Draft Project Impact Report

One Bromfield

Submitted to:
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Submitted by:
One Bromfield LLC
c/o Midwood Investment and Development
430 Park Avenue, Suite 505
New York, NY 10022

Prepared by:
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754

In Association with:
Adrian Smith + Gordon Gill Architecture LLP
McDermott Ventures
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
Howard Stein Hudson
Stephen Stimson Associates
PositivEnergy Practice, LLC
Haley & Aldrich, Inc.

APRIL 28, 2016

Epsilon
ASSOCIATES INC.

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Submitted Pursuant to Article 80B of the Boston Zoning Code

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April 28, 2016

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Chapter 1.0

Project Summary

1.0 PROJECT SUMMARY

1.1 Project Overview

One Bromfield LLC (the Proponent), an affiliate of Midwood Investment and Development, proposes to develop an approximately 0.55-acre site (the Project Site) at the corner of Washington and Bromfield Streets in the Downtown Crossing area of Boston. The Project Site, bounded by Washington Street to the east, Bromfield Street to the south, Province Court and Ordway Place to the north, and the property known as 32-54 Bromfield Street to the west, contains four existing buildings. The Project Site will be developed into a 59-story, approximately 605,000 square foot (sf) mixed-use building with three levels of retail space, and residential units above (the Project). Approximately 235 parking spaces will be located on the third and fourth floors accessed by valet service on the first floor.

The Project will provide continuous ground floor retail and active uses along Washington and Bromfield Streets, reinforcing the pedestrian-oriented character of Downtown Crossing. The Project's retail and residential components will foster pedestrian activity and contribute to the vitality of the area throughout the course of the day and during the evening hours. The building massing, with its soft edges and unique cuts, will make an iconic impression along the Boston skyline and will enhance the street level experience. In addition to public realm benefits, the Project will also provide new housing, including on-site affordable housing, construction and permanent jobs, and greatly enhanced tax revenues for the City.

Midwood Investment and Development has a diversified portfolio of over 110 properties located in 11 states. This is the Proponent's first development in Boston, however, Midwood is familiar with the Boston market, having owned buildings in downtown Boston since 1994, and recently acquired a suite of downtown buildings on One Milk Street. Financed with its own equity and bank debt, Midwood has a 90 year operating history and has made a significant commitment to the success of its locations through the creation of thoughtful, inspired developments in cities across the U.S.

Midwood has engaged world-renowned architects Adrian Smith + Gordon Gill Architecture (AS+GG). Founded in 2006, AS+GG has a staff of approximately 100 and provides architectural, interior and urban design services. Based in Chicago, AS+GG is an international practice and has designed a wide variety of building types around the world.

The Project is subject to Large Project Review under Article 80B of the Boston Zoning Code (the "Code") because it will exceed 100,000 square feet of gross floor area. A Letter of Intent was submitted to the Boston Redevelopment Authority (BRA) on July 10, 2008. A Project Notification Form was then submitted to the BRA on October 27, 2008. A Scoping Determination was issued by the BRA on July 1, 2009 pursuant to Section 80B-5 of the Code, requiring the submission of this Draft Project Impact Report (DPIR) to the BRA detailing the Project's impacts and proposed measures to mitigate, limit or minimize such impacts. Because of the subsequent recession and collapse of the capital markets, the Project permitting was delayed.

1.2 Development Team

Address/Location:	One Bromfield Street
Developer:	One Bromfield LLC c/o Midwood Investment and Development 430 Park Avenue, Suite 505 New York, NY 10022 (212) 682-9595 John Usdan, President Shazia Shahid, Vice President
Government and Community Relations:	McDermott Ventures 30 Rowes Wharf, Suite 600 Boston, MA 02110 (617) 557-9190 Pamela McDermott Carolyn Spicer
Architect:	Adrian Smith + Gordon Gill Architecture LLP 11 West Monroe, Suite 2300 Chicago, IL 60603 (312) 920-1888 Adrian Smith, FAIA Gordon Gill, FAIA Robert Forest, FAIA Jonathan Orlove, AIA
Landscape Architect:	Stephen Stimson Associates 288 Norfolk Street, #5 Cambridge, MA 02139 (617) 876-8960 Stephen Stimson

Legal Counsel:	Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. 1 Financial Center Boston, MA 02111 (617) 239-0225 Rebecca A. Lee, Esq.
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Peggy Briggs Talya Moked
Transportation and Parking Consultant:	Howard Stein-Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080 Guy Busa, P.E. Elizabeth Peart, P.E.
Civil Engineer:	Howard Stein-Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080 Richard Latini, P.E. James Downing, E.I.T.
MEP Engineer:	PositivEnergy Practice, LLC 115 S. LaSalle, Suite 2800 Chicago, IL 60603 (312) 374-9200 Tom Voltaggio
Geotechnical Consultant:	Haley & Aldrich, Inc. 100 Corporate Place, Suite 105 Rocky Hill, CT 06067 (860) 282-9400 Bradford J. Aldinger, P.E. Marya Gorczyca, P.E.

1.3 Public Benefits

The development of the Proposed Project will generate myriad public benefits for the surrounding neighborhoods and the City of Boston as a whole, both during construction and on an ongoing basis upon its completion. These public benefits fall into multiple categories, outlined below.

Urban Design Benefits

- Enhance the streetscape and the pedestrian experience through the use of lighting and transparent glass on the façade that will blend the boundaries between the indoor and outdoor environments.

- Improve the urban design characteristics and aesthetic character of the Project surroundings through the introduction of high-quality architecture to the Project Site.

- Comply with Article 37 of the Boston Zoning Code by being Leadership in Energy and Environmental Design (LEED) certifiable; anticipated at the Gold level.

Economic and Community Benefits

- The creation of approximately 419 new residential units in Downtown Boston located within walking distance from the MBTA Red, Orange, Blue and Green Lines.

- The creation of new affordable housing units consistent with the December 2015 Inclusionary Development Policy adopted by the BRA. Thirteen percent of the dwelling units at the Project will be affordable units.

- The creation of over 1,500 construction jobs and approximately 29 new permanent jobs.

- The creation of new property tax revenues to the City of Boston through significantly increased property values.

- Significant increase in the Project Site's contribution to the Downtown Crossing Business Improvement District as a result of increased property values.

1.4 Preliminary Project Schedule

The Proponent anticipates that the Project will commence construction in the second quarter of 2017 and last for approximately 32 months.

1.5 Consistency with Zoning

The Project Site is located within Subdistrict 1 (General Area) of the Midtown Cultural District, as shown on Map 1A of the Boston Zoning Maps, and is therefore governed by the provisions of Article 38 (Article 38) of the Boston Zoning Code, as amended (the Zoning Code). The Project Site is also located within the Restricted Parking Overlay District, within which parking uses are conditional unless they are accessory to residential uses. Since a portion of the parking garage at the Project may be used by persons visiting the retail space at the Project Site, zoning relief will be required for such parking use. In accordance with Section 38-24 of the Zoning Code, the provision and design of off-street loading facilities will be determined through the Article 80B Large Project Review process.

The height and density (Floor Area Ratio) of the Project will exceed the as-of-right maximums at the Project Site for proposed projects undergoing Large Project Review, so the Project will require both height and density zoning relief. In addition, while the building's shape and siting have been configured to minimize adverse shadow and view impacts on neighboring properties, the building may not meet the technical sky plane setback exception aspect of the Midtown Cultural District's specific design requirements. Hence, the Project will require zoning relief for this specific design requirement under Article 38 of the Boston Zoning Code as well.

The Project will comply with the requirements of the Inclusionary Development Policy adopted by the Boston Redevelopment Authority ("BRA") on December 17, 2015. That is, thirteen percent of the residential units at the Project will be affordable units.

There will be an estimated 419 residential units at the Project. The final number of residential units at the Project will be determined as design of the Project is completed. The Proponent will satisfy all of its affordable housing obligations on-site, through the provision of affordable rental units. All of the affordable units will be comparable to the market rate rental units, and their residents will have access to an array of building amenities that will be available to all rental tenants. The Proponent's affordable housing obligations will be memorialized in a written agreement between the Proponent and the BRA.

1.6 Legal Information

1.6.1 Legal Judgments Adverse to the Proposed Project

There are no legal judgments or actions pending concerning the Project or the Project Site.

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

There is no history of tax arrears at the Project Site.

1.6.3 Site Control/ Public Easements

The Project Site is comprised of four parcels of land totaling approximately 23,768 square feet, each owned by an affiliate of the Proponent. Through such affiliates, the Proponent originally acquired a portion of the Project Site in 1979 and has owned the entirety of the Project Site since 2007. There are no easements for the benefit of the public burdening any portion of the Project Site. The owners of the Project Site have rights in Ordway Place, the private alley which runs between the Project Site and the building known as 333 Washington Street (sometimes known as The Jewelers Building); the owners of the 333 Washington Street property have similar non-exclusive passage rights. No portion of the Project is being constructed on or over Ordway Place. The Project Site is shown on the survey included in Appendix A.

1.7 Regulatory Controls and Permits

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

Table 1-1 Preliminary List of Permits and Approvals

Agency, Board or Commission	Permit/Approval
Federal	
Federal Aviation Administration	Determination of No Hazard to Air Navigation (building and crane)
State	
Massachusetts Department of Environmental Protection	Pre-construction and demolition notices
Local	
Boston Civic Design Commission	Design review
Boston Redevelopment Authority	Article 80B Large Project Review
City of Boston Board of Appeal	Zoning relief
City of Boston Public Improvement Commission	Specific Repairs, Pedestrian Easement
City of Boston Committee on Licenses	Parking Garage Permit and Fuel Storage License
Boston Transportation Department	Approval of Construction Management Plan and Access Plan Agreement
Boston Landmarks Commission	Article 85 Demolition Delay Approval
Boston Water and Sewer Commission	Site plan and related approvals
Boston Air Pollution Control Commission	Downtown Parking Freeze Exemption
City of Boston Inspectional Services Department	Building permit and Certificate of Occupancy

1.8 Community Outreach

As part of its planning efforts, the Proponent has looked to the community for input since filing the initial PNF in 2008. The Proponent is committed to comprehensive and effective community outreach and has spent the last three months meeting with abutters and neighbors, as well as civic and neighborhood associations in regards to this Project. Feedback from these sessions has shaped the Project which is being put forth in this filing. The Proponent has also been working with the BRA and city agencies over the last year to shape the proposal. Midwood will continue to work with the community throughout the process.

To date, the Proponent has met with the following stakeholders and organizations, including but not limited to:

- Massachusetts State Representative Aaron Michlewicz
- City Councilor Bill Linehan
- Downtown Crossing Association
- Boston Preservation Alliance
- Historic Boston
- Midtown Cultural District Residents' Association
- Freedom Trail Foundation
- Friends of the Public Garden
- 45 Province Street Trustees
- 333 Washington Street/ the Jewelers Building Board of Trustees
- Old South Association Board Members
- The Clarendon Group (owner of 10/24 School Street)
- Ogawa Coffee
- The Druker Company
- Millennium Partners
- Omni Parker House
- The Godfrey Hotel
- Suffolk University
- Midtown-Park Plaza Association

Chapter 2.0

Project Description

2.0 PROJECT DESCRIPTION

This Chapter describes the Project in detail, including its location, site plan, and proposed building program.

2.1 Project Setting and Site

The Project Site is an approximately 0.55-acre (23,768 sf) parcel of land at the corner of Washington and Bromfield Streets in the Downtown Crossing area of Boston. The Project Site is part of the Downtown Crossing Business Improvement District, and the Proponent will continue to be a contributor to the significant improvements being undertaken in the area. The Project Site contains four existing buildings with approximately 80,000 sf of mostly office space and ground floor retail, at 11-21 Bromfield Street, 349-363 Washington Street, 365 Washington Street, and 367-369 Washington Street (also known as 1-9 Bromfield Street). It is bounded by Washington Street to the east, Bromfield Street to the south, Province Court and Ordway Place to the north, and the property known as 32-54 Bromfield Street to the west. The Project Site is in the heart of the Downtown Crossing area, is immediately adjacent to office, commercial and residential uses, and has excellent access to public transportation and vehicular transportation systems. See Figure 2-1 for an aerial locus map of the Project Site, and Figures 2-2 through 2-4 for images of the existing conditions on and around the Project Site. All figures are included at the end of this chapter.

It should be noted that the Project Site contains significant topographical variations; the Project site slopes downward about 12 feet from Province Street to Washington Street along the southern (Bromfield Street) side of the Project Site, and downward from Province Court to Bromfield Street along the western side of the Project Site, which together create a unique topography that has required a creative design approach. The Project design has been developed to try to accommodate the unusual topographic challenges of the Project Site.

2.2 Project History

A Letter of Intent was submitted to the Boston Redevelopment Authority (BRA) on July 10, 2008. On October 27, 2008, the Proponent submitted a Project Notification Form (PNF) pursuant to Article 80B of the Zoning Code for a building that included a base of six floors, with a 22-story tower rising above. The mixed-use program included a total of approximately 407,000 sf of gross floor area, including approximately 49,000 sf of retail space in the basement and first two floors; 192 parking spaces on the next three floors; primarily residential amenities and lobby area on the sixth floor; and approximately 276 residential units on floors seven through 28, totaling approximately 281,000 sf of residential space. On July 1, 2009 the BRA issued a Scoping Determination in response to the PNF. This Draft Project Impact Report both responds to the Scoping Determination and provides an analysis of the Project as redesigned.

2.3 Proposed Development

The Project, as shown in Table 2-1, will be an approximately 605,000 sf, 59-story mixed-use building that includes approximately 419 residential units and approximately 30,000 sf of retail space on three levels, one below-grade. The height of the Project will be 683 feet, conservatively measured from the lowest elevation of the Project Site[1]. The mechanical floor and equipment (plus enclosures) above reflect a total building height of 705 feet. This is below the 710 foot high threshold set forth in Massport's "Composite of Critical Airspaces," and thus the Project is expected to meet all applicable FAA and Massport requirements with respect to navigational safety. The residential units will be a variety of sizes to meet different needs, including studios, one, two, three and four bedroom units. Levels six and 37 will include residential amenities such as a lounge, party room, fitness center, pool, and a landscaped outdoor terrace on both the sixth and seventh floors. The building will include both rental apartments and residential condominiums, with the condominium floors located above the residential rental floors. Approximately 235 parking spaces will be included in a semi-automated stacker parking system on the third and fourth floors accessed by valet service on the first floor. Secure bicycle storage for residents (one per residential unit) will be included within the building. See Figure 2-5 for the proposed site plan and Figures 2-6 to 2-16 for floor plans, sections and elevations.

Table 2-1 Project Program

Project Element	Approximate Dimension
Retail Space	30,000 sf
Residential Units	419 units
Parking Spaces	235 spaces
Total Gross Square Footage (GSF)	**605,000 sf**
Building Height	683 ft/ 59 stories
Parcel Area	23,768 sf
Floor Area Ratio	25.5

The primary residential entrances to the Project Site will be off a porte-cochere on Bromfield Street, and retail entrances to the Project Site will be on Washington Street and Bromfield Street. The ground floor will include continuous retail and active uses along Washington Street, with additional retail entrances on Bromfield Street, reinforcing the pedestrian-oriented character of Downtown Crossing. The Project's retail and residential components will foster pedestrian activity and contribute to the vitality of the area throughout the course of the day and during the evening hours.

[1] The "Building Height" as measured in accordance with the Boston Zoning Code, is shorter, i.e., 677 feet

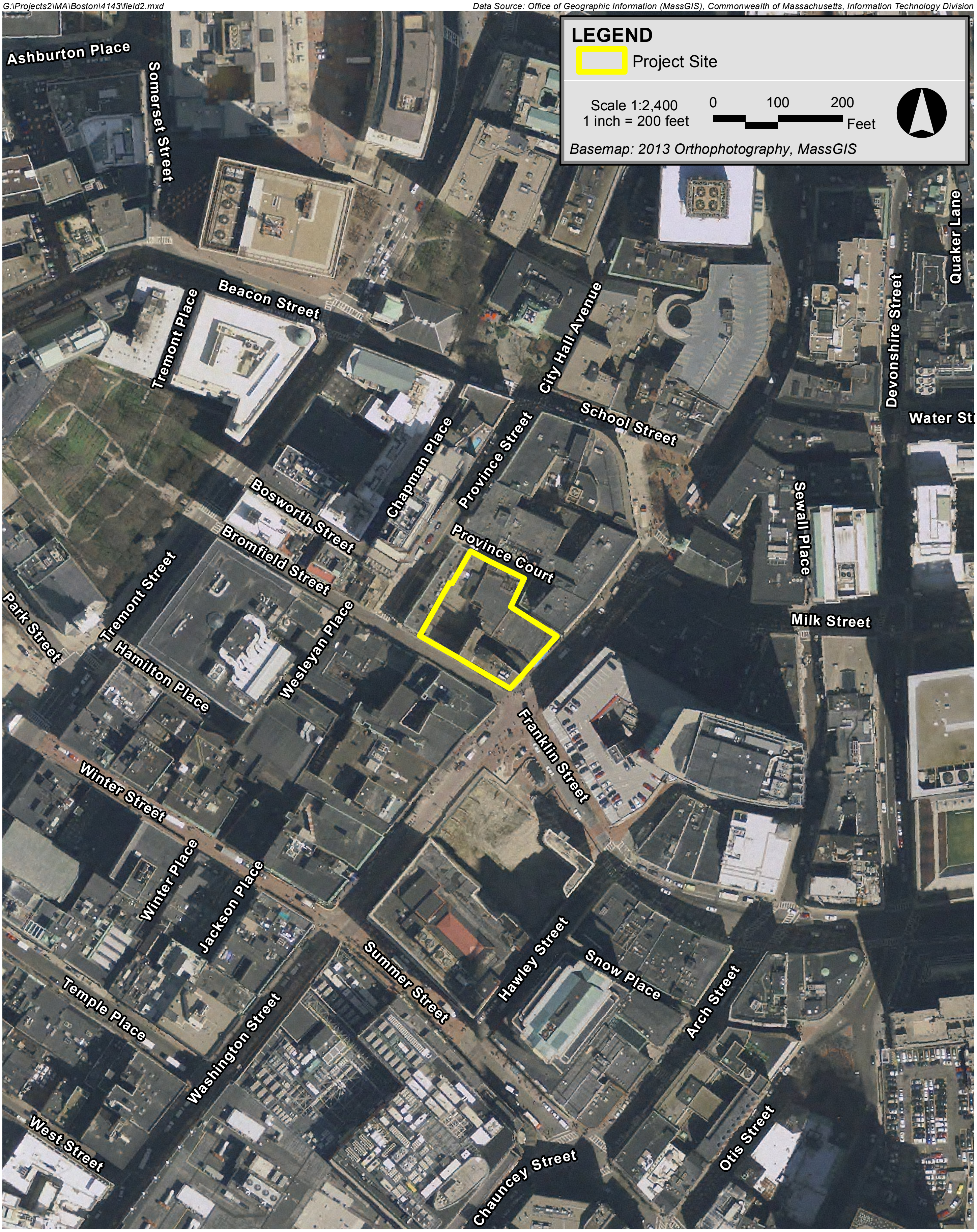
2.4 Alternatives as Required by the BRA Scoping Determination

2.4.1 No-Build Alternative

In the No-Build Alternative, the existing buildings would remain, and the potential benefits of the proposed Project would not be realized. The public realm would not be improved with the mixed-use program and design that will foster pedestrian activity and contribute to the vitality of the area throughout the course of the day and into the evening hours. The City of Boston would not benefit from the creation of new housing units adjacent to public transportation, the creation of new affordable housing units Downtown, the increased tax revenues or the new employment potential that the proposed building would generate.

2.4.2 As-of-right Alternative

The As-of-right Alternative would include a building that is 155 feet in height, approximately 100 feet above the existing building height. The building would be 90 feet in height at the property line, and 155 feet after a 10 foot setback. This wider building massing, as opposed to the slender tower in the preferred alternative, would obscure views from adjacent buildings and result in greater shadow impacts on the retail corridor along both Washington and Bromfield Streets. The As-of-right Alternative would include retail space on the ground floor and residential units above. The Proponent has determined, however, that the As-of-right Alternative would not include sufficient space to make the Project financially feasible. This Alternative has been analyzed for its transportation, wind, shadow and daylight impacts in Sections 3.5, 4.1, 4.2 and 4.3, respectively, as required by the BRA Scoping Determination.



One Bromfield **Boston, Massachusetts**

Figure 2-1
Aerial Locus Map

One Bromfield Boston, Massachusetts

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ARCHITECTURE

Figure 2-2

Existing Conditions – View from Washington Street.

One Bromfield Boston, Massachusetts

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Figure 2-3

Existing Conditions – View from Province Court

One Bromfield   Boston, Massachusetts

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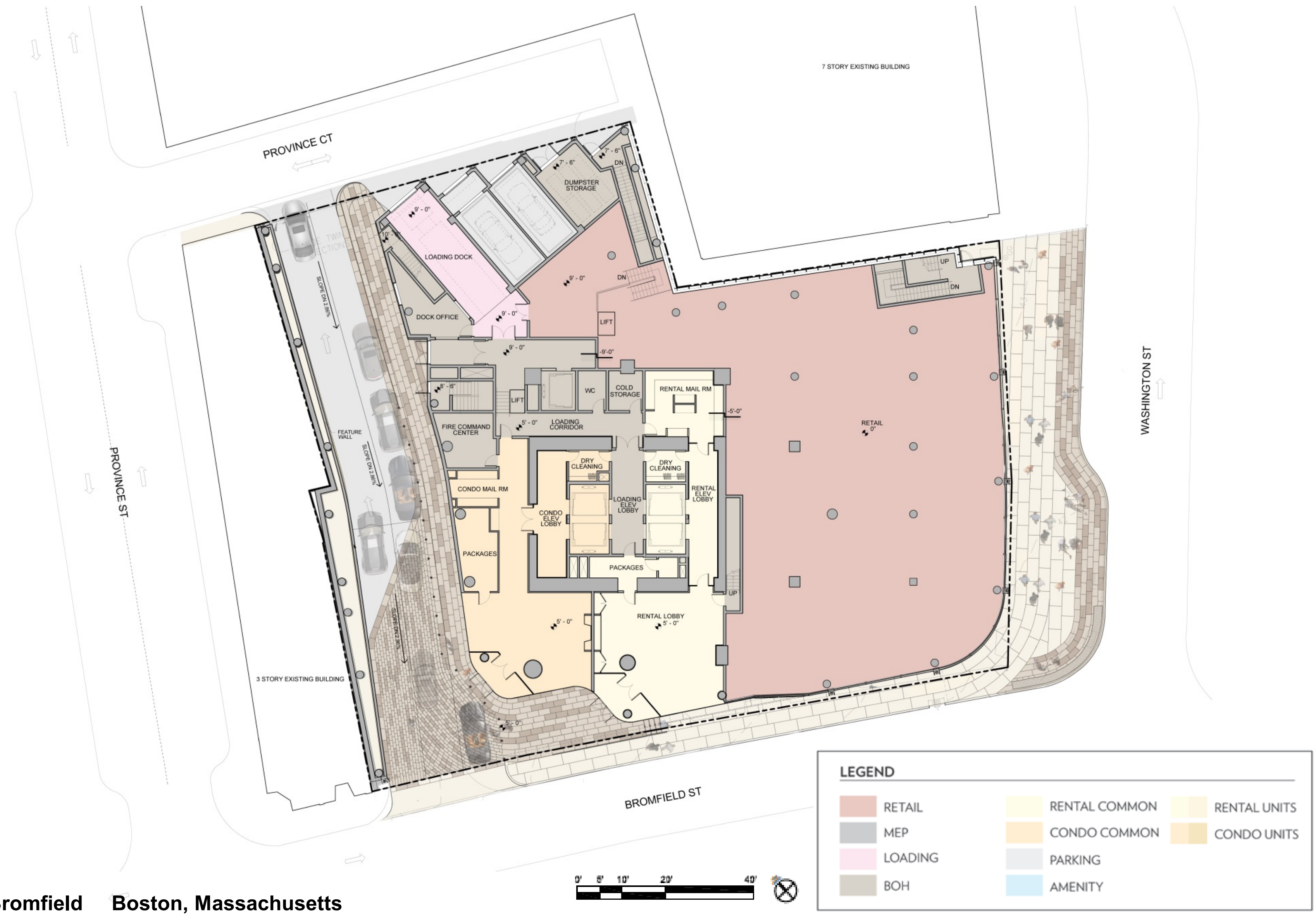
Figure 2-4

Existing Conditions – View from the Corner of Bromfield and Province Streets



One Bromfield Boston, Massachusetts

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Figure 2-5

Proposed Site Plan

One Bromfield Boston, Massachusetts

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Figure 2-6

Basement Level B1 Floor Plan

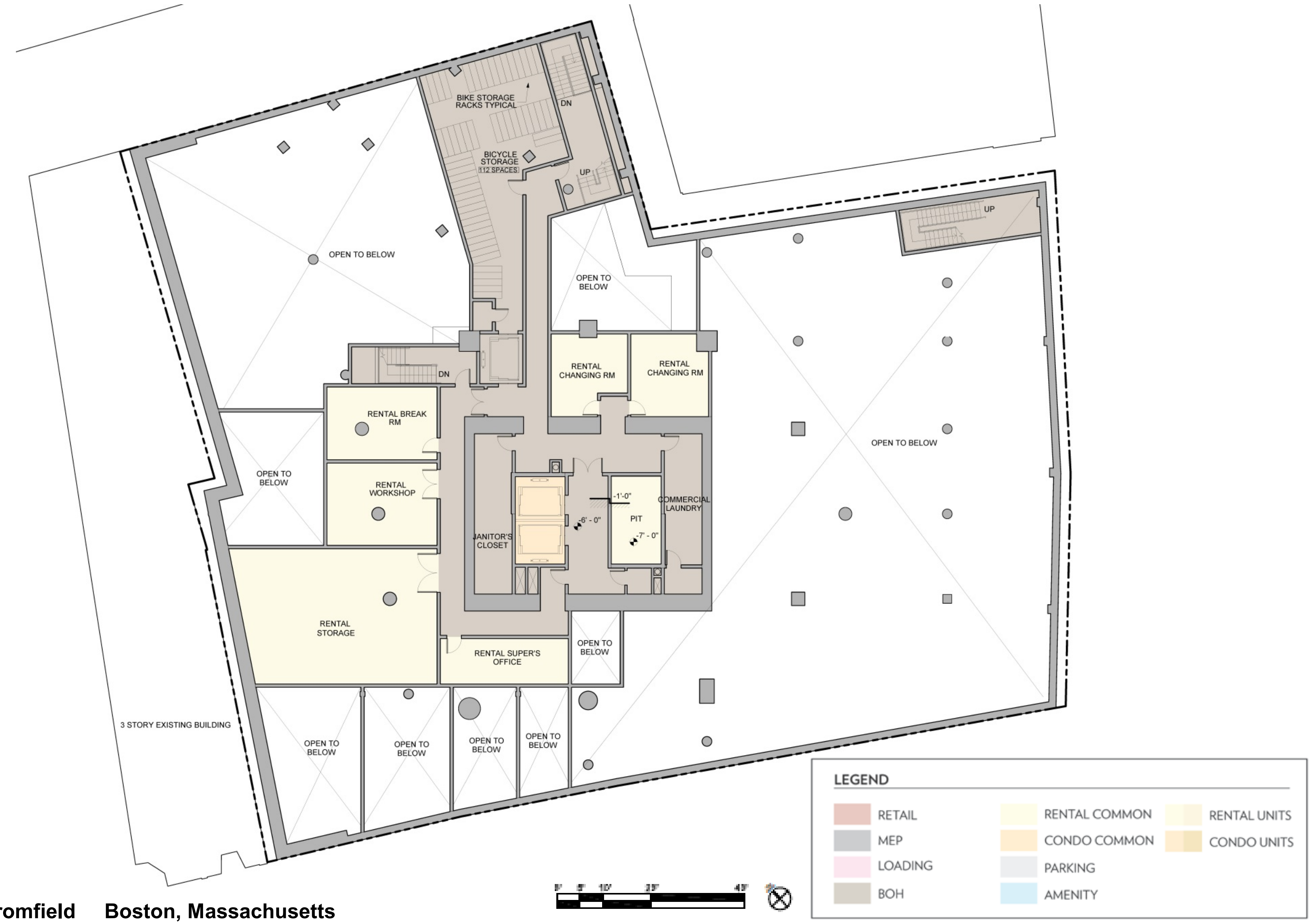

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Figure 2-7

Basement Level B1 Mezzanine Floor Plan

One Bromfield Boston, Massachusetts

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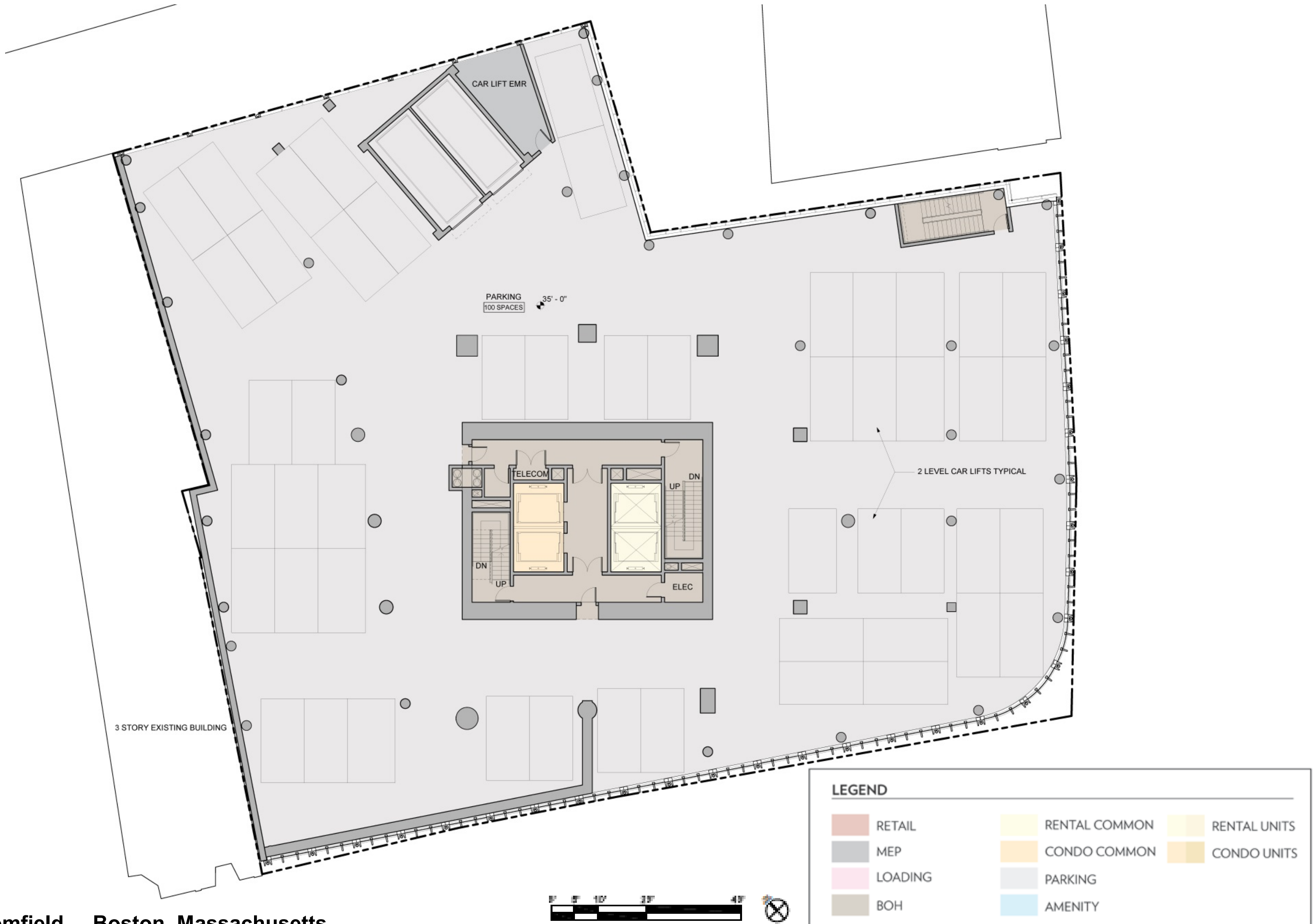
Figure 2-8

Level 2 Floor Plan



One Bromfield Boston, Massachusetts

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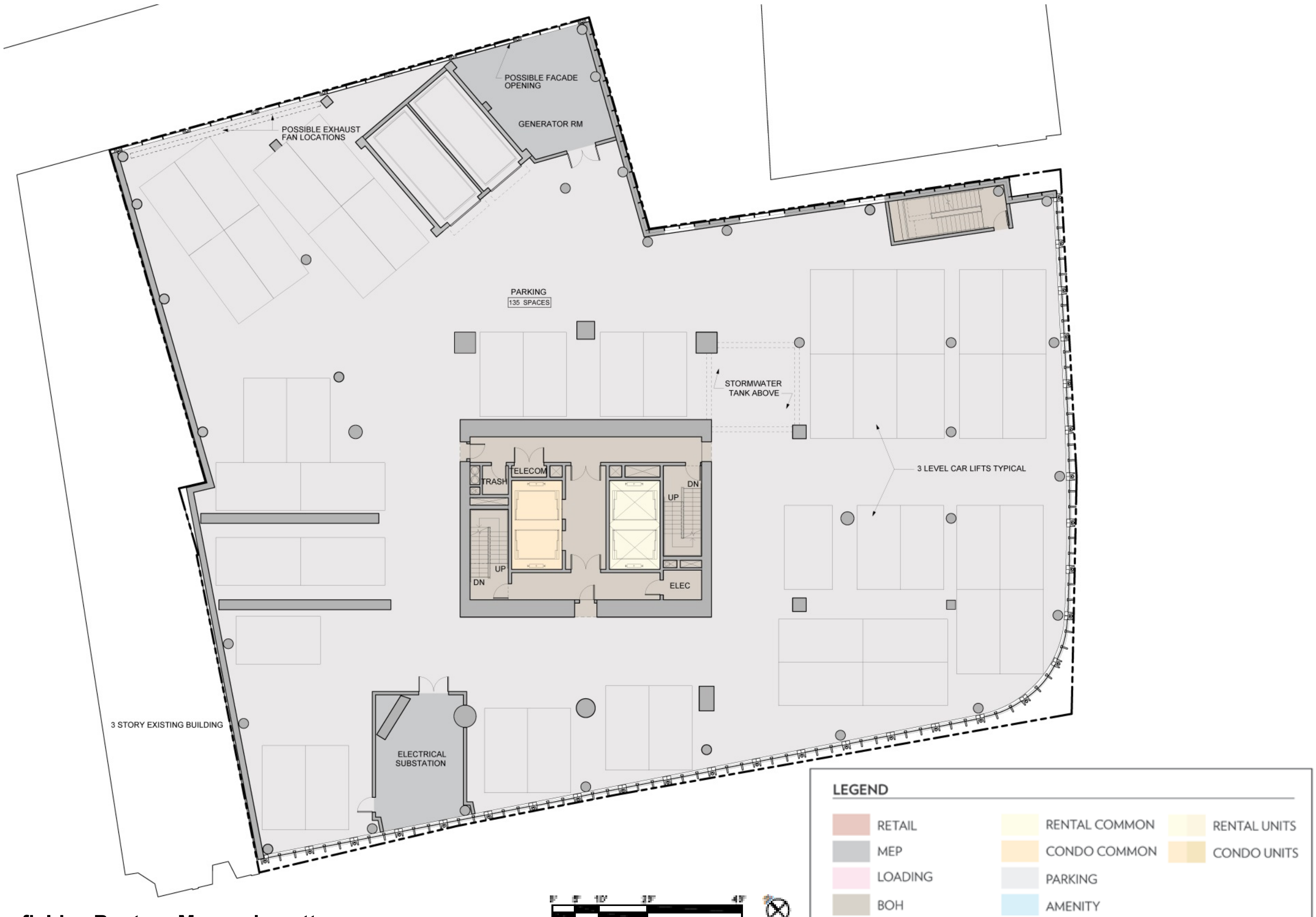
Figure 2-9

Level 3 Floor Plan



One Bromfield Boston, Massachusetts

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Figure 2-10

Level 4 Floor Plan

One Bromfield Boston, Massachusetts

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ARCHITECTURE

Figure 2-11

Level 5 Floor Plan

One Bromfield Boston, Massachusetts

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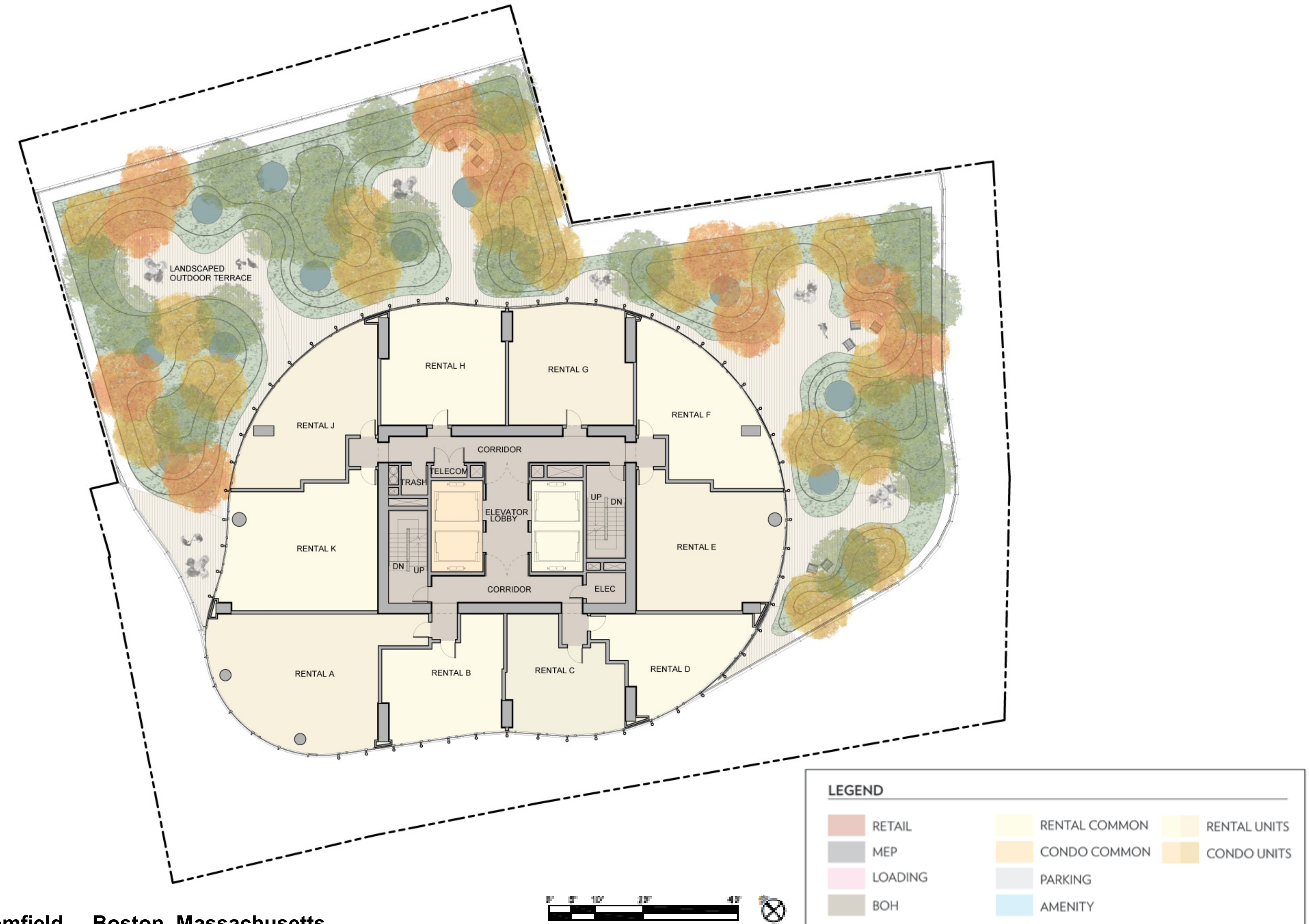
Figure 2-12

Level 6 Floor Plan



One Bromfield Boston, Massachusetts

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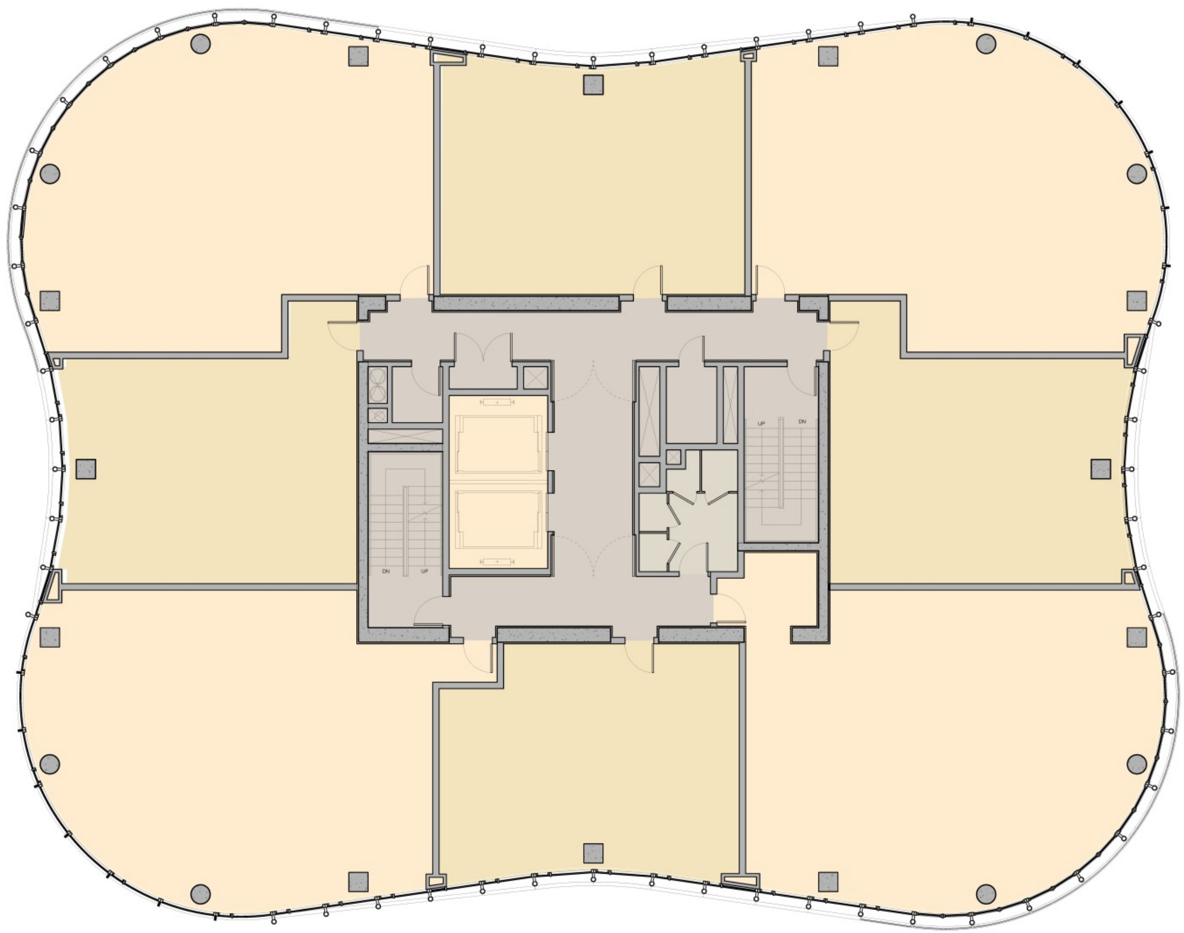
Figure 2-13

Level 7 Floor Plan

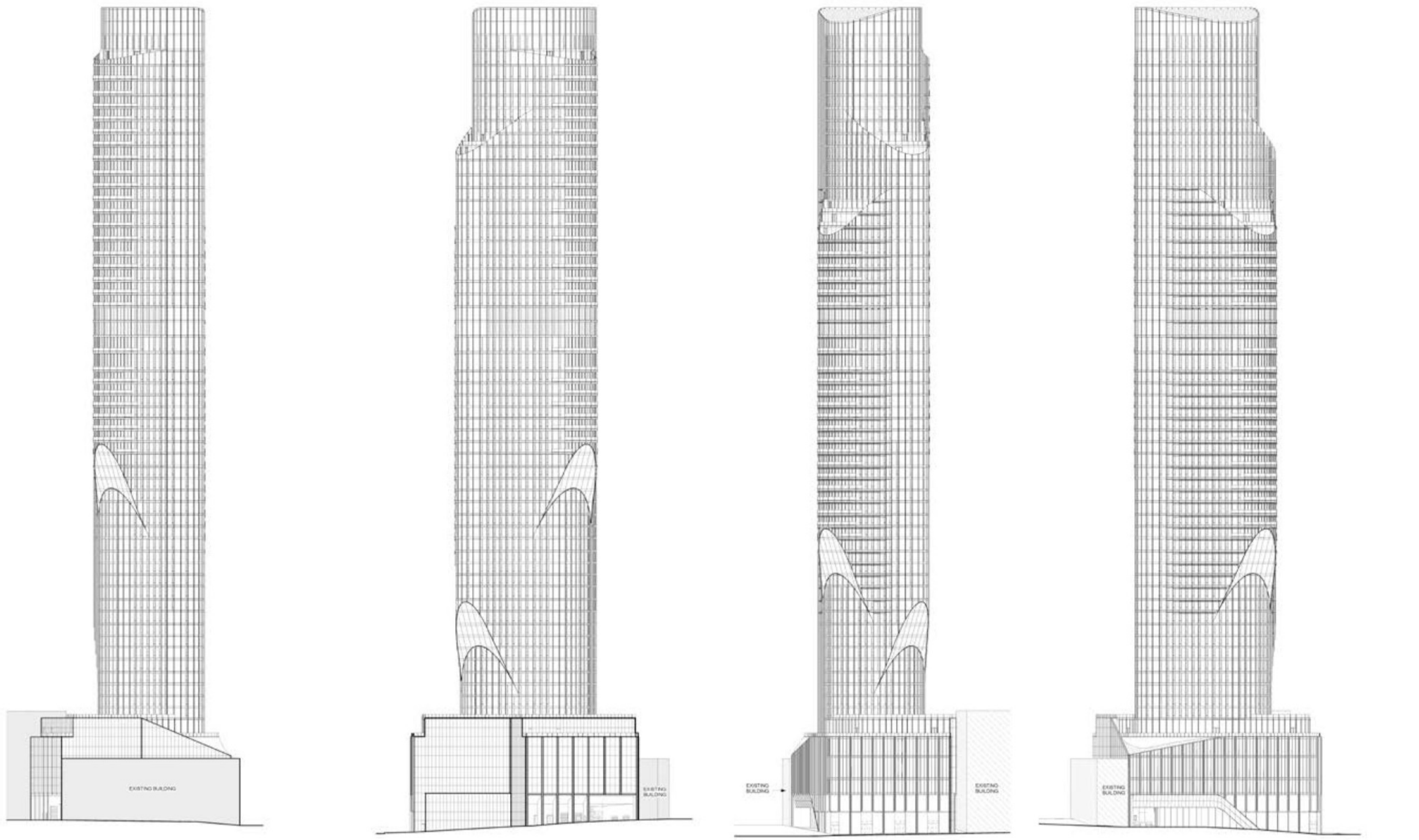


LEGEND

- RETAIL
- MEP
- LOADING
- BOH
- RENTAL COMMON
- CONDO COMMON
- PARKING
- AMENITY
- RENTAL UNITS
- CONDO UNITS

Figure 2-14

Upper Level Plan



OVERALL WEST ELEVATION 6A

OVERALL NORTH ELEVATION 4A

OVERALL EAST ELEVATION 3A

OVERALL SOUTH ELEVATION 1A

One Bromfield Boston, Massachusetts

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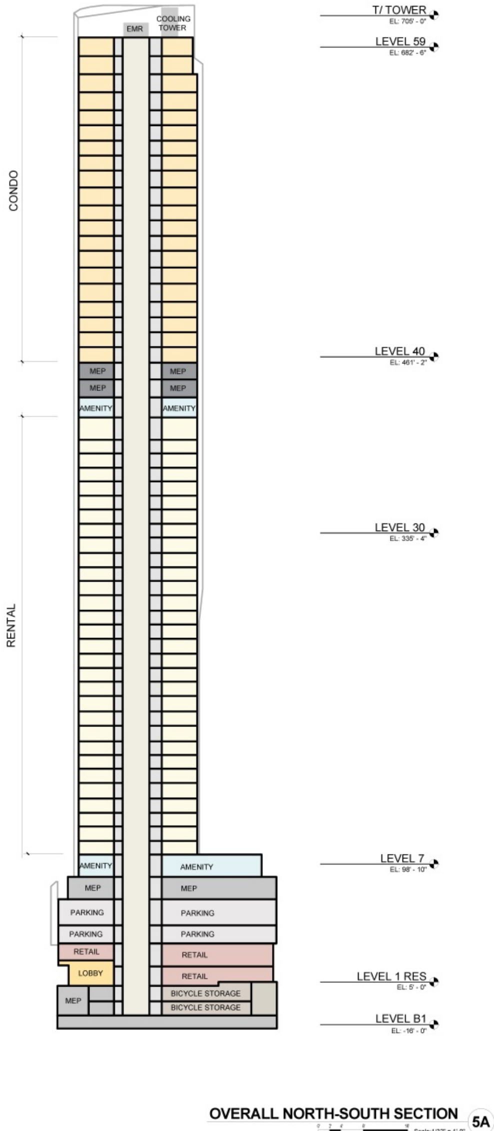
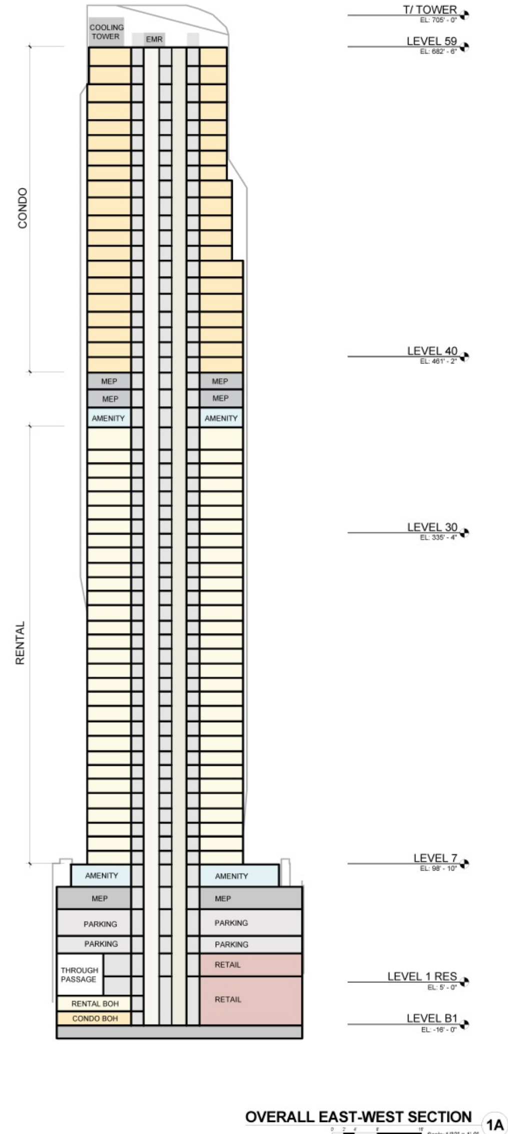
Figure 2-15

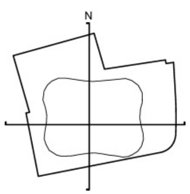
Elevations



OVERALL NORTH-SOUTH SECTION 5A



OVERALL EAST-WEST SECTION 1A



One Bromfield Boston, Massachusetts

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Figure 2-16
Sections

Chapter 3.0

Transportation Component

3.0 TRANSPORTATION

3.1 Introduction

3.1.1 Purpose of the Transportation Component

In accordance with the City of Boston's Transportation Access Plan Guidelines, this section describes roadway, pedestrian, and bicycle conditions; parking and loading; proposed mitigation; and transportation demand management (TDM) strategies for the Project.

3.1.2 Project Description

The Project Site, at One Bromfield Street, is bounded by Bromfield Street to the south, Washington Street to the east, an abutting building to the west that houses a restaurant and other retail stores, and, to the north, Province Court (a public alley), Ordway Place (a private alley) and an abutting mixed-use building. The new Millennium Tower/Burnham Building is located diagonally across the Washington Street/Bromfield Street/Franklin Street intersection to the southeast. Currently, retail stores and restaurants occupy the Project Site, with entrances on Washington Street and Bromfield Street. Some of the ground floor retail space along Washington and Bromfield Streets is currently vacant.

The Project includes the demolition of the existing on-site structures and the construction of a new mixed-use building totaling approximately 605,000 sf, with approximately 419 residential units, approximately 30,000 sf of commercial (retail) space, and an above grade, two-level parking garage with approximately 235 spaces for residents and some retail visitors to the site. No public parking will be provided.

Table 3-1 shows the summary of proposed land uses.

Table 3-1 Project Program

Land Use	Quantity
Residential	Approx. 419 units
Retail	Approx. 30,000 sf
Parking Spaces	Approx. 235 spaces

3.1.3 Methodology

In accordance with the Boston Transportation Department Transportation Access Plan Guidelines, the study team conducted a transportation analysis for the proposed Project. The analysis is summarized in the following sections:

- Section 3.2 includes an inventory of existing transportation conditions, including intersection operation, parking, public transportation, pedestrian conditions, bicycle conditions, and loading and service activity.

- Section 3.3 and Section 3.4 examine future transportation conditions and potential traffic impacts associated with the Project and other neighboring projects that have been approved by the BRA. Based upon the City's guideline of evaluating conditions for a five-year time horizon, long-term impacts are evaluated for the Year 2021. These sections include the following scenarios:

  - No-Build (2021) Conditions includes general background growth and volumes from specific projects expected by 2021 without the Project; and

  - Build (2021) Conditions includes specific travel demand forecasts for the Project.

- Section 3.5 describes the As-of-right Alternative.

- Section 3.6 includes proposed Proponent actions to mitigate the transportation impacts of the Project by improving the roadway, pedestrian, and bicycle environment, as needed.

- Transportation Demand Management is summarized in Section 3.7 and a summary of the proposed Construction Management Plan is included in Section 3.8.

3.1.4 Transportation Evaluation Summary

The Project will have relatively minor traffic impacts to study area intersections, primarily because of the residential nature of the Project. Residential developments generate far fewer trips per square foot than comparably sized office or retail developments and do not produce a large proportion of daily trips during commuter travel periods, thereby minimizing the Project's impacts during peak hours. Additionally, the convenience of the nearby MBTA subway stations at Downtown Crossing, State Street, Government Center (which has re-opened), and Park Street will encourage transit travel to and from the Project Site. Key transportation characteristics of the Project and analysis results include:

- During the a.m. peak hour, the Project will generate 26 entering vehicle trips and 34 exiting vehicle trips and during the p.m. peak hour, the Project will generate 36 entering trips and 36 exiting trips. (Vehicle trips include automobiles and taxicabs.)

- As part of the Project, the Proponent seeks, with City approval, to change the travel direction of Bromfield Street between Washington Street and the Project Site driveway to be one-way eastbound (toward Washington Street). Consequently, some commercial vehicles and taxicabs in the area would travel different routes to reach destinations along Bromfield Street and Province Street. The transportation analysis in this report studies two street circulations plans: Option 1, which maintains the existing street circulation, and Option 2, which incorporates the change to Bromfield Street travel direction as described above. Reassigned vehicle trips have been accounted for in the transportation analysis.

- Under Option 1, the porte-cochere driveway at the Project will accommodate one-way, southbound travel from Province Court, a public alley, toward Bromfield Street. Under Option 2, the porte-cochere driveway will accommodate one-way, northbound travel from Bromfield Street toward Province Court (exiting to Province Street). Under either option, the porte-cochere will have one travel lane for through traffic and one curbside stopping lane for valet staging and taxicab activity, as well as residential deliveries handled by box trucks, such as UPS and Federal Express. The eastern curb of the internal porte-cochere has the capacity for approximately six vehicles plus one space for a delivery vehicle.

- When arriving at the Project, residents will drive their vehicles to the internal porte-cochere and park in the curbside stopping lane. A garage attendant will then drive the vehicle to the attendant-operated elevators accessed from Province Court. Garage attendants will also retrieve vehicles from the garage for residents when they depart. The staging of vehicles waiting to be picked up by residents or serviced by the garage elevators will occur in the curb lane within the porte-cochere.

- The Project will include approximately 235 on-site parking spaces, primarily for residents. The parking ratio will not be greater than 0.56 spaces/residential unit (assuming 100% residential utilization of the parking spaces). It is expected that many residents will not own an automobile and will instead rely on taxicabs (or other vehicle transport services or ride-sharing services) for trips requiring a vehicle. During the mid-day, when some residential vehicles have vacated the garage, some parking for visitors to the on-site retail business will be available. No public parking will be provided.

- One intersection, Tremont Street/Cambridge Street/Court Street, will experience a change in overall level of service from the No-Build Condition to Build Condition. Under either option, the intersection operation will worsen from LOS D to LOS E during each peak hour. With minor signal timing changes, however, delays and queues would be reduced. Adjacent to the new Project building along Bromfield Street and Washington Street, new sidewalks will be constructed that meet the City's standards and those of the Americans with Disabilities Act and Massachusetts Architectural Access Board (ADA/AAB). The building will be set back from the Bromfield Street right of way to create a wider pedestrian sidewalk condition.

- In accordance with the City of Boston Bicycle Guidelines, and to encourage bicycling as an alternative mode of transportation, the Proponent will provide secure bicycle storage capacity for residents and employees. Residential bicycle storage capacity will be provided for 419 bicycles (one per unit).

- The Project will have one loading bay and one designated curbside loading space within the porte-cochere. The loading bay will be accessed via Province Court. Residential move-in/move-out activity will occur at the loading bay and be managed by an on-site transportation coordinator and subject to City regulation. Trash pick-up will occur along Province Court.

- The Project includes the repaving of Province Court, re-setting the existing curbs, and the re-installation of existing City signage on this public alley.

- The Proponent is committed to implementing Transportation Demand Management (TDM) measures to reduce residents' dependence on automobiles. TDM measures to be undertaken by the Proponent include: providing one free monthly MBTA subway pass per residential unit during the first six months of building operation, promoting transit services in marketing and orientation materials, providing adequate secure bicycle storage, joining the local Transportation Management Association, and designating an on-site transportation coordinator.

- A Transportation Access Plan Agreement (TAPA) will be entered into between the Proponent and BTD and set forth the specific TDM measures and agreements between the Proponent and the City of Boston.

3.1.5 Study Area

The Project's traffic impact study area is generally bounded by Court Street to the north, Bromfield Street/Franklin Street to the south, Washington Street to the east, and Tremont Street to the west. As shown in Figure 3-1, the study area includes the following eight signalized intersections and five unsignalized intersections:

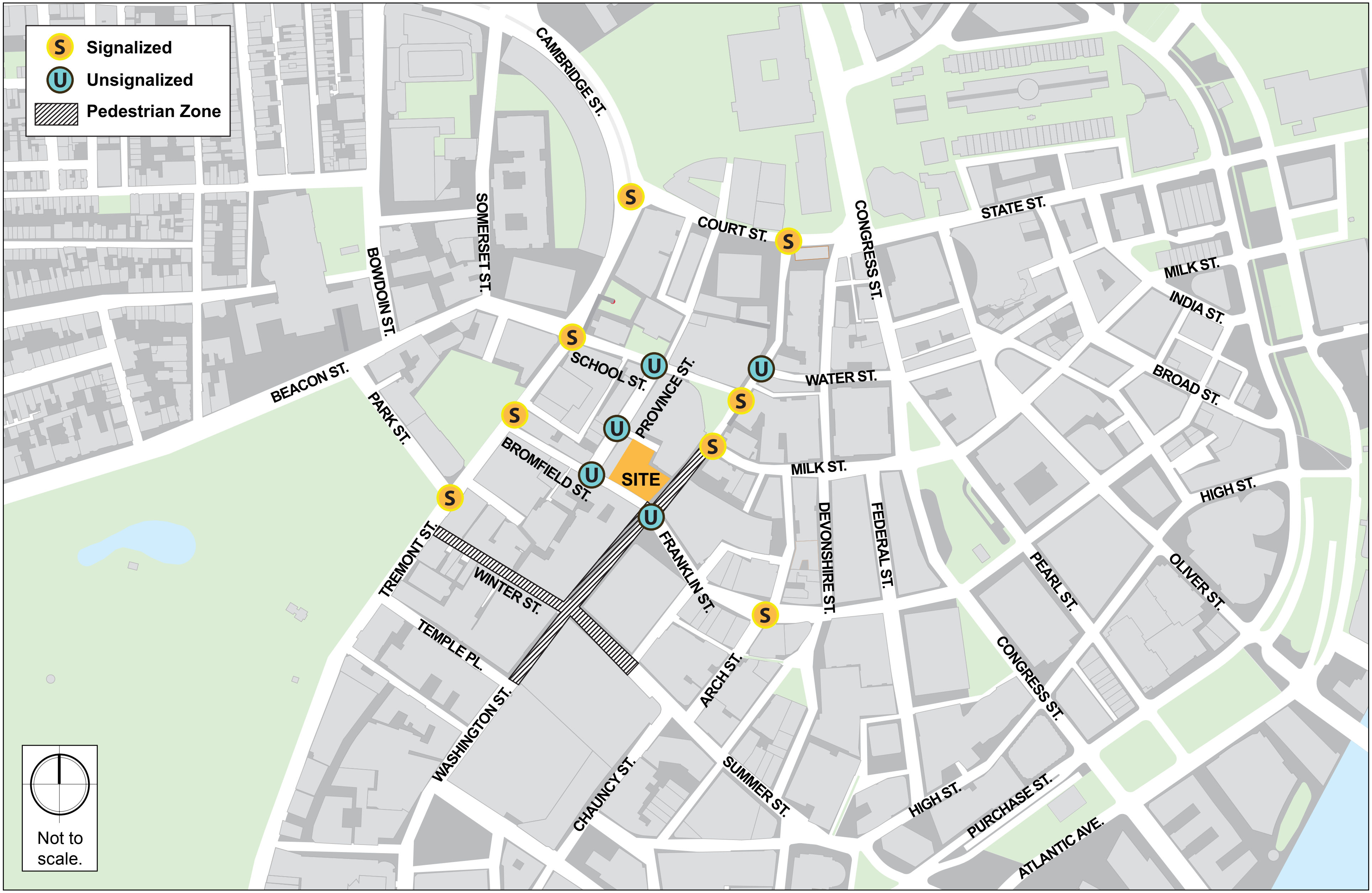
- Tremont Street/Cambridge Street/Court Street (signalized);

- Tremont Street/ Beacon Street/School Street* (signalized);

- Tremont Street/Bromfield Street* (signalized);

- Tremont Street/Park Street* (signalized);

- Washington Street/School Street* (signalized);



One Bromfield **Boston, Massachusetts**

Figure 3-1
Study Area Intersections

- Franklin Street/Arch Street (signalized);
- Washington Street/Milk Street (signalized);
- Washington Street/Court Street (signalized);
- Washington Street/Water Street/Garage Exit (unsignalized);
- Province Street/School Street* (unsignalized);
- Province Street/Province Court* (unsignalized);
- Bromfield Street/Province Street* (unsignalized); and
- Washington Street/Bromfield Street/Franklin Street* (unsignalized).

The locations marked with an asterisk were initially identified by the Boston Transportation Department (BTD) as study locations during review of the One Bromfield PNF. The remaining locations were subsequently added to the study area, per request of the BTD, to help provide a broader understanding of the wider impacts of street circulation changes proposed under the Build (2021) Condition. The circulation changes are presented in Section 3.4.1.

3.2 Existing (2016) Transportation Condition

This section includes descriptions of existing study area roadway vehicle restrictions, roadway geometries, intersection traffic control, peak-hour vehicular and pedestrian volumes, parking, public transportation availability, curbside regulations, the pedestrian and bicycle environment, and loading conditions.

3.2.1 Vehicle-Restricted Zone

In the Downtown Crossing area, vehicle restrictions have been in place for decades as part of a pedestrian-only zone where general vehicle traffic is always prohibited. Affected roadway segments include:

- Winter Street, between Summer Street and Tremont Street;
- Washington Street, between Temple Place and Milk Street;

- Bromfield Street, between Washington Street and Province Street; and
- Franklin Street, between Hawley Street and Washington Street.[1]

Between 11:00 a.m. and 6:00 p.m., most commercial vehicles (including taxicabs) are not permitted to travel along these roadway segments. The exceptions are Brinks, Wells Fargo, USPS, Boston Globe, and Boston Herald vehicles, which can use these roadways after 2:00 p.m. Within this area, taxicabs are permitted at all times along Franklin Street, north of Hawley Street. From that point, taxicabs can continue west on Bromfield Street toward Tremont Street or turn right onto Washington Street toward Milk Street. Taxicabs are also permitted to travel along Washington Street between 6:00 p.m. and 2:00 a.m. (These vehicle restrictions are depicted on the roadway network shown later in Figure 3-2.) Police, fire, emergency response and emergency utility service vehicles are always permitted in this area.

While general traffic is prohibited from travelling westbound on Franklin Street beyond Hawley Street, vehicle classification counts show that many vehicles moving through the Washington Street/Franklin Street/Bromfield Street intersection are not commercial vehicles or taxicabs and are travelling through this area illegally. This portion of Franklin Street is currently closed for construction of the Millennium Tower project, but based on 2007 counts at the Washington Street/Franklin Street/Bromfield Street intersection, about 15% of a.m. peak hour vehicles were travelling illegally through this location. During the p.m. peak hour, this rate rose to about 60%. Most vehicles travelling illegally are originating on Franklin Street westbound and are destined through to Bromfield Street toward Tremont Street.

