	26.9	C
Dudley St. Westbound	54.1	D	38.9	D

Detailed Highway Capacity Analysis worksheets are provided in the Appendix.

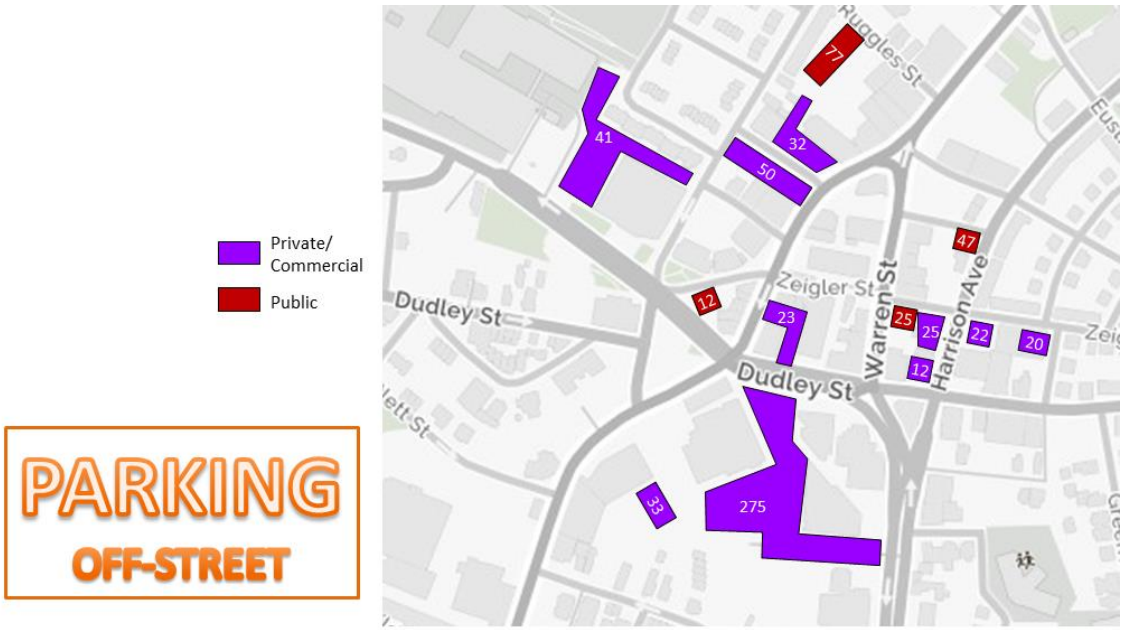
2.1.7 Public Parking

Figure 2.6 shows curbside use and parking regulations on public streets in the study area.

Figure 2.6 Curb Regulation

Figure 2.7 shows the location and capacity of off-street parking in the study area.

Figure 2.7 Off-Street Parking Lots and Capacities



2.1.8 Pedestrian Circulation

Dudley Square is a highly lively environment with movement in all directions. Figures 2.8 and 2.9 show counts of pedestrians at intersections, from the BTD's Dudley Square Design Project. Although they do not capture the full vitality of the Square, the counts indicate heavy pedestrian volumes intersecting with vehicular movements. Of particular note is the number of people crossing Washington St. at its unsignalized intersection with Roxbury St., to get to and from Dudley Station.

Figure 2.8 AM Pedestrian Volumes at Intersections

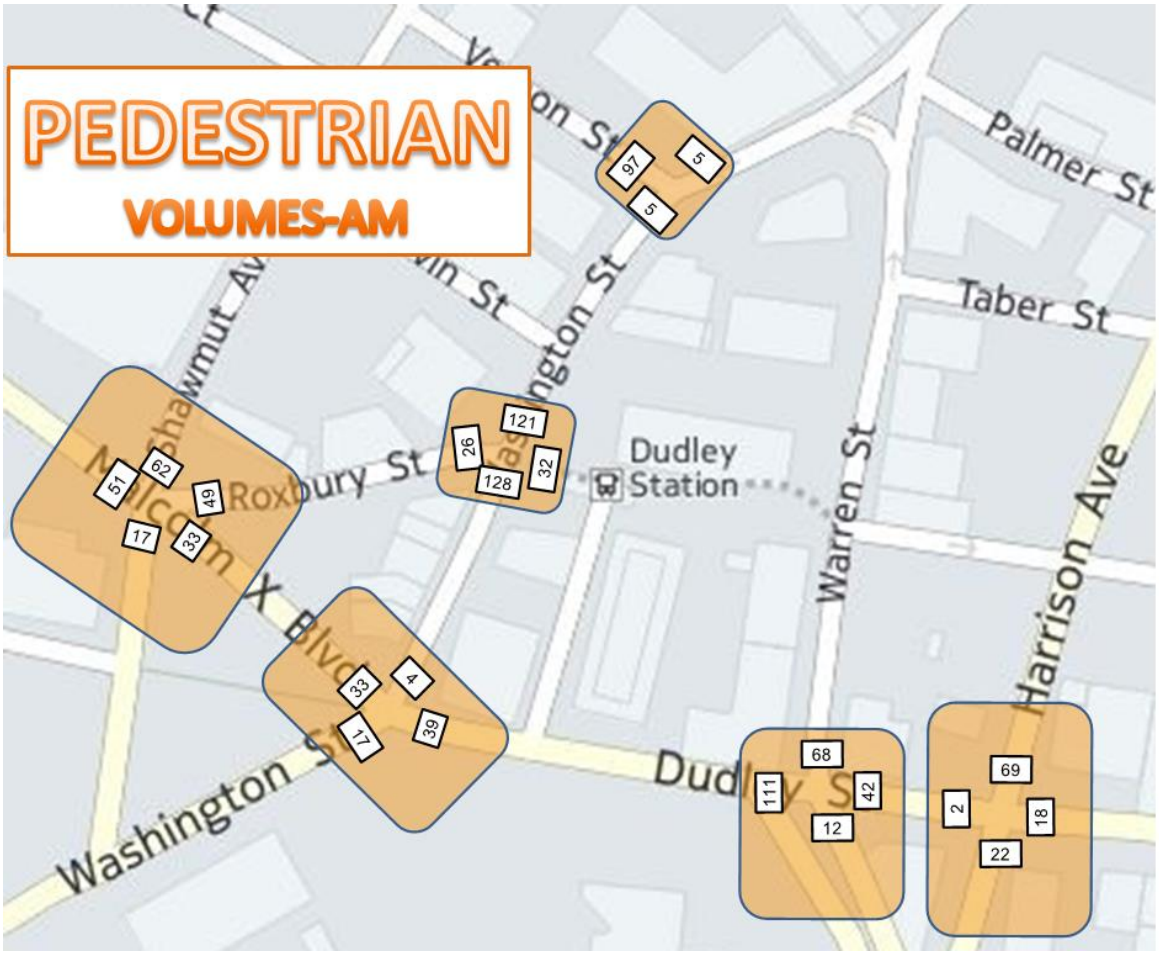
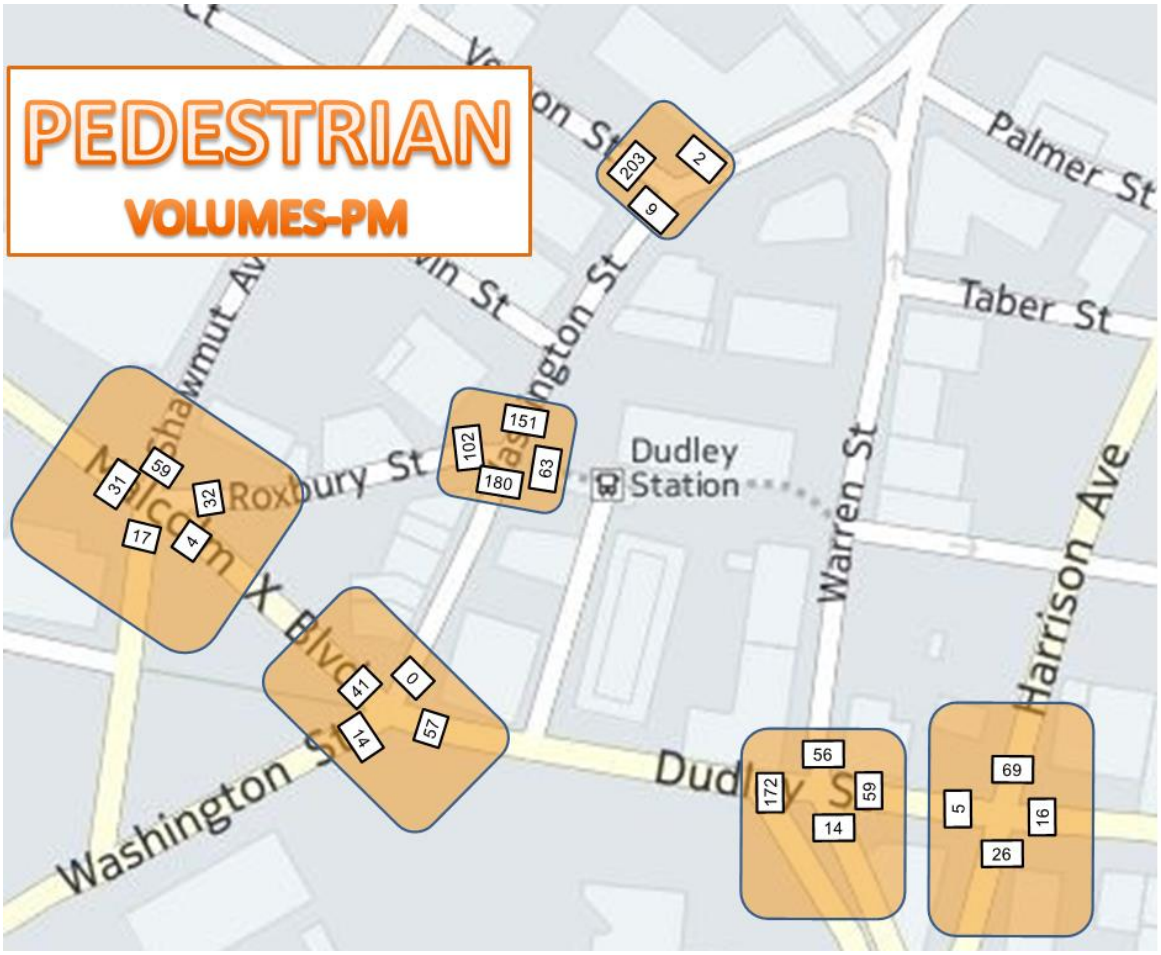


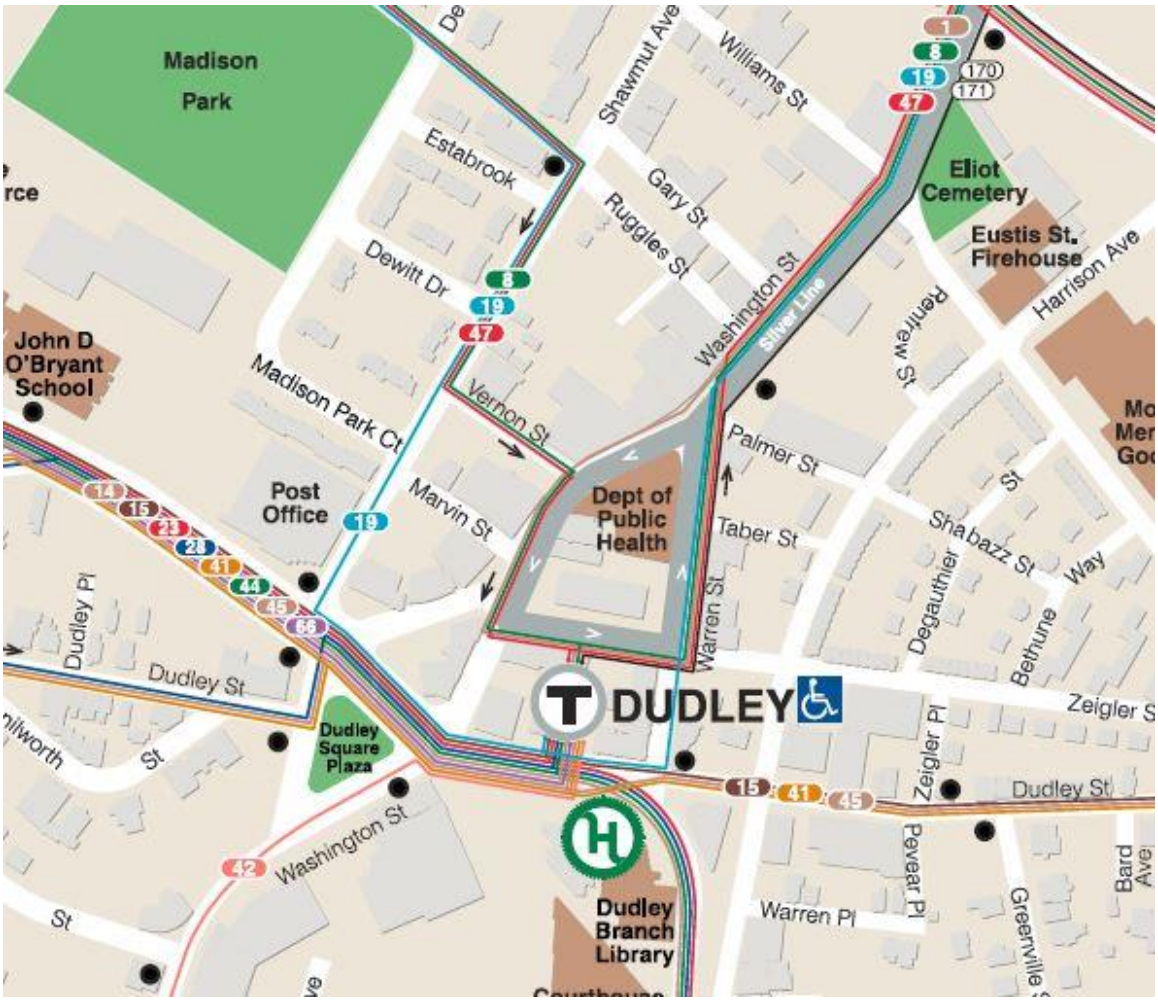
Figure 2.9 PM Pedestrian Volumes at Intersections



2.1.9 Transit

Figure 2.10 shows existing bus routes, including the Silver Line BRT.

Figure 2.10 MBTA System Map Detail



Figures 2.11 and 2.12 show the volumes of buses at study area intersections in the AM and PM peak hours.

Figure 2.11 Bus Volumes, AM Peak Hour

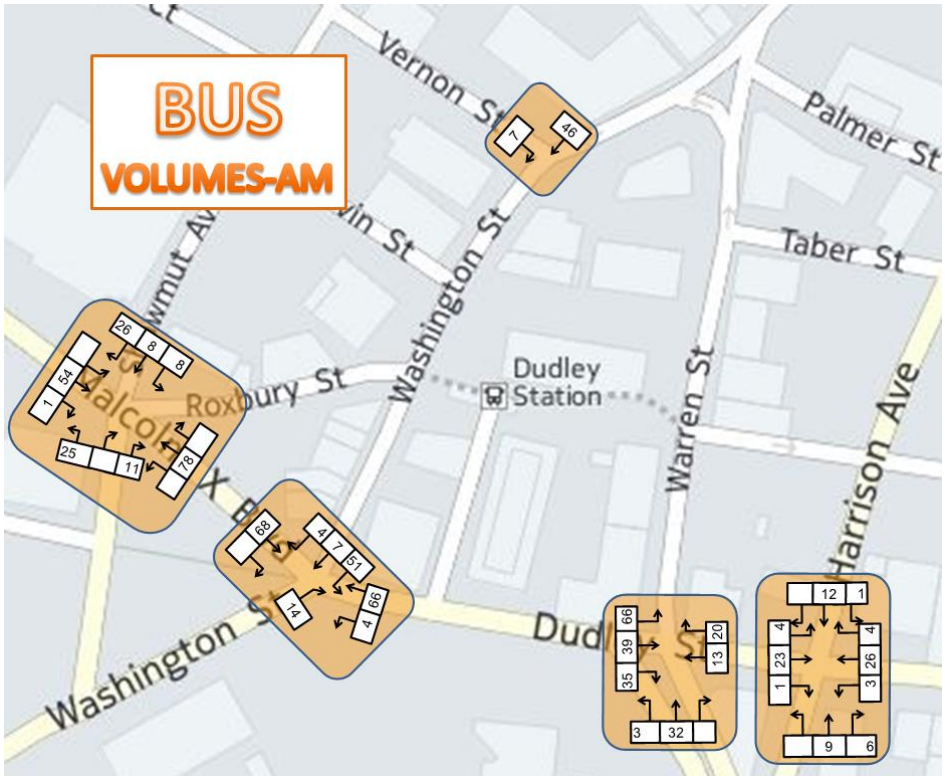
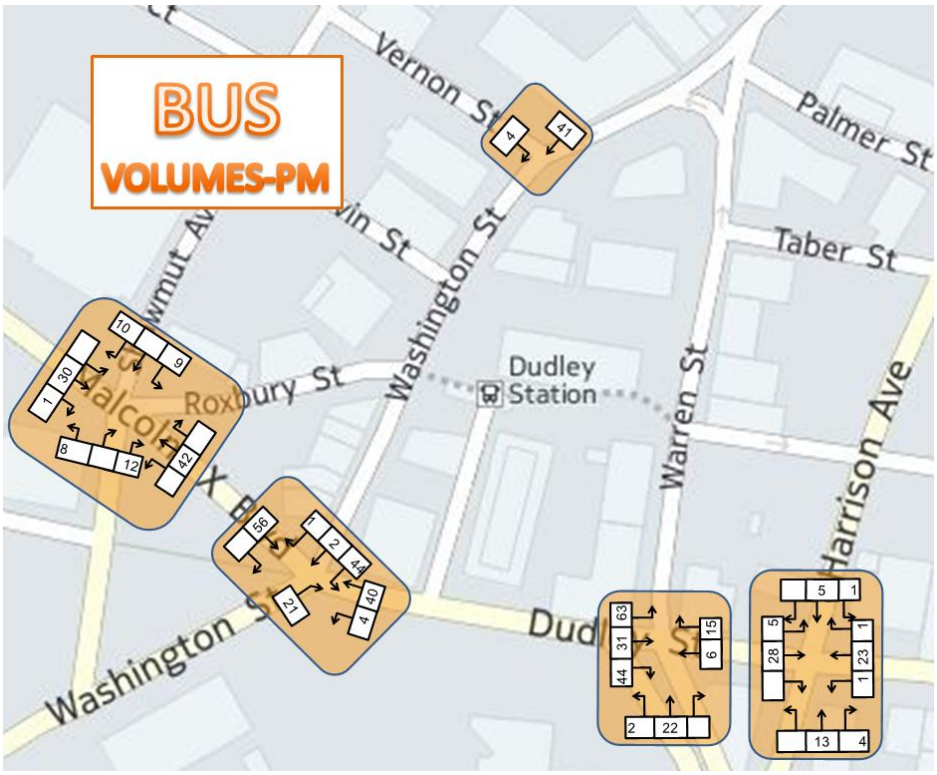


Figure 2.12 Bus Volumes, PM Peak Hour



2.1.10 Bicycle Conditions and Facilities

Figures 2.13 and 2.14 show bicycle volumes at the study area intersections in the AM and PM peak hours.

Figure 2.13 Bicycle Volumes, AM Peak Hour

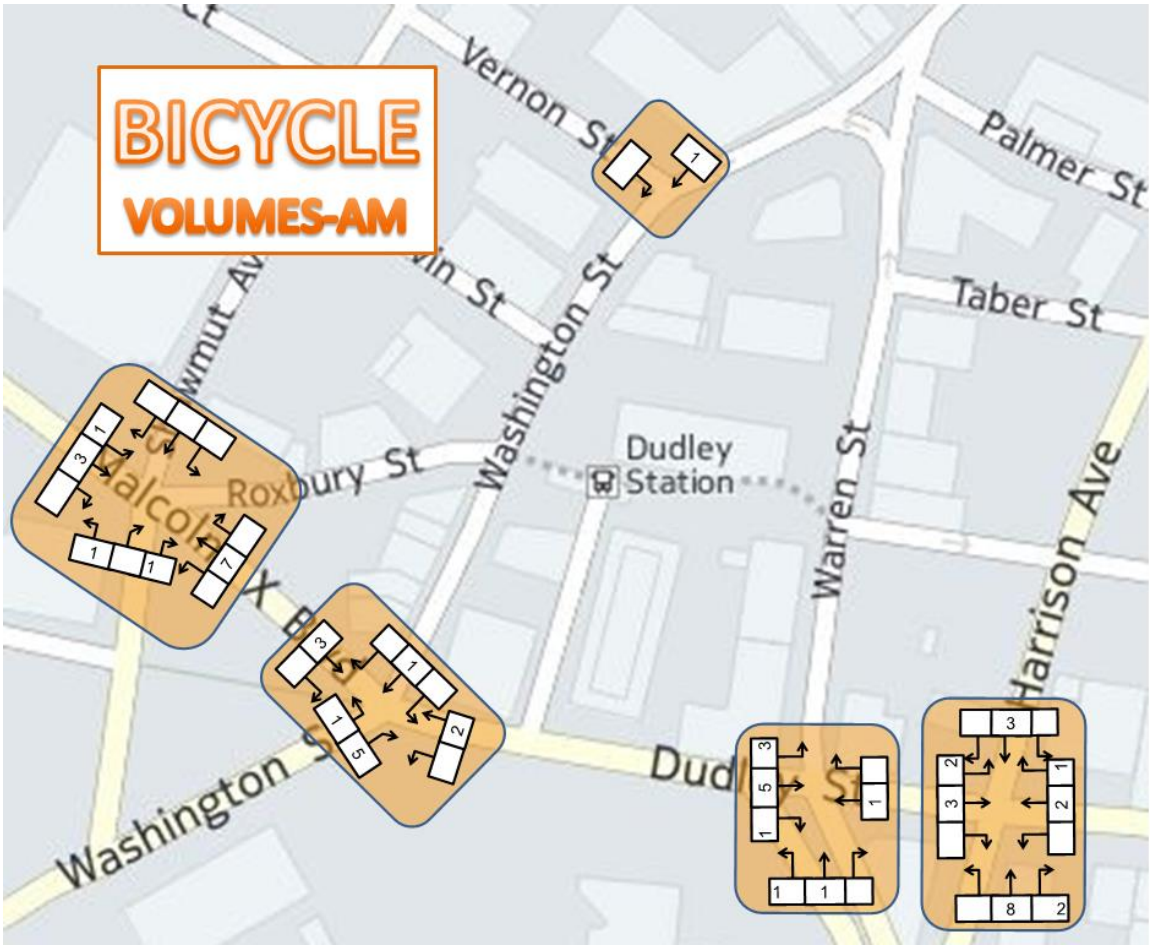
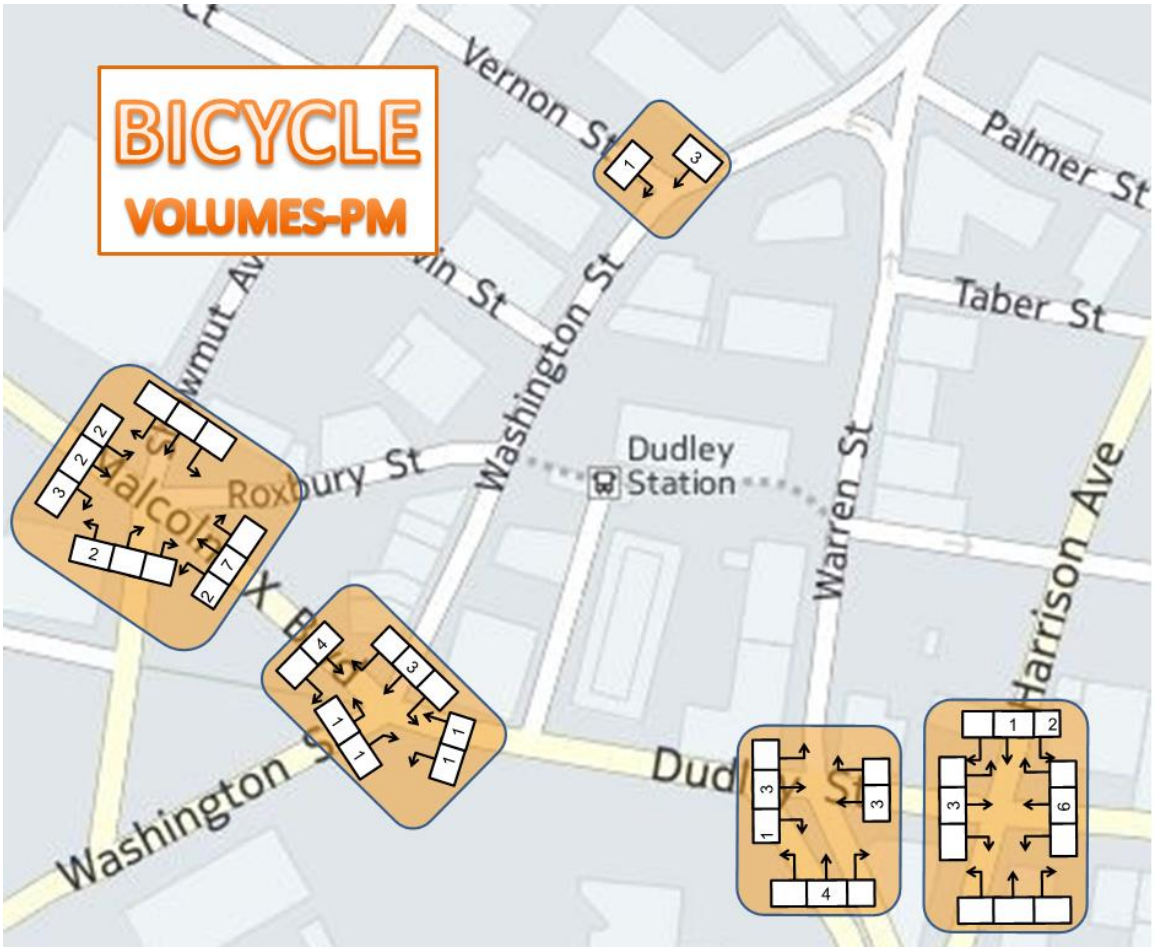


Figure 2.14 Bicycle Volumes, PM Peak Hour



2.1.11 Complete Street Opportunities for Marvin Street

The Boston Transportation Department and MBTA are in the process of implementing the City's Complete Street standards in Dudley Square. Under consideration was the re-routing of busses from Vernon Street to Marvin Street. Marvin Street currently has a narrow right of way resulting in the sidewalk adjacent to the Project being only five feet wide to accommodate a single travel lane and a parking lane. Relocating the bus route to Marvin would limit opportunities to convert the corridor to special urban place – a shared street for vehicles and pedestrians and the front door for the Rio Grande residences.

The Proponent will work with BTD to accommodate the changes from BTD's Dudley Square Complete Streets project and how it will affect this site, specifically the curb line and bus and vehicular operational changes anticipated for Roxbury Street.

The Proponents will continue to develop plans for Marvin Street in conjunction with BPDA design staff and the BTD.

2.1.12 Car Sharing

DriveBoston is the City's program to provide parking spaces in municipal lots and on city streets for car share vehicles. Currently there is a car share location on Ruggles St. between Washington St. and Shawmut Ave. The car sharing system has become a popular alternative to car ownership and reduces demand for on-site parking. Expansion of car sharing resources through dedicated car share spaces will be part of the programming as the Project finalizes plans to meet its parking requirements

2.1.13 No-Build Scenario

The No-Build Scenario portrays a projected future condition in which traffic volumes have changed due to the impact of specific identified development projects in the vicinity, which are planned for construction but have not yet been completed (pipeline projects).

To identify traffic expected to be generated by specific pipeline projects, all development proposals currently or recently under review by the Boston Planning and Development Agency (former BRA) were reviewed. A number of projects are in the pipeline in Roxbury[3]:

- Tremont Crossing Parcel P-3
- 1004-1012 Tremont St.
- 1065 Tremont St.
- 2-14 Taber St.
- 280-290 Warren St.
- 35 Northampton St.
- Bartlett Place
- Bartlett Station
- Bridge Boston Charter School
- DeWitt Community Center
- Douglass Park
- Madison Park Infill Parcel P-10
- Melnea Hotel
- Northampton Square
- Northeastern University Columbus Ave. housing
- Whittier Choice
- Walker Place
- 3012 Washington St.

Of these, it was determined that four are specifically projected to generate traffic through the Rio Grande study intersections.

- Madison Park Infill
- Melnea Hotel
- Bartlett Place
- Madison Tropical Parcel P-10

On the basis of the trip generation and trip distribution factors presented in the Project Notification Forms for these four projects, local project-specific trips through the study intersections were calculated, and are shown in Figures 2.15 and 2.16 for the AM and PM peak hours respectively.

[3] **http://www.bostonplans.org/projects/development-projects**

Figure 2.15 Trips generated by Background Projects, AM Peak Hour

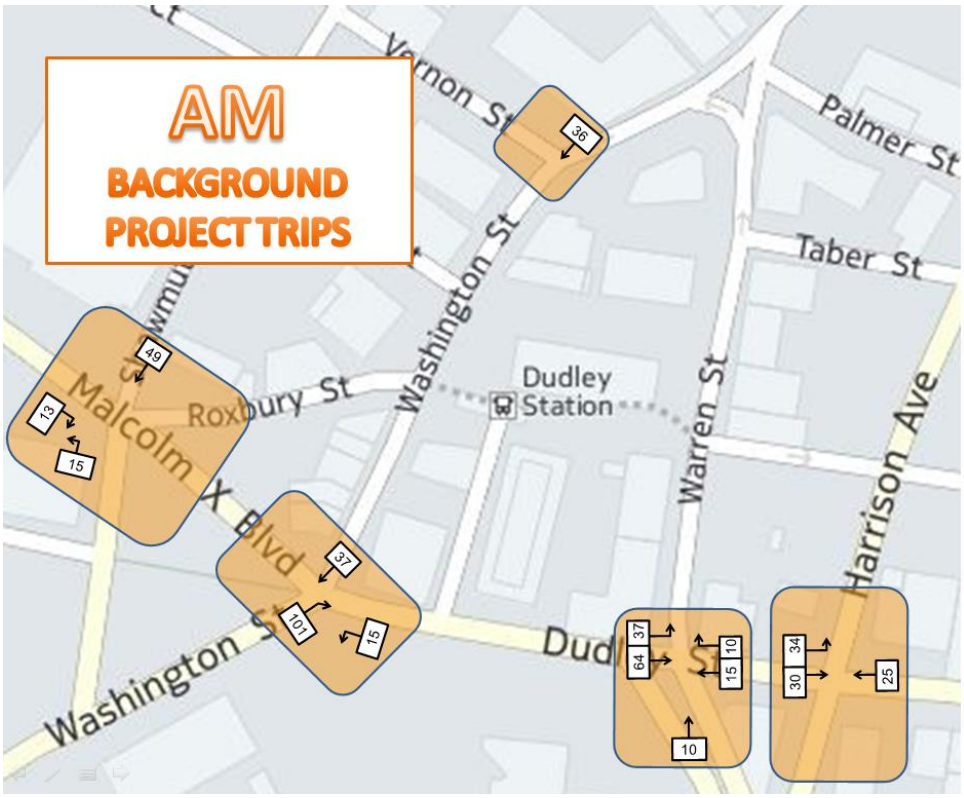
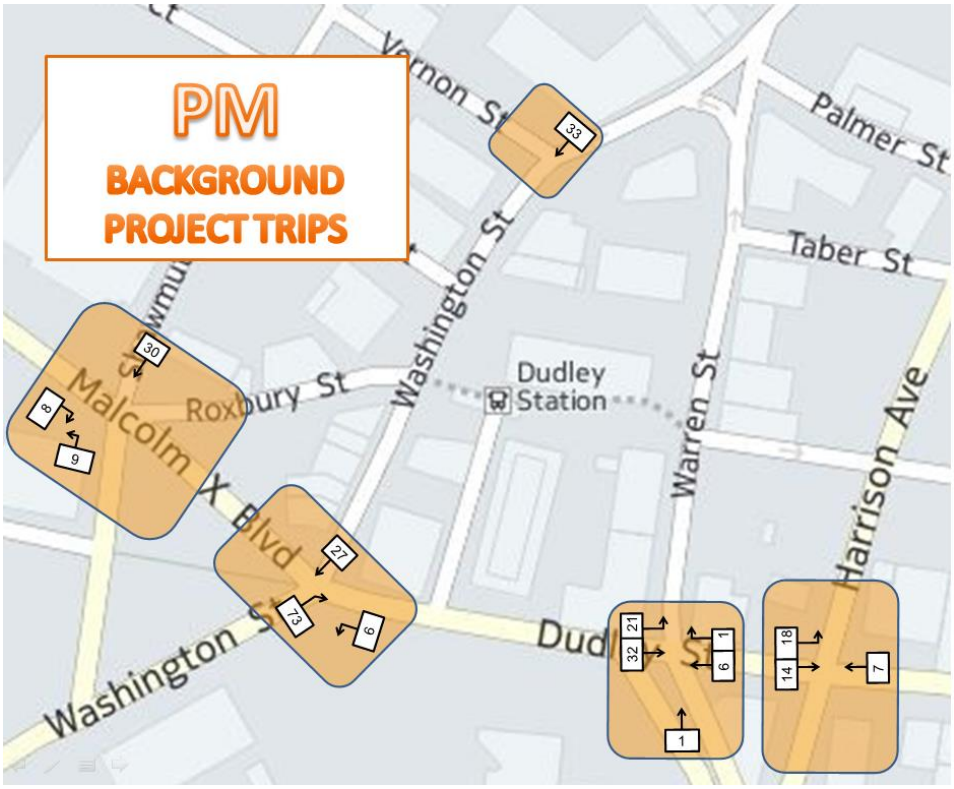


Figure 2.16 Trips generated by Background Projects, PM Peak Hour



To arrive at the No-Build scenario, the background development volumes were combined with the general traffic growth of .5% per year, over a period of 6 years, and added to the Existing Traffic volumes shown in Figures 2.4 and 2.5. Figures 2.17 and 2.18 show the projected No-Build traffic volumes for the AM and PM peak hours, respectively.

Figure 2.17 AM Peak-hour Vehicular Traffic Volumes, No-Build Scenario (2022)

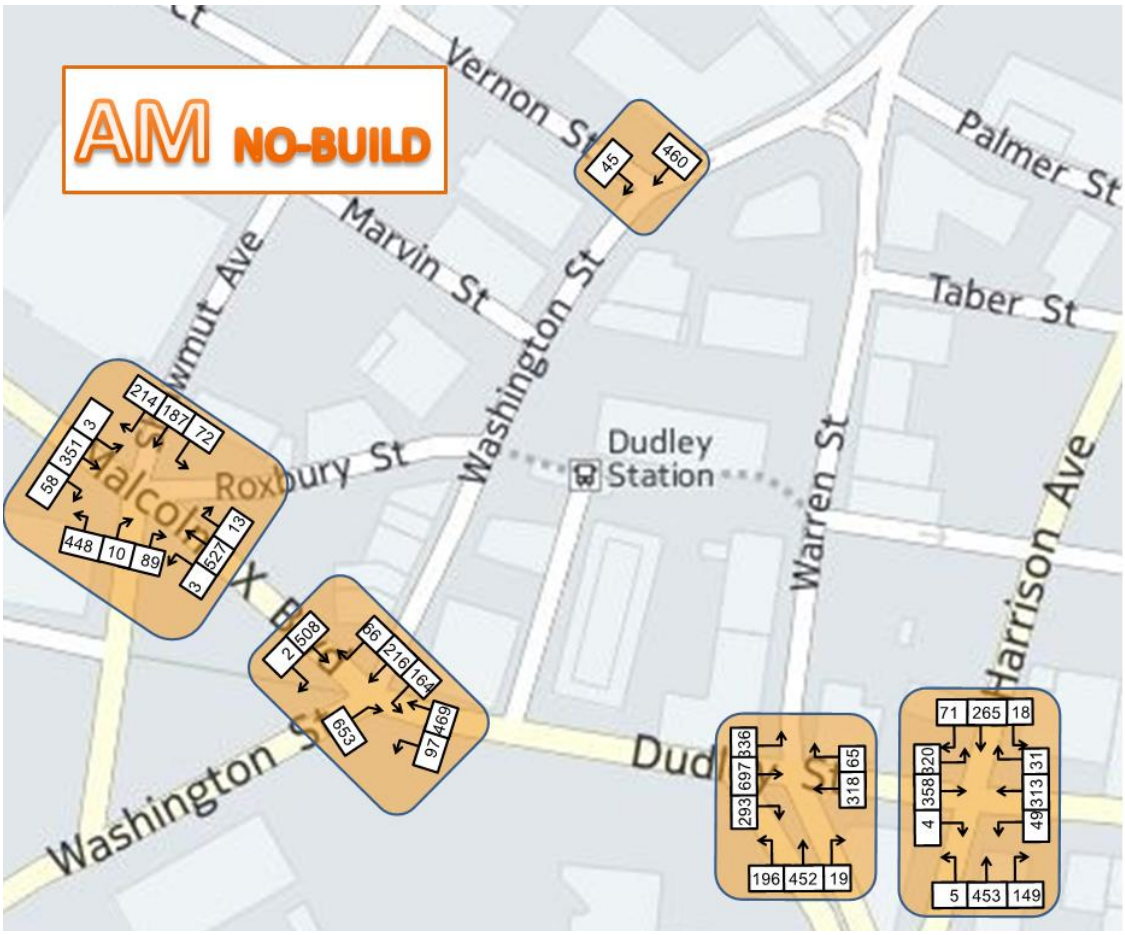


Figure 2.18 PM Peak-hour Vehicular Traffic Volumes, No-Build Scenario (2022)

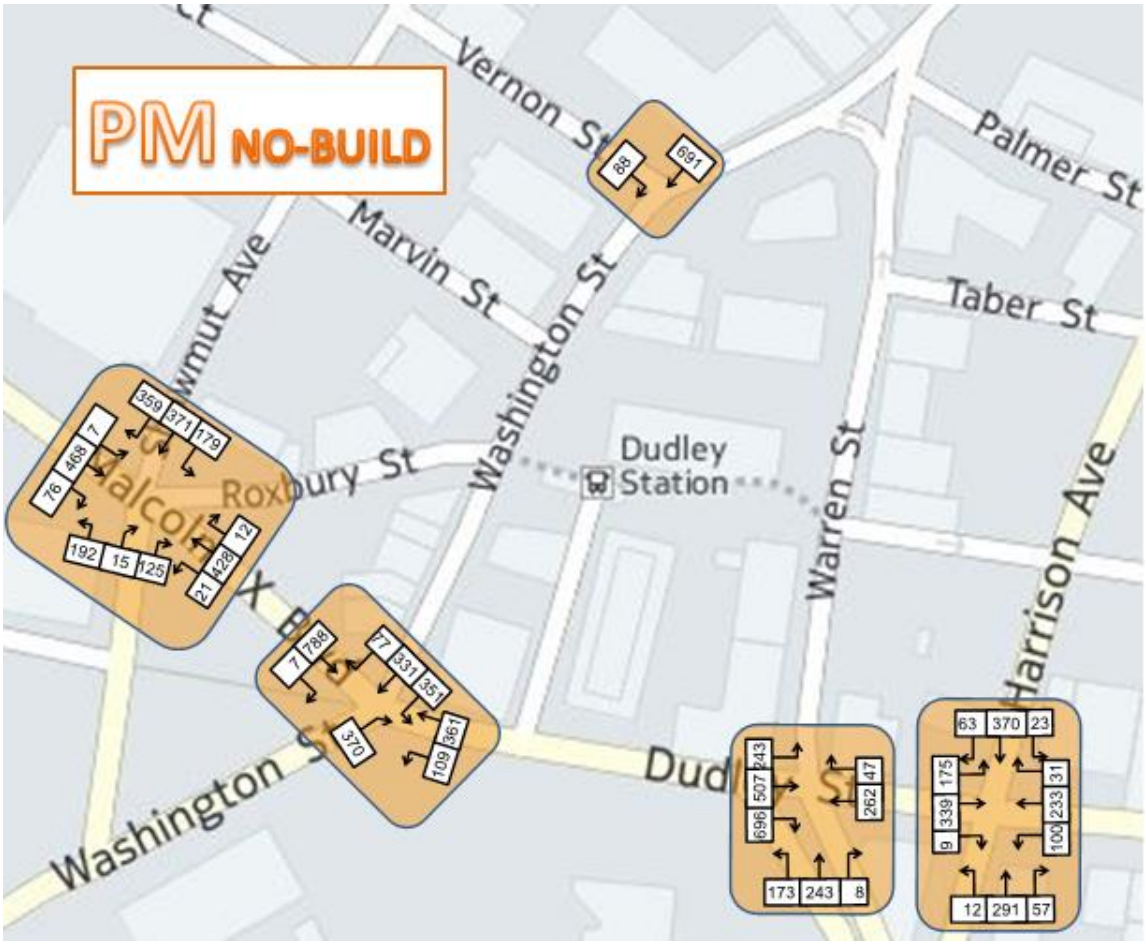


Table 2.4 shows the results of capacity analysis at the study intersections under the No-Build scenario.

Table 2.4 No-Build Scenario AM & PM Peak-hour Delay and Level of Service

	AM Peak Hour		PM Peak Hour	
INTERSECTION	**Delay**	**LOS**	**Delay**	**LOS**
Washington St./Vernon St.	**3.2**	**A**	**4.7**	**A**
Washington St. Southbound	3.5	A	4.6	A
Vernon St. Eastbound	0.7	A	5.5	A
Malcolm X Blvd./Shawmut Ave.	**66.8**	**E**	**67.2**	**E**
Shawmut Ave. Southbound	59.8	E	67.6	E
Malcolm X Blvd. Eastbound	47.3	D	98.9	F
Shawmut Ave. Northbound	123.8	F	69.6	E
Malcolm X Blvd. Westbound	28.3	C	28.5	C
Malcolm X Blvd./Washington St./Dudley St.	**135.3**	**F**	**98.0**	**F**
Washington St. Southbound	43.1	D	55.3	E
Malcolm X Blvd. Eastbound	17.8	B	62.0	E
Washington St. Northbound	300.9	F	213.2	F
Dudley St. Westbound	115.9	F	137.5	F
Dudley St./Warren St.	**30.5**	**C**	**15.4**	**B**
Dudley St. Eastbound	16.9	B	5.3	A
Warren St. Northbound	55.3	E	45.2	D
Dudley St. Westbound	31.0	C	20.4	C
Dudley St./Harrison Ave.	**38.6**	**D**	**24.3**	**C**
Harrison Ave. Southbound	25.8	C	32.8	C
Dudley St. Eastbound	28.9	C	3.6	A
Harrison Ave. Northbound	24.3	C	27.2	C
Dudley St. Westbound	93.3	F	39.7	D

2.1.14 Build Scenario

Trip Generation and Mode Split. The Institute of Transportation Engineers' trip generation rates are based on observations of land uses all over the United States, where transit is largely unavailable and the vast majority of trips are made by private automobile. In contrast, Dudley Square is walkable and transit-rich, with a significantly lower level of auto-dependence. To account for the effect of transit use on the vehicular trip generation characteristics of the Rio project, non-auto mode shares were deducted from the trip generation rates given in the Trip Generation manual.

According to the BTD's Development Review Guidelines the auto mode share for trips originating the Roxbury 1 district is 56% on a daily basis[1]. Accordingly, the trip generation rates for the Rio Grande project have been reduced by 44%. Table 4 shows the factors used in calculating the vehicle-trip volume projections.

[1] Assuming HOV (High Occupancy Vehicles) carry an average of 2.5 persons.

Table 2.5 Trip Generation Factors

Description/ ITE Code	#	Units	Weekday Trips	AM Trips	PM Trips	Vehicle Occupancy	Auto %	Pass-by %	AM In	AM Out	PM In	PM Out
Mid-Rise Apartment/ 223	211	DU	5.40	0.30	0.39	1.1	56%		31 %	69 %	58 %	42 %
General Office/ 710	28.208	KGSF	11.03	1.56	1.49	1.1	56%		88 %	12 %	17 %	83 %
Specialty Retail Center/ 826	25.977	KGSF	44.32	6.84	2.71	1.1	56%	50%	48 %	52 %	44 %	56 %

Table 2.6 shows vehicle-trips generated by the Rio Grande project, on the basis of the trip generation factors shown above.

Table 2.6 Vehicle-trips Generated by Rio Grande project

Description/ITE Code	Weekday	AM Trips		PM Trips	
		AM In	AM Out	PM In	PM Out
Mid-Rise Apartment/ 223	700	12	27	29	21
General Office/ 710	191	24	3	4	21
Specialty Retail Center/ 826	708	26	28	10	12
Total	**1,599**	**62**	**59**	**43**	**55**

2.1.15 Trip Distribution and Route Assignment

Trip distribution and local route assignment were modeled based on the BTD Zone 15 trip table, which shows the distribution of trips between Roxbury and other zones within the greater Boston area. Figures 2.19 and 2.20 show the assignment of inbound and outbound trips, respectively, through the study intersections.

Figure 2.19 Trip Distribution and Route Assignment, Inbound

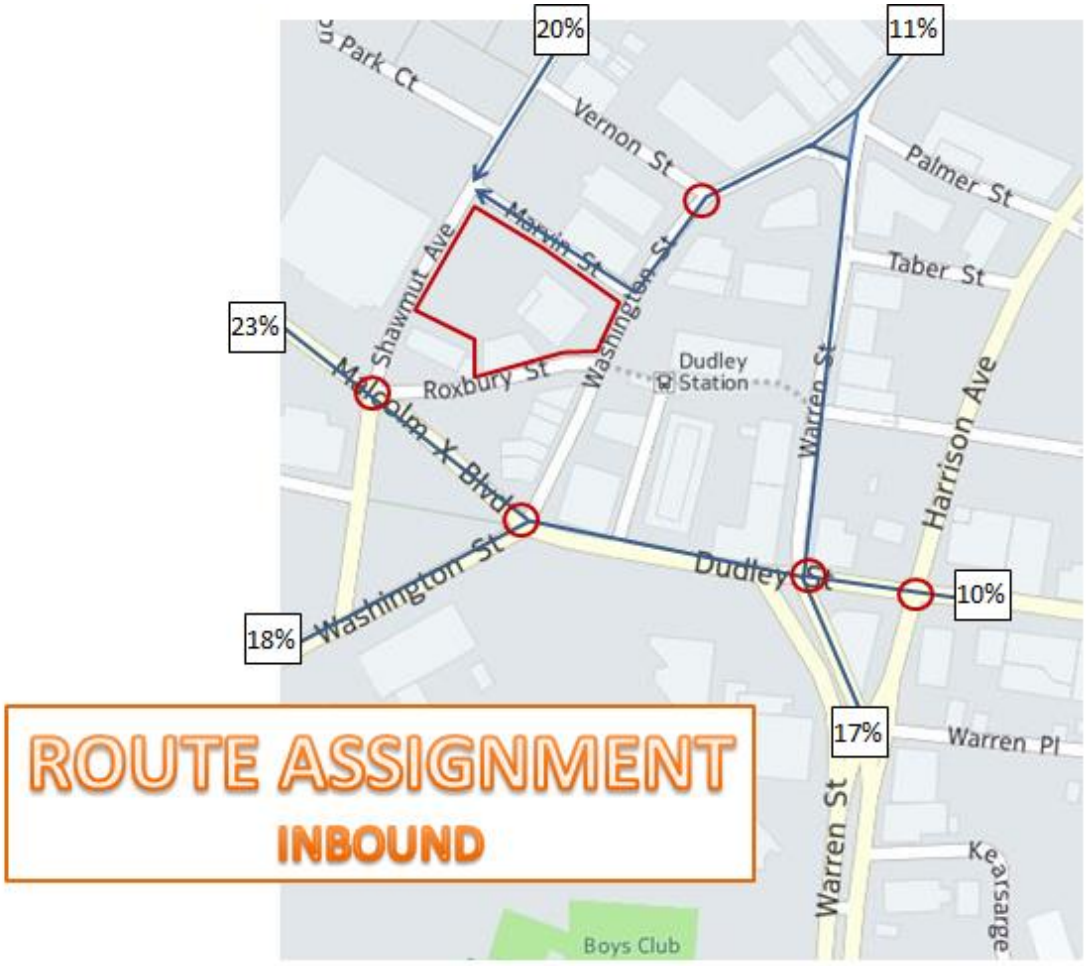
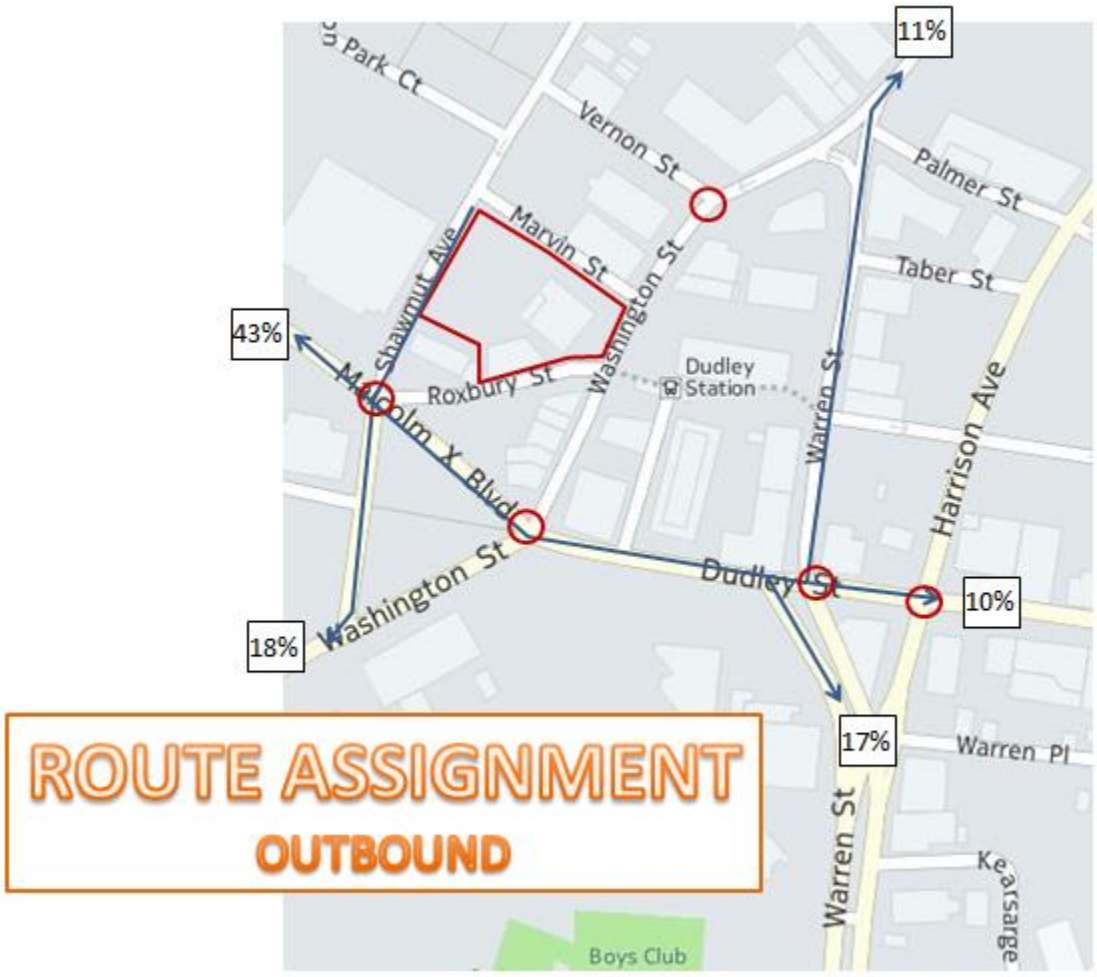


Figure 2.20 Trip Distribution and Route Assignment, Outbound



Figures 2.21 and 2.22 show the projected trips generated through the study intersections by the Rio Grande project in the AM and PM peak hours, respectively, based on the trip generation, mode split, trip distribution and trip assignment analysis above.

Project-generated trips are added to the traffic volumes depicted in the No-Build scenario to create the Build scenario, shown in Figures 2.23 and 2.24.

Figure 2.21 Peak-hour Trips Generated by the Rio Grande Project, AM Peak Hour

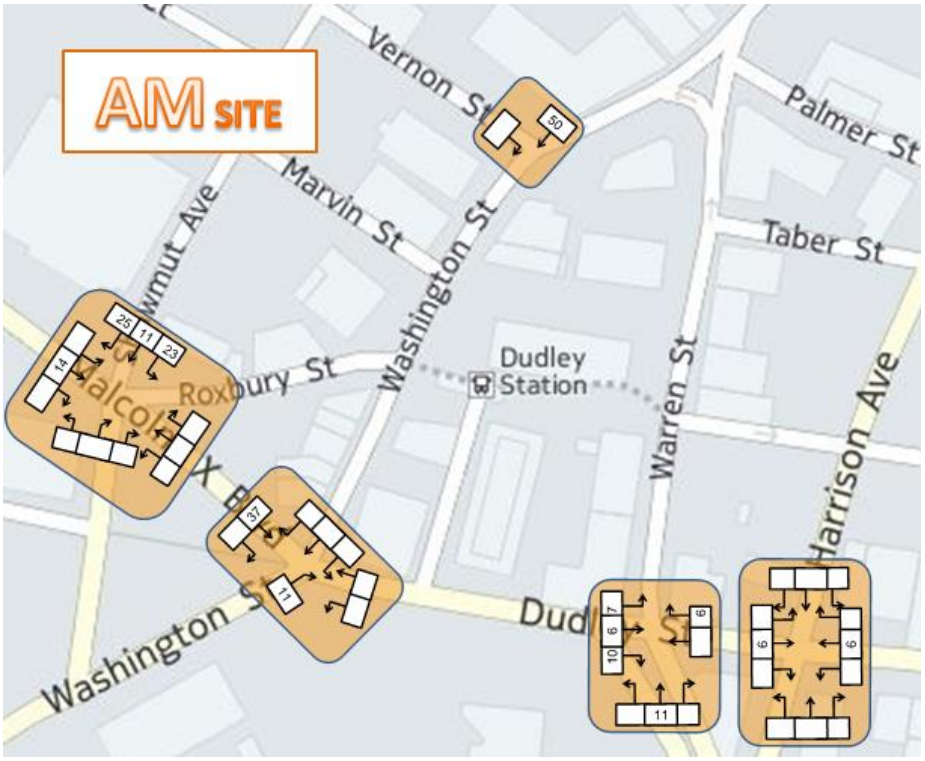


Figure 2.22 Peak-hour Trips Generated by the Rio Grande Project, PM Peak Hour

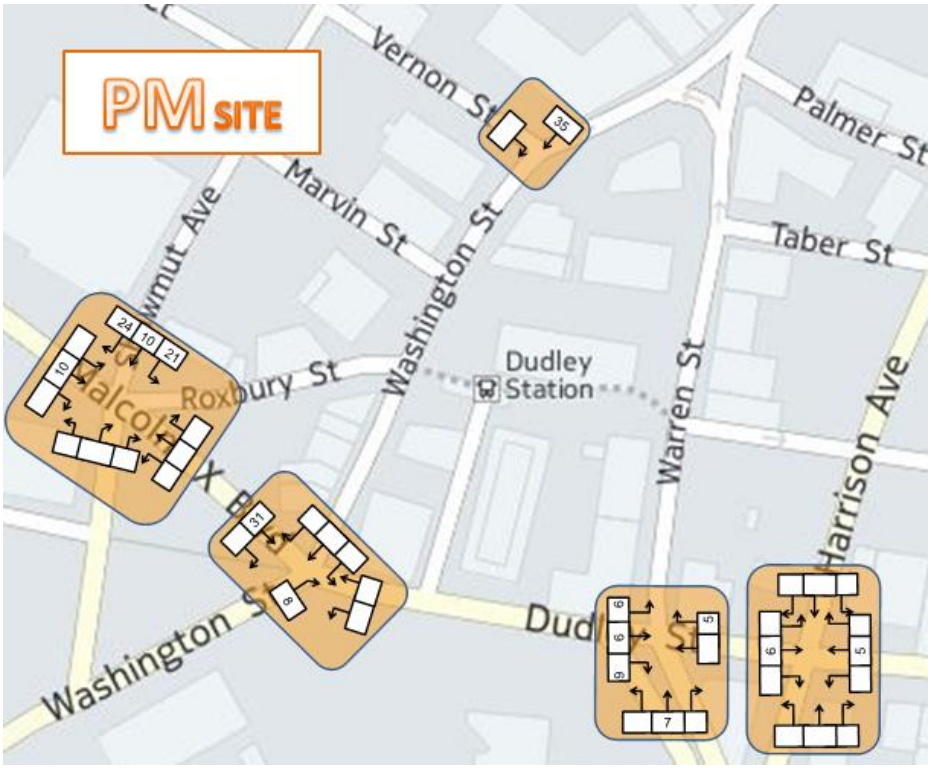


Figure 2.23 AM Peak-hour Vehicular Traffic Volumes, Build Scenario

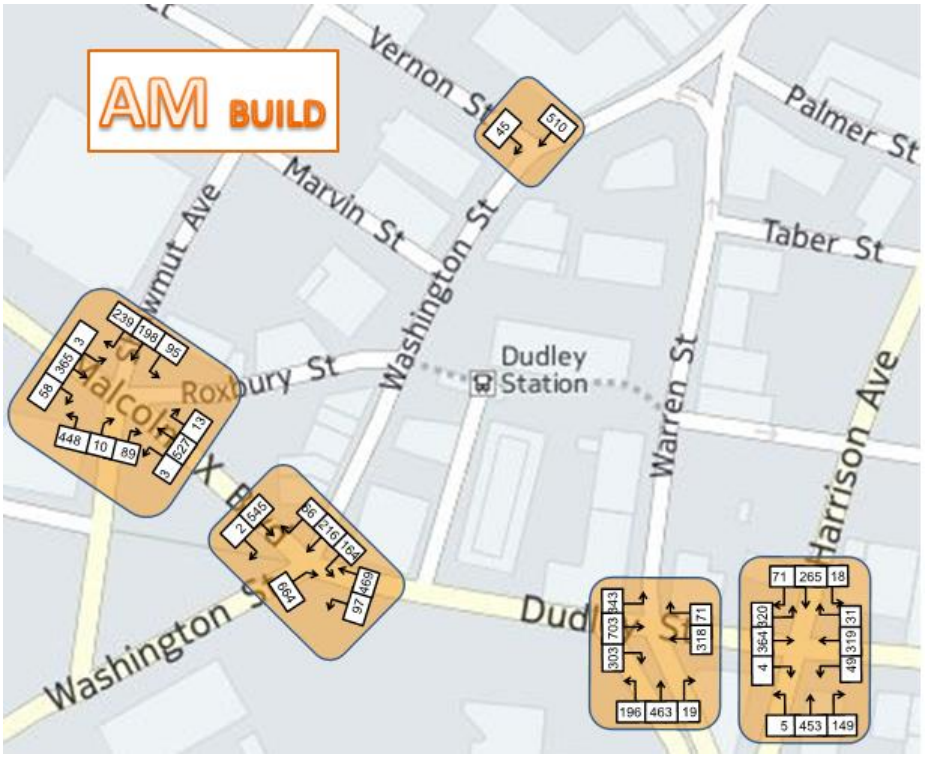


Figure 2.24 PM Peak-hour Vehicular Traffic Volumes, Build Scenario

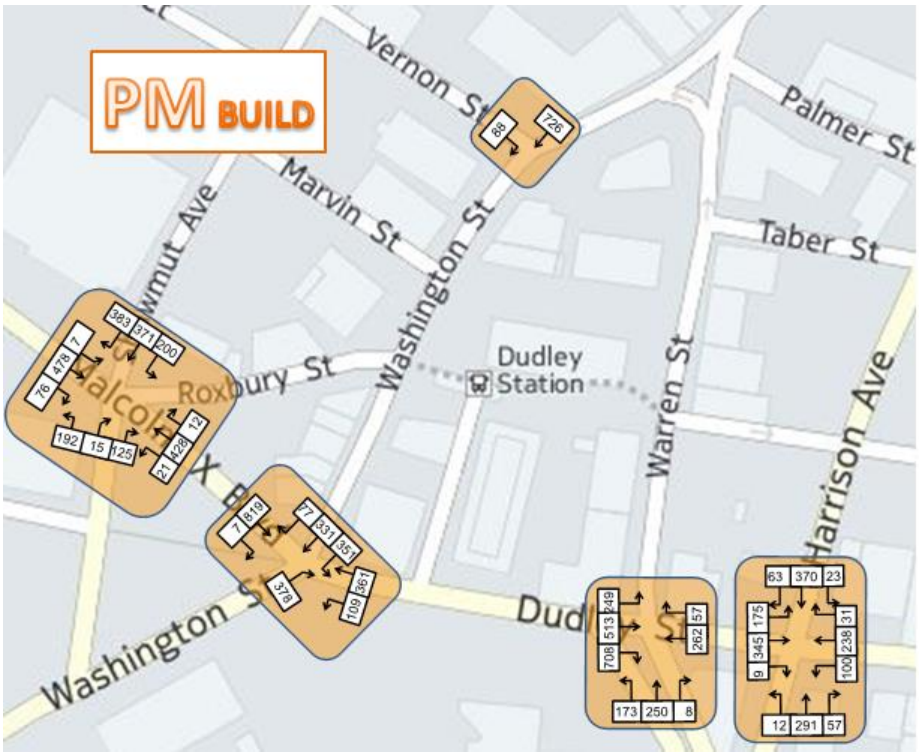


Table 2.6 shows the results of capacity analysis at the study intersections under the Build Scenario.

Table 2.6 Build-Scenario AM and PM Peak-hour Delay and Level of Service

	AM Peak Hour		PM Peak Hour	
INTERSECTION	**Delay**	**LOS**	**Delay**	**LOS**
Washington St./Vernon St.	**3.3**	**A**	**4.9**	**A**
Washington St. Southbound	3.6	A	4.7	A
Vernon St. Eastbound	0.8	A	6.8	A
Malcolm X Blvd./Shawmut Ave.	**69.4**	**E**	**58.0**	**E**
Shawmut Ave. Southbound	69.5	E	74.7	E
Malcolm X Blvd. Eastbound	48.8	D	46.7	F
Shawmut Ave. Northbound	123.8	F	69.6	E
Malcolm X Blvd. Westbound	28.6	C	28.4	C
Malcolm X Blvd./Washington St./Dudley St.	**141.5**	**F**	**103.8**	**F**
Washington St. Southbound	43.0	D	55.3	E
Malcolm X Blvd. Eastbound	19.7	B	73.3	E
Washington St. Northbound	311.8	F	225.5	F
Dudley St. Westbound	129.5	F	137.4	F
Dudley St./Warren St.	**33.5**	**C**	**15.9**	**B**
Dudley St. Eastbound	19.2	B	5.7	A
Warren St. Northbound	60.9	E	46.4	D
Dudley St. Westbound	31.4	C	20.3	C
Dudley St./Harrison Ave.	**41.2**	**D**	**24.3**	**C**
Harrison Ave. Southbound	25.8	C	32.8	C
Dudley St. Eastbound	29.8	C	3.7	A
Harrison Ave. Northbound	24.3	C	27.2	C
Dudley St. Westbound	105.5	F	40.0	D

2.1.16 Project Impacts

Table 2.7 shows a direct comparison of levels of service at each intersection during each scenario and time of day. Some intersections experience delay in all scenarios, especially Malcolm X Blvd./Washington St./Dudley St. However, the impact of the project on intersection operations is negligible. In no instance is there any level-of-service difference between the No-Build and Build scenarios.

Table 2.7 Comparison of Levels of Service in Existing, No-Build and Build

	AM LOS			PM LOS		
Intersection	**Existing**	**No-Build**	**Build**	**Existing**	**No-Build**	**Build**
Washington St./Vernon St.	**A**	**A**	**A**	**A**	**A**	**A**
Washington St. Southbound	A	A	A	A	A	A
Vernon St. Eastbound	A	A	A	A	A	A
Malcolm X Blvd./Shawmut Ave.	**E**	**E**	**E**	**E**	**E**	**E**
Shawmut Ave. Southbound	E	E	E	E	E	E
Malcolm X Blvd. Eastbound	D	D	D	F	F	F
Shawmut Ave. Northbound	F	F	F	E	E	E
Malcolm X Blvd. Westbound	C	C	C	C	C	C
Malcolm X Blvd./Washington St./Dudley St.	**F**	**F**	**F**	**E**	**F**	**F**
Washington St. Southbound	D	D	D	D	E	E
Malcolm X Blvd. Eastbound	B	B	B	E	E	E
Washington St. Northbound	F	F	F	F	F	F
Dudley St. Westbound	F	F	F	F	F	F
Dudley St./Warren St.	**C**	**C**	**C**	**B**	**B**	**B**
Dudley St. Eastbound	B	B	B	A	A	A
Warren St. Northbound	D	E	E	D	D	D
Dudley St. Westbound	C	C	C	B	C	C
Dudley St./Harrison Ave.	**C**	**D**	**D**	**C**	**C**	**C**
Harrison Ave. Southbound	C	C	C	C	C	C
Dudley St. Eastbound	B	C	C	A	A	A
Harrison Ave. Northbound	C	C	C	C	C	C
Dudley St. Westbound	D	F	F	D	D	D

Project-generated Transit Trips. BTD mode share data states that the transit share of trips in Roxbury is 16%. On the basis of the trip generation and mode split factors discussed under Trip Generation above, the Rio Grande project will generate an estimated 485 new transit trips on a daily basis. Approximately 67 new transit trips will occur during the AM peak hour and 55 new trips in the PM peak hour.

2.1.17 Bicycle Accommodation

BTD guidelines for projects subject to Transportation Access Plan Agreements call for a covered bicycle storage space for each unit. Accordingly, the Project will provide 211 covered bicycle storage spaces on-site, within the building parking areas.

2.1.18 Loading/Services

The level of loading and service activity at the site is expected to be and will have impact on the public roadway, sidewalks or parking activity. The Project is expected to generate approximately deliveries per day. It is anticipated that the majority of these deliveries will occur between 7:00 a.m. and 1:00 p.m. These numbers do not include trash truck trips. Loading will be accommodated with designated space in the rear parking area.

2.1.19 Access Plan Agreement

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

Transportation Demand Management. The above analysis demonstrates that the Rio Grande project will not generate significant amounts of vehicular traffic, and will not materially affect the operations of study area streets or intersections. However, to ensure this outcome, and

to play a positive role in the City's efforts to minimize traffic impacts of development and to support sustainable transportation practices, the project will adopt a Transportation Demand Management program. The program will consist of operational commitments regarding parking policies, mobility, alternative modes and pedestrian amenities, and will include:

- TDM will be facilitated by the nature of the Project (which does not generate significant peak hour trips) and its proximity to public transit alternatives.
- On-site management will keep a supply of transit information (schedules, maps, and fare information) to be made available to the residents and patrons of the site. The Proponent will work with the City to develop a TDM program appropriate to the Project and consistent with its level of impact.
- The Proponent is prepared to take advantage of transit access in marketing the site to future residents by working with them to implement the following TDM measures to encourage the use of non-vehicular modes of travel.
- The TDM measures for the Project may include but are not limited to the following:
    - Orientation Packets: The Proponent will provide orientation packets to new residents containing information on available transportation choices, including transit routes/schedules and nearby vehicle sharing and bicycle locations, if applicable.
    - Transportation Coordinator: The Proponent will designate a transportation

coordinator to oversee transportation issues, including parking, service and loading, deliveries, and will work with residents as they move in to raise awareness of public transportation, bicycling and walking opportunities.

- o Project Web Site: The web site will include transportation-related information for residents, workers and visitors.

2.1.20 Construction Management Plan

A Construction Management Plan (CMP) will address construction-period issues and will be submitted by the general contractor to BTD in support of the building permit application. The CMP will be filed with BTD in accordance with the City's transportation maintenance plan requirements. The CMP will cover issues including truck routes, occupancy of public ways, noise and dust attenuation and hours of construction activity. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be ad- dressed in detail in. The CMP will also address the need for pedestrian detours, lane closures, and/or parking restrictions, if necessary to accommodate a safe and secure work zone. To minimize transportation impacts during the construction period, the following measures will be considered for the CMP:

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

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

Appendices (on separate CD): Turning movement traffic counts; Synchro traffic analysis files

2.2 Environmental Protection

2.2.1 Wind

The objective of a Wind Assessment is to determine the effect a proposed development would have on the pedestrian level winds in the vicinity of the Project. The primary criteria used to determine impacts are the surrounding terrain and the height and façade treatment of a proposed building.

2.2.1.1 Introduction

Gradient Wind Engineering Inc. (GWE) completed a Pedestrian Level Wind (PLW) study for The Rio Grande Dudley Square (the Project), a planned 25-storey building located in the Roxbury neighborhood of Boston, Massachusetts. The study is based on industry standard wind tunnel testing techniques, architectural drawings provided by Stull and lee Inc. in January 2017, surrounding context data obtained from the BPDA, and recent site imagery.

2.2.1.2 Terms of Reference

The focus of this pedestrian level wind study is the Project, a planned 25-storey development located in the Roxbury neighborhood of Boston, Massachusetts. The project site occupies the north portion of a parcel of land bounded by Shawmut Avenue, Marvin Street, Washington Street, and Roxbury Street.

Upon completion, the Project will comprise a 25-storey building integral with a three- story podium, rising to a total height of approximately 285 feet above local grade. The ground floor contains retail space at the north side of the building, a residential lobby at the east side, as well as building supports services, and interior parking. Levels two and three rise with a generally square floor plate, above which the building transitions to an L-shaped platform. Level three contains residential units at the northeast side of the building, indoor amenity spaces at the southeast side, as well as a podium roof amenity terrace. Above level four, the building contains residential occupancy to level 25, and is topped by a mechanical penthouse.

Figure 2.26a illustrates the study site and surrounding context. Photographs 1 through 4 (Figures 2.28-2.31) depict the wind tunnel model used to conduct the study.

2.2.1.3 Objectives

The principal objectives of this study are to: (i) determine pedestrian level wind comfort and safety conditions at key areas within and surrounding the development site; (ii) identify areas where wind conditions may interfere with the intended uses of outdoor spaces; and (iii) recommend suitable mitigation measures, where required; and (iv) evaluate the influence of the proposed development (Build massing) on the existing wind conditions surrounding the study site (No Build massing.)

2.2.1.4 Methodology

The approach followed to quantify pedestrian wind conditions over the site is based on wind tunnel measurements of wind speeds at selected locations on a reduced-scale physical model, meteorological analysis of the Boston wind climate and synthesis, of wind tunnel data with

industry-accepted guidelines1. The following sections describe the analysis procedures, including a discussion of the pedestrian comfort and safety guidelines.

2.2.1.5 Wind Tunnel Context Modeling

The general concept and approach to wind tunnel modeling is to provide building detail in the immediate vicinity of the study site on the surrounding model, and to rely on a length of wind tunnel upwind of the model to develop wind properties consistent with known turbulent intensity profiles that represent the surrounding terrain. For this study, the wind tunnel was con- figured to simulate atmospheric velocity profiles consistent with suburban upwind terrain.

To conduct the wind tunnel study, a physical model of the planned Guscott Rio Grande development and relevant surroundings was constructed at a scale of 1:400. The wind tunnel mod- el, centered at the study site, includes all existing buildings and approved future developments (including the parking/office building located to the northeast of the development site across Marvin Street.) The existing building massing and approved future developments are defined according to mapping data acquired from the BPDA. Photographs 1 through 4 following the main text highlight the wind tunnel model used to conduct the study.

2.2.1.6 Wind Speed Measurements

The PLW study was performed by testing a total of 120 wind sensor locations for the No Build site massing, and 124 wind sensor locations for the Build massing on the scale model in GWE's wind tunnel. 120 sensors were placed at grade level, while the remaining 4 sensors used for the Build massing were placed at the level four amenity terrace on the study building. Wind speed measurements were performed at each of the sensors for 36 wind directions at 10° intervals.

Polar plots of the raw wind tunnel data acquired for each sensor location are available upon request.

Mean and peak wind speed values for each location and wind direction were calculated from real-time pressure measurements, recorded at a sample rate of approximately 500 samples per second, and taken over a 60-second time period. This period at model-scale corresponds approximately to one hour in full-scale, which matches the time frame of full- scale meteorological observations. Measured mean and gust wind speeds at grade were referenced to the wind speed measured near the ceiling of the wind tunnel to generate mean and peak wind speed ratios. Ceiling height in the wind tunnel represents the depth of the boundary layer of wind flowing over the earth's surface, referred to as the gradient height. Within this boundary layer, mean wind speed increases up to the gradient height and remains constant thereafter.

2.2.1.7 Meteorological Data Analysis

A statistical model for the wind climate in Boston was developed from approximately 40-years of hourly meteorological wind data recorded at Logan International Airport. Wind speed and direction data were analyzed for each month of the year in order to determine the statistically prominent wind directions and corresponding speeds, and to characterize similarities between monthly weather patterns. Based on this portion of the analysis, the four seasons are represented

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

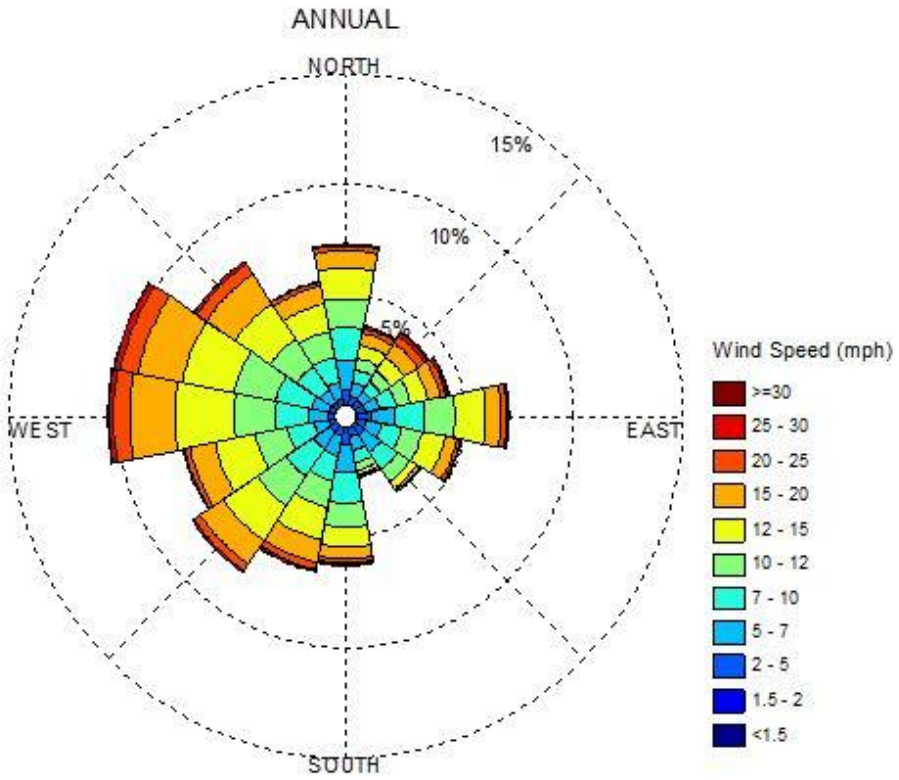
by grouping data from consecutive months based on similarity of weather patterns, and not according to the traditional calendar method.

The statistical model of the Boston wind climate, which indicates the directional character of local winds on an annual and seasonal basis, is illustrated on the following pages. The plots illustrate the distribution of measured wind speeds and directions in miles per hour (mph).

Probabilities of occurrence of different wind speeds are represented as stacked polar bars in sixteen azimuth divisions. The radial direction represents the percentage of time for various wind speed ranges per wind direction during the measurement period. The prominent wind

speeds and directions can be identified by the longer length of the bars. For Boston, the most common winds concerning pedestrian comfort occur from the south clockwise to the north, as well as those from the east-northeast. The directional preference and relative magnitude of the wind speed varies somewhat from season to season, with the summer months displaying the calmest winds relative to the remaining seasonal periods.

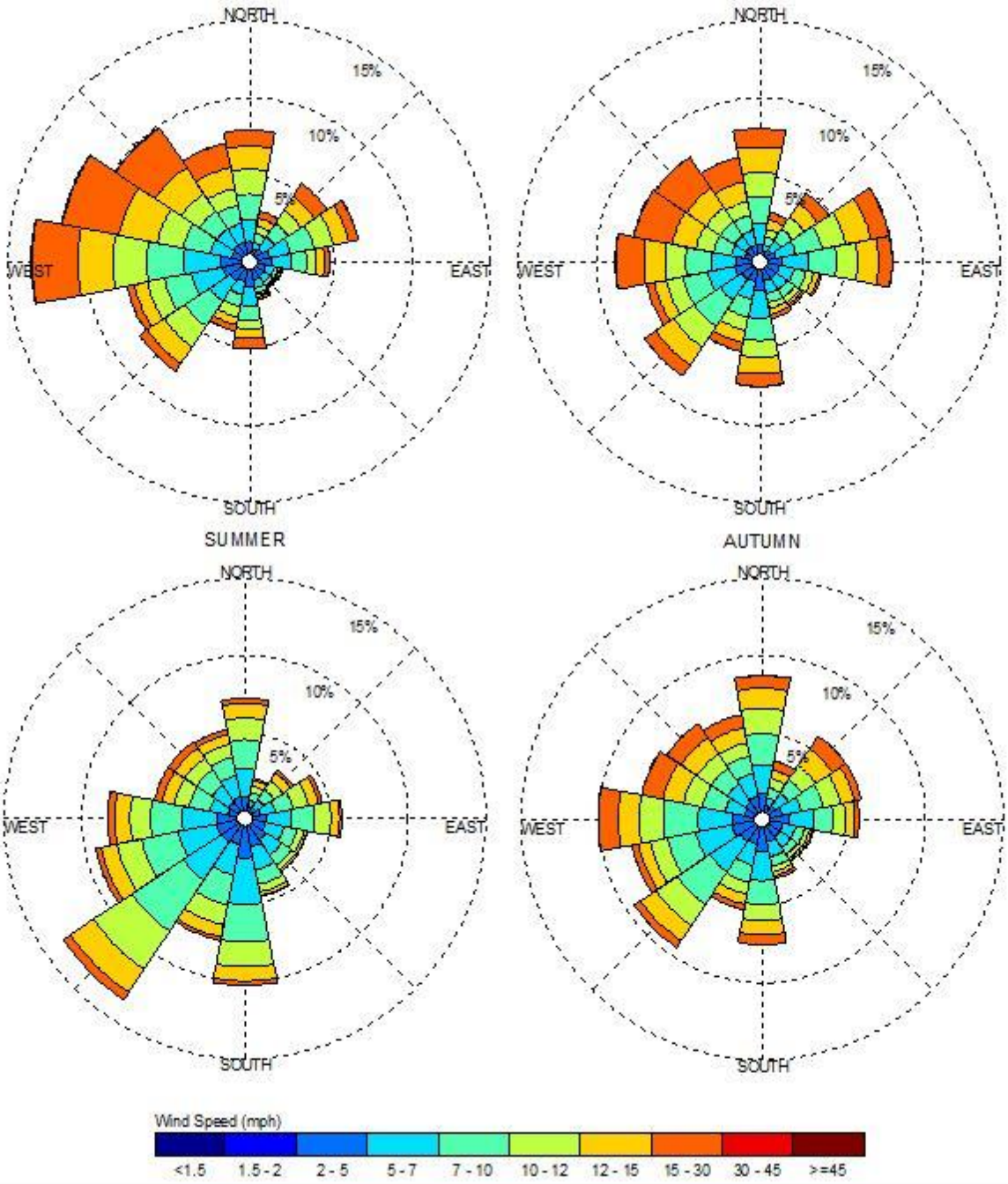
Figure 2.25 Annual Distribution of Winds for Various Probabilities – Logan International Airport, Boston, Massachusetts



Notes:

1. Radial distances indicate percentage of time of wind events.
2. Wind speeds represent mean hourly wind speeds measured at 33 feet above the ground.

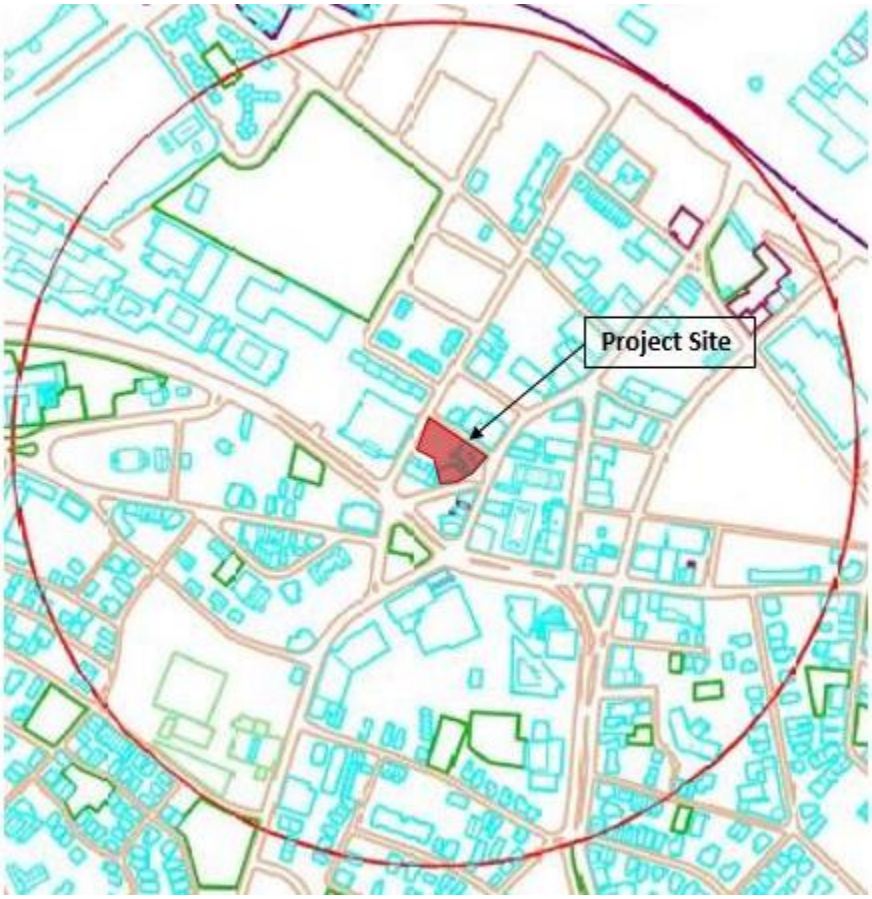
Figure 2.26 Seasonal Distribution of Winds for Various Probabilities – Logan International Airport, Boston, Massachusetts



Notes:

1. Radial distances indicate percentage of time of wind events.
2. Wind speeds represent mean hourly wind speeds measured at 33 feet above the ground.

Figure 2.26a Wind Study Area



2.2.1.8 Pedestrian Comfort Assessment

Pedestrian comfort criteria are based on mechanical wind effects without consideration of other meteorological conditions (i.e., temperature and relative humidity). The criteria provide an assessment of comfort, assuming that pedestrians are appropriately dressed for a specified outdoor activity during any given season. The BPDA employs two separate standards for determining pedestrian wind comfort. The first standard relates to the effective wind gust velocity (calculated as the hourly mean wind speed plus 1.5 times the root mean square wind speed), requiring that a threshold of 31 mph should not be exceeded more than one percent of the time. The second set of standards is based on the hourly mean wind speeds, and defines five pedestrian comfort classes and corresponding mean wind speed ranges. The comfort classes are defined in terms of standards for the hourly mean wind speed exceeded one percent of the time. The comfort classes and associated wind speed ranges are summarized as follows:

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

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

2.2.1.9 Results

Tables 2.8 through 2.12, following the main text, provide a summary of the annual and seasonal pedestrian wind comfort predictions for each sensor location for the No Build and Build scenarios. The Tables indicate the predicted percentages of time that wind speeds will exceed the specified ranges. Pedestrian comfort suitability (i.e. sitting, standing, walking, etc.) is determined by the wind speed range for which the hourly mean wind speed is exceeded for one percent of the time. The Tables also indicate, for each sensor, the percentage of time which the effective wind gust velocity threshold of 31 mph is exceeded.