The proposed circulation change on Bromfield Street, as discussed later in Section 3.4.1, would help prevent these illegal movements.

3.2.2 Existing Roadway Conditions

The study area includes the roadways described below, which are categorized according to the Massachusetts Department of Transportation Office of Transportation Planning's functional classifications.

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[1] In August 2015, Franklin Street between Hawley Street and Washington Street was temporarily closed due to construction activity associated with the Millennium Tower project. Recent City agency discussions indicate that this roadway segment may not be re-opened by the City to vehicular travel; that possibility has been accounted for in this transportation analysis in the discussion contained in Section 3.4.7.3.

Cambridge Street is a two-way, four lane roadway with a divided median located to the north of the Project site. Cambridge Street is classified as an urban principal arterial roadway under BTD jurisdiction and runs in a predominately east-west direction (turning into a north-south direction in the vicinity of the Project), between the Longfellow Bridge to the west and Tremont Street to the east. On-street parking and sidewalks are provided on both sides of the roadway.

Tremont Street is a one-way southbound, three lane roadway located to the west of the Project site. Tremont Street is classified as an urban principal arterial roadway under BTD jurisdiction and runs in a predominately north-south direction between Cambridge Street to the north and Marginal Road to the south. In the vicinity of the Project, on-street parking is restricted and sidewalks are provided on both sides of the roadway.

Beacon Street is a two-way, two lane roadway located to the west of the Project Site. Beacon Street is classified as an urban principal arterial roadway under BTD jurisdiction and runs in a predominately east-west direction between Tremont Street to the east and Route 16 Washington Street in Needham to the west. In the vicinity of the Project, on-street parking for commercial vehicles and taxicabs is provided on the south side of the roadway and sidewalks are provided on both sides of the roadway.

Court Street is a one-way westbound, two lane roadway located to the north of the Project Site. Court Street is classified as an urban principal arterial roadway under BTD jurisdiction and runs in a predominately east-west direction between Cambridge Street to the west and State Street to the east. In the vicinity of the Project, on-street parking for commercial vehicles and sidewalks are provided on both sides of the roadway.

Washington Street is a one-way northbound, one lane roadway located adjacent to the eastern boundary of the Project Site. Washington Street runs in a predominately north-south direction between Court Street in downtown Boston to Hyde Park Avenue in the Jamaica Plain neighborhood, about eight miles to the south. In the vicinity of the Project site, Washington Street is classified as an urban minor arterial roadway. Within the study area, Washington Street is under BTD jurisdiction and designated as a pedestrian-only zone (see description under Section 3.2.1). On-street parking is restricted and sidewalks are provided on both sides of the roadway, although most pedestrians walk on the roadway.

School Street is a one-way eastbound, one lane roadway located to the north of the Project Site. School Street is classified as an urban minor arterial roadway under BTD jurisdiction and runs in a predominately east-west direction between Tremont Street to the west and Washington Street to the east. In the vicinity of the Project, on-street parking for commercial vehicles and valet parking for the Omni Parker House Hotel is provided along the south side of the roadway. Sidewalks are provided on both sides of the roadway, although the sidewalk segment adjacent to Kings Chapel and Old City Hall is narrow.

Bromfield Street is a one-way westbound, one lane roadway located adjacent to the southern boundary of the Project Site. Bromfield Street is under BTD jurisdiction and is classified as an urban minor arterial roadway and runs in a predominately east-west direction between Washington Street to the east and Tremont Street to the west. In the vicinity of the Project, on-street parking for commercial vehicles is provided along the south side of the roadway and sidewalks are provided along both sides of the roadway.

Province Street is a two-way, two lane roadway located adjacent to the west side of the Project Site. Province Street is classified as a local roadway under BTD jurisdiction and runs in a predominately north-south direction between School Street to the north and Bromfield Street to the south. On-street parking for commercial vehicles and sidewalks are provided along both sides of the roadway.

Province Court is a dead end roadway located adjacent to the northern boundary of the Project Site. Province Court is classified as a local roadway under BTD jurisdiction and runs in a predominately east-west direction accessible from Province Street. On-street parking is restricted and sidewalks do not exist along either sides of the roadway. Province Court functions as a loading area/trash removal area for adjacent businesses.

Park Street is a two-way, two lane roadway located to the west side of the Project Site. Park Street is classified as an urban principal arterial roadway under BTD jurisdiction and runs in a predominately east-west direction between Tremont Street to the east and Beacon Street to the west. Metered parking spaces are available on one side of the roadway along with commercial vehicle spaces. Sidewalks are provided along both sides of the roadway.

Franklin Street is an urban minor arterial under BTD jurisdiction that connects India Street in the Financial District to Washington Street in Downtown Crossing. Within the study area, Franklin Street is one-way westbound. Near the intersection with Arch Street, Franklin Street contains two medians that are remnants from bus stop islands constructed in the late 1970s as part of the Downtown Crossing auto-restricted zone. Sidewalks are provided on both sides of the street. In August 2015, Franklin Street between Hawley Street and Washington Street was temporarily closed due to construction activity associated with the Millennium Tower project. Recent City agency discussions indicate that this roadway segment may not be re-opened by the City to vehicular travel. When it was open, Franklin Street west of Hawley Street was restricted to commercial vehicles and taxicabs. (See Section 3.4.7.2 for further discussion of vehicle restrictions along the Franklin Street segment between Hawley Street and Washington Street.)

Water Street is a one-way eastbound, one lane roadway located to the north of the Project site. Water Street, under BTD jurisdiction, is classified as an urban minor arterial roadway and runs in a predominately east-west direction between Washington Street to the west and Broad Street to the east. In the vicinity of the Project, on-street parking for commercial vehicles is provided along the south side of the roadway and sidewalks are provided along both sides of the roadway.

Arch Street is a one-way northbound, one lane roadway that runs from Summer Street to Milk Street. Arch Street is classified as an urban minor arterial under BTD jurisdiction. Between Summer Street and Franklin Street, there are metered parking spaces, commercial spaces, and handicapped spaces provided. North of Franklin Street, commercial parking is allowed on the east curb. Sidewalks are provided on both sides of the street.

Milk Street is classified as an urban minor arterial under BTD jurisdiction. It runs between the Surface Artery in the Financial District to Washington Street in Downtown Crossing. This roadway operates two-way between Washington Street and Devonshire Street and one-way eastbound beyond Devonshire Street. Within the study area, no on-street parking is allowed on Milk Street; sidewalks are provided on both sides of the roadway.

3.2.3 Existing Intersection Conditions

The study area includes the following intersections, which are described below:

Tremont Street/Cambridge Street/Court Street is a three-legged, signalized intersection with two approaches, located to the north of the Project Site. The Cambridge Street southbound approach consists of two through only lanes. The Court Street westbound approach consists of three lanes, currently marked as two channelized left-turn only lanes, and one channelized right turn only lane. On-street parking is provided along all approaches to the intersection. Crosswalks, wheelchair ramps, and pedestrian indication equipment are provided across all approaches to the intersection.

Tremont Street/Beacon Street/School Street is a four-legged, signalized intersection with two approaches. The eastbound Beacon Street approach consists of one shared through/right-turn lane with a cabstand. The Tremont Street southbound approach consists of four lanes, a left turn only lane, two through lanes, and a right-turn only lane. On-street parking is restricted along this approach. Right turns on red are allowed on both approaches. Crosswalks, wheelchair ramps, and pedestrian indication equipment are provided across all approaches to the intersection. In January 2016, the Boston Transportation Department implemented a new signal phasing and timing plan at this intersection. These recent changes are incorporated into the existing and future year analysis in this report.

Tremont Street/Bromfield Street is a three-legged, signalized intersection with two approaches. The westbound Bromfield approach consists of one left-turn only lane. The southbound Tremont Street approach consists of three through only lanes. On-street parking is restricted on all approaches. Crosswalks, wheelchair ramps, and pedestrian indication equipment are provided across all approaches to the intersection.

Washington Street/School Street is a three-legged, signalized intersection with two approaches. The eastbound School Street approach consists of one left-turn only lane. The northbound Washington Street approach consists of one through only lane. On-street parking is prohibited at the intersection, although commercial vehicles were observed loading along both approaches. Crosswalks, wheelchair ramps, and pedestrian indication equipment are provided across all approaches to the intersection.

Franklin Street/Arch Street is a two-legged, signalized intersection with two approaches. The westbound approach on Franklin Street has two travel lanes: a through lane and a shared through/right-turn lane. The northbound approach on Arch Street has a single, shared left-turn/through travel lane. A leftover median from an earlier roadway configuration exists on Franklin Street. Crosswalks and handicapped ramps are provided on all approaches. Pedestrian pushbuttons and indications are provided on all approaches. An exclusive pedestrian phase is provided.

Washington Street/Milk Street is a two-legged, signalized intersection with two approaches. The eastbound approach on Milk Street contains a single right-turn only lane. The northbound approach on Washington Street contains one shared through/right-turn travel lane. Right turns on red are not allowed at this intersection. Crosswalks and handicapped ramps are provided for all approaches. No pedestrian pushbuttons or indications are provided across the Washington Street northbound approach. Exclusive and concurrent pedestrian phases are provided for the crosswalk across Milk Street and the northern crosswalk on Washington Street.

Washington Street/Court Street is a two-legged, signalized intersection with two approaches. The westbound approach on Court Street has two through travel lanes. The northbound approach on Washington Street has a single left-turn only travel lane. On-street public parking is not permitted on the Washington Street approach. However, commercial vehicles are permitted during designated hours for pick-up/drop-off. A taxi stand is also provided at this intersection. Parking is prohibited on Court Street.

Washington Street/Water Street/Garage Exit is a four-legged, unsignalized intersection with two approaches. The eastbound Pi Alley Garage Exit approach consists of two gated exit ramps from the garage. Both exits allow left-turn and through movements. The northbound Washington Street approach consists of one shared through/right-turn lane. On-street parking is restricted along the Washington Street approach. A crosswalk with wheelchair ramps is provided across Water Street and a raised sidewalk is provided across the Pi Alley Garage Exit.

School Street/Province Street is a three-legged, unsignalized intersection with two approaches. The eastbound School Street approach consists of one shared through/right turn lane. The northbound Province Street consists of one right-turn only lane. On-street parking is provided along both approaches to the intersection. Crosswalks with wheelchair ramps are provided along all legs of the intersection.

Province Street/Province Court is a three-legged, unsignalized intersection with three approaches. The westbound Province Court functions as a loading area. The northbound Province Street approach consists of one shared through/right-turn lane. The southbound Province Street approach consists of one shared left-turn/through lane. On-street parking is provided on both Province Street approaches. Crosswalks and wheelchair ramps are not provided across any approach at the intersection, although a raised sidewalk continues across the Province Court approach.

Province Street/Bromfield Street is a three-legged, unsignalized intersection with two approaches. The westbound Bromfield Street approach consists of a shared through/right-turn lane. The southbound Province Street approach consists of a right-turn only lane. Commercial vehicles are permitted during the designated hours for pick-up/drop off and loading along the entire southern side of Bromfield Street. Parking is also provided on both sides of Province Street. Crosswalks and handicapped ramps are provided across the Province Street approach.

Tremont Street/Park Street is a two-legged, signalized intersection with two approaches. The westbound Park Street approach consists of a right-turn only lane. The Southbound Tremont Street approach consists of two through lanes and one shared through/right-turn lane. On-street parking is restricted on the Tremont Street approach. Metered parking is available on Park Street and commercial vehicles are permitted during designated hours for pick-up/drop off.

Washington Street/Bromfield Street/Franklin Street is a three-legged, unsignalized intersection with two approaches. The westbound approach on Franklin Street has a shared through/right-turn travel lane and is controlled with a stop sign. General traffic is not allowed on the segment of Franklin Street between Hawley Street and Washington Street. Taxis, however, may travel through on Franklin Street at any time of the day. Commercial vehicles are allowed on this section of Franklin Street between 6:00 p.m. and 11:00 a.m. While this segment of Franklin Street is currently closed for construction, recent City agency discussions indicate that it may not re-open to vehicular travel. This potential permanent closure has been accounted for in the transportation analysis presented in Section 3.4.7.2. The northbound approach on Washington Street is part of the auto-restricted zone of Downtown Crossing, although commercial vehicles are permitted between 6:00 p.m. and 11:00 a.m. This approach has one shared left-turn/through travel lane. Crosswalks and handicapped ramps are provided for all approaches.

3.2.4 Existing Traffic Volumes

For the initial set of study intersections identified by BTD, turning movement counts were collected on March 25, 2015 and June 3, 2015. Manual turning movement counts (TMCs) and vehicle classification counts were conducted during the weekday morning and afternoon peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m., respectively). The vehicle classification counts included car, truck, pedestrian, and bicycle movements. Based on the TMCs, the peak hours were identified as 8:00 a.m. – 9:00 a.m. and 5:00 p.m. – 6:00 p.m. For each intersection, data from the hour with the highest TMC was used for analysis.

Subsequently, four new intersections (as listed in Section 3.1.5) were added to the study area list to assess the impact of circulation changes under the Build (2021) Condition. TMC data collected within the last year for the Washington Street/Court Street intersection was obtained from the Congress Square project. In August 2015, Franklin Street between Hawley Street and Washington Street was temporarily closed due to construction activity associated with the Millennium Tower project. Because of this street closure, baseline data collection at the remaining three new intersections was not feasible. Therefore, historical TMC data were adopted for the intersections of Washington Street/Bromfield Street/Franklin Street, Washington Street/Milk Street, and Franklin Street/Arch Street. (Note that recent City agency discussions indicate that this Franklin Street segment may not re-open to vehicular travel; that possibility has been accounted for in this transportation analysis in the discussion contained in Section 3.4.7.3.)

The Existing (2016) Condition traffic volumes for weekday a.m. and p.m. peak hours are shown in Figure 3-2 and Figure 3-3, respectively. The detailed traffic counts are provided in Appendix B.

3.2.5 Existing Traffic Operations

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 2010 Highway Capacity Manual (HCM). Field observations of intersection geometry were collected and incorporated into the operations analysis.

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. Table 3-2 displays the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway and does not necessarily indicate that the operations at the intersection are poor or failing.

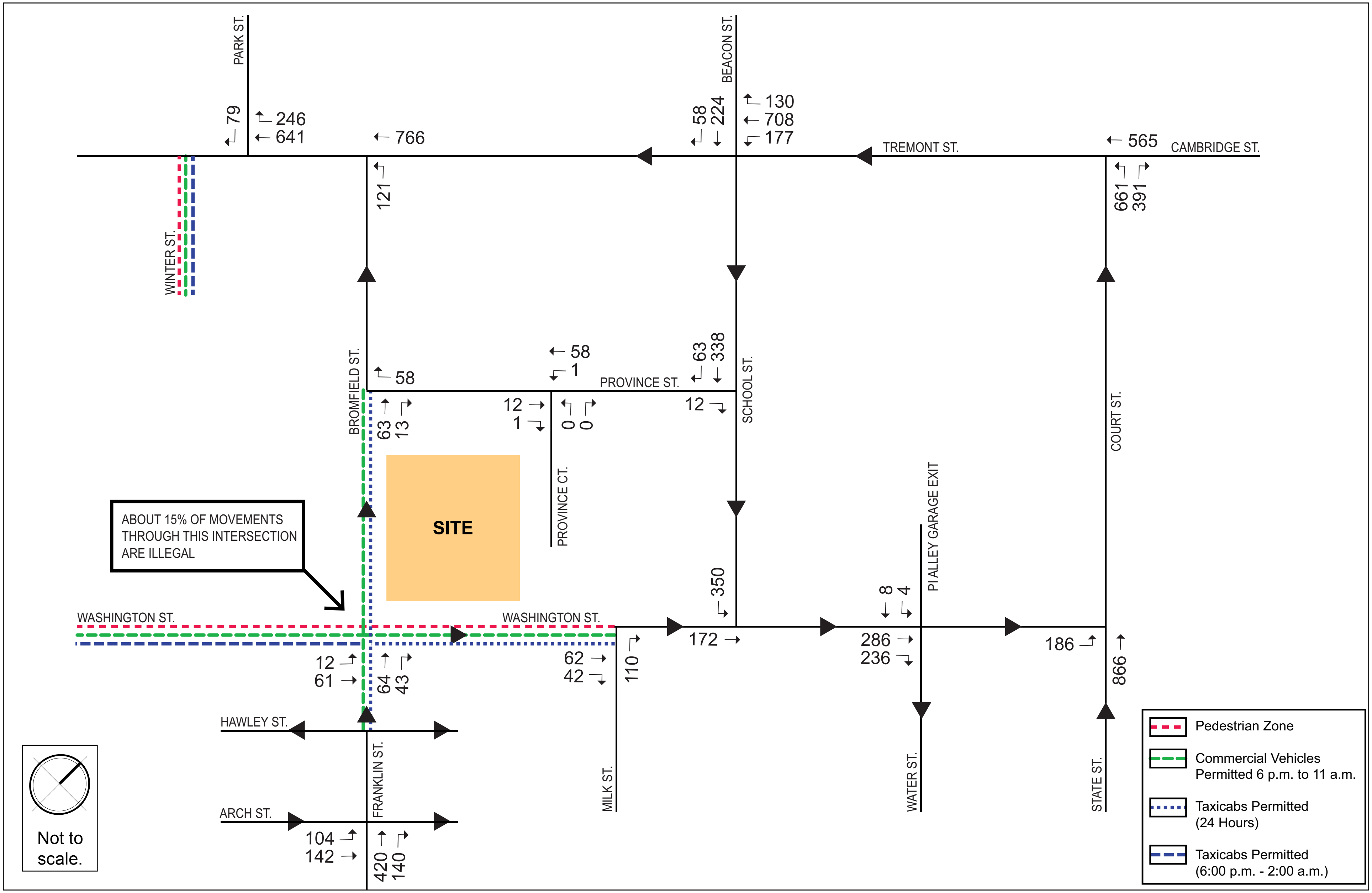

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Figure 3-2

Existing (2016) Condition Traf.c Volumes, Weekday a.m. Peak Hour

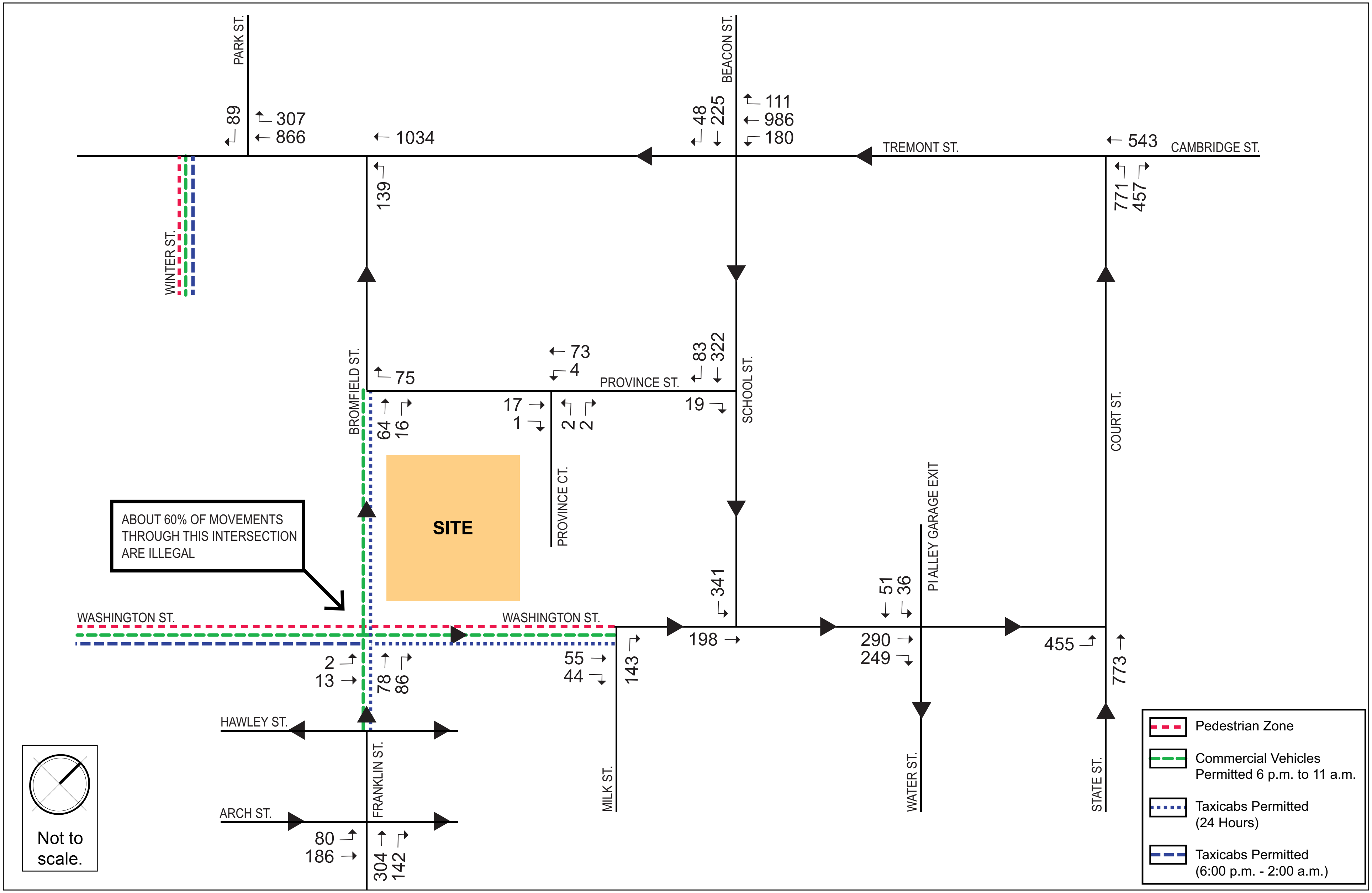

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Figure 3-3
Existing (2016) Condition Traf.c Volumes, Weekday p.m. Peak Hour

Table 3-2 Level of Service Criteria

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

Source: 2010 Highway Capacity Manual, Transportation Research Board.

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

- The volume-to-capacity (v/c) ratio is a measure of congestion at an intersection approach. A v/c ratio below one indicates that the intersection approach has available capacity to process the arriving traffic volumes over the course of an hour. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity during the peak 15 minute period.

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

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

Table 3-3 and Table 3-4 present the Existing (2016) Condition capacity analysis summary for the study area intersection during the a.m. and p.m. peak hours, respectively.

Complete Synchro reports are provided in Appendix B.

Table 3-3 Existing (2016) Condition, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**C**	**28.9**			
Court WB left|left	C	23.4	0.45	227	263
Court WB right	C	30.9	0.58	290	377
Cambridge SB thru|thru	C	34.3	0.61	183	242
Tremont Street/Beacon Street/School Street	**B**	**16.3**			
Beacon EB thru/right	D	41.5	0.77	171	241
Tremont SB left	A	5.4	0.33	0	48
Tremont SB thru | thru	B	10.4	0.44	112	151
Tremont SB right	A	3.4	0.32	0	23
Tremont Street/Bromfield Street	**A**	**9.6**			
Bromfield WB left	D	43.6	0.58	77	120
Tremont SB thru|thru|thru	A	3.7	0.26	39	51
Tremont Street/Park Street	**C**	**21.8**			
Park EB right	D	51.1	0.60	56	91
Tremont SB thru|thru|thru/right	B	18.8	0.61	109	126
Washington Street/School Street	**B**	**12.4**			
School EB left	A	8.7	0.42	63	113
Washington NB thru	B	18.9	0.45	44	67
Franklin Street/Arch Street	**A**	**9.7**			
Franklin WB thru| thru/right	A	5.0	0.30	34	75
Arch NB left/thru	C	20.4	0.65	52	107
Washington Street/Milk Street	**A**	**6.6**			
Milk WB right	A	0.2	0.10	0	0
Washington NB thru/right	B	13.4	0.28	18	52
Washington Street/Court Street	**B**	**11.3**			
Court WB thru | thru	B	10.7	0.46	161	204
Washington NB left	B	14.0	0.33	12	93
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	C	17.3	0.08	-	6
Washington NB thru/right	A	0.0	0.34	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.24	-	0
Province NB right	C	18.0	0.06	-	5
Province Street/Province Court					
Province Ct WB left/right	A	0.0	0.00	-	0
Province St NB thru/right	A	0.0	0.02	-	0
Province St SB left/thru	A	0.1	0.00	-	0

Table 3-3 Existing (2016) Condition, Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Province Street/Bromfield Street					
Bromfield WB thru/right	A	0.0	0.06	-	0
Province SB right	C	18.1	0.26	-	26
Washington Street/Bromfield Street/Franklin Street					
Franklin WB thru/right	A	7.4	0.13	-	-
Washington NB left/thru	A	7.6	0.09	-	-

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates level of service E or F.

Table 3-4 Existing (2016) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**C**	**23.6**			
Court WB left|left	A	8.6	0.40	115	148
Court WB right	B	12.6	0.52	150	229
Cambridge SB thru|thru	D	51.4	0.84	216	262
Tremont Street/Beacon Street/School Street	**B**	**16.6**			
Beacon EB thru/right	C	34.0	0.59	147	234
Tremont SB left	A	5.7	0.33	1	52
Tremont SB thru | thru	B	15.6	0.59	208	268
Tremont SB right	A	3.4	0.29	0	23
Tremont Street/Bromfield Street	**A**	**7.8**			
Bromfield WB left	D	50.6	0.64	98	148
Tremont SB thru|thru|thru	A	1.6	0.32	3	65
Tremont Street/Park Street	**C**	**27.6**			
Park EB right	D	43.7	0.41	56	107
Tremont SB thru|thru|thru/right	C	26.4	0.68	282	343
Washington Street/School Street	**B**	**12.6**			
School EB left	A	9.3	0.43	65	117
Washington NB thru	B	18.1	0.42	47	80
Franklin Street/Arch Street	**B**	**10.7**			
Franklin WB thru| thru/right	A	4.3	0.24	23	54
Arch NB left/thru	C	21.5	0.68	59	117

Table 3-4 Existing (2016) Condition, Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th	95th
Washington Street/Milk Street	**A**	**5.4**			
Milk WB right	A	0.2	0.13	0	0
Washington NB thru/right	B	12.8	0.26	16	49
Washington Street/Court Street	**B**	**17.1**			
Court WB thru | thru	B	11.2	0.43	137	178
Washington NB left	C	27.2	0.74	183	310
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	C	21.2	0.33	-	35
Washington NB thru/right	A	0.0	0.34	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.26	-	0
Province NB right	C	17.0	0.12	-	10
Province Street/Province Court					
Province Ct WB left/right	B	10.6	0.01	-	1
Province St NB thru/right	A	0.0	0.01	-	0
Province St SB left/thru	A	0.4	0.00	-	0
Province Street/Bromfield Street					
Bromfield WB thru/right	A	0.0	0.06	-	0
Province SB right	C	20.0	0.25	-	25
Washington Street/Bromfield Street/Franklin Street					
Franklin WB thru/right	A	7.5	0.18	-	-
Washington NB left/thru	A	7.4	0.02	-	-

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates level of service E or F.

Based on the results shown in Table 3-3 and Table 3-4, all intersections and approaches operate at LOS D or better.

3.2.6 Existing Parking

As shown in Figure 3-4, the on-street curbside regulations adjacent to the Project Site include a mix of no parking, commercial loading, and evening valet spaces. Very little on-street public parking is available and most public spaces in this area are provided in privately owned off-street parking facilities.

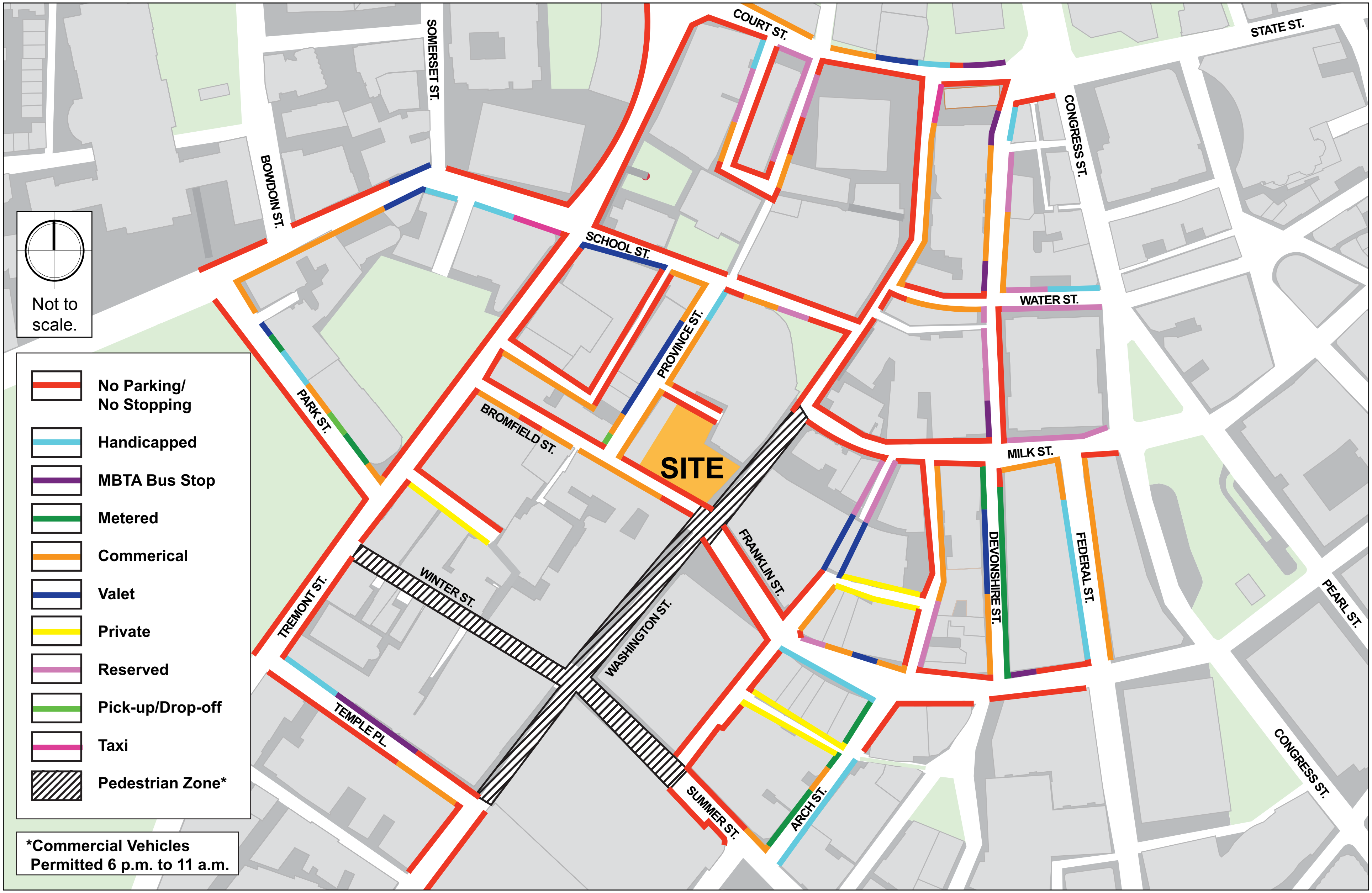

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Figure 3-4
Existing Curbside Regulations

Approximately 9,500 off-street parking spaces are provided in garages and lots within a quarter-mile radius of the Project site. Of these, about 1,500 are for private use and about 8,000 spaces are available for public use. These parking facilities and their capacities are identified in Table 3-5 and the locations are mapped in Figure 3-5.

Table 3-5 Off-Street Parking within a Quarter-mile of the Site

Map No.	Facility	Capacity (spaces)	
		Public	Private
	Lots		
1	37 Ashburton Place	38	0
2	VPNE Parking/17 Beacon Street	24	0
3	VPNE Parking/West Street	15	0
4	Essex/Lafayette Lot	0	14
5	Chauncy Street Lot	60	0
Subtotal		**137**	**14**
	Garages		
A	33 Arch Street	900	0
B	45 Province Street	184	110
C	One Beacon Street	150	0
D	Boston Common	1,500	625
E	Lafayette Place Garage	1,276	0
F	Tremont On Common	200	125
G	Post Office Square	1,400	0
H	99 Summer Street	0	120
I	101 Arch Street	0	52
J	One Devonshire Street	87	109
K	Pi Alley/275 Washington Street	600	0
L	LAZ Tremont Street	120	0
M	28 State Street	0	150
N	Center Plaza/50 Cambridge Street	586	0
O	Exchange Place/53 State Street	0	93
P	60 State Street Garage	227	78
Q	75 State Street Garage	700	0
Subtotal		**7,930**	**1,462**
Total Off-street Parking Spaces		**8,067**	**1,476**
		9,543	

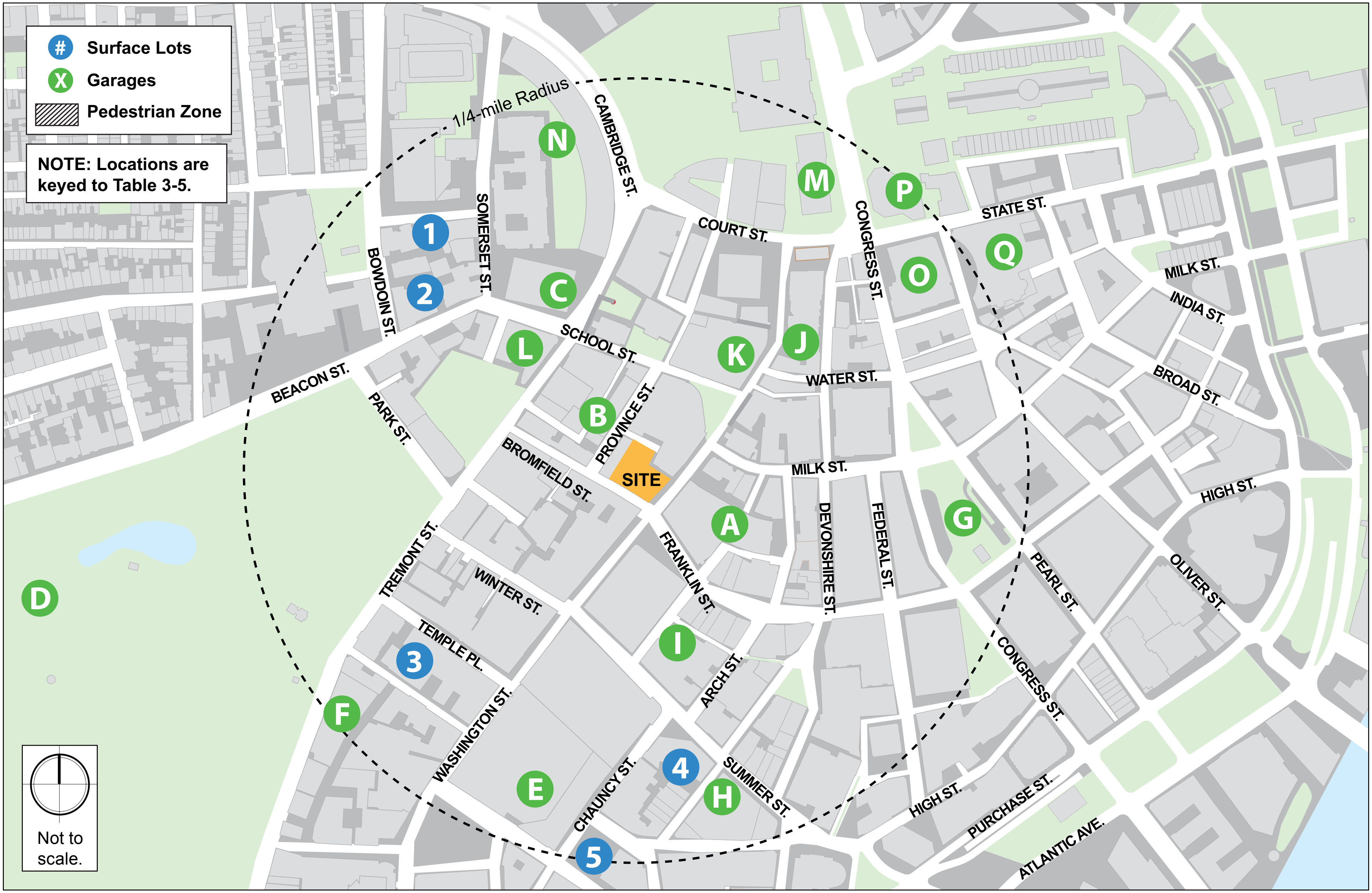

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Figure 3-5
Existing Off-Street Parking

3.2.7 *Existing Car Sharing*

The increasingly popular car-sharing services provide easy access to vehicular transportation for urban residents who do not own cars. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location.

In Boston, car sharing activity is predominantly served by Zipcar. Figure 3-6 shows the nearby Zipcar locations.

3.2.8 *Existing Public Transportation*

The study area is well served by public transportation. There are four Massachusetts Bay Transportation Authority (MBTA) subway stations within a five-minute walk (less than ¼ mile) of the Project site: Downtown Crossing, Park Street, State Street, and Government Center.

At Downtown Crossing Station, passengers can access both the Orange Line rapid transit service and Red Line rapid transit service. At Park Street Station, passengers can access both the Red Line rapid transit service and all four branches of the Green Line rapid transit service. State Street Station serves both the Orange Line rapid transit service and the Blue Line rapid transit service. Government Center Station continues to provide access to all four branches of the Green Line rapid transit service and the Blue Line rapid transit service. The Silver Line route SL5 operates between Dudley Station and Downtown Crossing; the primary stop in the downtown area is on Temple Place, a few blocks from the Project Site.

Seven local bus routes and ten express bus routes have stops within ¼ mile of the Project Site. The MBTA services in the study area are summarized in Table 3-6 and shown in Figure 3-7.

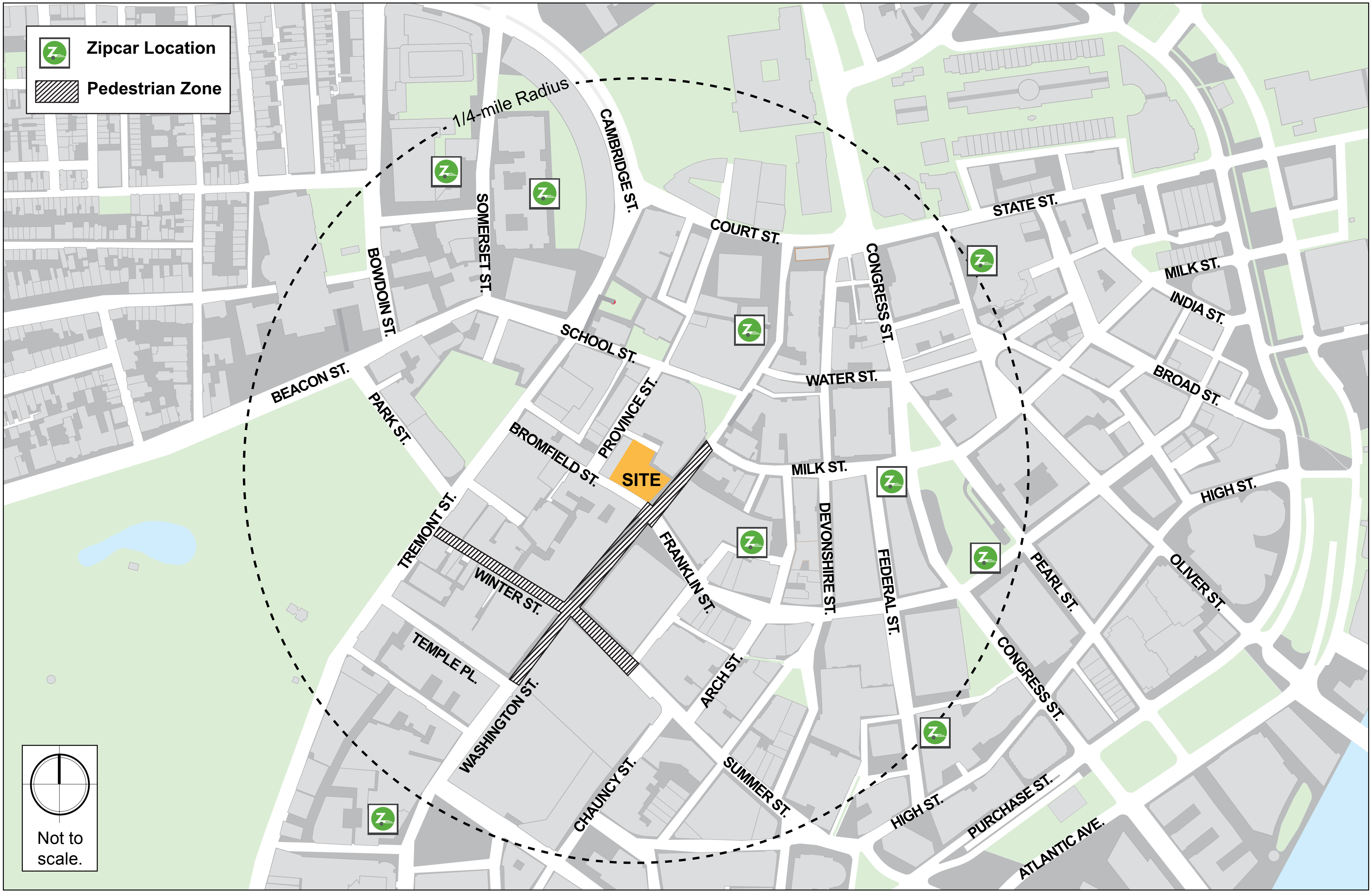

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Figure 3-6
Existing Car Sharing Locations

Table 3-6 MBTA Transit Service in the Study Area

Transit Service	Description	Peak-hour Headway (in minutes)[1]
	Rapid Transit Routes	
Orange Line	Forest Hills–Oak Grove	4-5
Green Line	Lechmere–Boston College, Cleveland Circle, Riverside, or Heath St.	6-7
Red Line	Alewife–Braintree/Mattapan	9
Blue Line	Wonderland–Bowdoin	5
Silver Line	Silver Line 5 (SL5): Dudley Station – Downtown (Temple Place)	7
	Local Bus Routes	
4	North Station–World Trade Center via Federal Courthouse and South Station	15-18
7	City Point - Otis & Summer Streets via Summer Street & South Station	4-6
11	City Point - Downtown BayView Route	6
43	Ruggles Station - Park & Tremont Sts. via Tremont St.	18
55	Jersey & Queensberry - Copley Sq. or Park & Tremont Sts. via Ipswich St.	15-20
92	Assembly Sq. Mall–Downtown via Sullivan Sq., Main St. and Haymarket Station	7-8
93	Sullivan Sq. Station–Downtown via Bunker Hill Street and Haymarket Station	7-10
	Express Bus Routes	
448	Marblehead-Downtown Crossing via Paradise Rd. or Humphrey St., Lynnway, & Airport	60
449	Marblehead-Downtown Crossing via Paradise Rd. or Humphrey St., Lynnway, & Airport	60
459	Salem Depot - Downtown Crossing via Logan Airport & Central Square, Lynn	70-75
501	Brighton Center–Downtown via Oak Square and Masspike	15-20
504	Watertown/Newton Corner–Downtown via Masspike	10
505	Central Sq., Waltham - Downtown via Moody St. & Mass. Turnpike	10-15
553	Roberts - Downtown Boston via Newton Corner & Central Sq., Waltham	20-25
554	Waverley Square – Downtown Boston	60
556	Waltham Highlands - Downtown Boston via Newton Corner & Central Sq., Waltham & Newtonville	30
558	Riverside - Downtown Boston via Newton Corner & Turnpike	30-45

1) Headway is the time between trains or buses, as applicable.

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Figure 3-7
Public Transportation

3.2.9 *Existing Pedestrian Conditions*

The Project Site is located in the dense Downtown Crossing area and is surrounded by a mix of commercial, retail, and residential buildings; educational and governmental organizations; theaters; and restaurants. A pedestrian-only zone, as shown on Figure 3-1, exists along Washington Street, Winter Street, and a segment of Summer Street. The associated vehicle restrictions are shown in Figure 3-2.

Sidewalks are provided along all streets in the area, although in the pedestrian only zones, pedestrians also walk along the roadway. Crosswalks are provided at most of the study area signalized intersections.

Pedestrian counts were conducted concurrently with the TMCs, as described in Section 3.2.4, and are presented in Figure 3-8 and Figure 3-9 for the a.m. and p.m. peak hours respectively.

3.2.9.1 Pedestrian Level of Service Methodology

As requested by the BTD, pedestrian level of service analysis was conducted along Bromfield Street, Province Street, and at four unsignalized study intersections based on the methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM). Pedestrian level of service is determined through analysis of crosswalk geometry, signal timing, and pedestrian volumes.

Pedestrian LOS at an unsignalized intersection is computed for approaches where pedestrians do not have the right-of-way or any stop control device, and is based on the critical gap, the vehicular flow rate, and the mean vehicle headway. The critical gap is the minimum amount of time (in seconds) required for one vehicle to enter the intersection. The vehicular flow rate is the number of vehicles per hour (vph) that move through a particular location. The mean vehicle headway (in seconds) is the average amount of time between vehicles passing a particular point. Input includes pedestrian volumes, vehicular volumes, walking speed, crosswalk width, and street width. According to the HCM, this method for unsignalized intersections does not apply to zebra-striped crosswalks, because pedestrians (by Massachusetts state law) have the right-of-way.

Table 3-7 is excerpted from the HCM and shows the LOS criteria for delay experienced by pedestrians at unsignalized intersections.

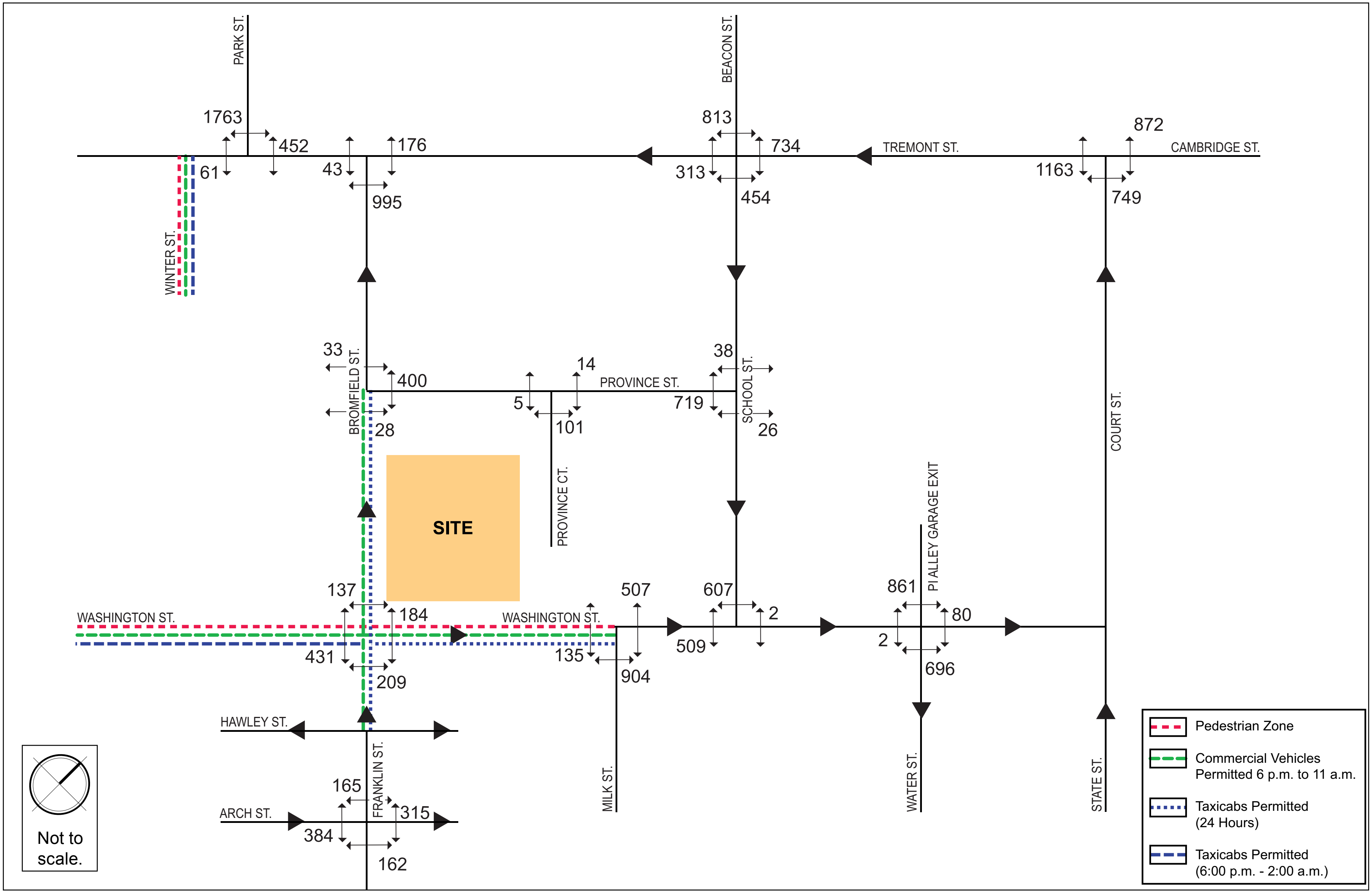

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Figure 3-8
Existing (2016) Condition Pedestrian Volumes, a.m. Peak Hour

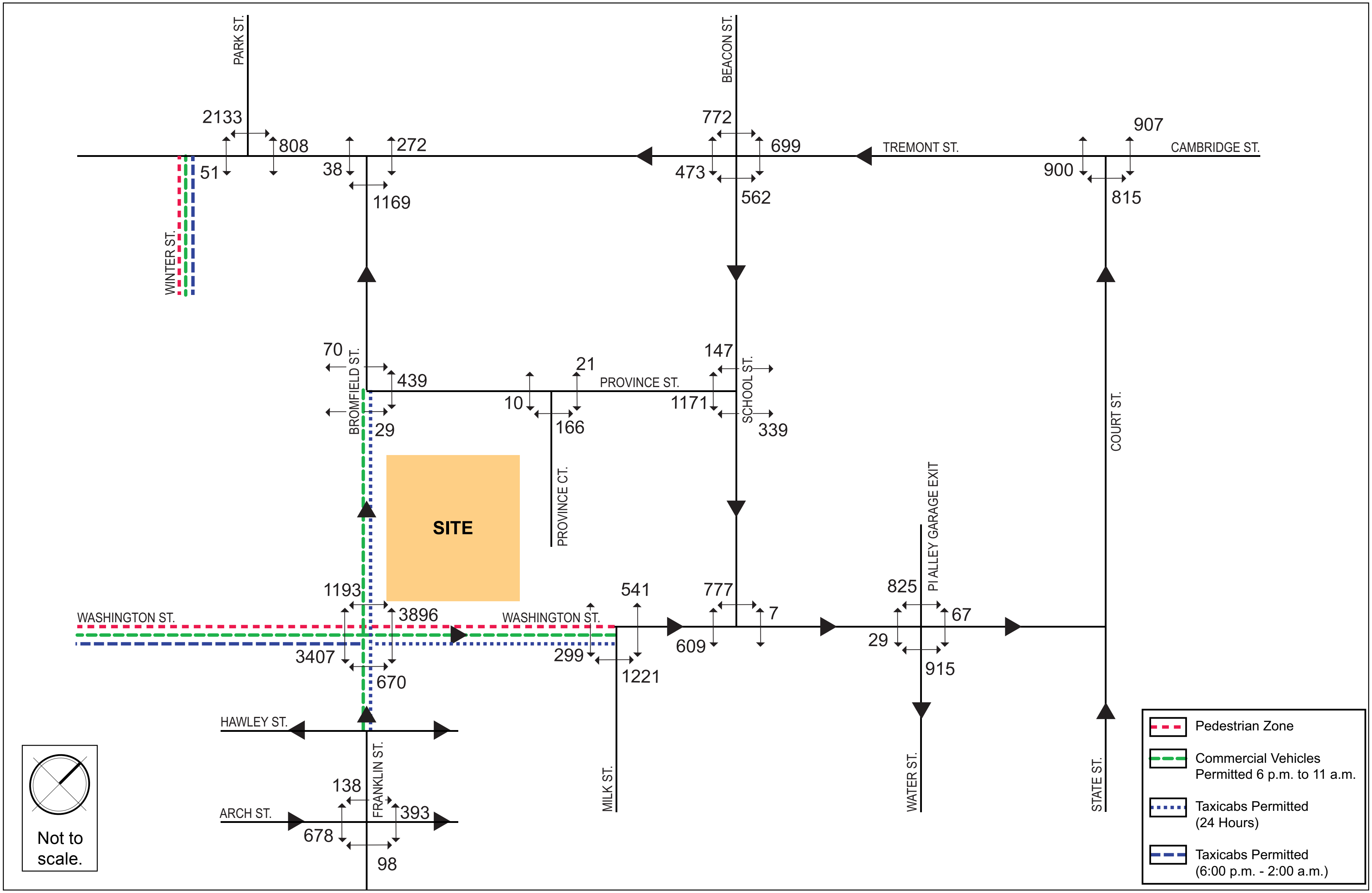

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Figure 3-9

Existing (2016) Condition Pedestrian Volumes, p.m. Peak Hour

Table 3-7 Level of Service Criteria for Pedestrian Delay at Intersections

Level of Service	Delay thresholds at unsignalized Intersections (seconds/person)	Likelihood of non-compliance
A	≤5	Low
B	>5 and ≤10	
C	>10 and ≤20	Moderate
D	>20 and ≤30	
E	>30 and ≤45	High
F	>45	

At unsignalized intersections, the LOS is based on average delay per pedestrian, obtained from the vehicular volumes and potential gaps. LOS A defines the most favorable condition, with minimum delay to cross. LOS F represents the worst condition, with significant delay. Similar to vehicular traffic, LOS D is generally considered acceptable in the urban environment of the study area.

Table 3-8 shows the LOS criteria for average flow of pedestrians on walkways and sidewalks to determine the "space LOS."

Table 3-8 Level of Service Criteria (Space) for Average Flow of Walkways and Sidewalks

Space Level of Service	Average Stopped Delay (sec./veh.)			
	Space (sf/person)	Flow rate (persons/min/ft)	Speed (ft/sec)	v/c ratio
A	>60	≤5	>4.25	≤0.21
B	>40–60	>5–7	>4.17–4.25	>0.21–0.31
C	>24–40	>7–10	>4.00–4.17	>0.31–0.44
D	>15–24	>10–15	>3.75–4.00	>0.44–0.65
E	>8–15	>15–23	>2.50–3.75	>0.65–1.0
F	<8	variable	≤2.50	variable

sf/person = square feet per person
persons/min/ft = persons per minute per linear foot
ft/sec = linear feet per second

Space LOS is derived from pedestrian walking speed, pedestrian start-up time, and pedestrian space requirements. LOS A defines the most favorable condition, with maximum space per pedestrian. LOS F represents the worst condition, with minimum space. LOS D is generally considered acceptable for urban environments like the study area.

3.2.9.2 Pedestrian Operations

The associated pedestrian level of service for the identified segments, crossings, and crosswalks is shown in Table 3-9 for the a.m. and p.m. peak hours.

Table 3-9 Pedestrian Level of Service

Location	a.m. peak hour	p.m. peak hour
Province Street segment		
East sidewalk, between Bromfield St. and Province Ct.	A	A
Bromfield Street segment		
North sidewalk, between Washington St. and Province St.	A	A
Bromfield Street/Province Street		
Bromfield Street, east crossing [1)]	A	A
Bromfield Street, west crossing [1)]	A	A
Province Street north crosswalk [2)]	A	A
Province Street/Province Court		
Province Court east crosswalk [2)]	A	A
Province Street north crossing [1)]	A	A
Province Street south crossing [1)]	A	A
School Street/Province Street		
School Street, east crosswalk [2)]	B	B
School Street, west crosswalk [2)]	B	B
Province Street, south crosswalk [2)]	A	A
Washington Street/Bromfield Street/Franklin Street		
Franklin Street, east crossing [1)]	A	A
Bromfield Street, west crossing [1)]	A	A
Washington Street, north crossing [1)]	A	A
Washington Street, south crossing [1)]	A	A

1) No crosswalk. Pedestrians should yield to vehicles and methodology is applicable.
2) Crosswalk. Because pedestrians have right of way per Massachusetts state law, methodology is not applicable. For reference, LOS is still calculated as if pedestrians did not have the right of way.

The peak hour pedestrian levels of service are LOS A or LOS B, indicating that adequate pedestrian capacity exists in the study area. The pedestrian level of service analysis sheets are provided in Appendix B.

3.2.10 Existing Bicycle Conditions

In recent years, bicycle use has increased dramatically throughout the City of Boston. The following roadways within the study area are designated bicycle routes on the City of Boston's "Bike Routes of Boston" map:

- Washington Street is designated as a beginner route suitable for all types of cyclists including newer cyclists with limited on-road experience.

- Tremont Street, Court Street, and Washington Street are designated as intermediate routes suitable for riders with some on-road experience.

- Beacon Street and Bromfield Street are designated as advanced routes suitable for traffic-confident cyclists with on-road experience.

Overall, the bicycle volumes are higher in the p.m. peak hour than during the a.m. peak hour. The highest number of bicycles (>50 cyclists per hour) was observed on Court Street. Other major bike corridors are on Tremont Street southbound, School Street eastbound, and Washington Street northbound. Bicycle counts were taken as part of the Project's data collection effort and are presented in Figure 3-10. Bicycle counts are included as part of the traffic count data in Appendix B.

The City's five-year bicycle plan includes the construction of protected bicycle lanes in portions of the study area, including Tremont Street and the Winter Street/Summer Street corridor.

Hubway, launched in July 2011, is a bicycle sharing system with more than 140 stations and 1,300 bicycles available throughout Boston, Brookline, Cambridge, and Somerville. As shown in Figure 3-11, six Hubway stations are located near the Project Site. Table 3-10 lists the locations of these facilities. At the current time, bicycles are not available during the winter months at these stations.

Table 3-10 Hubway Bicycle Sharing Stations

Station Location	Bicycle Capacity
Franklin Street at Arch Street	23
Post Office Square	17
Tremont Street near West Street	12
Government Center near Court Street	15
Faneuil Hall: Union Street at North Street	15
John Fitzgerald Surface Road at India Street	19

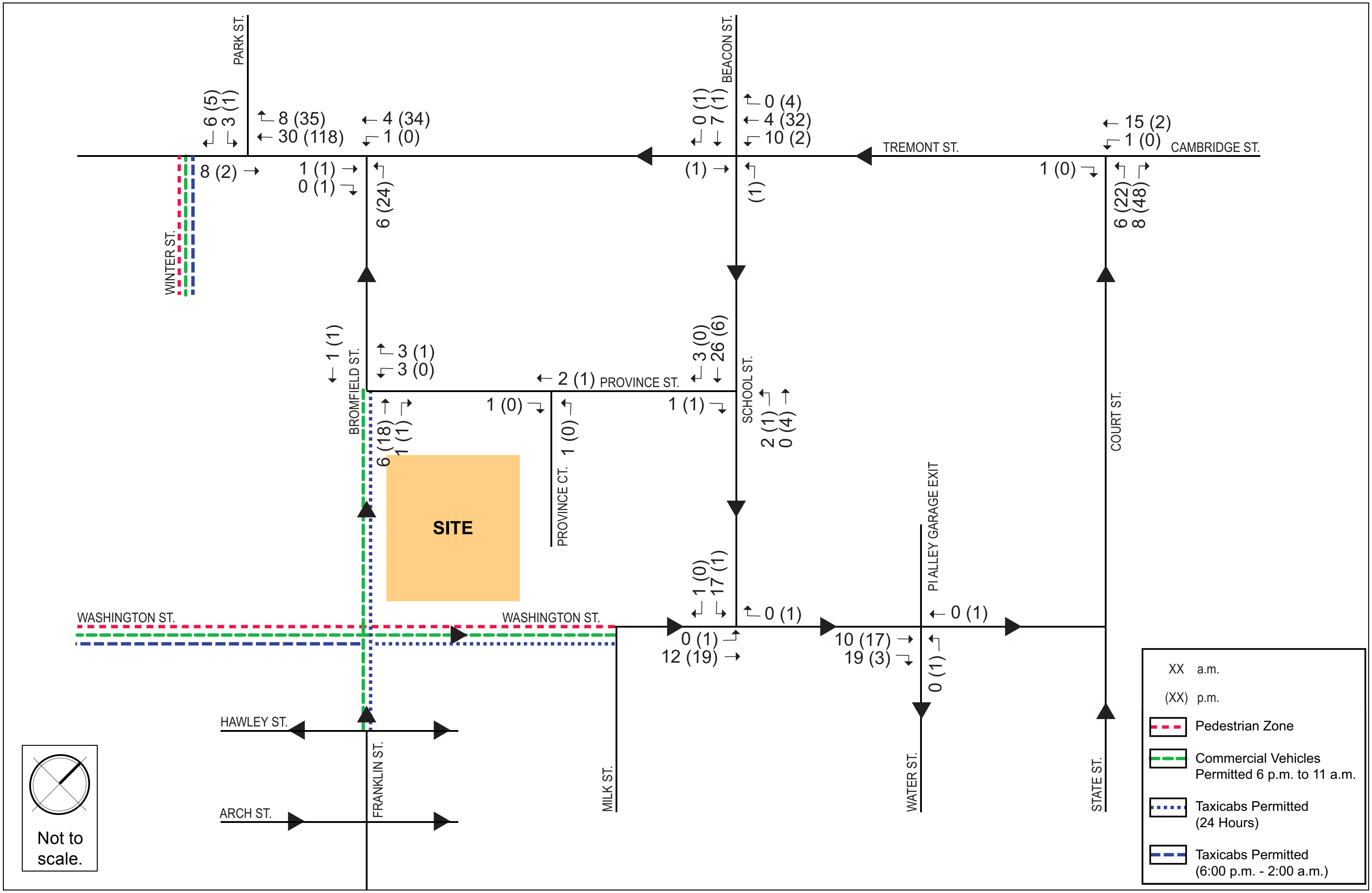

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Figure 3-10

Existing (2016) Condition Bicycle Volumes, a.m. and p.m. Peak Hours

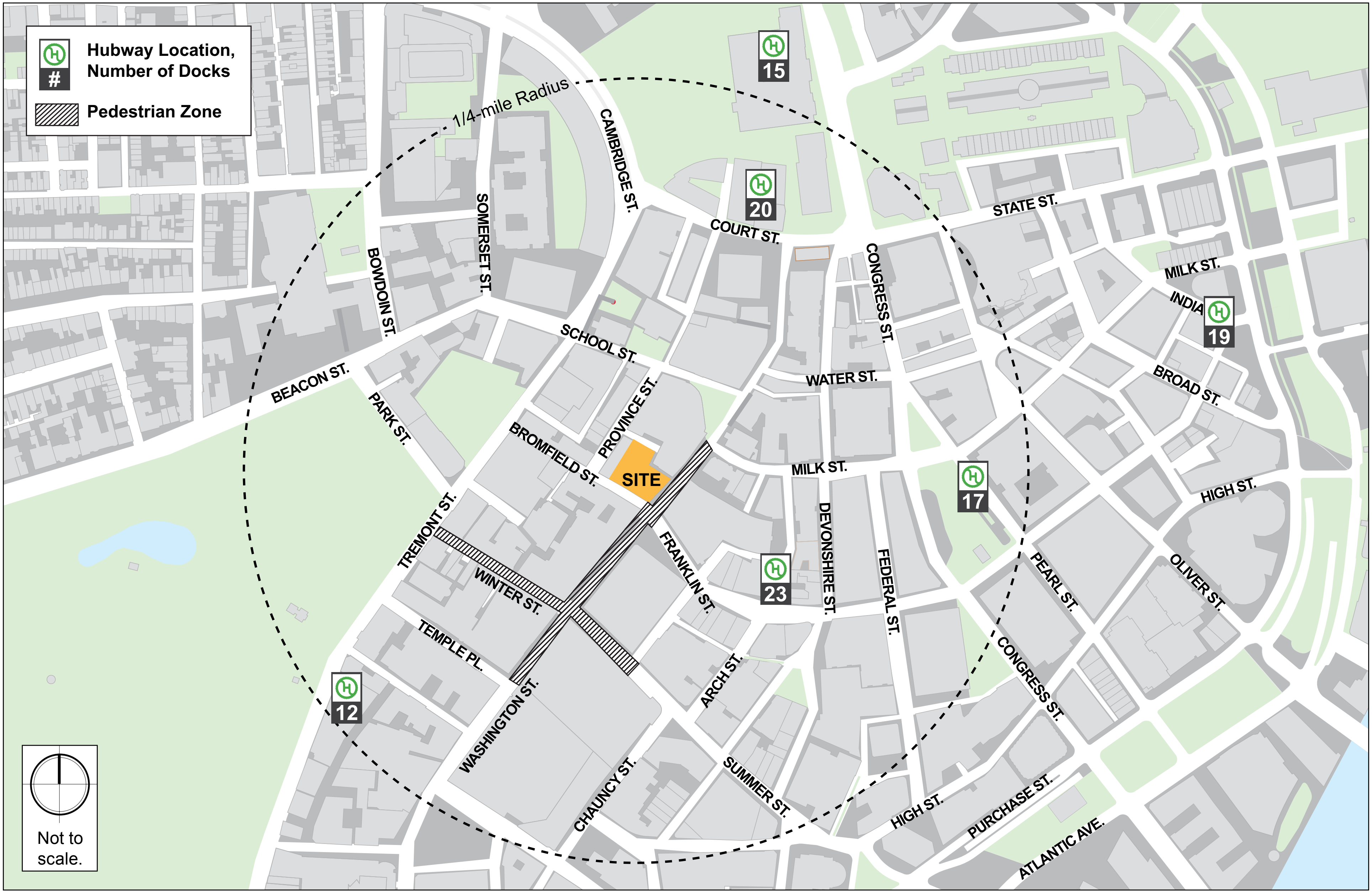

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Figure 3-11
Existing Bicycle Sharing Locations

3.2.11 Existing Loading and Service

Province Court is a dead-end, service alley (publicly owned) that abuts the Project Site, the 333 Washington Street building, and the 52 Province Street building. The current use of this alley is for deliveries and trash pick-up for businesses within these adjacent buildings. Delivery doorways to 333 Washington Street, two of the existing buildings on the Project Site, and the adjacent 52 Province Street building are located on Province Court. A City regulatory sign at the alley entry reads "Tow Zone – No Stopping – Fire Lane – Either Side" and a private "No Parking – Loading Zone – Cars will be Towed" sign is posted near the loading door for 333 Washington Street. When the Project Site is redeveloped, Province Court will be used as access/egress for the Project's loading areas and access/egress for the Project's vehicle elevators (which will only be used by garage attendants).