Following Tables 2.8 through 2.12, the annual pedestrian comfort predictions for the No Build and the Build scenarios are illustrated in colour-coded format in Figures 2.32 through 2.36. Conditions suitable for sitting are represented by the colour green, while standing is represented by yellow, walking by blue, uncomfortable for walking by magenta, and dangerous by gray. For locations where the effective wind gust velocity threshold is exceeded, the sensor is highlighted in red.

The following sections describe pedestrian wind comfort and safety predictions based on annual wind statistics (except where noted) for the No Build and Build scenarios.

2.2.1.10 No Build Configuration

The No-Build condition was modeled to include all existing buildings, including those located on the development site, and approved future developments (including the parking/office building located to the northeast of the development site across Marvin Street.) 120 sensors were used to measure wind speeds at existing surrounding sidewalks, building entrances, and other pedestrian areas. The results of the No Build study are shown in Figures 2.32 and 2.33.

Analysis of the No-Build scenario shows that wind conditions over the development site and surrounding areas are comfortable for walking or better on a seasonal and annual basis. As well, wind speeds at all pedestrian locations within the study area fall below the effective gust velocity criteria.

2.2.1.11 Comparison of No-Build to Build Configurations

The Build condition was analyzed for the same 120 wind sensor locations studied in the No-Build condition, as well as for an additional 4 sensors located on the elevated amenity terrace of the proposed building (See Figures 2.33 – 2.35).

Beyond the immediate vicinity of the development site, the planned building will have a generally minor influence on pedestrian wind comfort. Although wind speeds along Shawmut Avenue to the north of the site (Sensors 73, 74, 85, 86, 89, 94), and at the south side of the Dudley Square Station (Sensors 14-17) will be somewhat stronger for the Build scenario as compared to the No Build scenario, conditions will nevertheless remain suitable for walking, or better, on an annual basis.

For pedestrian areas within and surrounding the study site, annual wind speeds suitable for walking, or better, occur at most locations, specifically:

The residential lobby entrance area (Sensor 100) will be comfortable for standing.

At the retail entrances and over the sidewalk area near the intersection of Shawmut Avenue and Marvin Street (Sensors 102, 103, and 104) uncomfortable conditions are predicted for the tested configuration. Since the pedestrian wind testing was completed, a canopy has been added to the building corner at the intersection of Shawmut Avenue and Marvin Street, which will improve wind conditions in this area.

The remaining sidewalk and plaza spaces surrounding the site (Sensors 34, 35, 36, 98, 99, 101, 105, 106, 108, 109, 110, 113, 114, 118, and 119) will be comfortable for walking, standing, or sitting.

Within the open space to the immediate south of the study building (Sensor 107), uncomfortable conditions are measured.

Existing building entrances along the south perimeter of the site (Sensors 111, 112, 115, 116, 117, and 120) will be comfortable for walking, or better.

No locations over the study area experience dangerous wind conditions, and wind speeds will be below the effective gust velocity criteria at all locations on an annual basis. However, during the winter months the gust velocity criteria is exceeded at the north side of the study site (Sensors 102, 103, and 104), as well as to the immediate south of the study building (Sensor 107).

On the level four amenity terrace, annual wind speeds at the east side of the podium roof (Sensor 124) will be comfortable for sitting or more sedentary activities. Towards the centre of the terrace (Sensors 121 and 123), conditions become comfortable for standing, while at the west corner of the space (Sensor 122) conditions are suitable for walking. During the summer months, wind conditions over the majority of the terrace space (Sensors 121, 123, and 124) are comfortable for sitting or more sedentary activities, while the west side of the space (Sensor 122) is suitable for walking. In order to provide sitting conditions over the full terrace, it is recommended that a vertical wind barrier, measuring at least six feet above the walking surface, is installed along the full terrace perimeter.

2.2.1.12 CONCLUSIONS

In general, the introduction of the Project results in minor changes to pedestrian wind comfort at locations beyond the development site. Within and surrounding the development site, annual wind speeds are generally suitable for walking, standing, or sitting. Exceptions occur at the north side of the site near the intersection of Shawmut Avenue and Marvin Street, and immediately to the south of the study building, where uncomfortable conditions are expected. Since the pedestrian wind testing was completed, a canopy has been incorporated at the building corner at the intersection of Shawmut Avenue and Marvin Street, which will improve pedestrian wind conditions in this area.

For the level four amenity terrace on the study building, wind conditions in the summer will be suitable for sitting or standing. To ensure comfortable conditions appropriate for sitting over the full terrace space, it is recommended that a vertical wind barrier measuring at least six feet above the walking surface be installed along the terrace perimeter.

Of particular interest, no pedestrian areas are expected to experience dangerous wind speeds, and the effective gust velocity criteria is satisfied at all locations on an annual basis.

Table 2.8 Comparison of Pedestrian Wind Comfort - Annual

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
1	0.4	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
2	0.7	0.1	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
3	2.9	0.9	0.2	0.0	0.0	Standing	2.6	0.5	0.0	0.0	0.0	Standing
4	1.6	0.2	0.0	0.0	0.0	Standing	3.4	0.5	0.0	0.0	0.0	Standing
5	0.5	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
6	0.4	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
7	2.4	0.8	0.1	0.0	0.0	Standing	2.3	0.7	0.1	0.0	0.0	Standing
8	1.3	0.4	0.1	0.0	0.0	Standing	1.2	0.3	0.0	0.0	0.0	Standing
9	0.7	0.1	0.0	0.0	0.0	Sitting	0.5	0.1	0.0	0.0	0.0	Sitting
10	0.2	0.0	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
11	0.0	0.0	0.0	0.0	0.0	Sitting	2.8	0.5	0.0	0.0	0.0	Standing
12	0.2	0.0	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
13	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
14	2.9	0.6	0.0	0.0	0.0	Standing	6.3	2.0	0.4	0.0	0.1	Walking
15	0.6	0.1	0.0	0.0	0.0	Sitting	1.6	0.3	0.0	0.0	0.0	Standing
16	0.9	0.2	0.0	0.0	0.0	Sitting	1.7	0.4	0.1	0.0	0.0	Standing
17	3.9	0.9	0.1	0.0	0.0	Standing	6.0	1.9	0.3	0.0	0.2	Walking
18	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
19	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
20	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
21	0.7	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
22	4.5	1.1	0.1	0.0	0.0	Walking	4.8	1.2	0.1	0.0	0.0	Walking
23	1.3	0.2	0.0	0.0	0.0	Standing	1.2	0.2	0.0	0.0	0.0	Standing
24	1.6	0.2	0.0	0.0	0.0	Standing	1.4	0.2	0.0	0.0	0.0	Standing
25	0.9	0.1	0.0	0.0	0.0	Sitting	1.3	0.1	0.0	0.0	0.0	Standing
26	0.2	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
27	0.7	0.0	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
28	1.2	0.1	0.0	0.0	0.0	Standing	1.5	0.2	0.0	0.0	0.0	Standing
29	1.6	0.2	0.0	0.0	0.0	Standing	2.4	0.4	0.0	0.0	0.0	Standing
30	0.7	0.1	0.0	0.0	0.0	Sitting	1.3	0.2	0.0	0.0	0.0	Standing
31	0.1	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
32	0.6	0.0	0.0	0.0	0.0	Sitting	3.5	0.7	0.0	0.0	0.0	Standing
33	1.9	0.3	0.0	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
34	0.9	0.1	0.0	0.0	0.0	Sitting	7.1	2.1	0.3	0.0	0.1	Walking
35	0.0	0.0	0.0	0.0	0.0	Sitting	4.2	1.1	0.1	0.0	0.1	Walking
36	1.0	0.2	0.0	0.0	0.0	Sitting	3.1	1.0	0.2	0.0	0.1	Walking
37	1.3	0.1	0.0	0.0	0.0	Standing	1.5	0.2	0.0	0.0	0.0	Standing
38	0.2	0.0	0.0	0.0	0.0	Sitting	1.7	0.2	0.0	0.0	0.0	Standing
39	1.1	0.2	0.0	0.0	0.0	Standing	0.7	0.1	0.0	0.0	0.0	Sitting
40	0.9	0.1	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
41	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
42	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
43	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
44	1.3	0.2	0.0	0.0	0.0	Standing	1.3	0.2	0.0	0.0	0.0	Standing
45	4.9	1.1	0.1	0.0	0.0	Walking	5.7	1.5	0.1	0.0	0.0	Walking
46	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
47	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
48	1.3	0.2	0.0	0.0	0.0	Standing	1.2	0.3	0.0	0.0	0.0	Standing
49	0.7	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
50	0.2	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
51	0.8	0.2	0.0	0.0	0.0	Sitting	0.9	0.2	0.0	0.0	0.0	Sitting
52	0.7	0.1	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
53	0.1	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
54	0.4	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
55	0.6	0.0	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Standing
56	0.5	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
57	2.1	0.5	0.1	0.0	0.0	Standing	1.7	0.3	0.0	0.0	0.0	Standing
58	0.6	0.1	0.0	0.0	0.0	Sitting	0.8	0.2	0.0	0.0	0.0	Sitting
59	1.3	0.2	0.0	0.0	0.0	Standing	1.3	0.2	0.0	0.0	0.0	Standing
60	5.4	1.4	0.1	0.0	0.0	Walking	6.2	1.8	0.2	0.0	0.0	Walking

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
61	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
62	1.3	0.1	0.0	0.0	0.0	Standing	1.5	0.2	0.0	0.0	0.0	Standing
63	2.7	0.5	0.0	0.0	0.0	Standing	1.7	0.3	0.0	0.0	0.0	Standing
64	1.4	0.4	0.0	0.0	0.0	Standing	1.6	0.4	0.1	0.0	0.0	Standing
65	1.1	0.2	0.0	0.0	0.0	Standing	1.1	0.1	0.0	0.0	0.0	Standing
66	1.6	0.3	0.0	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
67	1.8	0.2	0.0	0.0	0.0	Standing	1.8	0.2	0.0	0.0	0.0	Standing
68	4.7	1.2	0.1	0.0	0.0	Walking	7.2	2.2	0.3	0.0	0.0	Walking
69	0.7	0.1	0.0	0.0	0.0	Sitting	1.7	0.5	0.1	0.0	0.0	Standing
70	1.4	0.2	0.0	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
71	1.4	0.2	0.0	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
72	1.3	0.2	0.0	0.0	0.0	Standing	1.6	0.3	0.0	0.0	0.0	Standing
73	0.0	0.0	0.0	0.0	0.0	Sitting	9.1	3.1	0.8	0.1	0.4	Walking
74	0.8	0.1	0.0	0.0	0.0	Sitting	2.8	0.6	0.1	0.0	0.1	Standing
75	3.7	1.1	0.2	0.0	0.1	Walking	1.4	0.3	0.0	0.0	0.0	Standing
76	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
77	0.5	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
78	2.2	0.8	0.2	0.0	0.0	Standing	1.9	0.6	0.1	0.0	0.0	Standing
79	1.7	0.2	0.0	0.0	0.0	Standing	1.4	0.1	0.0	0.0	0.0	Standing
80	1.1	0.1	0.0	0.0	0.0	Standing	1.0	0.1	0.0	0.0	0.0	Standing
81	0.8	0.1	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
82	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
83	0.2	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
84	0.1	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
85	2.4	0.8	0.2	0.0	0.1	Standing	3.8	1.2	0.2	0.0	0.1	Walking
86	0.6	0.0	0.0	0.0	0.0	Sitting	1.6	0.2	0.0	0.0	0.0	Standing
87	0.1	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
88	0.5	0.0	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
89	3.5	1.0	0.2	0.0	0.1	Standing	9.3	3.1	0.5	0.0	0.1	Walking
90	0.3	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
91	0.1	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
92	0.1	0.0	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
93	1.4	0.2	0.0	0.0	0.0	Standing	0.3	0.0	0.0	0.0	0.0	Sitting
94	0.1	0.0	0.0	0.0	0.0	Sitting	3.1	0.7	0.0	0.0	0.0	Standing
95	3.3	0.7	0.1	0.0	0.0	Standing	1.2	0.2	0.0	0.0	0.0	Standing
96	1.3	0.1	0.0	0.0	0.0	Standing	3.2	0.6	0.0	0.0	0.1	Standing
97	7.1	2.2	0.3	0.0	0.1	Walking	4.8	1.3	0.2	0.0	0.1	Walking
98	0.0	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
99	0.2	0.0	0.0	0.0	0.0	Sitting	2.2	0.4	0.0	0.0	0.0	Standing
100	0.8	0.1	0.0	0.0	0.0	Sitting	2.2	0.5	0.1	0.0	0.0	Standing
101	1.0	0.1	0.0	0.0	0.0	Sitting	11.5	4.1	0.7	0.0	0.2	Walking
102	1.0	0.1	0.0	0.0	0.0	Sitting	19.0	9.8	3.5	0.2	0.9	Uncomfortable
103	1.0	0.1	0.0	0.0	0.0	Standing	20.8	10.1	3.0	0.1	0.9	Uncomfortable
104	4.5	1.1	0.1	0.0	0.0	Walking	13.3	6.2	2.0	0.2	1.0	Uncomfortable
105	0.2	0.0	0.0	0.0	0.0	Sitting	6.7	2.5	0.7	0.0	0.4	Walking
106	0.0	0.0	0.0	0.0	0.0	Sitting	3.8	1.0	0.1	0.0	0.1	Walking
107	0.1	0.0	0.0	0.0	0.0	Sitting	10.7	5.1	2.0	0.2	0.7	Uncomfortable
108	0.0	0.0	0.0	0.0	0.0	Sitting	11.4	4.2	0.8	0.0	0.1	Walking
109	0.2	0.0	0.0	0.0	0.0	Sitting	9.7	3.7	0.8	0.0	0.2	Walking
110	1.1	0.1	0.0	0.0	0.0	Standing	0.0	0.0	0.0	0.0	0.0	Sitting
111	3.9	0.8	0.0	0.0	0.0	Standing	8.9	3.1	0.5	0.0	0.1	Walking
112	0.4	0.0	0.0	0.0	0.0	Sitting	3.3	1.2	0.2	0.0	0.0	Walking
113	2.1	0.3	0.0	0.0	0.0	Standing	6.4	1.6	0.1	0.0	0.0	Walking
114	0.4	0.0	0.0	0.0	0.0	Sitting	2.1	0.4	0.0	0.0	0.0	Standing
115	1.2	0.1	0.0	0.0	0.0	Standing	9.3	2.8	0.3	0.0	0.0	Walking
116	1.5	0.3	0.0	0.0	0.0	Standing	1.3	0.1	0.0	0.0	0.0	Standing
117	0.1	0.0	0.0	0.0	0.0	Sitting	4.0	1.0	0.1	0.0	0.0	Standing
118	0.5	0.0	0.0	0.0	0.0	Sitting	2.3	0.3	0.0	0.0	0.0	Standing
119	0.0	0.0	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Standing
120	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
121							1.9	0.2	0.0	0.0	0.0	Standing
122							5.5	1.3	0.2	0.0	0.1	Walking
123							1.1	0.2	0.0	0.0	0.0	Standing
124							0.3	0.0	0.0	0.0	0.0	Sitting

Table 2.9 Comparison of Pedestrian Wind Comfort - Spring

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
1	0.4	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
2	1.0	0.2	0.0	0.0	0.0	Standing	0.9	0.2	0.0	0.0	0.0	Sitting
3	4.0	1.4	0.3	0.0	0.1	Walking	3.0	0.6	0.1	0.0	0.0	Standing
4	1.7	0.2	0.0	0.0	0.0	Standing	3.7	0.5	0.0	0.0	0.0	Standing
5	0.6	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
6	0.3	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
7	3.7	1.2	0.2	0.0	0.1	Walking	3.4	1.1	0.2	0.0	0.0	Walking
8	2.0	0.5	0.1	0.0	0.0	Standing	1.9	0.5	0.1	0.0	0.0	Standing
9	1.0	0.1	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
10	0.2	0.0	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
11	0.0	0.0	0.0	0.0	0.0	Sitting	2.7	0.4	0.0	0.0	0.0	Standing
12	0.3	0.0	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
13	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
14	2.8	0.5	0.0	0.0	0.0	Standing	6.2	1.9	0.3	0.0	0.1	Walking
15	0.9	0.2	0.0	0.0	0.0	Sitting	2.0	0.4	0.1	0.0	0.0	Standing
16	1.2	0.2	0.0	0.0	0.0	Standing	2.4	0.7	0.1	0.0	0.0	Standing
17	4.0	0.8	0.0	0.0	0.0	Standing	6.2	1.9	0.2	0.0	0.1	Walking
18	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
19	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
20	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
21	0.8	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
22	4.6	1.0	0.1	0.0	0.0	Standing	4.9	1.1	0.1	0.0	0.0	Walking
23	1.7	0.2	0.0	0.0	0.0	Standing	1.5	0.2	0.0	0.0	0.0	Standing
24	1.8	0.2	0.0	0.0	0.0	Standing	1.6	0.2	0.0	0.0	0.0	Standing
25	0.9	0.1	0.0	0.0	0.0	Sitting	1.4	0.1	0.0	0.0	0.0	Standing
26	0.3	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
27	0.7	0.0	0.0	0.0	0.0	Sitting	0.8	0.0	0.0	0.0	0.0	Sitting
28	1.2	0.1	0.0	0.0	0.0	Standing	1.4	0.1	0.0	0.0	0.0	Standing
29	1.5	0.1	0.0	0.0	0.0	Standing	2.3	0.3	0.0	0.0	0.0	Standing
30	0.6	0.0	0.0	0.0	0.0	Sitting	1.2	0.1	0.0	0.0	0.0	Standing
31	0.1	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
32	0.4	0.0	0.0	0.0	0.0	Sitting	3.4	0.5	0.0	0.0	0.0	Standing
33	1.8	0.2	0.0	0.0	0.0	Standing	1.7	0.2	0.0	0.0	0.0	Standing
34	0.7	0.0	0.0	0.0	0.0	Sitting	7.2	2.0	0.2	0.0	0.1	Walking
35	0.0	0.0	0.0	0.0	0.0	Sitting	4.0	1.0	0.1	0.0	0.0	Standing
36	1.3	0.2	0.0	0.0	0.0	Standing	4.3	1.5	0.3	0.0	0.1	Walking
37	1.1	0.1	0.0	0.0	0.0	Standing	1.6	0.2	0.0	0.0	0.0	Standing
38	0.3	0.0	0.0	0.0	0.0	Sitting	1.7	0.2	0.0	0.0	0.0	Standing
39	1.3	0.2	0.0	0.0	0.0	Standing	0.7	0.1	0.0	0.0	0.0	Sitting
40	0.7	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
41	0.3	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
42	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
43	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
44	1.6	0.3	0.0	0.0	0.0	Standing	1.6	0.2	0.0	0.0	0.0	Standing
45	4.9	1.0	0.1	0.0	0.0	Standing	5.8	1.4	0.1	0.0	0.0	Walking
46	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
47	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
48	1.7	0.3	0.0	0.0	0.0	Standing	1.8	0.4	0.0	0.0	0.0	Standing
49	1.1	0.2	0.0	0.0	0.0	Standing	1.0	0.1	0.0	0.0	0.0	Standing
50	0.2	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
51	1.2	0.3	0.0	0.0	0.0	Standing	1.4	0.3	0.0	0.0	0.0	Standing
52	0.5	0.0	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
53	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
54	0.3	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
55	0.5	0.0	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
56	0.4	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
57	2.9	0.7	0.1	0.0	0.0	Standing	2.1	0.4	0.0	0.0	0.0	Standing
58	0.9	0.2	0.0	0.0	0.0	Sitting	1.1	0.2	0.0	0.0	0.0	Standing
59	1.8	0.3	0.0	0.0	0.0	Standing	1.7	0.3	0.0	0.0	0.0	Standing
60	5.7	1.2	0.1	0.0	0.0	Walking	6.6	1.7	0.1	0.0	0.0	Walking

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
61	0.2	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
62	1.1	0.1	0.0	0.0	0.0	Standing	1.3	0.1	0.0	0.0	0.0	Standing
63	3.0	0.5	0.0	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
64	2.1	0.6	0.1	0.0	0.0	Standing	2.3	0.7	0.1	0.0	0.0	Standing
65	1.4	0.2	0.0	0.0	0.0	Standing	1.4	0.2	0.0	0.0	0.0	Standing
66	2.1	0.4	0.0	0.0	0.0	Standing	2.4	0.4	0.0	0.0	0.0	Standing
67	1.7	0.1	0.0	0.0	0.0	Standing	1.8	0.2	0.0	0.0	0.0	Standing
68	5.3	1.2	0.1	0.0	0.0	Walking	8.3	2.4	0.3	0.0	0.0	Walking
69	0.8	0.1	0.0	0.0	0.0	Sitting	2.4	0.7	0.1	0.0	0.0	Standing
70	1.3	0.1	0.0	0.0	0.0	Standing	2.2	0.3	0.0	0.0	0.0	Standing
71	1.3	0.1	0.0	0.0	0.0	Standing	2.1	0.2	0.0	0.0	0.0	Standing
72	1.5	0.2	0.0	0.0	0.0	Standing	2.0	0.4	0.0	0.0	0.0	Standing
73	0.1	0.0	0.0	0.0	0.0	Sitting	11.7	4.2	1.2	0.1	0.6	Uncomfortable
74	0.8	0.1	0.0	0.0	0.0	Sitting	3.7	0.9	0.1	0.0	0.1	Standing
75	4.9	1.6	0.3	0.0	0.1	Walking	2.0	0.4	0.0	0.0	0.0	Standing
76	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
77	0.5	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
78	3.3	1.2	0.3	0.0	0.1	Walking	2.8	0.9	0.2	0.0	0.0	Standing
79	1.8	0.2	0.0	0.0	0.0	Standing	1.4	0.1	0.0	0.0	0.0	Standing
80	1.0	0.1	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Sitting
81	0.7	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
82	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
83	0.2	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
84	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
85	3.5	1.1	0.2	0.0	0.1	Walking	5.1	1.6	0.3	0.0	0.1	Walking
86	0.5	0.0	0.0	0.0	0.0	Sitting	1.4	0.2	0.0	0.0	0.0	Standing
87	0.0	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
88	0.4	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
89	4.7	1.4	0.2	0.0	0.1	Walking	10.5	3.4	0.5	0.0	0.1	Walking
90	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
91	0.1	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
92	0.1	0.0	0.0	0.0	0.0	Sitting	0.8	0.0	0.0	0.0	0.0	Sitting
93	1.6	0.2	0.0	0.0	0.0	Standing	0.3	0.0	0.0	0.0	0.0	Sitting
94	0.1	0.0	0.0	0.0	0.0	Sitting	3.0	0.7	0.0	0.0	0.0	Standing
95	3.8	0.8	0.1	0.0	0.0	Standing	1.3	0.2	0.0	0.0	0.0	Standing
96	1.2	0.1	0.0	0.0	0.0	Standing	3.6	0.6	0.0	0.0	0.0	Standing
97	6.7	2.0	0.2	0.0	0.0	Walking	5.1	1.3	0.1	0.0	0.1	Walking
98	0.0	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
99	0.1	0.0	0.0	0.0	0.0	Sitting	2.0	0.3	0.0	0.0	0.0	Standing
100	1.0	0.1	0.0	0.0	0.0	Standing	2.4	0.5	0.0	0.0	0.0	Standing
101	1.2	0.1	0.0	0.0	0.0	Standing	12.0	4.0	0.6	0.0	0.1	Walking
102	1.2	0.2	0.0	0.0	0.0	Standing	19.1	9.7	3.4	0.1	0.7	Uncomfortable
103	1.0	0.1	0.0	0.0	0.0	Standing	21.4	10.1	2.8	0.1	0.7	Uncomfortable
104	4.6	1.0	0.1	0.0	0.0	Standing	16.0	7.9	2.7	0.3	1.4	Uncomfortable
105	0.2	0.0	0.0	0.0	0.0	Sitting	8.9	3.6	1.1	0.1	0.5	Uncomfortable
106	0.0	0.0	0.0	0.0	0.0	Sitting	4.7	1.2	0.1	0.0	0.1	Walking
107	0.1	0.0	0.0	0.0	0.0	Sitting	14.7	7.4	2.8	0.2	0.9	Uncomfortable
108	0.0	0.0	0.0	0.0	0.0	Sitting	12.5	4.3	0.7	0.0	0.1	Walking
109	0.1	0.0	0.0	0.0	0.0	Sitting	10.5	3.8	0.7	0.0	0.1	Walking
110	0.9	0.1	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
111	4.1	0.7	0.0	0.0	0.0	Standing	9.6	3.1	0.4	0.0	0.0	Walking
112	0.3	0.0	0.0	0.0	0.0	Sitting	4.8	1.6	0.3	0.0	0.0	Walking
113	2.1	0.2	0.0	0.0	0.0	Standing	7.3	1.6	0.1	0.0	0.0	Walking
114	0.3	0.0	0.0	0.0	0.0	Sitting	2.6	0.5	0.0	0.0	0.0	Standing
115	1.1	0.1	0.0	0.0	0.0	Standing	9.8	2.6	0.2	0.0	0.0	Walking
116	1.7	0.3	0.0	0.0	0.0	Standing	1.4	0.1	0.0	0.0	0.0	Standing
117	0.1	0.0	0.0	0.0	0.0	Sitting	4.0	0.8	0.0	0.0	0.0	Standing
118	0.5	0.0	0.0	0.0	0.0	Sitting	2.1	0.2	0.0	0.0	0.0	Standing
119	0.0	0.0	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
120	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
121							2.1	0.2	0.0	0.0	0.0	Standing
122							6.0	1.4	0.2	0.0	0.1	Walking
123							1.3	0.2	0.0	0.0	0.0	Standing
124							0.3	0.0	0.0	0.0	0.0	Sitting

Table 2.10 Comparison of Pedestrian Wind Comfort - Summer

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
1	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
2	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
3	0.9	0.2	0.0	0.0	0.0	Sitting	0.5	0.1	0.0	0.0	0.0	Sitting
4	0.2	0.0	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
5	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
6	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
7	0.7	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
8	0.3	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
9	0.1	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
10	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
11	0.0	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
12	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
13	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
14	0.6	0.0	0.0	0.0	0.0	Sitting	2.3	0.3	0.0	0.0	0.0	Standing
15	0.1	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
16	0.2	0.0	0.0	0.0	0.0	Sitting	0.5	0.1	0.0	0.0	0.0	Sitting
17	0.6	0.0	0.0	0.0	0.0	Sitting	1.5	0.1	0.0	0.0	0.0	Standing
18	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
19	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
20	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
21	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
22	0.8	0.1	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
23	0.3	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
24	0.4	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
25	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
26	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
27	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
28	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
29	0.1	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
30	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
31	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
32	0.0	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
33	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
34	0.0	0.0	0.0	0.0	0.0	Sitting	1.9	0.1	0.0	0.0	0.0	Standing
35	0.0	0.0	0.0	0.0	0.0	Sitting	1.2	0.1	0.0	0.0	0.0	Standing
36	0.1	0.0	0.0	0.0	0.0	Sitting	1.0	0.3	0.0	0.0	0.0	Standing
37	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
38	0.0	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
39	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
40	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
41	0.1	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
42	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
43	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
44	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
45	1.3	0.1	0.0	0.0	0.0	Standing	1.8	0.2	0.0	0.0	0.0	Standing
46	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
47	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
48	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
49	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
50	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
51	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
52	0.1	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
53	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
54	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
55	0.1	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
56	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
57	0.4	0.1	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
58	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
59	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
60	1.1	0.1	0.0	0.0	0.0	Standing	1.4	0.2	0.0	0.0	0.0	Standing

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
61	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
62	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
63	0.3	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
64	0.4	0.1	0.0	0.0	0.0	Sitting	0.5	0.1	0.0	0.0	0.0	Sitting
65	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
66	0.3	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
67	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
68	1.5	0.2	0.0	0.0	0.0	Standing	2.7	0.4	0.0	0.0	0.0	Standing
69	0.1	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
70	0.1	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
71	0.1	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
72	0.4	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
73	0.0	0.0	0.0	0.0	0.0	Sitting	3.8	0.9	0.1	0.0	0.0	Standing
74	0.2	0.0	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
75	2.0	0.4	0.0	0.0	0.0	Standing	0.2	0.0	0.0	0.0	0.0	Sitting
76	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
77	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
78	0.8	0.2	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
79	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
80	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
81	0.1	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
82	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
83	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
84	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
85	0.8	0.1	0.0	0.0	0.0	Sitting	1.2	0.2	0.0	0.0	0.0	Standing
86	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
87	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
88	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
89	1.0	0.1	0.0	0.0	0.0	Sitting	3.6	0.5	0.0	0.0	0.0	Standing
90	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
91	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
92	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
93	0.3	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
94	0.0	0.0	0.0	0.0	0.0	Sitting	1.7	0.2	0.0	0.0	0.0	Standing
95	1.3	0.2	0.0	0.0	0.0	Standing	0.5	0.0	0.0	0.0	0.0	Sitting
96	0.1	0.0	0.0	0.0	0.0	Sitting	0.7	0.0	0.0	0.0	0.0	Sitting
97	2.9	0.4	0.0	0.0	0.0	Standing	1.7	0.2	0.0	0.0	0.0	Standing
98	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
99	0.0	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
100	0.1	0.0	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
101	0.1	0.0	0.0	0.0	0.0	Sitting	4.7	0.7	0.0	0.0	0.0	Standing
102	0.1	0.0	0.0	0.0	0.0	Sitting	10.5	3.6	0.5	0.0	0.0	Walking
103	0.1	0.0	0.0	0.0	0.0	Sitting	12.8	3.9	0.4	0.0	0.0	Walking
104	0.9	0.1	0.0	0.0	0.0	Sitting	10.2	3.3	0.6	0.0	0.2	Walking
105	0.0	0.0	0.0	0.0	0.0	Sitting	3.4	0.8	0.1	0.0	0.0	Standing
106	0.0	0.0	0.0	0.0	0.0	Sitting	1.1	0.2	0.0	0.0	0.0	Standing
107	0.0	0.0	0.0	0.0	0.0	Sitting	7.6	3.2	0.7	0.0	0.1	Walking
108	0.0	0.0	0.0	0.0	0.0	Sitting	3.7	0.6	0.0	0.0	0.0	Standing
109	0.0	0.0	0.0	0.0	0.0	Sitting	3.3	0.8	0.1	0.0	0.0	Standing
110	0.2	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
111	0.8	0.1	0.0	0.0	0.0	Sitting	2.6	0.5	0.0	0.0	0.0	Standing
112	0.0	0.0	0.0	0.0	0.0	Sitting	1.5	0.2	0.0	0.0	0.0	Standing
113	0.2	0.0	0.0	0.0	0.0	Sitting	1.3	0.1	0.0	0.0	0.0	Standing
114	0.0	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
115	0.2	0.0	0.0	0.0	0.0	Sitting	2.6	0.2	0.0	0.0	0.0	Standing
116	0.7	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
117	0.0	0.0	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
118	0.0	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
119	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
120	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
121							0.3	0.0	0.0	0.0	0.0	Sitting
122							2.0	0.3	0.0	0.0	0.0	Standing
123							0.4	0.0	0.0	0.0	0.0	Sitting
124							0.0	0.0	0.0	0.0	0.0	Sitting

Table 2.11 Comparison of Pedestrian Wind Comfort - Autumn

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
1	0.2	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
2	0.5	0.1	0.0	0.0	0.0	Sitting	0.4	0.1	0.0	0.0	0.0	Sitting
3	2.3	0.7	0.1	0.0	0.0	Standing	1.6	0.3	0.0	0.0	0.0	Standing
4	0.9	0.1	0.0	0.0	0.0	Sitting	2.1	0.2	0.0	0.0	0.0	Standing
5	0.3	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
6	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
7	2.0	0.6	0.1	0.0	0.0	Standing	1.9	0.5	0.1	0.0	0.0	Standing
8	1.1	0.3	0.0	0.0	0.0	Standing	1.0	0.2	0.0	0.0	0.0	Sitting
9	0.4	0.1	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
10	0.1	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
11	0.0	0.0	0.0	0.0	0.0	Sitting	1.7	0.2	0.0	0.0	0.0	Standing
12	0.1	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
13	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
14	1.9	0.2	0.0	0.0	0.0	Standing	4.9	1.2	0.1	0.0	0.0	Walking
15	0.4	0.1	0.0	0.0	0.0	Sitting	1.0	0.2	0.0	0.0	0.0	Standing
16	0.6	0.1	0.0	0.0	0.0	Sitting	1.3	0.3	0.0	0.0	0.0	Standing
17	2.5	0.4	0.0	0.0	0.0	Standing	4.3	1.0	0.1	0.0	0.0	Walking
18	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
19	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
20	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
21	0.5	0.1	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
22	2.9	0.4	0.0	0.0	0.0	Standing	3.1	0.5	0.0	0.0	0.0	Standing
23	0.9	0.1	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
24	1.1	0.1	0.0	0.0	0.0	Standing	1.0	0.1	0.0	0.0	0.0	Sitting
25	0.4	0.0	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
26	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
27	0.3	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
28	0.7	0.0	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
29	0.7	0.0	0.0	0.0	0.0	Sitting	1.2	0.1	0.0	0.0	0.0	Standing
30	0.3	0.0	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
31	0.0	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
32	0.2	0.0	0.0	0.0	0.0	Sitting	2.0	0.2	0.0	0.0	0.0	Standing
33	0.9	0.1	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
34	0.3	0.0	0.0	0.0	0.0	Sitting	5.2	1.1	0.1	0.0	0.0	Walking
35	0.0	0.0	0.0	0.0	0.0	Sitting	3.0	0.6	0.0	0.0	0.0	Standing
36	0.6	0.1	0.0	0.0	0.0	Sitting	2.5	0.8	0.1	0.0	0.0	Standing
37	0.7	0.0	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
38	0.1	0.0	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
39	0.7	0.1	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
40	0.4	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
41	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
42	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
43	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
44	0.8	0.1	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
45	3.4	0.5	0.0	0.0	0.0	Standing	4.3	0.8	0.0	0.0	0.0	Standing
46	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
47	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
48	0.9	0.1	0.0	0.0	0.0	Sitting	0.9	0.2	0.0	0.0	0.0	Sitting
49	0.5	0.1	0.0	0.0	0.0	Sitting	0.5	0.1	0.0	0.0	0.0	Sitting
50	0.1	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
51	0.6	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
52	0.4	0.0	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
53	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
54	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
55	0.3	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
56	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
57	1.5	0.3	0.0	0.0	0.0	Standing	1.1	0.2	0.0	0.0	0.0	Standing
58	0.5	0.1	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
59	0.9	0.1	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
60	3.5	0.6	0.0	0.0	0.0	Standing	4.3	0.9	0.0	0.0	0.0	Standing

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
61	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
62	0.6	0.0	0.0	0.0	0.0	Sitting	0.7	0.0	0.0	0.0	0.0	Sitting
63	1.5	0.2	0.0	0.0	0.0	Standing	0.9	0.1	0.0	0.0	0.0	Sitting
64	1.1	0.2	0.0	0.0	0.0	Standing	1.3	0.3	0.0	0.0	0.0	Standing
65	0.7	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
66	1.0	0.2	0.0	0.0	0.0	Standing	1.1	0.2	0.0	0.0	0.0	Standing
67	0.8	0.0	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
68	3.2	0.6	0.0	0.0	0.0	Standing	5.1	1.2	0.1	0.0	0.0	Walking
69	0.4	0.0	0.0	0.0	0.0	Sitting	1.2	0.3	0.0	0.0	0.0	Standing
70	0.6	0.0	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Sitting
71	0.6	0.0	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Standing
72	0.9	0.1	0.0	0.0	0.0	Sitting	1.0	0.2	0.0	0.0	0.0	Standing
73	0.0	0.0	0.0	0.0	0.0	Sitting	7.2	2.4	0.6	0.0	0.3	Walking
74	0.5	0.0	0.0	0.0	0.0	Sitting	2.1	0.5	0.1	0.0	0.1	Standing
75	3.1	0.9	0.1	0.0	0.1	Standing	0.9	0.2	0.0	0.0	0.0	Sitting
76	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
77	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
78	1.9	0.6	0.1	0.0	0.0	Standing	1.5	0.4	0.1	0.0	0.0	Standing
79	0.8	0.1	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
80	0.4	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
81	0.3	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
82	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
83	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
84	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
85	2.0	0.6	0.1	0.0	0.0	Standing	2.8	0.8	0.1	0.0	0.1	Standing
86	0.2	0.0	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
87	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
88	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
89	2.6	0.7	0.1	0.0	0.0	Standing	7.3	2.0	0.2	0.0	0.0	Walking
90	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
91	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
92	0.0	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
93	0.9	0.1	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
94	0.0	0.0	0.0	0.0	0.0	Sitting	2.5	0.4	0.0	0.0	0.0	Standing
95	2.3	0.4	0.0	0.0	0.0	Standing	0.8	0.1	0.0	0.0	0.0	Sitting
96	0.7	0.0	0.0	0.0	0.0	Sitting	2.1	0.3	0.0	0.0	0.0	Standing
97	5.6	1.3	0.1	0.0	0.0	Walking	3.7	0.8	0.1	0.0	0.0	Standing
98	0.0	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
99	0.1	0.0	0.0	0.0	0.0	Sitting	1.3	0.1	0.0	0.0	0.0	Standing
100	0.5	0.1	0.0	0.0	0.0	Sitting	1.6	0.3	0.0	0.0	0.0	Standing
101	0.6	0.1	0.0	0.0	0.0	Sitting	9.2	2.7	0.3	0.0	0.0	Walking
102	0.5	0.1	0.0	0.0	0.0	Sitting	16.9	7.8	2.2	0.0	0.3	Uncomfortable
103	0.5	0.0	0.0	0.0	0.0	Sitting	18.7	8.0	1.7	0.0	0.3	Uncomfortable
104	2.9	0.4	0.0	0.0	0.0	Standing	12.6	5.5	1.6	0.1	0.7	Uncomfortable
105	0.1	0.0	0.0	0.0	0.0	Sitting	5.8	2.0	0.5	0.0	0.2	Walking
106	0.0	0.0	0.0	0.0	0.0	Sitting	2.9	0.6	0.1	0.0	0.0	Standing
107	0.0	0.0	0.0	0.0	0.0	Sitting	8.3	3.8	1.3	0.1	0.4	Uncomfortable
108	0.0	0.0	0.0	0.0	0.0	Sitting	8.8	2.5	0.3	0.0	0.0	Walking
109	0.0	0.0	0.0	0.0	0.0	Sitting	7.6	2.4	0.4	0.0	0.0	Walking
110	0.6	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
111	2.4	0.3	0.0	0.0	0.0	Standing	6.7	1.8	0.2	0.0	0.0	Walking
112	0.1	0.0	0.0	0.0	0.0	Sitting	2.4	0.8	0.1	0.0	0.0	Standing
113	1.1	0.1	0.0	0.0	0.0	Standing	4.2	0.7	0.0	0.0	0.0	Standing
114	0.1	0.0	0.0	0.0	0.0	Sitting	1.3	0.2	0.0	0.0	0.0	Standing
115	0.6	0.0	0.0	0.0	0.0	Sitting	6.9	1.4	0.1	0.0	0.0	Walking
116	1.1	0.2	0.0	0.0	0.0	Standing	0.6	0.0	0.0	0.0	0.0	Sitting
117	0.0	0.0	0.0	0.0	0.0	Sitting	2.5	0.3	0.0	0.0	0.0	Standing
118	0.2	0.0	0.0	0.0	0.0	Sitting	1.4	0.1	0.0	0.0	0.0	Standing
119	0.0	0.0	0.0	0.0	0.0	Sitting	0.4	0.0	0.0	0.0	0.0	Sitting
120	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
121							1.0	0.1	0.0	0.0	0.0	Standing
122							3.9	0.8	0.1	0.0	0.0	Standing
123							0.8	0.1	0.0	0.0	0.0	Sitting
124							0.1	0.0	0.0	0.0	0.0	Sitting