While the existing Project Site does have some retail tenants, none currently uses the Province Court alley for loading. With available commercial parking zones, delivery activity for these existing businesses occurs mostly on-street along Washington Street and Bromfield Street.

To better understand the existing activity in this public alley generated by the abutting buildings, observations were made of Province Court via 24/7 video footage (placed on the Proponent's property) from Tuesday, September 8, through Thursday, September 10, 2015. Most of the activity in the alley was short-term parking by automobiles, single-unit trucks, vans, and pick-up trucks that parked at the end of Province Court, closest to Province Street. Drivers were observed exiting their vehicle, sometimes gathering goods from their vehicles, and proceeding along Province Street out of view of the video camera. Some drivers were likely delivering/picking-up small packages at businesses with front doors along Province Street, including those at 333 Washington Street rear. Alternatively, some drivers may have been running personal errands. Whether the activity for these vehicles was related to deliveries or to personal business could not be determined from the video footage. While Province Court is clearly signed as a "No-Parking – Loading Zone", it is apparent that the end of Province Court close to Province Street is well-used (about 20 vehicles per day) as an illegal, short-term parking area for nearby deliveries and errands.

During this three-day period, only three vehicles delivered/picked-up goods through the loading dock door at 333 Washington Street (three on Tuesday and none on the other days).

3.3 No-Build (2021) Condition

For transportation impact analyses, it is standard practice to evaluate two future conditions: No-Build Conditions (without the proposed project) and Build Conditions (with the proposed project). In accordance with BTD guidelines, Year 2021 was selected as the horizon year for the future conditions analyses.

The No-Build (2021) Conditions reflects a future scenario that incorporates any anticipated traffic volume changes independent of the Project and any planned infrastructure improvements that will affect travel patterns throughout the study area. Infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements. Traffic volume changes are based on two factors: an annual background traffic growth and vehicle trips associated with specific developments near the Project.

3.3.1 Background Traffic Growth

The methodology to account for future traffic growth, independent of the Project, consists of two parts. The first part of the methodology accounts for general background traffic growth that may be affected by changes in demographics, automobile usage, and automobile ownership. Based upon a review of recent traffic studies conducted for nearby projects and to account for any additional unforeseen traffic growth, a 0.5% annual traffic growth rate was used to develop the future conditions traffic volumes.

The second part of the methodology identifies any specific planned developments that are expected to affect traffic patterns throughout the study area within the future analysis time horizon. The projects listed below are located in the vicinity of the study area. The traffic volumes associated with these projects were specifically accounted for in the future conditions.

- **Millennium Tower/Burnham Building**. The One Franklin Project initially proposed in 2006 has been updated and is now called Millennium Tower and Burnham Building. The new Project includes the preservation of, and renovations to, the Burnham Building and the development of a new mixed-use residential building, the Tower. The Burnham Building will contain approximately 122,000 - 231,000 sf of retail space on the ground floor and first basement level, and at least one upper floor. Above the retail floors will be approximately 125,000 - 218,000 sf of office space. The parking garage will extend below the entire project site, including the use of two existing basement floors beneath the Burnham Building. The Tower will contain approximately 600 residential units. While much of the Burnham Building was occupied at the time of the traffic counts for this Project, the Tower was still under construction. Trip generation and distribution data were obtained from the transportation component of *Millennium Tower & Burnham Building Notice of Project Change,* prepared by Howard Stein Hudson in August 2012.

- **59 Temple Place/Godfrey Hotel**. This project includes the redevelopment of the site at 59-63 Temple Place and 501-507 Washington Street in the Downtown Crossing area. The project consists of converting a six-story building and an 11-story building, comprising mostly office space, into a new 242 room hotel with ground floor retail. New trips to be generated by this project were assigned to the study area intersections. Trip generation and distribution data were obtained from the transportation component of the *59 Temple Place Expanded Project Notification Form* prepared by Howard Stein Hudson in October 2012.

- **Government Center Garage** – This project includes construction of a 2.4 million sf development including 771 residential units, 204 new hotel rooms, 1.3 million sf of offices, 82,500 sf of retail space and 1,159 parking spaces. While the project will be built in several phases, all trips expected to be generated by this project were assigned to the study area intersections. Trip generation and distribution data were obtained from the transportation component of the *Redevelopment of the Government Center Garage Project Notification Form* prepared by Howard Stein Hudson in June 2013.

The following planned projects are within the One Bromfield study area, but will not generate significant volumes through the study area intersections. Additional traffic from the study area projects described below is reflected in the background growth rate:

- **Suffolk University-20 Somerset.** Suffolk University has demolished the existing building at the 20 Somerset Street site and constructed a new academic building with approximately 156,000 sf of classroom and supporting academic space. This building opened in September 2015 (the building was not opened when traffic data was collected.)

- ***17 Court Street Renovations.*** This BRA approved project by the New England Center for Homeless Veterans includes renovation of the existing facility at 17 Court Street to improve and expand the Center's services by approximately 5,000 sf. The renovation will create 35 units for permanent residents as well and relocate existing offices and services within the Center.

- **Congress Square.** This BRA approved project includes the redevelopment of six existing buildings along Congress Street, including additions to three of them, to repurpose the existing office buildings to a mix of ground floor and lower level retail/restaurant use with residential or hotel uses on upper floors. The project includes approximately 458,300 sf, of which 92,700 sf is new construction.

- **55 India Street.** This BRA approved project proposes the development of a 67,000 sf building with ground floor commercial space and 44 residential units at 55 India Street.

- **110 Broad Street.** This BRA approved project calls for the redevelopment of two buildings at 102 and 112 Broad Street. The historic Bulfinch Building at 102 Broad Street will be restored and serve as a lobby and residential space while the second commercial building at 110-112 Broad Street will be demolished and rebuilt with 52 residential units.

- **Haymarket Hotel** – This project includes the construction of a 225 key hotel with approximately 15,000 sf of ground-floor retail. The project will have no parking on-site, and will valet vehicles in the nearby Dock Square garage located on Clinton Street. This project is currently under review by the BRA.

The above background projects are mapped in Figure 3-12. The resulting No-Build (2021) Condition volumes are shown on Figure 3-13 and Figure 3-14, respectively.

3.3.2 Proposed Infrastructure Improvements

The MBTA's Government Center Station has recently opened after a two-year reconstruction project. As part of this station improvement project, the MBTA will upgrade pavement markings and signage and implement a new signal phasing and timing plan at the Tremont Street/Cambridge Street/Court Street intersection. The new plan will provide an exclusive pedestrian phase when pedestrians can cross all legs of this intersection, as opposed to conditions today, where pedestrians cross the intersection in two stages and must often wait in the median island. While these improvements have not yet been implemented, construction is expected to start in the near future. Therefore, they have been incorporated into the No-Build (2021) Conditions and Build (2021) Condition analysis.

3.3.3 No-Build (2021) Traffic Operations

The No-Build (2021) Conditions capacity analysis summary uses the same methodology as described for the Existing Condition. Table 3-11 and Table 3-12 present the No-Build (2021) Condition capacity analysis summary for the a.m. and p.m. peak hours, respectively. The tables show level of service, average delay, volume to capacity ratio, and 50th and 95th percentile queue lengths (feet) for the overall intersection and each approach. Complete Synchro reports are provided in Appendix B.

Under No-Build (2021) Conditions, all intersections and approaches will continue to operate at LOS D or better, with the exception of one approach at the Tremont Street/Cambridge Street/Court Street intersection. During each peak hour, the overall intersection would operate at LOS D under No-Build (2021) Conditions. During the a.m. peak hour, the Court Street westbound right turn lane would worsen from LOS C under Existing Conditions to LOS E under No-Build (2021) Conditions and during the p.m. peak hour, the same movement would worsen from LOS D under Existing Conditions to LOS E under No-Build (2021) Conditions.

One Bromfield **Boston, Massachusetts**

Figure 3-12
Area Development Projects

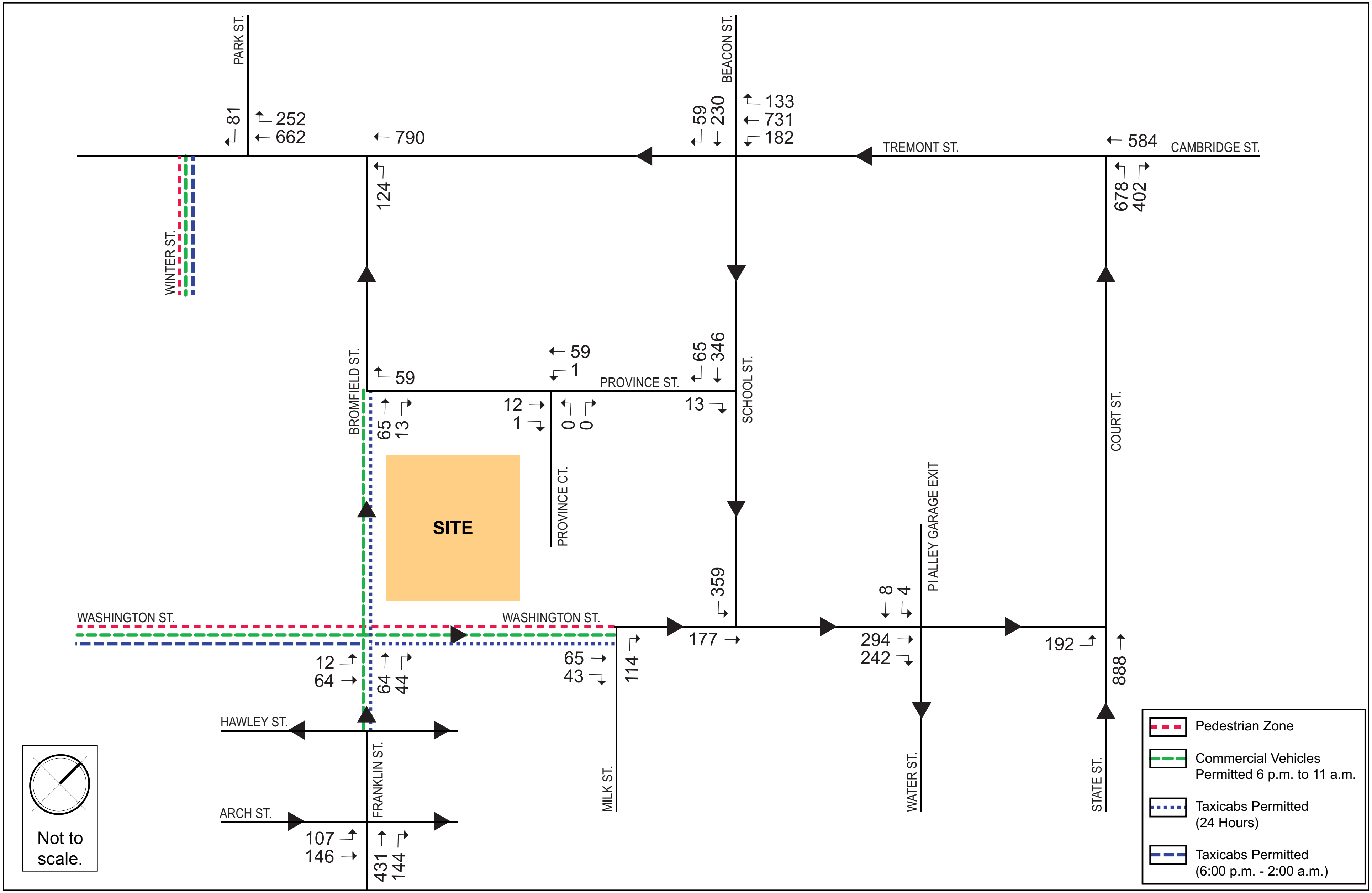

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Figure 3-13

No-Build (2021) Condition Traf.c Volumes, Weekday a.m. Peak Hour

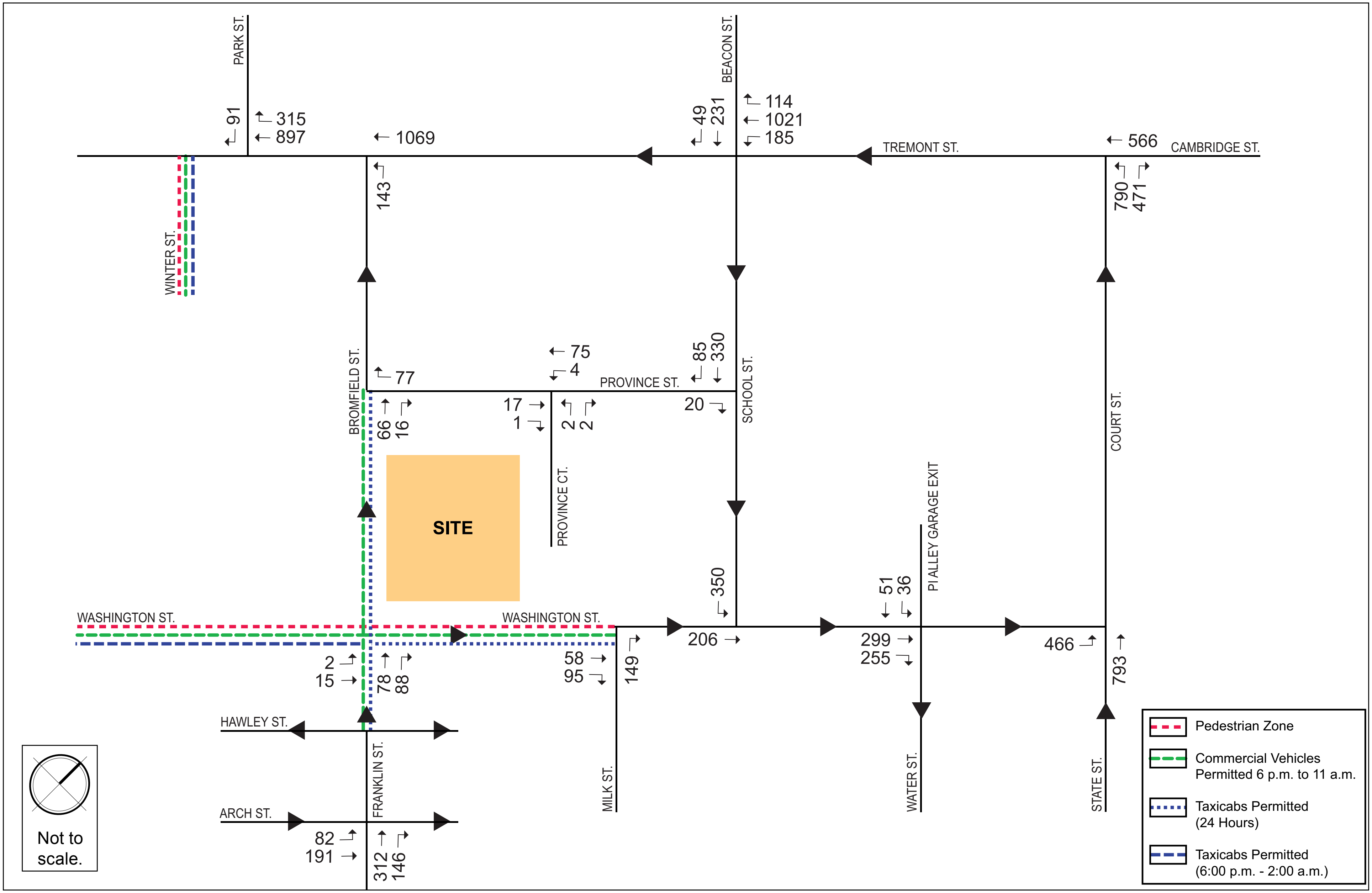

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Figure 3-14
No-Build (2021) Condition Traf.c Volumes, Weekday p.m. Peak Hour

Table 3-11 No-Build (2021) Conditions, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**D**	**52.1**			
Court WB left|left/right	D	41.1	0.87	269	#338
Court WB right	E	75.5	0.98	290	#484
Cambridge SB thru|thru	D	52.5	0.89	197	#288
Tremont Street/Beacon Street/School Street	**B**	**16.7**			
Beacon EB thru/right	D	43.0	0.79	177	#250
Tremont SB left	A	5.3	0.34	0	48
Tremont SB thru | thru	B	10.6	0.45	116	157
Tremont SB right	A	3.5	0.33	0	24
Tremont Street/Bromfield Street	**A**	**9.8**			
Bromfield WB left	D	43.9	0.59	79	122
Tremont SB thru|thru|thru	A	3.9	0.27	41	53
Tremont Street/Park Street	**C**	**22.1**			
Park EB right	D	52.3	0.61	58	93
Tremont SB thru|thru|thru/right	B	19.0	0.63	112	130
Washington Street/School Street	**B**	**12.5**			
School EB left	A	8.9	0.43	65	117
Washington NB thru	B	19.1	0.46	46	68
Franklin Street/Arch Street	**A**	**10.0**			
Franklin WB thru| thru/right	A	5.2	0.31	36	79
Arch NB left/thru	C	20.8	0.66	55	111
Washington Street/Milk Street	**A**	**6.7**			
Milk WB right	A	0.2	0.10	0	0
Washington NB thru/right	B	13.6	0.29	19	54
Washington Street/Court Street	**B**	**11.7**			
Court WB thru | thru	B	10.8	0.47	166	211
Washington NB left	B	15.8	0.35	17	104
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	C	17.5	0.08	-	6
Washington NB thru/right	A	0.0	0.35	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.25	-	0
Province NB right	C	18.3	0.07	-	5

Table 3-11 No-Build (2021) Conditions, Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Unsignalized Intersections					
Province Street/Province Court					
Province Ct WB left/right	A	0.0	0.00	-	0
Province St NB thru/right	A	0.0	0.02	-	0
Province St SB left/thru	A	0.1	0.00	-	0
Province Street/Bromfield Street					
Bromfield WB thru/right	A	0.0	0.06	-	0
Province SB right	C	18.2	0.27	-	26
Washington Street/Bromfield Street/Franklin Street					
Franklin WB thru/right	A	7.5	0.13	-	-
Washington NB left/thru	A	7.7	0.10	-	-

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.

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

Grey shading indicates a decrease in level of service into LOS E or LOS F as compared to the Existing (2016) Condition.

Table 3-12 No-Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**D**	**52.0**			
Court WB left|left/right	D	50.5	0.94	320	#455
Court WB right	E	63.8	0.95	287	m#489
Cambridge SB thru|thru	D	46.6	0.84	198	244
Tremont Street/Beacon Street/School Street	**B**	**10.2**			
Beacon EB thru/right	C	34.6	0.60	152	242
Tremont SB left	B	10.1	0.34	33	m44
Tremont SB thru | thru	A	5.0	0.61	38	m46
Tremont SB right	A	1.1	0.29	0	m0
Tremont Street/Bromfield Street	**A**	**7.9**			
Bromfield WB left	D	50.7	0.65	101	150
Tremont SB thru|thru|thru	A	1.6	0.33	3	74

Table 3-12 No-Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Park Street	**C**	**24.7**			
Park EB right	D	43.9	0.42	57	108
Tremont SB thru|thru|thru/right	C	23.3	0.70	249	327
Washington Street/School Street	**B**	**12.8**			
School EB left	A	9.5	0.44	67	120
Washington NB thru	B	18.4	0.44	49	83
Franklin Street/Arch Street	**B**	**11.0**			
Franklin WB thru| thru/right	A	4.5	0.25	24	57
Arch NB left/thru	C	22.0	0.69	62	121
Washington Street/Milk Street	**A**	**5.4**			
Milk WB right	A	0.2	0.13	0	0
Washington NB thru/right	B	13.0	0.27	16	51
Washington Street/Court Street	**B**	**18.1**			
Court WB thru | thru	B	11.4	0.44	142	185
Washington NB left	C	29.5	0.77	198	329
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	C	21.7	0.33	-	36
Washington NB thru/right	A	0.0	0.35	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.26	-	0
Province NB right	C	17.3	0.13	-	11
Province Street/Province Court					
Province Ct WB left/right	B	10.6	0.01	-	1
Province St NB thru/right	A	0.0	0.01	-	0
Province St SB left/thru	A	0.4	0.00	-	0
Province Street/Bromfield Street					
Bromfield WB thru/right	A	0.0	0.06	-	0
Province SB right	C	20.2	0.26	-	26
Washington Street/Bromfield Street/Franklin Street					
Franklin WB thru/right	A	7.5	0.18	-	-
Washington NB left/thru	A	7.4	0.02	-	-

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates a decrease in level of service into LOS E or LOS F as compared to the Existing (2016) Condition.

3.4 Build (2021) Condition

The Project includes demolition of the existing buildings on the Project Site and the construction of a new mixed-use building with approximately 419 residential units, approximately 30,000 sf of retail space, and approximately 235 parking spaces for residents and some mid-day retail visitors to the Project. No public parking will be provided.

3.4.1 Site Access and Circulation

The primary residential pedestrian entrances to the Project Site will be located in the porte-cochere near Bromfield Street. The ground floor retail uses will have doors along Washington Street and Bromfield Street. For vehicular access, two roadway circulation options, as described below, have been analyzed in this report.

3.4.1.1 Option 1 – Existing Circulation

The Project site plan with Option 1 circulation is shown in Figure 3-15. Under Option 1, roadway circulation in the area would remain unchanged. The porte-cochere driveway will accommodate one-way, southbound travel from Province Court, a public alley, to Bromfield Street. Vehicular access to the Project Site will be via Province Court to the internal porte-cochere, where one travel lane will be provided for through traffic and one curbside lane will be provided for valet staging and taxicab activity. The eastern curb of the internal porte-cochere has a capacity for approximately six vehicles plus one space for a delivery vehicle.

Residential vehicles will enter the porte-cochere via Province Court and garage attendants will take and park the vehicle. Vehicles will be taken via Bromfield Street and Province Street to the attendant-operated vehicular elevators accessed from Province Court. Garage attendants will also retrieve vehicles from the garage for residents when they depart. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. Only garage attendants will drive vehicles to and from the vehicle elevators. Taxicab drop-offs and pick-ups will occur within the porte-cochere.

Vehicles exiting the porte-cochere will turn right onto Bromfield Street and continue west on Bromfield Street toward Tremont Street or turn right onto Province Street.

3.4.1.2 Option 2 – Proposed Circulation

As part of the Project, the Proponent seeks, with City approval, to change the travel direction of Bromfield Street between the Project Site driveway and Washington Street to be one-way eastbound (toward Washington Street). Consequently, some commercial vehicles and taxicabs in the area would travel different routes to reach destinations along Bromfield Street and Province Street. Under Option 2, the porte-cochere driveway will accommodate one-way, northbound travel from Bromfield Street to Province Court. As shown on the

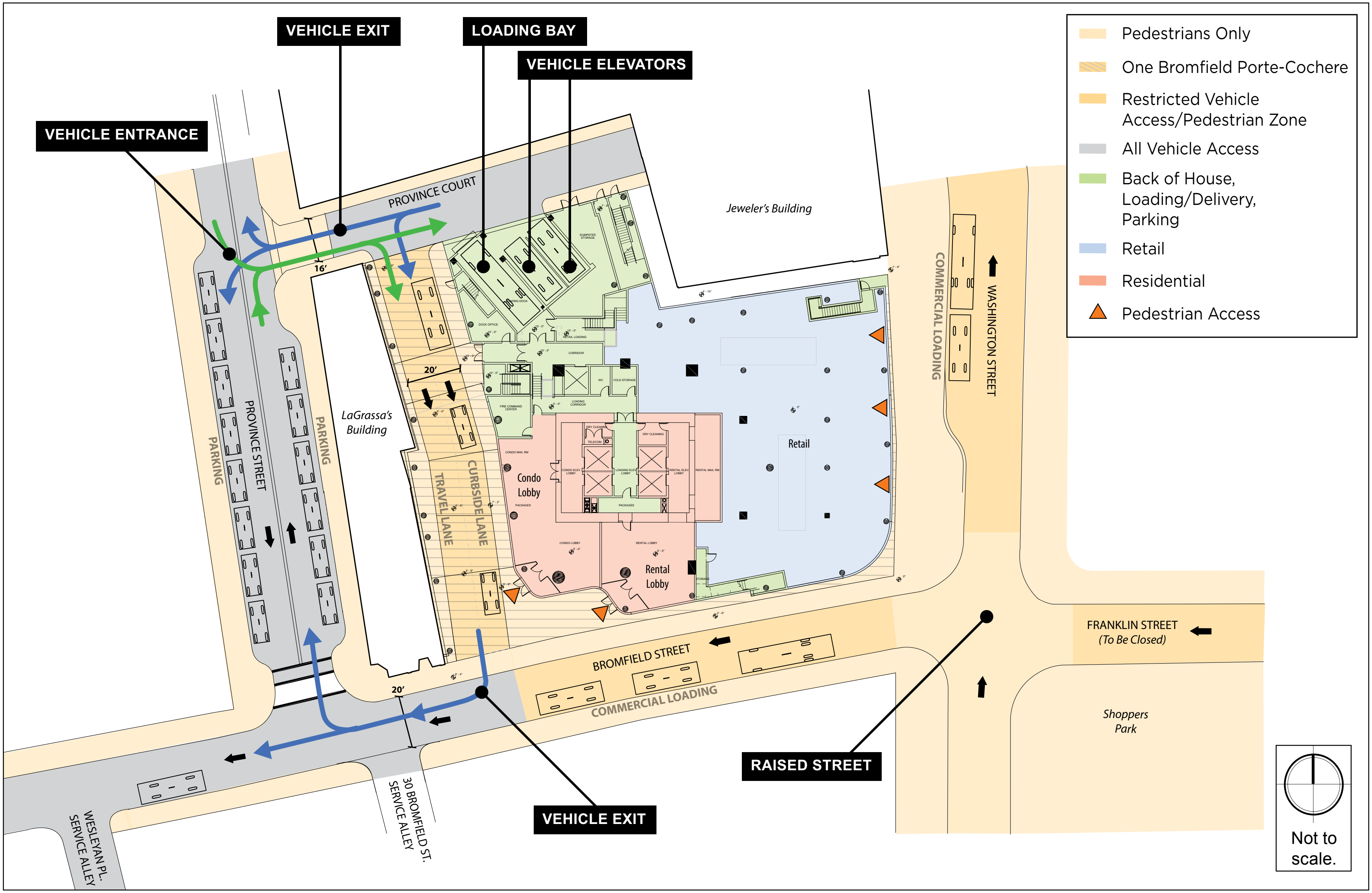

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Figure 3-15
Site Plan - Option 1, Existing Circulation

Project site plan in Figure 3-16, vehicular access to the Project Site will be via Bromfield Street. Within the porte-cochere, one travel lane will be provided for through traffic and one curbside lane will be provided for valet staging and taxicab activity. The eastern curb of the internal porte-cochere has a capacity for approximately six vehicles plus one space for a delivery vehicle.

Residential vehicles will enter the porte-cochere via Bromfield Street and garage attendants will take and park the vehicle. Vehicles will be transported via attendant-operated vehicular elevators accessed from Province Court. Garage attendants will also retrieve vehicles from the garage for residents when they depart. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. Only garage attendants will drive vehicles to and from the vehicle elevators. Taxicab drop-offs and pick-ups will occur within the porte-cochere.

Vehicles exiting the porte-cochere will turn onto Province Court, either right toward the garage or left toward Province Street.

3.4.1.3 Delivery Vehicles

Delivery vehicles will utilize the loading bay on Province Court or the designated delivery space in the porte-cochere. Delivery vehicles to the Project's loading dock will need to back into Province Court to access the loading dock. This same maneuver is required under existing conditions. Delivery trucks can also travel through the porte-cochere and park in the designated curbside loading space.

The proposed vehicle (automobile and truck) travel paths circulating into and out of the porte-cochere, the garage elevators, the loading bays, and Province Court, have been assessed using AUTOTURN, software that allows engineers to model vehicular maneuvers to ensure that all movements can be safely completed.

3.4.2 Trip Generation Methodology

Trip generation is a complex, multi-step process that produces an estimate of vehicle, transit, walk, and bicycle trips associated with a proposed development and a specific land use program. Following standard industry practice, and as required by the BTD, trip generation for the Project was derived from the Institute of Transportation Engineers' (ITE) Trip Generation (9th edition, 2012). The ITE rates produce vehicle trip estimates, which are converted to person trips based on vehicle occupancy rates (VOR). Using appropriate mode split information for this specific study area, the total person trips are then allocated to vehicle, transit, and walk/bicycle trips.

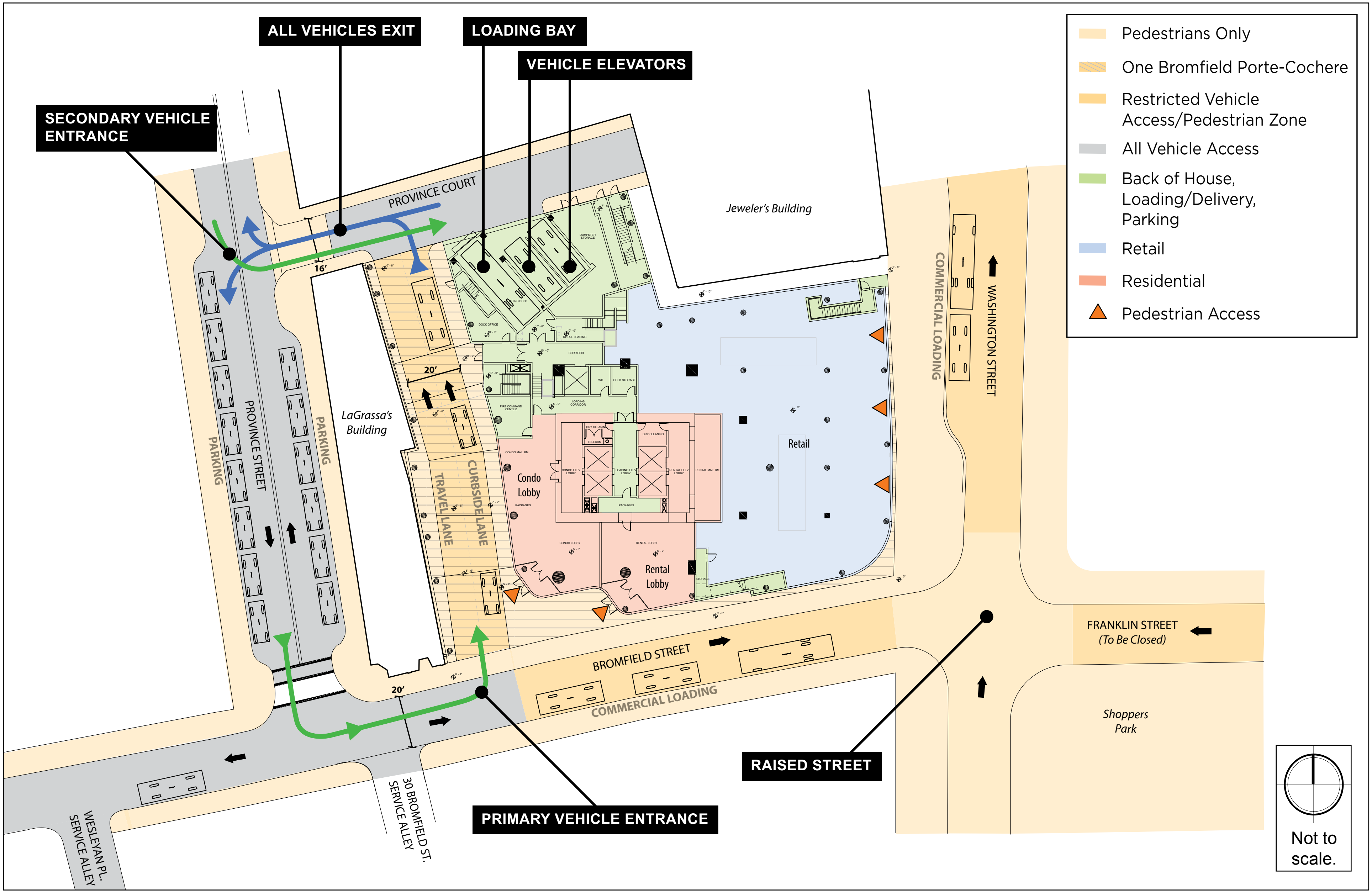

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Figure 3-16
Site Plan - Option 2, Proposed Circulation

When assessing a site with existing, active land uses, it is standard practice to estimate existing trips and subtract those trips from the projected future new trips. The result of this process yields "net new" trips that become the basis for traffic analysis and allows the study team to "take credit" for existing trip activity. Although the existing site at One Bromfield has both active and vacant space, no reduction has been applied to future trips. This approach yields the most conservative (higher impact) analysis results.

Trips associated with the new land uses on the site are based on the following land use codes (LUC):

Residential

- **Land Use Code 222 – High Rise Apartment.** High-rise apartments (rental dwelling units) are units located in rental buildings that have more than 10 levels (floors) and most likely have one or more elevators.
- **Land Use Code 232 – High Rise Condominium.** High-rise residential condominiums/townhouses are units located in buildings that have three or more levels (floors). Both condominiums and townhouses are included in this land use.

Retail

- **Land Use Code 820 – Shopping Center/Retail.** A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. Of the ITE retail categories, this one best suits the retail component proposed within the Project.

3.4.3 Travel Mode Share

The BTD publishes vehicle, transit, and travel mode shares specific to each area of Boston. The Project site is located within BTD Area 2. As is standard practice, these specific neighborhood mode shares are used to estimate the number of new vehicle trips, transit trips, and walk/bicycle trips generated by the Project. BTD's travel mode share data for Area 2 are shown in Table 3-13.

Table 3-13 Travel Mode Shares

Land Use	Direction	Walk Share	Transit Share	Vehicle Share[1)]	Vehicle Occupancy Rate [2)]
Daily					
Residential	In	42%	30%	28%	1.1
	Out	42%	30%	28%	1.1
Retail	In	59%	20%	21%	1.8
	Out	59%	20%	21%	1.8
a.m. Peak Hour					
Residential	In	7%	52%	41%	1.1
	Out	51%	18%	31%	1.1
Retail	In	14%	46%	40%	1.8
	Out	58%	10%	32%	1.8
p.m. Peak Hour					
Residential	In	51%	18%	31%	1.1
	Out	7%	52%	41%	1.1
Retail	In	58%	10%	32%	1.8
	Out	14%	46%	40%	1.8

1) includes automobiles and taxicabs
2) average persons per vehicle

3.4.4 Project Trip Generation

The Project's downtown location is close to many transit services and within walking distance to many employers, retail shops and restaurants, and cultural and educational institutions. As such, auto ownership rates for residents are expected to be low, with a correspondingly higher demand for taxicab (or other pay-for-service automobile transport) travel. As discussed later in Section 3.4.8, on-site parking will be provided at about 0.56 space/residential unit. Therefore, about 44% of units will not be provided with on-site parking and the associated residents will likely not own an automobile, instead relying on taxicabs (or other vehicle transport services) to make trips requiring a vehicle. To reflect this demand, the vehicle trips have been further disaggregated into private automobile trips and taxicab trips by assuming 56% of Project vehicle trips will be via private automobile and 44% via taxicab.

Table 3-14 shows the projected trip generation by land use and travel mode share for the proposed Project. The detailed trip generation is shown in Appendix B.

Table 3-14 Project Trip Generation

Land Use	Direction	Walk/ Bicycle Person Trips	Transit Person Trips	Vehicle Trips		
				Autos	Taxicabs	Total
Daily						
Residential	In	417	298	140	106	246
	Out	417	298	140	106	246
Retail	In	628	213	72	54	126
	Out	628	213	72	54	126
Total Daily	**In**	**1,045**	**511**	**212**	**160**	**372**
	Out	**1,045**	**511**	**212**	**160**	**372**
a.m. Peak Hour						
Residential	In	3	17	8	11	19
	Out	57	21	18	11	29
Retail	In	4	13	4	3	7
	Out	10	2	2	3	5
Total a.m. Peak Hour	**In**	**7**	**30**	**12**	**14**	**26**
	Out	**67**	**23**	**20**	**14**	**34**
p.m. Peak Hour						
Residential	In	40	14	12	9	21
	Out	4	29	12	9	21
Retail	In	46	8	8	7	15
	Out	10	33	8	7	15
Total p.m. Peak Hour	**In**	**86**	**22**	**20**	**16**	**36**
	Out	**14**	**62**	**20**	**16**	**36**

As shown, the estimated new daily vehicle trips generated by the Project will be 372 trips in and 372 trips out. Trip activity related to the Project will generally occur throughout the day, without a heavy concentration of trips during peak commuter travel periods. The Project is expected to generate 60 new vehicle trips during the a.m. peak hour and 72 new vehicle trips during the p.m. peak hour.

3.4.5 Vehicle Trip Distribution and Assignment

The trip distribution patterns for new vehicle trips generated by the Project were based on origin-destination data from BTD for Area 2 and knowledge of the local roadway network.

(Note that the on-site parking garage will be for residents and some mid-day retail visitors to the Project. Many of the new vehicle trips generated by the retail component of the Project (which are expected to be limited, given the transit-rich Project site) are expected to park in nearby public parking facilities, as shown in Figure 3-5. However, to provide a conservative (higher impact) traffic analysis, the vehicle trip distribution assigns retail trips to the Project Site rather than dispersing them throughout the study area.)

Two distribution patterns were developed to reflect vehicle circulation under Option 1 and Option 2, as described below.

3.4.5.1 Option 1 – Existing Circulation

Option 1 would maintain the existing street circulation, with Bromfield Street one-way westbound between Washington Street and Tremont Street. Because of upstream restrictions on Washington Street and Franklin Street, general traffic cannot legally travel to Bromfield Street via the Washington Street/Franklin Street intersection. The only vehicles legally permitted on the segment of Bromfield Street between Washington Street and Province Street are commercial vehicles (when permitted) and taxicabs. While travel regulations on this segment would continue to allow only commercial vehicles and taxicabs, historical traffic counts show that some general traffic does travel through this restricted zone unlawfully.

The automobile trip and taxicab trip distributions under Option 1 are mapped in Figure 3-17 and Figure 3-18, respectively. The two distributions are slightly different because taxicabs would be permitted to use Bromfield Street westbound, between Washington Street and Province Street.

3.4.5.2 Option 2 – Proposed Circulation

Under Option 2, the travel direction of Bromfield Street between the Project Site driveway and Washington Street would change to one-way eastbound. Travel on this segment would continue to be restricted to commercial vehicles and taxicabs. This change would allow commercial vehicles and taxicabs to turn left from Province Street onto Bromfield Street and

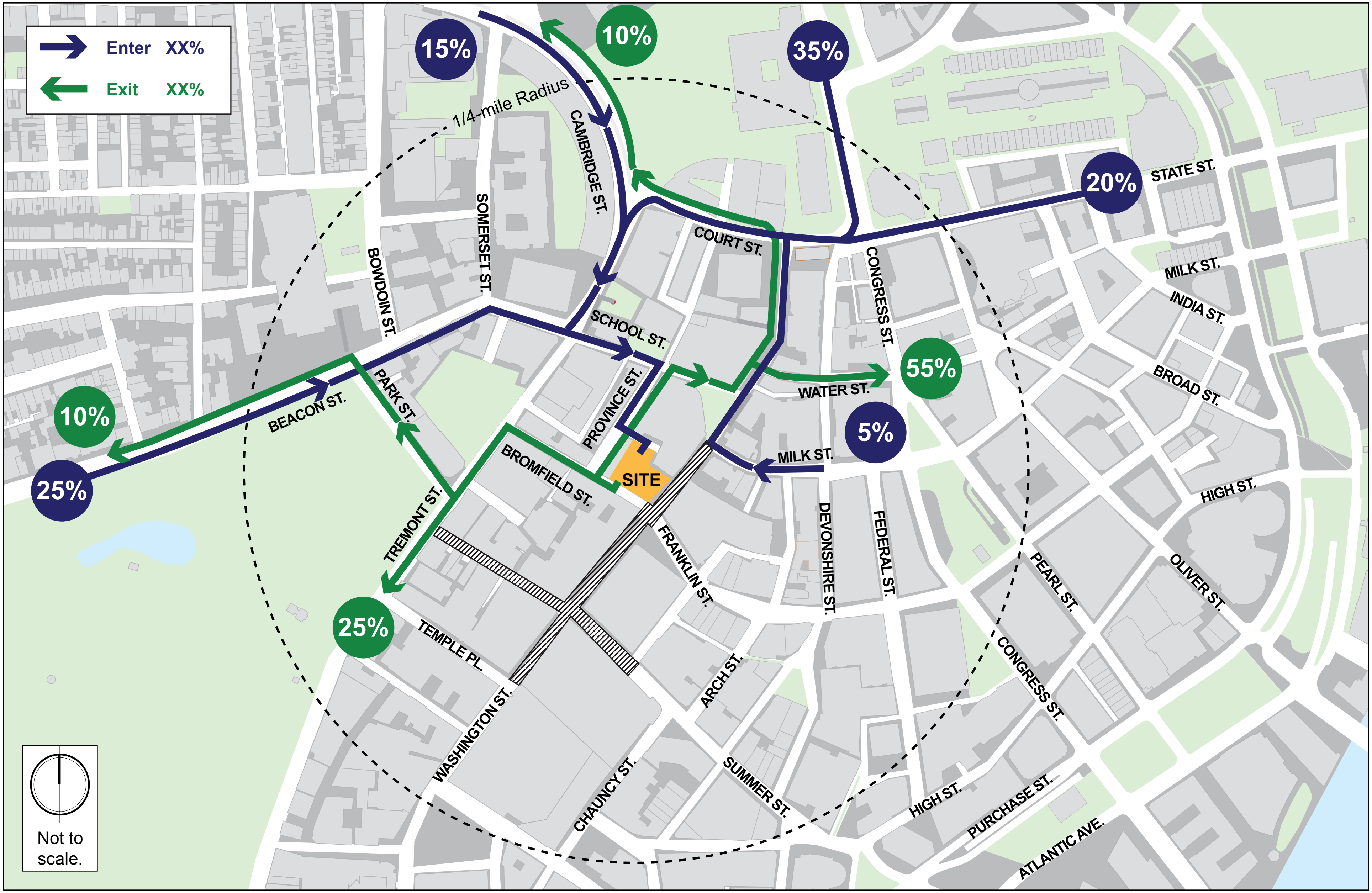

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Figure 3-17
Automobile Trip Distribution - Option 1

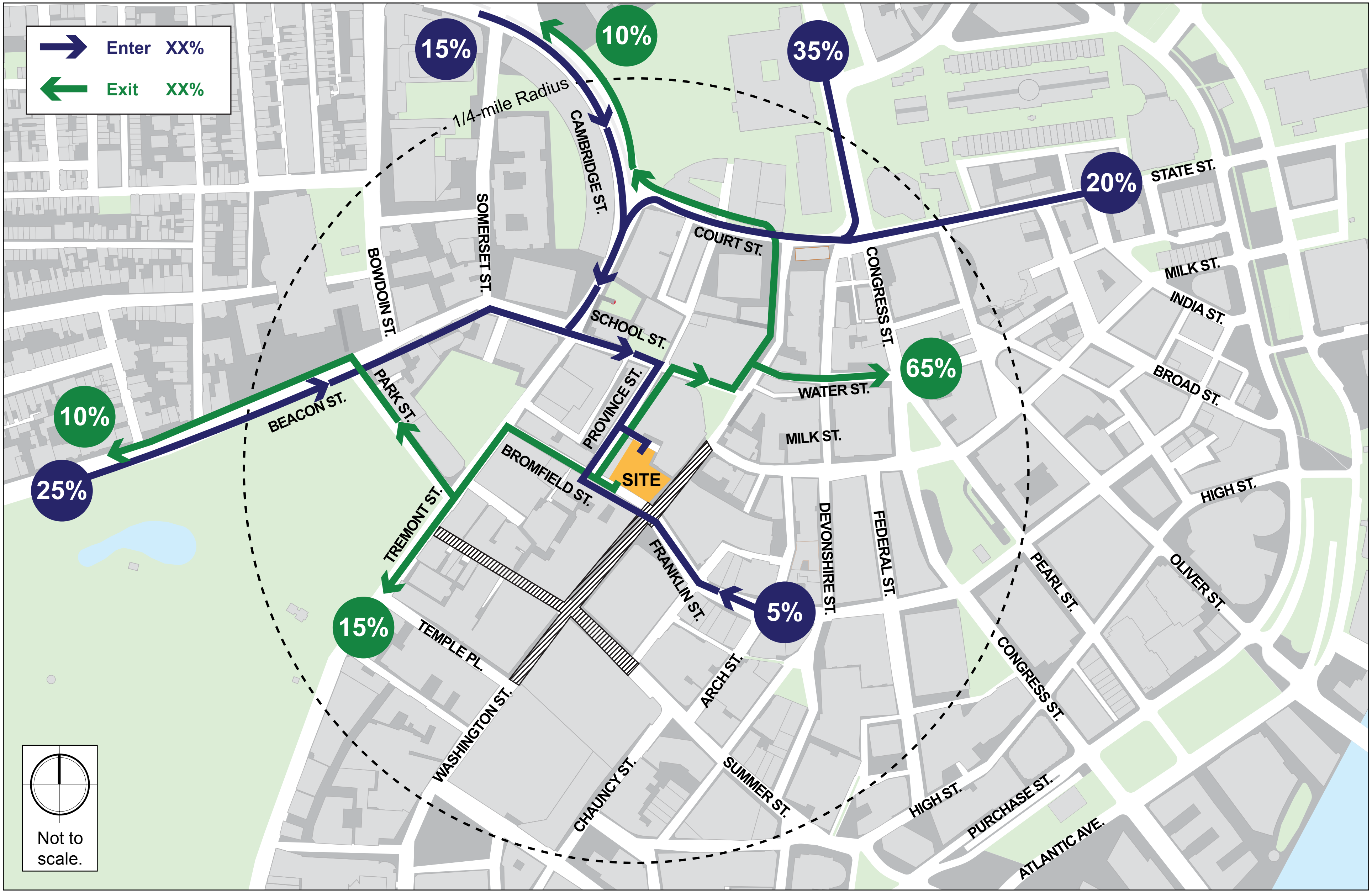

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Figure 3-18
Taxicab Trip Distribution - Option 1

either turn left into the Project driveway or continue on Bromfield Street and turn left onto Washington Street. The segment of Bromfield Street between Province Street and Tremont Street would remain one-way westbound (toward Tremont Street) and would continue to be open to general traffic.

Under Option 2, the travel paths of some non-Project vehicles would be affected. The reassignment of these trips has been incorporated into the vehicle trip distribution process and the Build (2021) Condition volumes for Option 2. See Appendix B for the a.m. and p.m. peak hour volume reassignment.

The automobile trip and taxicab trip distributions under Option 2 are mapped in Figure 3-19 and Figure 3-20, respectively. The two distributions are slightly different because taxicabs would be permitted to use Bromfield Street eastbound, between the Project Site driveway and Washington Street; however, general vehicles would be prohibited from using this roadway segment.

3.4.5.3 Vehicle Trip Assignment

For Option 1, the Project generated automobile vehicle trips are shown in Figure 3-21 and Figure 3-22, for the a.m. and p.m. peak hours, respectively. The associated taxicab trips are shown in Figure 3-23 and Figure 3-24 for the a.m. and p.m. peak hours, respectively.

Under Option 2, the Project generated automobile vehicle trips are shown in Figure 3-25 and Figure 3-26, for the a.m. and p.m. peak hours, respectively. The associated taxicab trips are shown in Figure 3-27 and 3-28 for the a.m. and p.m. peak hours, respectively.

3.4.6 Build (2021) Traffic Volumes

The peak hour Project generated trips for each option were assigned to the roadway network and added to the No-Build (2021) Condition volumes to develop the Build Condition volumes. Option 1 Build (2021) Condition traffic volumes are shown in Figure 3-29 and Figure 3-30 for the a.m. and p.m. peak hours, respectively. Option 2 Build (2021) Condition traffic volumes are shown in Figure 3-31 and Figure 3-32, respectively.

3.4.7 Build (2021) Condition Traffic Operations

The Build (2021) Condition analysis was based on the same methodology as the Existing Condition and No-Build (2021) Condition analysis. The resulting intersection capacity analysis summaries for Option 1 Build (2021) Condition are shown in Table 3-15 and Table 3-16 for a.m. and p.m. peak hours, respectively. The Option 2 Build (2021) Conditions are shown in Table 3-17 and Table 3-18, for a.m. and p.m. peak hours, respectively.

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Figure 3-19
Automobile Trip Distribution - Option 2

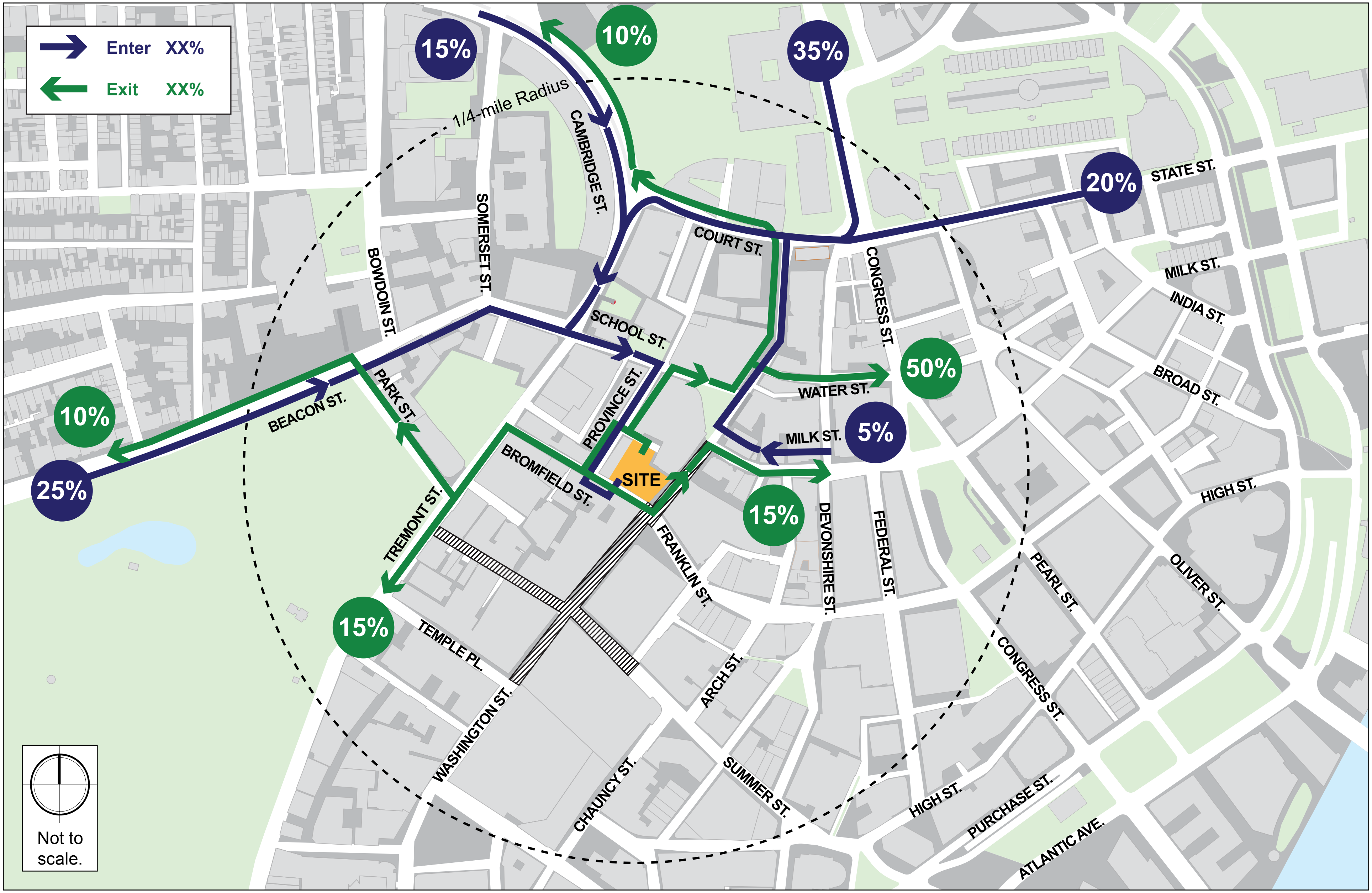

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Figure 3-20
Taxicab Trip Distribution - Option 2

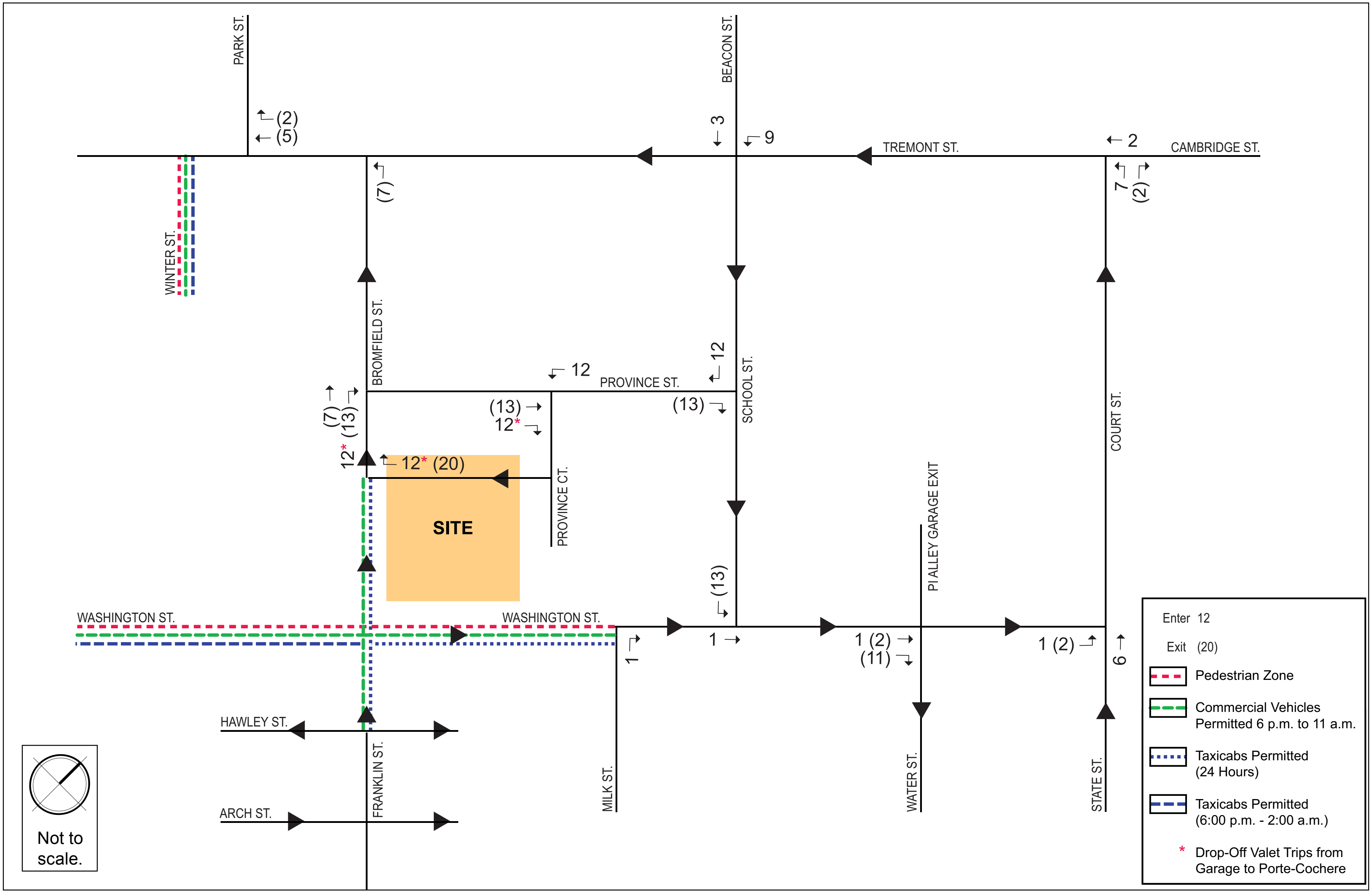

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Figure 3-21
Project Generated Vehicle Trips - Automobile, a.m. Peak Hour - Option 1

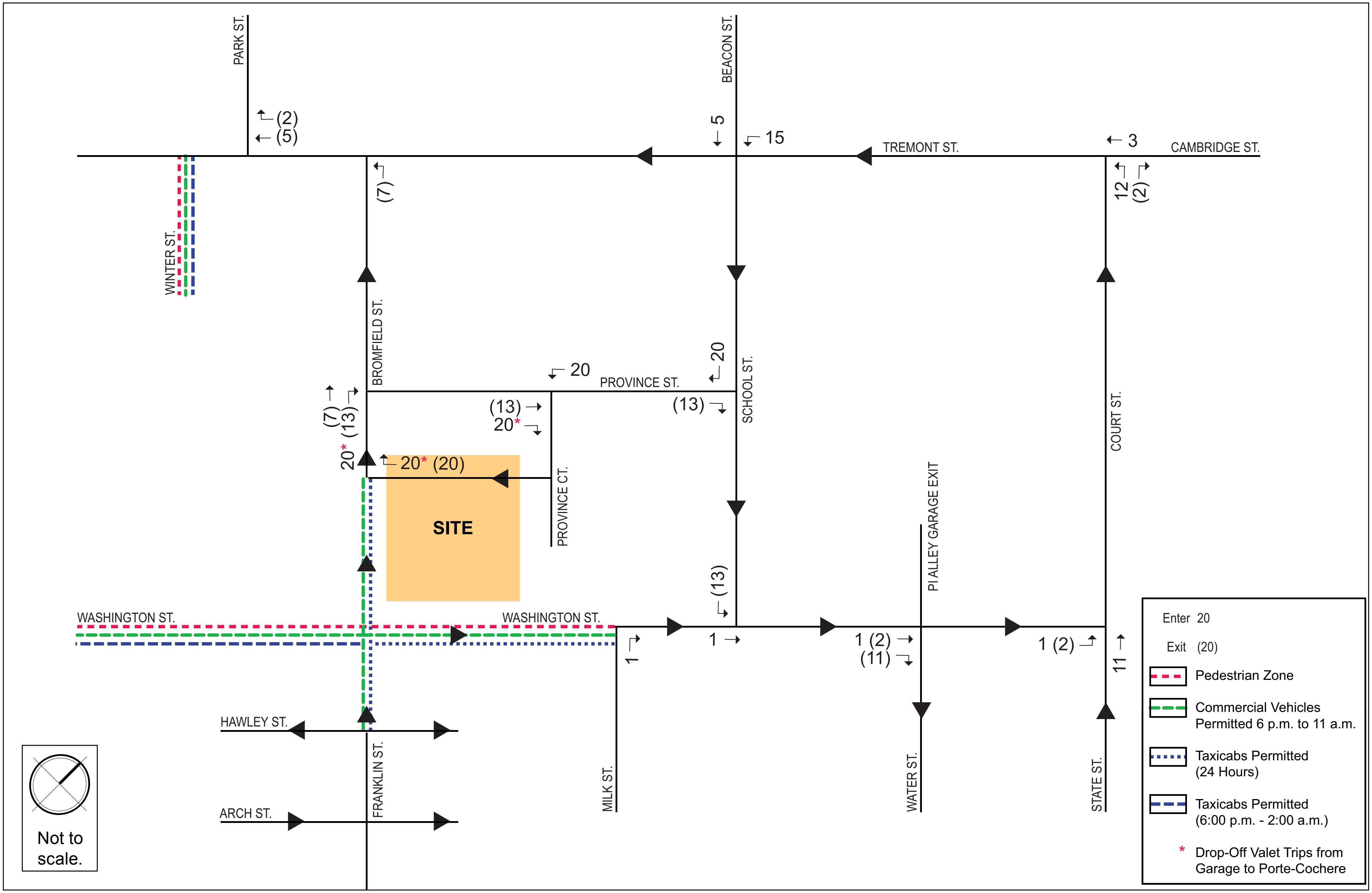

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Figure 3-22
Project Generated Vehicle Trips - Automobile, p.m. Peak Hour - Option 1

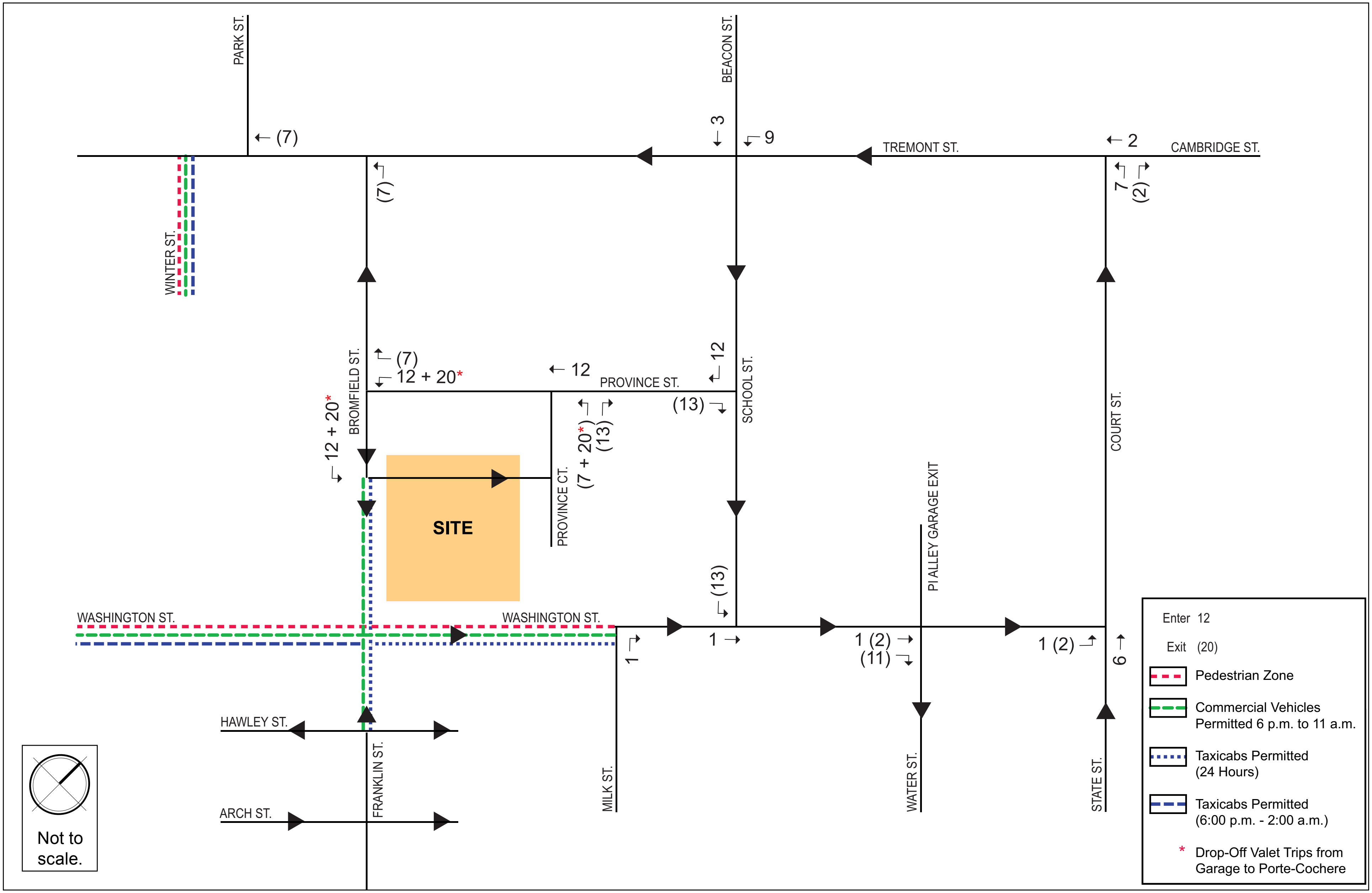

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Figure 3-25
Project Generated Vehicle Trips - Automobile, a.m. Peak Hour - Option 2