Table 2.12 Comparison of Pedestrian Wind Comfort - Winter

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
1	0.8	0.1	0.0	0.0	0.0	Sitting	0.3	0.1	0.0	0.0	0.0	Sitting
2	1.0	0.3	0.0	0.0	0.0	Standing	0.9	0.2	0.0	0.0	0.0	Sitting
3	3.5	1.2	0.3	0.0	0.1	Walking	4.0	0.8	0.1	0.0	0.1	Standing
4	2.7	0.4	0.0	0.0	0.0	Standing	5.4	0.9	0.1	0.0	0.0	Standing
5	0.9	0.2	0.0	0.0	0.0	Sitting	1.3	0.2	0.0	0.0	0.0	Standing
6	0.8	0.2	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
7	2.7	1.1	0.3	0.0	0.2	Walking	2.7	1.1	0.3	0.0	0.1	Walking
8	1.6	0.6	0.2	0.0	0.1	Standing	1.5	0.6	0.2	0.0	0.1	Standing
9	1.2	0.4	0.1	0.0	0.1	Standing	0.9	0.3	0.0	0.0	0.0	Sitting
10	0.4	0.0	0.0	0.0	0.0	Sitting	1.2	0.1	0.0	0.0	0.0	Standing
11	0.1	0.0	0.0	0.0	0.0	Sitting	4.9	1.0	0.1	0.0	0.0	Standing
12	0.4	0.1	0.0	0.0	0.0	Sitting	0.9	0.1	0.0	0.0	0.0	Sitting
13	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
14	5.0	1.0	0.1	0.0	0.0	Walking	10.4	3.6	0.6	0.0	0.2	Walking
15	0.9	0.2	0.0	0.0	0.0	Sitting	2.2	0.5	0.1	0.0	0.0	Standing
16	1.1	0.3	0.0	0.0	0.0	Standing	2.1	0.6	0.1	0.0	0.1	Standing
17	6.9	1.7	0.1	0.0	0.0	Walking	10.5	3.7	0.6	0.0	0.3	Walking
18	0.4	0.1	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
19	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
20	0.0	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
21	0.8	0.2	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Standing
22	8.5	2.1	0.2	0.0	0.0	Walking	9.0	2.3	0.2	0.0	0.0	Walking
23	1.8	0.4	0.1	0.0	0.0	Standing	1.7	0.4	0.1	0.0	0.0	Standing
24	2.0	0.4	0.1	0.0	0.0	Standing	1.8	0.4	0.1	0.0	0.0	Standing
25	1.6	0.2	0.0	0.0	0.0	Standing	2.2	0.4	0.1	0.0	0.0	Standing
26	0.5	0.1	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
27	1.4	0.2	0.0	0.0	0.0	Standing	1.8	0.2	0.0	0.0	0.0	Standing
28	2.0	0.2	0.0	0.0	0.0	Standing	2.6	0.3	0.0	0.0	0.0	Standing
29	2.9	0.3	0.0	0.0	0.0	Standing	4.6	0.7	0.0	0.0	0.0	Standing
30	1.3	0.1	0.0	0.0	0.0	Standing	2.5	0.3	0.0	0.0	0.0	Standing
31	0.3	0.0	0.0	0.0	0.0	Sitting	1.0	0.1	0.0	0.0	0.0	Sitting
32	1.0	0.0	0.0	0.0	0.0	Sitting	6.4	1.1	0.0	0.0	0.0	Walking
33	3.5	0.5	0.0	0.0	0.0	Standing	3.5	0.5	0.0	0.0	0.0	Standing
34	1.6	0.1	0.0	0.0	0.0	Standing	12.4	3.9	0.5	0.0	0.2	Walking
35	0.1	0.0	0.0	0.0	0.0	Sitting	6.9	1.9	0.2	0.0	0.1	Walking
36	1.6	0.4	0.1	0.0	0.0	Standing	3.9	1.4	0.4	0.0	0.1	Walking
37	2.1	0.2	0.0	0.0	0.0	Standing	2.6	0.5	0.0	0.0	0.1	Standing
38	0.4	0.1	0.0	0.0	0.0	Sitting	2.9	0.4	0.0	0.0	0.0	Standing
39	1.8	0.3	0.0	0.0	0.0	Standing	1.3	0.2	0.0	0.0	0.0	Standing
40	1.6	0.1	0.0	0.0	0.0	Standing	0.3	0.1	0.0	0.0	0.0	Sitting
41	0.4	0.1	0.0	0.0	0.0	Sitting	0.4	0.1	0.0	0.0	0.0	Sitting
42	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
43	0.1	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
44	1.9	0.3	0.1	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
45	8.0	1.9	0.1	0.0	0.0	Walking	9.4	2.6	0.3	0.0	0.0	Walking
46	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
47	0.0	0.0	0.0	0.0	0.0	Sitting	0.0	0.0	0.0	0.0	0.0	Sitting
48	1.8	0.6	0.1	0.0	0.0	Standing	1.6	0.6	0.2	0.0	0.0	Standing
49	1.2	0.4	0.1	0.0	0.0	Standing	1.2	0.3	0.1	0.0	0.0	Standing
50	0.3	0.0	0.0	0.0	0.0	Sitting	0.5	0.0	0.0	0.0	0.0	Sitting
51	1.2	0.3	0.0	0.0	0.0	Standing	1.3	0.3	0.1	0.0	0.0	Standing
52	1.0	0.1	0.0	0.0	0.0	Sitting	1.2	0.1	0.0	0.0	0.0	Standing
53	0.2	0.0	0.0	0.0	0.0	Sitting	0.3	0.0	0.0	0.0	0.0	Sitting
54	0.9	0.1	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
55	1.0	0.1	0.0	0.0	0.0	Standing	1.7	0.1	0.0	0.0	0.0	Standing
56	0.9	0.1	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
57	2.6	0.9	0.2	0.0	0.0	Standing	2.4	0.6	0.1	0.0	0.0	Standing
58	1.0	0.4	0.1	0.0	0.0	Standing	1.1	0.4	0.1	0.0	0.0	Standing
59	1.9	0.5	0.1	0.0	0.0	Standing	2.0	0.5	0.1	0.0	0.0	Standing
60	9.7	2.6	0.3	0.0	0.0	Walking	11.1	3.3	0.4	0.0	0.1	Walking

SENSOR	NO BUILD						BUILD					
	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES	WIND SPEED RANGE (mph)					COMFORTABLE ACTIVITIES
	MEAN				GUST		MEAN				GUST	
	> 12	> 15	> 19	>27	> 31		> 12	> 15	> 19	>27	> 31	
61	0.4	0.1	0.0	0.0	0.0	Sitting	0.6	0.1	0.0	0.0	0.0	Sitting
62	2.3	0.2	0.0	0.0	0.0	Standing	2.7	0.3	0.0	0.0	0.0	Standing
63	4.5	0.8	0.1	0.0	0.1	Standing	2.9	0.5	0.1	0.0	0.1	Standing
64	1.9	0.6	0.1	0.0	0.0	Standing	2.2	0.7	0.1	0.0	0.1	Standing
65	1.7	0.4	0.1	0.0	0.0	Standing	1.7	0.4	0.1	0.0	0.1	Standing
66	2.5	0.6	0.1	0.0	0.0	Standing	2.7	0.6	0.1	0.0	0.1	Standing
67	3.5	0.5	0.0	0.0	0.0	Standing	3.2	0.5	0.1	0.0	0.1	Standing
68	7.3	2.0	0.3	0.0	0.1	Walking	10.9	3.6	0.6	0.0	0.1	Walking
69	1.1	0.4	0.1	0.0	0.0	Standing	1.9	0.9	0.3	0.0	0.2	Standing
70	2.8	0.3	0.0	0.0	0.0	Standing	3.0	0.6	0.1	0.0	0.0	Standing
71	2.8	0.3	0.0	0.0	0.0	Standing	3.1	0.6	0.1	0.0	0.1	Standing
72	1.7	0.3	0.0	0.0	0.0	Standing	2.4	0.6	0.1	0.0	0.1	Standing
73	0.1	0.0	0.0	0.0	0.0	Sitting	10.9	3.6	1.1	0.2	0.7	Uncomfortable
74	1.2	0.1	0.0	0.0	0.0	Standing	3.2	0.9	0.2	0.0	0.2	Standing
75	3.6	1.4	0.4	0.0	0.2	Walking	1.9	0.7	0.2	0.0	0.1	Standing
76	0.2	0.0	0.0	0.0	0.0	Sitting	0.2	0.0	0.0	0.0	0.0	Sitting
77	0.9	0.1	0.0	0.0	0.0	Sitting	0.7	0.1	0.0	0.0	0.0	Sitting
78	2.4	1.0	0.3	0.0	0.1	Walking	2.4	0.9	0.2	0.0	0.1	Standing
79	2.8	0.3	0.0	0.0	0.0	Standing	2.3	0.2	0.0	0.0	0.0	Standing
80	2.0	0.2	0.0	0.0	0.0	Standing	1.9	0.3	0.0	0.0	0.0	Standing
81	1.5	0.1	0.0	0.0	0.0	Standing	1.1	0.1	0.0	0.0	0.0	Standing
82	0.1	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
83	0.4	0.0	0.0	0.0	0.0	Sitting	0.7	0.0	0.0	0.0	0.0	Sitting
84	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
85	2.5	1.1	0.4	0.0	0.3	Walking	4.3	1.5	0.5	0.1	0.3	Walking
86	1.1	0.1	0.0	0.0	0.0	Standing	3.0	0.4	0.0	0.0	0.0	Standing
87	0.1	0.0	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
88	1.0	0.2	0.0	0.0	0.0	Standing	1.2	0.1	0.0	0.0	0.0	Standing
89	4.1	1.4	0.5	0.0	0.2	Walking	13.3	5.0	1.1	0.1	0.4	Uncomfortable
90	0.6	0.1	0.0	0.0	0.0	Sitting	0.6	0.0	0.0	0.0	0.0	Sitting
91	0.2	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
92	0.3	0.0	0.0	0.0	0.0	Sitting	1.5	0.2	0.0	0.0	0.0	Standing
93	2.1	0.3	0.0	0.0	0.0	Standing	0.4	0.0	0.0	0.0	0.0	Sitting
94	0.2	0.0	0.0	0.0	0.0	Sitting	3.7	0.8	0.1	0.0	0.0	Standing
95	4.3	0.9	0.1	0.0	0.1	Standing	1.3	0.2	0.0	0.0	0.0	Standing
96	2.4	0.3	0.0	0.0	0.0	Standing	5.0	1.2	0.1	0.0	0.1	Walking
97	11.6	3.9	0.5	0.0	0.1	Walking	7.5	2.3	0.3	0.0	0.3	Walking
98	0.1	0.0	0.0	0.0	0.0	Sitting	0.8	0.1	0.0	0.0	0.0	Sitting
99	0.3	0.0	0.0	0.0	0.0	Sitting	3.9	0.6	0.0	0.0	0.0	Standing
100	1.2	0.4	0.1	0.0	0.0	Standing	3.8	1.0	0.1	0.0	0.0	Standing
101	1.5	0.5	0.1	0.0	0.1	Standing	18.0	7.0	1.3	0.0	0.3	Uncomfortable
102	1.5	0.5	0.1	0.0	0.0	Standing	29.6	17.0	6.6	0.3	1.7	Uncomfortable
103	1.7	0.2	0.0	0.0	0.0	Standing	29.9	16.4	5.5	0.2	1.7	Uncomfortable
104	8.2	2.0	0.2	0.0	0.0	Walking	12.6	6.2	2.2	0.4	1.3	Uncomfortable
105	0.4	0.1	0.0	0.0	0.0	Sitting	6.6	2.6	0.9	0.2	0.6	Walking
106	0.1	0.0	0.0	0.0	0.0	Sitting	5.6	1.7	0.3	0.0	0.2	Walking
107	0.2	0.0	0.0	0.0	0.0	Sitting	10.3	4.5	2.1	0.5	1.1	Uncomfortable
108	0.1	0.0	0.0	0.0	0.0	Sitting	19.1	7.9	1.6	0.0	0.2	Uncomfortable
109	0.4	0.0	0.0	0.0	0.0	Sitting	16.3	6.7	1.5	0.0	0.3	Uncomfortable
110	1.6	0.2	0.0	0.0	0.0	Standing	0.0	0.0	0.0	0.0	0.0	Sitting
111	6.5	1.3	0.1	0.0	0.0	Walking	15.4	5.9	1.0	0.0	0.1	Uncomfortable
112	0.8	0.2	0.0	0.0	0.0	Sitting	3.1	1.5	0.6	0.1	0.2	Walking
113	4.1	0.6	0.0	0.0	0.0	Standing	10.3	2.9	0.4	0.0	0.1	Walking
114	0.7	0.0	0.0	0.0	0.0	Sitting	2.7	0.8	0.2	0.0	0.1	Standing
115	1.8	0.1	0.0	0.0	0.0	Standing	15.5	5.1	0.7	0.0	0.1	Walking
116	1.7	0.4	0.0	0.0	0.0	Standing	2.1	0.4	0.1	0.0	0.0	Standing
117	0.2	0.0	0.0	0.0	0.0	Sitting	7.5	1.8	0.1	0.0	0.0	Walking
118	0.8	0.1	0.0	0.0	0.0	Sitting	3.7	0.5	0.0	0.0	0.0	Standing
119	0.2	0.0	0.0	0.0	0.0	Sitting	1.8	0.2	0.0	0.0	0.0	Standing
120	0.0	0.0	0.0	0.0	0.0	Sitting	0.1	0.0	0.0	0.0	0.0	Sitting
121							3.1	0.5	0.0	0.0	0.0	Standing
122							7.9	1.9	0.3	0.0	0.1	Walking
123							1.3	0.3	0.0	0.0	0.0	Standing
124							0.4	0.0	0.0	0.0	0.0	Sitting

Figure 2.28 Study Model Inside the GWE Wind Tunnel Looking Downtown

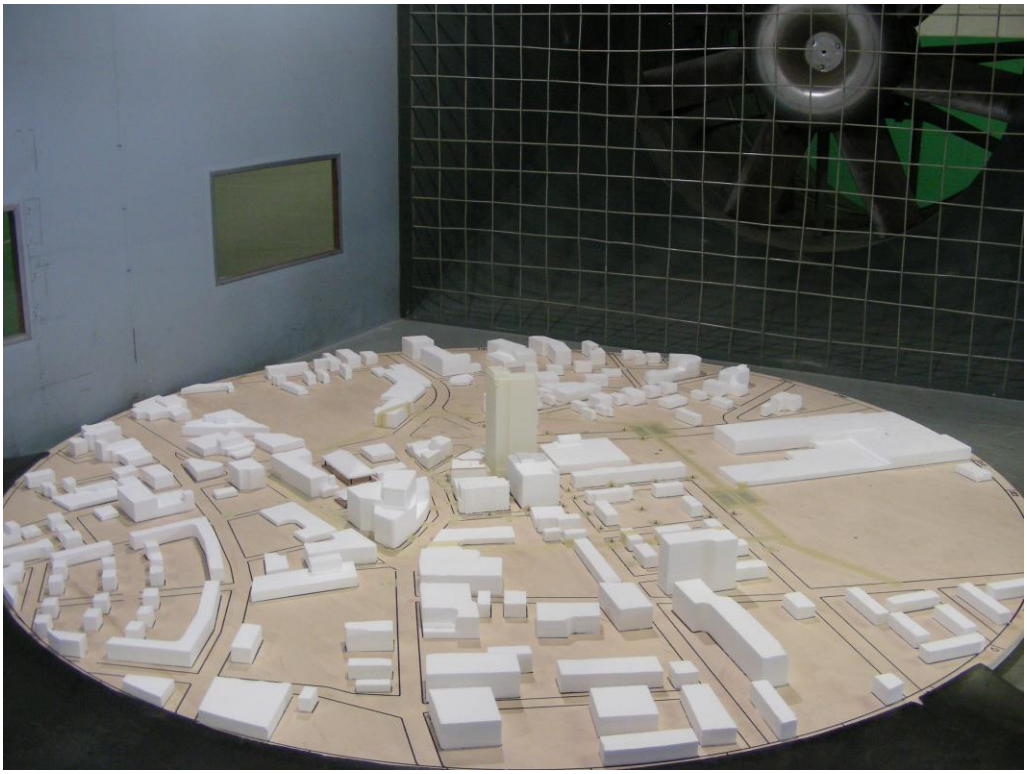


Figure 2.29 Study Model Inside the GWE Wind Tunnel Looking Upwind

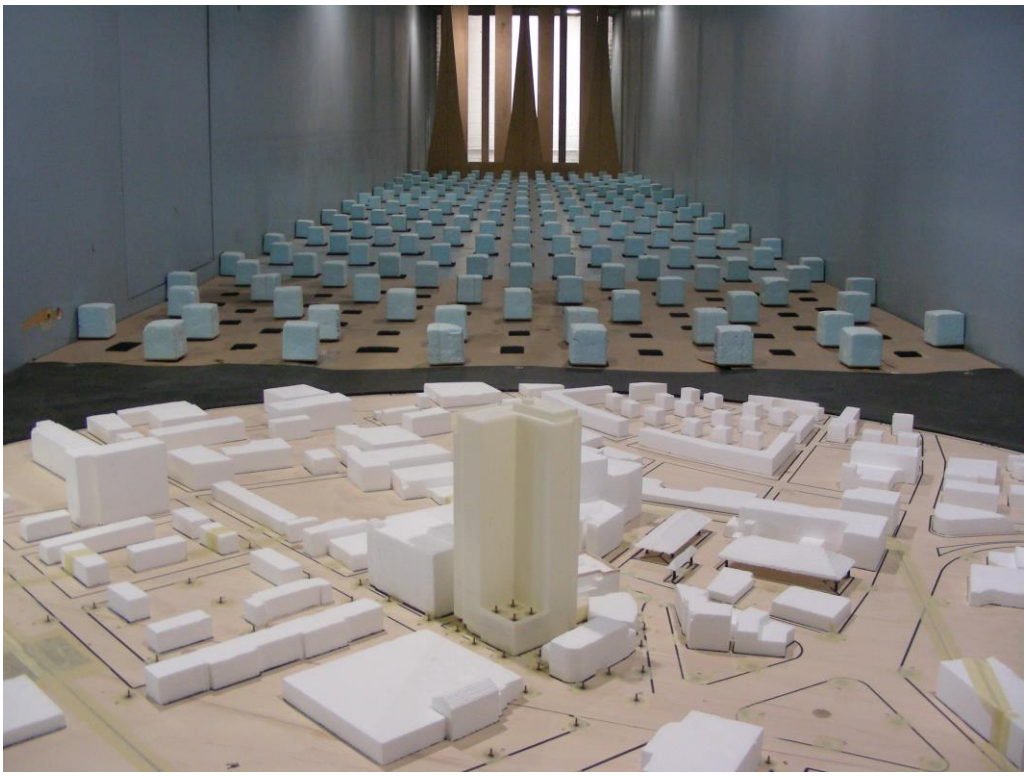


Figure 2.30 Study Model Inside the GWE Wind Tunnel Looking Upwind

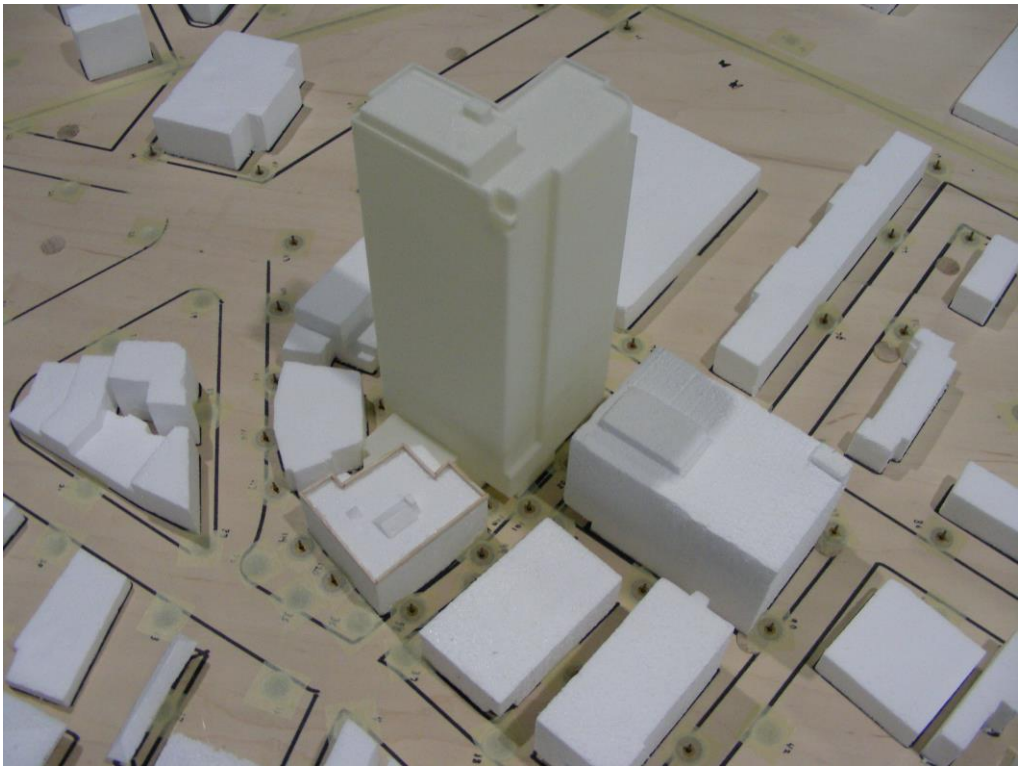


Figure 2.31 Study Model Inside the GWE Wind Tunnel Looking Upwind

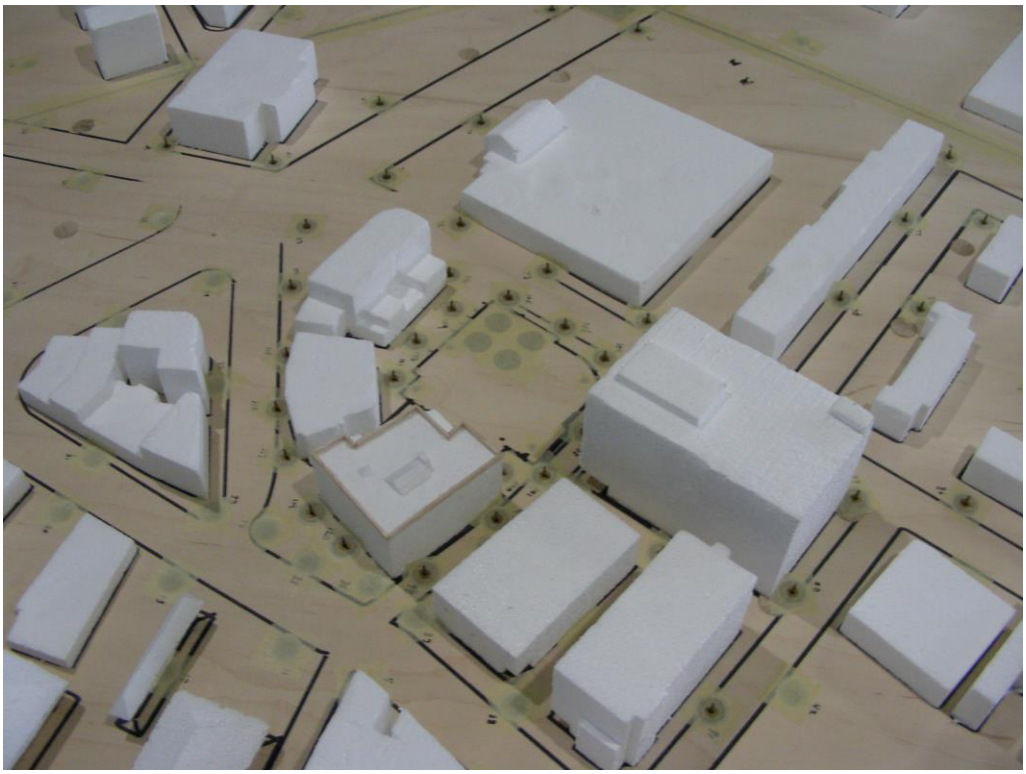


Figure 2.32 Annual Pedestrian Comfort Predictions - No Build Configuration

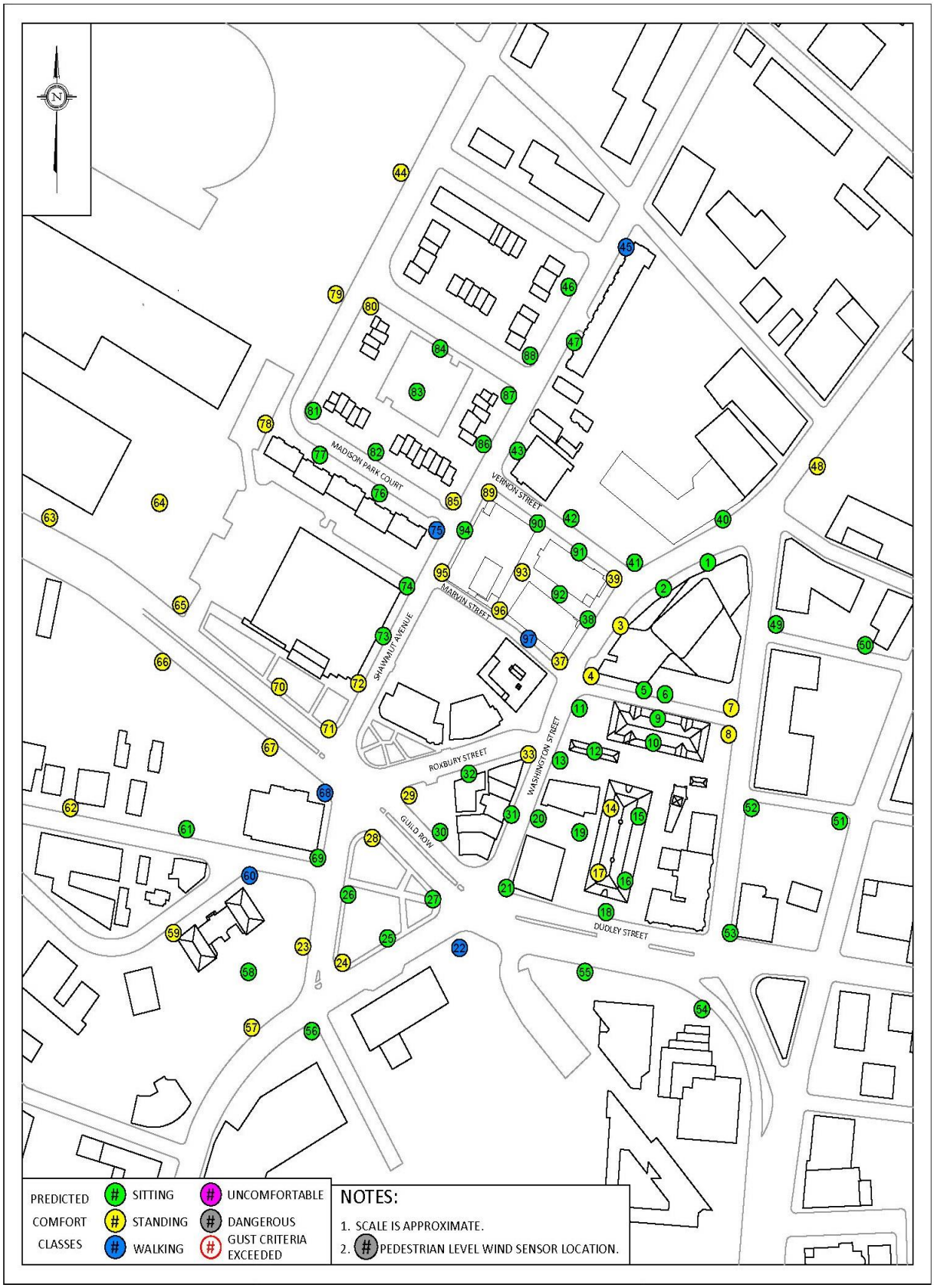


Figure 2.33 Annual Pedestrian Comfort Predictions - No Build Configuration

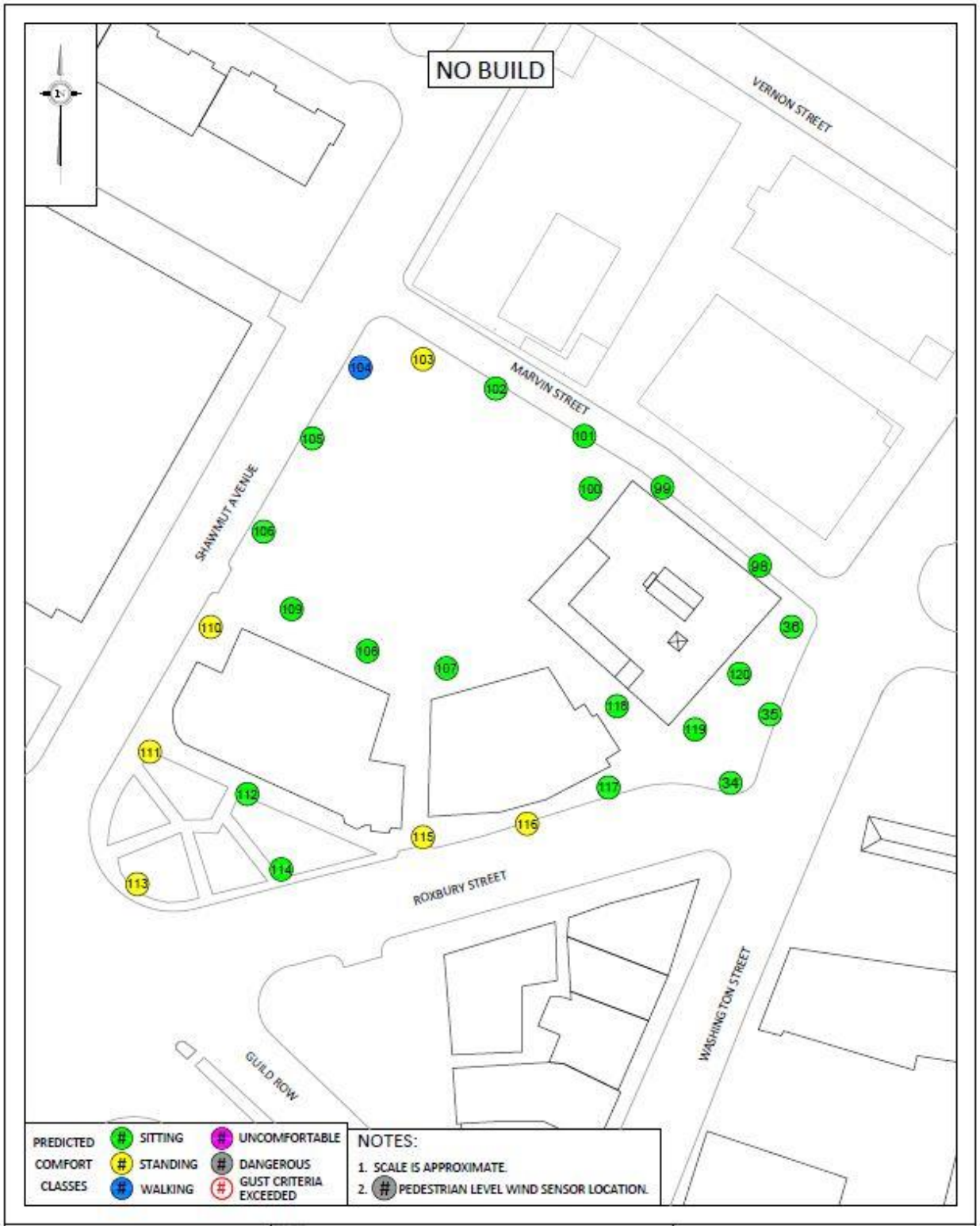


Figure 2.34 Annual Pedestrian Comfort Predictions - Build Configuration

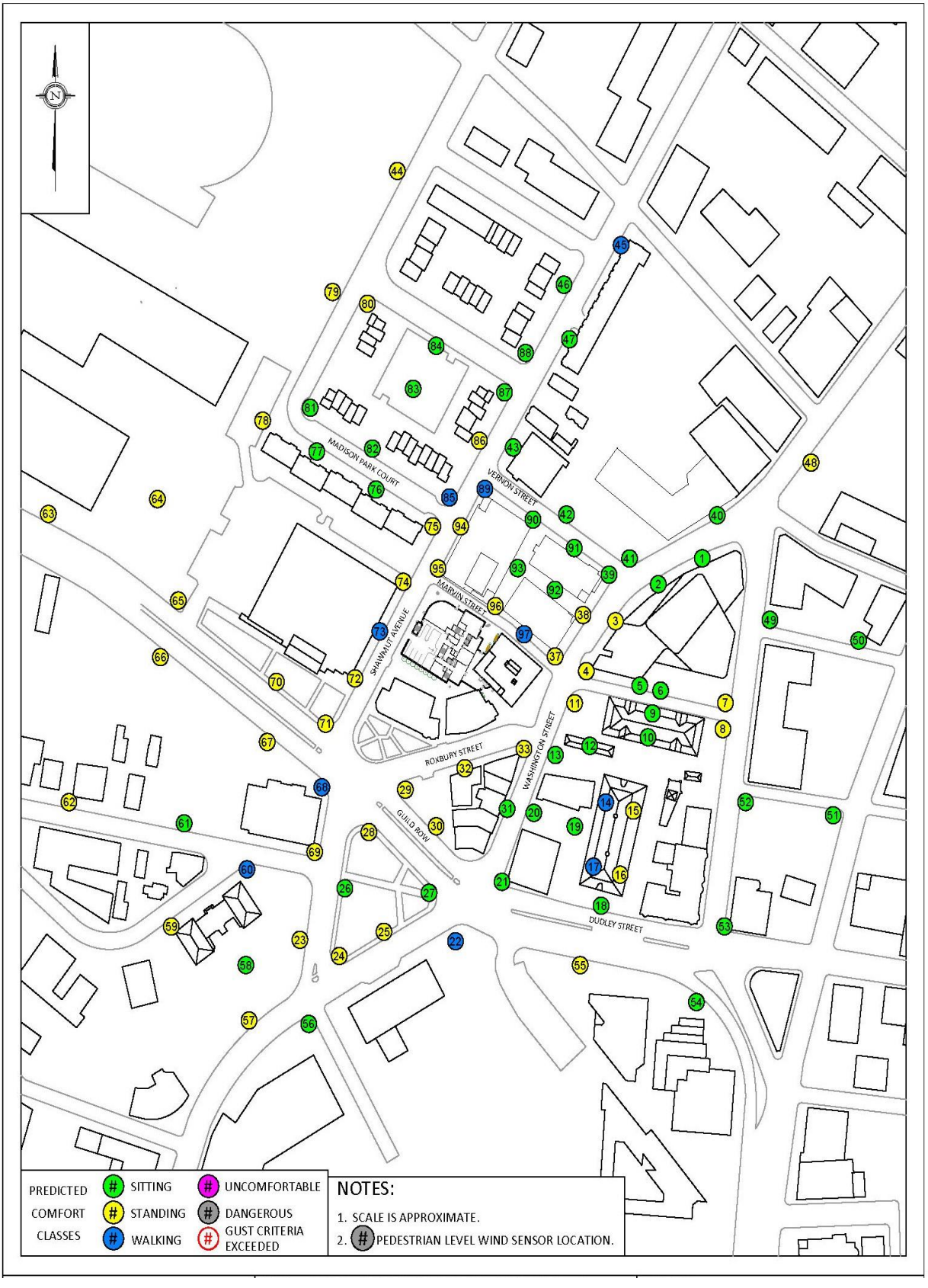


Figure 2.35 Annual Pedestrian Comfort Predictions - Build Configuration

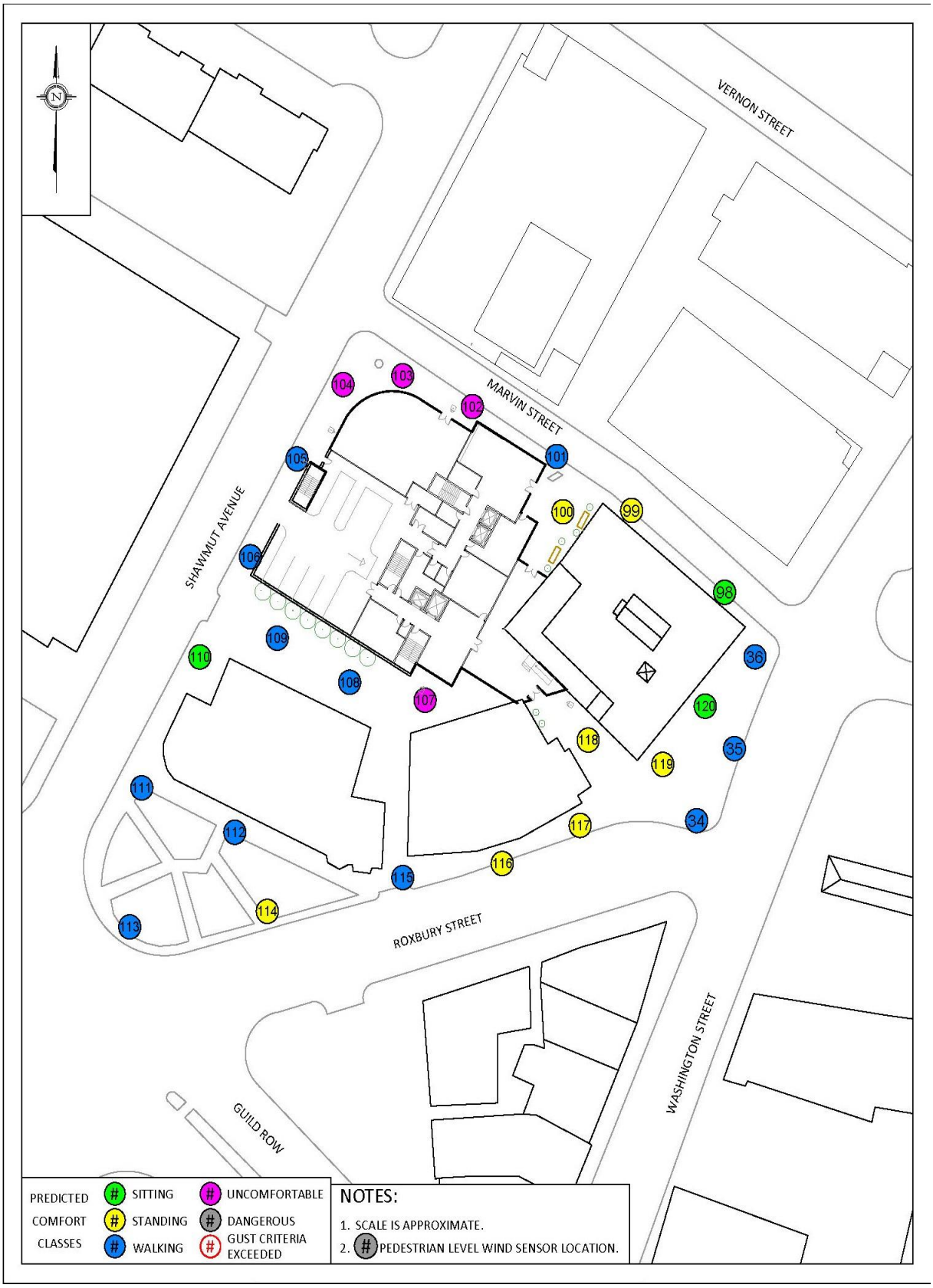


Figure 2.36 Annual Pedestrian Comfort Predictions - Build Configuration

2.2.3 Shadow

A shadow study indicating the potential impacts of the Project has been prepared and shown on Figures 2-37 to 2.49. As the study reveals, the Project is located in Dudley Square, a neighborhood business district consisting of primarily multi-story commercial buildings. The Square is surrounded by a mixture of large institutional use and low density residential developments. Of primary concern are the new shadow impacts on the residential uses and public open spaces.

The only public open spaces impacted by the Project is the Madison Park HS athletic field and those new shadows are limited to Winter mornings when shadows are the longest but fortunately use is limited (see Figure 2.47). There are limited impacts on all other public spaces which are sufficiently removed from the Project so as not be impacted even in the dead of winter. This includes the Eustis Burial Ground situated at the northern end of the Square.

Regarding the adjacent Madison Park Residential Community (northwest of the Project), there will be some shadow impacts mid-day during the winter months (see Figure 2.47-2.48). But these will only effect a small section of the community and will be similar in scope to the shadows case by the existing residential towers (Smith and Haynes Houses).

In summary, while the Proposed Project will be of sufficient height so as to cast shadows new shadows on the adjacent public realm and residential neighborhood, the footprint and orientation of the new tower limit impacts to winter months and to times when shadow impacts do not significantly impact quality of life.