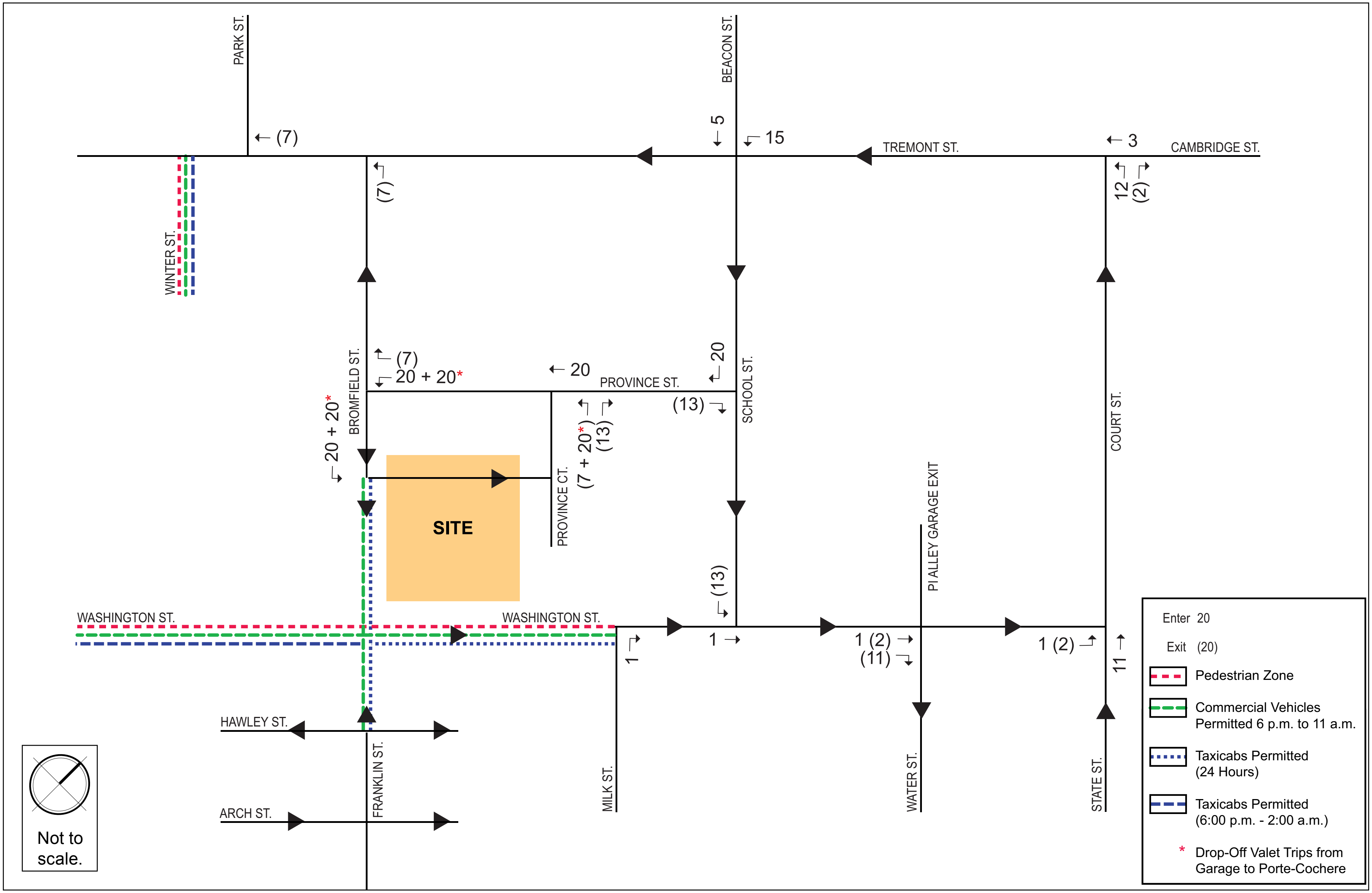

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Figure 3-26
Project Generated Vehicle Trips - Automobile, p.m. Peak Hour - Option 2

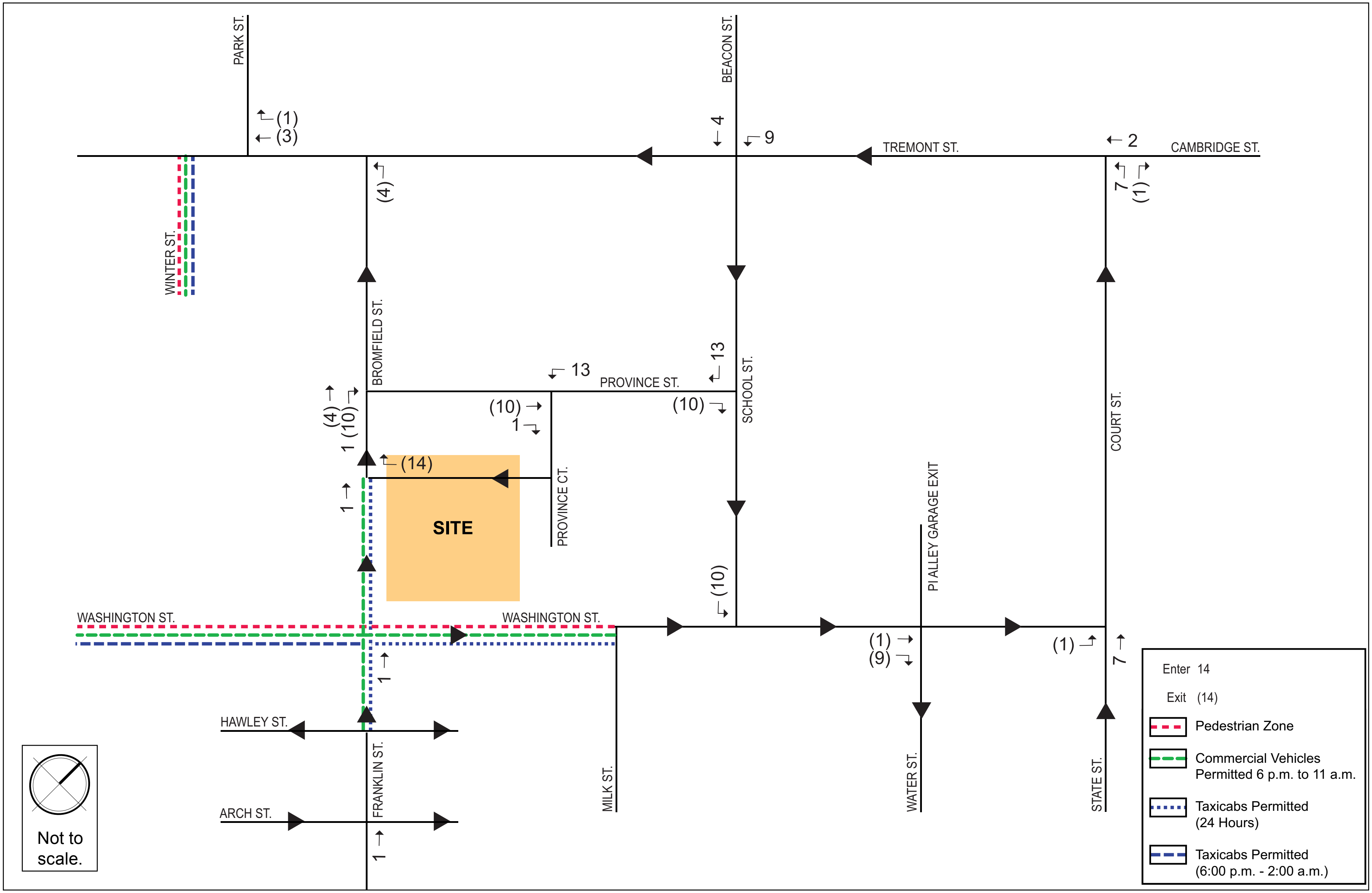

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Figure 3-23
Project Generated Vehicle Trips - Taxicabs, a.m. Peak Hour - Option 1

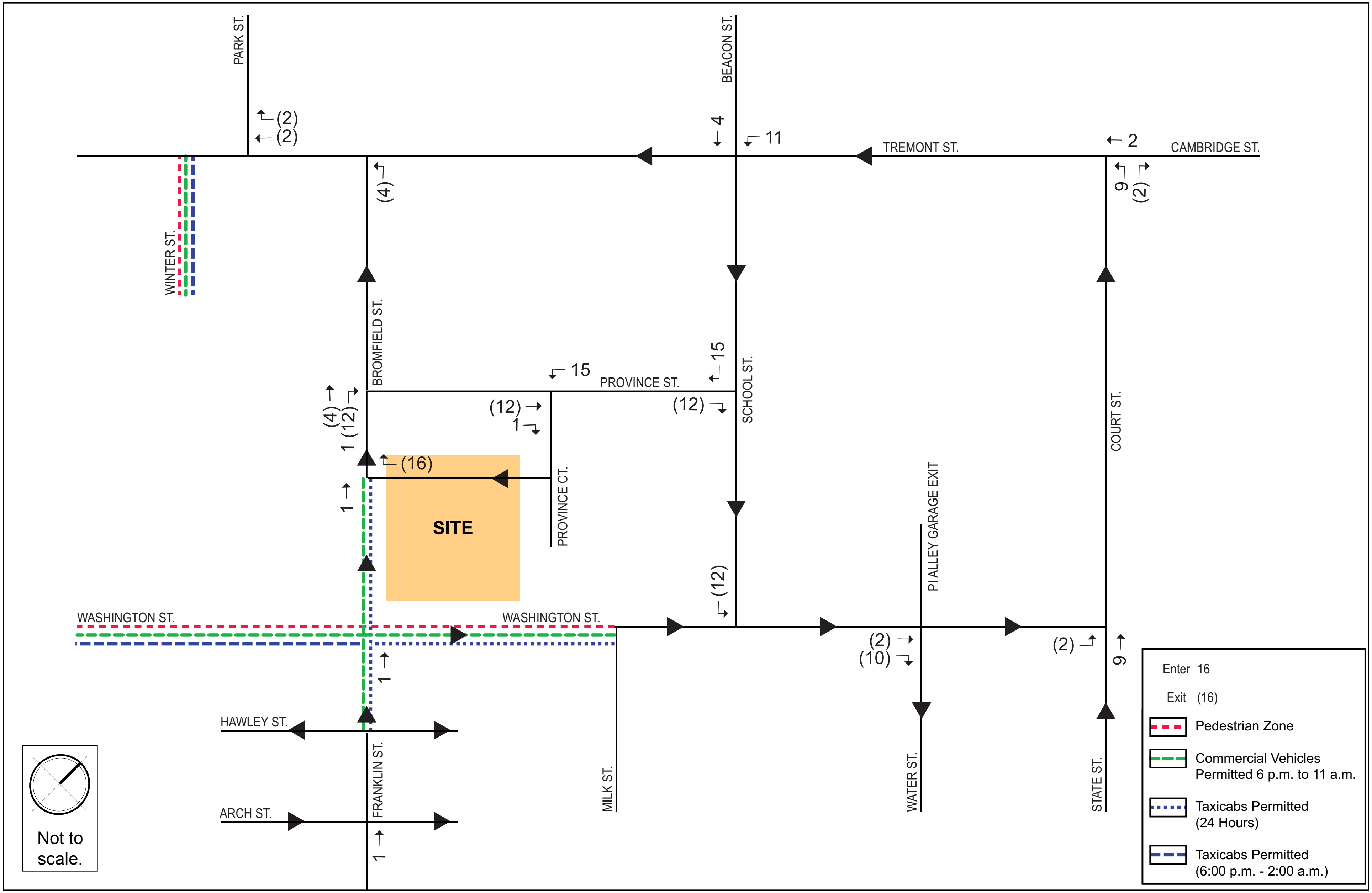

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Figure 3-24
Project Generated Vehicle Trips - Taxicabs, p.m. Peak Hour - Option 1

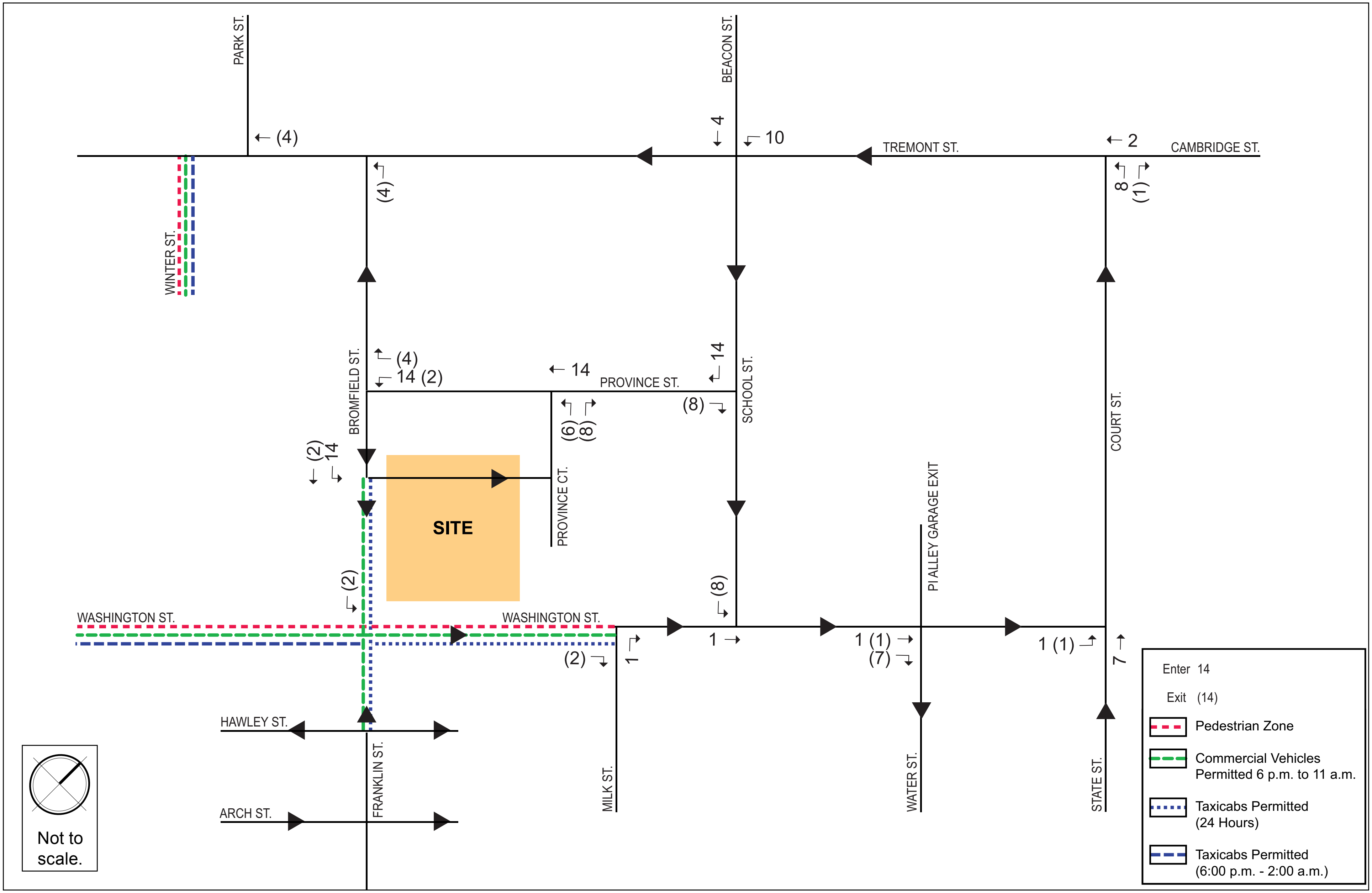

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Figure 3-27
Project Generated Vehicle Trips - Taxicabs, a.m. Peak Hour - Option 2

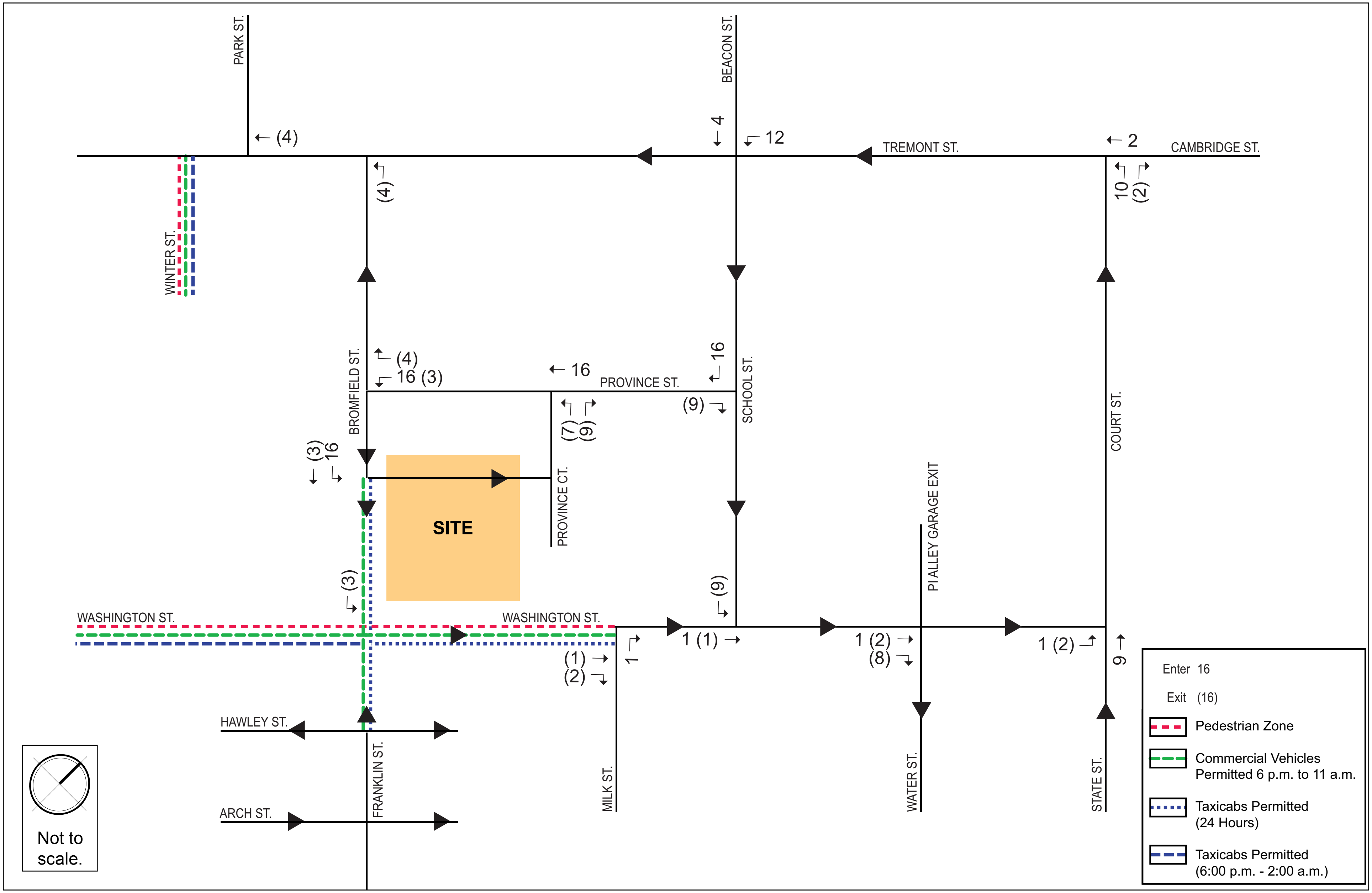

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Figure 3-28

Project Generated Vehicle Trips - Taxicabs, p.m. Peak Hour - Option 2

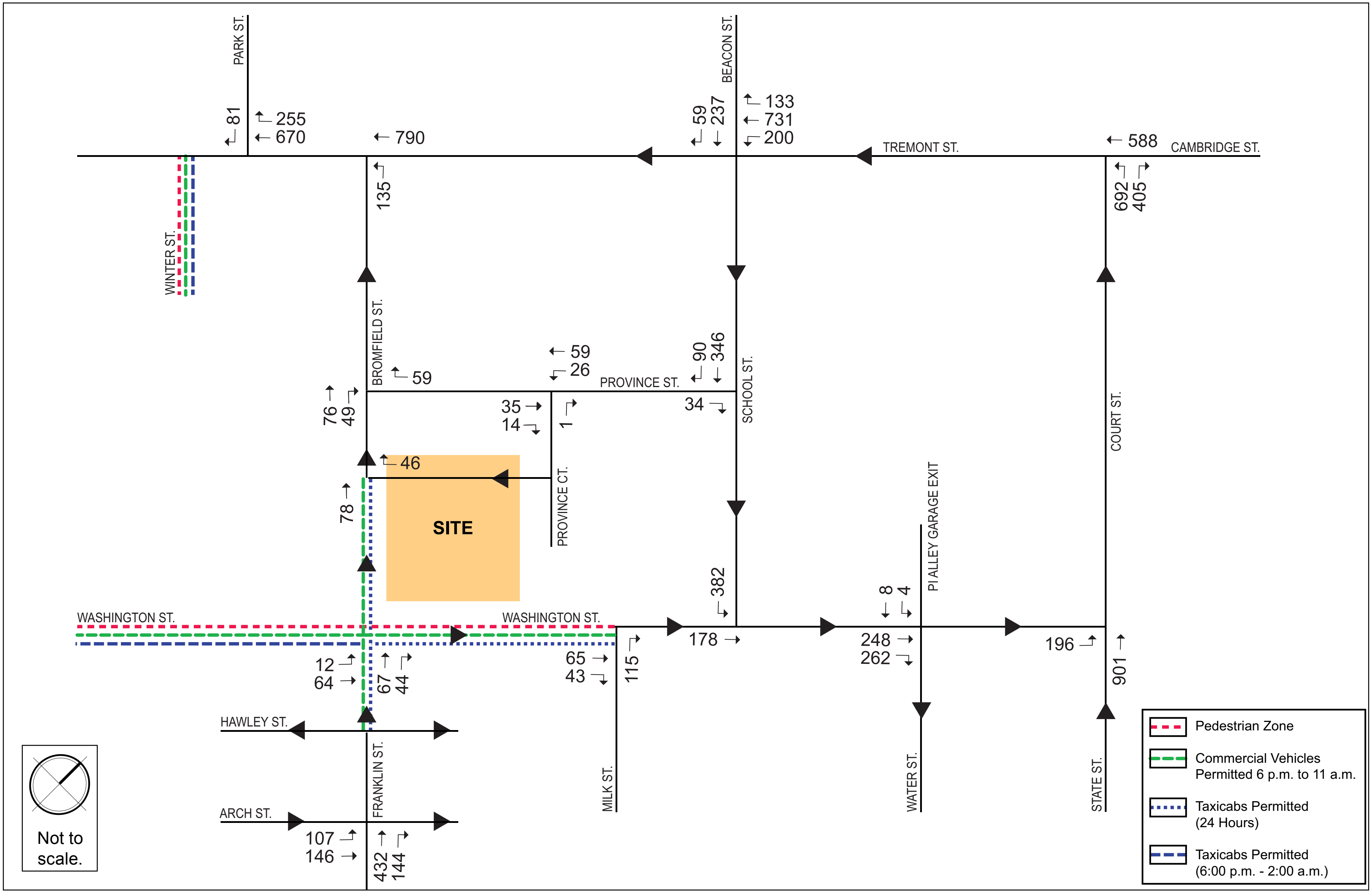

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Figure 3-29
Build (2021) Condition Traf.c Volumes, Weekday a.m. Peak Hour - Option 1

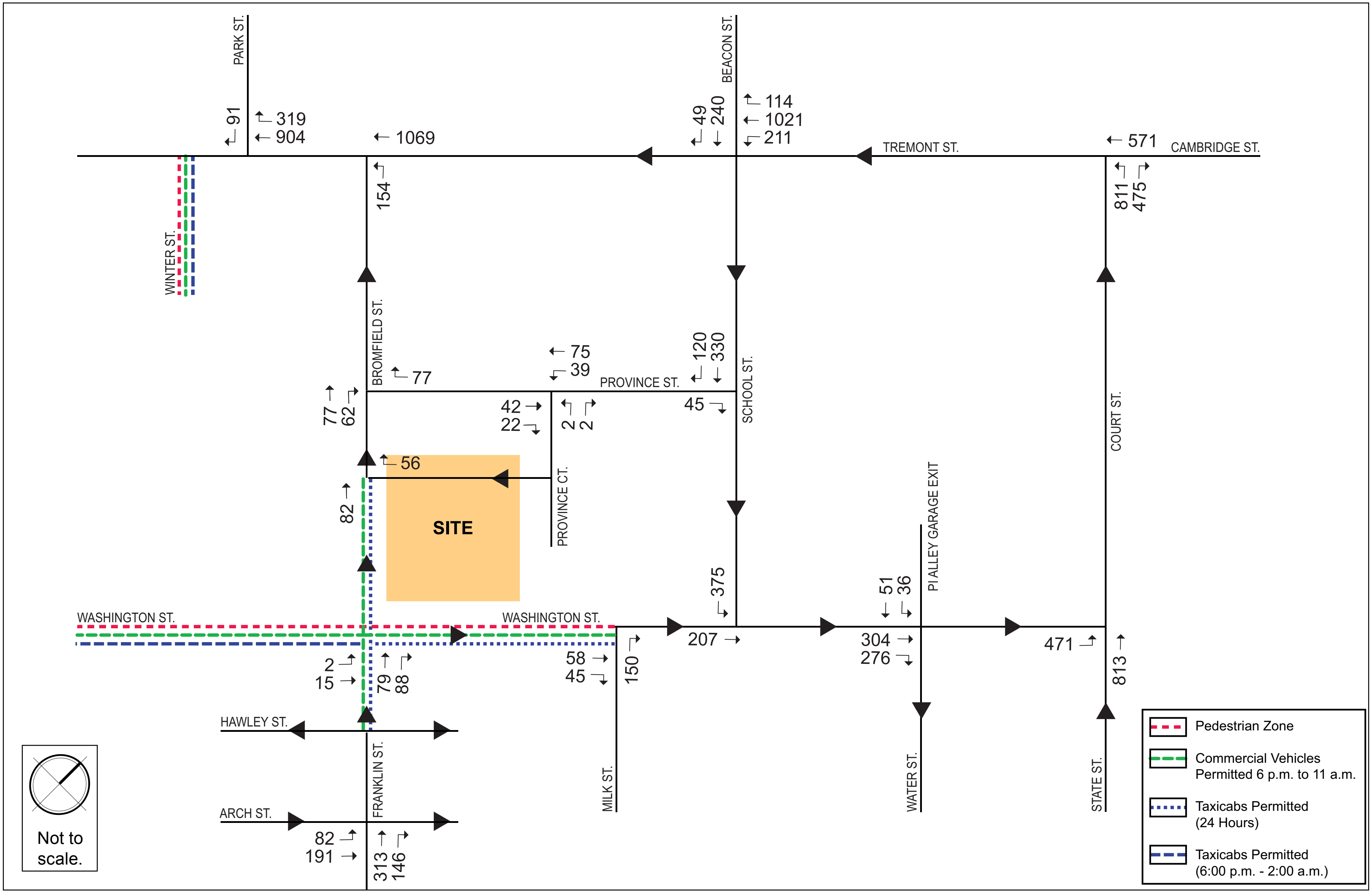

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Figure 3-30
Build (2021) Condition Traf.c Volumes, Weekday p.m. Peak Hour - Option 1

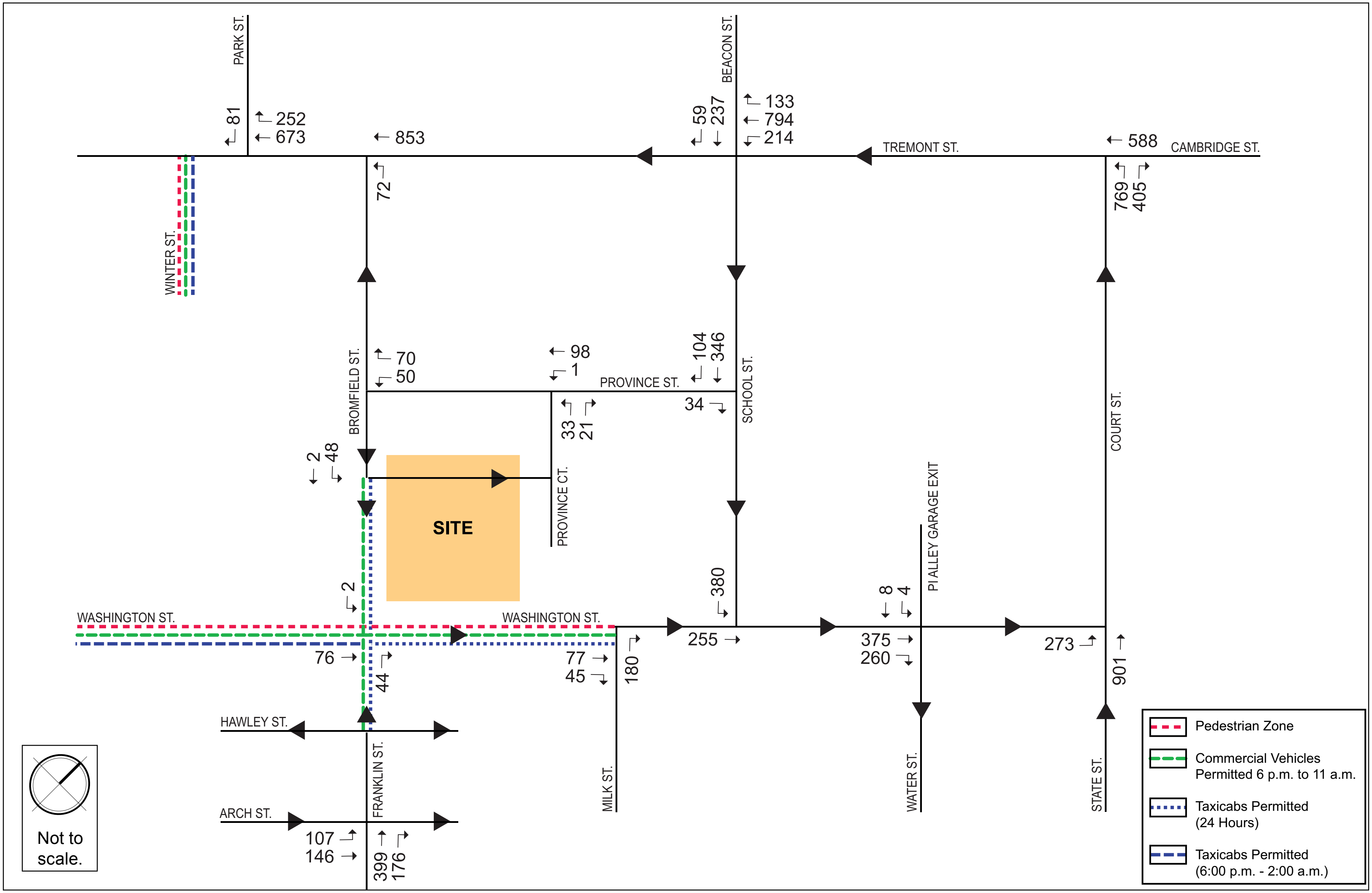

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Figure 3-31
Build (2021) Condition Traf.c Volumes, Weekday a.m. Peak Hour - Option 2

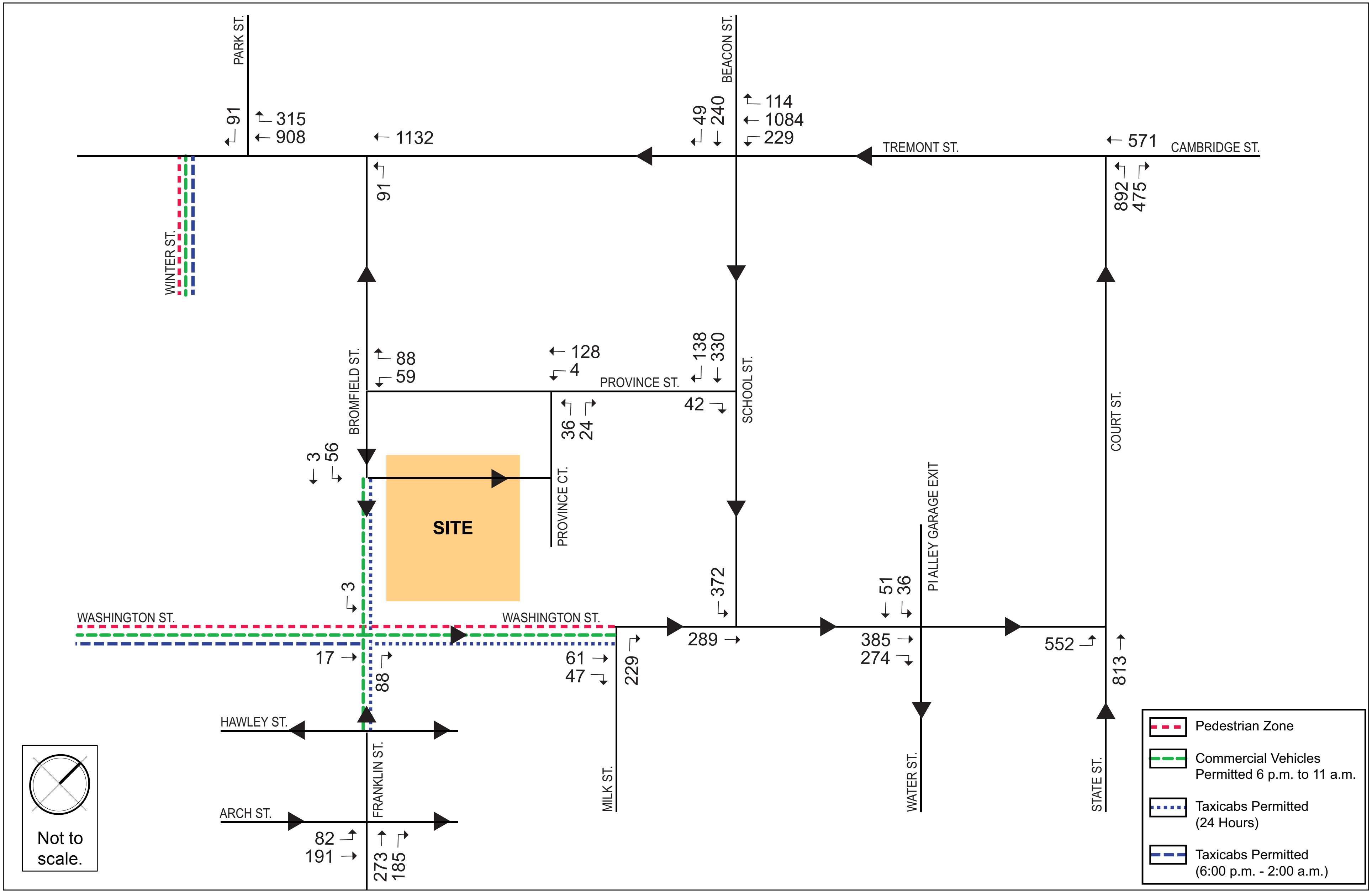

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Figure 3-32
Build (2021) Condition Traf.c Volumes, Weekday p.m. Peak Hour - Option 2

The tables show level of service, average delay, volume to capacity ratio, and 50th and 95th percentile queue lengths (feet) for the overall intersection and each approach. Complete Synchro reports are provided in Appendix B.

3.4.7.1 Option 1

During the a.m. peak hour, there would be no change in intersection level of service between No-Build and Build Conditions. However, during the p.m. peak hour, the Tremont Street/Court Street/Cambridge Street intersection overall level of service will worsen from LOS D to LOS E. Additionally, the Court Street westbound left | left/right turn lane would worsen from LOS D to LOS E. Further discussion of this intersection is presented in Section 3.6, Mitigation.

3.4.7.2 Option 2

Under Option 2, the Tremont Street/Court Street/Cambridge Street intersection would experience a minor change in level of service from No-Build (2021) Conditions. Overall operations at this intersection will remain at LOS D during the a.m. peak hour and worsen from LOS D to LOS E during the p.m. peak hour. Additionally, the Court Street westbound right turn lane would worsen to LOS E during the a.m. peak hour and LOS F during the p.m. peak hour. Further discussion of this intersection is presented in Section 3.6, Mitigation.

Table 3-15 Build (2021) Condition, Capacity Analysis Summary, a.m. Peak Hour – Option 1

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**D**	**48.7**			
Court WB left|left/right	D	42.8	0.89	276	#364
Court WB right	D	54.9	0.89	249	#407
Cambridge SB thru|thru	D	52.9	0.89	198	#290
Tremont Street/Beacon Street/School Street [1]	**B**	**17.2**			
Beacon EB thru/right	D	44.5	0.81	183	#264
Tremont SB left	A	6.3	0.43	0	50
Tremont SB thru | thru	B	10.6	0.45	116	157
Tremont SB right	A	3.5	0.33	0	24

Table 3-15 Build (2021) Condition, Capacity Analysis Summary, a.m. Peak Hour – Option 1 (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Bromfield Street	**B**	**10.4**			
Bromfield WB left	D	44.6	0.62	87	130
Tremont SB thru|thru|thru	A	4.0	0.27	41	53
Tremont Street/Park Street	**C**	**22.4**			
Park EB right	D	52.3	0.61	58	93
Tremont SB thru|thru|thru/right	B	19.4	0.64	115	133
Washington Street/School Street	**B**	**12.7**			
School EB left	A	9.2	0.46	70	126
Washington NB thru	B	19.2	0.47	46	68
Franklin Street/Arch Street	**A**	**10.0**			
Franklin WB thru| thru/right	A	5.2	0.31	36	80
Arch NB left/thru	C	20.8	0.66	55	111
Washington Street/Milk Street	**A**	**6.7**			
Milk WB right	A	0.2	0.10	0	0
Washington NB thru/right	B	13.6	0.29	19	54
Washington Street/Court Street	**B**	**12.0**			
Court WB thru | thru	B	10.9	0.48	171	216
Washington NB left	B	16.8	0.35	26	111
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	C	18.0	0.08	-	6
Washington NB thru/right	A	0.0	0.37	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.26	-	0
Province NB right	C	20.4	0.18	-	16
Province Street/Province Court					
Province Ct WB left/right	A	9.7	0.01	-	0
Province St NB thru/right	A	0.0	0.07	-	0
Province St SB left/thru	A	2.7	0.04	-	3
Province Street/Bromfield Street					
Bromfield WB thru/right	A	0.0	0.10	-	0
Province SB right	C	19.1	0.28	-	28
Bromfield Street/Site Driveway					
Bromfield WB thru	A	0.0	0.05	-	0
Site Driveway SB right	A	8.9	0.05	-	4

Table 3-15 Build (2021) Condition, Capacity Analysis Summary, a.m. Peak Hour – Option 1 (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Washington Street/Bromfield Street/Franklin Street					
Franklin WB thru/right	A	7.5	0.13	-	-
Washington NB left/thru	A	7.7	0.10	-	-

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates a decrease in level of service from No-Build (2021) Condition.

Table 3-16 Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour – Option 1

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**E**	**55.2**			
Court WB left|left/right	E	55.1	0.97	~330	#470
Court WB right	E	69.3	0.97	~298	m#498
Cambridge SB thru|thru	D	46.4	0.84	200	247
Tremont Street/Beacon Street/School Street [1]	**B**	**10.5**			
Beacon EB thru/right	D	35.1	0.62	158	250
Tremont SB left	B	10.1	0.38	38	m50
Tremont SB thru | thru	A	5.1	0.61	42	m46
Tremont SB right	A	1.1	0.29	0	m0
Tremont Street/Bromfield Street	**A**	**8.7**			
Bromfield WB left	D	51.2	0.67	108	159
Tremont SB thru|thru|thru	A	2.0	0.33	4	94
Tremont Street/Park Street	**C**	**24.9**			
Park EB right	D	43.9	0.42	57	108
Tremont SB thru|thru|thru/right	C	23.5	0.71	256	332
Washington Street/School Street	**B**	**13.0**			
School EB left	A	9.9	0.47	73	131
Washington NB thru	B	18.5	0.44	49	84
Franklin Street/Arch Street	**B**	**11.0**			
Franklin WB thru| thru/right	A	4.5	0.25	24	57
Arch NB left/thru	C	22.0	0.69	62	121
Washington Street/Milk Street	**A**	**5.4**			
Milk WB right	A	0.2	0.13	0	0
Washington NB thru/right	B	13.0	0.27	16	51

Table 3-16 Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour – Option 1 (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet) 50th percentile	Queue length (feet) 95th percentile
Signalized Intersections					
Washington Street/Court Street	**B**	**18.7**			
Court WB thru | thru	B	11.5	0.46	147	191
Washington NB left	C	31.1	0.78	207	#349
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	C	22.6	0.35	-	37
Washington NB thru/right	A	0.0	0.36	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.28	-	0
Province NB right	C	20.5	0.29	-	29
Province Street/Province Court					
Province Ct WB left/right	B	11.4	0.01	-	1
Province St NB thru/right	A	0.0	0.05	-	0
Province St SB left/thru	A	3.0	0.04	-	3
Province Street/Bromfield Street					
Bromfield WB thru/right	A	0.0	0.10	-	0
Province SB right	C	21.3	0.28	-	28
Bromfield Street/Site Driveway					
Bromfield WB thru	A	0.0	0.05	-	0
Site Driveway SB right	A	9.0	0.06	-	5
Washington Street/Bromfield Street/Franklin Street					
Franklin WB thru/right	A	7.5	0.18	-	-
Washington NB left/thru	A	7.4	0.02	-	-

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates a decrease in level of service from No-Build (2021) Condition.

Table 3-17 Build (2021) Condition, Capacity Analysis Summary, a.m. Peak Hour – Option 2

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**D**	**54.3**			
Court WB left|left/right	D	49.9	0.94	304	#405
Court WB right	E	66.0	0.95	276	#449
Cambridge SB thru|thru	D	52.9	0.89	198	#290
Tremont Street/Beacon Street/School Street [1]	**B**	**17.1**			
Beacon EB thru/right	D	44.5	0.81	183	#264
Tremont SB left	A	6.0	0.43	0	52
Tremont SB thru | thru	B	11.3	0.49	131	176
Tremont SB right	A	3.5	0.33	0	24
Tremont Street/Bromfield Street	**A**	**6.6**			
Bromfield WB left	D	39.7	0.38	44	83
Tremont SB thru|thru|thru	A	3.5	0.28	45	54
Tremont Street/Park Street	**C**	**20.4**			
Park EB right	D	52.3	0.61	58	93
Tremont SB thru|thru|thru/right	B	17.2	0.64	104	120
Washington Street/School Street	**B**	**18.8**			
School EB left	A	9.2	0.46	70	125
Washington NB thru	C	31.5	0.67	72	106
Franklin Street/Arch Street	**A**	**9.7**			
Franklin WB thru| thru/right	A	4.9	0.31	33	74
Arch NB left/thru	C	20.8	0.66	55	111
Washington Street/Milk Street	**A**	**6.0**			
Milk WB right	A	0.3	0.16	0	0
Washington NB thru/right	B	14.3	0.32	22	60
Washington Street/Court Street	**B**	**13.4**			
Court WB thru | thru	B	10.9	0.48	171	216
Washington NB left	C	21.5	0.49	90	167
Unsignalized Intersections					
Washington Street/Water Street/ Garage Exit					
Garage Exit EB left/thru	C	20.0	0.09	-	7
Washington NB thru/right	A	0.0	0.42	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.27	-	0
Province NB right	C	20.4	0.17	-	15

Table 3-17 Build (2021) Condition, Capacity Analysis Summary, a.m. Peak Hour – Option 2 (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Province Street/Province Court					
Province Ct WB left/right	B	12.4	0.31	-	33
Province St SB left/thru	A	0.1	0.00	-	0
Province Street/Bromfield Street					
Province SB left/right	C	22.1	0.49	-	66
Washington Street/Bromfield Street/ Franklin Street					
Bromfield EB left	A	7.4	0.00	-	-
Franklin WB right	A	6.7	0.05	-	-
Washington NB thru	A	7.4	0.09	-	-

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates a decrease in level of service from No-Build (2021) Condition.

Table 3-18 Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour – Option 2

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Tremont Street/Cambridge Street/Court Street	**E**	**64.9**			
Court WB left|left/right	E	68.8	1.03	~383	m#487
Court WB right	F	83.5	1.03	~345	m#494
Cambridge SB thru|thru	D	46.4	0.84	200	247
Tremont Street/Beacon Street/School Street [1]	**B**	**11.0**			
Beacon EB thru/right	D	35.1	0.62	158	250
Tremont SB left	B	11.9	0.41	50	m60
Tremont SB thru | thru	A	5.8	0.65	46	m49
Tremont SB right	A	1.0	0.29	0	m0
Tremont Street/Bromfield Street	**A**	**4.5**			
Bromfield WB left	D	47.0	0.48	63	109
Tremont SB thru|thru|thru	A	0.8	0.34	3	7
Tremont Street/Park Street	**C**	**23.4**			
Park EB right	D	43.9	0.42	57	108
Tremont SB thru|thru|thru/right	C	21.9	0.71	239	321
Washington Street/School Street	**B**	**18.3**			
School EB left	A	9.8	0.47	73	130
Washington NB thru	C	29.2	0.61	77	125

Table 3-18 Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour – Option 2 (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet) 50th percentile	Queue length (feet) 95th percentile
Signalized Intersections					
Franklin Street/Arch Street	**B**	**10.5**			
Franklin WB thru| thru/right	A	3.6	0.25	18	47
Arch NB left/thru	C	22.0	0.69	62	121
Washington Street/Milk Street	**A**	**4.5**			
Milk WB right	A	0.4	0.21	0	0
Washington NB thru/right	B	13.0	0.28	17	52
Washington Street/Court Street	**C**	**25.8**			
Court WB thru | thru	B	11.6	0.46	147	191
Washington NB left	D	46.9	0.92	281	#500
Unsignalized Intersections					
Washington Street/Water Street/Garage Exit					
Garage Exit EB left/thru	D	26.5	0.39	-	45
Washington NB thru/right	A	0.0	0.41	-	0
School Street/Province Street					
School EB thru/right	A	0.0	0.30	-	0
Province NB right	C	20.4	0.27	-	27
Province Street/Province Court					
Province Ct WB left/right	A	0.2	0.00	-	0
Province St SB left/thru	B	12.0	0.19	-	17
Province Street/Bromfield Street					
Province SB left/right	C	23.0	0.45	-	56
Washington Street/Bromfield Street/Franklin Street					
Bromfield EB left	A	7.3	0.00	-	-
Franklin WB right	A	6.7	0.09	-	-
Washington NB thru	A	7.2	0.02	-	-

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates a decrease in level of service from No-Build (2021) Condition.

3.4.7.3 Alternative for Franklin Street Operation

In August 2015, Franklin Street between Hawley Street and Washington Street was temporarily closed due to construction activity associated with the Millennium Tower project. The Build (2021) Condition analysis results presented in Table 3-15 through Table 3-18 reflect a condition where Franklin Street reopens with its current vehicle restrictions (as described in Section 3.2.1).

Recent City agency discussions indicate, however, that when the Millennium Tower construction is complete, this segment of Franklin Street may not be reopened by the City to any vehicular traffic. The impacts associated with this possibility have been evaluated by reassigning Franklin Street traffic through adjacent intersections and conducting intersection level of service for the affected study intersections.

The operational results of closing Franklin Street under Option 1 are shown in Table 3-19 and Table 3-20 for the a.m. and p.m. peak hours, respectively. Similarly, the results under Option 2 are shown in Table 3-21 and Table 3-22, for the a.m. and p.m. peak hours, respectively. Under either option, all movements would operate at LOS C or better.

Table 3-19 Build (2021) Condition with Franklin Street Closed, Capacity Analysis Summary, a.m. Peak Hour – Option 1

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Franklin Street/Arch Street	**A**	**9.8**			
Franklin WB thru| thru/right	A	4.4	0.28	27	63
Arch NB left/thru	C	20.8	0.66	55	111
Washington Street/Milk Street	**A**	**4.2**			
Milk WB right	A	0.2	0.12	0	0
Washington NB thru/right	B	11.2	0.22	10	40

Table 3-20 Build (2021) Condition with Franklin Street Closed, Capacity Analysis Summary, p.m. Peak Hour – Option 1

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet)	
				50th percentile	95th percentile
Signalized Intersections					
Franklin Street/Arch Street	**B**	**11.0**			
Franklin WB thru| thru/right	A	3.0	0.21	12	35
Arch NB left/thru	C	22.0	0.69	62	121
Washington Street/Milk Street	**A**	**2.4**			
Milk WB right	A	0.3	0.16	0	0
Washington NB thru/right	A	9.2	0.17	4	29

Table 3-21 Build (2021) Condition with Franklin Street Closed, Capacity Analysis Summary, a.m. Peak Hour – Option 2

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet) 50th percentile	Queue length (feet) 95th percentile
Signalized Intersections					
Franklin Street/Arch Street	**A**	**9.6**			
Franklin WB thru| thru/right	A	4.4	0.29	27	64
Arch NB left/thru	C	20.8	0.66	55	111
Washington Street/Milk Street	**A**	**5.2**			
Milk WB right	A	0.4	0.17	0	0
Washington NB thru/right	B	13.7	0.29	19	54

Table 3-22 Build (2021) Condition with Franklin Street Closed, Capacity Analysis Summary, p.m. Peak Hour – Option 2

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet) 50th percentile	Queue length (feet) 95th percentile
Signalized Intersections					
Franklin Street/Arch Street	**B**	**10.8**			
Franklin WB thru| thru/right	A	3.0	0.22	13	37
Arch NB left/thru	C	22.0	0.69	62	121
Washington Street/Milk Street	**A**	**3.2**			
Milk WB right	A	0.5	0.22	0	0
Washington NB thru/right	B	11.3	0.22	11	40

3.4.8 Build (2021) Parking Conditions

Approximately 235 on-site parking spaces will be provided for residents. While the maximum recommended BTD parking demand ratio for residential developments in this area is 0.5 to 1.0 spaces per unit, HSH has conducted parking supply and demand surveys and observations at existing residential buildings throughout Boston indicating that demand is often less than 0.5 spaces per unit. This trend, combined with the Project site's proximity to transit and other downtown destinations, supports the plan to supply only a limited number of parking spaces for on-site residential use.

On-site parking will be provided for residents at about 0.56 space/residential unit. Therefore, about 44% of units will not be provided with on-site parking. These residents will likely not own an automobile, and instead will rely on taxicabs, or other vehicle transport services, such as Uber or Zipcar to make trips requiring a vehicle.

Residents will drive to the porte-cochere (see Figure 3-15 and Figure 3-16) and garage attendants will take and park their vehicles. Vehicles will be transported via attendant-operated vehicular elevators accessed from Province Court. Garage attendants will also retrieve vehicles from the garage for residents when they depart. The garage elevators will have capacity for two vehicles. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. The curbside lane of the internal porte-cochere has capacity for approximately six vehicles plus one space for delivery vehicle, as discussed in Section 3.4.1.

During the mid-day, when some residential vehicles have vacated the garage, some parking for visitors to the on-site retail businesses will be available. Visitors will drop-off their vehicle within the porte-cochere and it will be parked by garage attendants. The remaining retail parkers generated by on-site retail are expected to use nearby public parking facilities in the area, as shown in Figure 3-5. No public parking will be provided on-site.

Any additional parking activity generated by the net increase in retail space can be accommodated at publicly available parking facilities in the area, as shown in Figure 3-5.

3.4.9 Build (2021) Public Transportation Conditions

As shown in Table 3-14, the Project will generate an estimated 1,022 public transportation person trips daily, with 53 new trips during the a.m. peak hour and 84 new trips during the p.m. peak hour. Given the variety and frequency of transit services in the area, including the Green Line, Orange Line, Red Line, and MBTA bus routes, the estimated increase in transit riders can adequately be served by existing transit options.

3.4.10 Build (2021) Pedestrian Conditions

The Project's main residential access will be located in the porte-cochere and can be accessed from Bromfield Street. Storefront retail will have doors along Washington Street and Bromfield Street.

As shown in Table 3-14, the Project will generate 3,112 new pedestrian trips (walk and transit trips) over the course of the day, 127 trips during the a.m. peak hour, and 184 trips during the p.m. peak hour. These pedestrian trips will be distributed among the building's residential entrance as well as street-level doorways that will serve the retail businesses. These additional pedestrian trips will not affect the pedestrian environment in the Downtown Crossing area.

3.4.11 Build (2021) Bicycle Conditions

Table 3-23 presents a summary of the Project's on-site bicycle accommodations.

Table 3-23 On-site Bicycle Accommodations

Use	Capacity of Secure Bicycle Storage for Residents/Employees (# of bicycles)
Residential	419
Retail	6
Total	425

In accordance with BTD guidelines, the Proponent will provide 419 secure/covered bicycle parking spaces for residents (one per residential unit) and six for retail employees (one per 5,000 sf of retail).

Bicycle storage will be provided in the underground garage and bicycle racks will be provided near primary entrances. Bicycle racks, signs, and parking areas will conform to BTD standards.

Because the closest Hubway bicycle-sharing station is about 500 feet from the Project site (on Franklin Street at Arch Street), no new Hubway station is proposed at or adjacent to the Project.

3.4.12 Build (2021) Condition Loading and Service Activity

The Project will have one loading bay and one designated curbside loading space within the internal porte-cochere. The loading bay will be accessed via Province Court. Delivery vehicles may also use the internal curbside space within the porte-cochere. Residential move-in/move-out activity will occur at the loading bay and be managed by an on-site transportation coordinator. Trash pick-up will occur along Province Court.

Delivery trip estimates for the new land uses were developed based on Central Transportation Planning Staff[2] data for the identified land uses. A summary of anticipated loading/service activity is presented in Table 3-24.

[2] Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area; Central Transportation Planning Staff; September 1993.

Table 3-24 Delivery Activity by Land Use

Land Use	New Daily Deliveries
Residential	3
Retail	3
Total	**6**

It is anticipated that the majority of these six daily deliveries will occur between 7:00 a.m. and 1:00 p.m. The low number of deliveries will have minimal impact on the vehicular operations in the study area.

3.5 As-of-right Alternative

The As-of-right alternative includes approximately 190 residential units and approximately 23,744 sf of retail space as compared to the proposed Project with 419 residential units and 29,000 sf of retail space. The associated vehicle trip comparison generation is shown in Table 3-25.

Table 3-25 Vehicle Trip Comparison – Proposed Project vs. As-of-Right Alternative

Time Period	Proposed Program	As-of-right Alternative
Daily	744	436
a.m. peak hour	60	34
p.m. peak hour	72	42

The proposed development program will generate more vehicle trips than the As-of-right Alternative. Over the course of a weekday, the As-of-right Alternative building program would be expected to generate 436 daily vehicle trips compared to 744 for the proposed Project. During the a.m. peak hour, the As-of-right Alternative would be expected to generate about 34 vehicle trips (26 fewer than the proposed Project) and about 42 vehicle trips (30 fewer than the proposed Project) during the p.m. peak hour.

3.6 Mitigation

While the traffic impacts associated with the new trips are minimal (generating approximately one vehicle trip per minute during the peak hours), the Proponent will continue to work with the City of Boston to ensure that the Project efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use.

Operations at most study intersections would not be impacted by the proposed Project. As presented in Section 3.4.7.1, only the Tremont Street/Court Street/Cambridge Street intersection would experience a change in level of service between No-Build and Build Conditions under Option 1. Overall operations at this intersection will remain at LOS D during the a.m. peak hour and worsen from LOS D to LOS E during the p.m. peak hour.

Under Option 2, the same location, Tremont Street/Court Street/Cambridge Street intersection, would experience a minor change in level of service from No-Build (2021) Conditions. Overall operations at this intersection will remain at LOS D during the a.m. peak hour and worsen from LOS D to LOS E during the p.m. peak hour. Additionally, the Court Street westbound right turn lane would worsen to LOS E during the a.m. peak hour and LOS F during the p.m. peak hour.

As part of the MBTA's Government Center Station improvement project, the MBTA has provided the City with a new intersection design and signal phasing/timing plan for the Tremont Street/Cambridge Street/Court Street intersection. The signal plan, which was incorporated into the future year analysis of the Project, will provide an exclusive pedestrian phase during which pedestrians can cross all legs of this intersection in one phase, as opposed to conditions today, where pedestrians cross the intersection in two phases and must usually wait in the median island. The new intersection and signal plan will improve pedestrian safety and reduce pedestrian delay.

It is standard practice for the BTD to monitor and adjust timings at a new signal, such as the one that will be installed at the Tremont Street/Cambridge Street/Court Street intersection, to minimize vehicle delay while providing safe crossing times for pedestrians. Although the BTD will ultimately optimize the new traffic signal operation to reflect field conditions, the Project study team has developed minor timing changes to improve intersection operations projected under Build (2021) Conditions.

During the peak hour, the recommended change under either option is to allocate a few seconds of green time from the Cambridge Street approach to the Court Street approach, which would eliminate the LOS F on the Court Street westbound right turn, better balance the volume to capacity ratios, and reduce the projected queues. The resulting delays are similar to those projected under No-Build Conditions without the Project. Table 3-26 and Table 3-27 shows the associated operational results for Option 1and Option 2, respectively.

The detailed analysis sheets associated with the results are provided in Appendix B.

Table 3-26 Tremont Street/Cambridge Street/Court Street, Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour – Option 1

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet) 50th percentile	Queue length (feet) 95th percentile
without timing changes					
Tremont Street/Cambridge Street/Court Street	**E**	**55.2**			
Court WB left|left/right	E	55.1	0.97	330	#470
Court WB right	F	69.3	0.97	298	m#498
Cambridge SB thru|thru	D	46.4	0.84	200	247
with timing changes					
Tremont Street/Cambridge Street/Court Street	**D**	**53.5**			
Court WB left|left/right	D	50.8	0.94	327	#454
Court WB right	D	63.8	0.95	294	m#485
Cambridge SB thru|thru	E	50.6	0.88	206	#269

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.

Table 3-27 Tremont Street/Cambridge Street/Court Street, Build (2021) Condition, Capacity Analysis Summary, p.m. Peak Hour – Option 2

Intersection	LOS	Delay (seconds)	V/C Ratio	Queue length (feet) 50th percentile	Queue length (feet) 95th percentile
without timing changes					
Tremont Street/Cambridge Street/Court Street	**E**	**64.9**			
Court WB left|left/right	E	68.8	1.03	~383	m#487
Court WB right	F	83.5	1.03	~345	m#494
Cambridge SB thru|thru	D	46.4	0.84	200	247
with timing changes					
Tremont Street/Cambridge Street/Court Street	**E**	**62.8**			
Court WB left|left/right	E	61.7	0.95	355	m#455
Court WB right	E	64.5	0.95	320	m#465
Cambridge SB thru|thru	E	63.1	0.95	212	#290

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.

3.7 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to reduce dependence on autos. TDM will be facilitated by the Project's proximity to available transit services, including the Orange Line (at Downtown Crossing and State Street stations), Red Line (Downtown Crossing and Park Street stations), and Green Line (Park Street Station and Government Center Station) and local MBTA bus routes.

Because the Project is primarily residential, its trip generation is already lower than that of an office or retail use project. TDM will be facilitated by the nature and location of the proposed Project. The site's proximity to workplaces, shopping, and transit will help reduce auto use by residents and visitors alike. The Proponent is committed to implementing a TDM program that supports the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak time periods, through the following TDM commitments listed below:

- Limited Parking: The Project will have approximately 235 parking spaces for residents. With 419 residential units, the resulting parking ratio rate is 0.56 spaces per unit.
- Public Transportation:
  - The Proponent will provide one free monthly MBTA subway pass per residential unit during for the first six months of building operation.
  - Include language in new commercial tenant leases to encourage tenants to promote public transportation and consider subsidizing employee use of public transit.
  - The Proponent will provide orientation packets to new residents containing information on the available transportation choices, including transit routes and schedules.
- Bicycle Spaces: Secure bicycle storage will be made available to tenants and visitors to encourage bicycling as an alternative mode of transportation. In accordance with BTD guidelines, the Proponent will provide 419 secure/covered bicycle parking spaces (one per residential unit) for residents and nine spaces for employees. Bicycle racks, signs, and parking areas will conform to BTD standards and be sited in safe, secure locations.
- Transportation Management Association (TMA): The Proponent will join the local TMA, A Better City (ABC).

- Transportation Coordinator: The Proponent will designate a transportation coordinator to manage loading and service activities and provide alternative transportation materials to residents and building tenants.

- A Transportation Access Plan Agreement (TAPA) will be entered into between the Proponent and BTD. The TAPA will codify the specific measures and agreements between the Proponent and the City of Boston.

3.8 Construction Management Plan

Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (CMP) to be filed with and approved by BTD in accordance with the City's traffic maintenance plan requirements. 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 incorporated into the Construction Management Plan:

- Construction workers will be encouraged to use public transportation and/or carpool.

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

Chapter 4.0

Environmental Review Component

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Pedestrian Level Winds

4.1.1 Introduction

A pedestrian wind study was conducted on the proposed Project located at One Bromfield Street in Boston, Massachusetts. The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas around the study site and provide recommendations for minimizing adverse effects, where necessary.

The study involved wind simulations on a 1:400 scale model of the proposed building and surroundings. These simulations were then conducted in Rowan Williams Davies & Irwin Inc.'s (RWDI) boundary-layer wind tunnel at Guelph, Ontario, for the purpose of quantifying local wind speed conditions and comparing to appropriate criteria for gauging wind comfort in pedestrian areas. The criteria recommended by the BRA were used in this study. This Section describes the methods and presents the results of the wind tunnel simulations.

The wind analysis shows that with the proposed Project, the overall wind conditions expected in the surrounding area are largely similar in the No Build and Build Conditions. Of the 94 locations studied, 10 locations are predicted to have slightly higher annual mean wind speeds as a result of the Project, and 13 locations are predicted to have lower annual wind speeds. The number of locations where winds exceed the effective gust velocity criteria are the same in both the No Build and Build Configuration.

4.1.2 Overview

Major buildings, especially those that protrude above their surroundings, often cause increased local wind speeds at the pedestrian level. Typically, wind speeds increase with elevation above the ground surface, and taller buildings intercept these faster winds and deflect them down to the pedestrian level. The funneling of wind through gaps between buildings and the acceleration of wind around corners of buildings may also cause increases in wind speed. Conversely, if a building is surrounded by others of equivalent height, it may be protected from the prevailing upper-level winds, resulting in no significant changes to the local pedestrian-level wind environment. The most effective way to assess potential pedestrian-level wind impacts around a proposed new building is to conduct scale model tests in a wind tunnel.

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

4.1.3 Methodology

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

- No Build Configuration: includes all existing and BRA approved surrounding buildings along with approved mitigation; and,

- Build Configuration: includes the proposed development in the presence of all existing and BRA approved surrounding buildings along with approved mitigation.

As shown in Figures 4.1-1 and 4.1-2, the wind tunnel model included the proposed Project and all relevant surrounding buildings and topography within a 1600 foot radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modelled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 94 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of five feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. The results were then combined with long-term meteorological data, recorded during the years 1981 to 2011 at Boston's Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year.

Figures 4.1-3 through 4.1-5 present "wind roses", summarizing the seasonal and annual wind climates in the Boston area, based on the data from Logan Airport. The left-hand side wind rose in Figure 4.1-3, for example, summarizes the spring (March, April, and May) wind data. In general, the prevailing winds at this time of year are from the west-northwest, northwest, west, south-southwest and southwest. In addition to these directions, strong winds are also prevalent from the northeast direction as indicated by the red and yellow color bands on the wind rose. On an annual basis (Figure 4.1-5) the most common wind directions are those between southwest and northwest. Winds from the east-southeast are also relatively common. In the case of strong winds, northeast, west, west-northwest and northwest are the dominant wind directions.

One Bromfield   **Boston, Massachusetts**

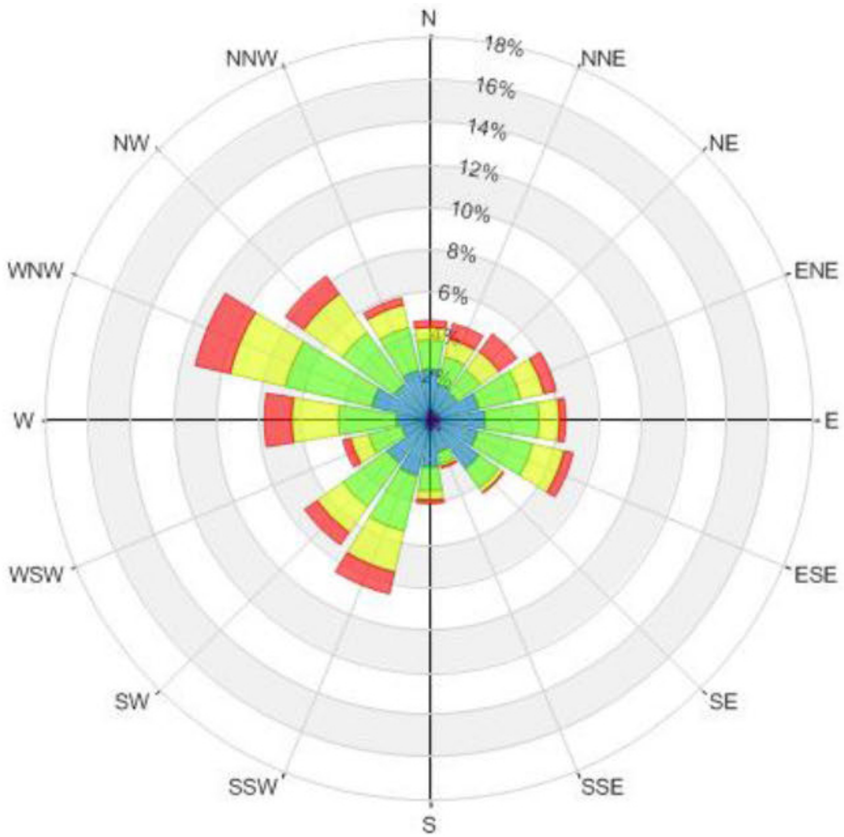
Figure 4.1-1

No Build Configuration

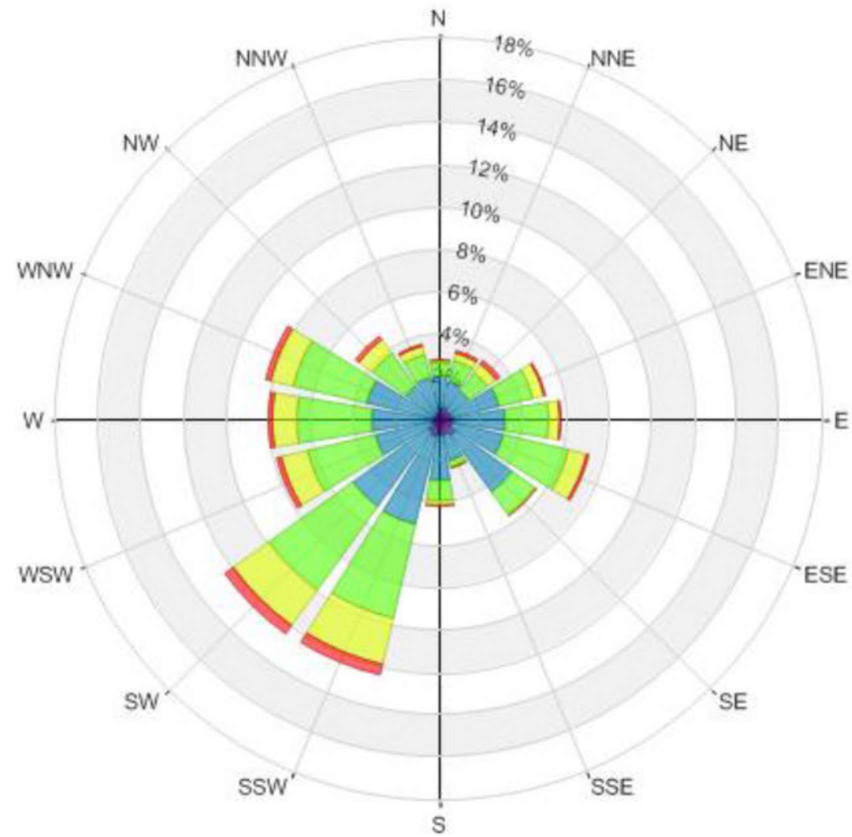
One Bromfield   Boston, Massachusetts

Figure 4.1-2

Build Configuration



Spring
(March - May)

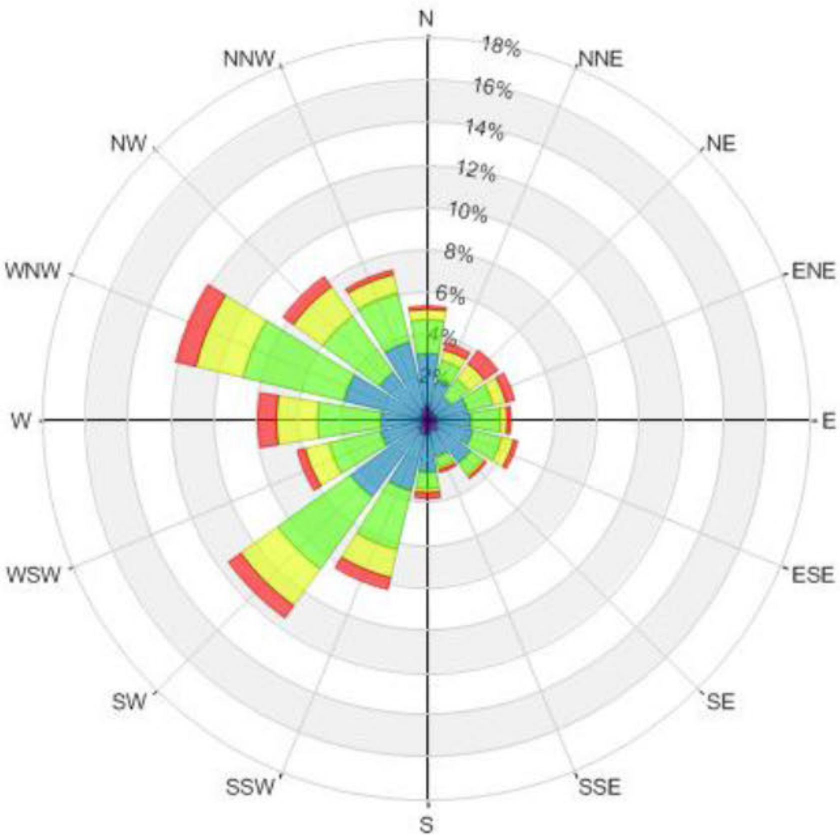


Summer
(June - August)

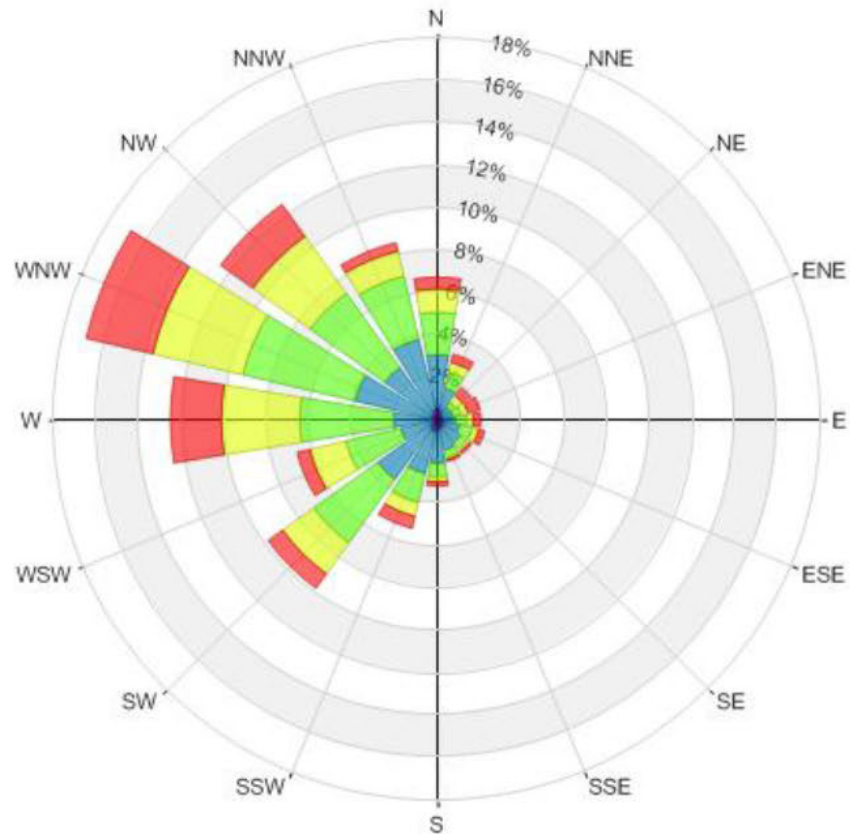
Wind Speed (mph)	Probability (%) Spring	Summer
Calm	2.5	2.8
1-5	6.3	9.0
6-10	28.6	38.6
11-15	33.0	34.8
16-20	19.4	12.2
>20	10.2	2.6

Figure 4.1-3

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1993-2013)



Fall
(September - November)

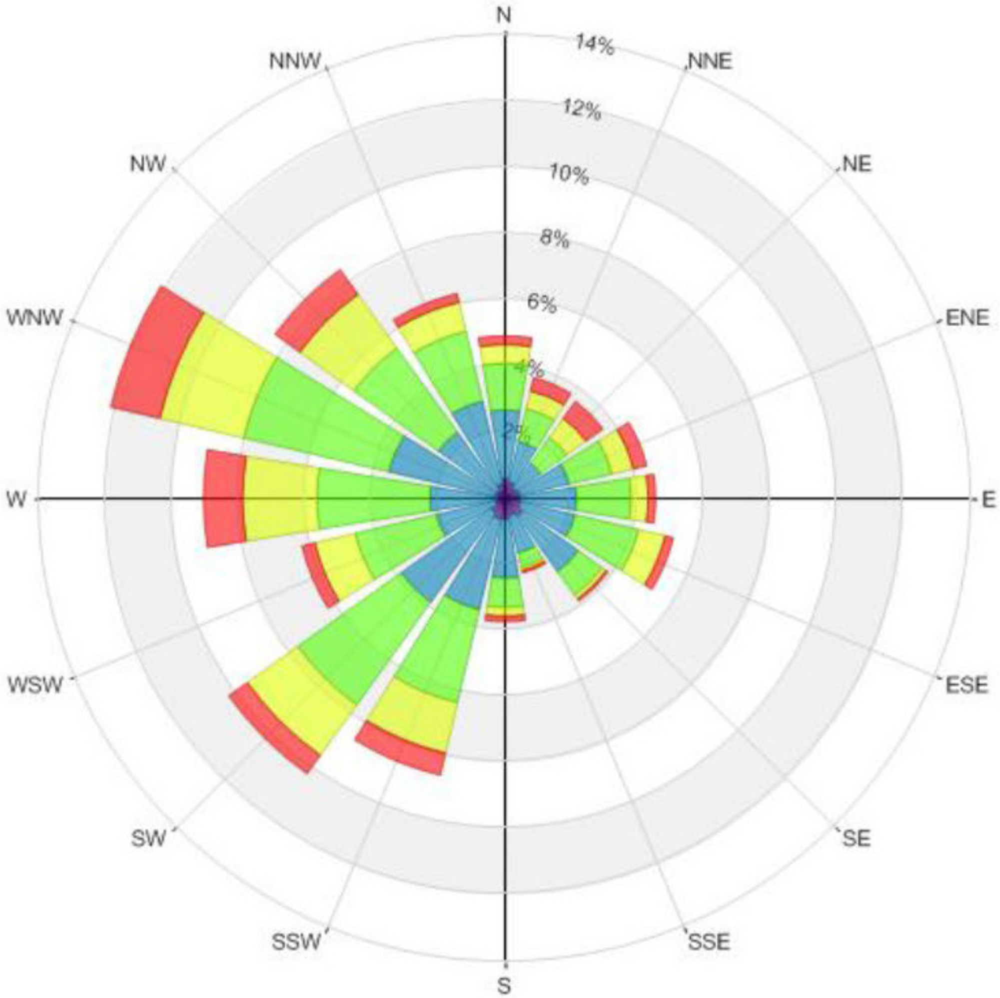


Winter
(December - February)

Wind Speed (mph)	Probability (%) Fall	Winter
Calm	3.1	2.4
1-5	8.0	6.1
6-10	34.2	27.6
11-15	32.7	30.9
16-20	15.2	20.1
>20	6.8	13.0

Figure 4.1-4

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1993-2013)



Annual Winds

Wind Speed (mph)	Probability (%)
Calm	2.7
1-5	7.3
6-10	32.3
11-15	32.9
16-20	16.7
>20	8.1

Figure 4.1-5

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1993-2013)

This study involved state-of-the-art measurement and analysis techniques to predict wind conditions at the study site. Nevertheless, some uncertainty remains in predicting wind comfort. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this report represent an average for the total population. Also, unforeseen changes in the project area, such as the construction or removal of buildings, can affect the conditions experienced at the site. Finally, the prediction of wind speeds is necessarily a statistical procedure. The wind speeds reported are for the frequency of occurrence stated (one percent of the time). Higher wind speeds will occur but on a less frequent basis.

4.1.4 Pedestrian Wind Comfort Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of the time. The second standard used by the BRA is based on the work of Melbourne[1] and is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking, as shown in Table 4.1-1.

The criteria are shown in terms of benchmarks for the one-hour mean speed exceeded one percent of the time (*i.e.*, the 99-percentile mean wind speed).

Table 4.1-1 Boston Redevelopment Authority Mean Wind Criteria*

Level of Comfort	Wind Speed
Dangerous	> 27 mph
Uncomfortable for Walking	>19 and <27 mph
Comfortable for Walking	>15 and <19 mph
Comfortable for Standing	>12 and <15 mph
Comfortable for Sitting	<12 mph

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

The wind climate found in a typical downtown Boston location is generally comfortable for pedestrian use of sidewalks and thoroughfares and meets the BRA effective gust velocity criterion of 31 mph. However, the general wind climate in Boston is likely to be frequently uncomfortable for more passive activities such as sitting.

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

4.1.5 Results

Table 1 in Appendix C presents the mean and effective gust wind speeds for each season as well as annually. Figures 4.1-6 through 4.1-9 graphically depict the wind comfort conditions at each wind measurement location based on the annual winds. Figure 4.1-10 shows the change in comfort categories between the No Build and Build configurations. Typically the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested, except where noted below in the text.

4.1.5.1 No Build Configuration

A wind comfort categorization of walking is considered appropriate for sidewalks. Lower wind speeds conducive to standing are preferred at building entrances.

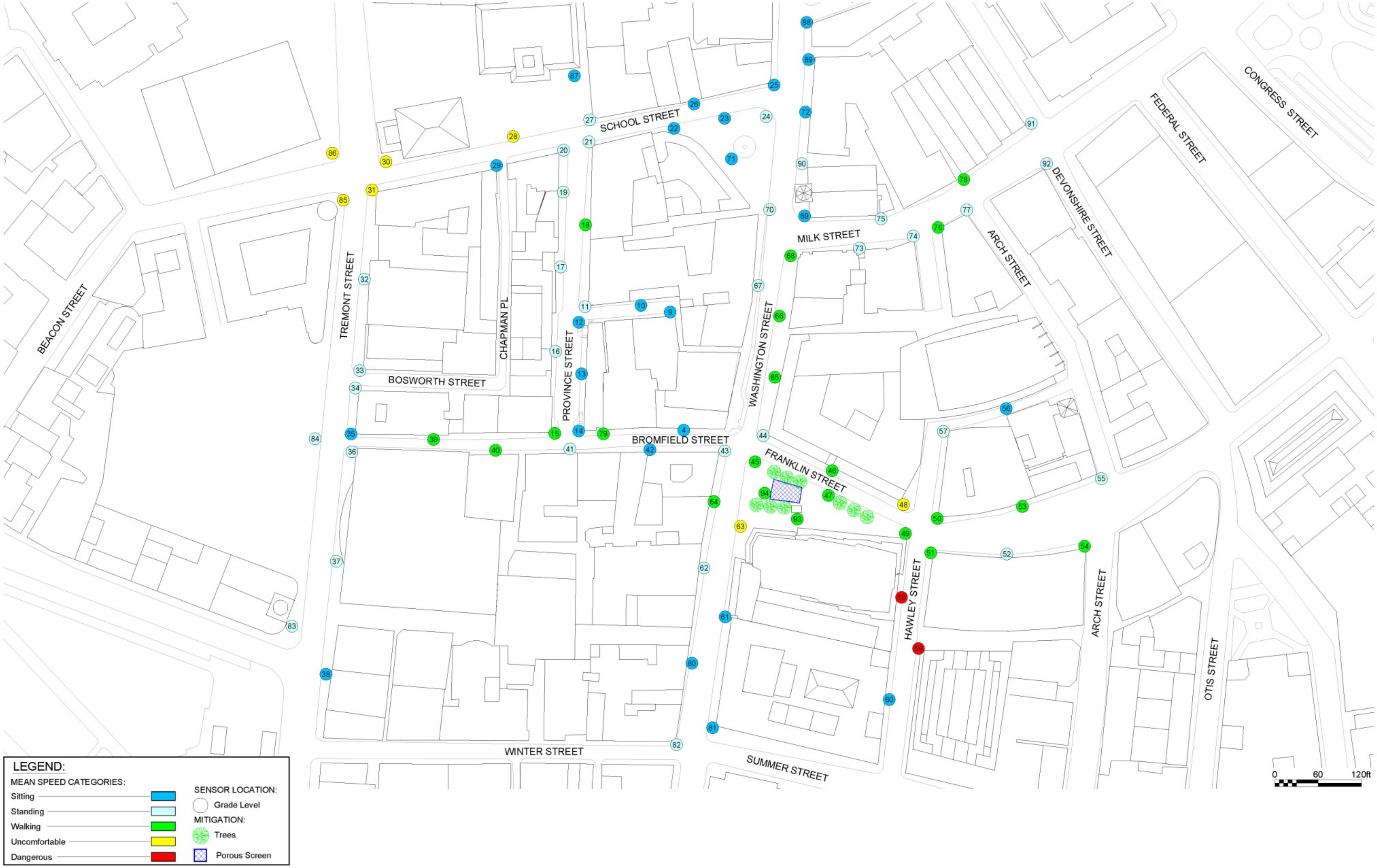
As shown in Figure 4.1-6, winds at most grade locations are comfortable for walking or better, annually, which is appropriate. Uncomfortable wind speeds exist at localized off-site locations on School Street (Locations 28, 30, 31, 85 and 86), Washington Street (Location 63) and Franklin Street (Location 48) on an annual basis, while potentially dangerous wind conditions exist at isolated areas on Hawley Street (Locations 58 and 59) annually.

The wind speeds at localized areas on School Street and Hawley Street exceeded the effective gust criterion annually in the No Build configuration (see Locations 28, 30, 58 and 59 Figure 4.1-8) and during the winter at Locations 48, 63 and 94 (see Appendix C).

4.1.5.2 Build Configuration

As discussed in Section 4.1.2, major buildings, especially those that protrude above their surroundings, often cause increased local wind speeds at the pedestrian level. The design team took pedestrian wind comfort into consideration, resulting in a tower geometry that minimizes wind impacts to the greatest extent practicable. Placing the tower in the center of a large podium helps to deflect winds that downwash from the tower and prevents these winds from reaching street level. In addition, the building's rounded corners decrease the pressure differential that is created when wind hits a face of the building and separates.

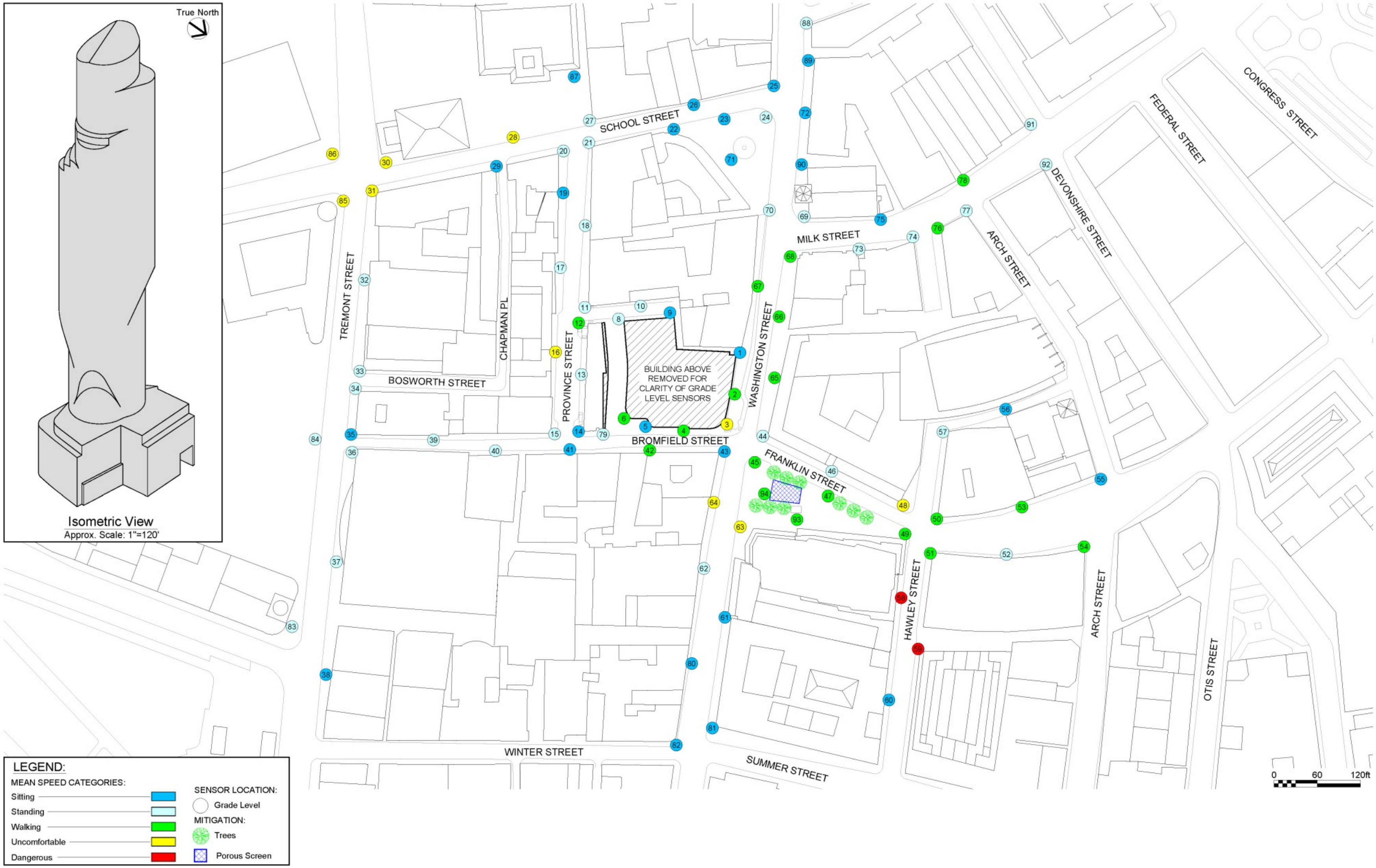
With the addition of the proposed Project to the site, the wind conditions at most locations are expected to remain similar or better than the No-build conditions, which is considered appropriate (see Figure 4.1-7 and 4.1-10). Of the 94 locations studied, 8 locations are predicted to have slightly higher annual mean wind speeds as a result of the Project, and 13 locations are predicted to have lower annual wind speeds (see Figure 4.1-10).



One Bromfield Boston, Massachusetts

Figure 4.1-6

Pedestrian Wind Conditions – Mean Speed – No Build



One Bromfield Boston, Massachusetts

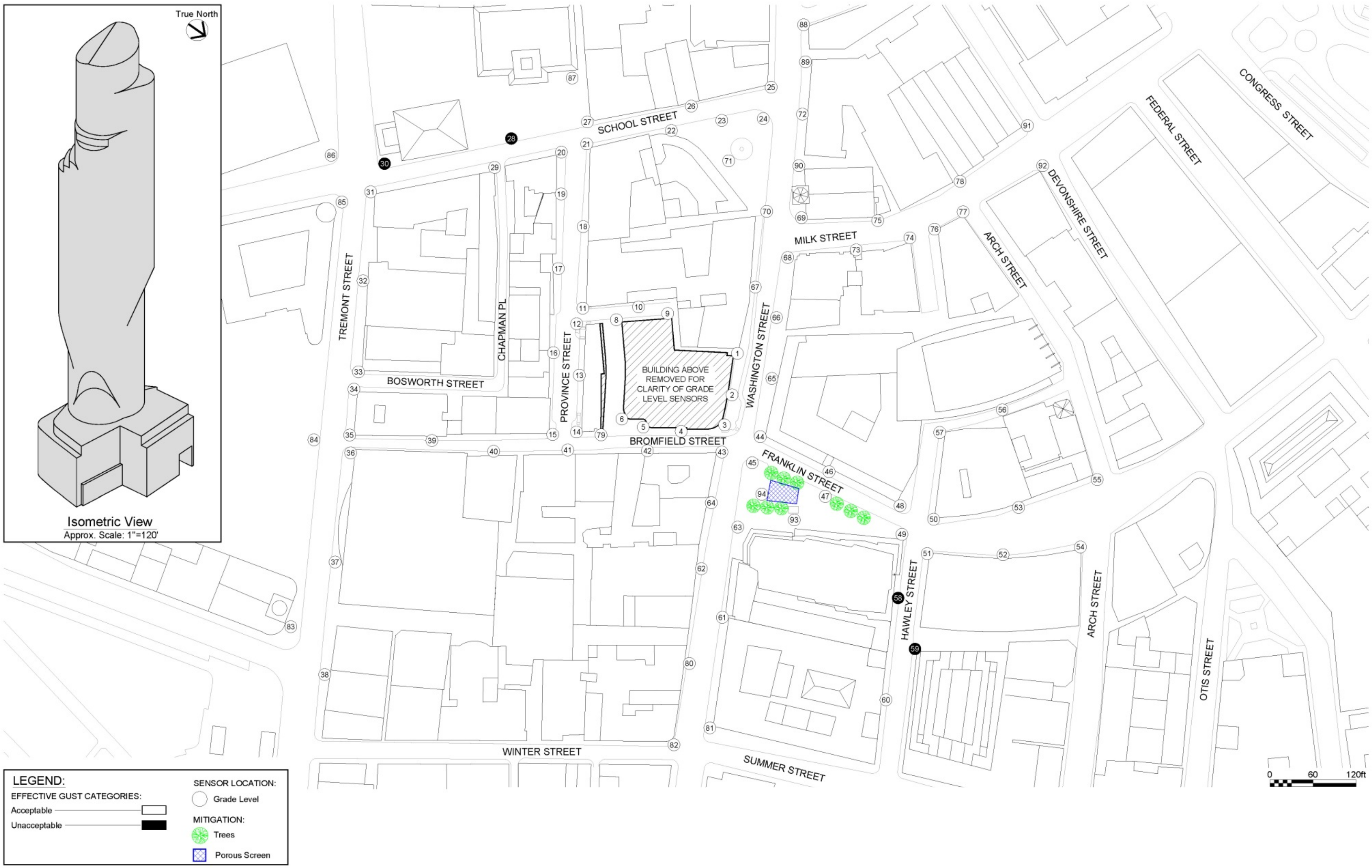
Figure 4.1-7

Pedestrian Wind Conditions – Mean Speed – Build

One Bromfield Boston, Massachusetts

Figure 4.1-8

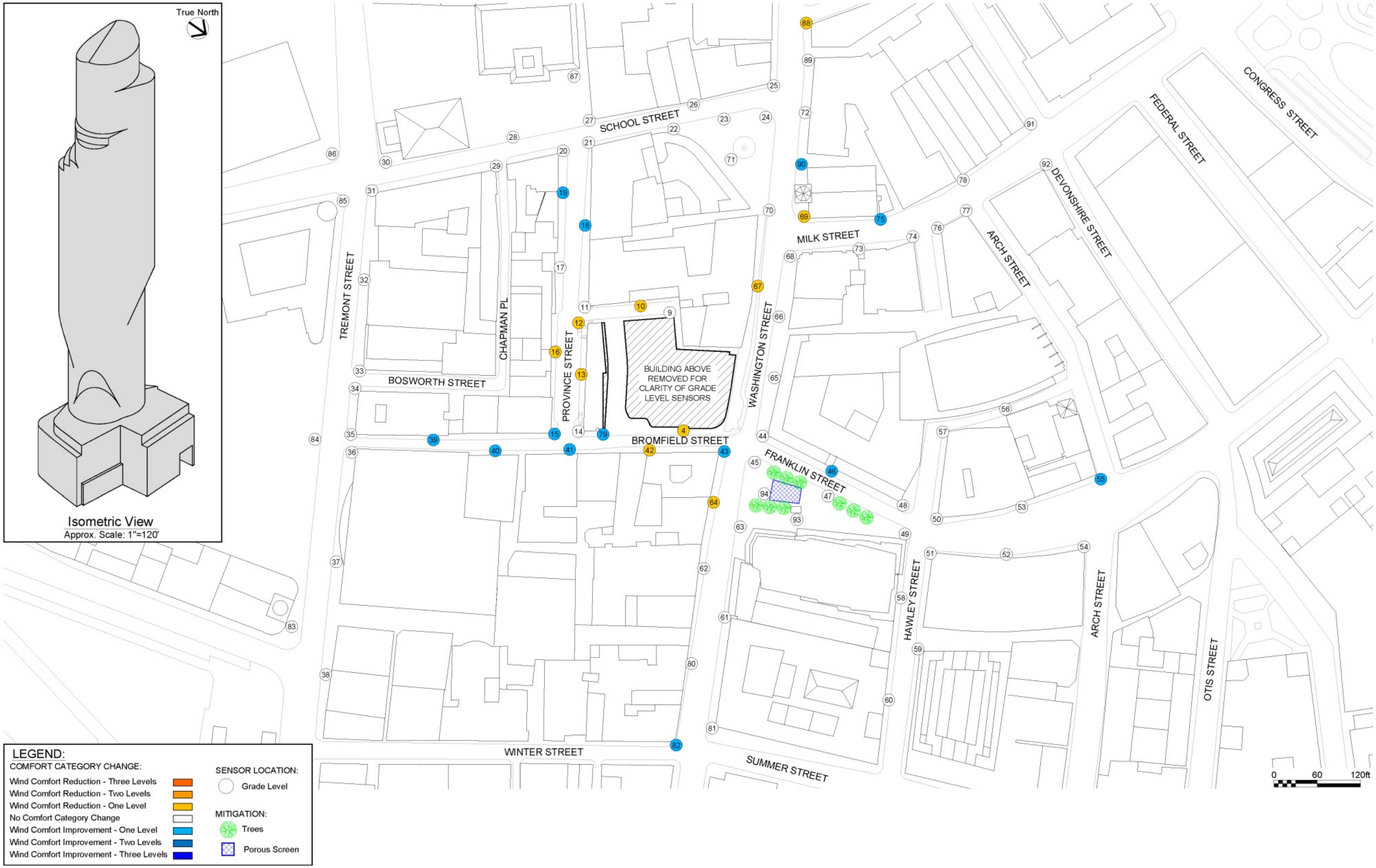
Pedestrian Wind Conditions – Effective Gust Speed – No Build



One Bromfield Boston, Massachusetts

Figure 4.1-9

Pedestrian Wind Conditions – Effective Gust Speed – Build



One Bromfield   Boston, Massachusetts

Figure 4.1-10

Pedestrian Wind Conditions – Comfort Category Change – No Build to Build

At the locations where wind speeds are predicted to increase, most of the locations remain appropriate for the intended pedestrian activities with the exception of localized areas along Province Street, Washington Street and Franklin Street, where uncomfortable wind speeds are predicted annually (Locations 16, and 64 in Figure 4.1-7). In addition, uncomfortable wind speeds are expected at the corner of Washington and Bromfield Streets (Location 3). As design progresses, potential mitigation measures to improve wind conditions as this location will be considered. The existing dangerous wind conditions along Hawley Street will remain, however, the Project will not create any new dangerous wind conditions. The Project will not result in new exceedances of the effective gust criterion on an annual basis.

4.1.5.3 As-of-right Alternative

The As-of-right Alternative has a similar massing and shorter height compared to the proposed Project. As a result, the on-site and off-site wind conditions for the As-of-right Alternative are expected to be similar or better than the conditions predicted in the Build Configuration.

4.1.6 Conclusion

The wind analysis shows that with the proposed Project, the overall wind conditions expected in the surrounding area are largely similar in the No Build and Build Conditions. Of the 94 locations studied, 10 locations are predicted to have slightly higher annual mean wind speeds as a result of the Project, and 13 locations are predicted to have lower annual wind speeds. The number of locations where winds exceed the effective gust velocity criteria are the same in both the No Build and Build Configuration.

4.2 Shadow Impacts

4.2.1 Introduction and Methodology

A shadow impact analysis was conducted to assess potential shadow impacts from the Project. The study looked at the following four times of the year, in accordance with BRA requirements:

1. Spring Equinox (March 21) at 9:00 a.m., 12:00 noon, and 3:00 p.m.
2. Summer Solstice (June 21) at 9:00 a.m., 12:00 noon, 3:00 p.m. and 6:00 p.m.
3. Autumnal Equinox (September 21) at 9:00 a.m., 12:00 noon, 3:00 p.m. and 6:00 p.m.
4. Winter Solstice at 9:00 a.m., 12:00 noon, and 3:00 p.m.

The shadow analysis presents the existing shadow and new shadow that would be created by the proposed Project, as well as a comparison to the As-of-right Alternative. The analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project Site. It should be noted that the model used for the analysis does not include trees, which can block new shadow from the proposed buildings during much of the year during certain time periods. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 4.2-1 to 4.2-14 at the end of this section.

The Project will be located in one of the densest areas of Boston. As a result, most new shadow associated with the Project will fall on nearby streets and sidewalks. Although public open spaces and pedestrian areas surrounding the Project will receive some new shadow, it will generally extend the existing shadow and will not have a substantial altering effect on the overall character of the spaces.

4.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow from the Project will be cast to the northwest. The shadow from the As-of-right Alternative would be cast onto a portion of Bosworth Street and its southern sidewalk. New shadow from the Project will extend onto additional portions of Bosworth Street and its sidewalks, a portion of Tremont Street and its sidewalks, and onto a portion of the Granary Burying Ground. No new shadow is cast onto other open spaces or bus stops in the vicinity of the Project.

At 12:00 p.m., new shadow from the Project will be cast to the north. The shadow from the As-of-right Alternative would be cast onto portions of Province Street and Province Court. New shadow from the Project will extend onto a small portion of Province Street and its western sidewalk, and a small portion of School Street and its sidewalks. New shadow will be cast onto the portion of Old City Hall Plaza not under existing shadow, as well as onto a portion of King's Chapel Cemetery.

At 3:00 p.m., new shadow from the Project will be cast to the northeast. Shadow from the As-of-right Alternative would be cast onto Province Court, and onto a portion of Washington Street, including a bus stop at the intersection of Washington and Milk Streets. New shadow from the Project will be cast onto Washington Street and its sidewalks, School Street and its sidewalks, and Water Street and its sidewalks. No new shadow is cast onto open spaces in the vicinity of the Project, including the Boston Common.

4.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow will be cast to the west. Shadow from the As-of-right Alternative would be cast onto Bromfield Street and its sidewalks, Province Street and its western sidewalks, and onto a portion of Bosworth Street and its sidewalks. New shadow from the Project will be cast onto a small sliver of the Granary Burying Ground, and onto a small portion of the Boston Common. By 9:20 a.m., the Project is no longer casting shadow on the Boston Common. No new shadow is cast onto other open spaces or bus stops in the vicinity of the Project.

At 12:00 p.m., new shadow will be cast to the northwest. Shadow from the As-of-right Alternative would be cast onto Province Court and its sidewalks. New shadow from the Project will be cast onto Province Street and its sidewalks. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project, nor onto any portion of the Boston Common.

At 3:00 p.m., new shadow will be cast to the northeast. Shadow from the As-of-right Alternative would be cast onto Province Court and its sidewalks, and onto Washington Street and its western sidewalks. New shadow from the Project will be cast onto Washington Street and its sidewalks, a portion of Milk Street and its northern sidewalk, and onto a small portion of the Irish Famine Memorial plaza on Washington Street. Shadow will also be cast onto the bus stop at the corner of Washington and Milk Streets.

At 6:00 p.m., new shadow will be cast to the southeast. Shadow from the As-of-right Alternative would be cast onto Washington Street and its sidewalks. New shadow from the Project will not extend beyond the As-of-right Alternative. No new shadow is cast onto other open spaces or bus stops in the vicinity of the Project, including the Boston Common.

4.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, new shadow will be cast to the northwest. No new shadow would be cast by the As-of-right Alternative. New shadow from the Project will be cast onto a portion of the Granary Burying Ground and onto a portion of the green space in front of the State House. No new shadow is cast onto bus stops in the vicinity of the Project, nor onto any portion of the Boston Common.

At 12:00 p.m., new shadow will be cast to the north. Shadow from the As-of-right Alternative would be cast onto of the small portion Province Court not under existing shadow. New shadow from the Project will be cast onto Tremont Street and its sidewalks and onto a small portion of King's Chapel Cemetery. No new shadow from the Project will be cast onto other open spaces or bus stops in the vicinity of the Project, including the Boston Common.

At 3:00 p.m. new shadow will be cast to the northeast. New shadow from the As-of-right Alternative would be cast onto Province Court and its sidewalks, and onto a sliver of Washington Street's western sidewalk. New shadow from the Project will be cast onto School Street and its sidewalks, Washington Street and its sidewalks, and the small portion of the Irish Famine Memorial that is not under existing shadow. No new shadow will be cast onto other open spaces or bus stops in the vicinity of the Project, including the Boston Common.

At 6:00 p.m., most of the area is under existing shadow. Shadow from the As-of-right Alternative would be cast onto a small portion of Milk Street. New shadow from the Project will not extend beyond the As-of-Right Alternative. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project, including the Boston Common.

4.2.5 Winter Solstice (December 21)

The winter solstice creates the least favorable conditions for sunlight in New England. The sun angle during the winter is lower than in any other season, causing the shadows in urban areas to elongate and be cast onto large portions of the surrounding area.

At 9:00 a.m., most of the area is under existing shadow. Neither the As-of-right Alternative nor the Project will cast new shadow onto nearby streets, sidewalks, open spaces or bus stops in the vicinity of the Project. , including the Boston Common

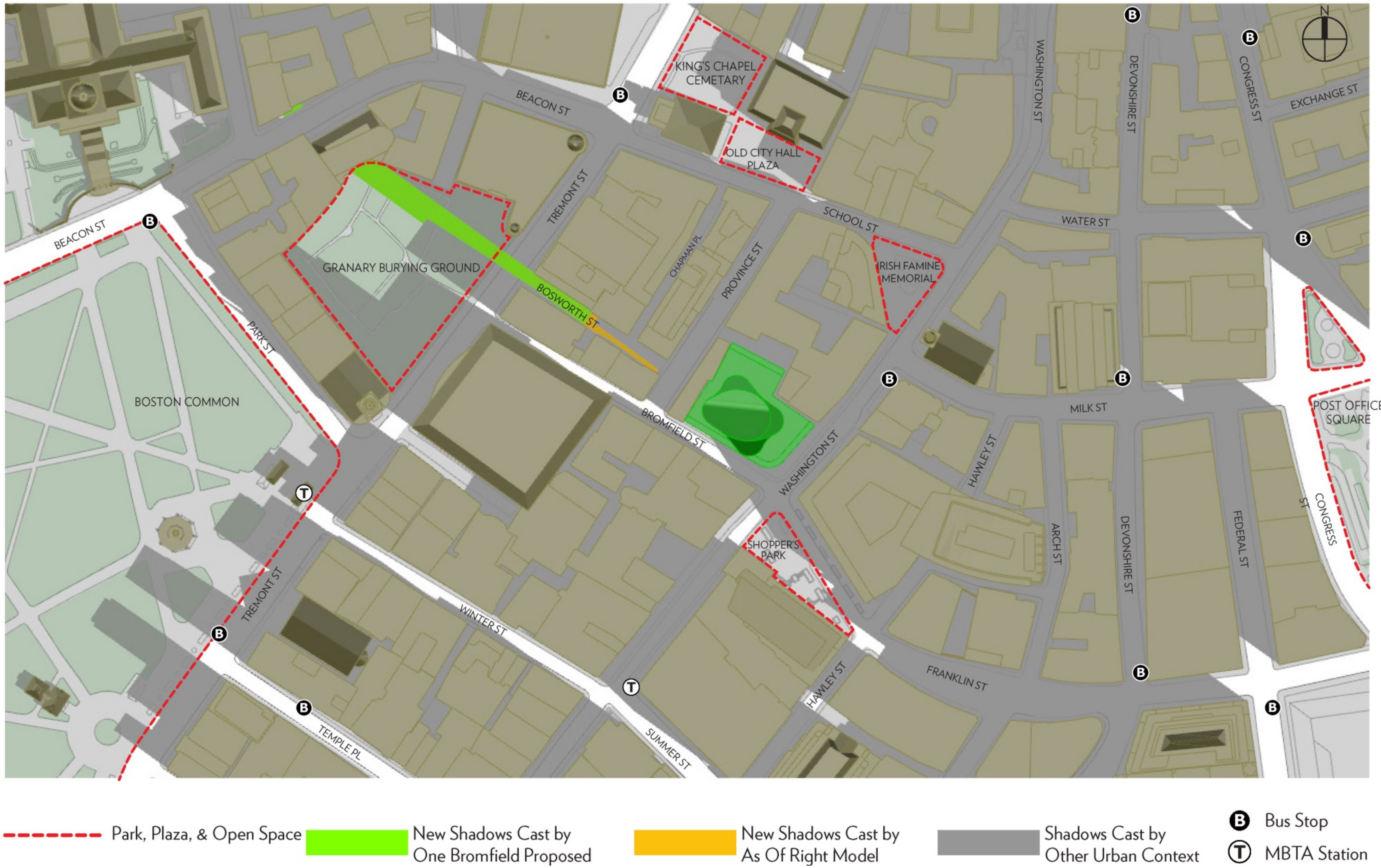
At 12:00 p.m., most of the area is under existing shadow. New shadow from the As-of-right Alternative would be cast to the north onto a small sliver of Province Street's western sidewalk. No new shadow from the Project will extend beyond the As-of-right Alternative.

At 3:00 p.m., most of the area is under existing shadow. Neither the As-of-right Alternative nor the Project will cast new shadow onto nearby streets, sidewalks, open spaces, or bus stops in the vicinity of the Project, including the Boston Common.

4.2.6 Compliance with Article 38 and Chapter 362 of the Acts of 1990

In addition to the shadow study for each of the study periods identified above, an analysis was conducted to ensure compliance with Chapter 362 of the Acts of 1990. Chapter 362 of the Acts of 1990 prohibits any structure which casts a new shadow upon the Boston Common except (i) any structure which casts new shadow during the first hour after sunrise or before seven o'clock in the morning, whichever is later, or the last hour before sunset, (ii) shadow which would have been cast by an as-of-right building permitted as of May 1, 1990, (iii) any structure within the Midtown Cultural District established by Article 38 which casts no new shadow for more than two hours from eight o'clock in the morning through two-thirty in the afternoon on any day from March 21 through October 21, inclusive, in any calendar year, on any area of the Boston Common.

The results of the shadow impact analysis on the Boston Common are provided in Appendix D. As demonstrated, the new shadow from the Project complies with the Boston Common Special Act. Although the Project is not in a Planned Development Area (PDA), the shadow study in Appendix D also shows that the Project will not result in substantial impact on the shadow impact areas as defined in Article 38.



One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL
ARCHITECTURE

Figure 4.2-1

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-2

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL
ARCHITECTURE

Figure 4.2-3

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

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-4

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

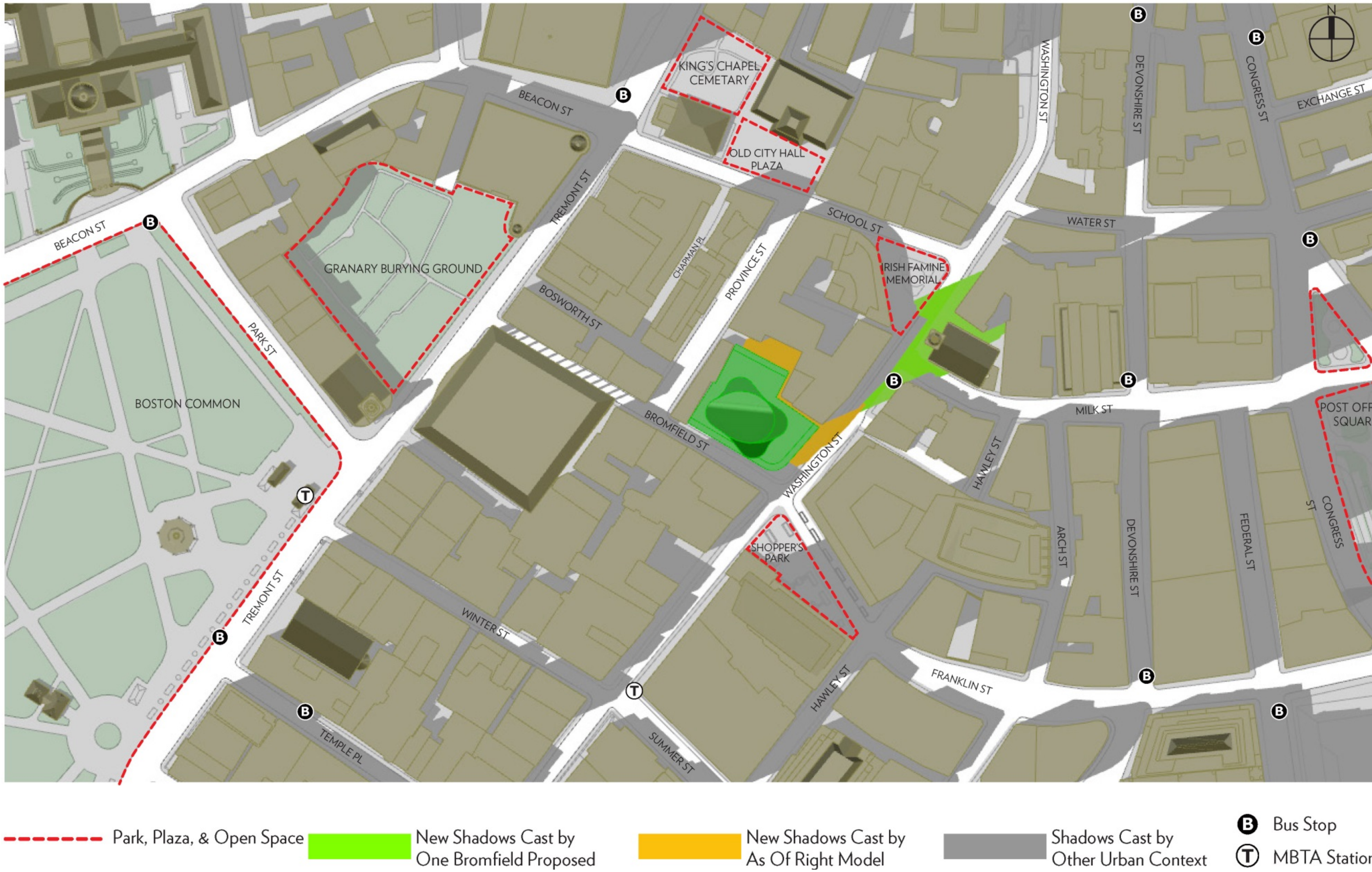
MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-5

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



One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL
ARCHITECTURE

Figure 4.2-6

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

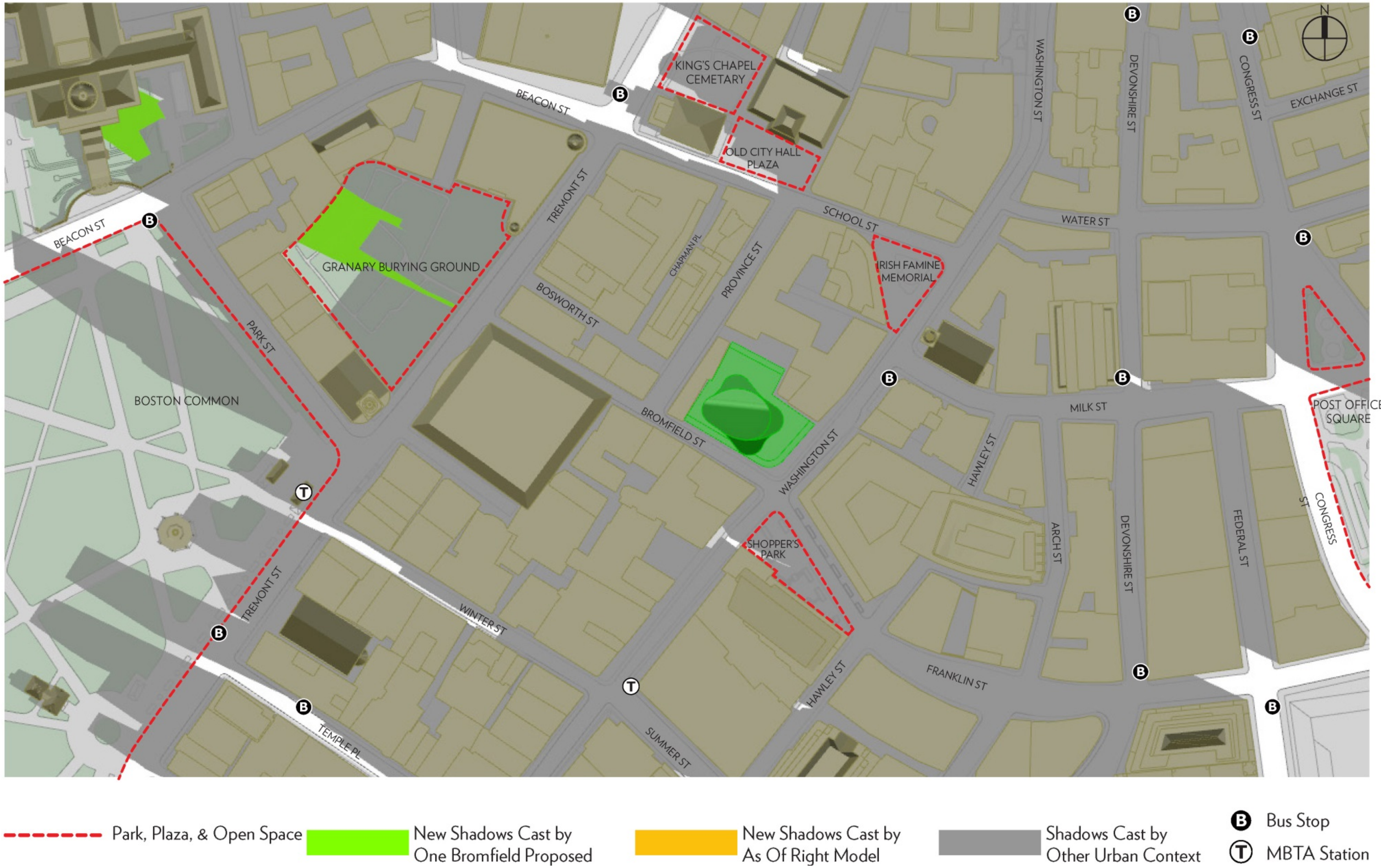
MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-7

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

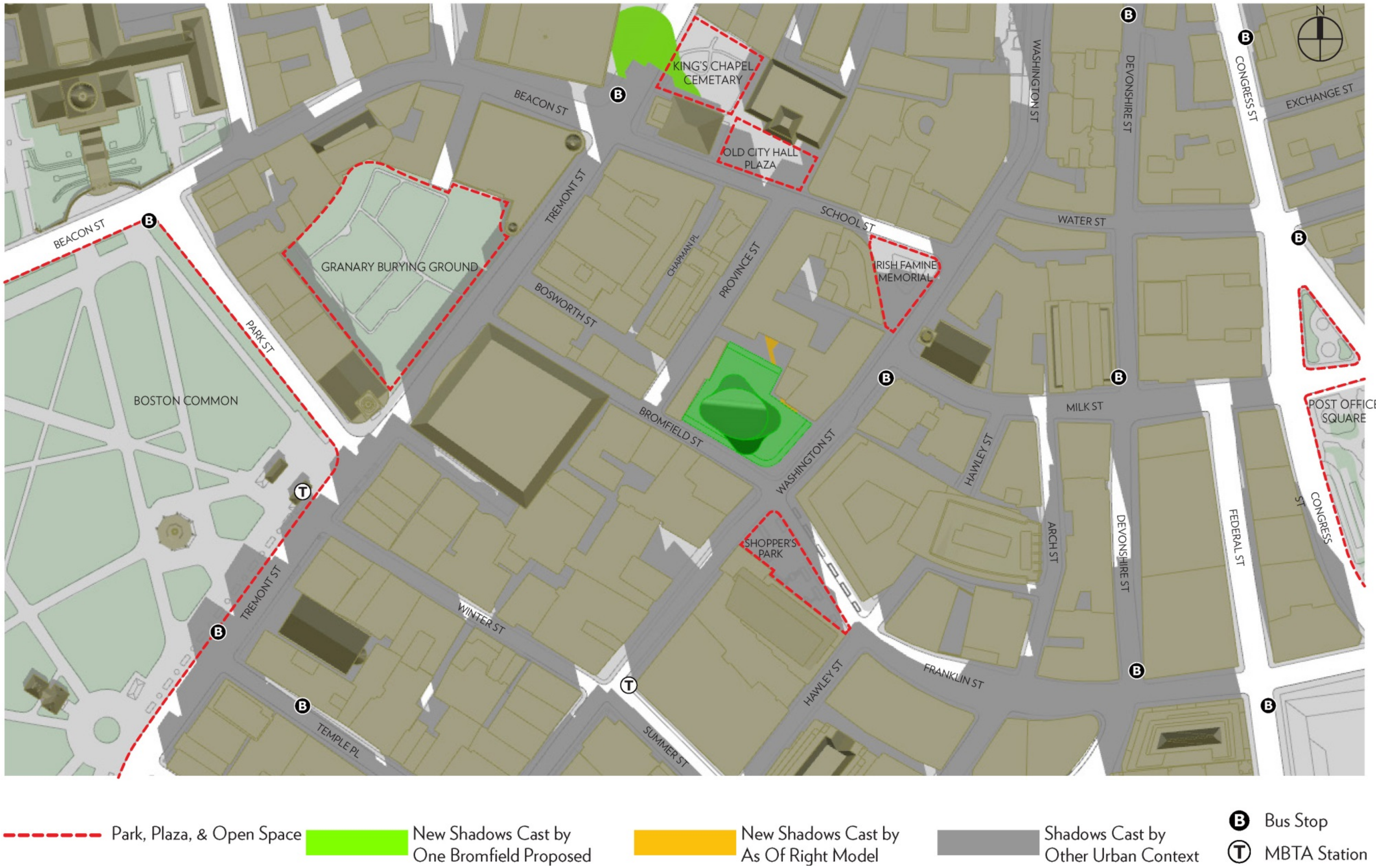


One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-8

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



One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL
ARCHITECTURE

Figure 4.2-9

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

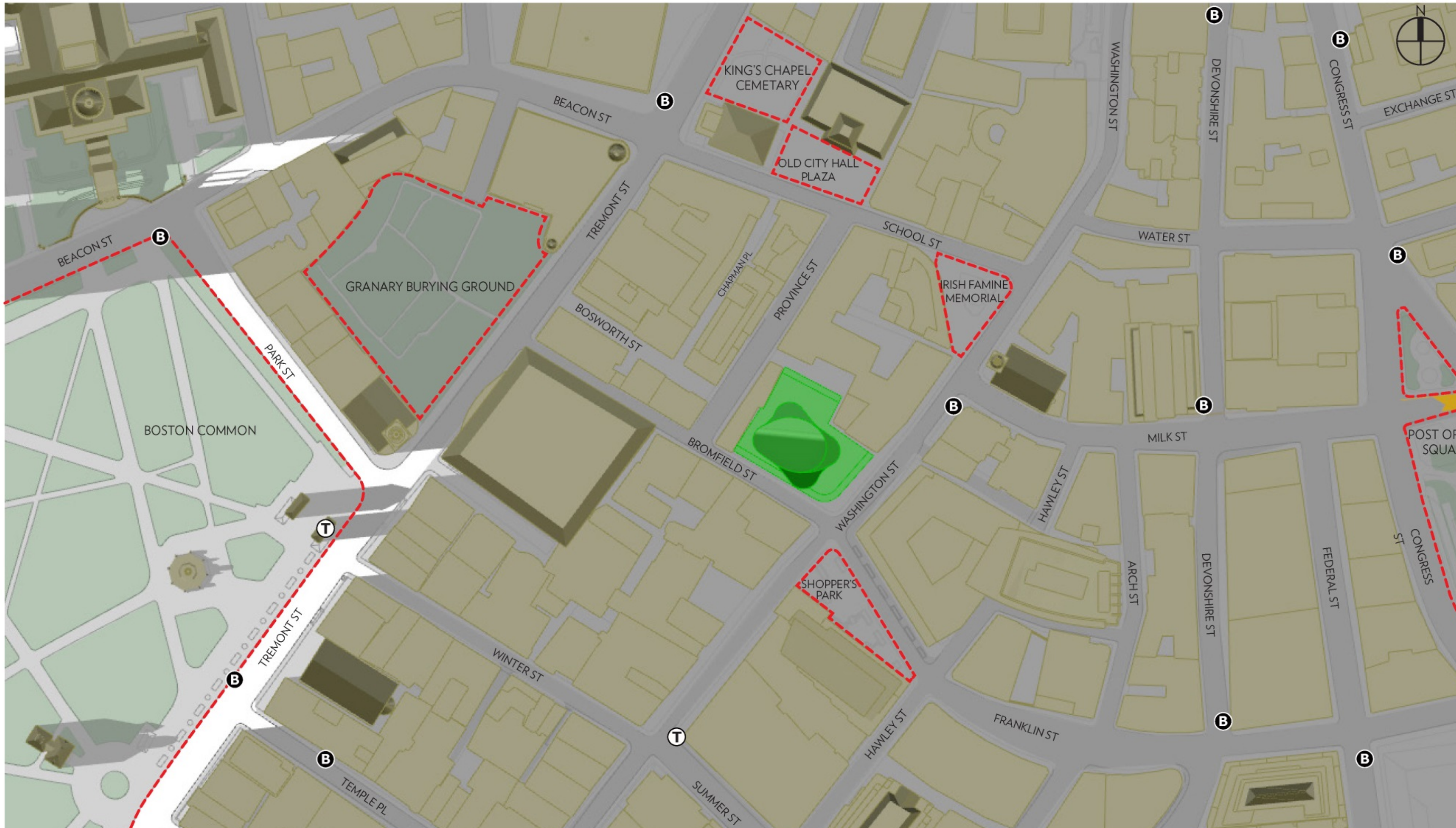
Bus Stop

MBTA Station

One Bromfield Boston, Massachusetts

Figure 4.2-10

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



Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-11

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

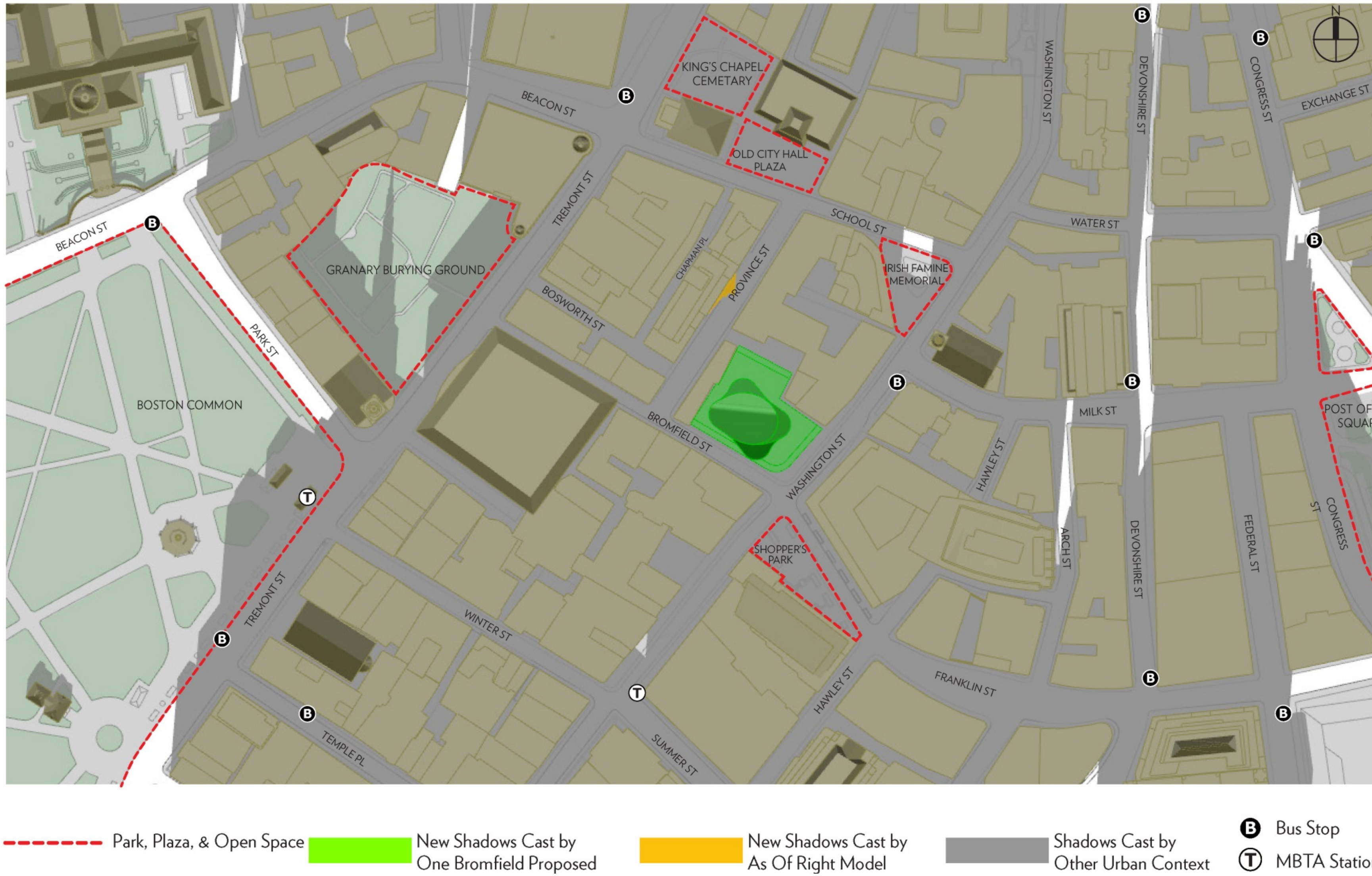
MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-12

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



One Bromfield **Boston, Massachusetts**

ADRIAN SMITH+GORDON GILL
ARCHITECTURE

Figure 4.2-13

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

Park, Plaza, & Open Space

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop

MBTA Station

One Bromfield Boston, Massachusetts

ADRIAN SMITH+GORDON GILL ARCHITECTURE

Figure 4.2-14

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

4.2.7 Conclusions

Due to the density of the surrounding districts, the majority of the new shadow cast by the Project will fall on nearby streets. The new shadow impacting sidewalks will ordinarily be small patches and fall on portions of sidewalks that are already partially covered in shadow.

Although public open spaces surrounding the Project will receive some new shadow, it will generally extend the existing shadow and will not have a substantial altering effect on the overall character of the spaces. There are no new shadows on the Granary Burying Ground during 11 of the 14 time periods studied. There are new shadows on the Boston Common during only one of the 14 time periods studied.

4.3 Daylight Analysis

4.3.1 Introduction

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

Because the Project Site is currently developed, the proposed Project will have a minimal impact on daylight obstruction compared to the existing conditions. The resulting conditions will be typical of the Downtown Crossing area and other densely-developed areas of Boston.

4.3.2 Methodology

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

Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent city streets or pedestrian ways centered on the proposed building. The façade of the building facing the viewpoint, including heights, setbacks, corners and other features, is plotted onto a base map using lateral and elevation angles. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from the viewpoint chosen. The BRADA program calculates the percentage of daylight that will be

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

obstructed on a scale of 0 to 100 percent based on the width of the view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building; the lower the number, the lower the percentage of obstruction of daylight from any given viewpoint.

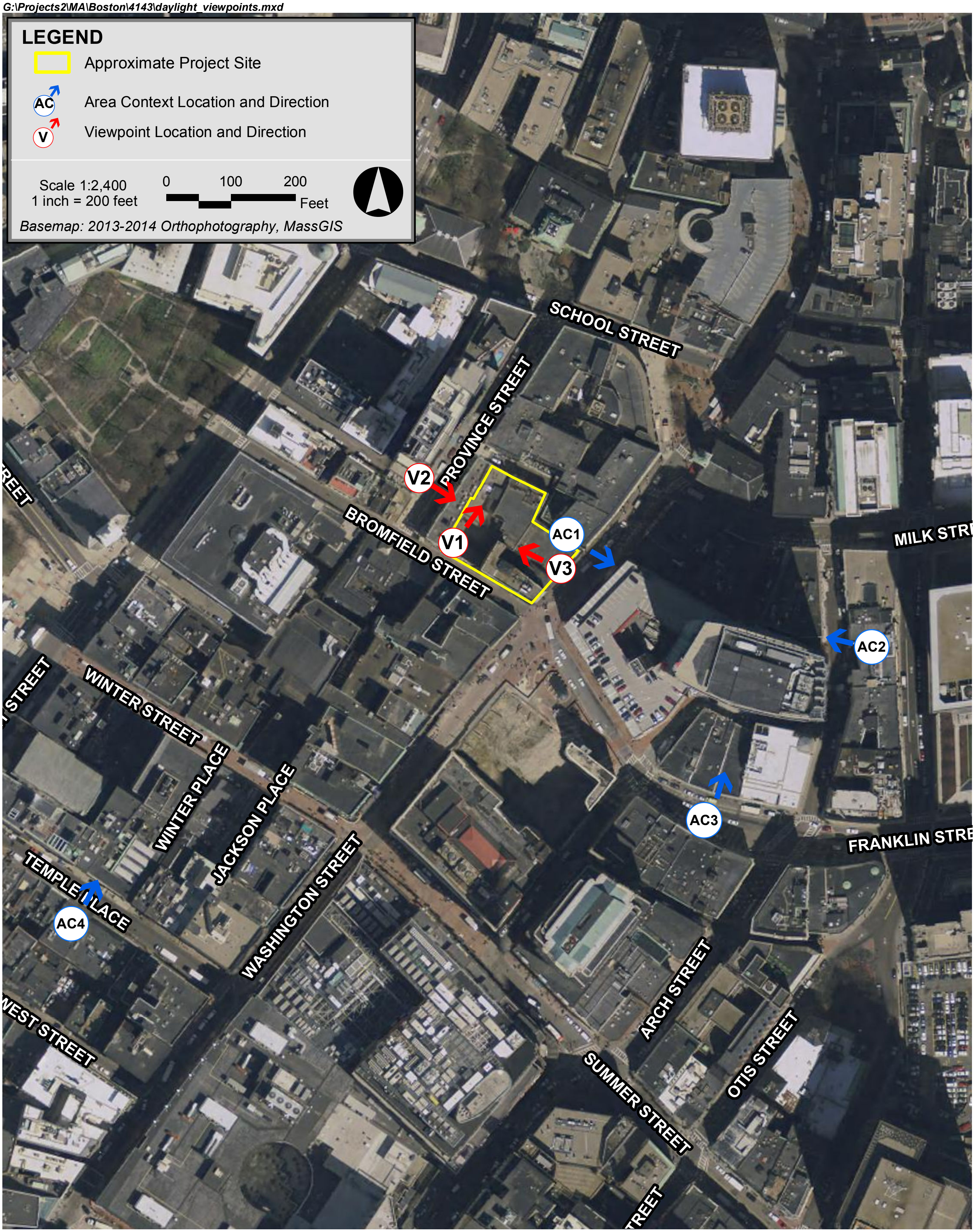
The analysis compares three conditions for the Project Site: Existing Condition; Proposed Condition; and As-of-right Alternative Condition; as well as the context of the area.