Figure 2.37 Shadow - March 21 - 9:00am

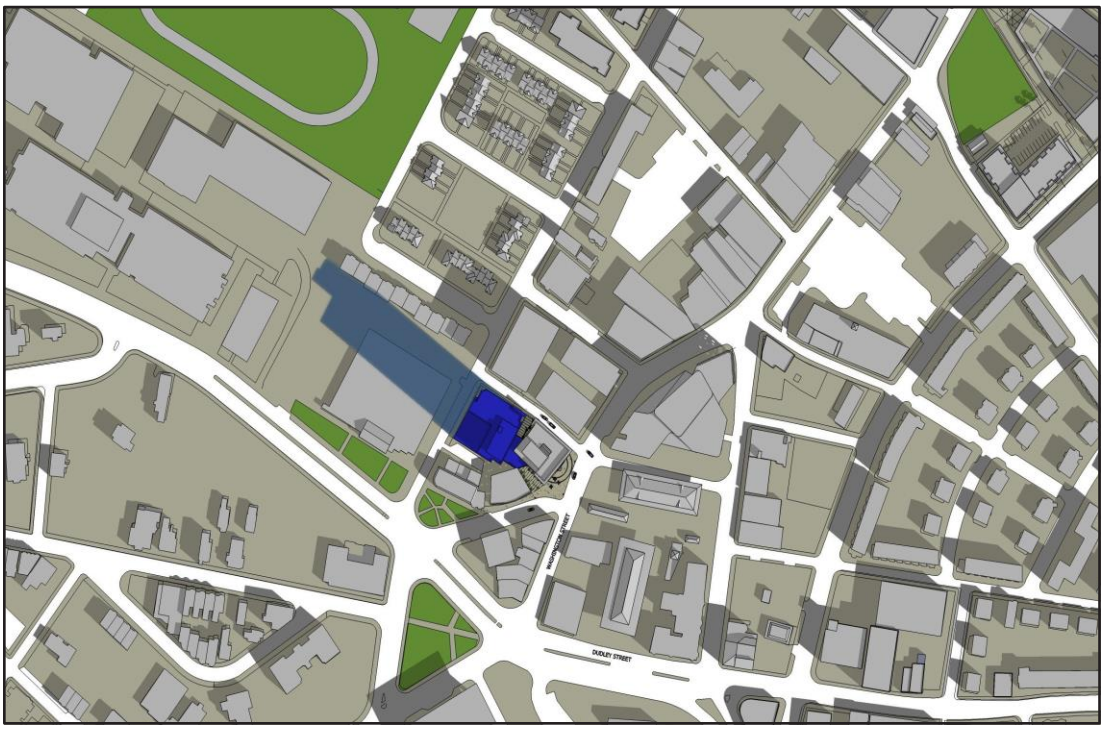


Figure 2.38 Shadow - March 21 - 12:00pm

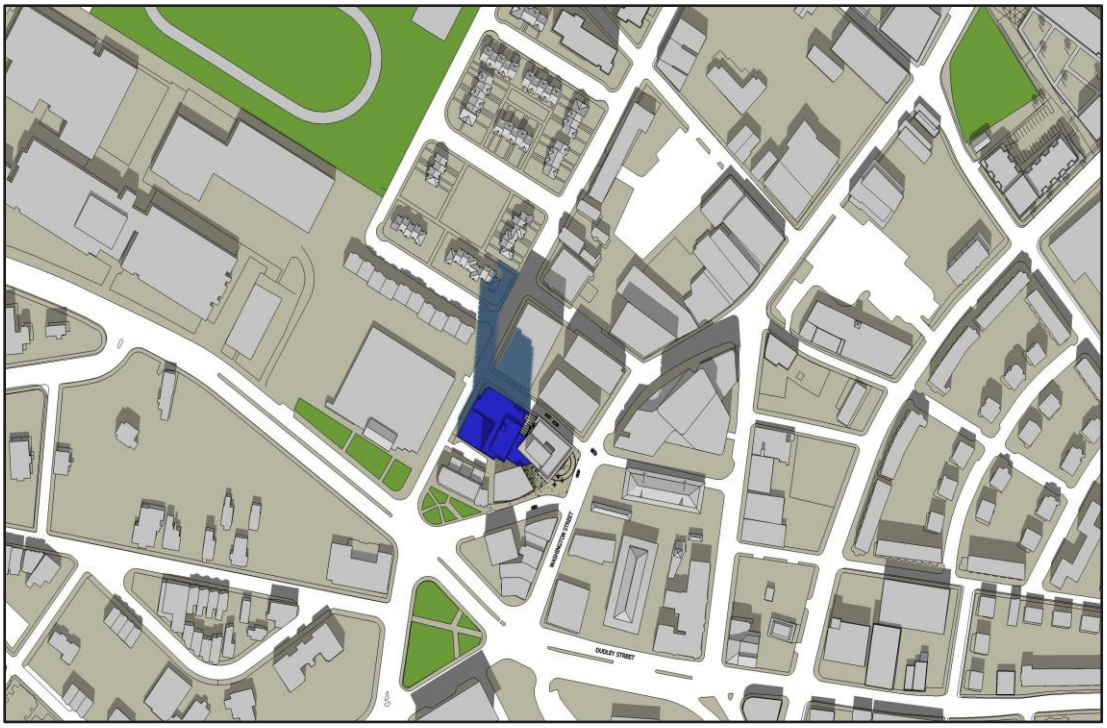


Figure 2.39 Shadow - March 21 - 3:00pm

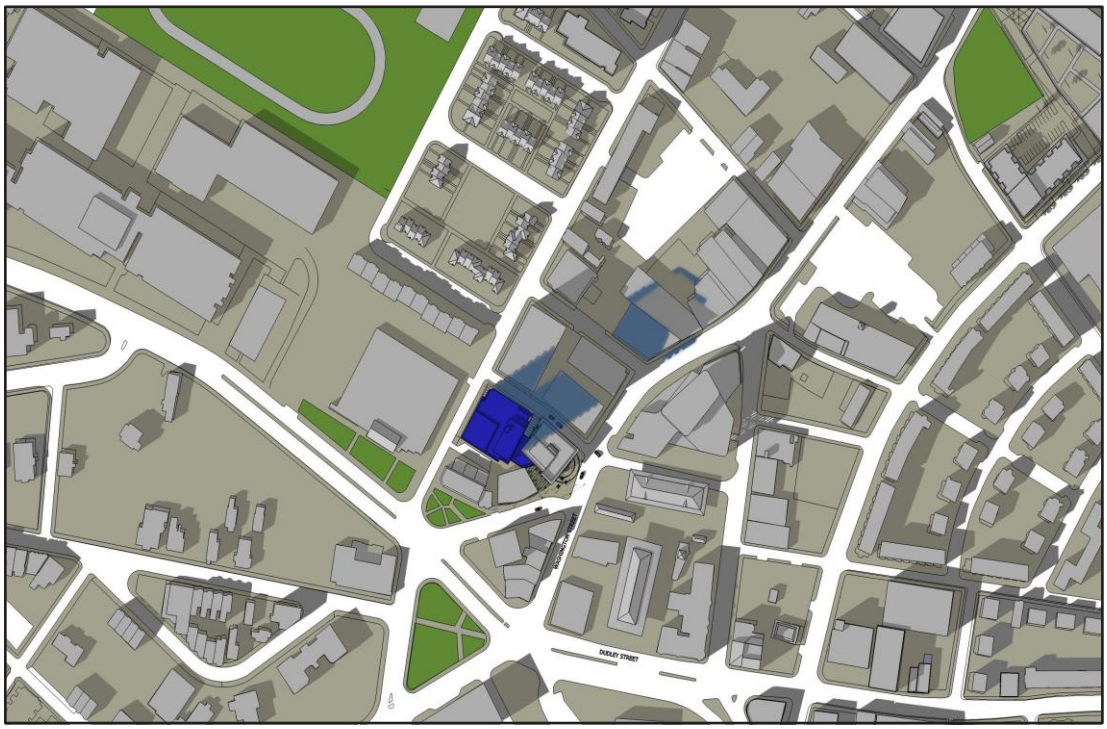


Figure 2.40 Shadow - March 21 - 4:00pm

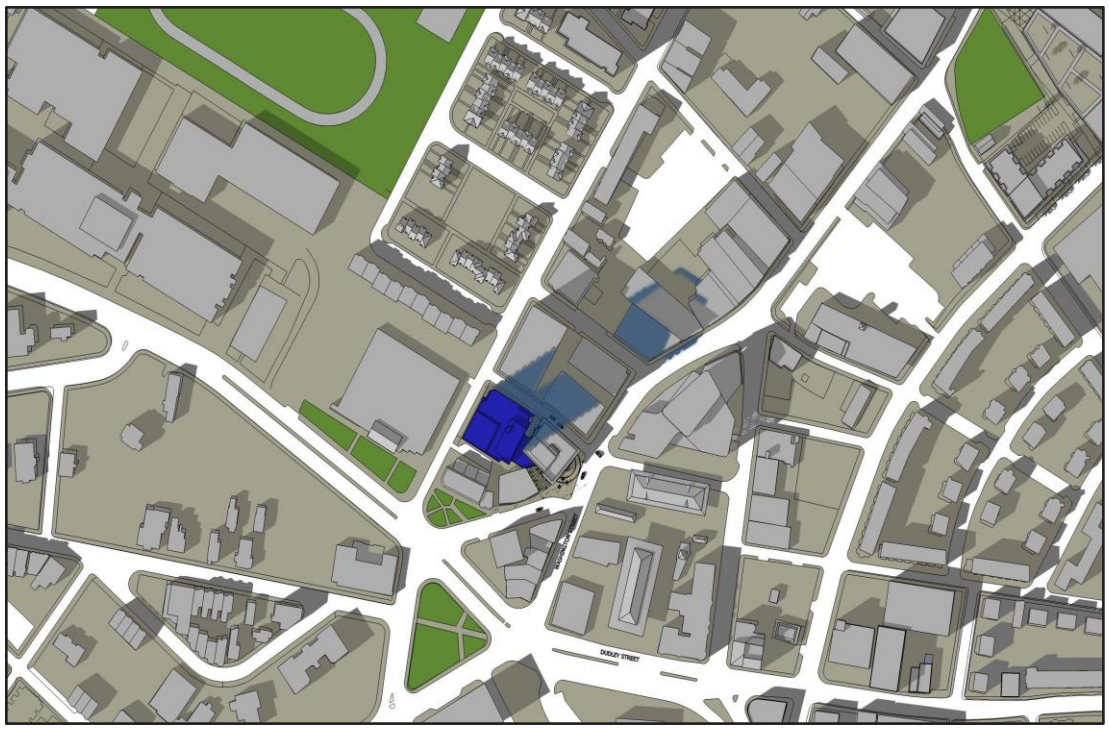


Figure 2.41 Shadow - June 21 - 9:00am

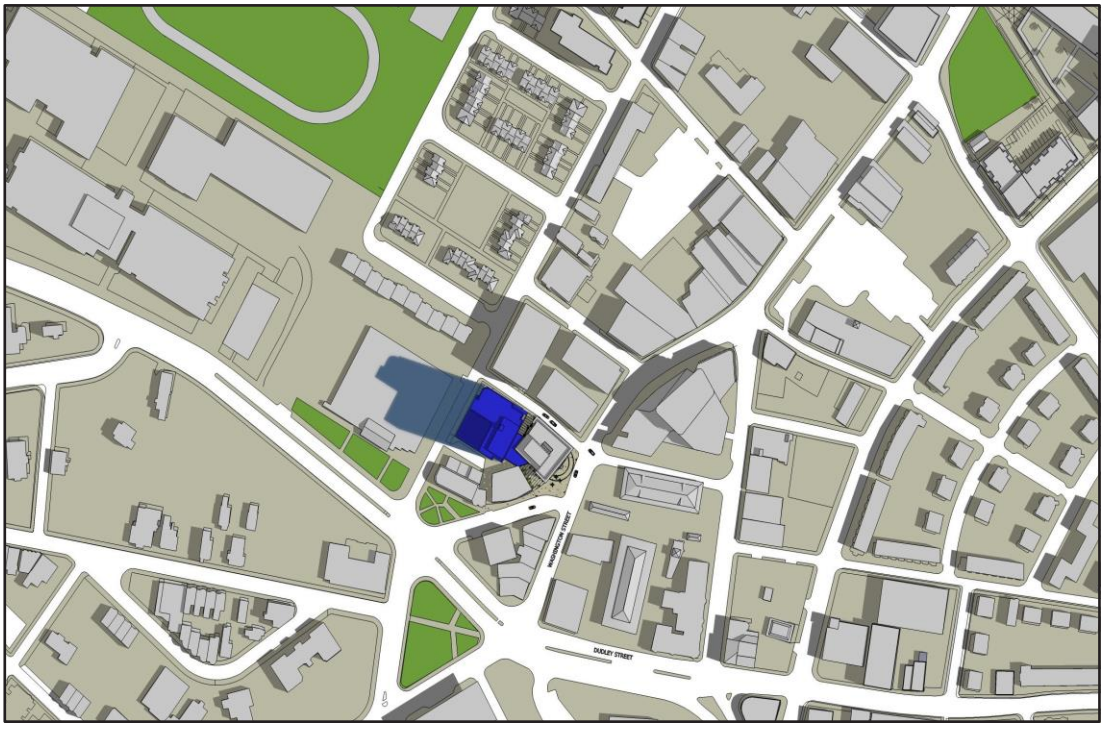


Figure 2.42 Shadow - June 21 - 12:00pm

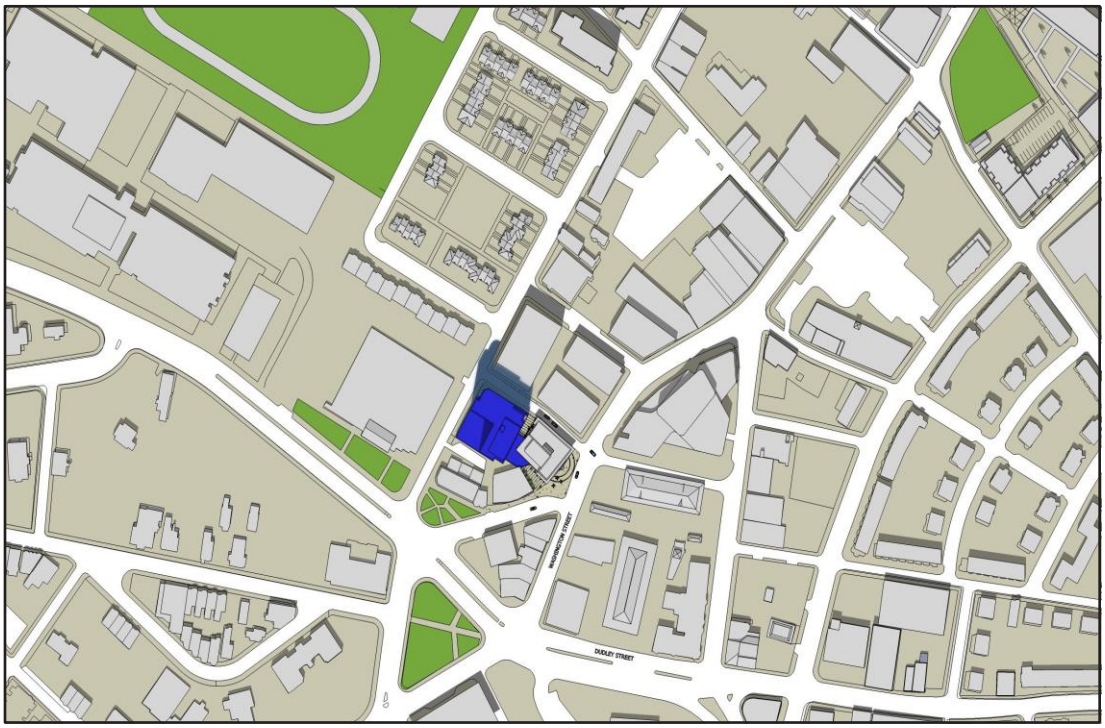


Figure 2.43 Shadow - June 21 - 6:00pm

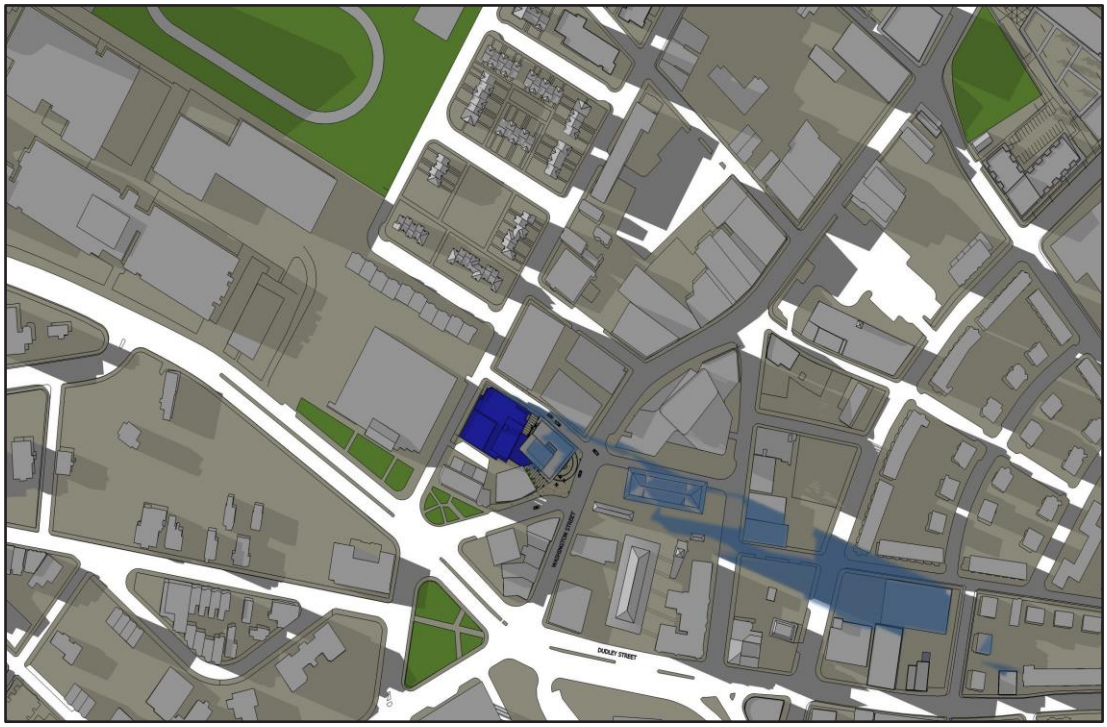


Figure 2.44 Shadow - September 21 - 9:00am

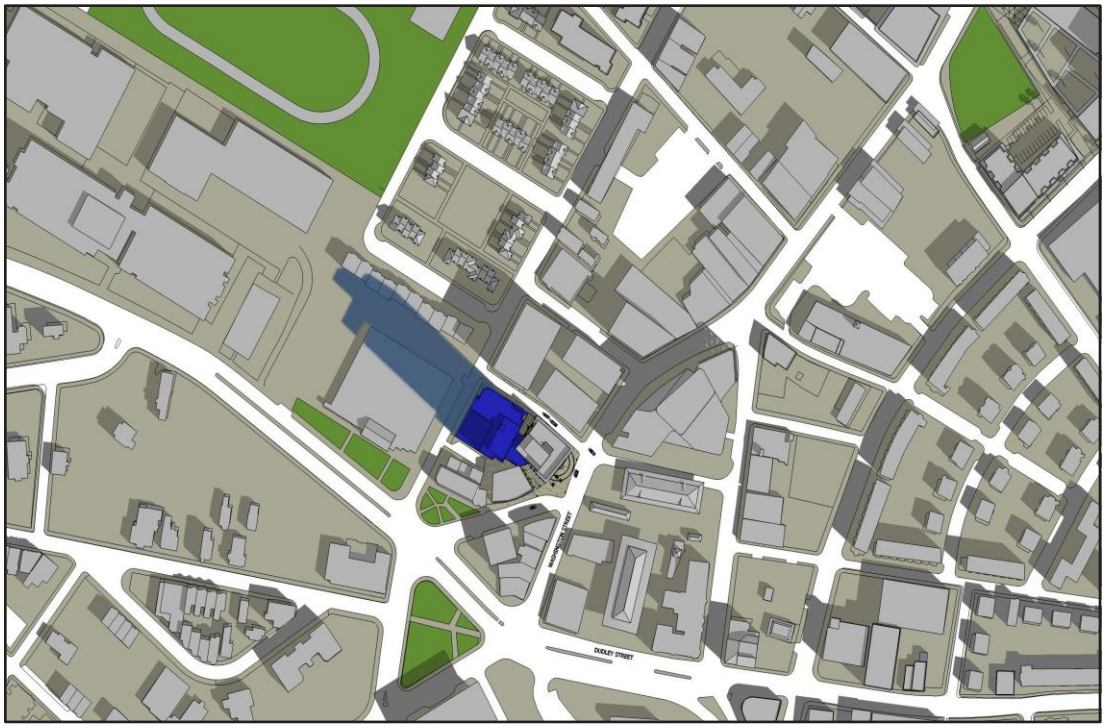


Figure 2.45 Shadow - September 21 - 12:00pm

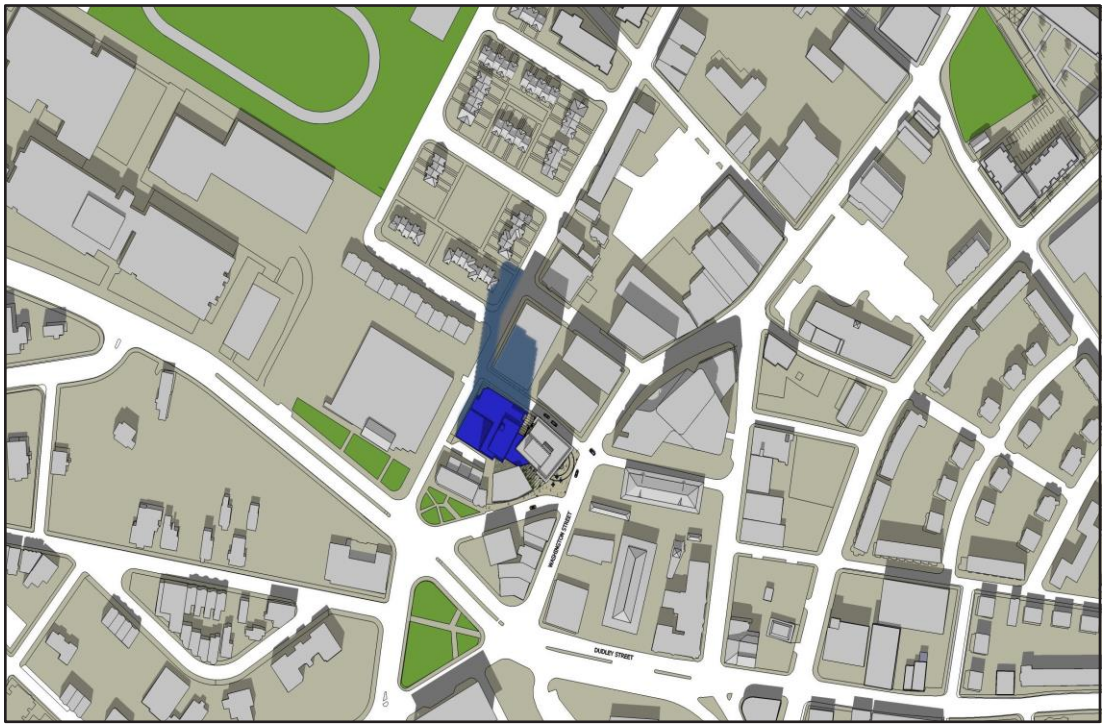


Figure 2.46 Shadow - September 21 - 3:00pm

Figure 2.47 Shadow - December 21 - 9:00am

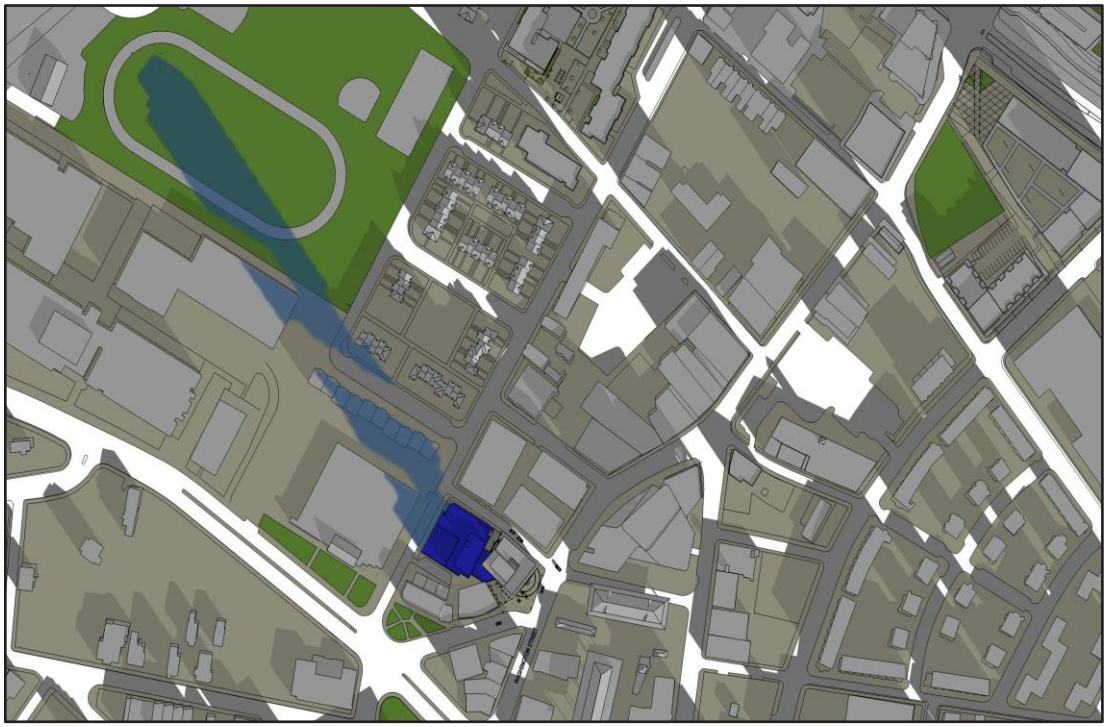


Figure 2.48 Shadow - December 21 - 12:00am

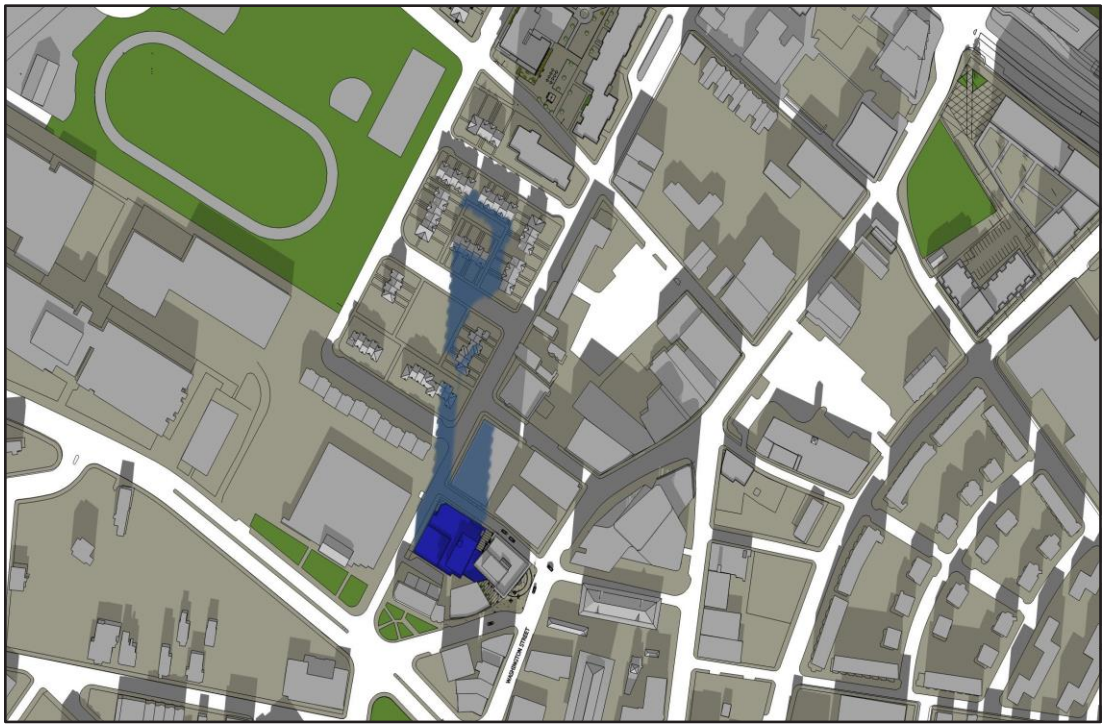


Figure 2.49 Shadow - December 21 - 3:00pm

2.2.3 Daylight

The purpose of the daylight study is to estimate the extent to which the Project restricts the amount of light reaching the streets or pedestrian ways in the immediate vicinity of the Project Site. The impact is based on the length of façade on the public streets and the change in height of the facade from the existing condition.

2.2.3.1 Introduction

The daylight analysis estimates 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. The daylight analysis considers both existing and proposed conditions, as well as daylight obstruction values of the surrounding area. Since the new building will be located on the portion of the Project Site mostly occupied by a surface parking lot and low-rise buildings, the pro- posed Project will increase daylight obstruction compared to existing condition.

2.2.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from the viewpoint chosen. The program calculates daylight obstruction on a scale of 0 to 100 percent based on a number of factors including 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. As per the analysis, the lower the number, the lower the percentage of obstruction of daylight at the view point.

The analysis compares three conditions: Existing Conditions; Proposed Conditions; and the context of the area. For this project the site of the new tower building is currently a surface parking lot that does not obstruct daylight from Marvin or Shawmut.

Two viewpoints along the ROWs adjacent to the new building 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

Figure 2.50 View Point Locations

viewpoint and area context viewpoints were taken in the following locations and are shown on Figure 2.50.

- Viewpoint VP-1: View from Marvin Street toward the Project Site
- Viewpoint VP-2: View from Shawmut Avenue toward the Project Site
- Area Context Viewpoint AC-1: View from the center of Marvin Street
- Area Context Viewpoint AC-2: View from the center of Shawmut Avenue

2.2.3.3 Results

The results for each viewpoint are described in Table 2.13. Figures 2.51 through 2.54 illustrate the BRADA results for each analysis.

Table 2.13 Daylight Analysis Results

Viewpoint Locations		Existing Conditions	Proposed Conditions
VP-1	View from Marvin Street toward the Project Site	0.0%	85.3%
VP-2	View from Shawmut Avenue toward the Project Site	0.0%	67.7%

Area Context Points		Existing Conditions	Proposed Conditions
AC-1	View from Marvin Street towards One United Bank	N/A	84.8%
AC-2	View from Shawmut Avenue toward 867 Shawmut Ave.	N/A	32.9%

Figure 2.51 Daylight Analysis – Proposed Condition at Viewpoint VP-1

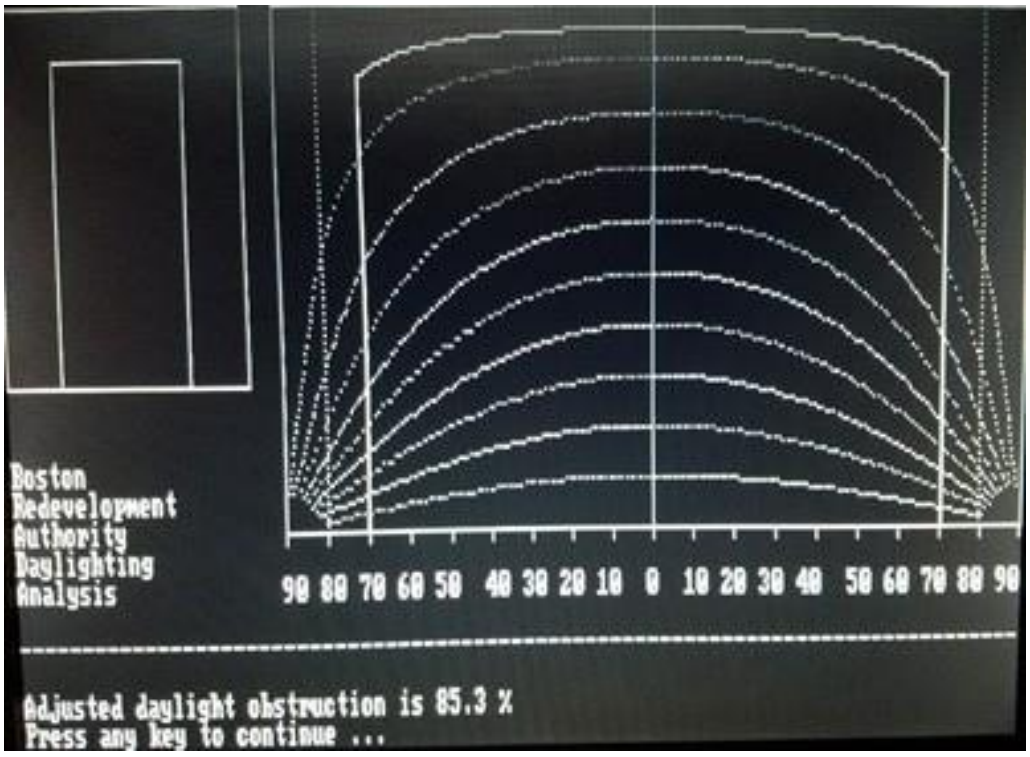


Figure 2.52 Daylight Analysis: Proposed Condition at Viewpoint VP-2

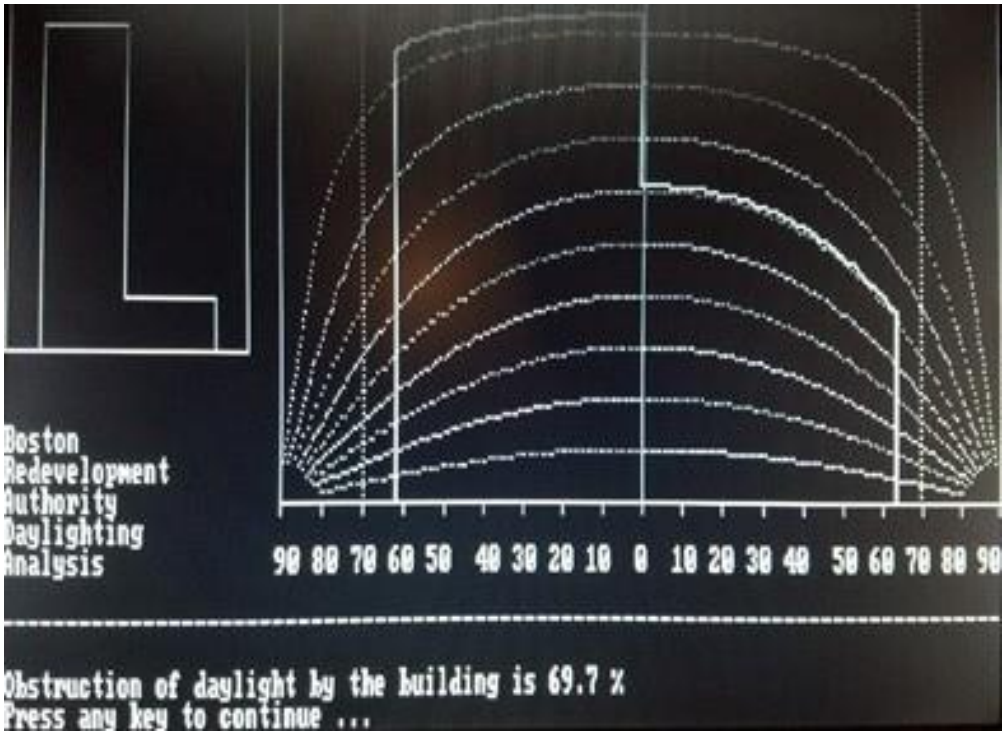


Figure 2.53 Daylight Analysis: Area Context AC-1

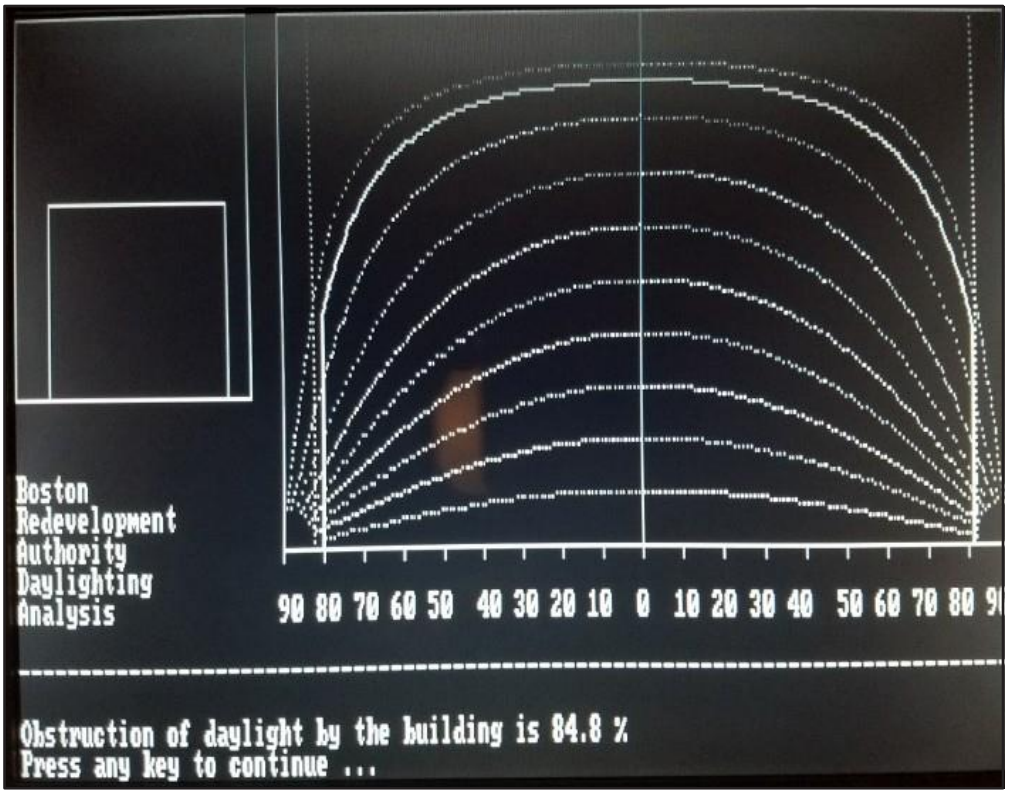
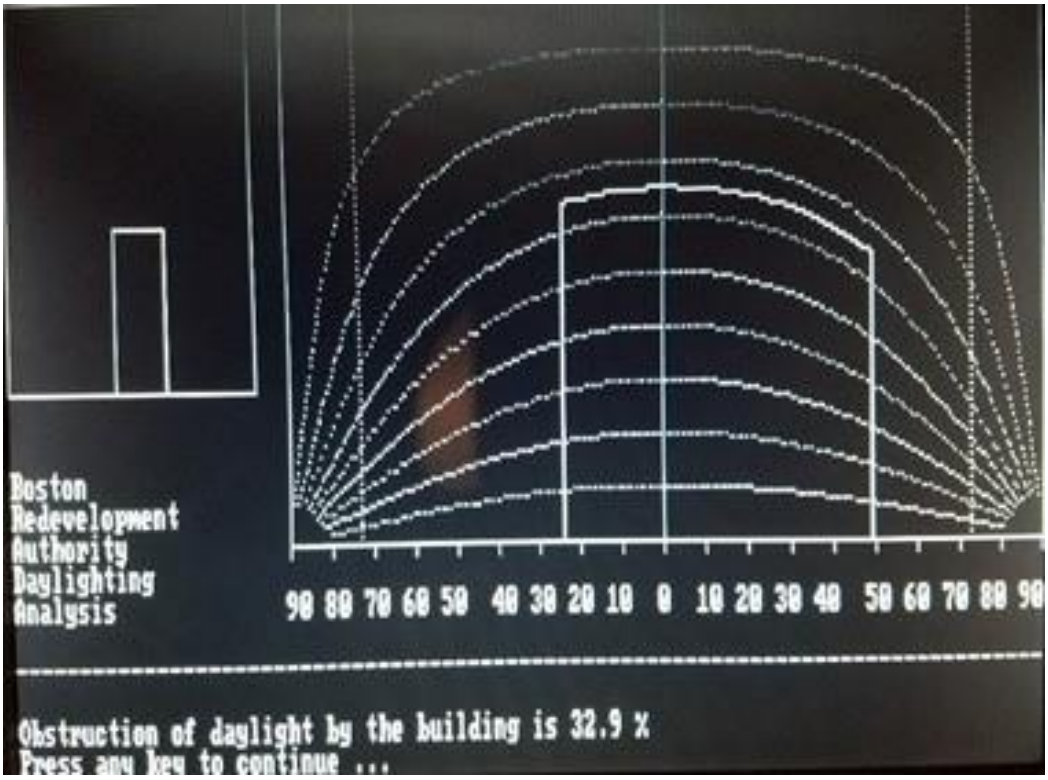


Figure 2.54 Daylight Analysis Area Context AC-2



Viewpoint 1 – Marvin Street

On Marvin Street at the location of the proposed development the project will increase the daylight obstruction value from 0% to 85.3%. The daylight obstruction value is increased greatly because the current site is a surface parking lot with insignificant daylight obstruction.

Viewpoint 2 – Shawmut Avenue

On Shawmut Avenue at the location of the proposed development the project will increase the daylight obstruction value from 0% to 69.7%. The daylight obstruction value is increased greatly because the current site is a surface parking lot with insignificant daylight obstruction.

Area Context Viewpoints

The Project Site is located in an area with a mix of relatively low density residential and higher density institutional and retail uses and surface parking lots. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for the Area Context Viewpoints described above and shown on Figure 2.50. The daylight obstruction values ranged from 84.8% for AC-1 to 32.9% for AC-2. Daylight obstruction values for the Project are greater than the Area Context values.

2.2.3.4 Conclusions

The BRADA analysis covers existing and proposed daylight obstruction conditions at the Project Site and in the surrounding area. The analysis indicate that while the development of the Project will result in increased daylight obstruction over existing conditions, the resulting conditions will be less than the daylight obstruction values in denser parts of the city. In order to minimize daylight

obstruction, the design incorporates appropriate setbacks from the streets, and space between buildings

2.2.4 Solar Glare

The Solar Glare Analysis is intended to measure potential glare from buildings onto streets, public spaces and sidewalks in order to determine the potential visual impact or discomfort due to reflective spot glare as well as heat build-up on adjacent buildings. This analysis is required if a proposed project incorporates substantial glass facades as a part of the design.

Since the Project will not use reflective glass or other reflective materials on the building facades, there should not be any adverse impacts from reflected solar glare on adjacent buildings, streets and sidewalks

2.2.5 Air Quality

Potential long-term air quality impacts are generally attributed to emissions from Project-related mechanical equipment and pollutant emissions from vehicular traffic attributed to the proposed development.

HVAC Equipment will be individual, gas-fired Aqua-therm systems for apartment heating and domestic hot water that would not create elevated carbon monoxide levels and would not trigger micro-scale air quality analysis.

Regarding potential vehicle related impacts, the traffic analysis (Section 2.1) shows several intersections in the study area do have a failing level of service. However, this is generally an existing condition and the Project-generated traffic will have negligible increases in delays. Since the Project will not increase the traffic levels by more than 10% and does not result in a further decline in level of service at most of the studied intersections, it is anticipated that a full micro-scale analysis would show the project has minimal impact on existing NAAQS thresholds and such analysis would not be beneficial.

However, BPDA has communicated the existing background air quality is of concern with very high incidents of asthma and other respiratory conditions in the project area. The Proponent will supplement any baseline air quality analysis available from the City and factor that information into the design of the Project's HVAC systems.

2.2.6 Stormwater/Water Quality

The Project is not expected to have any long-term, negative impact on the water quality of Boston Harbor or other nearby water bodies. Currently the project site consists of surface parking with no stormwater mitigation measures, the proposed development will generally replace the existing surface parking areas with roof area thus eliminating the sediments and oils associated with parking lots and replacing that with roof runoff which is generally considered clean. Mitigation measures to address the rate, volume and water quality impacts for both the short-term construction activity controls and post-construction stormwater management controls are described in this section.

2.2.6.1 Existing Conditions

Boston Water and Sewer Commission, (BWSC) maintains sewer and storm drain lines in Shawmut, Marvin, Roxbury and Washington Avenue. The city block bounded by the same streets makes up the project locus. Figure 2.55 is a map of the BWSC systems, Red lines indicate sewer lines, blue lines indicate water lines, green lines indicate drains and purple lines indicate combined sewer and drain lines. Generally the sewer and drainage infrastructure that circles the site has adequate capacity to serve the proposed development. The storm drain lines and the sanitary sewer lines all eventually connect into a combined system. The combined system directs stormwater and sanitary wastewater to the Deer Island wastewater treatment facility. In times of heavy rainfall, the combined system for Boston has locations where stormwater dis- charges to the Boston Harbor as a Combined Sewer Overflow event the system that serves this project site discharges into Dorchester Bay, see Figure 2.56 There does exist separated storm lines on all four streets that bound the site, these separated drain lines will be the lines that the Project connect the overflow drainage to. The project is not expected to connect new drainage infrastructure into the combined system.

Figure 2.55 Boston Water and Sewer Commission System around Site

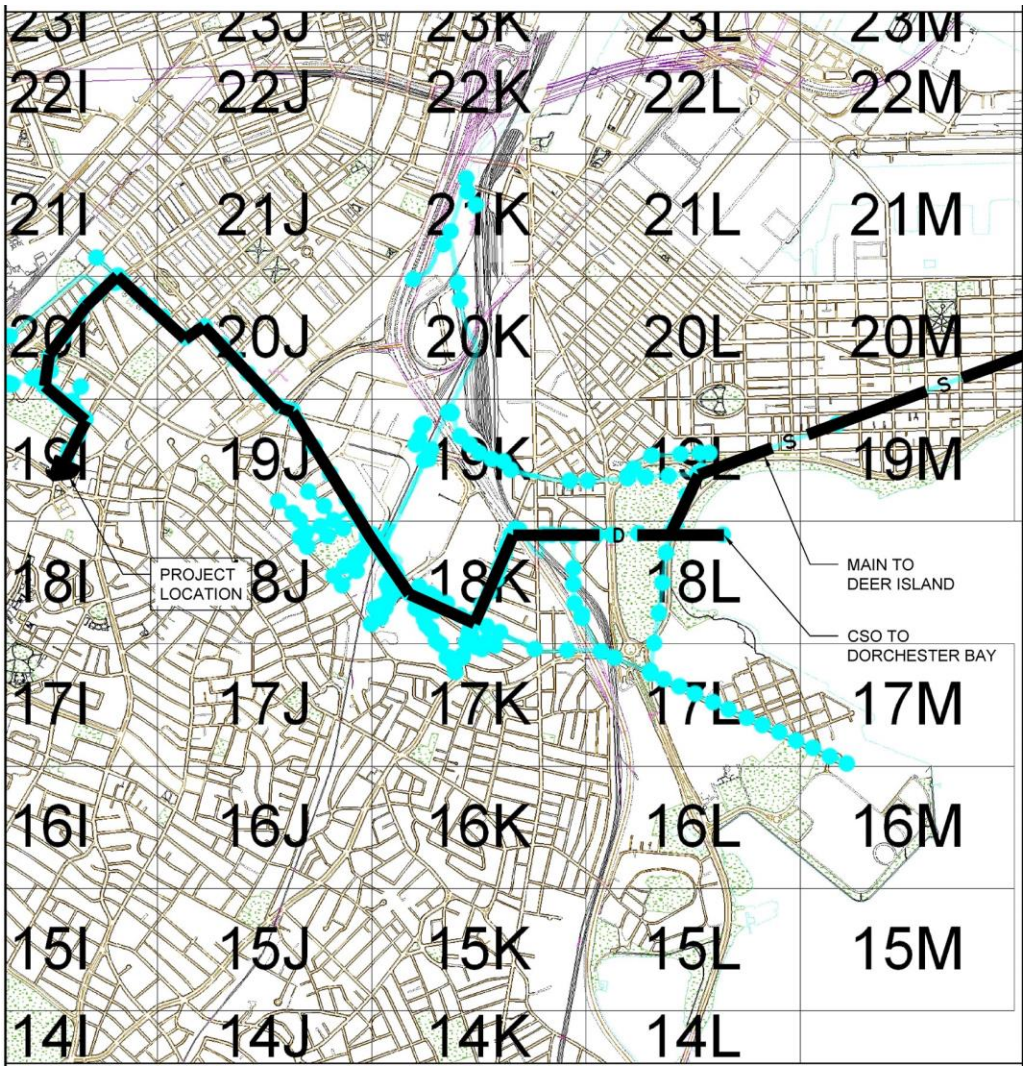
In Shawmut Avenue, there exists a 42"x 66" inch combined sewer storm drain trunk line and a 72-inch drain line that both convey sanitary and stormwater northeast.

In Marvin Street, a 12-inch drain line exists with no direct connection to any existing drainage systems in the project site. The 12-inch drain line appears to receive flow from the project site via overland flow and the municipal catch basins that exist on Marvin Street.

In Washington Street, there exists two separate systems; a 12-inch sewer and a 24"x36" drain line.

Currently, stormwater from the parking lot and existing buildings drains onto Shawmut Avenue and Marvin Street via overland flow and finds its way into the city drainage infrastructure in those streets. The city drainage system that collects this runoff consists primarily of two inlets at the corner of Marvin Street and Shawmut Avenue. Currently there are no treatment systems, infiltration system or rate mitigation systems to manage stormwater generated from the project site

Figure 2.56 Storm/Sanitary Mains serving Project Site



2.2.6.2 BWSC Stormwater Management Compliance

DEPs Stormwater Management Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMP's) in the stormwater management design. The Policy is administered locally pursuant to M.G.L. Ch. 131, s. 40.

In 2013 BWSC adopted a stormwater management policy that employs EPA BMPs for sites exceeding one acre. This standard applies to development sites that will disturb more than one acre in the construction process. This is not applicable for this project as the combined project site is approximately 37,500+/- sf and hence less than an acre in size.

2.2.6.3 MADEP Stormwater Management Standards

Current stormwater management policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMP's) in the stormwater management design. The Policy is administered locally pursuant to M.G.L. Ch. 131, s. 40. A brief explanation of each Policy Standard and the system compliance is provided below:

Standard #1: No new stormwater conveyances (e.g., outfalls) may discharge untreated storm-water directly to or cause erosion in wetlands or waters of the Commonwealth.

Compliance: The proposed design will comply with this Standard. No new untreated storm- water will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the proposed Project.

Standard #2: Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

Compliance: The proposed design will comply with this Standard. The proposed design only slightly increases the impervious area compared to the pre-development condition. A storm-water management system that includes infiltration will be designed to mitigate the peak rate of runoff from the Site.

Standard #3: Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post development site should approximate the annual recharge from the pre-development or existing site conditions, based on soil types.

Compliance: The proposed design will comply with this Standard. The plans will include a groundwater recharge system design per BWSC standards (One inch of water over the entire impervious area on the site.) Soil conditions will be determined by test pits and standard field testing procedures although it is expected that the existing soils at the site are disturbed urban fills.

Standard #4: For new development, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:

(a) Suitable nonstructural practices for source control and pollution prevention are

implemented;
(b) Stormwater management best management practices (BMPs) are sized to capture the prescribed runoff volume; and
(c) Stormwater management BMPs are maintained as designed.

Compliance: The proposed project will comply with this standard. The project will include oil-grit separation systems and the proposed stormwater infiltration system will be designed to remove at least 80% of the TSS load.

Standard #5: Land Uses with Higher Potential Pollutant Load – Not applicable.

Standard #6: Critical Areas – Not applicable.

Standard #7: Redevelopments and Other Projects only to the maximum extent possible.

Standard #8: Construction Period Pollution Prevention and Erosion and Sedimentation Control. Compliance: The proposed project will comply with this standard. A Construction Period Pollution Prevention and Erosion Control Plan will be prepared for this project. Sediment and construction materials will be controlled during construction through a combination of tracking pads at construction exits, silt fences and catch basin filters.

Standard #9: Operation and Maintenance Plan

Compliance: The proposed project will comply with this standard. An Operation and Maintenance Plan will be prepared for this project to ensure maintenance of the proposed stormwater management system.

Standard #10: Prohibition of Illicit Discharges

Compliance: The proposed project will comply with this standard. The Long Term Pollution Prevention Plan will include measures to prevent illicit discharges. Measures to reduce inflow/ infiltration into Boston Water and Sewer Commission's sanitary sewer system and stormwater drainage system are described below.

2.2.6.4 Proposed Stormwater System Post Construction Stormwater Management

Post construction, stormwater management will consist of pretreatment, an on-site recharge system that will utilize the newly created open space and landscape areas and connections to the existing BWSC municipal drainage systems in Shawmut Avenue and Marvin Street. The recharge system will serve to recharge the groundwater table and also to reduce flow to the BWSC drainage system.

The pretreatment systems will prevent site sediment from reaching the BWSC drain lines and ultimately, the Boston Harbor. The recharge system will replenish groundwater and mitigate peak rates of runoff and connections to the existing storm drain system will minimize the over- land flow that currently leaves the site at the existing driveways and parking lots.

This project will comply with BWSC Guidelines for Grit and Oil Separators. Outdoor parking and paved areas greater than or equal to 7,500 square feet require that a grit and oil separator (Particle Separator) be installed to capture drainage. The need for separators for indoor parking garages may also be required by the BWSC. The removal of oils and sediments will occur prior garages may also be required by the BWSC and MWRA, which would include a connection to the sanitary sewer system.

The Project will create no net increase in peak discharge rates of run-off. This is accomplished primarily because the site will not increase the amount of impervious area and the requirement of installing a stormwater infiltration system that mitigates the first inch of runoff.

The project site contains two existing buildings and a parking lot. The 25 story building will be built in the part of the site occupied by the existing parking lot. The proposed built condition will not increase the amount of impervious area at the property. The project will comply with the Stormwater Management Standards as described below and a stormwater pollution prevention plan will be developed through the BWSC application process and installed and managed by the contractor.

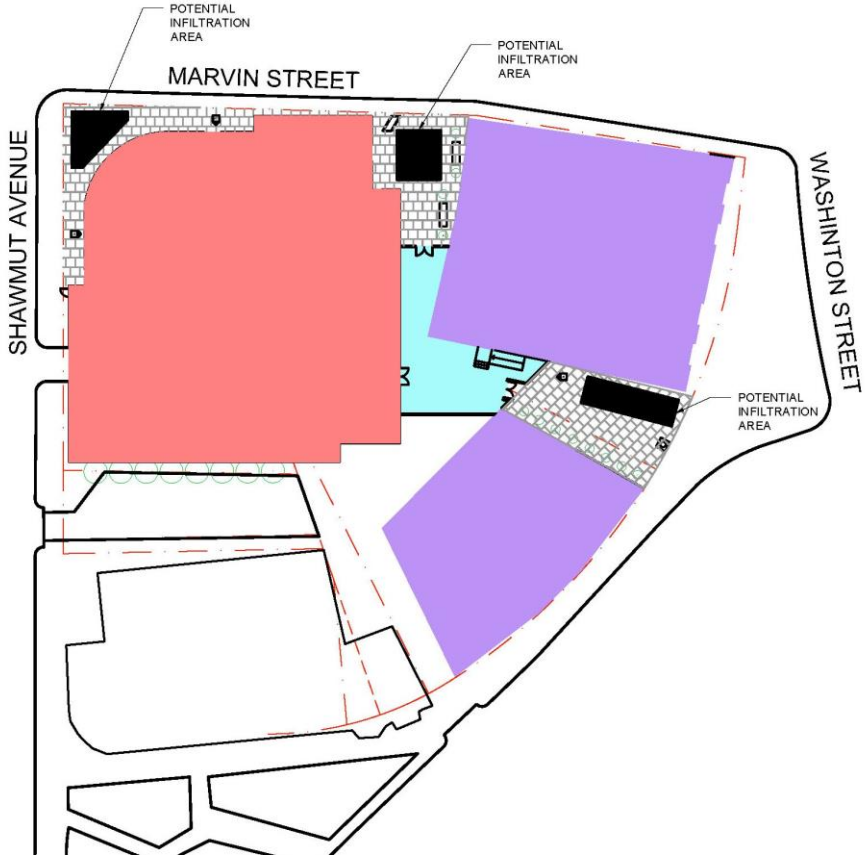
The proposed infiltration system will likely be located in one of three locations as illustrated in Figure 2.57. The infiltration system will consist of an underground structure that is allowed to

percolate stormwater into the existing soils around the building and will have an overflow that will discharge into the BWSC system. The infiltration systems will receive either roof runoff or treated surface runoff.

Porous paving, green roofs and other sustainable stormwater techniques will be investigated as additional measures to mitigate the effects of stormwater runoff

to infiltration and connections to the BWSC systems. The need for separators for indoor parking

Figure 2.57 Stormwater Management - Potential Water Infiltration Locations



2.2.6.5 Construction Activities

Construction activity stormwater management will be conducted in accordance with the requirements of the BWSC through a Pollution Prevention Plan. This plan will include measures for preventing sediment laden stormwater from running off site and protection devises for stormwater inlets and other municipal drainage infrastructure. At the least, the site will be encompassed with silt fencing to keep sediments within the limit of the project site. Catch basins will be fitted with filtration socks to capture sediments that may enter the system and anti-tracking pads will be located at entrances to the site that will capture sediments tracked offsite through truck traffic.

The project site is less than one acre, so it is anticipated that a federal National Pollutant Discharge Elimination System (NPDES) Permit will not be required however the Pollution Prevention Plan will likely follow the guidelines set forth in the NPDES guidelines and standard construction practice.

There are no in-water construction activities proposed for this project. No dredging, pile driving, pile removal, pier construction, seawall or shore stabilization are required as part of this project. Site dewatering, if needed, will be handled in accordance with the Construction Period Pollution Prevention Plan and will be filtered prior to discharge to the BWSC utility system. If needed a dewatering permit will be filed with the BWSC per requirements for projects of this size.

2.2.6.6 Water Quality and Resources

The Project will include at a minimum the required water quality treatment measures to re- move sediments from the stormwater that leaves the site. In addition to the post construction water quality measures, construction activities will be controlled with appropriate Erosion and Sediment Control devices to minimize the impacts of construction on the stormwater system. The Project will minimize the transport of the soils and sediment to the BWSC storm drain system using BWSC, Department of Environmental Protection ("DEP") and the Environmental Protection Agency ("EPA") Best Management Practices (BMPs"). The project proposes protecting existing catch basins with filter fabric, hay bales and/or crushed stone to prevent sediment from entering the BWSC storm drain system. Erosion and sediment controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized and construction is complete.

The proposed site design naturally eliminates a large stormwater pollution source in that the existing surface parking area that exists at the site currently is converted to roof area. Com- pared to the sediment and oil laden stormwater that is generated from surface parking lots, roof runoff is considered clean. The project, through standard engineering practice and BWSC requirements, will have deep-sump catch basins fitted with oil traps that will capture sediments and oils. Proprietary treatment systems will be included prior to stormwater entering the infiltration basins, this is a measure that will protect the infiltration system and provide added water quality. The infiltration basins themselves will also capture pollutants. All of the stormwater systems will be required to have an active stormwater Operation and Maintenance plan to make sure the systems function beyond their initial installation.

The stormwater exiting the site in the post developed condition is expected to be significantly cleaner than the stormwater running off the site in the current condition

2.2.6.7 Dewatering Permit

A Dewatering Permit application must be filed for certain discharges to the Commission's sanitary, storm drainage, or combined systems. Dewatering for this project will be conducted in accordance with the BWSC Dewatering Permit requirements.

If there is a proposal for discharge to the sanitary sewer or combined sewer, or to a drain that eventually connects to a combined sewer; an MWRA Sewer Use Discharge Permit is also required. Construction activities that require dewatering for this project are proposed to discharge to the storm drainage system. A dewatering system for this project is expected to include a means of filtration prior to connection to the BWSC system. The specific design of the dewatering system will depend on the construction activities and it will be the responsibility of the contractor to obtain the needed permits from BWSC and/or MWRA.

2.2.6.8 Mitigation Measures

The peak rate of runoff will not exceed the existing rate of runoff. Several measures will be implemented to manage storm water runoff in accordance with BWSC and DEP regulations including the addition of a landscaped courtyard and a stormwater management / infiltration system. Porous paving, green roofs and other sustainable stormwater techniques will be investigated as additional measures to mitigate the effects of stormwater runoff.

2.2.6.9 Coordination with BWSC

Proposed connections to the Commission's water, sanitary sewer, and storm drain system will be designed in conformance with the Commission's design standards, Sewer Use and Water Distribution System Regulations, and Requirements for Site Plans. When planning a new construction or renovation project, the first step in the process is the preparation of a Site Plan.

This document outlines the requirements necessary for preparing and submitting a Site Plan to BWSC. Once approved by BWSC, Site Plans are valid for one year.

The site plan must be signed by a Professional Engineer and Land Surveyor registered in Massachusetts. The Site Plan indicates the existing and proposed water mains, sanitary sewers, storm sewers, telephone, gas, electric, steam, and cable television. The plan will include the dis-connections of the existing services, if any, as well as the proposed connections. In addition, a Rough Construction Sign-Off document from the City of Boston's Inspectional Services Department is required prior to filing a GSA with BWSC.

Prior to connection to the BWSC utilities, the Utility Contractor will submit a General Service Application for review and approval prior to construction. An approved Site Plan must be on file with the Commission's Engineering Customer Services Department prior to submitting a GSA. The applicant or proponent does not file the GSA application. Only a bonded, licensed Drain Layer can file the GSA application.

2.2.7 Flood Hazard Zones/Wetlands

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the Site located in the City of Boston - Community Panel Number 25025C0079G indicates the FEMA Flood Zone Designations for the Site area. The map shows that the Project is located in a Zone X, Area determined to be outside the 0.2% annual chance flood plan The Site was developed and does not contain wetlands

2.2.8 Geotechnical/Groundwater

This section addresses the below-grade construction activities anticipated for the Project. It discusses existing soil and groundwater conditions, anticipated foundation construction methods and excavation work anticipated for the Project based on available subsurface information and a conceptual foundation design study.

This memorandum addresses existing soil and groundwater conditions, anticipated foundation types and construction methods and excavation work anticipated for the proposed Guscott Rio Grande project based on the available subsurface information and the preliminary foundation design considerations.

Recent exploratory borings indicate the site generally consists of artificial fill overlying naturally-deposited sands which in turn overlie bedrock. Given the variable loading of the building, it may be supported either on a combination of spread footing foundations bearing in the naturally-deposited sands or compacted structural fill and deep foundations bearing in bedrock, or entirely on deep foundations bearing in bedrock. The basement floor slab may be con- structed as a traditional slab-on-grade or a structural slab designed to span between foundations. Due to potential uplift pressures from groundwater, a slab-on-grade would require a drainage system beneath the slab.

Groundwater was encountered at approximately 18 feet deep during the recent geo- technical exploration and therefore waterproofing may be required for the basement slab, below-grade walls, below-grade slabs, spread footings and deep foundations. The Project Site is not located within the area monitored by the Boston Ground Water Trust so review and permitting by this organization is not required. Project specifications will require control of groundwater, where necessary, during excavation to avoid disturbing foundation, slab, and

excavated subgrades. The Contractor will also be required to control the flow of surface water into excavations at all times. A qualified geotechnical engineer will observe foundation excavation for compliance with project specifications. All necessary construction dewatering and related permits from the City (BWSC) and State (MWRA) will be secured as required.

Excavations adjacent to Marvin Street, Shawmut Avenue, abutting properties and existing buildings will require support of excavation to maintain property limits and to limit impacts to adjacent properties. Temporary support of excavation will be required to support the excavation for demolition and removal of the existing structures and for construction of the new building. Support of excavation systems may be braced steel sheet piling, slurry wall, or secant pile wall systems. Due to the anticipated depths of excavations, the support of excavation system will require internal bracing or external tiebacks, depending upon whether external tiebacks would be acceptable to the adjacent property owners and easements may be required from the City if external tiebacks are needed.

2.2.9 Solid and Hazardous Wastes

A search of the following federal and state databases indicate that the subject property has no history of reportable contamination, nor is there any evidence of above ground or under- ground storage tanks on the property. The following databases were accessed as part of this research:

- Federal NPL
- Federal Resource Conservation and Recovery Act (RCRA) CORRACTS
- Federal RCRA Non-CORRACTS TSD Facilities List
- Federal CERCLIS List
- Federal CERCLIS NFRAP Sites List
- Federal RCRA Generator List

- Federal Emergency Response Notification System (ERNS)
- State Listed Disposal Sites
- State Solid Waste / Landfill Facilities (SWLF)
- State Underground Storage Tank List (UST)
- State Institutional Control/Engineering Control Registries
- State Spills List
- Municipal File Review Findings
- Massachusetts Department of Environmental Protection Waste Sites and Reportable Releases database

Should evidence of contaminated soils be discovered during construction, the proponent will retain a licensed site professional (LSP) to monitor remediation and cleanup operations and will insure that monitoring and reporting requirements are followed. Soils removed from the site during construction will be managed for off-site disposal in accordance the current regulations and policies of the Massachusetts DEP.

2.2.9.1 Operational Solid and Hazardous Wastes

The Project will generate solid waste typical of other residential, office, and retail uses. The Project will construct facilities for collecting non-recyclable and recyclable waste. Non-recyclable waste and compacted material will be removed by a waste hauler contracted by the Project. With the exception of "household hazardous wastes" typical of residential, retail and office uses (for example, cleaning fluids and paint), the project will not generate hazardous waste.

Table 2.14 Storm/Sanitary Mains serving Project Site

Unit Type	Program	Number of Beds	Generation Rate	Solid Waste (Tons per year)
One, Two and Three Bedroom Units	App 299 Bedrooms	n/a	4 lbs/bedroom/day	218.3 Tons
Commercial/Retail	65,000 SF		5.5 tons/1,000 sf/ year	357.5 Tons
Total Solid Waste Generation				**575.8 Tons**

With the exception of "household hazardous wastes" typical of residential and commercial retail uses (for example, cleaning fluids and paint), the residential and commercial uses will not generate hazardous waste

2.2.9.2 Recycling

Solid waste will include wastepaper, cardboard, glass and bottles. The Proponent will coordinate with the City's recycling coordinator to develop and implement a recycling program to minimize solid waste. The Project will include space for recycling on each floor and the trash room with space for the storage and pick-up of recyclable materials.

2.2.10 Noise/Vibration

A preliminary noise analysis was conducted at the proposed project site to determine existing noise levels and estimate the impacts of the proposed project. This analysis included a baseline noise monitoring program to measure existing noise levels in the area of the proposed project at ground level and a comparison of future noise levels produced from the operation of the proposed building to the applicable City of Boston Zoning District Noise Standards. This preliminary

analysis, which is consistent with BRA requirements for noise studies, indicates that predicted noise levels from the project with appropriate noise controls should comply with applicable regulations.

2.2.10.1 Noise Regulations and Criteria

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

The table 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". These maximum allow- able sound pressure levels apply at the property line of the receiving property. The "Residential Zoning District" limits apply to any lot located within a residential zoning district or to any residential use located in another zone except an Industrial Zoning District, according to Regulation 2.2. Similarly, per Regulation 2.3, business limits apply to any lot located within a business zoning district not in residential or institutional use

Table 2.15 City of Boston District Noise Standards

Octave-band Center	Residential Zone		Residential / Indus-trial Zone		Business Zone	Industrial Zone
Frequency (HZ)	**Daytime (dB)**	**Other Times (dB)**	**Daytime (dB)**	**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**

2.2.10.2 Existing Conditions

A preliminary background noise level survey was conducted to understand the existing noise levels at the project, the survey included monitoring decibel levels in Shawmut Avenue, Melvin Street and Washington Avenue. Existing condition noise levels were measured at five feet above the ground. The existing noise sources adjacent to and within the project site include: vehicle and truck traffic along the roads; rooftop and ground level mechanical equipment; bus traffic noise; pedestrian foot traffic; and aircraft.

2.2.10.3 Noise Monitoring

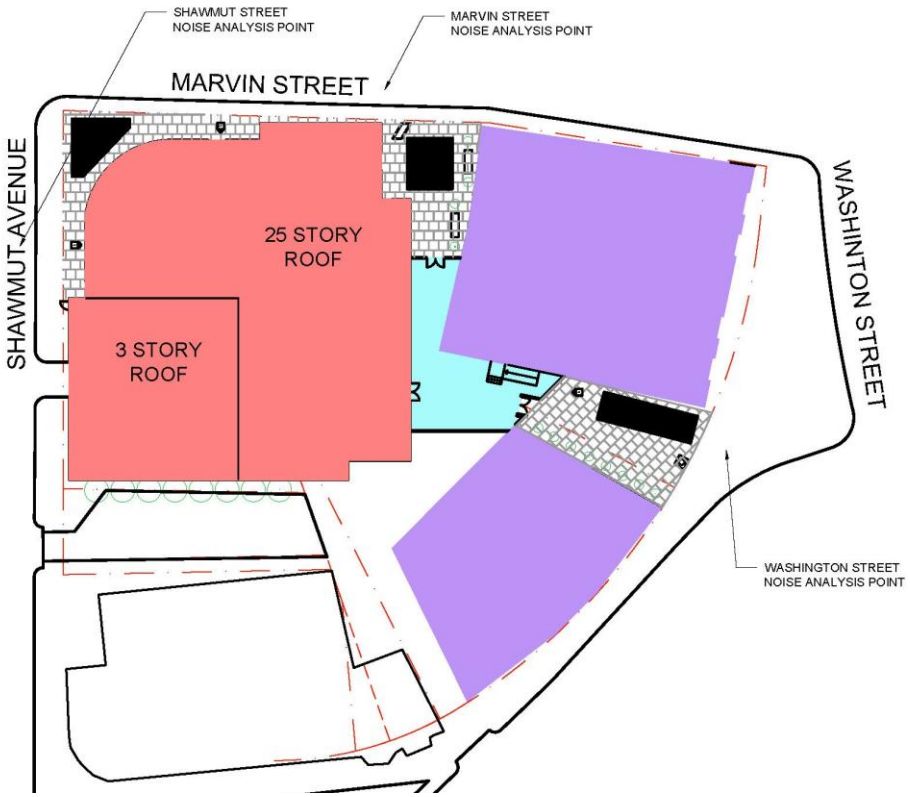
Sound level measurements were made on Tuesday, February 28, 2017 during the daytime (11:00 a.m. to 12:30 p.m.), and during nighttime hours (6:00 a.m. to 6:55 a.m.). Since noise impacts from

the Project on the community will be highest when background noise levels are the lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to avoid peak traffic conditions. All measurements were 15 minutes in duration. Sound levels were measured at publicly accessible locations at a height of approximately five feet above ground level.

2.2.10.4 Noise Analysis Locations

Three representative baseline noise monitoring locations were selected based on the location of the proposed building and likely mechanical locations. These measurement locations are illustrated on Figure 2.58.

Figure 2.58 Noise Analysis Points



2.2.10.5 Baseline Noise Levels

Table 2.16 indicates the results of noise monitoring at three locations around the site. The levels observed on the date and times indicated appear to often exceed the city standards. The elevated noise levels are likely attributed to the increased level of vehicular traffic and the public transportation activity associated with the bus station.

Table 2.16 Baseline Noise Levels

	Washington Street		Marvin Street		Shawmut Avenue	
Time	12:17pm	6:15am	11:54 am	6:22am	12:40 pm	6:55am
Period	15 mins	15 mins	15 min	15 min	15 min	15 min
High	81	74	69	64	89	85
Low	54	43	42	39	61	56
Average	**69**	**65**	**56**	**49**	**71**	**68**

2.2.10.6 Project Noise Sources

The primary sources of continuous sound exterior to the project will consist of rooftop cooling towers, and garage exhaust fans. The roof of the three story portion of the tower building is anticipated to contain one Recold JW-70C Fluid Cooler. Similarly, the roof of the proposed 25-story residential tower is anticipated to contain one MD Series Cooling Tower, exhaust fans for the garage space are also proposed. The noise levels for the major noise producing equipment identified above is tabulated on Table 2.17. The table indicates the noise ranges for the units specified for the building in correlation to the city requirements. The table indicates the decibel levels at 5 and 50 feet away from the cooling tower units. The actual location of the cooling tower units will be greater than the distances identified as the units will be placed on the roof tops of the 3 story, (approximately 50 feet above the sidewalks) and the 25 story, (approximately 300 feet above the sidewalks) buildings. The additional height will further reduce the noise levels at the street.

Table 2.17 Baseline Noise Levels

Octave-band Center	Marley MD 5008PAC		Recold JW - 70C		ERCH-90-30L	ERCH-45-15H
Frequency (Hz)	**5-feet (dB)**	**50-feet (dB)**	**5-feet (dB)**	**50-feet (dB)**	**Supply (dB)**	**Supply (dB)**
32	-	-	-	-	-	-
63	90	77	90	73	89.4	96.5
125	87	76	89	72	87.3	90.6
250	83	70	87	70	103	83.1
500	81	67	85	68	102.2	79.6
1000	77	65	84	67	98	77
2000	74	60	81	64	92.8	74.1
4000	70	56	79	62	88.2	72.2
8000	64	51	80	63	83.7	65.7
A-Weighted (dBA)	**83**	**70**	**89**	**72**	**91.7**	**72**

Other secondary noise sources might include air handling units, energy recovery units, smaller exhaust fans, and pumps. It is expected that these units will either be fully enclosed within rooftop penthouses, located inside the building interior, or are assumed to have sound levels lower than the primary sources of noise, these noise sources were not considered in this analysis to contribute significantly to the overall sound level. Although the parapet may not be included in the final design, measures will be included to ensure that the Project complies with applicable noise

regulations. Mitigation will be applied to sources as needed to ensure compliance with the applicable noise regulations. A tabular summary of the modeled mechanical equipment proposed for the Project is presented below. Anticipated sound power level data for each unit, as provided by the manufacturer or calculated from provided sound pressure level data, is presented below.

2.2.10.7 Conclusions

Baseline noise levels were measured in the vicinity of the Project site and were compared to predicted noise levels based on information provided by the manufacturers of representative mechanical equipment or estimated from the equipment's capacity. With appropriate mitigation the project is not expected to introduce significant outdoor mechanical equipment noise into the surrounding community. Results of the analysis indicate that typical nighttime noise levels from the project are expected to remain below the City of Boston Noise Zoning requirements. It should be noted that the existing ambient background levels at many locations immediately surrounding the Project already exceed the City of Boston limits without any contribution from the Project. The results presented indicate that the Project is not anticipated to significantly impact the existing acoustical environment.

At this time, the mechanical equipment and noise controls are conceptual in nature and, during the final design phase of the Project, will be specified to meet the applicable City of Boston noise limits. Additional mitigation may include the selection of quieter units, screening walls, mufflers, or equipment enclosures as needed.

2.2.10.8 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the project. Increased community sound levels, however, are an inherent consequence of construction activities. Construction work will comply with the requirements of the City of Boston Noise Ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities.

Mitigation measures are expected to include:

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

2.2.11 Construction Impacts

A Construction Management Plan (CMP) will be submitted to the BTD for review and approval prior to issuance of a building permit. The CMP will include:

- A Construction Activity Schedule

- Defined Construction Staging Areas
- Parameters for the Demolition Phase
- Guidelines for Perimeter Protection/Public Safety
- Material Handling and Construction Waste Plan
- Construction Traffic Management including Worker Parking and Truck Routes
- Construction Air Quality and Noise management and mitigation

The Proponent will comply with all applicable state and local regulations governing construction of the Proposed Project. The Proponent will require that the general contractor comply with the Construction Management Plan, ("CMP") developed in consultation with, and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters. Construction methodologies that ensure public safety and protect nearby businesses will be employed. Techniques such as barricades, walk- ways, painted lines, and signage will be used as necessary. Construction management and scheduling – including plans for construction worker commuting and parking, routing plans and scheduling for trucking and deliveries, protection of existing utilities, maintenance of fire access, and control of noise and dust -- will minimize impacts on the surrounding environment. Throughout Project construction, a secure perimeter will be maintained to protect the public from construction activities.

2.2.11.1 Construction Air Quality

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

- Using wetting agents on area 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.

2.2.11.2 Construction Waste Management

The Proponent will reuse or recycle demolition and construction materials to the greatest extent feasible. Construction procedures will allow for the segregation, reuse, and recycling of materials. Materials that cannot be reused or recycled will be transported in covered trucks by a contract hauler to a licensed facility.

2.2.12 Rodent Control

A rodent extermination certificate will be filed with the building permit application to the City. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work for the proposed Project, in compliance with the City's requirements. Rodent extermination prior to work start-up will consist of treatment of areas throughout the Site. During the construction process, regular service visits will be made.

2.2.13 Wildlife Habitat

A rodent extermination certificate will be filed with the building permit application to the City. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work for the proposed Project, in compliance with the City's requirements. Rodent extermination prior to work start-up will consist of treatment of areas throughout the Site. During the construction process, regular service visits will be made

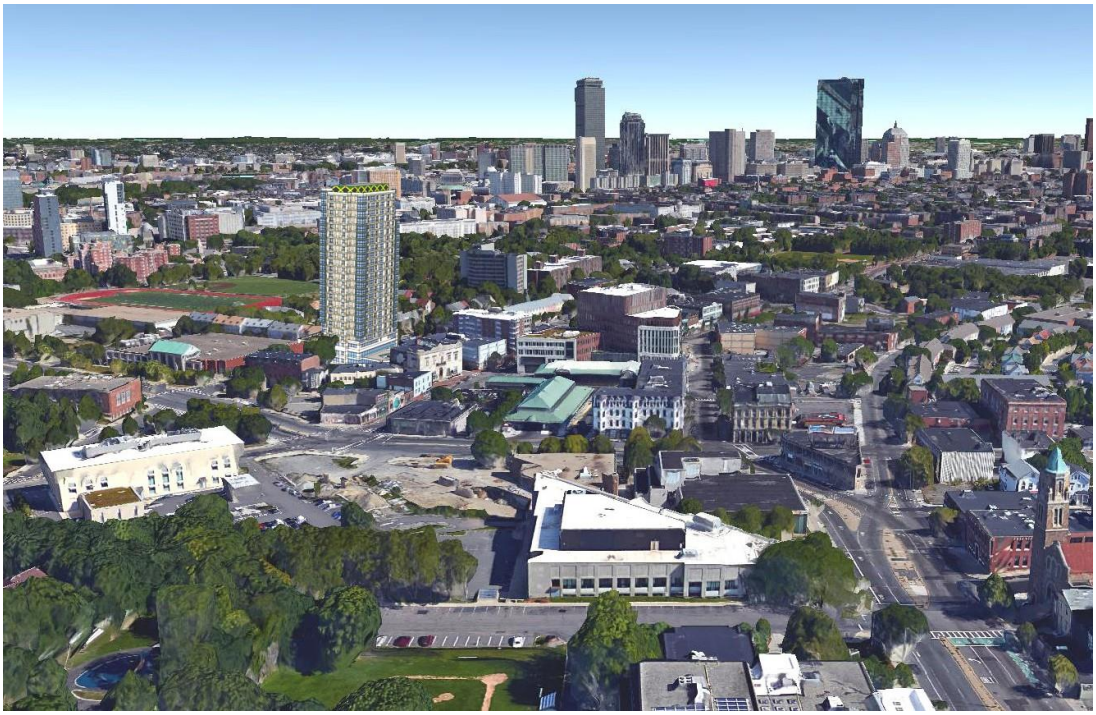
2.3 Urban Design

2.3.1 City Wide Context

In recent years there have been palpable changes to the form of the city's skyline. Once defined primarily by a cluster of high rises in the downtown core and a slightly more linear cluster of towers in the Back Bay, increasingly a more nodal pattern of high-rise development is emerging.

New towers serviced by transit lines are springing up or proposed at the edge of Chinatown, in the Seaport District, in the Fenway and in Kendal Square in Cambridge. These new towers are visual markers of discrete areas of the city. At Parcel P3 several blocks from the Rio Grande site a cluster of towers are proposed of similar height to the Rio Grande proposal.

The symbolic value of a distinctive tall building in the heart of Roxbury cannot be over stated. Combined with the recently completed Bolling Building and anchored by the busy Dudley Square (also called Dudley Terminal) transit hub, the new tower places this neighborhood squarely in the pantheon of important city destinations.



2.3.2 Street Level Context

The adaptive reuse of the ground levels of the Boston Consolidated Glass Building and Roxbury Institute for Savings for retail, shops, restaurants and cafes, guarantees substantial pedestrian activity well into the evening hours. The expansive extended sidewalk in front of the Savings Building will be complemented by a decorative paved passageway leading to the lobby which serves two full floors of nearly 30,000 s.f. of commercial office space

A two-story glazed atrium which links the two existing structures and the tower provides an accessible entrance to the Savings Building along with access to the office lobby and building management offices.

Marvin Street is the principal address for the residential tower. An expansive glass lobby and adjacent paved forecourt gives the residential lobby a substantial presence on Marvin Street.

The Shawmut Avenue side of the building at the ground level faces the Post Office Building including access to the postal loading docks. Since that side of the Post Office building is a blank wall the service and loading the service and loading for the Rio Grande Tower is designed to be accessed from Shawmut. The south edge of the new building abuts a service parking lot. A robust planting strip is proposed as a buffer between the lot and the Rio Grande Tower

2.3.3 Site Plan

Decorative paved passageways from Washington (and Roxbury) Street and from Marvin Street lead to a two-level glazed atrium space which unites the three principal components of the Rio Grande complex. The ground level of all three buildings are primarily planned for active commercial uses. Other ground level uses include separate office and residential lobbies, building leasing and management offices and at the corner of Shawmut and Marvin Street, two retail spaces expected to accommodate Unity Bank and Citizen's Bank relocated from current Roxbury Institute for Savings building.

The Shawmut Avenue side of the Rio Grande Tower at the ground level is primarily purposed for loading and service functions. The north, west and south edges of the new tower are pro- posed to be constructed as close to the lot lines as possible and will likely require variances to current zoning

2.3.4 Building Access

Vehicular loading and service access will be from a curb cut on Shawmut Avenue. Residents and office workers can also be dropped off curbside at Marvin Street, Washington Street and Roxbury Street. A narrow driveway west of the Boston Consolidated Gas Building provides limited vehicular access to the rear of the Buff Bay Building (aka Consolidated Gas Building) and the basement level of the Rio Grande Tower.

Conceived as a heavily transit oriented design concept with minimal on site parking primary access to the building will be from the adjacent sidewalks and new paved passageways.

2.3.5 Open Spaces/Streetscape

The proposed building footprint utilizes virtually all the site. The design does include a substantial landscape deck on the fourth level. The principal "open space" resource on the ground level is an aggregate of the glazed atrium which will be a conditioned space and the two paved passageways from Washington (and Roxbury) and Marvin Street.

The passageways are envisioned as lively hardscapes with decorative paving, interesting lighting, planters, banners and other street furnishings. It is also anticipated that during the warmer months the passageways will be utilized for tables and chairs to accommodate outdoor activities including casual dining and the occasional small group music performance

The expanded sidewalk in front of the Savings Bank building is expected to remain and will be incorporated into the overall streetscape planning for the project including coordinated paving materials and patterns and complementary lighting fixtures.

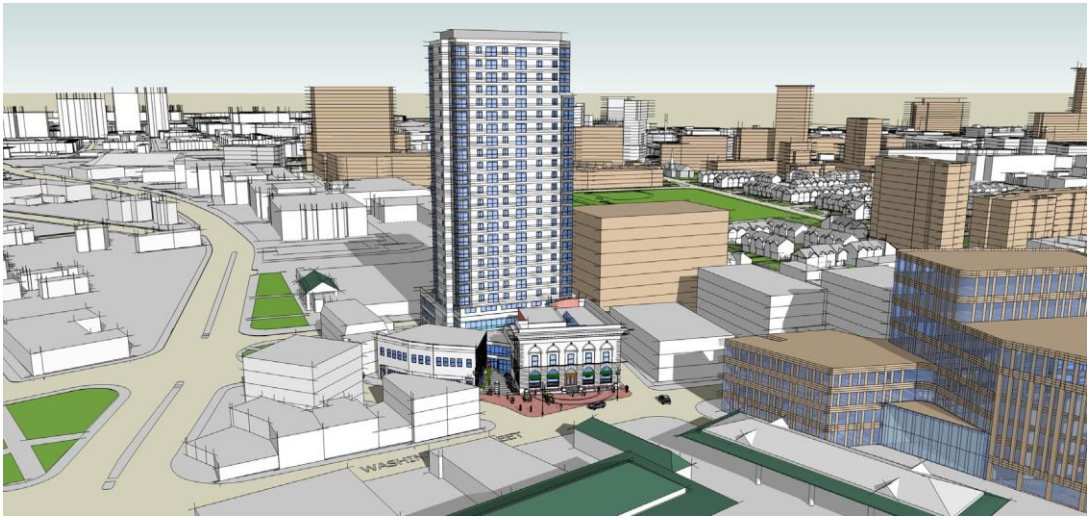
2.3.6 Tower Design - Height, Massing and Façade Treatment

The L-Shaped 25 story tower component of the complex will be a dominant element on the skyline. However, it's placement, set back from both the Savings Bank Building and the Consolidated Gas Building acknowledges the unique architectural quality of these two historically significant structures and minimizes its impact on the two buildings.

The light filled, two story glass atrium linking the three structures, when combined with substantial amounts of glass curtain wall the ground level of the tower and the two floors (2 and 3) of office space, results in a very light visual footprint at the pedestrian level.

As the tower extends to the full 25-stories, a series of projection, setbacks, material changes and variations in glazing patterns adds visual interest.

The principal facade materials will be toned in light hues mitigating the substantial mass of the tower. Elements of color will be introduced to the composition to provide visual accents and further interest. The facade design utilizes vigorous geometric patterning through scoring of the dominant materials linking the solids, voids and setbacks in the massing to create a coherent whole



2.4 Historic and Archaeological Resources

This Component addresses the potential impact of the proposed development on the City's historic resources located on or within a half of a mile of the site.

2.4.1 Roxbury History

Roxbury was one of the six harbor villages (including Boston) founded by the Massachusetts Bay Company in 1630. Originally known as Rocksberry or Rocksborough, it was settled by immigrants from Dorchester, England, under the leadership of William Pynchon. Recognized as a town by the Court of Assistants in 1630, the community erected its first meetinghouse in 1630 at John Eliot Square which became the community's village center. John Eliot Square is located a few blocks to the southwest of the Project site. During the Colonial period, Roxbury was established as a "picturesque towne" with agriculture being the primary economic pursuit. Many of the streets laid out in the first years of the settlement still define the area today including Washington, Eustis, Centre, Dudley, Roxbury and Warren Streets. Eustis burial ground also dates to original settlement.

Roxbury's location on the only road to Boston gave it an advantage in transportation, trade and strategic military position. Washington Street (formally Roxbury Street) was the sole land gate to Boston and remained so until the construction of Charles River Bridge in 1786. The Pro- posed Project sits on Washington Street on the original lowlands between Dudley Street and the narrow strip of land known as the Old Neck. This area became Roxbury's principal business district and most densely settled residential quarter based primarily on this location. The business district became the center for minor industries including tanning and the production of leather goods, clock and cabinet making, banking, and carriage manufacturing. As a result of this transition little of the pre-Civil War "faire and handsome country town" exists today.

Expanded transportation service fostered the transition of Roxbury and Dudley Square from farming and minor industry to a commercial and residential center. By 1827 hourly coaches began to run between John Eliot Square and Boston – the first such service in New England. By 1856 the first street railroad was established and the trend to not live near one's work but in a freestanding, single family homes. Farms were subdivided and developed with single family residences. During the late 19th century, a half dozen "family" hotels were built in Dudley Square to supply the demand of wealthy businessmen for apartment hotels near the city. The centrality of Dudley Station to a metropolitan transportation system supported the proliferation of this multi-unit building type.