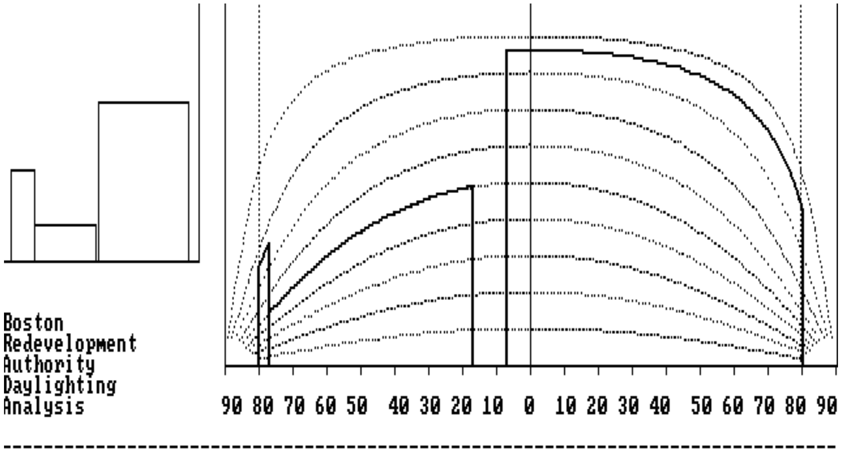
Three viewpoints were chosen to evaluate daylight obstruction for the Existing, Proposed, and As-of-right Alternative conditions; one from Bromfield Street (Viewpoint 1), one from Province Street (Viewpoint 2), and one from Washington Street (Viewpoint 3). Four area context points were considered in order to provide a basis of comparison to existing conditions in the surrounding area. The viewpoints were taken from the following locations and are shown on Figure 4.3-1.

- **Viewpoint 1:** View from Bromfield Street facing northeast toward the Project Site
- **Viewpoint 2:** View from Province Street facing southeast toward the Project Site
- **Viewpoint 3:** View from Washington Street facing northwest toward the Project Site
- **Area Context Viewpoint (AC1)**: View from Washington Street facing east toward 33 Arch Street
- **Area Context Viewpoint (AC2)**: View from Arch Street facing west toward 33 Arch Street
- **Area Context Viewpoint (AC3)**: View from Hawley Street facing north toward 33 Arch Street
- **Area Context Viewpoint (AC4)**: View from Temple Place facing north toward 16 Temple Place

4.3.3 Results

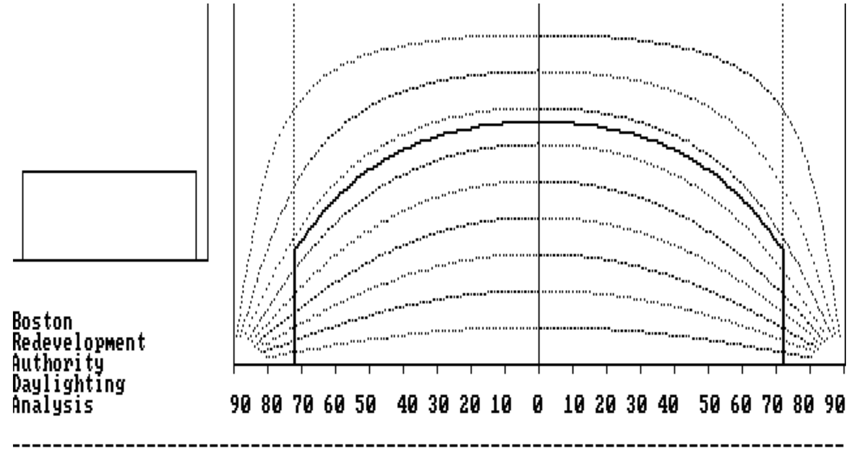
The results for each viewpoint under each alternative condition are described in Table 4.3-1. Figures 4.3-2 through 4.3-5 illustrate the BRADA results for each analysis and are located at the end of this section.


LEGEND
Approximate Project Site
AC
Area Context Location and Direction
V
Viewpoint Location and Direction
Scale 1:2,400
1 inch = 200 feet
0
100
200
Feet
Basemap: 2013-2014 Orthophotography, MassGIS
SCHOOL STREET
PROVINCE STREET
BROMFIELD STREET
MILK STRE
V1
V2
V3
AC1
AC2
AC3
AC4
WINTER STREET
WINTER PLACE
JACKSON PLACE
WASHINGTON STREET
TEMPLE PLACE
FRANKLIN STRE
ARCH STREET
OTIS STREET
SUMMER STREET
WEST STREET



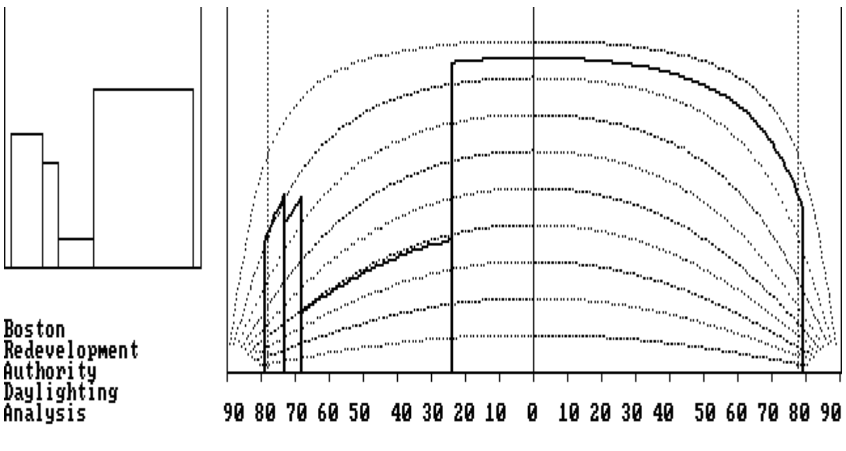
Obstruction of daylight by the building is 83.5 %

Viewpoint 1: View from Bromfield Street facing northeast toward the Project site



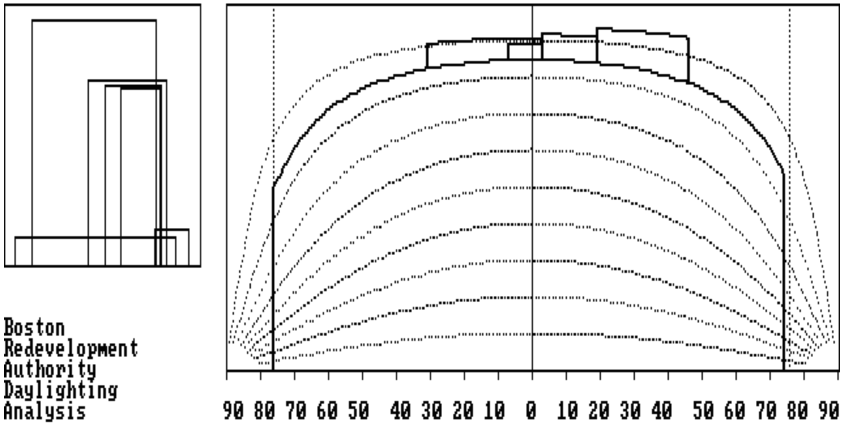
Obstruction of daylight by the building is 66.2 %

Viewpoint 2: View from Province Street facing southeast toward the Project site



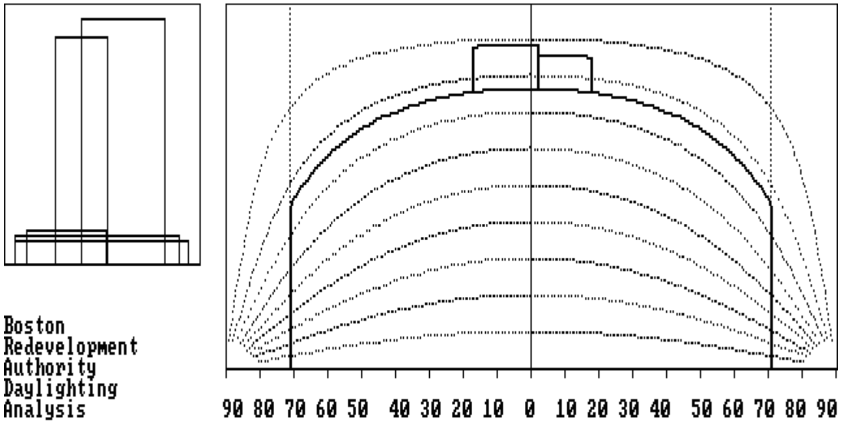
Obstruction of daylight by the building is 76.8 %

Viewpoint 3: View from Washington Street facing northwest toward the Project site



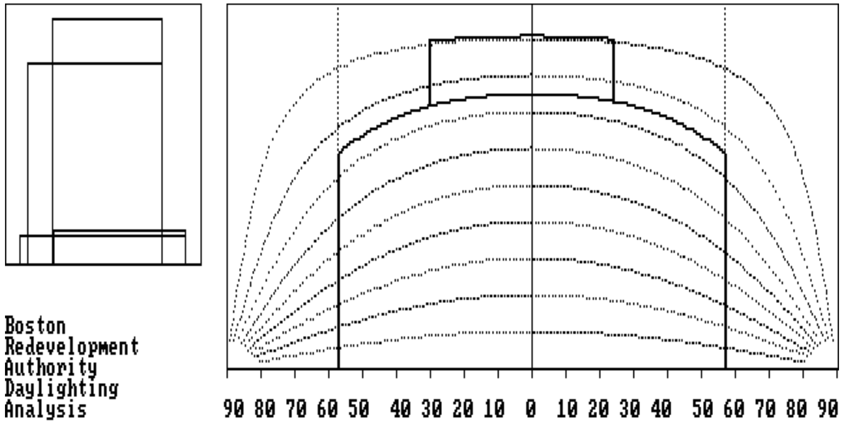
Obstruction of daylight by the building is 87.3 %

Viewpoint 1: View from Bromfield Street facing northeast toward the Project site



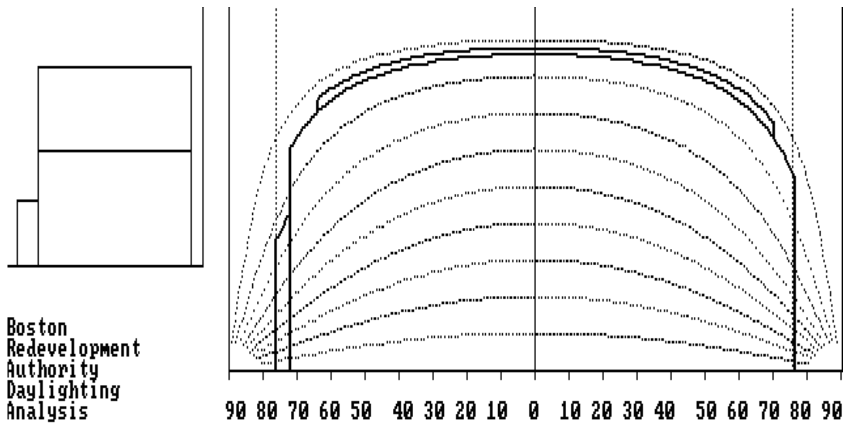
Obstruction of daylight by the building is 79.0 %

Viewpoint 2: View from Province Street facing southeast toward the Project site



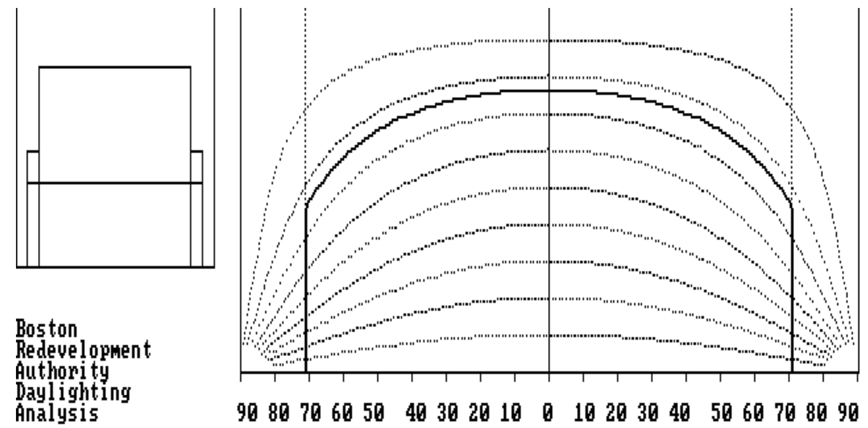
Obstruction of daylight by the building is 82.5 %

Viewpoint 3: View from Washington Street facing northwest toward the Project site



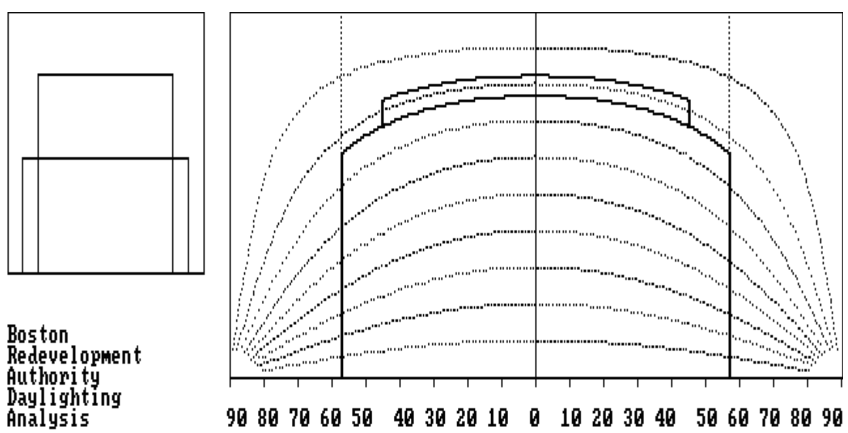
Obstruction of daylight by the building is 87.6 %

Viewpoint 1: View from Bromfield Street facing northeast toward the Project site



Obstruction of daylight by the building is 76.3 %

Viewpoint 2: View from Province Street facing southeast toward the Project site

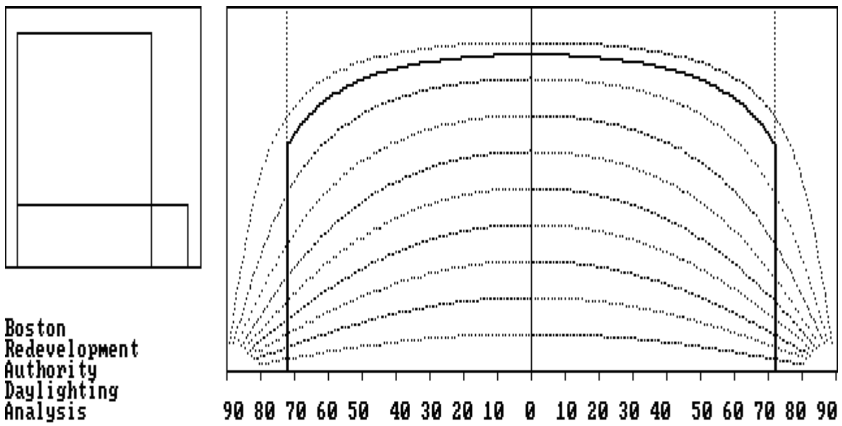


Obstruction of daylight by the building is 81.1 %

Viewpoint 3: View from Washington Street facing northwest toward the Project site

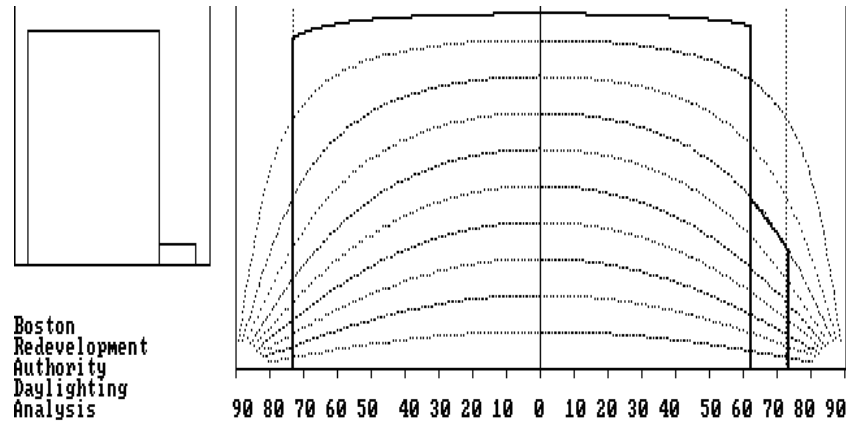
Figure 4.3-4

As-of-right Conditions



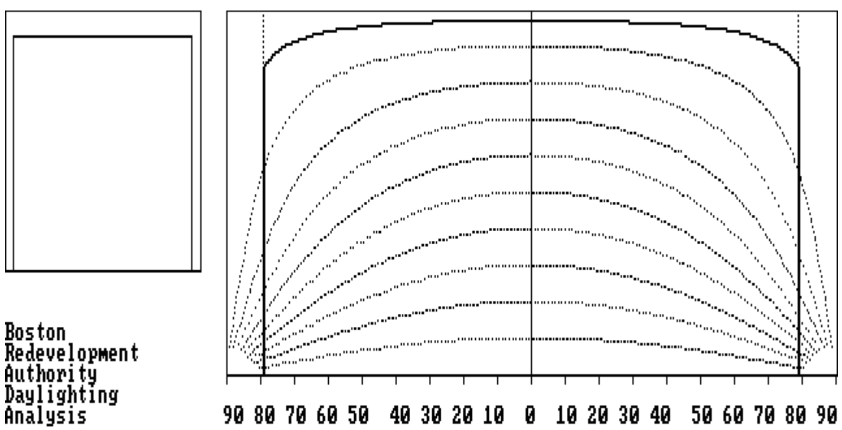
Obstruction of daylight by the building is 86.7 %

Area Context Viewpoint (AC1): View from Washington Street facing east toward 33 Arch Street



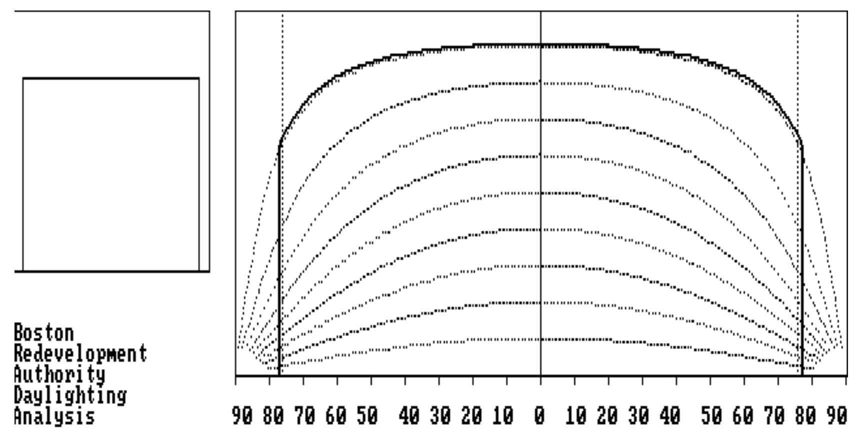
Obstruction of daylight by the building is 95.7 %

Area Context Viewpoint (AC2): View from Arch Street facing west toward 33 Arch Street



Obstruction of daylight by the building is 97.0 %

Area Context Viewpoint (AC3): View from Hawley Street facing north toward 33 Arch Street



Obstruction of daylight by the building is 91.6 %

Area Context Viewpoint (AC4): View from Temple Street facing north toward 16 Temple Street

Table 4.3-1 Daylight Obstruction Values

Viewpoint Locations		Existing Conditions	Proposed Conditions	As-of-right Alternative
Viewpoint 1	View from Bromfield Street facing northeast toward the Project Site	83.5%	87.3%	87.6%
Viewpoint 2	View from Province Street facing southeast toward the Project Site	66.2%	79.0%	76.3%
Viewpoint 3	View from Washington Street facing northwest toward the Project Site	76.8%	82.5%	81.1%
Area Context Points				
AC1	View from Washington Street facing east toward 33 Arch Street	86.7%	N/A	N/A
AC2	View from Arch Street facing west toward 33 Arch Street	95.7%	N/A	N/A
AC3	View from Hawley Street facing north toward 33 Arch Street	97.0%	N/A	N/A
AC4	View from Temple Place facing north toward 16 Temple Place	91.6%	N/A	N/A

Bromfield – Viewpoint 1

Bromfield Street runs along the southwestern edge of the Project Site. Viewpoint 1 was taken from the center of Bromfield Street, looking northeast at the Project Site. The development of the Project will result in a slight increase in the daylight obstruction value at this viewpoint from 83.5% to 87.3%. While this is an increase over Existing Conditions, the daylight obstruction value for the Project is consistent with the area context values and is similar to the As-or-right Alternative, which would have a daylight obstruction value of 87.6%.

Province Street – Viewpoint 2

Province Street runs along the northwestern edge of the Project Site. Viewpoint 2 was taken from the center of Province Street looking southeast at the Project Site. Existing conditions at the Project Site have a daylight obstruction value of 66.2%, due to the two-story building located on the western edge of the Project Site. The As-of-right Alternation would result in a daylight obstruction value of 76.3% since the mass of the building would take up a majority of the site. The development of the Project will increase daylight obstruction values at the site to 79.0%, which is very similar to the As-of-right Alternative and lower than the area context values.

Washington Street – Viewpoint 3

Washington Street runs along the southeastern edge of the Project Site. Viewpoint 3 was taken from the center of Washington Street, looking northwest at the Project Site. The As-of-right Alternation would result in a daylight obstruction value of 81.1 %. The development of the Project will be similar to the As-of-right Alternative, and will increase daylight the obstruction value at this viewpoint from 76.8% to 82.5%. This is consistent with the area context daylight obstruction values.

Area Context Views

The Project area is primarily characterized by mixed-use buildings with commercial and residential uses, with retail and restaurant uses on the ground floor. The Project is located in a dense urban area with a number of existing and planned high-rises in the vicinity. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for the four area context viewpoints described above and shown on Figure 4.3-1. The daylight obstruction values range from 86.7% for AC1 to 97.0% for AC3. Daylight obstruction values for the Project are similar to the Area Context values.

4.3.4 Conclusions

The daylight analysis conducted for the Project describes Existing, Proposed and As-of-right Alternative daylight obstruction conditions at the Project Site and in the surrounding area. The results of the BRADA analysis indicate that while the Project will result in a minor increased daylight obstruction over Existing Conditions, the resulting conditions will be similar to the daylight obstruction values of the As-of-right Alternative and will be consistent with the surrounding area.

4.4 Solar Glare

As currently designed, the majority of the Project's exterior elevations will be glazed with low visual reflectivity glass. The Project is not expected to cause any significant solar glare impacts on the surrounding buildings, pedestrian areas, or roadways. Building details and design elements will be presented to the BRA and the Boston Civic Design Commission as the design progresses.

4.5 Air Quality Analysis

An air quality analysis has been conducted to determine the impact of pollutant emissions from mobile sources generated by the proposed Project. Specifically, a microscale analysis was performed to evaluate the potential air quality impacts of carbon monoxide (CO) resulting from traffic flow around the Project area. Any new stationary sources will be reviewed to the extent required by regulations by the Massachusetts Department of Environmental Protection (MassDEP).

4.5.1 National Ambient Air Quality Standards and Background Concentrations

Background air quality concentrations and federal air quality standards were utilized to conduct the above air quality impact analyses. Federal National Ambient Air Quality Standards (NAAQS) were developed by US Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety. The modeling methodologies were developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[3] The following sections outline the NAAQS standards and detail the sources of background air quality data.

4.5.1.1 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the US Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, EPA promulgated NAAQS for the following criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM10 and PM2.5), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in Table 4.5-1. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS.

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

A one-hour NO_2 standard was promulgated on January 22, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly NO_2 NAAQS was published in the Federal Register on February 9, 2010 and became effective on April 12, 2010. The form of this standard is the three-year average of the 98th percentile of the daily maximum one-hour concentrations.

Similarly, a one-hour SO_2 standard was promulgated on June 2, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly SO_2 NAAQS was published in the Federal Register on June 22, 2010 and became effective on August 23, 2010. The form of this standard is the three-year average of the 99th percentile of the daily maximum one-hour concentrations.

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[3] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

The inhalable particulate (PM10) NAAQS were promulgated on July 1, 1987 at the federal level with the intent of replacing the existing standards limiting ambient levels of Total Suspended Particulate (TSP). In 2006, the annual PM10 standard was revoked. However it remains codified in 310 CMR 6.00. EPA also promulgated a Fine Particulate (PM2.5) NAAQS, effective December 2006, with an annual standard of 15 $\mu g/m^3$ and the 24-hour standard of 35 micrograms per cubic meter ($\mu g/m^3$). The annual standard has since been strengthened to 12 $\mu g/m^3$ (in 2012).

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

Table 4.5-1 National (NAAQS) and Massachusetts (MAAQS) Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$) Primary	NAAQS ($\mu g/m^3$) Secondary	MAAQS ($\mu g/m^3$) Primary	MAAQS ($\mu g/m^3$) Secondary
NO_2	Annual (1)	100	Same	100	Same
	1-hour (2)	**188**	None	**None**	None
SO_2	Annual (1)(9)	80	None	80	None
	24-hour (3)(9)	365	None	365	None
	3-hour (3)	None	1300	None	1300
	1-hour (4)	**196**	None	**None**	None
$PM_{2.5}$	Annual (1)	**12**	**15**	**None**	**None**
	24-hour (5)	**35**	**Same**	**None**	**None**
PM_{10}	Annual (1)(6)	**None**	None	**50**	Same
	24-hour (3)(7)	150	Same	150	Same
CO	8-hour (3)	10,000	Same	10,000	Same
	1-hour (3)	40,000	Same	40,000	Same
Ozone	8-hour (8)	**147**	Same	**235**	Same
Pb	3-month (1)	1.5	Same	1.5	Same

(1) Not to be exceeded
(2) 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
(3) Not to be exceeded more than once per year.
(4) 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
(5) 98th percentile, averaged over 3 years
(6) EPA revoked the annual PM_{10} NAAQS in 2006.
(7) Not to be exceeded more than once per year on average over 3 years
(8) Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years.
(9) EPA revoked the annual and 24-hour SO_2 NAAQS in 2010. However they remain in effect until one year after the area's initial attainment designation, unless designated as "nontattinmentl".

Source: http://www.epa.gov/ttn/naaqs/criteria.html and 310 CMR 6.04

Massachusetts Ambient Air Quality Standards (MAAQS) are codified in 310 CMR 6.04, and generally follow the NAAQS but are not identical (highlighted in **bold** in Table 4.5-1 above.

4.1.5.2 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports was obtained for 2012 to 2014. The 3-hour and 24-hour SO_2 values are no longer reported in the annual reports. Data for these pollutant and averaging time combinations were obtained from the U.S. EPA's AirData website.

The Clean Air Act allows for one exceedance per year of the CO and SO_2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM-10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM-2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. For annual PM-2.5 averages, the average of the highest yearly observations was used as the background concentration. A new 1-hr NO_2 standard was recently promulgated. To attain this standard, the 3-year average of the 98th percentile of the maximum daily 1-hour concentrations must not exceed 188 $\mu g/m^3$.

Background concentrations were determined from the closest available monitoring stations to the proposed development. All pollutants are not monitored at every station, so data from multiple locations are necessary. The closest monitor is at 174 North Street in Boston's North End neighborhood, roughly 0.5 miles northeast of the Project Site. However this site samples only for PM2.5. The next closest site is at Kenmore Square, roughly 2.0 miles west-southwest of the Project. This site samples for SO2, NO2, PM10, and CO. Finally, a monitor at Harrison Avenue (2.2 miles southwest) samples for Ozone and Lead. A summary of the background air quality concentrations are presented in Table 4.5-2.

Table 4.5-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

Pollutant	Averaging Time	2012	2013	2014	Background Concentration ($\mu g/m^3$)	NAAQS	Percent of NAAQS
SO_2 (1)(6)	1-Hour (5)	34.6	31.4	25.4	30.5	196.0	16%
	3-Hour	27.8	36.4	24.6	36.4	1300.0	3%
	24-Hour	14.1	15.7	13.1	15.7	365.0	4%
	Annual	4.9	2.6	2.5	4.9	80.0	6%
PM-10	24-Hour	28.0	50.0	53.0	53.0	150.0	35%
	Annual	15.7	19.0	14.9	19.0	50.0	38%
PM-2.5	24-Hour (5)	20.9	19.9	14.5	18.4	35.0	53%
	Annual (5)	9.5	8.8	7.1	8.5	12.0	71%
NO_2 (3)	1-Hour (5)	92.1	90.2	92.1	91.5	188.0	49%
	Annual	35.9	33.4	32.3	35.9	100.0	36%

Table 4.5-2 Observed Ambient Air Quality Concentrations and Selected Background Levels (Continued)

Pollutant	Averaging Time	2012	2013	2014	Background Concentration ($\mu g/m^3$)	NAAQS	Percent of NAAQS
CO (2)	1-Hour	1489.8	1489.8	1489.8	1489.8	40000.0	4%
	8-Hour	1031.4	1031.4	1031.4	1031.4	10000.0	10%
Ozone (4)	8-Hour	153.1	115.8	106.0	153.1	147.0	104%
Lead	Rolling 3-Month	0.014	0.006	0.014	0.014	0.15	9%

Notes:
From 2012-2014 EPA's AirData Website
(1) SO_2 reported ppb. Converted to μg/m3 using factor of 1 ppm = 2.62 μg/m3.
(2) CO reported in ppm. Converted to μg/m3 using factor of 1 ppm = 1146 μg/m3.
(3) NO_2 reported in ppb. Converted to μg/m3 using factor of 1 ppm = 1.88 μg/m3.
(4) O_3 reported in ppm. Converted to μg/m3 using factor of 1 ppm = 1963 μg/m3.
(5) Background level is the average concentration of the three years.
(6) The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.

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

For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 1.3 ppm (1,490 $\mu g/m^3$) for one-hour and 0.9 ppm (1,031 $\mu g/m^3$) for eight-hour CO.

4.5.2 Methodology

The BRA typically requests an analysis of the effect on air quality of the increase in traffic generated by projects subject to Large Project Review. This “microscale” analysis is typically required for any intersection (including garage entrances/exits) where 1) Project traffic would impact intersections or roadway links currently operating at LOS D, E, or F or would cause LOS to decline to D, E, or F; 2) Project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) the Project will generate 3,000 or more new average daily trips on roadways providing access to a single location. The microscale analysis involves modeling of carbon monoxide (CO) emissions from vehicles idling at and traveling through signaled intersections. Predicted ambient concentrations of CO for the Build and No Build cases are compared with federal (and state) ambient air quality standards for CO.

The microscale analysis typically examines ground-level CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. The NAAQS standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on current vehicles has reduced the occurrences of CO hotspots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The analysis for the Project followed the procedure outlined in U.S. EPA's intersection modeling guidance.[4]

The microscale analysis has been conducted using the latest versions of EPA's MOVES and CAL3QHC programs to estimate CO concentrations at sidewalk receptor locations.

Baseline (2016) and future year (2021) emission factor data calculated from the MOVES model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections.

Existing background values of CO at the nearest monitor location at Kenmore Square were obtained from MassDEP. CAL3QHC results were then added to background CO values of 1.3 ppm (one-hour) and 0.9 ppm (eight-hour), as provided by MassDEP, to determine total air quality impacts due to the Proposed Project. These values were compared to the NAAQS for CO of 35 ppm (one-hour) and 9 ppm (eight-hour).

The modeling methodology was developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[5]

Modeling assumptions and backup data for results presented in this section are provided in the Appendix E.

Intersection Selection

As stated previously, a "microscale" analysis is typically required for the Project at intersections where 1) Project traffic would impact intersections or roadway links currently operating at LOS D, E, or F or would cause LOS to decline to D, E, or F; 2) Project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) the Project will generate 3,000 or more new average daily trips on roadways providing access to a single location.

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[4] U.S. EPA, Guideline for Modeling Carbon Monoxide from Roadway Intersections; EPA-454/R-92-005, November 1992.

[5] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

Two signalized intersections included in the traffic study meet the above conditions (see Chapter 3). The traffic volumes and LOS calculations provided in Chapter 3 form the basis of evaluating the traffic data versus the microscale thresholds. The intersections found to meet the criteria for inclusion in the microscale analysis are:

- the intersection of Tremont Street, Beacon Street, and School Street; and
- the intersection of Tremont Street, Cambridge Street, and Court Street.

Microscale modeling was performed for the intersections based on the aforementioned methodology. The 2016 existing conditions, and the 2021 No Build and Build conditions were each evaluated for both morning (a.m.) and afternoon (p.m.) peak.

Emissions Calculations (MOVES)

The EPA MOVES computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOVES model are based on motor vehicle operations typical of daily periods. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the county specific vehicle age registration distribution, fleet mix, meteorology, and other inputs. The inputs for MOVES for the existing (2016) and build year (2021) are provided by MassDEP.

All link types for the modeled intersection were input into MOVES. Idle emission factors are obtained from factors for a link average speed of 0 miles per hour (mph). Moving emissions are calculated based on speeds at which free-flowing vehicles travel through the intersection as stated in traffic modeling (SYNCHRO) reports. A speed of 30 mph is used for all free-flow traffic. Speeds of 10 and 15 mph were used for right (and U-turns, if necessary) and left turns, respectively. Roadway emissions factors were obtained from MOVES using EPA guidance.[6]

Winter CO emission factors are typically higher than summer. Therefore, January weekday emission factors were conservatively used in the microscale analyses.

Receptors and Meteorology Inputs

Sets of up to roughly 130 receptors were placed in the vicinity of the modeled intersection. Receptors extended approximately 300 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersections are presented in Figure 4.5-1 through Figure 4.5-2.

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[6] U.S. EPA, 2010. Using MOVES in Project-Level Carbon Monoxide Analyses. EPA-420-B-10-041

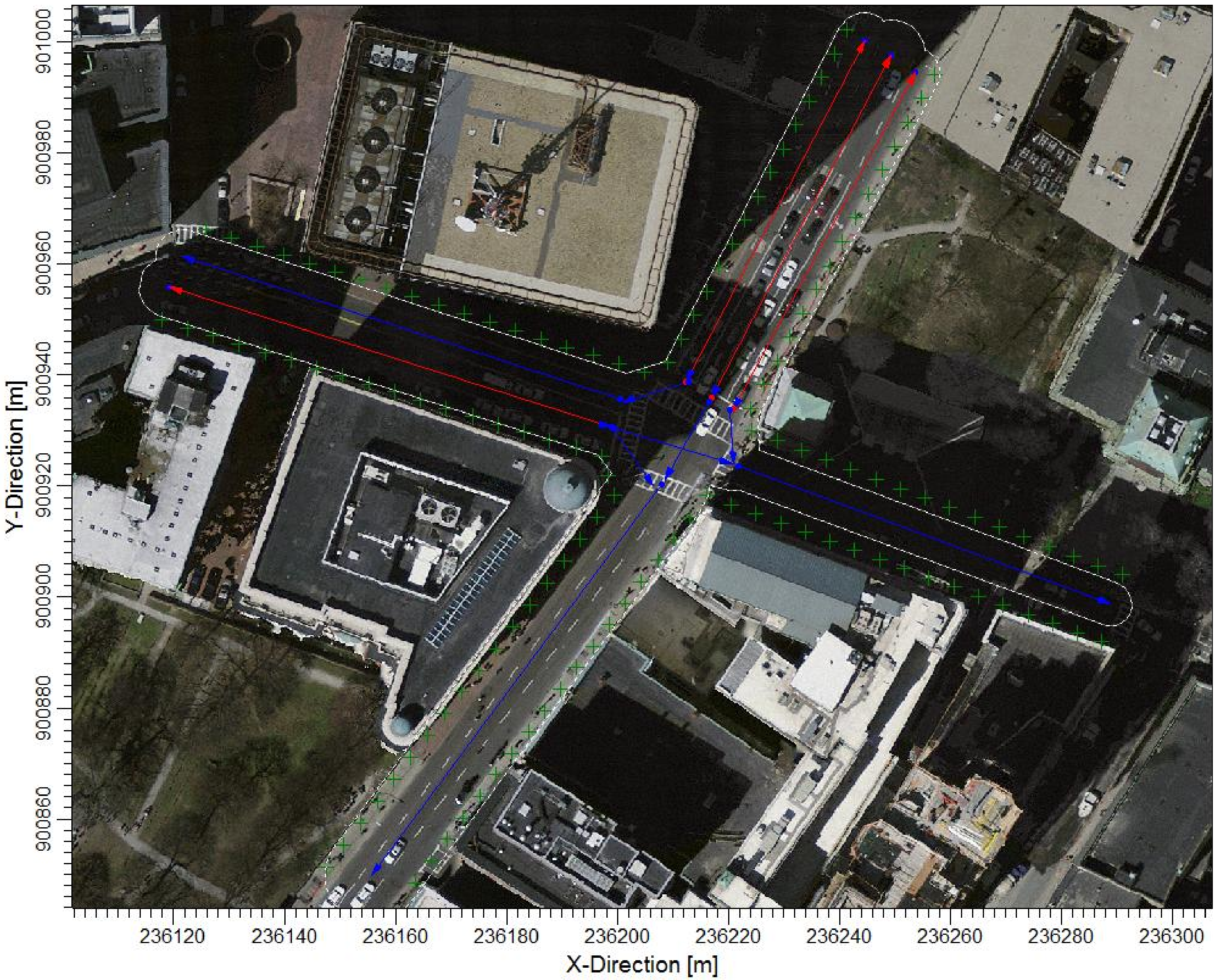

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Figure 4.5-1

Link and Receptor Locations for CAL3QHC modeling of Intersection of Tremont Street, Beacon Street & School Street

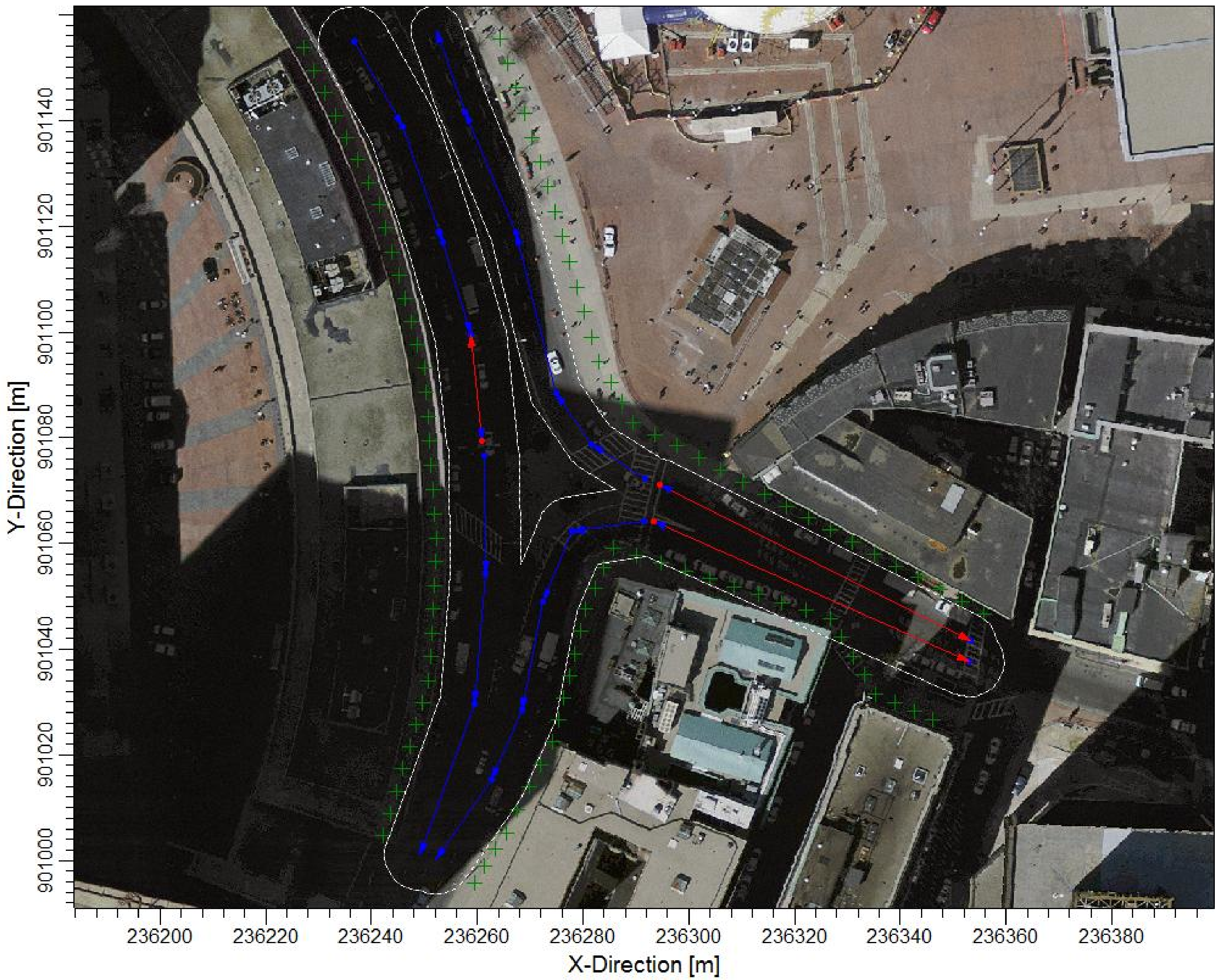

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Figure 4.5-2

Link and Receptor Locations for CAL3QHC modeling of Intersection of Tremont Street, Cambridge Street& Court Street

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[7], a wind speed of one meter per second, stability class D (4), and a mixing height of 1,000 meters were used. To account for the intersection geometry, wind directions from 0° to 350°, every 10° were selected. A surface roughness length of 321 centimeters was selected.[8]

Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-links at intersections, worst-case meteorological conditions, and traffic input data. The one-hour concentrations were scaled by a factor of 0.9 to estimate eight-hour concentrations.[9] The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling outputs.

4.5.3 Air Quality Results

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 4.5-3 through 4.5-6 for the 2016 and 2021 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.9.[10]

The results of the one-hour and eight-hour maximum modeled CO ground-level concentrations from CAL3QHC were added to EPA supplied background levels for comparison to the NAAQS. These values represent the highest potential concentrations at the intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology. The highest one-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (0.3 ppm) plus background (1.3 ppm) is 1.6 ppm for the peak cases. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (0.3 ppm) plus background (0.9 ppm) is 1.2 ppm for the same locations and scenarios. All concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

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7 U.S. EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections.* EPA-454/R-92-005, November 1992.

8 U.S. EPA, *User's Guide for CAL3QHC Version 2: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*. EPA –454/R-92-006 (Revised), September 1995.

9 U.S. EPA, AERSCREEN User's Guide; EPA-454/B-11-001, March 2011.

10 U.S. EPA, AERSCREEN User's Guide; EPA-454/B-11-001, March 2011.

Table 4.5-3 Summary of Microscale Modeling Analysis (Existing 2016)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.3	1.3	1.6	35
	PM	0.3	1.3	1.6	35
Tremont Street, Cambridge Street, and Court Street	AM	0.3	1.3	1.6	35
	PM	0.3	1.3	1.6	35
8-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.3	0.9	1.2	9
	PM	0.3	0.9	1.2	9
Tremont Street, Cambridge Street, and Court Street	AM	0.3	0.9	1.2	9
	PM	0.3	0.9	1.2	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

Table 4.5-4 Summary of Microscale Modeling Analysis (No-Build 2021)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.2	1.3	1.5	35
	PM	0.2	1.3	1.5	35
Tremont Street, Cambridge Street, and Court Street	AM	0.2	1.3	1.5	35
	PM	0.3	1.3	1.6	35
8-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.2	0.9	1.1	9
	PM	0.2	0.9	1.1	9
Tremont Street, Cambridge Street, and Court Street	AM	0.2	0.9	1.1	9
	PM	0.3	0.9	1.2	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

Table 4.5-5 Summary of Microscale Modeling Analysis (Build 2021)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.2	1.3	1.5	35
	PM	0.2	1.3	1.5	35
Tremont Street, Cambridge Street, and Court Street	AM	0.2	1.3	1.5	35
	PM	0.3	1.3	1.6	35
8-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.2	0.9	1.1	9
	PM	0.2	0.9	1.1	9
Tremont Street, Cambridge Street, and Court Street	AM	0.2	0.9	1.1	9
	PM	0.3	0.9	1.2	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

Table 4.5-6 Summary of Microscale Modeling Analysis (Mitigated Build 2021)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.1	1.3	1.4	35
	PM	0.2	1.3	1.5	35
Tremont Street, Cambridge Street, and Court Street	AM	0.2	1.3	1.5	35
	PM	0.3	1.3	1.6	35
8-Hour					
Tremont Street, Beacon Street, and School Street	AM	0.1	0.9	1.0	9
	PM	0.2	0.9	1.1	9
Tremont Street, Cambridge Street, and Court Street	AM	0.2	0.9	1.1	9
	PM	0.3	0.9	1.2	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

4.5.4 Conclusions

Results of the microscale analysis show that all predicted CO concentrations are well below one-hour and eight-hour NAAQS. Therefore, it can be concluded that there are no anticipated adverse air quality impacts resulting from increased traffic in the area.

4.5.5 Stationary Sources

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

4.5.5.1 Boilers

The current plans include a number of small condensing boilers for heat and domestic hot water. All units will be natural gas-fired and located on the Level 38M mechanical floor. The units are expected to be exhausted through individual stacks.

4.5.5.2 Emergency Generator

Current design plans include an emergency generator to be installed within the building. The unit will provide life safety and standby emergency power to the building. Typically, generators operate for approximately one hour each month for testing and general maintenance and as needed for emergency power. The unit will be diesel-fired and located within the building structure enclosed by concrete at Level 4. The generator is to be designed such that its exhaust stack extends at least 10 feet above the building roof height above ground level.

4.5.5.3 Cooling Towers

Current plans call for cooling towers to be installed on the building to be constructed. These units will remove the excess heat generated by the building's mechanical equipment. All units will be located on the roofs of the buildings.

4.6 Solid and Hazardous Waste

4.6.1 Hazardous Waste

If soil disposal is required, the Proponent will obtain site specific information regarding environmental conditions of excavated soils to evaluate for the presence of oil and hazardous materials. Foundation construction for the new building will likely generate soil requiring off-site transport. Chemical testing of the material will be required by receiving facilities to identify chemical constituents and any contaminants present. Chemical testing of the material will be conducted prior to construction in accordance with facility requirements.

Any material leaving the site will be legally transported in accordance with local, state and federal requirements. In addition, any regulated soil conditions related to oil and hazardous materials will be managed in accordance with appropriate Massachusetts MassDEP regulatory requirements.

4.6.2 Operation Solid and Hazardous Waste Generation

The Project will generate solid waste typical of residential and retail uses. Solid waste is expected to include wastepaper, cardboard, cans and glass bottles, as well as general trash. Recyclable materials will be recycled through a program implemented by building management. The Project will generate approximately 582 tons of solid waste per year.

With the exception of household hazardous wastes typical of residential and retail developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, or disposal of potentially hazardous materials.

4.6.3 Recycling

A dedicated recyclables storage and collection program will facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills. The residential portion of the Project will include either a single trash/recycle chute with a 'bi-sorter' or two separate chutes; one each for trash and recycling, leading to the trash room on the ground level. The trash will have a compactor and the recycling will be single stream, which collects more types of recycled materials and results in more recycling because there is no need to separate different types of materials. Commercial tenants will be encouraged via their leases to adopt robust recycling strategies, which will be overseen by the commercial property manager.

4.7 Noise

4.7.1 Introduction

A sound level assessment conducted by Epsilon Associates, Inc. included a baseline sound monitoring program to measure existing sound levels in the vicinity of the Project Site, computer modeling to predict operational sound levels from mechanical equipment associated with the Project, and a comparison of future Project sound levels to applicable City of Boston Zoning District Noise Standards.

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

4.7.2 *Noise Terminology*

There are several ways in which sound (noise) levels are measured and quantified, all of which use the logarithmic decibel (dB) scale. The following section defines the noise terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities observed in the environment. A property of the decibel scale is that the sound pressure levels of two distinct sounds are not purely additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a three-decibel increase (53 dB), not a doubling (100 dB). Thus, every three-decibel change in sound level represents a doubling or halving of sound energy. Related to this is the fact that a change in sound level of less than three dB is generally imperceptible to the human ear.

Another property of the decibel scale is that if one source of noise is 10 dB (or more) louder than another source, then the total combined sound level is simply that of the louder source (i.e., the quieter source contributes negligibly to the overall sound level). For example, a source of sound at 60 dB plus another source at 47 dB is 60 dB.

The sound level meter used to measure noise is a standardized instrument.[11] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various conditions. One network is the A-weighting network (there are also B- and C-weighting networks), which most closely approximates how the human ear responds to sound as a function of frequency, and is the accepted scale used for community sound level measurements. Sounds are frequently reported as detected with the A-weighting network of the sound level meter in dBA. A-weighted sound levels emphasize the middle frequencies (i.e., middle pitched—around 1,000 Hertz sounds), and de-emphasize lower and higher frequencies.

Because the sounds in our environment vary with time, they cannot simply be represented with a single number. In fact, there are several methods used for quantifying variable sounds which are commonly reported in community noise assessments, as defined below.

- L_{eq}, the equivalent level, in dBA, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed.
- L_{90} is the sound level, in dBA, exceeded 90 percent of the time in a given measurement period. The L_{90}, or residual sound level, is close to the lowest sound level observed when there are no obvious nearby intermittent noise sources.

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11 *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

- L_{50} is the median sound level, in dBA, exceeded 50 percent of the time in a given measurement period.
- L_{10} is the sound level, in dBA, exceeded only 10 percent of the time in a given measurement period. The L_{10}, or intrusive sound level, is close to the maximum sound level observed due to occasional louder intermittent noises, like those from passing motor vehicles.
- L_{max} is the maximum instantaneous sound level observed in a given measurement period.

By employing various noise metrics, it is possible to separate prevailing, steady sounds (the L_{90}) from occasional louder sounds (L_{10}) in the noise environment. This analysis treats all noise sources from the Project as though the emissions will be steady and continuous, described most accurately by the L_{90} exceedance level.

In the design of noise controls, which do not function quite like the human ear, it is important to understand the frequency spectrum of the noise source of interest. The spectra of noises are usually stated in terms of octave-band sound pressure levels, in dB, with the octave frequency bands being those established by standard (American National Standards Institute (ANSI) S1.11, 1986). To facilitate the noise-control design process, the estimates of noise levels in this analysis are also presented in terms of octave-band sound pressure levels. Octave-band measurements and modeling are used in assessing compliance with the City of Boston noise regulations.

4.7.3 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.

Table 4.7-1 below presents the "Zoning District Noise Standards" contained in Regulation 2.5 of the APCC "Regulations for the Control of Noise in the City of Boston," adopted December 17, 1976. These maximum allowable sound pressure levels apply at the 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 4.7-1 City Noise Standards, Maximum Allowable Sound Pressure Levels

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

Notes:

1. Noise standards from Regulation 2.5 "Zoning District Noise Standards", City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976.
2. All standards apply at the property line of the receiving property.
3. dB and dBA based on a reference pressure of 20 micropascals.
4. Daytime refers to the period between 7:00 a.m. and 6:00 p.m. daily, except Sunday.

4.7.4 Existing Conditions

A background noise level survey was conducted to characterize the existing "baseline" acoustical environment in the vicinity of the Project, located within the Downtown Crossing area of Boston. Existing noise sources in the vicinity of the Project Site currently include: vehicle and truck traffic along local roadways; rooftop mechanical equipment; daytime construction activity; pedestrian foot traffic; and the general City soundscape.

4.7.4.1 Noise Monitoring Methodology

Sound level measurements were made on Wednesday, January 6, 2016 during the daytime (2:30 p.m. to 5:00 p.m.) and on Friday, January 8, 2016 during nighttime hours (12:00 a.m. to 2:00 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. Measurements at locations ST-1 and ST-2 were 20 minutes in duration, with measurements at location LT-1 extended for a one-hour duration.

Sound levels were measured at publicly accessible locations at a height of five feet (1.5 meters) above ground level, under low wind conditions, and with dry roadway surfaces. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a General Tools digital psychrometer. Unofficial observations about meteorology or land use in the community were made solely to characterize the existing sound levels in the area and to estimate the noise sensitivity at properties near the Project Site.

4.7.4.2 Noise Monitoring Locations

Three representative noise monitoring locations were selected based upon a review of zoning and land use in the Project area. These measurement locations are depicted on Figure 4.7-1 and described below.

- **Location LT-1** is located in front of 45 Province Street at the intersection of Province Street and Province Court, representative of the closest residential receptor to the north of the Project.
- **Location ST-2** is located in front of 44 Bromfield Street, representative of the closest residential, educational, and commercial receptors to the west and south of the Project.
- **Location ST-3** is located in front of 330 Washington Street, representative of nearby residential, institutional, and commercial receptors south and east of the Project.

4.7.4.3 Noise Monitoring Equipment

A Larson Davis Model 831 sound level meter equipped with a PRM831 Type I Preamplifier, a 377B20 half-inch microphone, and manufacturer-provided windscreen was used to collect background sound pressure level data. This instrumentation meets the "Type 1 - Precision" requirements set forth in ANSI S1.4 for acoustical measuring devices. The measurement equipment was calibrated in the field before and after the surveys with a Larson Davis CAL200 acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. Statistical descriptors (L_{eq}, L_{90}, etc.) were calculated for each sampling period, with octave-band sound levels corresponding to the same data set processed for the broadband levels.

4.7.4.4 Measured Background Noise Levels

Baseline noise monitoring results are presented in Table 4.7-2, and summarized below:

- The daytime residual background (L_{90} dBA) measurements ranged from 60 to 63 dBA;
- The nighttime residual background (L_{90} dBA) measurements ranged from 55 to 58 dBA;
- The daytime equivalent level (L_{eq} dBA) measurements ranged from 65 to 70 dBA;
- The nighttime equivalent level (L_{eq} dBA) measurements ranged from 62 to 76 dBA.

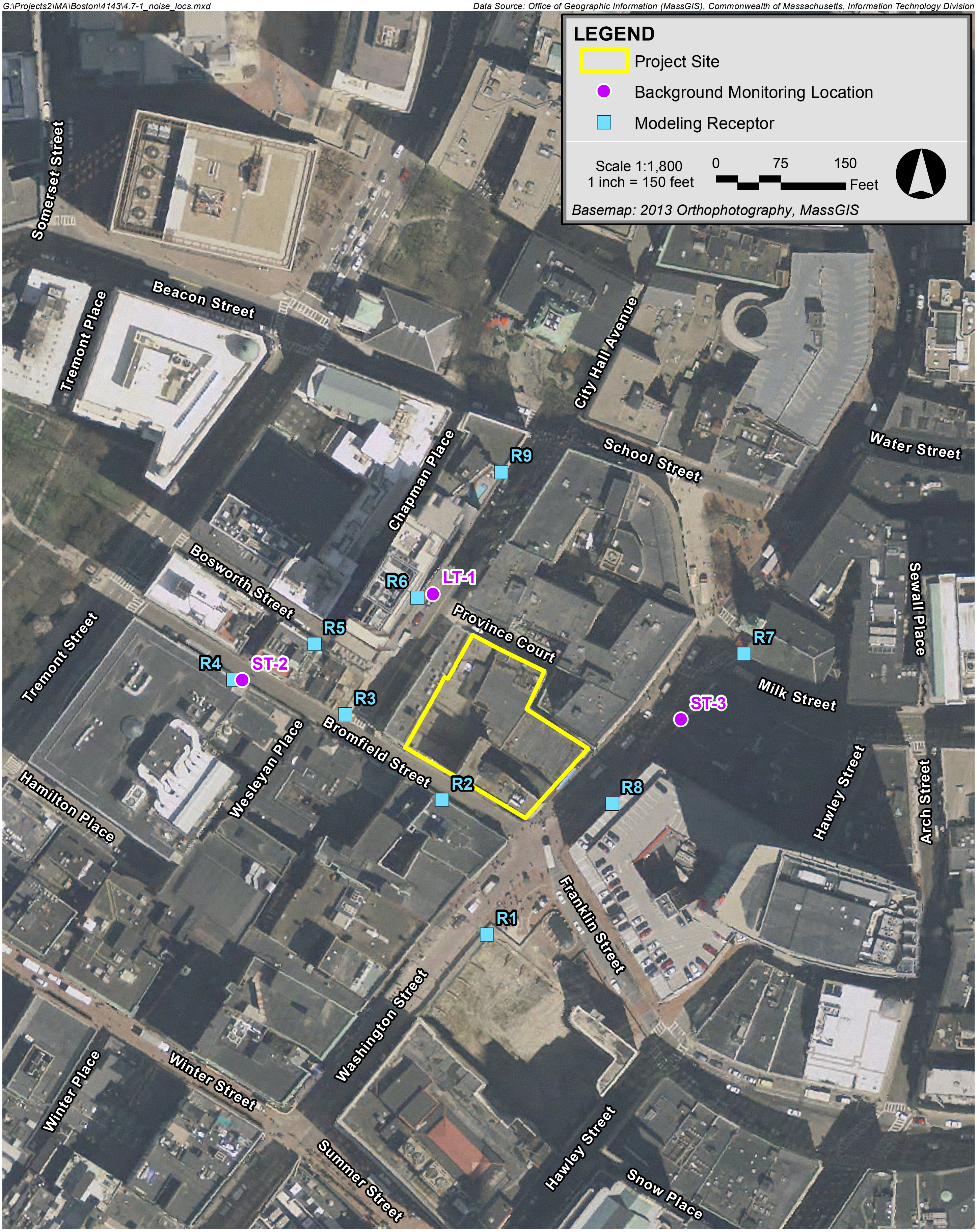

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Figure 4.7-1

Noise Monitoring & Modeling Locations

Table 4.7-2 Summary of Measured Background Noise Levels – January 6, 2016 (Daytime) & January 8, 2016 (Nighttime)

Location	Period	Start Time	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}	L_{90} Sound Pressure Levels by Octave-Band								
								31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
			dBA	dBA	dBA	dBA	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
LT-1	Day	2:48 PM	65	84	67	63	62	66	66	62	63	61	56	51	45	37
ST-2	Day	3:50 PM	68	91	66	61	60	66	61	62	63	57	53	48	42	39
ST-3	Day	4:18 PM	70	93	70	64	63	67	65	64	61	60	58	54	48	41
LT-1	Night	12:02 AM	62	85	63	59	58	62	63	59	57	57	53	49	41	27
ST-2	Night	1:04 AM	62	73	65	59	58	64	57	61	61	55	52	46	39	32
ST-3	Night	1:28 AM	76	89	78	59	55	61	60	60	57	53	49	43	33	21

Weather Conditions:

	Date	Temp	RH	Sky	Wind
Daytime	Wednesday, January 06, 2016	45 °F	10%	Sunny	S-SW @ 3-5 mph
Nighttime	Friday, January 08, 2016	35 °F	63%	Clear	NE @ 2-4 mph

Monitoring Equipment Used:

	Manufacturer	Model	S/N
Sound Level Meter	Larson Davis	LD831	3047
Microphone	Larson Davis	377B20	LW130579
Preamp	Larson Davis	PRM831	23825
Calibrator	Larson Davis	Cal200	7147

4.7.5 Future Conditions

4.7.5.1 Overview of Potential Project Noise Sources

The primary sources of continuous sound exterior to the Project will consist of rooftop cooling towers, garage exhaust fans, air handling units, intake and exhaust louvers venting mechanical spaces, and emergency power equipment.

Four 500-ton single cell cooling towers are anticipated be located on the tower roof behind a rooftop perimeter screening wall. Each floor of the parking garage (Levels 3 &4) will have six 10,000 CFM garage exhaust fans for a total of twelve along the northern façade of the proposed building. The parking garage will draw inlet air through a louvered area in the southern façade of the proposed building (no garage inlet fans proposed). The Level 5 MEP space is anticipated to consist of eight air handling units (AHU) and eleven exhaust fans vented through acoustically-louvered intake and exhaust areas along the southern and northern facades of the proposed building, respectively. A single AHU inlet is anticipated to be ducted directly through the northern and southern façades of the proposed building on Level 38 (total of two inlets fitted with acoustic louvers). Acoustically-louvered exhaust areas in the eastern and western facades of the proposed building are anticipated to vent two rooms on Level 38 and 38M each containing a single AHU and three exhaust fans. A single 1,000 kW emergency generator is anticipated to be located on Level 4 with the intake and cooling air exhaust ducts fitted with an attenuator and terminating through the northern façade of the proposed building through an acoustically-louvered opening. The generator exhaust duct, fitted with a super critical grade silencer, will terminate on the lower roof of Level 7.

Other secondary noise sources including chillers, domestic hot water heaters, pumps, and space heating boilers will either be enclosed within the building interior, or are assumed to have sound levels 10 dBA lower than the primary sources of noise, and were not considered in this analysis to contribute significantly to the overall sound level. Stair pressurization fans were assumed to be emergency-use only and were not included.

Mitigation will be applied to sources as needed to ensure compliance with the applicable noise regulations. The noise control features assumed in this analysis consist of an emergency generator sound attenuator and super critical grade exhaust silencer, as well as acoustic louvers on the Level 5 MEP intake and exhaust area, Level 38M exhaust area, Level 38 AHU inlet ducts, garage exhaust fan exit points and emergency generator intake/exhaust air exit point.

A tabular summary of the modeled mechanical equipment proposed for the Project is presented below in Table 4.7-3. Sound power level data for each unit, as provided by the manufacturer or calculated from provided sound pressure level data, is presented in Table 4.7-4. Sound power levels of those units for which data was not provided were assumed based on data for similar or representative equipment. Noise reduction levels assumed in the model are provided in Table 4.7-5. The approximate locations of the mechanical equipment were provided by the Project team through preliminary roof and floor plans.

Table 4.7-3 Modeled Noise Sources

Noise Source	Quantity	Equipment Location	Size/Capacity per Unit
Cooling Tower	4	Level 59 Roof	500 Ton
Garage Exhaust Fan	12	Level 3 & 4 Parking	10,000 CFM
Air Handling Unit (AHU)	14	Levels 5, 38, 38M MEP	10,000 CFM
Emergency Generator	1	Level 4 (Intake) & Level 7 (Exhaust)	1,000 kWe
Level 5 MEP Intake/Exhaust Louvers	2	Level 5 MEP	-
Level 38M MEP Exhaust Louvers	2	Level 38 MEP	-

Table 4.7-4 Modeled Sound Power Levels per Unit

Noise Source	Broadband	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
Cooling Tower[1]	88	91	91	87	85	82	80	78	75	86
Garage Exhaust Fan[2]	84	74	74	75	81	82	80	75	73	63
Air Handling Unit (AHU) – Inlet[3]	93	83	83	85	89	91	88	83	80	79
Emergency Generator – Mechanical[4]	129	123	126	132	132	127	124	118	113	93
Emergency Generator – Exhaust[5]	123	90	94	110	108	111	111	114	112	122
Level 5 MEP Intake Louvers[6]	74	92	88	76	81	69	59	51	53	57
Level 5 MEP Exhaust Louvers[7]	72	90	86	74	78	67	57	49	51	55
Level 38M MEP Exhaust Louvers[8]	64	86	82	66	71	59	49	41	43	48

Notes:

1. Marley Model NC8407MLN1 1-cell, 500-ton Cooling Tower with Quiet Fan, or similar
2. Assumed Greenheck SE2-48-407-C15, or similar
3. Aero Indoor Air Handler Size 21, 10000 CFM, 39M Supply Fan
4. MTU 16V 2000 G85, 1115 kW Engine, PWL based on Undampened Exhaust SPL @ 1m
5. MTU 16V 2000 G85, 1115 kW Engine, PWL based on Engine Surface SPL @ 1m
6. Based on interior Li = 89 dBA, assuming all concrete block interior and IAC louver TL with area of 180 ft^2
7. Based on interior Li = 89 dBA assuming all concrete block interior and IAC louver TL with area of 115 ft^2
8. Based on interior Li = 90 dBA assuming all concrete block interior and IAC louver TL with area of 15 ft^2
9. No data available in 32 Hz band. Assumed equal to 63 Hz band.

Table 4.7-5 Modeled Noise Reduction Levels

Noise Control	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
	dB	dB	dB	dB	dB	dB	dB	dB	dB
Generator Air Exhaust/Intake Attenuator[1]	4[4]	8	14	26	30	26	25	19	15
Generator Exhaust Silencer[2]	17[4]	35	45	47	45	37	37	38	39
Acoustic Louver[3]	3[4]	7	9	12	24	31	33	29	30

1. Vibro-Acoustics RD-MV Attenuator (DIL), or similar
2. Vibro-Acoustics Super Critical Muffler (DIL), or similar
3. IAC Acoustics SL-600 Slimshield Acoustic Louver (TL), or similar
4. No data available in 32 Hz band. Assumed equal to 63 Hz band.

4.7.5.2 Noise Modeling Methodology

Noise impacts from mechanical equipment associated with the Project were predicted using Cadna/A noise calculation software (DataKustik Corporation, 2005). This software, which uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation), offers a refined set of computations accounting for local topography, ground attenuation, drop-off with distance, barrier shielding, diffraction around building edges, reflection off building facades, and atmospheric absorption of sound from multiple noise sources.

An initial analysis considered all of the mechanical equipment without the emergency generator running to simulate typical nighttime operating conditions at nearby receptors. A second analysis combined the mechanical equipment and the emergency generator to reflect worst-case daytime conditions during brief, routine, testing of the generator when ambient levels are higher.

4.7.5.3 Noise Modeling Results

Nine modeling locations with a height of 1.5 meters above-grade were included in the analysis representing the nearest noise-sensitive residential, business, and institutional receptors. Figure 4.7-1 shows the locations of each modeled receptor as well as the monitoring locations selected for background measurements.