In 1867 Roxbury was annexed to Boston marking the area's transition to a large-scale business center. Development accelerated with the introduction of the electric trolley to Roxbury during the late 1880s sparking construction of retail and specialty businesses. By the early 1900s, Dudley Square had become a major commercial center in the City supporting a diversity of uses including multi-family residential, commercial office, institutional, and restaurant and recreational uses all housed in handsome masonry and/or granite multi-story structures. This development was furthered by the building of the Boston Elevated Railway (1899-1901) with Dudley Station being the southern terminus. The Boston Elevated Railway was extended to Forest Hills in 1909 expanding the districts importance as the gateway to the greater Roxbury community and a regional link to Central Boston

Through the beginning of the 20th century, Roxbury had been a community of English, Irish and German immigrants and their descendants. The massive migration from the South to northern cities in the 1940s and 1950s saw Roxbury again transition into a center of the African-American

Community. Social issues and the resulting urban renewal activities of the 1960s and 1970s contributed to the neighborhoods decline. The relocation of the elevated Railway in the 1980s and the continued economic revival of the City overall has fostered a rebirth of Dudley Square further supported by new institutional uses and the Silver Line MBTA route

2.4.2 Historic Resources on the Project Site

The Dudley Station National Register Historic District is located in the northern most portion of the Roxbury neighborhood of Boston. Dudley Square was an important colonial-period way station and market center on Washington Street, the principal overland route linking Boston's Shawmut Peninsula with the New England mainland.

The Dudley Station area's evolution as Roxbury's principal business district and most densely settled residential quarter is tied to the realities of pre-19th century topography, improved Boston/Roxbury transportation links, and multilevel political/economic developments. Be- ginning in the mid-17th century, the district evolved as a commercial/residential area along Washington Street. It was situated on the lowlands between Dudley Street and the narrow strip of land known as the Old Neck, which linked Roxbury with Boston. Until 1786, and the building of the Charles River Bridge, the northern portion of Roxbury was the sole land gate to Boston. Early roads within the district, including Eustis, Warren, and Washington Streets, fanned out to Dorchester, Braintree, Dedham, and all points south.

From the 17th to early 19th century, tanning and the production of leather goods, clock and cabinet making, banking, and carriage manufacturing were minor industries conducted with- in the Dudley Station area. Mid-19th century saw the transition from "picturesque village" to a large-scale business center with more architecturally sophisticated structures During the 1ate 19th century, a half dozen "family" hotels were built to supply the demand of wealthy businessmen for apartment hotels near the City. The centrality of Dudley Station to a metropolitan transportation system explains the proliferation of this multi-unit building type.

The introduction of the electric trolley to Roxbury during the late 1880s sparked construction activity

on the island bounded by Warren, Washington, and Dudley Streets. Dudley Station, located at the intersection of Warren and Washington Streets, was the district's centerpiece. Built from to 1899-1901, the Station was the southern terminus of the Boston elevated railroad. Service was extended to Forest Hills in 1909. Remnants of the station remain as part of the regional bus station that continues to operate today

During the first decades of the 20th century, improved access offered to the area by the "Main Line E1" encouraged the growth of recreational enterprises in the district. And with each increase in service to broader geographic areas and every improvement in speed and efficiency, there was more attraction for the resident Roxbury population to relocate further out from the central City, particularly by the white protestant population. Beginning in 1900,

Jewish immigrants arrived in Roxbury, and, twenty years later an Afro-American migration to Roxbury began. The Dudley Station area has been the commercial center of the African American community ever since

Roxbury Institute for Savings, 2343-2345 ~Washington Street (1901). At 2343-2345 Washington Street is the former Roxbury Institution for Savings, which was designed in the Second Renaissance Revival style by Peabody and Stearns in 1901. The two-story bank is constructed of yellow brick with dressed facades of limestone. The main facade's rusticated base features arched, recessed windows and a central entrance with ornate bronze doors marked by an iron balcony. Five windows on the upper level with 'console-bracketed lintels are set within blind keystone arches. The dentilated and modillioned cornice and elegant limestone balustrade with classical urns and ornate cartouche complete the rectangular block

Boston Consolidated Gas Company, 11-29 Roxbury Street (1927). The dramatically curved main facade of the Boston Consolidated Gas Company follows Roxbury Street's path. This low, two-story office building was designed in 1927 by Parker, Thomas, and Rice. Cast stone covers its Art Deco main facade with secondary facades composed of yellow brick. A three-bay central entrance unit is flanked by five-bay wings. Display windows (with brick infill) and entrances with vaguely Renaissance Revival surrounds appear at street level. The building terminates in a decorative frieze and low, beveled parapet

2.4.3 Historic Areas Within a Half Mile of the Site

The Proposed Project is located in the Roxbury Neighborhood of Boston. The designated Historic Districts within a half mile of the site include:

2.4.3.1 Eliot Burying Ground Historic District (National Register District)

Eliot Burying Ground, roughly a triangle with a rounded hypotenuse, lies at the corner of Washington and Eustis Streets, formerly, the two main roads leading to Boston and Dorchester from Roxbury. Abutting it on the southerly tip is the former firehouse at 20 Eustis Street. Surrounding the entire ground is a pudding stone wall with a granite cap and cast iron gate, erected in 1856. Eliot Burying Ground was the first in Roxbury, established just after the town's incorporation in 1630 from the common land, and remains one of Boston's oldest cemeteries.

The site is also significant as the general location of the first defensive work constructed by the Americans - a redoubt thrown up across Washington Street (then Roxbury

Street) and Eustis Street (then Dorchester -Street) and called Burying Ground Redoubt. It was constructed during the siege of Boston and was subsequently enlarged and strengthened.

The District is approximately 1,000 feet northeast of the proposed development and will be marginally affected by shadows from the residential tower, particularly during the winter months.

2.4.3.2 John Eliot Square Historic District (National Register District)

John Eliot Square is a triangular shaped district which includes nineteen buildings of which two are major historic buildings and seven are supporting historic structures. Eliot Square has been the center of Roxbury since the towns founding in 1630. The growing settlement formed the parish of The First Church in Roxbury, which has occupied five successive structures on the same site. Chosen as the first minister of the new church, John Eliot, whose name has long been associated with the Square, gained the sobriquet, "Apostle of the Indians", for his efforts in educating local Indian tribes. The only road to Boston from the inland towns forked at Eliot Square and lead to Cambridge (via Roxbury Street) and to Dedham. (Via Centre Street). The community developed along these highways with the First Church meetinghouse as a visual focal point.

The District is approximately 1,500 feet west of the Proposed Project. While the Proposed Project will be visually prominent from the Square, it is not anticipated to have a significant impact

2.4.3.3 Roxbury Highlands Historic District (National Register District)

The Roxbury Highlands Historic District includes the historic nucleus of seventeenth century Roxbury. The northern portion of the District includes one of the major routes to Boston in service during the colonial period and provided a setting also for some of the earliest 'country seats' in the colonies, for Governors Dudley, Shirley, and others. The Revolutionary War had a devastating impact on the district with many structures taken down a few days after the Battle of Bunker Hill and used to construct defenses.

The Highlands was an important strategic military location for the Revolutionary War, with its commanding height overlooking the land connection to Boston along Washington Street. Highland Park, occupying the summit of the hill and including the Cochituate Standpipe (built in 1869 to designs by landscape architect Frederick Law Olmsted), is the location of the former

High Fort, a Revolutionary War earthworks fortification with corner bastions. The Colonial Style Dillaway-Thomas House is the only surviving pre-Revolutionary structure in the District. The oldest post-Revolutionary War structure is the Eliot Meeting House (1804). There are numerous residential structures within the district that are individual National Register listings and are identified under Section 2.4.3 below.

Roxbury Highlands also exists as an important example of Boston's "streetcar suburb" development, growing from an early farming community to a fashionable nineteenth-century suburb and finally to a twentieth-century urban neighborhood.

The District is located approximately 2,000 feet to the southwest of the Proposed Project. While the Proposed Project will be visually prominent from the District, it is not anticipated to have a significant impact

2.4.3.4 Lower Roxbury Historic District (National Register District)

The Lower Roxbury Historic District, Boston, is a 3.2 acre, well preserved, turn-of-the-twentieth-century apartment and mixed commercial/residential neighborhood in an area of flat terrain traversed by broad avenues. The architecture of the District is characteristic of the larger Lower Roxbury/South Boston neighborhood as it developed along Tremont Street and Columbus Avenue in the late nineteenth and early twentieth centuries. Existing as a sizable cluster of closely-built, historic structures, the district's strength is its collection without intrusion of multi-story, turn-of the-century, brick, Revival style, residential and mixed commercial/residential buildings.

This district is sufficiently removed from the Project and will not be impacted by the Proposed Project.

2.4.3.5 Frederick Douglass Square Historic District

The Frederick Douglass Square Historic District is an architecturally cohesive late-19th century urban neighborhood, significant as the sole surviving fragment of one of Boston's final speculative landfill ventures. Situated in Lower Roxbury, just across the South End border, this five-acre district is characterized by a dense network of narrow streets lined with two- and

three-story Panel Brick and Queen Anne row houses. While the neighborhood contains several outstanding examples of early apartment architecture, it is best known for its concentration of single-family row houses associated with the philanthropic activity of Boston's prominent social reformer, Robert Treat Paine, Jr.

This district derives its name from its proximity to Frederick Douglass Square, a minor cross- roads located two miles southwest of downtown Boston, so named by order of Mayor James Michael Curley on February 3, 1917, this open space at the junction of Cabot, Tremont, and Hammond streets honors black abolitionist Frederick Douglass (1818 -1895). Situated at the heart of an African-American community, this square achieved local prominence as a forum for 20th-century political rallies and Civil Rights protests.

This district is sufficiently removed from the Project and will not be impacted by the Proposed Project.

2.4.3.6 Moreland Street Historic District (National Register District)

Bounded roughly between Blue Hill Avenue and Warren Street and Winthrop and Waverly, the district is significant for its substantial inventory of distinguished architecture representing a range of styles and residential building types prevailing in the Boston area from 1840 to the 1920's, for the evolution of the urban/suburban plan as an important example of Boston's streetcar suburb development and for its association with the lives of persons of national and local importance, particularly General Joseph Warren and members of his family.

This district is sufficiently removed from the Project and will not be impacted by the Proposed Project.

2.4.2.7 Mount Pleasant Historic District (National Register District) is characterized by its continued history as a residential neighborhood, notable for its mid-to-late 19th-century building types. The District signified one of the first speculative developments of an old Roxbury farm for suburban residential development. Deed restrictions explicitly established Mt Pleasant as a residential area divorced from the world of work, especially manufacturing. This separation of home and family from work is a key tenet of the suburban ideal.

This district is sufficiently removed from the Project and will not be impacted by the Proposed Project

2.2.4 Historic Properties within a Half Mile of the Project Site

There are several properties of individual historic value that are within a half mile of the Project. Of note are the properties designated as National and Boston Landmarks:

2.4.3.1 Alvah Kitterdge House – 12 Linwood Street
2.4.3.2 William Lloyd Garrison House – 125 Highland
2.4.3.3 Goldsmith Block, 41 Ruggles Street
2.4.3.4 Cox Building – 1-7 Dudley Street (John Elliot Square)
2.4.3.5 Edward Everett Hale House – 12 Morley
2.4.3.6 Hibernia Hall – 182-186 Dudley St
2.4.3.7 Dearborne School – 25 Ambrose St
2.4.3.8 Dillaway School – 16 Kenilworth St

These resources are sufficiently removed from the Project and are unlikely to be impacted by the Proposed Project.

2.2.5 Historic Properties within a Mile of the Project Site

A complete list of properties and areas proximate to the site that are listed on the National Register of Historic Places and/or are designated Boston Landmarks are listed in Table 2-18 and located on Figure 2-59.

2.2.6 Archaeological Resources

The Site consists of a previously developed urban parcel. Due to previous development activities and disturbances, it is expected that the Site does not contain significant archaeological resources.

2.2.7 Impacts of Historic Resources

As noted, the Roxbury neighborhood's development dates back to the 17th century with the immediate vicinity of the project site currently developed as a traditional late 19th and early 20th century urban residential neighborhood with numerous individual properties of historic significance. The goal of the redevelopment is to bring new life to this historical important area.

The Proposed Project will redevelop two structures that are contributing resources to Dudley Square merging the structures with a new mixed use building. The location of the new structure is pulled back from the main historic corridor and its street wall minimizing its visual impact. The location of the structure will also minimize shadow impacts on the Square and other important resources.

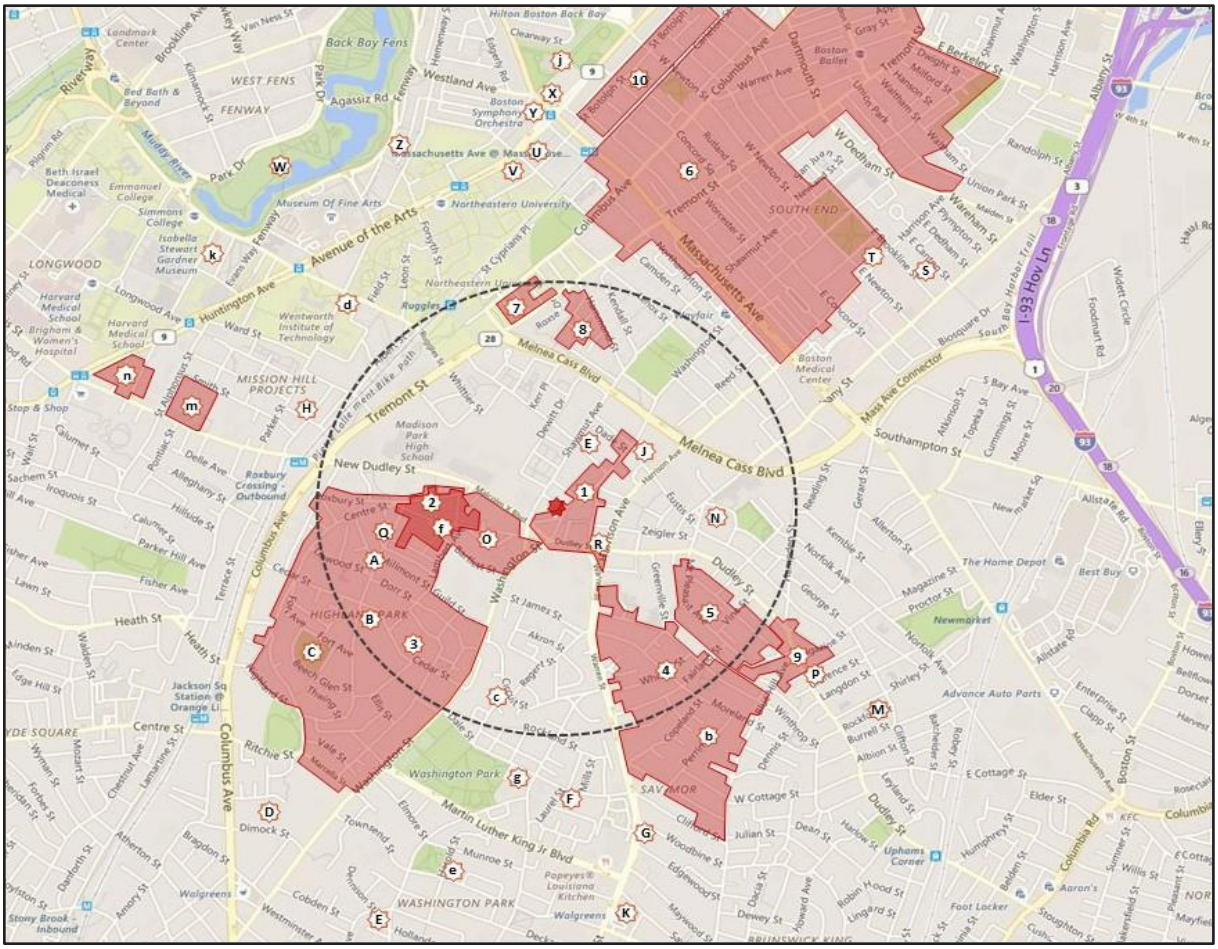
As a result, and as the analysis shows, the new structure will have only minor impacts on the areas historic resources while also drawing more interest to the area giving exposure to some of the more significant but forgotten historic places in the City.

The Project is in a designated historic district and proximate to a Historic Protection Area – as a result review by the Boston Landmark Commission may be required. The Proponent will notify the Environment Department of the proposed development and comply with any determination made regarding review by the BLC.

Table 2.18 Designated Historic Resources

Key	Name
National Register of Historical Places listings - Historic Districts	
1:	Dudley Square Historic District
2:	John Eliot Square District
3:	Roxbury Highlands Historic District - Columbus Ave, Dudley St, and Washington St.
4.	Moreland Street Historic District – Blue Hill Ave; Warren, Waverly, and Winthrop Streets
5.	Mount Pleasant Historic District
6.	South End Historic District
7.	Lower Roxbury Historic District
8.	Fredrick Douglass Square Historic District
9.	Governor Shirley Square Historic District
10.	St. Bololph Street Historic District
National Register of Historic Places – State Listings	
A:	Alvah Kitterdge House – 12 Linwood Street
B.	William Lloyd Garrison House – 125 Highland
C.	Roxbury High Fort//Highland Park – Beech Glen Street
D.	New England Hospital for Women and Children/Dimock Community Health Center/– 41-55 Dimock Street
E.	Goldsmith Block, 41 Ruggles Street
F.	Eliot Congregational Church – 56 Dale Street
G.	Roxbury Presbyterian Church, 328 Warren Street
J.	Eustis Street Architectural Conservation District (Eliot Burial Ground, Eustis Street Fire Station,
K.	Charles Street African Methodist Episcopal Church /All Souls Unitarian Church 551 Warren St.
M.	Shirley Eustis House – 31-37 Shirley St.
N.	Dearborne School – 25 Ambrose St
O.	Dillaway School – 16 Kenilworth St
P.	Francis and Isabella Apartments – 430 Dudley St.
Q.	Edward Everett Hale House – 12 Morley
R.	Hibernia Hall – 182-186 Dudley St
S.	Lawrence Model Lodging Houses. 79-109 East Canton St.
T.	Joshua Bates School, 731 Harrison Ave.
U.	The Riviera, 270 Huntington Ave.
V.	Boston Young Men's Christian Association, 312-320 Huntington Avenue
W.	Emerald Necklace Parks
X.	Horticultural Hall, 300 Massachusetts Avenue
Y.	Symphony Hall, 301 Massachusetts Avenue
Z.	Student's House, 96 The Fenway
b	Sarah J. Baker School, 33 Perrin Street
c.	St. Joseph's Complex, Regent, Shulbert and Circuit Streets
d.	Greek Orthodox Cathedral of New England, 520 parker Street
e.	Harriswood Crescent, 60 Harold Street
Boston Landmarks/Massachusetts Historic Districts and Structures	
f:	Cox Building – 1-7 Dudley Street (John Elliot Square)
g.	Malcolm X/Ella Little-Collins House – 72 Dale Street
W.	Emerald Necklace Parks
j.	Christian Science Church Complex, 250 Massachusetts Avenue
k.	Isabella Stewart Gardner Museum, 280 The Fenway
H.	Vienna Brewery Complex, 133 Halleck Street
m.	Mission Church Complex, Tremont, St. Alphonsus and Smith Streets
n.	Mission Hill Triangle Architectural Conservation District

Figure 2.59 Historic Resources Plan



2.5 Infrastructure Systems

This section outlines the existing utilities surrounding the Project Site, the proposed connections required to provide service to the new development and the potential impacts on the existing utility systems.

2.5.1 Sewage System

2.5.1.1 Existing Conditions

There are existing sewer connection to BWSC sewer lines from the project site. These lines are discussed in the Stormwater/Water Quality section of the PNF (Page 2-66) and show on associated figures. Based on the projected flow from this project, connections could be made to either one or both of the mains I Washington and Marvin Streets.

A sewer connection permit with the BWSC and MWRA is required and will be obtained for this project.

2.5.1.2 Proposed Sewage Generation

The Project's sewage generation rates were estimated using Massachusetts State Environmental Code (Title 5) at 310 CMR 15.203. This reference lists typical values for the source listed in Table 2-19. Other wastewater generation includes the cooling system. As shown in Table 2-14, the Project will have average daily flows of approximately 36,874 gpd of sanitary sewage.

The net change in sewage generation is presented below in Table 2-13

2.5.1.3 Wastewater Generation

The Project's sewage generation rates are estimated using the System Sewage Flow Design flows set forth at 310 CMR 15.203 and the proposed building program. 310 CMR 15.203 lists typical design flows for the proposed sources. Design flows are equivalent to estimated generated flow for the proposed use plus a factor representing flow variations. 310 CMR 15.203 design flows are used to evaluate new sewage flows or an increase in flows to existing connections. In addition to the sanitary flows from the program use of the mixed use development, stormwater runoff in the form of snow melt that is deposited in the garage space and at the covered loading docks will be collected in a MWRA approved oil/grit separator prior to discharge to the sanitary system

2.5.1.4 Proposed Connections

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Project is expected to generate an increase in waste- water flows of approximately 35,706 gallons per day. The sewer services for the Project will connect to the sewer main in Shawmut Avenue and/or Marvin Street. It is likely that improvements or modifications to the Marvin Street system and connections to the Shawmut Street system will be necessary. All improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's Site Plan Review process for the Project. This process includes a comprehensive design review of the proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts.

Table 2.19 Project Sewer Generation Per 310 CMR-15.203

Floor	Area	Occupancy Category	Area (Sp. Ft)	Unit QTY	Bedroom QTY	Gallons/ Bedroom	Gallons Per 1,000 Sq. Ft.	Total GPD
1	Retail	Retail Sales	2,696	-	-	-	50	134.5
1	Lobby	Lobby	1,826	-	-	-	75	137.25
1	Office	Office	10,933	-	-	-	75	819.75
2	Office	Office	14,104	-	-	-	75	1,057.5
3	Office	Office	14,104	-	-	-	75	1,057.5
4	Residential	Amenity	10,368	-	-	-	75	777.5
5-19	MicroUnit	Bedroom	400	30	1	0	-	3,300
5-19	Studio	Bedroom	625	15	1	0	-	1,650
5-25	1 Bedroom	Bedroom	850	78	1	0	-	8,580
5-25	2 Bedroom	Bedroom	900	88	2		-	19,360
							Total	**36,874**

Table 2.20 Net Change in Sewer Generation

	Existing	Future	Net New Flow
Estimated Sewage Flow	1,168	36,435 GPD	35,706 GPD

2.5.2 Water Supply System

2.5.2.1 Existing Water Infrastructure

As previously noted, Boston Water and Sewer Commission maintains sewer, water and storm drain lines in Shawmut, Marvin and Roxbury Streets.

In Shawmut Avenue, there exists a 12-inch water line.

In Marvin Street, there exists an 8-inch water line extends from Washington Street west on Marvin Street approximately 100-feet. The 8-inch line terminates at a fire hydrant on Marvin Street after servicing the property to the north of Marvin Street. A second water line extends from Shawmut Avenue east and terminates immediately after crossing into Marvin Street.

In Washington Street, there exists a 12-inch water line.

BWSC flow test data of actual flows and pressures at hydrants within the vicinity of the Project Site will be requested by the Proponent for the design of the buildings domestic water and fire protection service.

The Project's estimated increase in domestic water demand is 40,561.4 gpd (36,874*1.1). The water for the Project will be supplied by the BWSC systems within Washington Street, Roxbury Street, Marvin Street, and/or Shawmut Avenue.

All reasonable efforts to reduce water consumption will be made. Aeration fixtures and appliances will be chosen for water conservation qualities. In public areas, metering faucets and high-

efficiency low flow urinals and toilets are anticipated to be installed. All new water services will be installed in accordance with the latest local, state, and federal codes and standards. Back flow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC's Automatic Meter Reading (AMR) system.

2.5.2.2 Water Consumption

The proposed domestic water and fire services are expected to connect to the 12-inch waterline in Shawmut. The stub that extends from Shawmut into Marvin may also be used for servicing the Project however currently that line terminates and it can be expected that the BWSC will require that line to connect through Marvin to the terminated line extending from Washington Street. The domestic and fire protection water service connections required by the Project will meet the applicable local and state codes and standards, including cross-connection back flow prevention. Compliance with the standards for the domestic water system and fire service connections will be reviewed as part of BWSC's Site Plan Review process.

2.5.3 Stormwater System

2.5.3.1 Existing Condition

Boston Water and Sewer Commission maintains sewer, water and storm drain lines in Shawmut, Marvin and Roxbury Streets.

In Shawmut Avenue, there exists a 42"x 66" inch combined sewer storm drain trunk line and a 72-inch drain line that both convey sanitary and stormwater northeast.

In Marvin Street, a 12-inch drain line exists in Marvin Street with no direct connection to a drain- age system in the project site. The 12-inch drain line appears to receive flow from the project site via overland flow and the municipal catch basins that exist on Marvin Street.

In Washington Street, there exists a 12-inch sewer, a 24"x36" drain line.

2.5.3.2 Proposed Stormwater System

Post construction, stormwater management will consist of an on-site recharge system that will utilize the newly created open space and landscape areas. The recharge system will serve to recharge the groundwater table and also to reduce flow to the BWSC drainage system.

Stormwater overflow from the on-site mitigation measures will be directed to the BWSC storm- water system in one of the adjacent streets. Overflow to the existing storm drain system will aid in preventing impacts to abutting properties and the recharge system will replenish groundwater levels. Treatment systems associated with the drainage system will prevent site sediment from reaching the BWSC drain lines and ultimately, the Boston Harbor.

The Project will yield no net increase in peak discharge rates of run-off and will be designed to improve ground water recharge. This is accomplished primarily by installing a stormwater system that infiltrates, at a minimum, the first inch of runoff per BWSC requirements. This project will comply with BWSC Guidelines for Grit and Oil Separators. Outdoor parking and paved areas greater than or equal to 7,500 square feet require that a grit and oil separator (Particle Separator) be installed to capture drainage. The need for separators for indoor parking garages may also be required by the BWSC. Additional information regarding Stormwater management is contained in the following section

2.5.4 Water Quality and Stormwater Management

The Project will include at a minimum the required water quality treatment measures to re- move sediments from the stormwater that leaves the site. In addition to the post construction water quality measures, construction activities will be controlled with appropriate Erosion and Sediment Control devices to minimize the impacts of construction on the stormwater system.

The Project will minimize the transport of the soils and sediment to the BWSC storm drain system using BWSC, Department of Environmental Protection ("DEP") and the Environmental Protection Agency ("EPA") Best Management Practices (BMPs"). The project proposes protecting existing catch basins with filter fabric, hay bales and/or crushed stone to prevent sediment from entering the BWSC storm drain system. Erosion and sediment controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized and construction is complete.

2.5.4.1 Dewatering Permit

A Dewatering Permit application must be filed for certain discharges to the Commission's sanitary, storm drainage, or combined systems. Dewatering for this project will be conducted in accordance with the BWSC Dewatering Permit requirements.

If there is a proposal for discharge to the sanitary sewer or combined sewer, or to a drain that eventually connects to a combined sewer; an MWRA Sewer Use Discharge Permit is also required. Construction activities that require dewatering for this project are proposed to dis- charge to the storm drainage system. All the storm drains in the vicinity of the project eventually discharge into the city drain system. Once construction is complete, the Project will be in compliance with local and state stormwater management policies. See Section below for additional information.

2.5.5 BWSC Stormwater Management Compliance

DEPs Stormwater Management Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMP's) in the stormwater management design. The Policy is administered locally pursuant to M.G.L. Ch. 131, s. 40.

In 2013 BWSC adopted a stormwater management policy that employs EPA BMPs for sites exceeding one acre. This standard applies to development sites that will disturb more than one acre in the construction process. This is not applicable for this project as the combined project site is approximately 37,500+/- sf and hence less than an acre in size.

2.5.5.1 Mitigation Measures

The peak rate of runoff will not exceed the existing rate of runoff. Several measures will be implemented to manage storm water runoff in accordance with BWSC and DEP regulations including the addition of a landscaped courtyard and a stormwater management / infiltration system. Porous paving, green roofs and other sustainable stormwater techniques will be investigated as additional measures to mitigate the effects of stormwater runoff.

2.5.5.2 Coordination with BWSC

Proposed connections to the Commission's water, sanitary sewer, and storm drain system will be designed in conformance with the Commission's design standards, Sewer Use and Water Distribution System Regulations, and Requirements for Site Plans. When planning a new construction or renovation project, the first step in the process is the preparation of a Site Plan.

This document outlines the requirements necessary for preparing and submitting a Site Plan to BWSC. Once approved by BWSC, Site Plans are valid for one year.

The site plan must be signed by a Professional Engineer and Land Surveyor registered in Massachusetts. The Site Plan indicates the existing and proposed water mains, sanitary sewers, storm sewers, telephone, gas, electric, steam, and cable television. The plan will include the dis-connections of the existing services, if any, as well as the proposed connections. In addition, a Rough Construction Sign-Off document from the City of Boston's Inspectional Services Department is required prior to filing a GSA with BWSC.

Prior to connection to the BWSC utilities, the Utility Contractor will submit a General Service Application for review and approval prior to construction. An approved Site Plan must be on file with the Commission's Engineering Customer Services Department prior to submitting a GSA. The applicant or proponent does not file the GSA application. Only a bonded, licensed Drain Layer can file the GSA application

2.5.6 Energy Needs

2.5.6.1 Heating and Cooling

Levels 1-3: Commercial Office and Retail Spaces Retail, lobby and office spaces located on the first, second and third floor levels will be heated and cooled via a water source heat pump system served by a dedicated boiler plant located in the basement and a fluid cooler located on the third floor roof assembly. Water source heat pump systems will be supply conditioned air via insulated ductwork.

Levels 4-25: Residential Dwelling Units Residential dwelling unit heating and cooling will be provided via a central boiler and chiller plant located at the roof mechanical penthouse. The central plant will be a two-pipe manual change-over piping arrangement to serve all residential spaces on the fourth through twenty-fifth floor. (3) Central boilers will be natural gas, high-efficiency condensing boilers. Total heating required for the residential floors will be approx. 2,200 MBH. (2) 200 ton water cooled chillers will provide cooling to the residential spaces and shall be paired with a 2-Cell cooling tower located on the roof adjacent to the mechanical penthouse. Terminal heating and cooling systems within residential spaces are to be vertical fan coil units (FCU) with integral (heated or chilled water) coils. Local thermostats in each unit shall control a 2-way valve on the coil within the fan coil unit. Auxiliary electric resistance coils will be provided within each FCU, allowing any apartment to be heated during the shoulder seasons when only chilled water is available. This electrical load has been factored into the preliminary electric service requirements.

Domestic Hot Water (DHW) production will be provided centrally using indirect fired DHW tanks located within the roof mechanical penthouse. These tanks will serve all 236 units via common risers. A DHW recirculation system will be required, per 248 CMR.

The building's preliminary calculated gas consumption is 4,000 MBH and will require a 5" service and riser to the penthouse mechanical systems. This preliminary load is based on space heating

of ventilation air, and DHW production requirements and assumes electric dryers and electric kitchen ranges will be used for all residential dwelling units.

2.5.6.2 Ventilation System Requirements

Levels 1-3: Commercial Office and Retail Spaces Ventilation for the two office floors will be provided via (2) Energy Recovery Ventilators (ERV's) one per floor. These systems are to be located on the third floor roof. Each ERV must be equipped with economizer cooling and include indirect fired gas re-heat and packaged DX cooling for conditioning outside air (OA).

Lobbies and retail spaces will be served individually by individual energy recovery ventilators connected to dedicated heat pump units and exterior louvers.

Total Ventilation Requirement for levels 1-3 is approx. 3,600 CFM.

Levels 4-25: Residential Dwelling Units A single rooftop ERV system located at the roof penthouse, shall operate continuously to serve 236 dwelling units. Ventilation supply air shall be ducted directly into each dwelling unit to satisfy IMC 2009 and ASHRAE 62.1 requirements (air- flow rates shall vary depending on unit size and number of bedrooms). Each dwelling unit shall have an exhaust air grille located at the ceiling of each bathroom to continuously exhaust air from the apartment, removing contaminated air. Continuous supply of outside fresh air shall be ducted into the apartment at the equivalent rate of exhaust, when the clothes dryer is not operating. The rate of ventilation air shall increase upon activation of the clothes dryer, to accommodate the increased rate of exhaust air flow from the dwelling unit. This is achieved by the installation of supply air flow regulators and motorized dampers within each apartment to modulate the supply air rates.

Total Ventilation Requirement for levels 4-25 is approx. 30,000 CFM (to satisfy IMC 2009/ ASHRAE 62.2 as well as 20% clothes dryer operation diversity).

2.5.6.3 Electrical Requirements

The primary electrical service for the building will be a 3,500 ampere, 480/277 volt, 3 phase, 4 wire electrical service. A 1,600 ampere bus duct will extend from the main switch gear to electrical closets on each floor. The electrical closets will contain a transformer and electrical metering and distribution equipment to serve the residences.

The utility company will provide an electrical transformer located within a vault or a dedicated space within the building.

The fire pump will be served by a dedicated electrical service rated at 800 ampere, 480/277 volt, 3 phase, 4 wire electrical service.

The infrastructure will include a emergency generator 400kW.

2.5.6.4 Fire Alarm Requirements

The proposed design of the fire alarm system has been based on engineering criteria as defined by the NFPA 72-2010, and the Commonwealth of Massachusetts CMR 780 and local Boston Fire Prevention Code. The building shall be equipped throughout with an addressable fire alarm system with battery backup power, the system shall include voice/alarm communication capability that is now required for high rise building per sections 403.4 and 907.2.13. Manual fire

alarm boxes (i.e. pull stations) are to be located within five feet of each means of exit discharge. System smoke detectors shall be located within all office, lobby, retail, residential and mechanical areas. Audio/visual notification appliances are to be installed in public areas, as well as ADA compliant/sensory impaired dwelling units.

2.5.6.5 Emergency Generator Requirements

An emergency generated shall be located at the ground floor and shall serve critical infra-structure for the building, including but not limited to fire pump system, elevators, local fire alarm system and emergency lighting throughout the building

2.5.6.6 Energy Conservation Measures

- High Efficiency, condensing mode, low emissions, gas fired boilers.
- Energy Recovery Ventilators to provide ventilation air requirements to satisfy ASHRAE 62.1 & IMC 2009.
- Low-flow water fixtures shall meet or exceed water sense flow rate requirements for water closet, lavatory and kitchen fixtures.
- High-efficient LED lighting systems to serve public and private interior and exterior areas.
- Economizers to be provided at each ERV to allow passive cooling/heating when conditions are suitable.
- Proposed Alternate M-1: 60 kW Cogen module to generate electricity on site for net metering. Waste energy from electrical production serves indirect water heaters to condition DHW for residential spaces. If permitted by local electrical utility

2.6 Sustainable Design

In order to conform to Article 37, all sustainability initiatives of the project are intended to be measured using the framework of the LEED rating system with a commitment to environmental best practices. The Project team will hold an early design charrette to align sustainability goals and road map credits with task responsibilities for the life-cycle of the LEED Campus project. This meeting will clearly define sustainability goals for the Project using a synergistic approach that will be applied to each facet of design development. Using LEED as a tool to bring together diverse team members who typically work in a more linear sequence, this design charrette will promote collaboration starting in the early stages of design development. Environmental goals, responsibilities, fees, and benchmarks will be coordinated and communicated clearly and consistently.

A LEED V4 BD+C NC checklist (Figure 2.60) is included to provide an overview of the credits anticipated to be achieved by the project. This LEED checklist is only a preliminary evaluation and the credits pursued may alter with development of the building design. The Proponent's approach to each of the credit categories is described below.

2.6.1 Integrative Process

Beginning in pre-design and continuing throughout the design phases, opportunities to achieve synergies across disciplines and building systems will be identified and implemented. Analyses focused on energy & water related systems will inform the owner's project requirements (OPR), basis of design (BOD), design documents, and construction documents.

2.6.2 City of Boston Article 37

The Project will include the following Prerequisite Boston Green Building Credits:

Boston Public Health Development Prerequisite Credits:

Prerequisite Diesel Retrofit of Construction Vehicles

Retrofit of all diesel construction vehicles from the United States Environmental Protection Agency approved retrofit technologies, or a contribution of a comparable amount to the Air Pollution Control Commission Abatement Fund.

Prerequisite Outdoor Construction Management Plan

An outdoor construction management plan including provisions for wheel washing, site vacuuming, truck covers and anti-idling signage.

Prerequisite Integrated Pest Management Plan

The Project will include Item No. 3 and 4 listed below, of the Boston Credits.

Boston Credits:

A. Modern Grid Credit; Not applicable for this Project.

B. Historic Preservation Credit; Not applicable for this Project.

C. Groundwater Recharge Credit; Yes

1. The Project will capture rainwater including landscape irrigation.

D. Modern Mobility Credit Yes

Prerequisites:

1. Designate an on-site transportation coordinator in the management office.
2. Post information about public transportation and car-sharing options.
3. Provide transit, bike and pedestrian access information on building website.
4. Provide on-site, external bicycle racks for visitors and covered secure bicycle storage for the building occupants. 15% residential and 5% other uses.
5. Comply with Boston Transportation Department district parking ratios.
6. Join a Transportation Management Association (for mixed-use projects).

For Residential Projects:

1. Provide preferred parking spaces for a car-sharing service capable of serving 1% of building occupants.
2. Residential parking spaces required by zoning may only be purchased and used by building tenants/unit owners.
3. On-site electric charging plug-in stations for plug-ins capable of serving 1% of the building occupants.

2.6.3 Sustainability Narrative

2.6.3.1 Location and Transportation

The previously developed project site is located within a densely developed, high priority neighborhood and accessible via multiple modes of public transportation. As a result, the Project is envisaged with minimal onsite parking, which encourages use of public transportation or bicycles over single rider car use.

Sensitive Land Protection: The project is located in a previously developed site.

High Priority Site: The project is located on an infill site in a historic district in Boston.

Surrounding Density and Diverse Uses:

- Option 1: The surrounding existing density within a ¼-mile (400-meter) radius of the project boundary has a combined 22,000sf/acre of buildable land.
- Option 2: The project's main entrance is within a ½-mile (800-meter) walking distance of the main entrance of eight or more existing and publicly available diverse uses (as listed in Appendix 1 of LEED V4 NC).

Access to Quality Transit: The Project Entry is within a ¼-mile (400-meter) walking distance of existing transit center (Dudley Square Station) with aggregate trips amounting to more than 360 week- day trips and 216 weekend trips.

Bicycle Facilities: The Project will be complying with the Boston Transportation Department requirements of one bike space per unit be provided. A bicycle storage area is to be located in the Tower's basement.

Reduced Parking Footprint: Case 2: The project will achieve 40% reduction from the base parking ratio.

2.6.3.2 Sustainable Sites

A site assessment will be conducted before design to assess site conditions, evaluate sustainable options and inform related decisions. Low-impact design strategies and monitoring measures will be employed to minimize construction pollution on the previously developed site. A rainwater management plan aimed at capturing and infiltrating stormwater effectively within the site will be developed. Selection of roofing materials and pavement materials will specifically target reduction of heat island effects. Strategies to minimize light pollution will also be adopted.

Construction Activity Pollution Prevention (Pre-requisite): The Project will create and implement an erosion and sedimentation control plan for all construction activities associated with the Project.

Site Assessment: A site assessment survey or assessment will be completed and documented.

Rainwater Management:

Path 2: The Project will, in a manner best replicating natural site hydrology processes, manage on-site the runoff from the developed site for the 98th percentile of regional or local rainfall events using low-impact development (LID) and green infrastructure.

Heat Island Reduction: The Project will minimize effects on microclimate, human and wildlife habitats using a combination of non-roof and roof measures.

Light Pollution Reduction: The Project will meet up-light and light trespass requirement using either the backlight-up-light-glare (BUG) method (Option 1) or the calculation method (Option 2). Projects may use different options for up-light and light trespass.

2.6.3.3 Water Efficiency

The indoor, potable water use will be effectively reduced with the use of low-flow and high efficiency plumbing fixtures. In addition to using native species that adapt easily to the local

climate, the consumption of potable water for irrigation will be limited to need based demand as permanent irrigation system will not be installed.

Outdoor Water Use Reduction (Pre-requisite): The Project will not use any permanent irrigation. Indoor Water Use Reduction (Pre-requisite): The Project will reduce aggregate water consumption by 20% from the baseline by using Water Sense enabled fixtures.

Building-Level Water Metering (Pre-requisite): The Project will install permanent water meters that measure the total potable water use for the building and associated grounds.

Outdoor Water Use Reduction: The Project will not use permanent irrigation beyond a 2-year establishment period.

Indoor Water Use Reduction: The Project will reduce fixture and fitting water use from the calculated baseline in WE Prerequisite Indoor Water Use Reduction. Alternate water sources will also be explored.

Cooling Tower Water Use: The Project will conserve water for cooling tower makeup while controlling microbes, corrosion, and scale in the condenser water system.

Water Metering: The Project will install permanent water meters for two or more of the following water subsystems, as applicable to the Project: Irrigation, Indoor plumbing, domestic hot water, etc.

2.6.3.4 Energy and Atmosphere

Fundamental commissioning, minimum energy performance, building-level as well as advanced energy metering, and fundamental refrigerant management form part of the building systems to optimize energy performance and reduce energy consumption. Enhanced commissioning, renewable energy production, enhanced refrigerant management, and green power options will be evaluated for effective energy use by the building system.

The building systems will be designed to optimize system performance and reduce energy consumption. The design will include high efficiency building systems. The team will engage a building commissioning agent to ensure the proper installation and operation of systems. No chlorofluorocarbon (CFC) based refrigerants will be used in order to avoid ozone depletion in the atmosphere. The team will explore the feasibility of onsite renewable technologies. At a minimum, the building will be designed to be "solar ready" to ease future photo-voltaic installations.

Attention will be paid to the interior lighting control systems in all back of house and amenity/ common areas. The design will include high-performance strategies for the building envelope, in-unit lighting, appliances, and low-flow plumbing fixtures to reduce potable cold water and domestic hot water consumption.

The HVAC design includes high-performing water source heat pumps, condensing boilers, efficient heat reject systems, and energy recovery dedicated outdoor air units. The team is also analyzing the feasibility of on-site co-generation systems. The building owner will engage a Commissioning Agent during the design phase to review the proposed design and ultimately confirm the building systems are installed and function as intended and desired. A systems manual and training protocol will be developed through the Commissioning Agent to ensure the proper use and maintenance of the building systems post-occupancy.

Prerequisite 1 - Fundamental Commissioning and Verification

A Commissioning Agent will be engaged by the owner for purposes of providing basic commissioning services for the building energy related systems including HVAC & R, lighting, and domestic hot water systems. The Agent will verify the building systems are installed, calibrated and perform to the building owner's Project requirements and the Project team's basis of design.

Prerequisite 2 - Minimum Energy Performance

The building's energy performance will meet the minimum requirements of EAp2. For EAc1, the design, at minimum, is expected to show a 16 percent energy cost savings when compared to a baseline building based on ASHRAE Standard 90.1-2010 Appendix G methodology. This requirement will be met by selecting efficient mechanical equipment.