The predicted sound levels, presented in Table 4.7-6, from all mechanical equipment operating simultaneously (except the emergency generator) at rated load are expected to range from 25 to 47 dBA at nearby receptors (25 to 45 at the closest residences). Table 4.7-7 presents predicted sound levels from all mechanical equipment including the emergency generator during routine daytime testing periods which are expected to range from 27 to 47dBA at nearby receptors including the closest residences.

Results of this evaluation demonstrate that sound levels from Project operation are anticipated to fully comply with the City of Boston nighttime broadband and octave-band noise limits described in Table 4.7-1. Additionally, Project-only sound levels are predicted to remain well below the existing background sound levels in the area shown in Table 4.7-2, which already exceed many of the City of Boston limits without any contribution from the Project. At several modeling locations, mitigation designed to meet the City of Boston octave-band limits resulted in A-weighted broadband levels lower than the City of Boston A-weighted broadband limits. As such, this analysis indicates that the proposed Project can operate without significant impact on the existing acoustical environment.

Table 4.7-6 Modeled Project-Only Sound Levels – Typical Nighttime Operation (No Emergency Generator)

Modeling Location ID	Zoning / Land Use	Evaluation Period	Broadband (dBA)	Sound Pressure Level (dB) per Octave-band Center Frequency								
				32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
R1	Residential	Night	29	48	43	34	35	25	16	10	4	0
R2	Business	Night	47	65	61	49	53	42	32	24	25	28
R3	Residential	Night	40	55	51	41	47	35	25	18	18	17
R4	Educational[1]	Night	34	52	48	38	40	31	22	15	11	7
R5	Residential	Night	25	44	40	31	30	22	16	11	2	0
R6	Residential	Night	41	57	53	45	48	38	28	21	21	17
R7	Museum[1]	Night	29	45	41	34	34	25	18	12	5	0
R8	Business	Night	38	54	50	41	44	33	24	16	16	11
R9	Business	Night	30	46	43	36	36	27	20	14	6	0
City of Boston Limits	**Residential**	**Night**	**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business	**Night**	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**
	Industrial	**Night**	**70**	**83**	**82**	**77**	**73**	**67**	**61**	**57**	**53**	**50**

1. Daytime use only

Table 4.7-7 Modeled Project-Only Sound Levels – Typical Daytime Operation + Routine Emergency Generator Testing

Modeling Location ID	Zoning / Land Use	Evaluation Period	Broadband (dBA)	Sound Pressure Level (dB) per Octave-band Center Frequency								
				32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
R1	Residential	Day	29	50	43	35	35	25	20	13	6	0
R2	Business	Day	47	65	61	49	53	42	32	24	25	28
R3	Residential	Day	43	56	51	43	47	38	38	32	24	17
R4	Educational[1]	Day	34	53	48	38	40	31	23	17	12	7
R5	Residential	Day	26	46	40	32	30	23	19	14	6	2
R6	Residential	Day	46	62	54	52	49	40	40	35	31	37
R7	Museum[1]	Day	32	53	42	36	35	27	27	21	11	4
R8	Business	Day	38	56	50	42	44	33	28	21	18	14
R9	Business	Day	32	53	44	38	36	28	24	18	10	7
City of Boston Limits	**Residential**	**Day**	**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Business	**Day**	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**
	Industrial	**Day**	**70**	**83**	**82**	**77**	**73**	**67**	**61**	**57**	**53**	**50**

1. Compared to daytime 'residential' limits

4.7.6 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 (as described in Section 4.7.5.1), 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 as well as noise levels from routine daytime testing of the emergency generator 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 in Section 4.7.5.3 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.

4.8 Flood Hazard Zones/ Wetlands

The recently updated Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the Project Site indicates that it is located outside of a designated flood zone (FIRM, City of Boston, Community-Panel Number 25025C0081J, Effective Date March 16, 2016).

The site does not contain wetlands and is fully developed.

4.9 Geotechnical Impacts

This section discusses site soil and groundwater conditions, earthwork, and the anticipated foundation construction methods for the proposed Project.

The Project includes a residential tower constructed on a podium containing retail and amenity space. Construction of one below-grade basement level is planned for retail use.

4.9.1 Subsurface Soil and Bedrock Conditions

The Project Site is located within the original Boston colonial shoreline and is generally characterized by favorable ground conditions. A test boring program was completed at the Project Site by the Proponent. In addition, available test boring logs from near the Project have also been compiled and reviewed to understand area geologic conditions. Subsurface conditions are characterized by the following general soil profile:

Generalized Description	Approximate Thickness of Layer (ft)
Fill (variable, granular fill)	1 to 12
Marine Deposits (Typ. medium to very dense silt or very stiff sandy clay)	10 to 30
Glacial Deposits (very dense silt, with varying amounts of sand, gravel, cobbles)	40 to 50
Bedrock (Cambridge Argillite)	Depth to Rock of 70 to 90 ft

The property is currently occupied by four buildings that range in height from two to six stories above grade and have one to two basement levels. The lowest level basement of existing structures is typically finished at approximately El. 31 (ft BCB, Boston City Base). Sidewalk vaults are present below Washington and Bromfield Streets. Topographically, the site slopes from the northwest to the southeast from approximately El. 55 near the intersection of Province Street and Province Court to approximately El. 40 near the intersection of Bromfield and Washington Streets.

4.9.2 Groundwater Conditions

Groundwater levels measured at depths of about 15.5 to 43 ft during drilling of test borings correspond to about El. 5.5 to 28. Drilling fluids were used to maintain borehole stability during drilling such that the groundwater levels observed may not be representative of stable conditions. A groundwater observation well is planned to be installed in a subsequent subsurface exploration program to provide additional groundwater level data for Project design.

Historical groundwater level data reviewed from around the Project Site indicated groundwater levels varying between El. 10 to 21. Site groundwater levels are expected to fluctuate due to seasonal variations in precipitation and temperature, and other factors such as nearby construction activities, surface runoff, and leakage into and out of utilities and other below grade structures, and local fill and soil conditions.

4.9.3 Project Impacts and Foundation Considerations

The foundation design and construction methodology for the new structure have considered existing site conditions, proximity and conditions of adjacent structures, and the need to minimize potential impacts to adjacent structures including the MBTA Orange Line tunnel. Foundation support for the new structure is anticipated as follows:

- Based on the test borings, the top of naturally-deposited Marine and Glacial Deposits suitable for foundation support are anticipated at planned basement and foundation excavation depths. The tower will be supported on a mat foundation bearing in the dense glacial deposits underlying the Project Site. Column and wall loads for the podium will be supported on individual footings bearing in the Marine deposits.

- Existing grades on streets and sidewalks surrounding the Project Site range from approximately from El. 40 to 55. The proposed bottom of excavation for the foundation construction, assuming a mat and footing foundation system, is assumed to be on the order of 15 to 30 ft below adjacent city streets and 5 to 10 ft below existing building basement levels. Deeper excavations will be required locally for portions of the core and elevator pit.

- Minimizing impacts to surrounding structures is a primary consideration in the foundation design and construction methodology to be used for the Project below-grade construction. Mitigation measures include developing performance criteria and implementing a monitoring program.

- Due to site constraints, the proximity of adjacent facilities (including the MBTA Orange Line), and the planned depth of excavation below surrounding street grades, installation of a temporary earth support will be required for excavation and construction of the basement level and foundation system. The temporary earth support system will be designed and installed to limit ground movement and groundwater impacts as well as protect adjacent streets and structures, particularly those in close proximity to the Project Site such as the MBTA tunnel and street utilities. The system is planned to consist of drilled-in soldier piles and lagging.

- Foundation construction methodology will consist of using conventional excavation equipment. No pile driving is planned.

4.9.4 Groundwater Impacts

Though excavations are not currently anticipated to extend below groundwater, except potentially in areas of limited, locally deeper excavations, temporary construction dewatering likely will be required to manage precipitation and surface water to allow excavation and foundation construction to proceed in-the-dry. The dewatering limits and duration will be limited to that required to perform the work. Prior to the start of construction, appropriate temporary construction dewatering permits will be obtained from applicable agencies such as the Massachusetts Water Resources Authority (MWRA) and Boston Water and Sewer Commission (BWSC). Dewatering activities will be conducted in accordance with the criteria defined in those permits, and designed not to have any negative impacts on area groundwater levels.

4.9.5 Groundwater Conservation Overlay District (GCOD)

The Project Site is not located within the Groundwater Conservation Overlay District (GCOD) and thus the Project is not subject to the requirements of Article 32 of the Boston Zoning Code. Further, available records do not indicate that there are wood pile supported buildings within close proximity of the Project Site that would be susceptible to impacts of groundwater lowering. No impacts to permanent groundwater levels at neighboring properties are anticipated, but in any event, construction dewatering and other activities will be designed to avoid any such negative impacts.

4.9.6 Monitoring Program

The Proponent intends to implement a monitoring program prior to and during construction to document pre-construction conditions, and to detect potential construction impacts on adjacent facilities, if any. The program will include conducting preconstruction condition surveys of adjacent structures (subject to necessary abutter approvals), and installation and monitoring of instrumentation. The instrumentation program will include the following:

- settlement reference points on adjacent buildings and structures;
- monitoring gauges on cracks that may be identified in/on adjacent buildings;
- monitoring lateral deflection of the excavation support system; and
- vibration monitoring during vibration-generating activities such as building demolition.

Ambient data will be developed prior to the start of work. Movement and vibration limits and other criteria will be incorporated into the construction contract documents.

4.10 Construction Impacts

4.10.1 Introduction

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

Proper pre-planning with the City and neighboring stakeholders, including abutters and the Downtown Crossing Business Improvement District (BID), will be essential to the successful construction of the Project. Construction methodologies, which ensure public safety and protect nearby residences and businesses, will be employed. Techniques such as barricades, walkways and signage will be used. The CMP will include routing plans for trucking and deliveries, plans for the protection of existing utilities, control of noise and dust, and plans for off-site materials storage and delivery queueing.

During the construction phase of the Project, the Proponent will provide the name, telephone number and address of a contact person to communicate with on issues related to the Project construction.

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

4.10.2 Construction Methodology/Public Safety

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

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

4.10.3 Construction Schedule

The Proponent anticipates that the Project will commence construction in the first quarter of 2017 and last for approximately 32 months.

Typical construction hours will be from 7:00 am to 6:00 pm, Monday through Friday, with most shifts ordinarily ending at 3:30 pm. No substantial sound-generating activity will occur before 7:00 am. If longer hours, additional shifts, or Saturday work is required, the construction manager will obtain any necessary City permits. It is noted that some activities such as finishing activities could run beyond 6:00 pm to ensure the structural integrity of the finished product; certain components must be completed in a single pour, and placement of concrete cannot be interrupted; all applicable City permits will be obtained.

4.10.4 Construction Staging/Access

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

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

4.10.5 Construction Mitigation

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

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

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

4.10.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 1,540 construction jobs will be created over the length of construction. The Proponent will require the construction manager to comply with the Boston Residents Job Policy, requiring good-faith efforts to have at least 50% of the total employee work hours be for Boston residents, at least 25% of total employee work hours be for minorities and at least 10% of the total employee work hours be for women.

To reduce vehicle trips to and from the construction site, no construction worker parking will be available at the site and all workers will be strongly encouraged to use public transportation and ridesharing options. The Construction Manager will work aggressively to ensure that construction workers are well informed of the public transportation options serving the area. Space on-site will be made available for workers' supplies and tools so they do not have to be brought to the work site each day.

4.10.7 Construction Truck Routes and Deliveries

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

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

4.10.8 Construction Air Quality

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

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

4.10.9 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the Project. Increased community sound levels, however, are an inherent consequence of construction activities. 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.

4.10.10 Construction Vibration

All means and methods for performing work at the site will be evaluated for potential vibration impacts on adjoining property, utilities, and adjacent existing structures. Acceptable vibration criteria will be established prior to construction, and vibration will be monitored, if required, during construction to ensure compliance with the agreed-upon standard.

4.10.11 Construction Waste

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

4.10.12 Protection of Utilities

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

4.10.13 Rodent Control

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

4.10.14 Wildlife Habitat

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

Chapter 5.0

Sustainable Design and Climate Change Preparedness

5.0 SUSTAINABLE DESIGN AND CLIMATE CHANGE PREPAREDNESS

5.1 Sustainable Design

To comply with Article 37 of the Code, the Proponent intends to measure the results of its sustainability initiatives using the framework of the Leadership in Energy and Environmental Design (LEED) rating system. As new construction for residential and retail uses, the Project will use the LEED V4 for BD+C (New Construction) to show compliance with Article 37, which requires that the Project be LEED certifiable. The LEED rating system tracks the sustainable features of a project by achieving points in the following categories: Integrative Process, Location and Transportation, Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation in Design.

Integrative Process

Integrative Process: The Project tem held two LEED workshops during the early stages of the design process, and a decision on LEED points to be targeted was made prior to the end of schematic design.

Location and Transportation

Sensitive Land Protection: The Project Site comprises previously developed parcels in a densely developed neighborhood.

Surrounding Density and Diverse Uses: The density within a ¼ mile radius of the Project Site exceeds the credit requirements for average density. The building's main entrance is within a ½ mile of the main entrance of more than eight existing and publicly available diverse uses.

Access to Quality Transit: The Project Site is within ¼ mile walking distance to the MBTA Blue, Orange, Green, Red and Silver lines, providing more than 360 daily weekday trips and more than 216 daily weekend trips.

Bicycle Facilities: The Project Site connects to a road network with a speed limit of 25 mph or less, and will provide short-term storage for at least 2.5% of all peak visitors and long-term storage for at least 30% of all building occupants (i.e., at least one space per unit).

Reduced Parking Footprint: The Project achieves a 40% reduction from the base ratio.

Sustainable Sites

Construction Activity Pollution Prevention (prerequisite): The Project construction documents will include erosion and sedimentation control guidance for onsite implementation by the Construction Manager (CM). The CM is required to implement a compliant erosion and sedimentation control plan that meets local requirements and the U.S. Environmental Protection Agency (EPA) Construction General Permit (Phase I and II) of the National Pollutant Discharge Elimination System (NPDES) Program.

Site Assessment: The Proponent may complete and document a site survey or assessment that meets the criteria of this credit.

Open Space: The Project will provide accessible outdoor space greater than or equal to 30% of the total site area (including building footprint). A minimum of 25% of that outdoor space will be vegetated or have overhead vegetated canopy.

Rainwater Management: The Project will comply with this credit using Option 1 Path 3. This is a zero lot line project and will manage the 85th percentile rain event on site.

Heat Island Reduction: All parking will be under cover and the Proponent will specify low reflectivity roofing and landscaping.

Light Pollution Reduction: The Project will meet the uplight and light trespass requirements of this credit for all exterior luminaires located inside the Project boundary.

Water Efficiency

Outdoor Water Use Reduction (prerequisite): The Project will reduce the landscape water requirement by at least 30% from the calculated baseline for the site's peak watering month. Reductions will be achieved through plant species selection and irrigation system efficiency, as calculated by the Environmental Protection Agency (EPA) WaterSense Water Budget Tool.

Indoor Water Use Reduction (prerequisite): Through the specification of low-flow, high-efficiency plumbing fixtures, the Project will exceed the required 20% annual potable water use reduction.

Building Level Water Metering (prerequisite): Permanent water meters will be installed and whole building water use data will be shared with USGBC for five years.

Outdoor Water Use Reduction: Potable water use for irrigation will be reduced by 100% through the selection of native plants, and the use of alternative water sources and smart irrigation controls.

Indoor Water Use Reduction: Through the specification of low-flow, high-efficiency plumbing fixtures, the Project will exceed the required 30% annual potable water use reduction.

Energy and Atmosphere

Fundamental Commissioning and Verification (prerequisite): A third party commissioning agent, (CxA) 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 CxA will verify the building systems are installed, calibrated and perform to the building owners project requirements through verification and performance reviews of the systems to be commissioned. The commissioning agent will provide a summary report.

Minimum Energy Performance (prerequisite): Architectural and engineering systems will be designed to meet the mandatory requirements of ASHRAE 90.1-2010 and to achieve at least 5% energy performance improvement beyond that defined by ASHRAE 90.1-2010.

Building Level Energy Metering (prerequisite): New building-level energy meters will be installed to provide base building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, etc.). Energy consumption data will be shared with USGBC for five years.

Enhanced Commissioning: The Project will have a third party Commissioning Agent that will fulfill the requirements of the credit. The CxA's services will include review of the Owner's Project Requirements (OPR) and Basis of Design (BOD) documents, development of a commissioning plan, incorporation of a commissioning specification section into the construction documents and verification through startup observation and functional testing that the installed systems are operating in accordance with the OPR, BOD, and construction documents. The previous services apply to the following commissioned systems: HVAC systems, lighting control, and domestic hot water heating.

Optimize Energy Performance: The Project will demonstrate a minimum of a 18% improvement in energy use when compared to a baseline building performance as calculated using the rating method in Appendix G of ANSI/ASHREA/IESNA Standard 90.1-2007.

Advanced Energy Metering: Advanced energy metering will be installed for all energy sources.

Materials and Resources

Storage and Collection of Recyclables (prerequisite): The Project will reduce the amount of building waste that is taken to landfills by supporting occupant and retail tenant recycling efforts. A central area for the collection of recyclables will be included in the building.

Construction and Demolition Waste Management Planning (prerequisite): The construction management team will develop and implement a Construction Waste Management plan for waste generation on site and a final report will be produced detailing all major waste streams generated.

Building Life-cycle Impact Reduction: The Project will comply with Option 4 –Whole Building Life-cycle Assessment. The Project's structure and enclosure will demonstrate a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories, one of which will be a global warming potential. No impact category assessed as part of the life-cycle assessment will increase by more than 5% compared with the baseline building.

Building Product Disclosure and Optimization – Environmental Product Declaration: The Project team will specify that Environmental Product Declarations be provided for at least 20 different permanently installed products sourced from at least five different manufacturers that meet the credit criteria. Products that comply with one of the criteria for multi-attribute optimization may be used for 50%, by cost, of the total value of permanently installed products in the Project.

Building Product Disclosure and Optimization – Sourcing of Raw Materials: The Project will use at least five suppliers providing a total of 20 permanently installed products that provide a Global Reporting Initiative compliant Corporate Sustainability Report.

Construction and Demolition Waste Management: The construction management team will develop and implement a Construction Waste Management plan for waste generation on site. The construction manager will endeavor to divert as much demolition debris and construction waste from area landfills as possible, with a goal to achieve 75% diversion.

Indoor Environmental Quality

Minimum Indoor Air Quality Performance (prerequisite): The building mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standard 62.1-2010 and/or applicable building codes. Any naturally ventilated spaces will comply with the applicable portions of ASHRAE 62.1 as well.

Environmental Tobacco Smoke Control (prerequisite): The Project will comply with Option 2. No smoking will be allowed within the common areas of the building nor within the rental apartments. Designated smoking areas outside of the building will be located at least 25 feet from doorways, operable windows and outdoor air intakes.

Enhanced Indoor Air Quality Strategies: The Project will comply with both Options 1 and 2. Using mechanical, natural, and/or mixed mode ventilation systems, ASHRAE 62.1 standards will be met or exceeded.

Low-emitting Materials: Materials will be specified for at least five credit categories that meet the threshold level of compliance with emissions and content standards.

Construction Indoor Air Quality Management Plan: The construction manager will ensure that construction procedures comply with the credit criteria.

Indoor Air Quality Assessment: New filtration media will be installed and a flush-out will be performed prior to Project occupancy.

Thermal Comfort: HVAC systems and the building envelope will be designed to meet the requirements of ASHRAE Standard 55-2010.

Daylight: The Project has been designed to maximize daylight into the building.

Quality Views: The Project will be designed to maximize quality views to the outdoors.

Acoustic Performance: The Project will be designed to meet or exceed the sound and vibration criteria outlined for this credit.

Innovation in Design

The team has identified several possible ID credits listed below, (limited to five ID credits total):

- Exemplary Performance for Quality Views
- Pilot Credit for Planning for Resilience
- Exemplary Performance for Heat Island Reduction
- LEED Accredited Professional

Regional Priority

Regional Priority Credits, (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a Project team achieves one of the designated RPCs, an additional credit is awarded to the Project. RPCs applicable to the site include: Renewable Energy Production, Optimize Energy Performance, High Priority Site, Rainwater Management and Indoor Water Use Reduction. This Project anticipates one RPC for Rainwater Management.

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

Project Checklist

1 BROMFIELD
January 2016

Y	?	N			
1			Credit	Integrative Process	1

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

8	2	0	**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

4	7	0	**Water Efficiency**		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
2	4		Credit	Indoor Water Use Reduction	6
	2		Credit	Cooling Tower Water Use	2
	1		Credit	Water Metering	1

12	15	6	**Energy and Atmosphere**		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
3	3		Credit	Enhanced Commissioning	6
8	6	4	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

8	1	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
2			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

14	2	0	**Indoor Environmental Quality**		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
2			Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
	2		Credit	Interior Lighting	2
3			Credit	Daylight	3
1			Credit	Quality Views	1
1			Credit	Acoustic Performance	1

4	2	0	**Innovation**		6
3	2		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

1	2	1	**Regional Priority**		4
1			Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1
	1		Credit	Regional Priority: Specific Credit	1
		1	Credit	Regional Priority: Specific Credit	1

65	32	13	**TOTALS**	Possible Points:	110

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

5.2 Climate Change Preparedness

5.2.1 Introduction

The Project team examined two areas of concern related to climate change: drought conditions and increased number of high-heat days. Due to the Project's location, elevation and topography, the Project Site is not considered susceptible to the impacts of a reasonably-assumed sea level rise. It is also unlikely to experience extreme flooding in the case of large storms.

A copy of the preliminary Climate Change Checklist is included in Appendix F.

5.2.2 Drought Conditions

Under a global high emissions scenario that would increase the potential climate change impacts, the occurrence of droughts lasting one to three months could go up by as much as 75% over existing conditions by the end of the century. To minimize the Project's susceptibility to drought conditions, the landscape design is anticipated to incorporate native and adaptive plant materials which require low or no irrigation and are known for their ability to withstand adverse conditions. Plumbing fixtures will be specified to achieve a reduction in water use through low-flow water-closets, low-flow showers, and low-flow sinks. The Project team is considering the use of alternative water sources.

5.2.3 High Heat Days

The Intergovernmental Panel on Climate Change (IPCC) has predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from the current five-to-twenty days annually, to thirty-to-sixty days annually[1]. Energy conservation and other energy management building systems will be integral components of the Project.

The Project design will incorporate a number of measures to minimize the impact of high temperature events. The building will feature a high efficiency building envelope, the building's massing provides self-shading, and the Project will specify a high albedo roof and vegetated roof where practicable to minimize the heat island effect.

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[1] IPCC (Intergovernmental Panel on Climate Change), 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Avery, M. Tignor, and H. L. Miller (eds.)]. Cambridge University Press, Cambridge, UK, and New York, 996 pp.

5.3 Energy Systems

Energy modeling for the Project has not yet been completed; however, as indicated on the LEED Checklist, the Proponent will strive to reduce the Project's overall energy demand and GHG emissions that contribute to global warming. The Project's proposed TDM program will also help to lessen fossil fuel consumption.

The Proponent authorized a "screening analysis" to study the potential of connecting the Project to a local district steam/condensate plant in lieu of using owner-provided equipment within the building for seasonal space heating systems, humidification systems and domestic hot water systems. The analysis concludes that the provision of gas-fired condensing boilers used to generate heating hot water for seasonal space heating loads, gas-fired steam boilers used to generate steam for humidification and gas-fired heaters used to generate domestic hot water is more attractive.

Chapter 6.0

Urban Design

6.0 URBAN DESIGN

6.1 Site Description

Located at One Bromfield Street, the Project Site sits in the heart of Downtown Crossing, bounded by Washington Street to the east, Bromfield Street to the south, and Province Court and Ordway Place to the north. This location places the site in the center of the Washington Street retail corridor, and in proximity to a number of notable public places. Just two blocks away at the other end of Bromfield Street is the Granary Burying Ground. To the north of the Project Site sits the Irish Famine Memorial, Kings Chapel, the Old South Meeting House, the Old Corner Bookstore, and Old City Hall. The Project Site is also located just a few blocks away from the Boston Common.

Downtown Crossing, anchored by a four-block pedestrian zone developed in the late 1970s, was once the department store shopping hub of the greater Boston area. However, like many urban shopping districts across the country, the area struggled to adapt to profound shifts in the retail industry, such as the consolidation of anchor department stores and the dominance of internet retailing. Over the last decade, under the guidance of the City's Downtown Crossing Economic Improvement Initiative, and Boston's first Business Improvement District, Downtown Crossing has seen a resurgence that has solidified its status as a central place of activity in Boston's economy. Recent development projects underway, such as the Millennium Tower and Burnham Building, which includes the preservation of, and renovations to, the Burnham Building once occupied by Filene's, and the rehabilitation of 59 Temple Place into the Godfrey Hotel, are attracting residents and visitors alike to the area.

6.2 Massing and Design

The overall building form of the Project responds to the unique site conditions at this important intersection defined by the convergence of Franklin Street and Bromfield Street along the Washington Street retail corridor at the north corner of Shopper's Park. The podium is six stories tall, similar in height to buildings surrounding the site, including across Bromfield Street and Washington Street, creating a consistent human scale along the adjacent sidewalks (see Figure 6-1). Along Washington Street, the podium massing and articulation are reflective of the architectural character along the adjacent retail corridor. The retail bay modulation expressed on the ground floor is defined by a rhythm of warm-toned metal pilasters extending from the ground to the top of the podium with transparent retail-activated glazing in-between. In concert with the established neighborhood articulation, the second floor retail space acts as an intermediary datum that ties the open expression of the ground floor with the more finely subdivided articulation on the third floor and above. Vertical primary, secondary and tertiary elements provide a familiar Washington Street rhythm and human scale articulation to the podium façade. Horizontal, warm-toned elements help define the floor line and give a sense of scale appropriately related to the punched-window vernacular of the adjacent structures.

One Bromfield   Boston, Massachusetts

ADRIAN SMITH + GORDON GILL
ARCHITECTURE

Figure 6-1

View from Washington Street

This same massing and articulation wraps around to Bromfield Street and extends westward, where a softened chamfer cut is used to carve out a recessed and distinguishable residential entry (see Figures 6-2 and 6-3). At the upper southwest portions of the podium, the massing slopes down to create a sense of scale transition from the 90 foot high street wall on Washington Street to the three-story massing of the adjacent building on Province Street. This southwest-facing geometric incline allows for a sunlit landscaped rooftop amenity space in which building occupants may socialize. In addition, the podium location allows sunlight to reach the sidewalk and retail corridor during certain times of the year in the middle of the day.

The tower massing, inclusive of its soft edges and unique cuts, makes an iconic impression along the skyline. The well-positioned tower is situated at the apex of the downtown Boston skyline as viewed from the western portions of the City (see Figure 6-4). The roof shape works with the Millennium Tower (currently under construction), located directly to the southeast of the Project Site. The soft massing form includes curved extensions from the body of the tower, creating a distinctive form that allows for larger floor plates on the middle floors, without taking away from the rooftop amenity space or encroaching on the human scale of the podium when viewed from the street. The massing principles are presented in Figure 6-5.

The tower geometry is complemented by a warming exterior wall palette, which ties the building into the fabric of the city skyline. The façade articulation includes vertical fins which are seen to bring the warm tones found within Boston's vast examples of bronze, copper, terracotta, and brick (see Figure 6-6). Additional architectural details relate to modern expressions of the Boston vernacular of French balconies and bowed bay windows. These bay windows are inherently built into the massing in the softened fluted corner fillets, while balcony expressions are provided to give scale, offer an indoor-outdoor amenity to occupants, provide summertime solar shading, and a residential identity to the tower.

6.3 Evolution of Design

Early studies which considered views, wind direction, daylighting, and solar radiation indicated that the tower should optimally be oriented with its broadest faces toward the northeast and southwest. Contextual considerations also informed a strong desire to create spatial and cross-view separations between the nearby mid-scale and large-scale developments of 45 Province Street and Millennium Tower, respectively. These considerations, along with programmatic needs and site constraints, indicated that a point tower would be the optimal strategy and expression for the building mass. To this end, a central core with a perimeter enclosure based upon the 30-foot span were the conceptual starting point for the building form.

With the fundamentals established for the tower orientation and general scale, formal architectural and additional performance criteria began to shape the tower. The prominent nature of the site location within the context of the city suggests a tower of a special character that is distinguishable among the buildings on the downtown skyline. A softer form allows for this distinctive character to emerge amongst the mostly rectilinear forms within the city. This is achieved by rounding the corners and softly shaping the interior edges of the rectilinear-based floor plan profile. This results in a floorplan that can be designed like a straight-lined extrusion, however with the unique qualities, both spatially and formally, of an undulating form.

One Bromfield Boston, Massachusetts

ADRIAN SMITH + GORDON GILL
ARCHITECTURE

Figure 6-2

View from the Corner of Washington and Franklin Streets

One Bromfield **Boston, Massachusetts**

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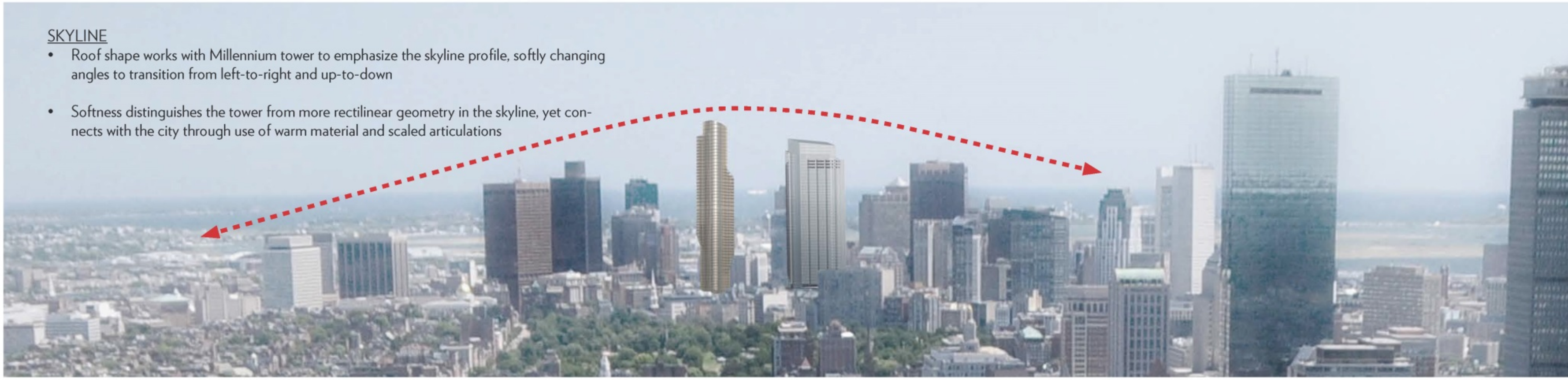
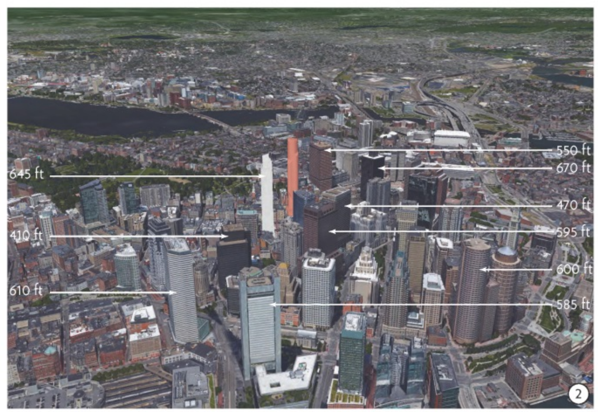
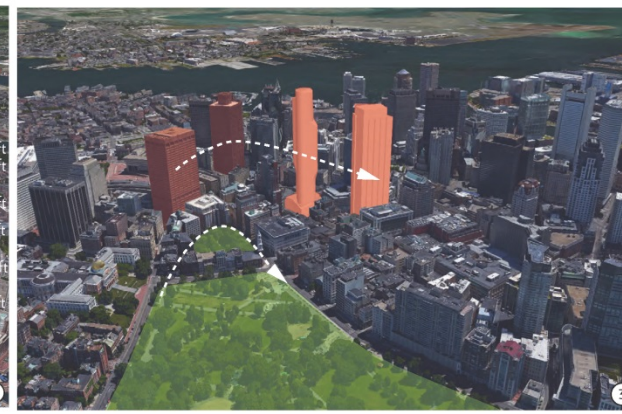
ARCHITECTURE

Figure 6-3
View from Bromfield Street



BUILDING UPON THE LOGIC OF BOSTON'S SKYLINE



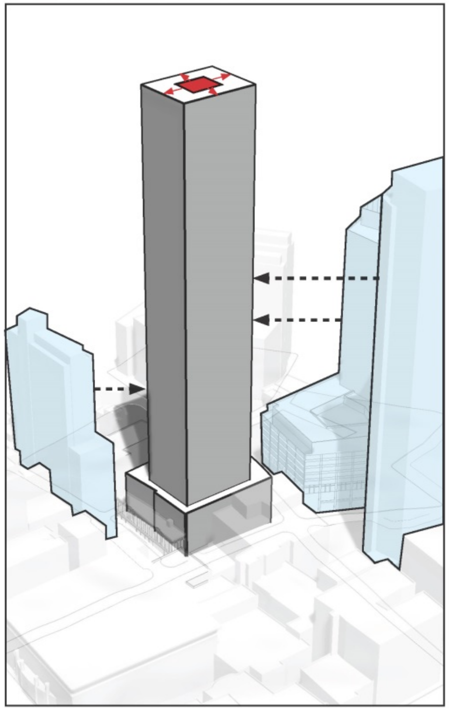


1. Following the placement pattern of taller buildings in the city

2. Fits within the context of already established height in downtown Boston

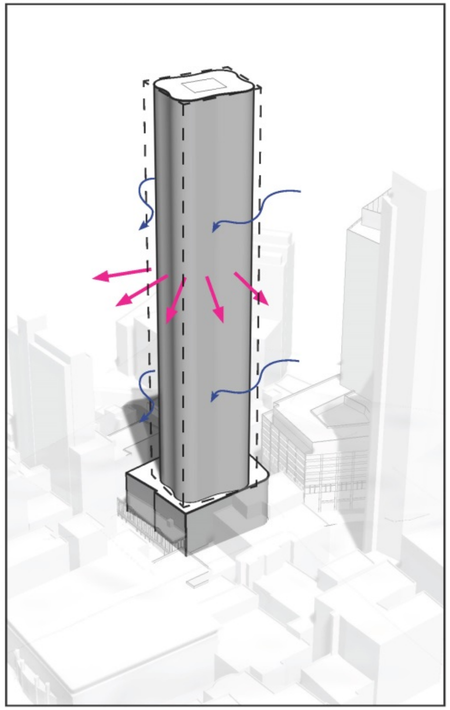
3. Reinforces and holds the pivot point or "elbow" defined by Boston Common and Granary Burying Ground

EXTRUSION WITH LEASABLE SPAN



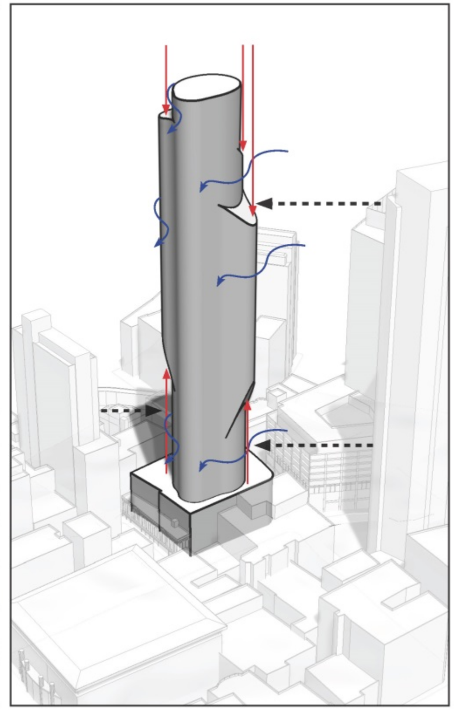
- Position to maximize distance from other high-rise buildings
- Create functional and efficient floor plan dimensions

SOFTEN AND OPTIMIZE ORIENTATION



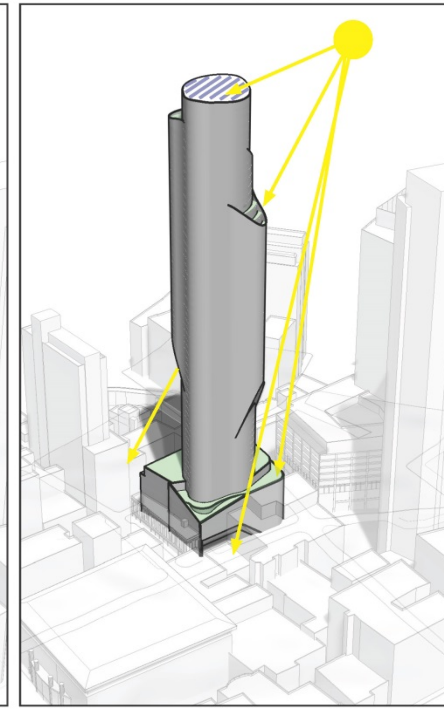
- Optimize rotation for passive thermal performance
- Maximize views toward Boston Common
- Fillet corners for decreased impact of wind loads on structure
- Further increase separation from adjacent context

CARVE MASSING



- Confuses wind for improved structural performance and pedestrian comfort
- Massing registers with datum on the mid and high-rise urban scales
- Maximizes separation to adjacent structures while minimizing potential cross views
- Provides visual and iconic interest to and from tower

SOLAR AMENITY AND PERFORMANCE



- Lower cuts provide increased solar and view corridor access to the public way and podium outdoor amenity spaces
- Upper cuts provide private terraces for residents
- Southern angled rooftop provides potential for solar collection

Figure 6-5

Massing Principles

One Bromfield **Boston, Massachusetts**

Figure 6-6
Aerial View

Chapter 7.0

Historic and Archaeological Resources

7.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Historic and Archaeological Resources section describes the historic and archaeological resources within and in the vicinity of the Project Site.

7.1 Historic Resources Within the Project Site

The Project Site, located in the Downtown Crossing area of Boston, is bounded by Province Court and Ordway Place to the north, Bromfield Street to the south, the property known as 32-54 Bromfield Street to the west, and Washington Street to the east. The Project Site consists of four parcels totaling approximately 23,768 sf of land. The Project Site is located in an area predominantly comprised of large multi-story steel frame and masonry buildings with first floor retail spaces and large storefront windows with upper stories serving as residences or offices. Dates of construction range from the late 19th-century through the late 20th-century. Brick, cast stone and stone along with metal panels and single pane and multi-light windows are common building materials in the area. The area is a commercial hub with wide sidewalks, shops, restaurants, and hotels.

The Project Site contains four existing buildings included in the Inventory of Historic and Archaeological Assets of the Commonwealth (Inventory):

351-363 Washington Street

Constructed in 1928, the two-story building now contains two separate retail spaces. The 1980 Boston Landmark Commission (BLC) Inventory Form notes the building was altered in 1945-48. Further alterations to the building, including changes to the exterior building envelope through the application of metal panels and cast stone, have occurred since the Inventory Form was completed. In 1980, the BLC evaluated this building as a Category VI structure, (Non-Contributing). The "Greek key motif," noted on the BLC Inventory Form, is no longer visible on the Washington Street elevation, but is present on the side elevation within the alley off of Washington Street. Over time the building has been significantly altered.

365 Washington Street

An altered example of the Boston Granite style prevalent in Boston between ca. 1830 and 1870, this ca. 1840-50 building is three stories in height and three bays wide. The third floor and attic represent the building's original design, while the second floor retains some turn-of-the-century cast iron storefront elements. The ground floor has been altered with the installation of modern storefronts. In 1980, the BLC evaluated the building as a Category V structure, (Minor Significance). The building has been significantly altered.

1-9 Bromfield Street

Known as the Bromfield Building, this six-story building is situated at the prominent corner of Washington and Bromfield Streets. The Renaissance Revival style commercial structure features pairs of one-over-one, double hung, wood windows with cast stone on the third through sixth floors. The yellow brick building is capped with a brick parapet and features cast iron storefront features at the second floor level. The ground floor has been extensively altered with the installation of modern storefronts. In 1980, the BLC evaluated this building as a Category V (Minor Significance) structure. This building has been significantly altered through the loss of the original parapet and ground floor storefronts.

11-21 Bromfield Street

This ca. 1948 one-story commercial structure housed the City Sports retail store, prior to the company's recent closure. Described as a "post-WW II utilitarian structure" in the 1980 BLC Inventory Form, the building features a central door and two slightly projecting end bays. Although the original storefront windows and door have been replaced, the building retains its original cast stone walls and polished, dark red granite base and upper central bay. It was previously determined by the BLC as a Category VI (Non-Contributing) building that "detracts from the rhythm of the streetscape."

7.2 Historic Resources Within the Vicinity of the Project Site

The Project Site is located within and in the vicinity of several historic resources listed in the State and National Registers of Historic Places. Table 7-1 identifies these resources and corresponds to resources depicted in Figure 7-1.

In addition to multiple State and National Register properties in the vicinity of the Project Site, the property at 32-54 Province Street, known as the "Hutchinson Building," is located immediately adjacent to the Project Site within the same City block. The building is three-stories high, two-bays wide and fourteen-bays long and is included in the Inventory. This Classical Revival style building was constructed in 1924 and features "Boston Casualty Co" in bronze letters on the upper floors of the Province and Bromfield Street elevations. Designed by Ralph Harrington Doane, the building features a pair of triangular pediments supported by pilasters over Palladian motif windows on the second and third floors. Although the ground floor has been altered with the introduction of mid-to-late twentieth century storefronts, the building retains original rolled steel sash windows throughout the second and third floors. The building was originally evaluated by the BLC in 1980 as a Category IV (Non-Contributing) structure, but was re-evaluated in 1982 as a Category III (Significant) structure. As discussed earlier in this DPIR, the Proponent will undertake pre-construction and construction period monitoring and other measures to ensure that construction of the Project does not have adverse effects on nearby historic resources.

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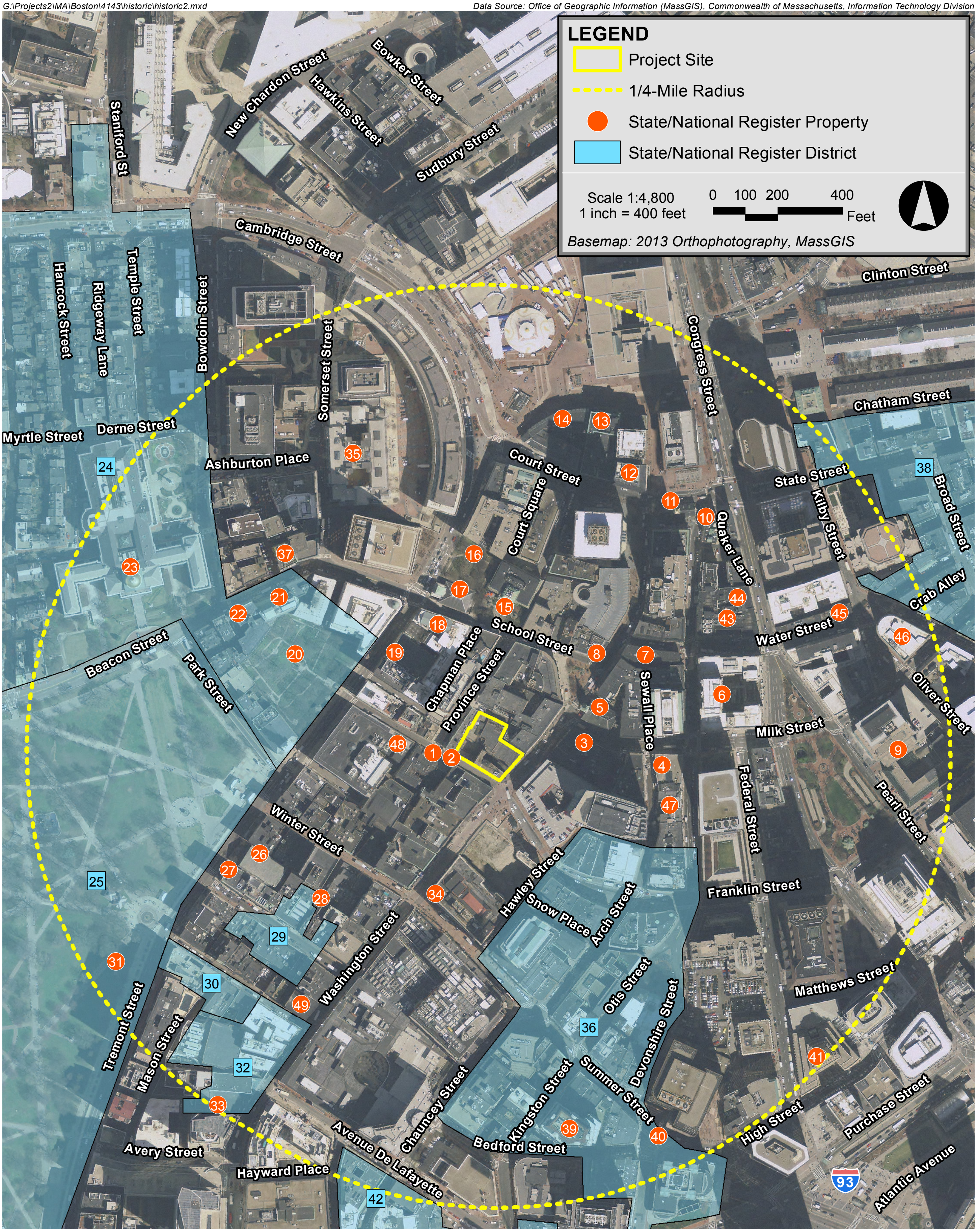
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division



One Bromfield **Boston, Massachusetts**

Figure 7-1

Historic Resources Map

Table 7-1 Historic Resources in the Vicinity of the Project Site

No.	Historic Resource	Address	Designation
1	Wesleyan Association Building	32-38 Bromfield Street	
2	Ballard Block	26-30 Bromfield Street	LL
3	Newspaper Row	322-328 Washington St., 5-23 Milk St., and 11 Hawley St.	NRDIS
4	International Trust Co. Building	39-47 Milk Street	NRIND, LL
5	Old South Meetinghouse	308 Washington Street	NHL, NRDIS, PR
6	John W. McCormack Federal Building & Courthouse	5 Post Office Square	NRIND, LL
7	Winthrop Building	1-17 Water St., 276-278 Washington St. and 4-16 Spring Lane	NRIND
8	The Old Corner Bookstore	277-285 Washington Street	NRIND, PR
9	Federal Reserve Bank Building	30 Pearl Street	LL
10	Second Brazer Building	25-29 State Street	NRIND, LL
11	Old State House	State Street	NHL, LL, PR
12	Ames Building	1 Court Street	NRIND, LL
13	Old Colony Trust Company Building (VA Outpatient Clinic)	17 Court Street	NRDOE
14	Sear Crescent and Sears Block	38-68 and 70-72 Cornhill Street	NRIND
15	Old City Hall	45 School Street	NHL, NRIND
16	King's Chapel Burying Ground	Tremont Street	NRIND, PR
17	King's Chapel	38 Tremont Street	NHL, PR
18	Parker House	60 Tremont Street	NRDOE

Table 7-1 Historic Resources in the Vicinity of the Project Site (Continued)

No.	Historic Resource	Address	Designation*
19	Tremont Temple Baptist Church	76-88 Tremont Street	NRDOE
20	Park Street District	Roughly bound by Beacon, Tremont and Park Streets	NRDIS
21	Boston Athenaeum	10½ Beacon Street	NRIND, NRDIS, LHD
22	Chester Harding House	16 Beacon Street	NRIND, NRDIS, LHD
23	Massachusetts State House	24 Beacon Street	NHL, LHD, PR
24	Beacon Hill Historic District	Roughly bounded by Beacon St., Embankment Rd, Storrow Dr., Cambridge and Bowdoin Streets	NHL, NRDIS, LHD
25	Boston Common	Beacon, Park, Tremont and Charles Streets	NHL, NRDIS, LL
26	Saint Paul's Church	136 Tremont Street	NHL
27	R.H. Stearns Building	76-78 Warrenton Street	NRIND
28	Locke-Ober Restaurant	3-4 Winter Place	NRIND
29	Temple Place Historic District	11-55 and 26-58 Temple Place	NRDIS
30	West Street Historic District	West and Tremont Streets	NRDIS
31	Tremont Street Subway Headhouse	Tremont Street at Boston Common	NHL, NRDIS, LL
32	Washington Street Theatre District	511-559 Washington Street	NRDIS
33	Paramount Theatre	549-563 Washington Street	NRDIS, LL
34	Filene's Department Store	426 Washington Street	LL
35	Suffolk County Courthouse	1 Pemberton Square	NRIND
36	Commercial Palace Historic District	Roughly bounded by Bedford, Summer, Franklin, Hawley, and Chauncy Streets	NRDOE
37	Boston Transit Commission Building	15 Beacon Street	NRIND

Table 7-1 Historic Resources in the Vicinity of the Project Site (Continued)

No.	Historic Resource	Address	Designation*
38	Custom House Block Historic District	Roughly bounded by Chatham Street, Batterymarch Street , High Street and John F. Fitzgerald Surface Road	NRDIS
39	The Bedford Building	89-103 Bedford Street	NRIND
40	Church Green Buildings Historic District	101-113 Summer Street	NRDIS, LL
41	United Shoe Machinery Corporation Building	138-164 Federal Street and 34-66 High Street	NRIND, LL
42	Textile District	Roughly bounded by Essex St. from Phillips Sq. to Columbia St. and Chauncy St. from Phillips Sq. to Rowe Place	NRDIS
43	National Shawmut Bank Building	20-42 Water Street	NRDOE
44	Monks Building	33 Congress Street	NRDOE
45	Codman Building	10 Liberty Square	NRIND
46	Samuel Appleton Building	1 Liberty Square	NRDOE
47	Compton Building	159 Devonshire Street	NRIND
48	Publicity Building	40-44 Bromfield Street	NRIND
49	Blake and Armory Building	59 Temple Place	NRIND

*Designation Legend

NRIND Individually listed on the National Register of Historic Places

NRDIS National Register of Historic Places historic district

NRDOE Determined eligible for inclusion in the National Register of Historic Places

NHL National Historic Landmark

LHD Local Historic District

LL Local Landmark

7.3 Archaeological Resources Within the Project Site

A small portion of the Project Site is within the bounds of archaeological site 19-SU-13. As the Project involves construction on areas of the Project Site previously disturbed and then developed with multi-story buildings, impacts to archaeological resources are not anticipated.

7.4 Potential Impacts to Historic Resources

7.4.1 Demolition of Existing Buildings

The proposed Project will require the demolition of the four existing buildings within the Project Site. None of the buildings are listed or have been found to be eligible for listing on the National Register of Historic Places. Additionally, all of the buildings have had some level of alteration, such as 363 Washington Street, which is described as altered beyond recognition in the Inventory. The BLC will be afforded the opportunity to review the proposed demolition through the Article 85 Demolition Delay review process.

7.4.2 Visual Impacts to Historic Resources

The Project is within the Downtown Crossing neighborhood of Boston, home to multiple properties listed on the State and National Registers of Historic Places. Several listed properties are located in the immediate vicinity of the Project Site including, but not limited to, the Wesleyan Association Building, 20-30 Bromfield Street (also a Boston Landmark), , the Boston Transcript Building, the Boston Post Building, Old South Meeting House (also a National Historic Landmark, and Boston Landmark) and the Old Corner Bookstore.

The proposed building has a six story base and a 53-story tower. The base is similar in height to other buildings in the area, keeping a consistent streetwall within large ground floor storefront windows and multi-light upper story windows similar to the surrounding buildings. The slender tower is designed to be set back from the base and has a much narrower frame than is typical of other tall buildings in Boston.

The tower also fits within the spine of Boston's skyline and is complementary in height to the Millennium Tower under construction. While the Project is within the viewshed of a number of nearby historic properties due to its height, the mass of the building is minimized by its small frame. The proposed cladding will consist of steel frame and large glass panels, creating a sense of transparency and openness. The entrances on the east and south elevations will scale down the building to street level, while maintaining a sense of depth from the sidewalk. The proposed Project is in keeping with the architectural character of the surrounding neighborhood.

7.4.3 Shadow Impacts to Historic Resources

Shadow impacts to the historic resources will be mitigated by the presence of other multi-story buildings already casting shadows in the area. As illustrated in the shadow study diagrams (Figures 4.2-1 to 4.2-14), during isolated time periods the Project will cast minimal net new shadow on areas within the Ballard Block, Wesleyan Association Building, Park Street Historic District, Beacon Hill Historic District, King's Chapel Burying Ground, Old City Hall, Old South Meeting House, Boston Common, Old Corner Bookstore and Post Office Square.

New shadow on historic resources with the City of Boston is limited to new shadow at 9:00 a.m., 12:00 p.m. and 3:00 p.m. on March 21, 9:00 a.m. and 3:00 p.m. on June 21, and 9:00 a.m., 12:00 p.m. and 6:00 p.m. on September 21. However, new shadow will be minimized by the existing shadow cast from other multi-story buildings in the Downtown area as well as the thin frame of the proposed tower. Most historic resources will only have a narrow band of new shadow cast upon them and only at an isolated time. For example: Boston Common will have a narrow band of new shadow cast upon it on June 21 from 8:00 a.m. to 9:20 a.m. The new shadow is mitigated by existing shadow; including shadow cast from the adjacent Park Street Church. Additionally, the new shadow will fall only in the northeast corner of the Boston Common and will not fall on documented historic features such as statues and monuments. According to the shadow study, only one historic property (the Old South Meeting House) will have shadow cast upon it twice, a thin band on March 21 at 3:00 p.m. and a larger band on June 21 at 3:00 p.m. In sum, net new shadow created by the Project will have no significant impacts on historic resources.

7.4.4 Wind Impacts to Historic Resources

The Project entails construction of a new building which will result in localized changes in wind conditions. Within the surrounding area window conditions at pedestrian level will both improve and degrade in small measure depending upon the location. Five nearby historic properties will have their wind conditions change: the Ballard Block, Wesleyan Association Building, Old South Meeting House, Burnham Building and the Commercial Palace Historic District.

Wind comfort levels will improve slightly at the Ballard Block and Wesleyan Association Building. The Old South Meeting House and the Burnham Building will see their wind comfort levels both reduce and improve depending upon location at those properties. The Commercial Palace Historic District will see its wind comfort levels reduced slightly. Overall wind impacts to historic resources will be negligible.

7.5 Consistency with Other Historic Reviews

7.5.1 Article 85

The proposed demolition of the existing buildings on the Project Site, including 351-363 Washington Street, 365 Washington Street, 1-9 Bromfield Street and 11-21 Bromfield Street, will all be subject to review by the Boston Landmarks Commission under Article 85 of the Boston Zoning Code as they are all over 50 years of age. An Article 85 Application for all four properties will be submitted to the BLC for approval.

7.5.2 Massachusetts Historical Commission

The Proponent does not anticipate that the Project will require any state or federal licenses, permits or approvals, and does not anticipate utilizing any state or federal funds. Therefore, review by the Massachusetts Historical Commission (MHC) is not anticipated at this time. In the event that state or federal licenses, permits, approvals or funding is involved, the Proponent will file an MHC Project Notification Form to initiate MHC review of the Project.

Chapter 8.0

Infrastructure

8.0 INFRASTRUCTURE

This section addresses the Project's impact on the capacity and adequacy of existing water, sewage, stormwater, energy, and electrical communications utility systems. Based on the evaluation of the Project, the capacity of the BWSC water and sewer system is adequate to serve the anticipated sewage and water flows. Electric, gas, telephone, and cable service are also available to the Project Site and will be coordinated with the appropriate utility companies as the Project design is further advanced.

8.1 Wastewater

8.1.1 Existing Sewer System

The sanitary sewer system in the vicinity of the Project Site is owned, operated, and maintained by BWSC (see Figure 8-1). There is an existing 24-inch by 27-inch combined sewer located in Bromfield Street and a 12-inch combined sewer in Province Street. There is also a 15-inch combined sewage line on the west side of Washington Street.

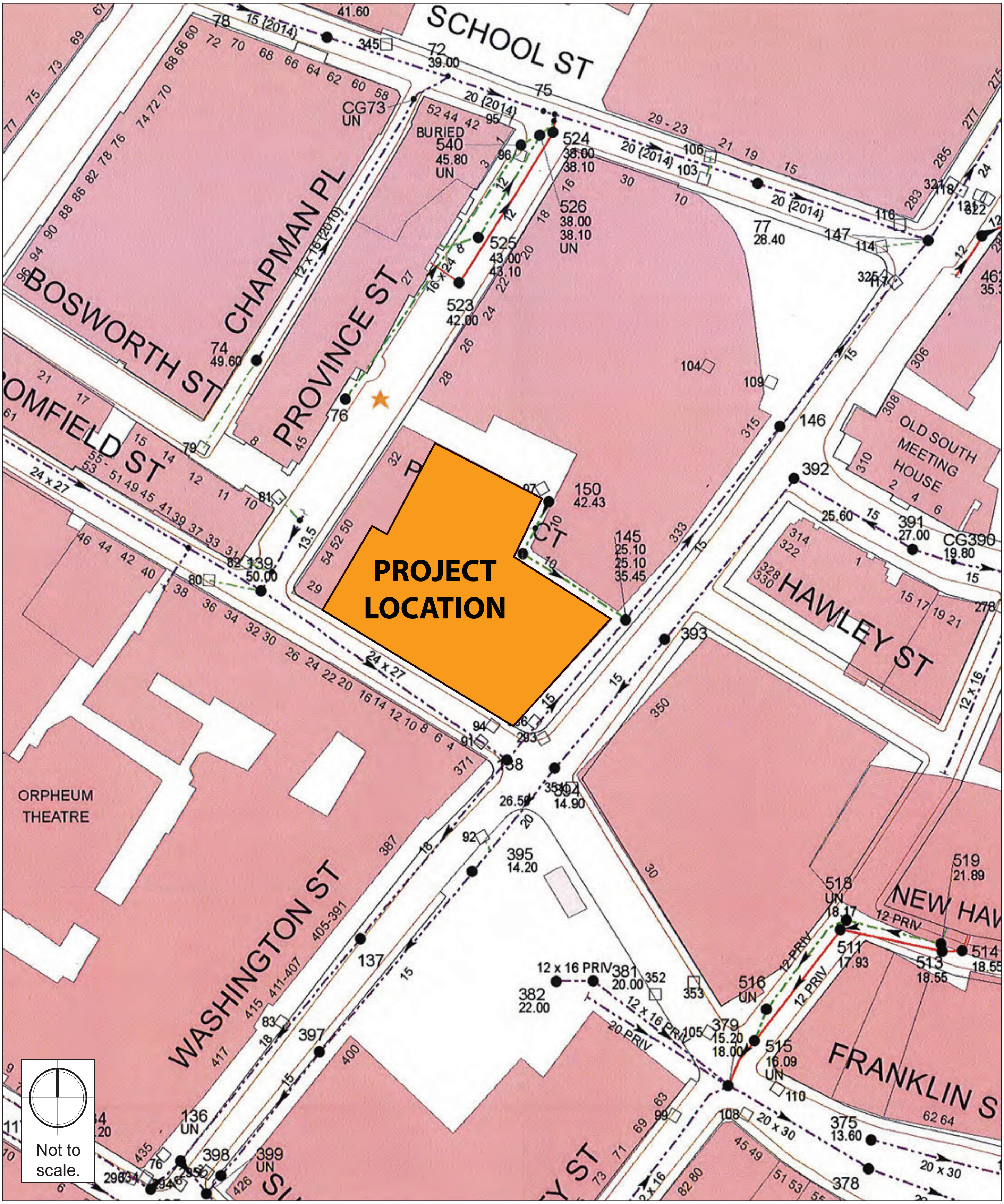
The BWSC combined sewer lines drain into the MWRA sewer lines. Regional sewer service and treatment are provided by the MWRA system, which ultimately connects to the Deer Island Wastewater Treatment Plant. From here, sanitary sewer flow is treated and discharged to the Boston Harbor.

8.1.2 Project-Generated Sanitary Sewer Flow and Proposed Sewer System

As shown in Table 8-1 below, the Project will have an estimated daily sewage flow of 65,080 gallons per day (gpd). This calculation was based on 310 CMR 15.203 (Title V), which provides design flow parameters for various building uses. Sanitary sewage discharge will connect to the existing 24-inch by 27-inch combined sewer located in Bromfield Street. The Proponent will coordinate with the BWSC on the design and capacity for this proposed connection to the sewer system.

Since the projected flow rate of wastewater generated is greater than 15,000 gallons per day, the Project is subject to the MassDEP requirement to offset the new flows associated with the project by removing infiltration/inflow (I/I) on a 4:1 basis of 4 gallons removed for every gallon generated. The Proponent will address this I/I mitigation with the BWSC.

The Project does not propose any industrial uses. Parking garage floor drains will be routed through an oil and sand trap in accordance with the BWSC's Requirements for Site Plans, prior to discharge to the BWSC sanitary sewer system.



One Bromfield Boston, Massachusetts

HOWARD STEIN HUDSON
Engineers + Planners

Figure 8-1

BWSC Sewer System Map

Table 8-1   Estimated Sewage Flows

Building Use	Number	Sewage Generation Rate	Total Flow (gpd)
Studio/One Bedroom Units (281 units)	281 Bedrooms	110 gpd/bedroom	30,910
Two Bedroom Units (120 units)	240 Bedrooms	110 gpd/bedroom	26,400
Three Bedroom Units (15 units)	45 Bedrooms	110 gpd/bedroom	4,950
Four Bedroom Units (3 units)	12 Bedrooms	110 gpd/bedroom	1,320
Retail Space	30,000 sf	50 gpd/1,000 sf	1,500
Total			**65,080**

8.2 Water System

8.2.1 Existing Water Service

The water distribution system in the vicinity of the Project Site is owned, operated, and maintained by BWSC. Bromfield Street and Province Street contain 12-inch ductile iron cement lined (DICL) water mains that are part of BWSC's Southern High service network with the main in Province Street constructed in 2008 and the main in Bromfield Street constructed in 1980. There is an 8-inch DICL in Province Court constructed in 2008. There is also a 16-inch DICL Southern High water main constructed in 1980 and a 12-inch high pressure fire service line constructed in 1916 in Washington Street. A 16-inch high pressure fire service line constructed in 1915 exists in Bromfield Street. According to BWSC records, there are five 4-inch fire services and one 4-inch domestic service that enter the Project Site and feed the existing buildings. The existing water distribution system is illustrated on Figure 8-2.

There are three fire hydrants located in the vicinity of the Project Site. One hydrant is located on the northwest corner of Bromfield Street and Province Street. The second is located on Bromfield Street across from the Project near Washington Street. The third hydrant is located on Washington Street just north of Ordway Place and the Project Site. It appears that these hydrants will provide sufficient coverage for the Project. The Proponent will confirm this with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

One Bromfield   Boston, Massachusetts

Figure 8-2

BWSC Water System Map

8.2.2 Anticipated Water Consumption

The Project's water demand for domestic service is based on the estimated sewage generation. A conservative factor of 1.1 is applied to the average daily wastewater flows to estimate an average daily water demand to account for system losses, irrigation and consumption. The Project's estimated water demand is approximately 71,588 gpd.

8.2.3 Proposed Water Service

The Project's new domestic water and fire protection services will connect to the 12-inch water main in Bromfield Street (see Figure 8-2). An isolator valve will be installed at the water main between the two fire protection service connections in Bromfield Street. The water will be supplied by the BWSC.

8.2.4 Water Supply Conservation and Mitigation Measures

The Project design will include aeration fixtures and appliances will be chosen for water conservation qualities. In common areas, sensor operated faucets and toilets will be installed. Potable water use for irrigation will be reduced through the selection of native plants and smart irrigation controls.

8.3 Storm Drainage System

8.3.1 Existing and Proposed Storm Drainage System

BWSC requires the first one inch of rainfall, times the impervious area on site, must be infiltrated prior to discharge to a storm drain or combined sewer. The Project anticipates meeting the BWSC infiltration requirement through the use of infiltration injection wells and a green roof. Stormwater run-off from the building roof drains will be collected and conveyed to a storage tank within the building. Stormwater from the storage tank will be pumped to infiltration injection wells likely located under the sidewalk to provide recharge to the soils below. Stormwater runoff from larger stormwater events will discharge into the existing 24-inch by 27-inch combined sewer located in Bromfield Street. The Project Site is currently fully developed and completely impervious. Therefore, the proposed Project will not increase the amount of impervious area on the site and consequently there will be no increase in the amount of stormwater run-off flowing to the combined sewer system.

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

8.3.2 Coordination with BWSC

All improvements and connections to BWSC infrastructure will be reviewed by the BWSC as part of its Site Plan review process. This process includes a comprehensive design review of the proposed service connections, assessment of system demands and capacity, and establishment of water and sewer service accounts.

8.4 Electrical Service

Eversource owns and maintains the electrical transmission system in the vicinity of the Project Site. The actual size and location of the proposed building services will be coordinated with Eversource during the detailed design phase.

8.5 Natural Gas

National Grid owns and maintains infrastructure in the vicinity of the Project Site. The actual size and location of the building services will be coordinated with National Grid during the detailed design phase.

8.6 Telecommunications Systems

The Proponent will select private telecommunications companies to provide telephone, cable, and data services. There are several potential candidates with substantial downtown Boston networks capable of providing service. Upon selection of a provider or providers, the Proponent will coordinate service connection locations and obtain appropriate approvals.

8.7 Utility Protection During Construction

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

Chapter 9.0

Coordination with other Governmental Agencies

9.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

9.1 Architectural Access Board Requirements

The Project will comply with the requirements of the Massachusetts Architectural Access Board and will be designed to comply with the standards of the Americans with Disabilities Act. See Appendix G for the Accessibility Checklist.