Additionally, an improved building envelope design and efficient lighting will be required to achieve this minimum. The team will develop a whole building energy model to demonstrate the expected performance rating of the designed building systems. The Project team will target a higher goal for the Project of at least a 20 percent improvement in energy cost savings, based on initial design intent.

Prerequisite 3 - Building-Level Energy Metering

Utility grade meters will be provided to meter gas, water and electrical consumption on site.

- Gas Metering: Multiple separate gas utility meters will be provided, one to serve the residential portion of the building (boilers in the penthouse), one to serve the office and general retail specs (boilers in the basement), and possibly added gas utility meters for future tenants on the first floor (e.g.: to serve commercial restaurant kitchens).

- Potable Water Metering: Two separate water utility meter stations are planned, one to serve the residential portion of the building, and one for the retail and office tenant areas.

  For the retail tenants, the Owner plans to install utility grade meters to separately sub-meter each of their separate water consumptions. A BWSC abatement meter strategy will be used to segregate the water used for irrigation (roof garden) and thereby receive a cost abatement since this water does not enter the sewer system.

  There is a possibility that BWSC will require use of only one meter station for the entire building in which case utility grade metering will be provided by the Owners in order to sub-meter the residential areas consumption separate of the rest.

- Electrical Metering: Power for residential dwelling units will be individually metered with utility meters, with a common meter bank located in closets at each floor. (These meter banks may be installed at every third or second floor).

  A single common "house" electrical meter will be provided to meter electrical consumption for the residential common areas (e.g.: lobby, elevators, and central mechanical systems, exterior lighting, trash compactors, potable water pressure booster stations, and equipment located within common areas such as the fitness center). Retail and office tenants will be individually metered with utility meters located

in the basement. There will also be a separate "house" electrical meter for power and lighting required in the common spaces associated with the retail and office spaces.

Prerequisite 4 - Fundamental Refrigerant Management

The specifications for refrigerants used in the building HVAC & R systems will NOT permit the use of CFC based refrigerants. The proposed design of the HVAC systems will achieve the prerequisite.

Enhanced Commissioning

The team will engage a third party Commissioning Agent (CA) during the Design Development phase. The CA's role will include, at minimum, a review of the Owner's Project requirements, creating, distributing and implementing a commissioning plan, and performing a design review of the Project documents.

Optimize Energy Performance

The team will establish a baseline kBTU/sq.ft. utilizing ASHRAE 90.1-2010 Appendix G methodology. The Project's end goal is to reduce the buildings energy consumption by 20% over the baseline calculation. The energy reduction will be achieved through the use of:

- Thermal Modeling: Building thermal modeling (eQuest) will be used during the design process to help examine design options and select final energy conserving design options, and determine final design performance.
- Central Boiler Plant: High efficiency, natural gas-fired, condensing boilers shall serve all residential units and common areas. The heating plant will be paired with indirect fired domestic hot water (DHW) tanks to provide DHW to residential units.
- Central Variable Speed Pumping Stations: For both the central 2-pipe changeover system serving the residential Vertical Fan Coils (VFC's) and the hydronic system serving the water source heat pumps in the office retail tenant areas the pumping stations shall be equipped with VFD's that modulate pump flow rates thereby reducing power consumption. As part of this approach the VFC's and the WSHP's will be equipped with motorized two way valves so that hydronic flow through the coil is only allowed when the thermostat calls for heating or cooling. Design also includes use of VFDs for potable water pressure boosting systems.
- Energy Recovery Ventilators (ERV's): ERV's shall serve all residential, common and commercial spaces throughout. Airflow rates shall be calculated to meet IMC Code and ASHRAE requirements. ERV's shall be equipped with economizers for when outdoor conditions allow, and blower motors with variable frequency drives (VFD's) to modulate airflow rates.
- Lighting Systems: The intention for lighting is to reduce lighting power density to below code required maximums. LED lighting systems paired with daylight sensing and occupancy sensors shall reduce electrical consumption while maintaining required lighting levels. Photo sensor controlled day light diming control will also be used where cost effective.
- Enhanced Building Envelope: The building shall utilize an improved envelope

construction that reduces heating/cooling thermal design loads over baseline calculations. The envelope design will be designed to meet or exceed code required minimum R-values.

Advanced Energy Metering

In addition to the items outlined within the "Prerequisite: Building Level Energy Metering", the following metering shall be incorporated:

- Also see the Building-Level Energy Metering (Prerequisite) section for description of Owner installed and monitored tenant sub metering. This Owner generated sub-metering will help incentivize further water conservation by billing tenants for their individual water consumption.
- A dedicated CW sub-meter will be provided to monitor the cooling tower water consumption.
- A Single dedicated CW sub-meter will be provided to monitor the buildings irrigation system.
- Utility Electrical meters shall include "Smart Meter" technology allowing the end user to track usage, relay information through Modbus, LAN or BACNet systems, and monitor consumption within 60 minute intervals.
- Utility Gas meters shall include pulse meter technology that allows the owner to track gas consumption remotely via Modbus communication.
- Utility Cold water meters shall be installed with technology that allows the meter to track consumption and send information via smart meter technology.

Demand Response – Demand Response and Load Management programs are currently available for enrollment within the Roxbury, Massachusetts area. At this time, the project scope does not include active enrollment within a Demand Response program. However, enrollment within a Demand Response program may potentially provide significant energy and cost savings. The enrollment in a local Demand Response program enrollment may be reviewed in further detail at a later date to provide the owner with a greater understanding of the potential for cost savings as well as impact on building equipment/system operation.

Enhanced Refrigerant Management

The product specifications shall outline the requirements for all chiller and Water Source Heat Pumps (WSHP's) to have R410A refrigerants. R410A refrigerant has zero Ozone Depletion Potential (ODP).

Preliminary calculations have lead us to the understanding that the Project will be below the required thresholds. Documentation will be provided post-construction to confirm the Project qualifies for the Enhanced Refrigerant Management credit.

Green Power and Carbon Offsets

There are currently green power service agreements available through the local electricity utility provider. These green power service agreements allow the owner to purchase electricity at a premium rate above the market rate, supporting local wind, solar and other forms of renewable

energy production. At this time, the program does not include active enrollment in a green power purchasing agreement. However, this item may be further analyzed in order to fully understand the cost implications resulting from entering into a 5-year green power purchasing program enrollment to provide either 50% or 100% of the building's electricity.

There is also the potential for the project to generate Renewable Energy Certificates (REC's) through on-site electrical generation. There is the potential for installing Cogeneration or Combined Heat and Power (CHP) systems within the mechanical penthouse. The potential for CHP system installations may be further reviewed with the appropriate parties at a later date to ensure proposed systems are capable of interconnection at the site as well as modeling the systems to understand the potential quantity of REC's that can be generated on site.

The current program does not include enrollment within a green power purchasing agreement, or on-site generation of REC's.

2.6.3.5 Materials and Resources

Multiple strategies are in place for resourceful material use and reduction of waste generation. A construction and demolition waste management plan will be incorporated to reduce demolition debris and construction waste. Selection of material with reduced life-cycle impacts will focus on utilizing recycled and local resources to minimize energy waste associated with the extraction, processing, transportation, maintenance, and disposal of building materials.

Prerequisite 1 - Storage and Collections of Recyclables

Storage of collected recyclables will be accommodated within the Project design. Occupants will have a dedicated area to bring their recyclables for storage and collection on each residential floor. Building management will have scheduled recyclable collection times where staff will collect and transfer each floors recyclables to the central storage location to await pickup. Recyclables will be collected by a contracted waste management company on a regular basis.

Prerequisite 2 - Construction and Demolition Waste Management Planning

Develop and implements a construction and demolition waste management plan:

- Establish waste diversion goals for the Project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent.
- Specify whether materials will be separated or comingled and describe the diversion strategies planned for the project. Describe where the material will be taken and how the recycling facility will process the material.
- Provide a final report detailing all major waste streams generated, including disposal and diversion rates.
- Alternative daily cover (ADC) does not qualify as material diverted from disposal. Include materials destined for ADC in the calculations as waste. Land-clearing debris is not considered construction, demolition, or renovation waste that can contribute to waste diversion.

Building Life-Cycle Impact Reduction:

For new construction (buildings or portions of buildings), conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories listed below, one of which must be global warming potential. No impact category assessed as part of the life-cycle assessment may increase by more than 5% compared with the baseline building.

Building Product Disclosure and Optimization - Environmental Product Declarations:

Project will use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.

USGB approved program – Products that comply with other USGBC approved environmental product declaration frameworks.

Building Product Disclosure and Optimization - Sourcing of Raw Materials:

Project will use at least 20 different permanently installed products from at least five different manufacturers that have publicly released a report from their raw material suppliers which include raw material supplier extraction locations, a commitment to long-term ecologically responsible land use, a commitment to reducing environmental harms from extraction and/or manufacturing processes, and a commitment to meeting applicable standards or programs voluntarily that address responsible sourcing criteria.

Building Product Disclosure and Optimization - Material Ingredients:

The Project will use building products that document ingredient optimization for at least 25%, by cost, of the total value of permanently installed products in the project.

Construction and Demolition Waste Management

Project will not generate more than 2.5 pounds of construction waste per square foot (12.2 Kilograms of waste per square meter) of the building's floor area.

2.6.3.6 Indoor Environmental Quality

The Project intends to provide a healthy indoor environment for its occupants with enhanced indoor air quality and low-emitting materials. Further, a construction indoor air quality management plan will be incorporated in addition to conducting indoor air quality assessment. Additional provisions for improving thermal comfort, interior lighting, daylighting, and acoustic performance will be evaluated.

Prerequisite 1 - Minimum IAQ Performance: The building mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standard 62.1-2010 sections 4 through 7 and/or applicable building codes. Any naturally ventilated spaces will comply with the applicable portions of ASHRAE 62.

Prerequisite 2- Environmental Tobacco Smoke (ETS) Control:

The building will be non-smoking. Additionally, smoking will be prohibited within 25 feet of all building openings and air intakes.

Enhanced Indoor Air Quality Strategies

The Project intends to achieve the Enhanced IAQ credit utilizing strategies outlined within Option-1. Entry systems shall be constructed to capture particulates as they enter the building, these systems shall be regularly maintained. Air systems will be designed to mitigate the possibility of cross-contamination. Garage spaces and lower level basement spaces shall have dedicated ventilation (exhaust and OA intake systems) using ERV's that are isolated from the interior occupied tenant and common spaces.

All interior spaces shall be mechanically ventilated via dedicated return and supply ductwork. Custodial and maintenance closets shall be completely enclosed and have fully sealed door assemblies and, both dedicated exhaust and supply of OA, these areas will be negatively pressurized in relation to adjacent spaces. Dedicated ERV systems shall have MERV-13 filtration, VFC's and WSHP shall have min. MERV-8 filtration.

Low-Emitting Materials

- Low-Emitting Materials, Adhesives & Sealants:
- The specifications will include requirements for adhesives and sealants to meet the low VOC criteria. The Construction Manager will be required to track all products used to ensure compliance.
- Low-Emitting Materials, Paints and Coatings:
  The specifications will include requirements for paints and coatings to meet the low VOC criteria. The Construction Manager will be required to track all products used to ensure compliance.
- Low-Emitting Materials, Flooring Systems:
  The specifications will include requirements for hard surface flooring materials to be Floor Score certified and carpet systems will endeavor to comply with the Carpet institute Green label program. The Construction Manager will be required to track all products used to ensure compliance.
- Low Emitting Materials, Composite Wood and Agrifiber Products:
  The Project will specify and install composite wood and agrifiber products that contain no added urea-formaldehyde. The Construction Manager will use only compliant composite wood materials.

Construction Indoor Air Quality Management Plan

The design team shall detail and contractors shall implement an IAQ management plan to be utilized during the construction of the project. Materials that have higher moisture absorption rates shall be stored on site in fully enclosed temporary spaces. All central mechanical ventilation systems shall not be operated prior to occupancy. Residential air systems shall not be operated during construction, all filters within these systems shall be min. MERV-8 and shall be replaced immediately prior to occupancy. Use of tobacco products shall be prohibited within the building and within 25' of building entrances.

Indoor Air Quality Assessment

Post-construction and prior to occupancy, the building shall undergo a baseline IAQ test using the protocols stated within Option-2 of LEED "Indoor Air Quality Testing". These tests shall be conducted

as required by the applicable standards and verification of compliance shall be documented prior to occupancy.

Thermal Comfort

The Project HVAC system design shall be in compliance with ASHRAE 55 for all tenant units, as well as provide the flexibility for tenant fit-out extensions of the mechanical systems to meet the ASHRAE 55 requirements for thermal comfort. Compliance with this credit will be dependent on the final systems design and comparative calculations.

Individual system controls shall be provided for at least 50% of individual occupied spaces. Each one bedroom and two-bedroom apartments will use one or more fan coil that has separate thermostatic control. These controls will allow the user to adjust the set-point temperature and fan speed controls and shall have the capability of 7-day programmable occupancy schedules at a minimum.

Interior Lighting

Controllability of Systems, Lighting:

The Project team will design to provide lighting controls to occupants within all multi-occupant amenity spaces, as well as provide individual lighting controls to a minimum of 90 percent of occupants within individually occupied spaces and units. Switched receptacles will be utilized to ensure lighting options within units are provided.

Daylight

Daylight and Views, Daylight Access for 75 percent of spaces:

It is the intent of the design to provide ample glazing along the perimeter, maximizing the availability of daylight within these spaces. Compliance with this credit will be dependent on the final calculations based on the final floor plan layouts.

Daylight and Views, Views for 90 percent of the spaces:

It is the intent of the design to provide ample glazing along the perimeter allowing for views for at least 90 percent of the regularly occupied spaces within the units and amenity spaces, as well as encourage this design intent within tenant spaces.

Acoustic Performance

Systems shall be designed to comply with ASHRAE HVAC sound level thresholds for occupant comfort. Air systems shall be designed for ensuring low velocity airflow rates within residential and commercial tenant space ductwork. Compliance with this credit will be dependent on the final systems design and sound level testing post construction. An acoustical engineer will be part of the consulting team.

2.6.3.7 Innovation in Design (1 Point)

Several potential Exemplary Performance credits have also been identified. These include strategies related to green education and green housekeeping related to common area maintenance procedures. The Project will also have a LEED Accredited Professional leading the sustainable design effort.

2.6.3.8 Regional Priorities

Regional Priority Credits

Regional Priority Credits (RPC) are designated by the USGBC for a particular area of the country. When a project team achieves one of the designated RPCs (Boston), an additional credit is awarded to the Project. The Project team anticipates achieving two RPCs for the following: Rainwater Management & Water Efficiency: Indoor Water Use Reduction.

Regional Priority: Optimize Energy Performance: (1 Point)

Based on the previous stated goal of achieving a 20% energy consumption reduction over baseline calculations, the current program qualifies for an additional 1 point credit under the Regional Priorities Credits.

Regional Priority: Rainwater Management: (1 Point)

The program currently outlines the goal to pursue Path 2 defined within the SS Rainwater Management Credit. Based on this, the program qualifies for an additional 1 point under the Regional Priority Credits.

2.6.3.9 Conclusion

As noted in the Sustainability introduction, the LEED V4 BD+C: New Construction Checklist is provided (Figure 2-60) to track probably credits for each category. The Project will be able to achieve at minimum a LEED Silver rating with the potential to achieve Gold. The Project will continue to advance the City's Green Design Goals and create the most efficient building possible.

2.6.3 Climate Change Resilience

Subject to Article 80, Large Project Review, a climate change preparedness checklist has been pre- pared for this project that addresses changes in sea level, temperatures, heat events, droughts, rain- fall events, and wind events. A Climate Change Preparedness and Resiliency Checklist is given in the appendix.

The project design will incorporate measures such as street trees, additional landscaped areas, installation of operable windows, and use of high-albedo roofing material to minimize the impact of high temperatures.

2.6.4 Accessibility

Subject to Article 80, Large Project Review, an Accessibility Checklist has been prepared for this project that addresses compliance with the Americans For Disabilities Act and standards established by Architectural Access Board and is included in the Appendix. The design will continue to advance post submission of this PNF – the Proponent will at the earliest opportunity schedule a review with the Accessibilities Commission staff.

Figure 2-60 LEED Checklist

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

Project Checklist

Project Name: **Guscott Rio Grande**

Date: 6-Mar-17

Y	?	N			
1			Credit	Integrative Process	1

12	0	4	**Location and Transportation**		16
			Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
1		1	Credit	High Priority Site	2
4		1	Credit	Surrounding Density and Diverse Uses	5
5			Credit	Access to Quality Transit	5
		1	Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
		1	Credit	Green Vehicles	1

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

6	0	5	**Water Efficiency**		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
2		4	Credit	Indoor Water Use Reduction	6
1		1	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

13	4	16	**Energy and Atmosphere**		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
	3		Credit	Enhanced Commissioning	6
	8	10	Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
		3	Credit	Renewable Energy Production	3
1			Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

9	0	4	**Materials and Resources**		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
3		2	Credit	Building Life-Cycle Impact Reduction	5
1		1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
1		1	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

11	0	5	**Indoor Environmental Quality**		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1		1	Credit	Enhanced Indoor Air Quality Strategies	2
1		1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1		1	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1		1	Credit	Interior Lighting	2
3			Credit	Daylight	3
		1	Credit	Quality Views	1
1			Credit	Acoustic Performance	1

3	0	3	**Innovation**		6
2		3	Credit	Innovation 1) Green Education 2) Green House Keeping	5
1			Credit	LEED Accredited Professional	1

2	0	2	**Regional Priority**		4
1			Credit	Regional Priority: ŧ Optimize Energy Performance	1
1			Credit	Regional Priority: Rainwater Management	1
		1	Credit	Regional Priority:	1
		1	Credit	Regional Priority:	1

64	4	42	**TOTALS**	Possible Points: 110

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

3.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

3.1 Massachusetts Environmental Policy Act

The Project does meet certain discretionary thresholds for review under the Massachusetts Environmental Policy Act (MEPA). The Proponent is soliciting an advisory opinion from MEPA to determine if an Environmental Notification Form (ENF) is required.

3.2 Massachusetts Historical Commission

The Project does not require any state permits but is adjacent to a National Register listed property. The Massachusetts Historical Commission (MHC) will be contacted regarding potential review by that agency.

3.3 Boston Landmarks Commission

The Project is in a designated historic district and proximate to a Historic Protection Area – as a result review by the Boston Landmark Commission may be required. The Proponent will notify the Environment Department of the proposed development and comply with any determination made regarding review by the BLC.

3.4 Architectural Access Board Requirements

The Project will comply with the requirements of the Architectural Access Board and the standards of the Americans with Disabilities Act.

3.5 Boston Civic Design Commission

Article 28 of the Boston Zoning Code stipulates that projects over 100,000 square feet shall be subject to review by the Boston Civic Design Commission. The Proposed Development will be introduced to the BCDC at earliest opportunity, most likely their June 6th general meeting.

3.6 Other Permits and Approvals

Section 1.5 of this PNF lists agencies from which permits and approvals for the Project will be sought.

3.7 Community Outreach

The Proponent is committed to effective community outreach and will engage the community to ensure public input on the Project. The BPDA is finalizing membership for a project specific Impact Advisory Group (IAG) with an introductory meeting expected in late May.

4.0 PROJECT'S CERTIFICATION

This form has been circulated to the Boston Planning and Development Agency (former BRA) as required by the Boston Zoning Code, Article 80.

Lisa Guscott
Rio Grande Dudley Square, LLC

May 26, 2017

Signature of Preparer

Thomas Maistros, Jr.
Stull and Lee, Inc

May 26. 2017

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	**Rio Grande Tower**
Project Address Primary:	**2343-2345 Washington Street**
Project Address Additional:	**11-29 Roxbury Street**
Project Contact (name / Title / Company / email / phone):	**Lisa Guscott, Long Bay Management Corp., lguscott@longbaymgt.com, (617) 799-8661**

A.2 - Team Description

Owner / Developer:	**Long Bay Development Corporation, Inc.**
Architect:	**Stull and Lee, Inc.**
Engineer (building systems):	**Norian/Sergio Engineering, Inc.**
Sustainability / LEED:	**Doyle Engineering, Inc.**
Permitting:	**Stull and Lee, Inc./Bevco Associates**
Construction Management:	**JaneyCo/Gilbane, Inc.**
Climate Change Expert:	**Doyle Engineering, Inc.**

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	**211 units of residential housing, 28,059 SF of retail, 28,208 SF of commercial**
List the First Floor Uses:	**Retail, Residential and Commercial Lobbies and Management Office**

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

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	**34,300 SF**	Building Area:	**285,253 SF**
Building Height:	**282.5 Ft.**	Number of Stories:	**25 Flrs.**
First Floor Elevation (reference Boston City Base):	**31 FT Elev.**	Are there below grade spaces/levels, if yes how many:	**No** / *Number of Levels*

A.5 - Green Building

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

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

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

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

A.6 - Building Energy

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

Electric - base / peak:	**740,000 (kW) / 1,482,000 (kW)**	Heating – base / peak:	**1.3 MMBtu/hr / 2.61 MMBtu/hr**
What is the planned building Energy Use Intensity:	**8.9 kWh/SF/YR**	Cooling – base / peak:	**230 (Tons) / 460 (Tons)**

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

Electric:	**200 kW**	Heating:	**0 (MMBtu/hr)**
		Cooling:	**0 (Tons/hr)**

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

Electrical Generation:	**300 (kW)**		Fuel Source:	**Natural Gas**
System Type and Number of Units:	**Combustion Engine**	Gas Turbine	Combine Heat and Power	**1 (Units)**

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	**50 Years**	75 Years

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

Select most appropriate:	10 Years	**25 Years**	50 Years	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	**25 Years**	50 Years	75 Years

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

6F/90F	Deg.

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

N/A Deg.	N/A Days	N/A Events / yr.

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

N/A Days	N/A Events / yr.

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

N/A Inches / yr.	N/A Inches	N/A Events / yr.

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

N/A Peak Wind	N/A Hours	N/A Events / yr.

B.2 - Mitigation Strategies

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

Building energy use below code:	At Least 20%
How is performance determined:	ASHREA Energy Modeling

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

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

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

Roof:	R = 38 U= 0.026	Walls / Curtain Wall Assembly:	R = 20/U=0.050
Foundation:	R = 10 / U=0.10	Basement / Slab:	*R =19/U-0.053*
Windows:	R = 2.94/ U =0.34	Doors:	*R = / U =*

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

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

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

Select all appropriate:	Connected to a	Building will be	Connected to	Distributed

local electrical micro-grid	**Smart Grid ready**	distributed steam, hot, chilled water	thermal energy ready

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

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

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

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

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

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

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

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

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

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

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

Yes / **No**

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base* **31** *Elev.(Ft.)*
Building Proximity to Water:	**>500** *Ft.*

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

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

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

2013 FEMA Prelim. FIRMs:	*Yes* / **No**	Future floodplain delineation updates:	*Yes* / **No**

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

>500 *Ft.*

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

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

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

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

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

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

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

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

Yes / No

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

Yes / No	If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*	

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

Yes / No	
If Yes, describe:	

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

Yes / No	If Yes, for how long:	*days*	

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

C.4 - Building Resilience and Adaptability

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

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

Select appropriate:	*Yes / No*	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

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

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

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

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:				

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

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

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:	**Rio Grande Tower**
Primary Project Address:	**2343-2345 Washington Street, 11-29 Roxbury Street**
Total Number of Phases/Buildings:	**Three (3) buildings (two renovated, one new)**
Primary Contact (Name / Title / Company / Email / Phone):	**Lisa Guscott, Long Bay Management Corp., lguscott@longbaymgt.com, (617) 799-8661**
Owner / Developer:	**Long Bay Development Corporation, Inc.**
Architect:	**Stull and Lee, Inc.**
Civil Engineer:	**TBD**
Landscape Architect:	**TBD**
Permitting:	**Stull and Lee, Inc./Bevco Associates**
Construction Management:	**JaneyCo/Gilbane, Inc.**

At what stage is the project at time of this questionnaire? Select below:

	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.	**No**

2. Building Classification and Description:

This section identifies preliminary construction information about the project including size and uses.

What are the dimensions of the project?

Site Area:	***34,300 SF***	Building Area:	***285,253 GSF***
Building Height:	***282.5 FT.***	Number of Stories:	***25 Flrs.***

First Floor Elevation:	**31 FT (Boston Base)**	Is there below grade space:		*Yes / **No***
What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	**Steel Frame**	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	**Residential - Multi-unit, Four +**	Institutional	Educational
	Business	**Mercantile**	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	**Retail/Lobby/Management Office**			

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:	**Proposed Development is located in the Dudley Square Neighborhood Commercial Center of Roxbury. The site and immediate surrounding area has little to no grade change.**
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	**Dudley Station, which provides access to a major bus station and the Silver Line, is located directly across Washington Street from the proposed development. To the west, the site is less than a mile from Ruggles MBTA Station, which provides bus, rapid transit, and commuter rail services. Ruggles Station and the Silver Line are full accessible while the MBTA busses have limited accessibility.**
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	**Madison Park Technical Vocational High School and John D. O'Bryant High School are in close proximity to the site (just to the west). The edge of Northeastern University is less than a mile northwest of the site.** **The Whittier Street Health Center is approximately 3/4 mile to the northwest, Boston Medical Center is approximately a mile from the site, and Longwood Medical Center (including Brigham and Women's Center and Boston Children's Hospital) is 1.4 miles from the site.** **The Smith House is an independent senior housing building approximately 100 yards to the northwest of site, as is the Ruggles Affordable Assisted Living is supportive senior housing. Madison Park Village, Whittier Street**

	Housing Development and Ruggles Street Apartments are all affordable housing developments near the site.
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	The site is on several bus routes that access Ruggles and Dudley Stations with direct transit access to downtown. The US Post Office and the Boston Police District B-2 Station are in Dudley Square – the Post Office directly across Shawmut Avenue to the east and the Police Station is a ¼ mile to the southeast. The Boston Police Headquarters is on Tremont Avenue approximately a mile to the west of the site. The Dudley Square library is less than ½ a mile southeast of the site.
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:	The Site is in the Dudley Square National Historic District.
Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Yes, the sidewalks along Washington Street have been adjusted to control vehicle movement resulting in sidewalk widths of 10 to over 20 feet. Ramps are provided and appear to meet ADA requirements. Concrete sidewalks on Marvin Street are narrow (app 5') but in good condition. Concrete sidewalks on Shawmut are app. 8' wide but not in good condition and the travel width is interrupted by street trees.
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:	The City is proposing further adjustments to current curb alignment along Washington Street to conform to Complete Streets plans for Dudley Square. Sidewalks along Marvin Street and Shawmut Avenue are narrow and do not meet ADA or Complete Street standards. These sidewalks will be designed and reconstructed as part of the proposed development and the Boulevard Planning Overlay District process.
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***,	No

choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	**Final sidewalk dimensions will be determined through the BPDA Article 80 Design Review and Boulevard Planning process. Currently sidewalks have minimal slope clearly less than 1:20 that would require railings or other forms of assistance.**
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?	**TBD**
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?	**On Private Property only – design to be determined.**
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	**TBD**
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	**TBD**
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*.	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	**On site parking will be limited to five spaces and will be for short-term use (parcel deliveries and resident drop-off). The project is continuing to investigate opportunities/location for resident/tenant parking, probably in a nearby garage not on the current site.**

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?	**TBD**
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	**TBD**
Where is the accessible visitor parking located?	**TBD**
Has a drop-off area been identified? ***If yes,*** will it be accessible?	**No but project has discussed opportunities to alternate Marvin Street to provide drop-off zone and wider sidewalks.**
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.*	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	**New Building and Buff Bay Building will be a flush condition. Former Roxbury Savings Bank Building has steps at the Washington Street entrance with limited opportunities for ramping w/o impacting the historic façade. Alternate entrances to be incorporated as part of the interior accessways are being developed but not finalized.**
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no,*** what is the reason?	**Yes except for Roxbury Savings Bank (reasons noted above). Public entrances into residential and office lobbies/atrium will be fully are compliant.**
If project is subject to Large Project Review/Institutional Master Plan,	**TBD**

describe the accessible routes way-finding / signage package.	
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	**211**
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?	**46 Units are proposed as condominiums, 165 are rental. Final distribution of affordable units has not been made but current concept is IDP units will be all rental units.**
If a residential development, how many accessible Group 2 units are being proposed?	**Project will comply with Mass Building Code with a minimum of 5% full accessible.**
If a residential development, how many accessible Group 2 units will also be IDP units? ***If none***, describe reason.	**Accessible units will be proportionally distributed between market and IDP units.**
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.	**N/A**
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes,*** provide reason.	**No**
Are there interior elevators, ramps or lifts located in the development for access around architectural	**N/A**

barriers and/or to separate floors? ***If yes,*** describe:	
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.*	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	**Public Space improvements are restricted public ways immediately abutting the proposed development.**
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?	**The development will be entirely accessible including residential amenities spaces on upper floors (indoor common areas and outdoor decks).**
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.	**TBD**
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?	**Project has not been reviewed with Disabilities Commission.**
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	**Project has not been reviewed with Disabilities Commission.**

the Advisory Board give to make this project more accessible?	

10. Attachments

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

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.
Provide a diagram of the accessible route connections through the site, including distances.
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable)
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry.
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. ***Refer to exhibits in the PNF – It is the Proponent's goal to provide the Accessibilities Commission with a formal submission of schematic drawings prior to the PNF Scoping Session.***

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

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

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

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682

APPENDIX C - Disclosure Statement Concerning Beneficial Interests as Required by Article 80, Section 80B-8, of the Boston Zoning Code

(1) Name of Project: The Guscott Tower

(2) Location: 451 Blue Hill Ave., Suite #4 Dorchester, MA 02121

(3) Applicant: Rio Grande Dudley, Square, LLC

(4) I hereby state, under the penalties of perjury, that the true names and addresses of all Persons who have a Beneficial Interest (including the amount of their Beneficial Interest accurate to within one-tenth of one percent if such interest exceeds one percent) in the above-listed property are listed below in compliance with the provisions of Article 80, Section 80B-8, of the Boston Zoning Code.

NAME AND RESIDENCE OF EACH PERSON WITH SAID BENEFICIAL INTEREST (continue on separate sheet if necessary):

SEE ATTACHED

NAME:		Percentage Interest
ADDRESS:		
NAME:		Percentage Interest
ADDRESS:		
NAME:		Percentage Interest
ADDRESS:		
NAME:		Percentage Interest
ADDRESS:		
NAME:		Percentage Interest
ADDRESS:		

(5) The undersigned also acknowledges and states that except as stated below, none of the above-listed individuals is an official elected to public office in the Commonwealth of Massachusetts, nor is an employee of the State Department of Capital Planning and Operations.

(6) I hereby state, under the penalties of perjury, that the names and addresses of all firms and professional corporations employing attorneys, real estate brokers, architects, engineers, planners, or surveyors, and all other agents who have acted on behalf of any of the foregoing

PROPONENT: **Rio Grande Dudley Square LLC**

Schedule of Beneficial Ownership of the Proponent.

Beneficial Interests Ownership	Percentage of Ownership	Names of Beneficiaries	Addresses of Benficiaries
	33.33%	Estate of George R. Guscott and Mrs. Carrie D. Guscott	451 Blue Hill Avenue Boston MA 02121
	33.33%	Estate of Kenneth I. Guscott and Mrs. Valerie W. Guscott	451 Blue Hill Avenue Boston MA 02121
	30.38%	Mr. Cecil H. Guscott	451 Blue Hill Avenue Boston MA 02121
	2.96%	Ms. Lisa J. Guscott	451 Blue Hill Avenue Boston MA 02121
	100.00%	TOTAL	

with respect to the application for Zoning Relief on the above-listed property are listed below in compliance with the provisions of Article 80, Section 80B-8, of the Boston Zoning Code.

NAMES AND ADDRESSES OF ALL FIRMS AND PROFESSIONAL CORPORATIONS, AND AGENTS WHO HAVE ACTED ON SAID APPLICATION (continue on separate sheet if necessary):

NAME:	David Lee _ Stull & Lee
ADDRESS:	103 Terrace Street Boston, MA 02120

NAME:	Beverley Johnson - Beyco
ADDRESS:	202 West Seldon Street Boston, MA 02126

NAME:	Ruth Sillman _ Nixon Peabosy
ADDRESS:	100 Summer Street Boston, MA

NAME:	
ADDRESS:	

NAME:	
ADDRESS:	

SIGNED under the penalties of perjury.

Signature: _____

Name Printed: LISA JOANN GUSCOTT

Date: 5/19/17

9.0 Community Support Letters:

The Black Ministerial Alliance of Greater Boston, Inc.

July 10, 2015

Attn: Ms. Lisa Guscott
President & CEO
Long Bay Management, Co.
Rubina Guscott Building
451 Blue Hill Avenue, Suite 4
Boston, MA 02121

Dear Lisa:

On behalf of the Board of Directors of the Black Ministerial Alliance of Greater Boston, Inc. (BMA), **I invite your father, Ken Guscott, to attend our 2015 Gala Anniversary Celebration as our Honoree.** I know that he has spoken with Lori Nelson about this and we wanted to send an official invitation to you to explain more about the event on Ken's behalf.

This year's theme is Celebrating our Commitment to Diversity. Ken's service to our constituents in our diverse Communities of Color in Boston neighborhoods made his nomination an easy choice! Furthermore, the BMA is deeply appreciative of his influence as a positive role model to so many who aspire to become entrepreneurs. We know that he is in touch with our voice, our needs, as well as our resources and strengths, and we are grateful for that. It would be our privilege to highlight the depth of his work and commitment to our mission as part of our event's festivities.

The 2015 Gala, 21st Anniversary Celebration is scheduled for Thursday, October 22, 2015 from 5:30pm – 8:30pm at Florian Hall in Dorchester. There will be a reception at 5:30pm for a photo opportunity and to mingle with our constituents. The main program and dinner will begin at 6:30pm and we expect a minimum of 300 in attendance, including the Mayor of Boston and other local politicians.

The Board of Directors of the BMA and members sincerely hope you, your fathers, and others from Long Bay Management will be able to attend as we honor Ken for his service and accept our award for the impact he has made on our Communities of Color.

If you have any questions, please feel free to contact me directly at dwright@bmaboston.org or 617-959-7698, or you may reach out to Amy Malkemes, Director of Development, if I am not available. She can be reached at amalkemes@bmaboston.org or 617-445-2737 ext. 128.

Sincerely,

David Wright

Rev. David Wright, Esq.
Executive Director

■ The Black Ministerial Alliance ■ 7 Palmer Street, 3rd Floor Roxbury, MA 02119 ■ **Fax:** 617.445.3557
■ **Phone:** 617.445.2737 ■ **Website:** www.bmaboston.org

Windale Developers, Inc.

May 14, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

I am submitting this letter to express strong support for the *Rio Grande Project* that will be constructed on developer-owned land located at 2343 Washington Street in Dudley Square.
For over 40 years, the Guscott family has been deeply committed to creating opportunities in the minority community, including providing financial support for community education projects from the net profits of the Long Bay Management Company.

This project will have a transformative impact on Dudley Square as a major center of housing and commerce, and will serve as a model for future development in the neighborhood. Just as importantly, the Rio Grande Project, which is led by an African-American team, will facilitate sustainable wealth creation and capacity in the minority business community and generate economic opportunity in the broader minority community.

After many years of work by community residents and the City of Boston to establish physical and economic revitalization goals and standards to increase the housing inventory and the level of commercial investment in Dudley Square, while also generating sustainable economic growth and expansion, the Rio Grande Project captures the essence of neighborhood expectations in an exciting and innovative manner.

The specific elements of the Rio Grande development program will also establish a new model for development in densely-populated urban neighborhoods in the following ways:

1. The 25 story tower will generate a critical mass of workforce and market-rate housing in Dudley Square that will increase the housing inventory in the Roxbury community and will promote the neighborhood as a destination for retail and new entertainment venues.

2. The project's direct access to Dudley Station, one of the major transportation hubs of the public transit system, will provide residents and employees of the tower with direct access to Dudley and downtown Boston;

3. This project will serve as a catalyst for the ongoing physical and economic revitalization of Dudley Square.

Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Arnold C. Johnson

Arnold C. Johnson
President,

95 Humboldt Ave., Dorchester, MA 02121 Tel # (617) 442-5454 Fax # (617) 442-5154

May 13, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

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Based on the transformative impacts of the Rio Grande project, I wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Mr. Kevin D. Cherry

5/13/15

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

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2. The project's direct access to Dudley Station, one of the major transportation hubs of the public transit system, will provide residents and employees of the tower with direct access to Dudley and downtown Boston;

3. This project will serve as a catalyst for the ongoing physical and economic revitalization of Dudley Square.

Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Bridgette Wallace
Founder
SkyLab

UNITED HOUSING MANAGEMENT LLC

530 Warren Street Boston Massachusetts 02121

Telephone 617 541 5510 Fax 617 445 4320 1 800 439 0183 TDD Relay www.unitedhousing.com

May 13, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

I am submitting this letter to express strong support for the *Rio Grande Project* that will be constructed on developer-owned land located at 2343 Washington Street in Dudley Square.
For over 40 years, the Guscott family has been deeply committed to creating opportunities in the minority community, including providing financial support for community education projects from the net profits of the Long Bay Management Company.

This project will have a transformative impact on Dudley Square as a major center of housing and commerce, and will serve as a model for future development in the neighborhood. Just as importantly, the Rio Grande Project, which is led by an African-American team, will facilitate sustainable wealth creation and capacity in the minority business community and generate economic opportunity in the broader minority community.

After many years of work by community residents and the City of Boston to establish physical and economic revitalization goals and standards to increase the housing inventory and the level of commercial investment in Dudley Square, while also generating sustainable economic growth and expansion, the Rio Grande Project captures the essence of neighborhood expectations in an exciting and innovative manner.

05.15.15

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Ken:

The combination of the importance of the Rio Grande Project that would be located at 2343 Washington Street in Boston, and the decades of Guscott family commitment to the economic and community advancement of the Dudley area and the transformative impact the project would have on the area has me write you to express strong support for the project. For all the reasons above and because the Dudley area is growing in its importance to workforce access, local employment growth and transportation access to and from many areas of the city, the Rio Grande Project's time is now.

It is also important that a long committed and successful African-American team will facilitate sustainable wealth creation and capacity in the minority business community and generate economic opportunity in the broader minority community.

After many years of work by community residents and the City of Boston to establish physical and economic revitalization goals and standards to increase the housing inventory and the level of commercial investment in Dudley Square, while also generating sustainable economic growth and expansion, the Rio Grande Project captures the essence of neighborhood expectations in an exciting and innovative manner.

As I understand it, the specific elements of the Rio Grande development program will also establish a new model for development in densely-populated urban neighborhoods in the following ways:

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Milton Benjamin, Pres.
KAGE Growth Strategies, LLC

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

CFO, United Housing Management

Ms. Kim Janey
27 Copeland Street
Roxbury MA
O2119

May 13, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

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Sincerely,

June 4, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Shelley Webster

7 Cricket Lane*Randolph, MA 02368*(617)719-7869

June 2, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

I submit this letter to express my strong support for the *Rio Grande Project* that will be constructed on developer-owned land located at 2343 Washington Street in Dudley Square. For over 40 years, the Guscott family has been deeply committed to creating opportunities in the minority community, including providing financial support for community education projects from the net profits of the Long Bay Management Company.

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Keith McDermott

May 10, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

I am submitting this letter to express strong support for the *Rio Grande Project* that will be constructed on developer-owned land located at 2343 Washington Street in Dudley Square. For over 40 years, the Guscott family has been deeply committed to creating opportunities in the minority community, including providing financial support for community education projects from the net profits of the Long Bay Management Company.

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Darryl Settles
Catalyst Ventures Development

617-512-9275

May 13, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Dianne Wilkerson

Dianne Wilkerson, President
New Day Services, Inc.

June 4, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

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Based on the transformative impacts of the Rio Grande project, I wholeheartedly support the advancement of the Rio Grande Project to construction.

Warm regards,

Charlotte
Charlotte M. Nelson
Activist – Community Development & Empowerment

CROSSWINDS ENTERPRISES, INC.

97 Humboldt Ave.
Dorchester, MA 02121

Phone: 617-445—5100
Fax: 617-445-5482 Email: xxwinds@aol.com

May 14, 2015

Kenneth Guscott
Long Bay Management Company
1452 Blue Hill Avenue
Dorchester, MA 02121

Dear Mr. Guscott:

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Based on the transformative impacts of the Rio Grande project, we wholeheartedly support the advancement of the Rio Grande Project to construction.

Sincerely,

Arnold C. Johnson

Arnold C, Johnson
President,

June 8, 2015

Brian P. Golden, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Dear Mr. Golden,

Please accept this letter of recommendation and support for the following project: The Rio Grande project to be constructed at 2343 Washington Street, Roxbury at Dudley Square.

Dudley Square has been the site for several developments in recent years: The Area B. Police Station, Dudley Square Elderly Housing, Tropical Foods and the Boston School Department at the new Bruce Bolling Municipal Building. The Rio Grande Project will continue the progress towards a thriving urban center at Dudley Square with the addition of new retail/ commerce opportunities and much needed work force housing.

The housing issues for so many of our younger residents who have matriculated from our educational institutions and would like to continue to live and work in the city, with expanding innovation districts and convenient transit system to downtown and Longwood Medical areas for professional employment, will be addressed with this particular development.

Retail opportunities, employment opportunities and innovation will coincide at Dudley Square to boost the economic outlook for an area that has been overlooked by the economic boom that has happened at Fan Pier, Downtown Crossing, Seaport and many other areas of Boston. Homeowners, and longtime residents are excited that they will again be able to access retail and entertainment destinations within their community by the development of this project.

The Guscott family has a stellar reputation for the quality of the projects that they have developed. The principle of support for equal access to jobs during the construction phase as well as after construction is a principle to which the Guscotts have always adhered. Their philosophy matches the Boston Jobs and Residency Policy (BRJP) and will support wealth creation by employing qualified workers for much needed employment opportunities. Additionally their support of local entrepreurs and businesses generates wealth.

As a long time resident of Roxbury and community activist, I wholeheartedly support the Rio Grande Project. I look forward to a thriving Dudley Square and this project continues the progress toward that possibility.

Yours truly,
Dorothea M. Jones
Dorothea M. Jones