9.2 Massachusetts Environmental Policy Act (MEPA)

The Proponent does not expect that the Project will require review by the Massachusetts Environmental Policy Act (MEPA) through the Office of the Massachusetts Executive Office of Energy and Environmental Affairs. Current plans do not call for the Project to receive any state permits or state funding, or involve any state land transfers.

9.3 Massachusetts Historical Commission

The Proponent does not anticipate that the Project will require any state or federal licenses, permits or approvals, and does not anticipate utilizing any state or federal funds. Therefore, review by the Massachusetts Historical Commission (MHC) is not anticipated at this time. In the event that state or federal licenses, permits, approvals or funding is involved, the Proponent will file an MHC Project Notification Form to initiate MHC review of the Project.

9.4 Boston Civic Design Commission

The Project will comply with the provisions of Article 28 of the Boston Zoning Code and will undergo Boston Civic Design Commission design review as part of the Article 80 process.

Chapter 10.0

Response to Comments

10.0 RESPONSE TO COMMENTS

This chapter provides responses to the BRA Scoping Determination and the associated comment letters that were received on the PNF filed with the BRA on October 27, 2008. The comment letters have been annotated and individual comments coded in the right-hand margin. The responses to the comments are listed below with the corresponding code numbers. Comment letters were received from the following agencies and organizations.

- Boston Redevelopment Authority Scoping Determination
- David Carlson (BRA)
- Katie Pedersen (BRA)
- Boston Environment Department
- Boston Fire Department
- Boston Public Works Department
- Boston Transportation Department
- Boston Water and Sewer Commission
- Impact Advisory Group
- Boston Historical Society
- Boston Preservation Alliance
- Old South Meeting House
- The Abbey Group
- The Druker Company, Ltd.

Boston Redevelopment Authority

Boston's Planning & Economic Development Office

Thomas M. Menino, *Mayor*
Clarence J. Jones, *Chairman*
John F. Palmieri, *Director*

One City Hall Square
Boston, MA 02201-1007
Tel 617-722-4300
Fax 617-248-1937

July 1, 2009

Paul Davis
Midwood Management Corporation
430 Park Avenue, Suite 505
New York, NY 10022

Re: Scoping Determination for the Proposed One Bromfield Project

Dear Mr. Davis:

Please find enclosed the Scoping Determination for the proposed One Bromfield project (the "Proposed Project"). The Scoping Determination describes the information required by the Boston Redevelopment Authority ("BRA") in response to the Project Notification Form, which was submitted to the BRA on October 27, 2008 in compliance with Article 80B of the Boston Zoning Code. Additional information may be required during the course of the review of the Proposed Project.

If you have any questions regarding the enclosed Scoping Determination or the review process, please do not hesitate to contact me at 617-918-4267.

Sincerely,

John FitzGerald
Project Manager

cc: Brenda McKenzie, BRA
Kairos Shen, BRA
James Tierney, BRA
Heather Campisano, BRA
Jay Walsh, Mayor's Office of Neighborhood Services

BOSTON REDEVELOPMENT AUTHORITY

SCOPING DETERMINATION
ONE BROMFIELD STREET

SUBMISSION REQUIREMENTS
FOR DRAFT PROJECT IMPACT REPORT (DPIR)

PROPOSED PROJECT:	ONE BROMFIELD STREET
PROJECT SITE:	BOUNDED BY BROMFIELD STREET, WASHINGTON STREET, PROVINCE STREET, PROVINCE COURT AND ORDWAY COURT, IN THE MIDTOWN CULTURAL DISTRICT
PROPONENT:	MIDWOOD MANAGEMENT
SCOPING DETERMINATION DATE:	July 1, 2009

I. PREAMBLE AND PROCESS BACKGROUND

The Boston Redevelopment Authority ("BRA") is issuing this Scoping Determination pursuant to Section 80B-5 of the Boston Zoning Code ("Code"), in response to a Project Notification Form ("PNF") which Midwood Management (the "Proponent") filed for the One Bromfield Street Project ("the Proposed Project") on October 27, 2008. Notice of the receipt by the BRA of the NPC was published in the Boston Herald on October 27, 2008 which initiated a 30-day public comment period with a closing date of December 2, 2008, but was extended until January 23, 2009. The Scoping Determination requires the Proponent to respond to comments received from City and State agencies, elected officials, the Mayorally appointed Impact Advisory Group (the "IAG"), and the public.

On July 10, 2008, in accordance with the BRA's policy on mitigation as outlined in Mayor Thomas M. Menino's Executive Order Relative to the Provision of Mitigation by Development Projects in Boston, the Proponent submitted a Letter of Intent with the respect to the redevelopment of property located at the corner of Washington and Bromfield Streets in the Downtown Crossing neighborhood, encompassing properties located at 349-369 Washington Street and 11-21 Bromfield Street. The Letter of Intent calls for the demolition of these existing structures and the construction of a new building containing approximately 407,000 square feet of gross floor area, and consists of a base of six floors with a tower of 22 stories rising above.

On July 28, 2008, letters soliciting IAG nominations for the Proposed Project were delivered to City Councilor Salvatore LaMattina, former Speaker for the House Salvatore DiMasi, and Senator Anthony Petruccelli. Additional letters seeking recommendations were delivered to the Office of Neighborhood Services and the City Councilors At-Large. Nominations were also sought from the BRA.

Six (6) individuals were appointed to the IAG and have been invited to participate in advising BRA staff on the determination and consideration of impacts and appropriate mitigation regarding the Proposed Project. The following list includes the names of the IAG members:

1. Mr. George Coorsen
2. Ms. Rosemarie Sansone
3. Mr. David Lee
4. Mr. Yanni Tsippas
5. Mr. Harvey Leong
6. Mr. William Ashmore

The BRA appreciates the efforts of the IAG and the members should be applauded for their commitment to the review of the Proposed Project.

The Notice and the PNF were sent to the City's public agencies pursuant to Section 80A-2 of the Code. Pursuant to Section 80B-5.3 of the Code, a scoping session was held on November 17, 2009 with the City's public agencies and BRA review staff where the proposed project was reviewed and discussed. Members of the IAG were also invited to attend the scoping session.

The Proponent conducted two (2) public meetings, the first at Boston City Hall which was held on November 17, 2008, and the second at the Omni Parker House, which was held on January 14, 2009. The community will continue to have an opportunity for input during the Article 80 review process.

Written comments in response to the PNF received by the BRA from agencies of the City of Boston are included in **Appendix A** and must be answered in their entirety. Public comments on the PNF received by the BRA prior to the issuance date of this Scoping Determination have been included in **Appendix B.** The DPIR should include complete responses to all comments included in **Appendix A** and **B** and within the framework of the criteria outlined in the Scoping Determination.

The Scoping Determination requests information that the BRA requires for its review of the Proposed Project in connection with Article 80 of the Code, Development Review and Approval and other applicable sections of the Code.

II. PROJECT DESCRIPTION

The Proposed Project includes the demolition of the four (4) existing buildings on the site and the construction of a new building. The Proposed Project will include a six (6) story larger base, with a twenty-two (22) story tower above it. The mixed-use program includes a total of approximately 407,000 sf of gross total floor, including approximately 49,000 sf of retail space in the basement and first two floors; One hundred and ninety two (192) parking spaces on the next three floors; primarily residential amenities and lobby area on the sixth floor; and approximately 276 residential units on floors 7 through 28 totaling approximately 281,000 sf.

III. ARTICLE 80 PROCESS REQUIREMENTS

The Proposed Project is being reviewed pursuant to Article 80, Development Review and Approval, which sets forth a comprehensive procedure for project review of the following components: transportation, environmental protection, urban design, historic resources, infrastructure systems, site plan, and Development Impact Project, if any. The Proponent is required to prepare and submit to the BRA a Draft Project Impact Report ("DPIR") that meets the requirements of the Scoping Determination by detailing the Proposed Project's impacts and proposed measures to mitigate, limit or minimize such impacts. The DPIR shall contain the information necessary to meet the specifications of Section 80B-3 (Scope of Large Project Review; Content of Reports) and Section 80B-4 (Standards for Large Project Review Approval), as required by the Scoping Determination. After submitting the DPIR, the Proponent shall publish notice of such submittal as required by Section 80A-2. Pursuant to Section 80B-4(c)(i)(3), the BRA shall issue a written Preliminary Adequacy Determination ("PAD") within sixty (60) days. Public comments, including the comments of public agencies, shall be transmitted in writing to the BRA no later than fifteen (15) days prior to the date by which the BRA must issue its PAD. The PAD shall indicate the additional steps, if any, necessary for the Proponent to satisfy the requirements of the Scoping Determination. If the BRA determines that the DPIR adequately describes the Proposed Project's impacts and, if appropriate, proposed measures to mitigate, limit or minimize such impacts, the PAD will announce such a determination and that the requirements of further review are waived pursuant to Section 80B-5.4(c)(iv). Section 80B-6 requires the Director of the BRA to issue a Certification of Compliance indicating the successful completion of the Article 80 development review requirements before the Commissioner of Inspectional Services can issue any building permit for the Proposed Project.

IV. REVIEW/SUBMISSION REQUIREMENTS

In addition to full-size scale drawings, 35 copies of a bound booklet containing all submission materials reduced to size 8-1/2" x 11", except where otherwise specified, are required. The booklet should be printed on both sides of the page. In addition, an adequate number of copies must be available for community review. A copy of this scoping determination should be included in the booklet for review.

A. General Information

1. Applicant/Proponent Information

   a. Development team BRA 1

      (1) Names

         (a) Developer (including description of development entity and type of corporation)
         (b) Attorney
         (c) Project consultants and architects

      (2) Business address, telephone number, FAX number and e-mail, where available for each

      (3) Designated contact for each

   b. Legal Information BRA 2

      (1) Legal judgements or actions pending concerning the Proposed Project

      (2) History of tax arrears on property owned in Boston by Applicant

      (3) Evidence of site control over project area, including current ownership, all restrictive covenants and contractual restrictions affecting the proponent's right or ability to accomplish the Proposed Project, and the nature of the agreements for securing parcels not owned by the Applicant.

(4) Nature and extent of any and all public easements into, through, or surrounding the site.

B. Regulatory Controls and Permits

BRA 3

An updated listing of all anticipated permits or approvals required from other municipal, state or federal agencies, including a proposed application schedule shall be included in the DPIR.

C. Project Site

BRA 4

The DPIR shall include a complete description of the Project Site. The description should include, at minimum, square footage of the site, a map indicating the boundaries, and a legal description including meets and bounds. The DPIR shall include for each Alternative, a calculation of FAR utilizing the definition for calculation as provided for in the Boston Zoning Code. Only property under the control of the Proponent should be considered in the Project Site and subsequent Project Descriptions.

D. Project Alternatives

BRA 5

The DPIR must include the following three (3) alternatives. The analyses as provided for in the Environmental Protection Component, Urban Design Component, and Transportation Component sections of this Scoping Determination shall be required for each of the alternatives. The Proponent is permitted to provide any additional alternative(s) in addition to those provided below.

Alternative 1 - No build as a means of measuring the baseline;

Alternative 2 – Full build of Proposed One Bromfield Project as proposed by proponent for the DPIR;

Alternative 3 – Full build of an "As-of-Right" or Zoning Compliant Proposal.

E. Affordable Housing

BRA 6

More details with respect to the affordable housing component should be provided. The Proposed Project is expected to comply with the Mayor's Executive Order relative to the Inclusionary Development Policy. There are currently three (3) options offered under the Inclusionary Development Policy: (1) the construction of affordable units on-site; (2) the construction/provision of affordable units off-site; and/or (3) payment in lieu of providing on-site affordable units. If the developer is proposing to locate some or all of the affordable units off-site, this location should be identified. Furthermore, any units provided off-site must be ready for occupancy on or before the date that the units within the Proposed Project are ready for occupancy.

F. Project Description

BRA 7

The DPIR shall contain a full description of the Proposed Project and Scoping Alternatives and its elements, including size, physical characteristics, and proposed uses. This section of the DPIR shall present the development context of the Project (description of the surrounding environment), existing site conditions, project purpose and objectives, approximate project cost and development schedule, and other project proposals in the vicinity of the Proposed Project. Only projects that have completed or are currently undergoing Article 80 review should be included. The projects should be included as proposed in their filings at the Boston Redevelopment Authority.

G. Transportation Component

BRA 8

The DPIR shall include a detailed traffic and transportation analysis that examines the Proposed Project's impact on the transportation network and proposes measures intended to mitigate, limit, or minimize any adverse impact reasonably attributable to the Proposed Project. The analysis must utilize as its framework the scope as outlined in the Boston Transportation Department ("BTD") Transportation Access Plan Scope dated November 28, 2008 included in **Appendix A.** Written comments of the City of Boston Transportation Department dated November 28, 2008 are included in **Appendix A** and are incorporated herein by reference and made a part hereof.

The DPIR will outline the mitigation program proposed for the Proposed Project, including costs, schedules and responsibilities. In carrying out the analysis of transportation impacts and mitigation measures, the Proponent shall continue working with the BTD.

H. Environmental Protection Component

The DPIR shall contain an Environmental Protection Component as outlined. Opportunities for sustainable design as well as other issues are described in the written comments by the City of Boston Environment Department dated December 16, 2008, David Carlson dated "end of January '09 and as amended", and by Katie Pederson dated January 2, 2009 are included in **Appendix A** and are incorporated herein by reference and made a part hereof. The analyses as provided for in the Environmental Protection Component section of this Scoping Determination shall be required for each of the alternatives.

Wind

BRA 9

The DPIR shall include a quantitative wind analysis of the potential pedestrian level wind impacts. This analysis shall determine potential pedestrian level winds adjacent to and in the vicinity of the Proposed Project and shall identify areas where wind velocities are expected to exceed acceptable levels, including the Authorities guideline of an effective gust velocity of 31 mph not to be exceeded more than 1% of the time.

The wind impact analysis shall evaluate the following conditions:

1. No-Build - the existing condition of the site and environs to establish the baseline condition.

2. Future Build Condition – Full build of proposed One Bromfield Street Project as proposed by the proponent for the DPIR.

3. Alternative conditions – Full build of an "As-of-Right" or Zoning Compliant Proposal.

For areas where wind speeds are projected to exceed acceptable levels, measures to reduce wind speeds and to mitigate potential adverse impact shall be identified.

Shadow

BRA 10

A shadow analysis shall be required for existing and build conditions for the hours 9:00 a.m., 12:00 noon, and 3:00 p.m. for the vernal equinox, summer solstice, autumnal equinox, and winter solstice and for 6:00 p.m. during the summer and autumn. It should be noted that due to time differences (daylight savings vs. standard), the autumnal equinox shadows would not be the same as the vernal equinox shadows and therefore separate shadow studies are required for the vernal and autumnal equinoxes.

The shadow impact analysis must include net new shadow as well as existing shadow and must clearly show the incremental impact of the Proposed Project. For purposes of clarity, new shadow should be shown in a dark, contrasting tone distinguishable from existing shadow. The shadow impact study area shall include, at a minimum, the entire area to be encompassed by the maximum shadow expected to be produced by the proposed project (i.e., at the winter solstice). The build condition(s) shall include all buildings under construction and any proposed buildings anticipated to be completed prior to completion of the proposed project. Shadow from all existing buildings within the shadow impact study area shall be shown. A North arrow shall be provided on all figures.

Particular attention shall be given to existing or proposed public open spaces and pedestrian areas, including, but not limited to, the sidewalks and pedestrian walkways within, adjacent to, and in the vicinity of the proposed project and existing and proposed plazas, park areas, and other open space areas within and in the vicinity of the proposed development addition, the shadow diagrams also shall indicate rooftop shadow impacts as well as any additional shading of the façades of any identified historic property.

Design or other mitigation measures to minimize or avoid any adverse shadow impact shall be identified.

Daylight

BRA 11

The Proposed Project is significantly higher than the zoning allows, and prior submissions of the same Project. It also tilts over the observable right-of-way. Although comparisons to prior submissions are not provided, the impacts are doubtless greater than heretofore, and unacceptable on Province Street. Chapman Place is expected, as a service alley between tall structures, to have high values. A even higher value of 98% (Province Street point C) is nearly unheard-of on any downtown street. Mitigation of this impact by substantially eliminating the right-of-way overhang and reducing the height is strongly recommended. Additionally, the build condition value of point B (Figure 5.3-5) reported (75.9%) is probably lower than the actual obstruction due to a possible glitch in the BRADA program which failed to connect the building segments shown in the diagram.

Solar Glare

BRA 12

Due to the glass façade of the Proposed Project, solar glare will be a concern, the impact dependent on the specific quality (reflectivity) and nature of the glass ultimately chosen. The solar glare analysis shall measure potential reflective glare from the building(s) onto potentially-affected streets, public open spaces, and sidewalk areas to determine the potential for visual impairment or discomfort due to reflective spot glare. Further review of the potential impact will be required. Mitigation measures to eliminate any adverse reflective glare shall be identified. The technical data used for the analyses shall be included.

Air Quality

BRA 13

The DPIR shall describe the existing and projected future air quality in the project vicinity and shall evaluate ambient levels to determine conformance with the

National Ambient Air Quality Standards and U.S. Department of Housing and Urban Development (HUD) requirements for residential and other sensitive receptors. Particular attention shall be given to mitigation measures to ensure compliance with air quality standards.

A future air quality (carbon monoxide) analysis shall be required for any intersection (including the garage entrances/exits) where level of service (LOS) is expected to deteriorate to D and the proposed project causes a 10 percent increase in traffic or where the level of service is E or F and the proposed project contributes to a reduction of LOS. Notwithstanding this limitation, the proponent shall consult with the BRA and the Massachusetts Department of Environmental Protection (DEP) to determine whether air quality analyses should be performed at any other intersections in the vicinity of the project site, based on traffic projections. The methodology and parameters of the traffic-related air quality analysis shall be approved in advance by the Boston Redevelopment Authority and the Massachusetts Department of Environmental Protection. The results of the air quality analysis shall be compared to the Massachusetts State Implementation Plan to determine project compliance with the Plan. Mitigation measures to eliminate or avoid any violation of air quality standards shall be described.

An indirect source air quality analysis of the operation of the parking garage shall be prepared to determine potential air quality impacts on nearby sensitive receptors and compliance with air quality standards. Garage emissions should be estimated using appropriate U.S. EPA guidance (Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9 (Revised): Evaluating Indirect Sources, EPA-450/4-78-001). The EPA SCREEN3 model should be used to calculate maximum CO impacts from the garage at the various sensitive receptors. Particulate emissions shall be derived from the EPA PART5 emission model and ground level impacts from the exhaust vents shall be estimated by use of the SCREEN3 model. Maximum one-hour concentrations at the closest sensitive receptors and the maximum 24-hour concentration shall be estimated and compared to applicable EPA standards.

A description of the project's heating system and of the parking garage ventilation system, including location of intake and exhaust vents and specifications, and an analysis of the impact on pedestrian level air quality and on any sensitive receptors from operation of the heating and exhaust systems shall be required. Measures to prevent the release of any contaminants and to avoid any violation of air quality standards shall be described.

Solid and Hazardous Wastes

BRA 14

The project site has been used for parking. Therefore, it is possible that the site would have been impacted by spills of oil or hazardous materials, including metals. Underground storage tanks also may be present on the site. The presence of any contaminated soil or groundwater and any underground storage tanks at the project site shall be evaluated and remediation measures to ensure their safe removal and disposal shall be described. Any assessment of site conditions pursuant to the requirements of M.G.L. Chapter 21E that has been or will be prepared for the site shall be included in the DPIR (reports may be included in an Appendix but shall be summarized in detail, with appropriate tables and figures, within the main text).

The DPIR shall quantify and describe the generation, storage, and disposal of all solid wastes from the construction and operation of the proposed project. The DPIR shall identify the specific nature of any hazardous wastes that may be generated and their quantities and shall describe the management and disposal of these wastes. In addition, measures to promote the reduction of waste generation and recycling, particularly for paper, glass, plastics, metals, and other recyclable products, and compliance with the City's recycling program, shall be described in the DPIR.

Noise

BRA 15

The DPIR shall establish the existing noise levels at the project site and vicinity based upon a noise-monitoring program and shall calculate future noise levels after project completion based on appropriate modeling and shall demonstrate compliance with the Design Noise Levels established by the U.S. Department of Housing and Urban Development for residential and other sensitive receptors and with all other applicable Federal, State, and City of Boston noise criteria and regulations. The noise evaluation shall include the effect of noise generated by the area's traffic and other noise sources. Any required mitigation measures to minimize adverse noise impacts and to reduce interior noise levels of residential and other sensitive receptors to acceptable limits shall be described.

An analysis of the potential noise impacts from project-generated traffic and from the project's mechanical and exhaust systems and compliance with applicable regulations of the City of Boston shall be required. A description of the project's mechanical and exhaust systems and their location shall be included. Measures to minimize and eliminate adverse noise impacts on nearby sensitive receptors from traffic noise and mechanical systems shall be described.

Stormwater Management/Water Quality

BRA 16

The DPIR shall contain an evaluation of the project site's existing and future stormwater drainage and stormwater management practices. The DPIR shall illustrate existing and future drainage patterns from the project site and shall describe and quantify existing and future stormwater runoff from the site and the proposed project's impacts on site drainage. The proposed project's stormwater management system, including best management practices to be implemented, measures proposed to control and treat stormwater runoff and to maximize on-site retention of stormwater, measures to prevent groundwater contamination, and compliance with the Commonwealth's Stormwater Management Policies, also shall be described. The DPIR shall describe the project area's stormwater drainage system to which the project will connect, including the location of stormwater drainage facilities and ultimate points of discharge.

Geotechnical Impact/Groundwater

BRA 17

A description and evaluation analysis of existing sub-soil conditions at the project site, groundwater levels, potential for ground movement and settlement during excavation and foundation construction, and potential impact on adjacent buildings, utility lines, and the roadways shall be required. This analysis shall also include a description of the foundation construction methodology, the amount and method of excavation, and measures to prevent any adverse effects on adjacent buildings, utility lines, and roadways. Measures to ensure that groundwater levels will be maintained and will not be lowered during or after construction also shall be described. In addition, the geotechnical analysis shall evaluate the earthquake potential in the project area and shall describe measures to be implemented to mitigate any adverse impacts from an earthquake event.

Construction Impacts

BRA 18

A construction impact analysis shall include a description and evaluation of the following:

(a) potential dust and pollutant emissions and mitigation measures control these emissions.

(b) potential noise generation and mitigation measures to minimize increase in noise levels.

(c) location of construction staging areas and construction worker parking; measures to encourage carpooling and/or public transportation use by construction workers.

(d) construction schedule, including hours of construction activity.

(e) access routes for construction trucks and anticipated volume of construction truck traffic.

(f) construction methodology (including foundation construction), amount and method of excavation required, disposal of the excavate, description of foundation support, maintenance of groundwater levels, and measures to prevent any adverse effects or damage to adjacent structures and infrastructure.

(g) method of demolition of existing buildings on the project site and disposal of the demolition debris.

(h) potential for the recycling of construction and demolition debris, including asphalt from the existing parking lots.

(i) identification of best management practices to control erosion and to prevent the discharge of sediments and contaminated groundwater or stormwater runoff into the City's drainage system during the construction period.

(j) coordination of project construction activities with other major construction projects being undertaken in the project vicinity at the same time including scheduling and phasing of individual construction activities.

(k) impact of project construction on rodent populations and description of the proposed rodent control program, including frequency of application and compliance with applicable City and State regulatory requirements.

(l) measures to protect the public safety.

<u>Sustainable Design</u>

BRA 19

A new development of the size and complexity of the proposed One Bromfield Street project presents a host of opportunities for sustainable design and construction to prevent damage to the environment, consistent with the goals of Executive Order 385 and recent initiatives of the Mayor and the BRA. The DPIR shall describe appropriate environmentally protective technologies and practices that can be incorporated into the design and operation of the proposed One Bromfield Street project development and the project proponent's commitment to include such measures into the proposed project. Measures shall include, but not be limited to, the following:

- Optimize natural day lighting, passive solar gain, and natural cooling; specify energy efficient HVAC and lighting systems, appliances, and other equipment, and solar preheating of makeup air.

- Favor building materials and purchases of supplies that are non-toxic, made from recycled materials, and made with low embodied energy.

- Build easily accessible recycling system infrastructure into the project's design.

- Incorporate additional opportunities to conserve water beyond water-saving technologies required by law.

- Make the building design adaptable for the future inclusion of innovative energy and environmental technologies as they develop over time.

- Conduct annual audits of energy consumption, waste streams, and the use of renewable technologies.

Additional opportunities for sustainable design are described in the written comments of the City of Boston Environment Department, included in **Appendix A** and are incorporated herein by reference and made a part hereof.

<u>Article 85</u>

BRA 20

As indicated in the PNF, the proposed project would require demolition of existing structures, The proposed demolition requires Article 85 Demolition Delay review by the Boston Landmarks Commission (the "BLC") and can be referenced within the written comments of the City of Boston Environment Department, included in **Appendix A** and are incorporated herein by reference and made a part hereof

I. Urban Design Component

BRA 21

A complete discussion of the Proposed Project as relates to the Urban Design Component and other Article 80 review topics are described in a memorandum from David Carlson dated "end of January '09 and as amended" included in **Appendix A** and are incorporated herein by reference and made a part hereof and will be addressed in their entirety in the DPIR.

Boston Civic Design Commission ("BCDC") review is ongoing; the Project is currently under review in Design sub-committee.

The following urban design materials for the Proposed Project must be submitted for the DPIR.

1. Written description of program elements and space allocation for each element

2. Plan for the surrounding area and district and sections at an appropriate scale (1" = 100' or larger) showing relationships of the Proposed Project to the surrounding area and district:

a. massing
b. building height
c. scaling elements
d. open space
e. major topographical features
f. pedestrian and vehicular circulation
g. land use

3. Black and white or color 8"x10" photographs of the site and neighborhood

4. Eye-level perspectives (reproducible line drawings) showing the proposal (including main entries and public passages/areas) in the context of the surrounding area. Views should include long-, mid-, and close-range viewpoints for different purposes. Long-ranged (distanced) views of the proposed project should also be studied to assess the impact on the neighborhood, skyline or other view lines. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) both the build and no-build conditions. The view locations should be approved by the BRA before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.

5. Site sections at 1" = 20' or larger showing relationships to adjacent buildings and spaces. Please note that it is not within the purview of the Proponent to reconfigure adjacent proposals or area plan interpretations to suit their own proposed goals, and this should be avoided in the DPIR. It is also critical to reach an understanding of the relationship of the public domain spaces and access points both to outside public ways and to lobby spaces in the Project as proposed.

6. Site plan at an appropriate scale (1" = 20' or larger) showing:

   a. General relationships of proposed and existing adjacent buildings and open space

   b. Open spaces defined by buildings on adjacent parcels and across streets

   c. General location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features

   d. Pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas

e. Survey information, such as extending elevations, benchmarks, and utilities

7. Study model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration, facade composition, etc.

8. Massing model at 1" = 40' in basswood or equivalent agreed-upon material suitable for placement in the Downtown model at the BRA. Please contact the Director of the Model Shop (David Carlson). Models shall be provided for all alternatives studied. Any 'future context' models should, however, accurately depict massings which conform absolutely to plan and zoning restrictions. Photographs of the massing model(s) which do not adhere to this stricture will not be accepted.

9. Drawings at an appropriate scale (e.g., 1" =8', 1"-16', or 1"-20') to describe the facade design and proposed materials including:

   a. Building and site improvement plans

   b. Elevations in the context of the surrounding area

   c. Sections showing organization of functions and spaces

   d. Preliminary building plans showing ground floor and typical upper floors

   e. Phasing of the proposed project

10. A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.

11. Proposed schedule for submittal of all design or development related materials.

The Proposed Project made a formal presentation before the Boston Civic Design Commission ("BCDC") on December 2, 2008 and is presently still in BCDC Design sub-committee.

J. Infrastructure Impact Component

BRA 22

An infrastructure impact analysis should be performed. The written comments of David Carlson, included in **Appendix A**, are incorporated herein by reference and made a part hereof. The discussion of Proposed Project impacts on infrastructure systems should be organized system-by-system as suggested below. The applicant's submission must include an evaluation of the Proposed Project's impact on the capacity and adequacy of existing water, sewerage, energy (including gas and steam), and electrical communications (including telephone, fire alarm, computer, cable, etc.) utility systems, and the need reasonably attributable to the proposed project for additional systems facilities.

Any system upgrading or connection requiring a significant public or utility investment, creating a significant disruption in vehicular or pedestrian circulation, or affecting any public or neighborhood park or streetscape improvements, comprises an impact which must be mitigated. The DPIR must describe anticipated impacts in this regard, including specific mitigation measures, and must include nearby Proposed Project (i.e. One Franklin, 45 Province, any others in 'tributary range' or contributing to demand or capacity needs) build-out figures in the analysis. The standard scope for infrastructure analysis is given below:

1. Utility Systems and Water Quality

a. Estimated water consumption and sewage generation from the Proposed Project and the basis for each estimate. Include separate calculations for air conditioning system make-up water

b. Description of the capacity and adequacy of water and sewer systems and an evaluation of the impacts of the Proposed Project on those systems

c. Identification of measures to conserve resources, including any provisions for recycling or 'green' strategies

d. Description of the Proposed Project's impacts on the water quality of Boston Harbor or other water bodies that could be affected by the Project, if applicable

e. Description of mitigation measures to reduce or eliminate impacts on water quality

f. Description of impact of on-site storm drainage on water quality

g. Information on how the Proposed Project will conform to requirements of the Ground Water Trust under Article 35 by providing additional recharge opportunities

h. Detail methods of protection proposed for infrastructure conduits and other artifacts, including BSWC sewer lines and water mains and subway lines, during construction

i. Detail the energy source of the interior space heating; how obtained, and, if applicable, plans for reuse of condensate.

Thorough consultation with the planners and engineers of the utilities will be required, and should be referenced in the Infrastructure Component section.

2. Energy Systems

a. Description of energy requirements of the project and evaluation of project impacts on resources and supply

b. Description of measures to conserve energy usage and consideration of the feasibility of including solar or other alternative energy provisions or other on-site energy provisions.

Additional constraints or information required are described below. Any other system (emergency systems, gas, steam, optic fiber, cable, MBTA, etc.) impacted by this development should also be described in brief.
It is noted that the PNF contains initial information for the most part organized as suggested; in addition to the information proposed, more information is requested to clarify sewage tributary flows and constraints as well as energy choices, which are not specifically addressed. The location of transformer and other vaults required for electrical distribution or ventilation must be chosen to minimize disruption to pedestrian paths and public improvements both when operating normally and when being serviced, and must be described. Storm drain and sewage systems should be separated or separations provided for in the design of connections.

BOSTON REDEVELOPMENT AUTHORITY

BRA1 Development Team

Please see Section 1.2.

BRA2 Legal Information

Please see Section 1.6

BRA 3 Regulatory Controls and Permits

Please see Section 1.7

BRA 4 Project Site

Please see Chapter 2 for a description of the Project site.

BRA 5 Project Alternatives

Please see Chapter 2 for a discussion of the Project alternatives. These alternatives are also incorporated into the analyses throughout this DPIR.

BRA 6 Affordable Housing

The proposed Project will comply with the BRA's recently adopted Inclusionary Development Policy.

BRA 7 Project Description

Please see Chapter 2 for a Project description.

BRA8 Transportation Component

Please see Chapter 3 for a detailed traffic and transportation analysis.

BRA9 Wind

A wind analysis is included in Section 4.1.

BRA10 Shadow

A shadow analysis is included in Section 4.2.

BRA11 Daylight

A daylight analysis is included in Section 4.3.

BRA12 **Solar Glare**

Please see Section 4.4.

BRA13 **Air Quality**

An air quality analysis is included in Section 4.5.

BRA14 **Solid and Hazardous Waste**

Please see Section 4.6.

BRA15 **Noise**

A noise analysis is included in Section 4.8.

BRA16 **Stormwater Management/Water Quality**

Please see Section 8.3.

BRA17 **Geotechnical Impact/Groundwater**

Please see Section 4.10.

BRA18 **Construction Impacts**

Please see Section 4.11.

BRA19 **Sustainable Design**

Chapter 5 includes a discussion of sustainable design, including a LEED checklist and narrative.

BRA20 **Article 85**

The Proponent will initiate Article 85 Demolition Delay review during the Article 80B review process.

BRA21 **Urban Design**

Please see Chapter 6.

BRA22 **Infrastructure**

Please see Chapter 8.

MEMORANDUM

TO: John Fitzgerald
FROM: David Carlson
DATE: end of January 2009 and as amended
SUBJECT: One Bromfield Street
PNF Scoping Comments

The Proposed Project consists of approximately 407,000 SF of residential (276 units), retail, and support uses in a massing and height configuration that is comparable in scale to the adjacent 45 Province Street Project currently under construction. It took several attempts over nearly a decade for that Project to get the right mix of use and configuration, and considerable study was given to potential view and historic resource impacts - as well as lower floor programming -as part of the process leading to the final (approved) design change. The One Bromfield Proponent has made a preliminary presentation to the BCDC and has been referred to Design Committee. The comments of the Commissioners as recorded in the minutes from December of 2008 are attached. It is anticipated that the Proponent will respond to the Commissioners' comments as well as those of the public and BRA staff.

For a Project which is proposed to exceed the underlying zoning, prudent urban design and environmental analyses would suggest comparing the existing conditions to an 'as-of-right' or zoning-compliant alternative, and this comparison is requested for the DPIR. Note some of the studies requested below as well. The preferred Project presented in the DPIR does not have to have the same massing as that presented in the PNF.

URBAN DESIGN COMPONENT

The Proposed Project as described in the PNF will replace four existing buildings; the Proponent must check with the Boston Landmarks Commission and initiate the Article 85 Demolition Delay review. It is good that the building at the corner of Province and Bromfield streets will be retained (it is outside the Project area) as that has the most historic merit. BRADC 1

In replacing four existing buildings, the Proponent also replaces a good number of entries on the streets. The small businesses emblematic of Boston's character, such as the Bromfield Pen shop, that remain on the site today should be relocated or otherwise provided for during and after construction of the Proposed Project. BRADC 2 We appreciate and encourage the effort by the Proponent to animate the property with a retail base. Although complexity is being added to the site via the internal drop-off lane and pass-through, we ask that the residential entry and multiple retail entries enliven the street edges to the maximum extent possible, and that the retail mix include provision for smaller entities as well. BRADC 3 Coordination with the BRA's Downtown Crossing team is recommended.

The Province Court alley, in the past known as Hatter's Row due to a concentration of such uses, must be greatly improved as a part of the Proposed Project and meshed with the improvements to Province Street initiated by the 45 Province Street Project. BRADC 4 Although functionally it is planned to handle loading and parking access, the overall environment of the alley must be improved and the management of its waste pick-up must be consolidated in conjunction with the local businesses and building owners. BRADC 5 The parking and loading access must be treated as an attractive amenity and not as an infrastructure afterthought. BRADC 6 Lighting and a maintenance plan should be developed.

The design proposes potentially rich materials (precast, metal and glass) in a composition that creates two slim, differentiated slabs (one with a secondary slab mass) above a site-filling podium. This likely addresses some potential wind concerns, and the height of the podium responds to some datum lines, but the connection between the two elements is weak. The components have strong, simple designs which add to their composition, yet the scale seems out of place among its neighbors on Washington Street. Several aspects of the design *require further study*: BRADC 7 BRADC 8

1. Study the vertical proportions of the building and its façade treatments in light of the rich texture of buildings in the Midtown Cultural District. Relate the upper and podium elements either by related hierarchy of architectural elements and materials or by possible (but not continuous along the streetwall) direct massing connection(s). BRADC 9

2. Work on the proportions of the upper elements of the building in particular as it is viewed from various vantage points, potentially modifying the proportional ratio of the two major elements in plan, or varying the vertical proportions. Use this strategy, or one similar, to help give the building a more defined and differentiated ending at its skyline, particularly in relationship to nearby towers such as 33 Arch, One Franklin, and 45 Province. The arc of the Tontine Crescent arguably should not inform the tower's orientation as much as Bromfield Street itself. BRADC 10

3. Study the expression of the lower floors along both Bromfield and Washington; maximize transparency and active uses. At the same time, consider the treatment of the garage openings. But also consider the relationship of the two facades to the area's rich architectural context. Of some note were the neighborhood elevations shown as contextual arguments – but arguing, we feel, for the modification of your approach and underscoring the anomalous nature of your preliminary proposal. Include the elements of the approved but not yet built or just built nearby One Franklin and 45 Province Street projects in this study. BRADC 11 BRADC 12

4. The height of the podium does not have to relate directly to nearby datum lines, but has some flexibility in that it represents an older height zone. Within that zone, consider the retail, parking expression, and possibly the first floor or the residential program (which has a mix of program elements that can be deeper in plan) as contemporary expressions of the tripartite base, middle, top. BRADC 13

5. Provide a series of views, at immediate, midrange, and long view distances. We suggest the array of views generated in the study of 45 Province, since the sensitive criteria should be in the same range. Views, given the corner location, from up Bromfield and down Franklin, and from both directions along Washington Street should additionally be provided at a minimum. See the standard requirements below. BRADC 14

6. This Project is one that could catalyze the reconstruction of this corner block of Bromfield and Washington to realize certain aspects of the Downtown Crossing studies; this should be coordinated with both the retail strategy and the street improvements planned for the vicinity at the intersection and possibly along Bromfield, and this should be demonstrated in the DPIR. At a minimum, the sidewalks should be reconstructed to conform to this as a possible future condition. Any granite or bluestone sidewalk slabs that exist should be preserved *in situ* as they are collectively considered landmarks for the City. BRADC 15 BRADC 16

The following (standard list of) urban design materials should be submitted for the DPIR for the Proposed Project (or, if no DPIR is requested, should be submitted as a record 'schematic design' submission) pursuant to the BRA's Development Review Procedures: BRADC 17

1. Written description of program elements and space allocation for each element

2. Plan for the surrounding area and district and sections at an appropriate scale (1" = 40' or larger) showing relationships of the Proposed Project to the surrounding area and district:

   a. massing
   b. building height
   c. scaling elements
   d. open space
   e. major topographical features
   f. pedestrian and vehicular circulation
   g. land use

3. Black and white or color 8"x10" photographs of the site and neighborhood

4. Eye-level perspective (reproducible line drawings) showing the proposal (including main entries and public passages/areas) in the context of the surrounding area. Views from the area streets (Washington, Bromfield, Province, Franklin, i.e.) are required, showing the surrounding context, with particular emphasis on important viewing areas such as key approaches from nearby neighborhoods or the Public Garden, City Hall Plaza, and Boston Common. Long-ranged (distanced) views of the proposed project should also be studied to assess the impact on the skyline or other view lines. Photomontages are encouraged as a technique to fully understand the contextual setting. Context and the massing of other approved Projects (including 45 Province Street and One Franklin). At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) both the build and no-build conditions. The view locations should be approved by the BRA before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.

5. Site sections at 1" = 20' or larger showing relationships to adjacent buildings and spaces.

6. Site plan at an appropriate scale (1" = 20' or larger) showing:
   a. General relationships of proposed and existing adjacent buildings and open space
   b. Open spaces defined by buildings on adjacent parcels and across streets
   c. General location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
   d. Pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
   e. Survey information, such as extending elevations, benchmarks, and utilities
   f. Construction limits

7. Study building/site model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration (window treatment), facade composition, etc.

8. Massing model at 1" = 40' in basswood suitable for placement in the Downtown Model at the BRA.

9. Drawings at an appropriate scales (<u>e.g.</u>, 1" =8', 1"-16', or 1"-20') to describe the facade design and proposed materials including:
   a. Building and site improvement plans

b. Elevations in the context of the surrounding area
c. Sections showing organization of functions and spaces
d. Preliminary building plans showing ground floor and typical upper floors
e. Phasing of the proposed project

10. A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.

11. Proposed schedule for submittal of all design or development related materials.

12. Proposed LEED certification plans and point rating goal assessment. BRADC 18

13. Electronic model of the Proposed Project in format suitable for use in the BRA's digital 3-D model of Boston. Format should be approved by Urban Design's Technology manager

WIND AND SHADOW COMMENT

The wind and shadow analyses must conform to all the requirements imposed by the underlying zoning of Article 38, including an analysis of any shadows on shadow impact areas as defined therein. The shadow analysis for the Proponent's preferred Project, as amended for the DPIR submission, must demonstrate by analysis what is only claimed in the PNF, that it meets the criteria in both the Acts and in Article 38 regarding shadow on the Common. Because of its adjacency, a detailed shadow analysis should also be performed regarding the potential of any new shadows cast on the Old South Meeting House facade, similar to that required for 33 Arch and One Franklin. The Proposed Project should attain the performance standard of meeting or exceeding in positive benefits any impacts derived from the 'as-of-right' alternative. Proposed Projects either approved or in the Article 80 pipeline should be included, as is standard, in any such comparisons as background. BRADC 19

INFRASTRUCTURE SYSTEMS COMPONENT

An infrastructure impact analysis should be performed. BRADC 20

The discussion of Proposed Project impacts on infrastructure systems should be organized system-by-system as suggested below. The applicant's submission must include an evaluation of the Proposed Project's impact on the capacity and adequacy of existing water, sewerage, energy (including gas and steam), and electrical communications (including telephone, fire alarm, computer, cable, etc.) utility systems, and the need reasonably attributable to the proposed project for additional systems facilities.

Any system upgrading or connection requiring a significant public or utility investment, creating a significant disruption in vehicular or pedestrian circulation, or affecting any public or neighborhood park or streetscape improvements, comprises an impact which must be mitigated. The DPIR must describe anticipated impacts in this regard, including specific mitigation measures, and must include nearby Proposed Project (i.e. One Franklin, 45 Province, any others in 'tributary range' or contributing to demand or capacity needs) build-out figures in the analysis. The standard scope for infrastructure analysis is given below:

1. Utility Systems and Water Quality

a. Estimated water consumption and sewage generation from the Proposed Project and the basis for each estimate. Include separate calculations for air conditioning system make-up water

b. Description of the capacity and adequacy of water and sewer systems and an evaluation of the impacts of the Proposed Project on those systems

c. Identification of measures to conserve resources, including any provisions for recycling or 'green' strategies

d. Description of the Proposed Project's impacts on the water quality of Boston Harbor or other water bodies that could be affected by the Project, if applicable

e. Description of mitigation measures to reduce or eliminate impacts on water quality

f. Description of impact of on-site storm drainage on water quality

g. Information on how the Proposed Project will conform to requirements of the Ground Water Trust under Article 35 by providing additional recharge opportunities

h. Detail methods of protection proposed for infrastructure conduits and other artifacts, including BSWC sewer lines and water mains and subway lines, during construction

i. Detail the energy source of the interior space heating; how obtained, and, if applicable, plans for reuse of condensate.

Thorough consultation with the planners and engineers of the utilities will be required, and should be referenced in the Infrastructure Component section.

2. Energy Systems

a. Description of energy requirements of the project and evaluation of project impacts on resources and supply

b. Description of measures to conserve energy usage and consideration of the feasibility of including solar or other alternative energy provisions or other on-site energy provisions.

Additional constraints or information required are described below. Any other system (emergency systems, gas, steam, optic fiber, cable, MBTA, etc.) impacted by this development should also be described in brief.

It is noted that the PNF contains initial information for the most part organized as suggested; in addition to the information proposed, more information is requested to clarify sewage tributary flows and constraints as well as energy choices, which are not specifically addressed. The location of transformer and other vaults required for electrical distribution or ventilation must be chosen to minimize disruption to pedestrian paths and public improvements both when operating normally and when being serviced, and must be described. Storm drain and sewage systems should be separated or separations provided for in the design of connections.

Excerpted from the Boston Civic Design Commission Minutes of December 2, 2008:

The next item was a presentation of the **One Bromfield Street** project. Sam Norod (SN) of Elkus/Manfredi introduced Paul Davis (PD), of the ownership team (Midwood Management). SN then presented the design, noting its locus and circulation patterns in the area. The proposal was for 276 rental units (just over 400,000 SF, 330' high) with 3 stories of retail, and parking. We looked at the area, the crescent coming around, and the curve of 33 Arch - this led us to tip the building away from Bromfield. That moved the shadow away from the Granary Burial Ground...a lot of things happened. SN noted the slope on the site, and the retail program locations - showing the ground floor, and access to parking and loading off the Province Court alley. The residential lobby faces into the drop-off drive, but also comes to (Bromfield) Street. AL: What is the elevation difference? SN: It's 7' along Bromfield, a total of 11'. The idea of splitting the retail comes from an experienced retail developer. There are actually 3 levels of parking, a ratio of about 0.7 spaces per unit. There is no retail parking. The 7th (sic) floor is an amenity for the residents, then there are units above. SN carefully noted the BRA staff discussion focus on the podium level, and showed the relationships along both sides of Washington Street. SN: The scale is similar to that of Woolworth's, etc. along Franklin and Bromfield; along Washington, there are Millennium, Filene's, and Borders. We are working on the pedestrian scale. The design is more staccato along Bromfield. We have tried to give the impression of two simple planes; we're trying to find something simple.

DS: So, the reason it's twisted...? SN: The memory of the Tontine Crescent sweep of Franklin. DH: I like the rotation, the way it relates to the other buildings - I would like to discuss scale. Not so much the glass, but the masonry frame. In isolation, it's an elegant composition. But in the context, I worry about the masonry being overwhelming. Literally, the breadth of it. You guys have done a great job across the street at Filene's with the historic buildings. And on your curtain wall here, the surface becomes really, really important. I can imagine the other side (north) more successful, because of the bump. The tower seems broad - compared to the other buildings across the street - broad, and undifferentiated. You want it to feel like a residential building - it looks like an office building now. SN: We are in the same place. We are looking for something compositional, we share your sense. AL: Is it south-facing? DH: Shading could be a cool thing.
AL: Some observations. Clearly you're a building above a base related to the City around it. The cant above, separating the geometry of the upper and lower components, works but could be bolder. On the podium, you've tried to make it look like a 3-story building. The amenity floor is neither fish nor fowl. It needs definition at the base - two stories of pedestrian life, and then there's the stuff above. I would look for its definition below, and treat the whole thing. Go up more continuously, give it richness at the base. SN: We started looking at this from the point of view of zoning, so it's set back. We could treat the amenity space as an attic story. AL: Why are you so deferential to what used to be the Boston Five? You can find more definition along the street - and the parking could be open. DS: Why not parking below grade? SN: The subway, and adjacency to historic buildings.

LW: Your analysis is all based on retail. But Washington has a series of open spaces. The Bromfield sidewalks in particular are very tight. The whole building could be canted. Look at open spaces along Washington, not just retail. DH: There are elegant forms above, and we've talked about raising the podium. Maybe - some relief in the podium which allows a volume to come down...that might also offer relief along the base. SN: We had looked at the glass coming down there. MD: I agree with the issue. That might suggest looking at the sidewalk. SN: The difficulty of site access....KS: Transparency, the way the buildings relate (45 Province)....I agree with the ground floor concerns. Projections, balconies, open spaces - how do we differentiate, animate the face of these buildings? The 3rd and 4th levels feel like the Ritz podium. There's a divergence, where you bring a use up and animate a floor above, as Marshall's, Filene's did. DH: Or even the amenity floor could participate in the street. AL: Make the base taller and narrower. The bottom would be better, and you would regain the footprint (SF) lost in the narrowing. DS: It doesn't have to be the full block width at that height. SN: Like a village? AL: Not sure I would do that, but I *would* raise the height. DS: Maybe the back of the site (tower) could shift. DH: the two 'pieces' are now equal; maybe they could be less so, so one dominates. MD: Questions? Shirley Kressel (SK): What is the zoning? Mel Shuman: 110'. SK: So you're 330'. That's close. What is the status of the buildings you're replacing? PD: They are all (BLC) category 4 or 5, not designated.

With that, the One Bromfield Street project was sent to Design Committee.

BRA DAVID CARLSON

BRADC1 Article 85 Demolition Delay review

The Proponent will initiate Article 85 Demolition Delay review during the Article 80B review process.

BRADC2 Small businesses in surrounding area

The Proponent will market the retail spaces at the Project widely, including to existing business in the area.

BRADC3 Residential and retail entrances

The Project will include multiple retail entrances along Washington Street and Bromfield Street, and the primary residential entrance will be on Bromfield Street. The multiple entries and design will enliven the street edges.

BRADC4 Improvement of Province Court

As part of the Project, Province Court will be re-paved and its curbs re-set. The use and operation of Province Court is within the jurisdiction of the City of Boston, since Province Court is a public way.

BRADC5 Province Court waste pick-up

The Project has been designed with an interior loading area that will accommodate trucks for trash and recycling pick-up. The Proponent will work with the adjacent businesses and building owners to the extent practicable.

BRADC6 Parking and loading components

As part of the Project, Province Court will be re-paved and its curbs re-set. A lighting and maintenance plan will be developed.

BRADC7 Design materials

Current design deviates substantially from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC8 Design components

Current design deviates substantially from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC9 Manner in which building fits within the Midtown Cultural District context

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC10 Views of the upper elements of the building

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC11 Expression of lower floors

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC12 Design elements of One Franklin and 45 Province Street projects

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC13 Podium Height

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BRADC14 Provide perspectives

See visualization included within Section 6.2.

BRADC15 Retail strategy and street improvements

See visualization included within Section 6.2 and site plan in Figure 2-5.

BRADC16 Preservation of granite or bluestone sidewalk slabs

Sidewalks along Washington and Bromfield Streets will be reconstructed in accordance to the Boston Complete Streets Guidelines. Any granite or bluestone sidewalk slabs will be preserved in situ or relocated on-site, subject to appropriate City approvals.

BRADC17 Urban design materials

Please see Chapter 6.

BRADC18 Proposed LEED certification plans and point rating goal assessment.

Please see Chapter 5.

BRADC19 Wind and shadow analyses

Please see Chapter 4 for the wind and shadow analyses, including an analysis of shadow impacts as defined in Article 38.

BRADC20 Infrastructure Systems component

Please see Chapter 8.

BRA MEMORANDUM

TO: John Fitzgerald

FROM: Katie Pedersen

DATE: January 2, 2009

RE: One Bromfield Street
Boston, Massachusetts
Comments on Project Notification Form

I have reviewed the Project Notification Form (PNF) dated October 27, 2008 and submit the following comments for the Environmental Protection Component. The proposed One Bromfield Street development (consisting of 23,700 square feet of land area) will be located at the corner of Washington and Bromfield Streets in Boston's Downtown Crossing area (the Site). The Midwood Management Corporation (the Proponent) proposes the demolition of the four existing buildings on the site and the construction of a new building (the Proposed Project). The Proposed Project will include a base of six floors, with a 22-story tower rising above. The Proposed Project consists of approximately 407,000 square feet of gross floor area, including both retail and residential uses.

Wind

The Proponent shall be required to perform a quantitative (wind tunnel) analysis of the potential pedestrian level wind impacts. The analysis shall determine potential pedestrian level winds adjacent to and in the vicinity of the Proposed Project site and shall identify areas where wind velocities are expected to exceed acceptable levels, including the Authority's guideline of an effective gust velocity of 31 mph not be exceeded more than 1% of the time. **BRAKP1**

Particular attention shall be given to public areas and other areas of pedestrian use, including, but not limited to, the entrances of the Proposed Project buildings and existing and proposed buildings in the vicinity of the Proposed Project, the existing and proposed sidewalks and walkways within and adjacent to the Proposed Project development and in vicinity of the Proposed Project, and all existing and proposed park areas, and other open spaces within the vicinity of the proposed development.

The wind impact analysis shall evaluate the following conditions:

1. No-Build- the existing condition of the site and environment to establish the baseline condition.

2. Future Preferred Build Condition- the proposed development as described in the Project Notification Form.

3. Alternative Build Condition(s)- any alternative development concept(s) to the Preferred Build Condition required to be studied.

Shadow

The shadow impact analysis included the PNF sufficiently demonstrates that the Proposed Project is not anticipated to create significant new shadow on existing and proposed public open spaces, major pedestrian areas and the sidewalks adjacent to and in the vicinity of the Proposed Project. The Proposed Project has also demonstrated compliance with Section 2 (c) of Chapter 362 of the Acts and Resolves passed by the General Court of Massachusetts in 1990 (An Act Protecting Certain Public Commons) and the requirements of the Article 38 of the Boston Zoning Code.

Solar Glare

The Proponent has stated that the Proposed Project design does not include large areas of reflective glass or other materials that would contribute to solar glare. Therefore, a solar glare analysis shall not be required. However, should the Proposed Project design change and include substantial glass-facades, a solar glare analysis shall be required.

Air Quality

The Proponent shall provide a description of the existing and projected future air quality in the Proposed Project vicinity and shall evaluate ambient levels to determine **BRAKP2** conformance with the National Ambient Air Quality Standards (NAAQS) and U.S. Department of Housing and Urban Development (HUD) requirements for residential and other sensitive receptors. Particular attention shall be given to mitigation measures to ensure compliance with air quality standards.

A description of the Proposed Project's heating and mechanical systems, including the location of the buildings intake and exhaust vents and specifications, as well as any **BRAKP3** potential impacts of the Proposed Project on the attainment or maintenance of the NAAQS at the buildings and other nearby locations. Mitigation measures deemed necessary to minimize or avoid violations of state or federal ambient air quality standards **BRAKP4** shall be described.

Construction of the Proposed Project will create fugitive dust and air emissions from construction-related traffic and additional wind-blown dust as a result of ground disturbance. The Proponent shall be required to employ the mitigation measures as necessary to minimize the potential impact of air pollution emissions from Proposed **BRAKP5** Project construction operations.

Noise

The Proponent shall establish the existing noise levels at the Proposed Project site and **BRAKP6** vicinity and shall calculate future noise levels after the Proposed Project is completed and demonstrate compliance with applicable Federal, State and City of Boston noise criteria and regulations. The noise evaluation shall include the noise generated by the area's traffic and other noise sources. Future noise levels shall include the noise generated by the Proposed Project's mechanical equipment. Measures to minimize and eliminate adverse noise impacts on nearby sensitive receptors, including the Proposed Project itself, from traffic noise and mechanical systems shall be described.

Solid and Hazardous Waste

The Proponent shall be required to quantify and describe the generation, storage, and disposal of all solid wastes from the construction and operation of the Proposed Project. In addition, measures to promote the reduction of waste generation and recycling, in compliance with the City's recycling program, shall be described. **BRAKP7**

Stormwater Management

The Proponent shall provide an evaluation of the Proposed Project site's existing and future stormwater drainage and stormwater management practices. In addition, an illustration of existing and future drainage patterns from the Proposed Project site as well as a description and quantification of existing and future stormwater runoff from the site and the Proposed Project's impacts on site drainage have been provided in the PNF. **BRAKP8**

The Proposed Project's stormwater management system, including best management practices to be implemented, measures proposed to control and treat stormwater runoff and to maximize on-site retention of stromwater, measures to prevent groundwater contamination, and compliance with the Massachusetts Department of Environmental Protection's (DEP) Stormwater Management Standards shall be provided. The Proponent shall also provide a description of the Proposed Project's stormwater drainage facilities and ultimate point of discharge. **BRAKP9**

Sustainable Design/Green Buildings

The purpose of Article 37 of the Boston Zoning Code is to ensure that major buildings projects are planned, designed, constructed and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston. Any proposed project subject to the provisions of Article 37 shall be LEED Certifiable (U.S. Green Buildings Council) under the most appropriate LEED rating system. Proponents are encouraged to integrate sustainable building practices at the pre-design phase.

The Proponent has provided a completed LEED for New Construction v 2.2 checklist for which the Proposed Project purports to achieve 27 points. The Proponent shall provide an explanatory narrative demonstrating compliance with specific points. The Proponent is encouraged to strive to attain the 4 points indicated as ***maybes***, as points are often lost between the submission of the PNF and construction. **BRAKP10**

BRA KATIE PEDERSON

BRAKP1 **Wind Analysis**

Please see Section 4.1.

BRAKP2 **Ambient Air Quality**

Please see Section 4.5.

BRAKP3 **Air Quality - Heating and mechanical systems**

Please see Section 4.5.

BRAKP4 **Air Quality - Mitigation measures**

Please see Section 4.5.

BRAKP5 **Air Quality- Construction operations**

Please see Section 4.11.8.

BRAKP6 **Noise**

Please see Section 4.8.

BRAKP7 **Solid and hazardous waste**

Please see Section 4.6.

BRAKP8 **Stormwater drainage and management**

Please see section 4.7 of the DPIR for the information on Stormwater.

BRAKP9 **Stormwater drainage facilities**

Please see Section 8.3.

BRAKP10 **Sustainable Design**

The Sustainable Design elements are discussed in Chapter 5.

December 16, 2008

John Palmieri, Director
Boston Redevelopment Authority
Boston City Hall, Room 925
Boston, MA 02201
Attention: John FitzGerald, Project Manager

Re: One Bromfield Street - Project Notification Form

Dear Director Palmieri:

The City of Boston Environment Department has reviewed the Project Notification Form (PNF) and offers the following comments.

The project proposed by Millwood Management Corporation, is a 28 story, 353-foot tall (to the top of the mechanicals structure) to be occupied by about 49,000 square feet (sf) of basement, first floor and second floor retail, 192 parking spaces on three, four and five, a lobby area, health club and residential amenities on six, and 276 rental apartments on floors seven through 28. The screened parking facility will be accessed from Province Court with egress onto Bromfield Street. Five spaces may be used by employees with the remainder dedicated to resident use. It appears that there are at least 11 tandems spaces per level. All parking will be managed by a valet service. Loading/service/trash bay access will be inside of the building and accessed from Province Court. The Downtown Crossing site, currently occupied by four buildings which will be demolished, is bounded by Washington Street, Bromfield Street, Province Court and Ordway Court. The property is subject to the Downtown Parking Freeze.

The PNF indicates that the Draft Project Impact Report (DPIR) will include:

- a noise study
- a quantitative wind study
- the description of a recycling plan

A preliminary LEED-NC v 2.2 checklist shows that the Proponent has identified 27 credits for inclusion in the project with two Boston Green Building Credits (Modern Mobility and Groundwater Recharge) and an additional 15 standard LEED credits under consideration. Twenty-six (26) credits will not be sought.

We look forward to an updated checklist in the DPIR accompanied by a narrative describing implementation plans for each credit. Sample documentation can be found on the BRA Web site – on the main page left menu, click on 'Documents' then on 'Planning and Zoning' and then on '12.10.07 179 Lincoln – LEED (Part-1)' and on '12.10.07 179 Lincoln – LEED (Part-2)'. **BED1**

This department suggests that the Proponent evaluate two energy-saving elevator systems for the project – the Kone EcoSystem MR Mid-to High-Rise www.kone.come/countries/en_us/Elevators/EcoSystem) and Otis Elevator's Company's Elevonic High Rise Gearless elevator (Otis.com/site/us). **BED2**

We request the Proponent install permanent castings stating, "Don't Dump: Drains to Boston Harbor," on the sidewalk next to any catch basin existing, created or modified during project construction and alongside any catch basins located in areas to be used by vehicles. Castings can be obtained from the Operations Division at **BED3** the Boston Water and Sewer Commission (BWSC) at 617-617-989-7000.

The shadow study diagrams in the PNF do not provide the level of detail necessary for review of the project. **BED4** There is no narrative description of shadow impacts and only a passing reference to the shadow bank. Shadow diagrams should include:

- a north arrow
- street names
- the identification of doorways, bus stops, open space and areas where pedestrians are likely to congregate (in front of historic resources or other tourist destinations, for example)
- clear delineation of shadow on both rooftops and facades and
- clear distinctions between existing shadow and new shadow

Diagrams should be oriented and scaled consistent with diagrams that will show wind monitoring locations and levels, for both the Build and No Build conditions.

A plan should be developed to ensure that there is no idling in violation of the Commonwealth's anti-idling law **BED5** (MGL 90 s16A and 310 CMR 7.11) at loading and drop-off/pick-up/waiting areas; it should be included in the DPIR.

Exterior lighting should meet safety needs while not contributing to light pollution. Fixtures should be shielded and downward directed. We recommend as a resource, the Campaign for Dark Skies which can be accessed at 'http://www.britastro.org/dark-skies/' – click 'Lighting' and then 'Good & bad lighting/. Please describe in the **BED6** DPIR the exterior lighting plan for the project.

Save That Stuff (617-241-9998), a Charlestown company, has recently initiated a composting program, one of the few available in the Boston area. We suggest that any restaurant or food service tenants consider **BED7** participating in this program which will turn their organic waste into a useful product while helping to control waste removal costs and, when properly managed, assist with pest control.

The staff of the Boston Landmarks Commission (BLC) has reviewed the PNF. The project site includes four existing buildings listed in the Inventory of Historic and Archaeological Assets of the Commonwealth and nearby to multiple historic resources. The "significance" of each building and its contribution to historic context and/or streetscape varies. The six story building at the prominent corner of Washington and Bromfield appears to be the least altered of the four, retains historic presence and reinforces the scale of the streetscape.

The BLC staff notes that preservation and rehabilitation of historic buildings is recognized as a sustainable building practice by the U.S. Green Building Council and the City of Boston. BLC staff strongly encourages a **BED8** thorough study of alternatives that rehabilitate, or incorporate historic buildings into proposed development plans, rather than demolition. Demolition would constitute not only a loss of historic fabric, but also represents a loss of the building's embodied energy, fuel expenditure and air pollution during the demolition and removal of the building, as well as a large deposit of material to landfills.

Proposed demolition of buildings over 50 years of age or within Downtown or the Harborpark requires Article 85 **BED9** Demolition Delay review by the Boston Landmarks Commission. Please note that "significance" described in the PNF and attributed to the 1980 BLC Survey forms may no longer be relevant, as these survey forms are over 20 years old and are in the process of being reevaluated. The buildings proposed for demolition may be considered "significant" under the terms of Article 85.

In the absence of preservation or rehabilitation of the existing historic buildings, BLC staff has some comments on the proposed new construction. The overall massing of the proposed construction does attempt to relate to **BED10** the existing streetscape in scale, but the proposed tower raises concerns. The obvious issue regarding the proposed development is the height of the tower. While there are other towers nearby and the design intends to minimize visual impact, the proposed tower needs to be carefully evaluated for its physical and visual impacts on adjacent and nearby historic context. A new tower at this prominent location may have negative impacts on **BED11** nearby historic resources. BLC staff looks forward to detailed shadow and wind analysis diagrams, as well as nearby historic resources. BLC staff looks forward to detailed shadow and wind analysis diagrams, as well as various renderings showing the proposed construction in context, from various vantage points, near and far.

The proposed "base" of the building does generally attempt to relate to the scale of surrounding context, but it appears that the proposed design may require refinement to provide appropriately scaled elements at the pedestrian level. BLC staff supports a modern aesthetic for new construction, but suggests refined details are essential for the success of such a proposal. The proposed tower concept for two vertical slabs is interesting, but difficult to evaluate without further refined elevations and renderings that clearly illustrate proposed materials and details. There is some concern that the proposed design concept may actually increase the visual intrusion of the tower, rather than minimize it. It is recognized that the Washington Street and Bromfield Street elevations will have the most impact, but the north and west elevations are also important to evaluate for visual impact on context. The elevations included in the PNF are not developed enough for BLC staff to provide further specific detailed design comments; BLC staff looks forward to the opportunity to review the proposal again as the design develops. **BED12**

BLC staff agrees with BRA Urban Design staff that new construction projects in the City should be constructed with traditional building materials and techniques rather than synthetic composite materials. Simulated materials such as exterior insulated finish systems (EIFS), and glass fiber reinforced concrete (GFRC) are inconsistent with Boston architecture and are unlikely to withstand decades of the City's freeze-and-thaw climate. **BED13**

The BLC requests that dated cornerstones be incorporated into all new construction. This element will allow those who are attentive to and value the architecture of the City to appreciate the historical context in which structures were conceived. **BED14**

Current weekday auto trips for the retail and office uses are 174. Daily vehicle trips for the proposed project are expected to be 426. Residential mode splits are expected to be 42 percent walk, 30 percent transit and 28 percent auto. Projected retail mode splits are 59 percent walk, 20 percent transit and 21 percent auto.

A Transportation Demand Management (TDM) program is to be described in the Draft Project Impact Report (DPIR) and codified in a Transportation Access Plan Agreement (TAPA). TDM measures may include:

- language in commercial leases encouraging retail tenants to promote ridesharing, carpooling, transit use and to consider offering transit pass subsidies for employees
- encouraging commercial tenant participation in the A Better City Transportation Management Association (ABCTMA)
- providing secure bicycle parking
- distributing or making available transit maps and schedules to employees, residents and guests
- providing one transit pass for six months for the first occupancy of each unit

We urge the Proponent to:

- require in commercial leases the implementation of TDM measures most likely to discourage vehicular commuting **BED15**
- provide secure, covered bicycle parking for residents and commercial tenants and a bike rack for tenant customers
- provide changing rooms/lockers for commuters who bike or walk to work on site or by arrangement with a neighboring business that provides these amenities
- devoting one or more parking spaces for a car-sharing service such as Zipcar.

Valet parking can result in air quality degradation due to idling. Management of parking at the project will determine the level of effect that the system will have on air quality, pedestrian flows and vehicular circulation. The following elements when reviewing the application for the project: **BED16**

- Expected arrival and departure numbers, particularly at peak times for various uses.
- Available queuing space.
- The potential for queuing that intrudes upon sidewalks and interferes with pedestrian movements.

The PNF does not indicate how parking spaces not leased by residential tenants, if any, will be used. We ask that the DPIR discuss the disposition of any extra spaces. **BED17**

Some excess building materials may be suitable for donation to the Building Materials Resource Center (100 Terrace Street, Roxbury, 02120, 617-442-8917). This non-profit center offers, for only a handling fee, new and used materials for low and middle income homeowners. **BED18**

This department receives frequent complaints about noise generated at construction sites before 7:00 a.m. Complaints show that contractors often allow workers on site before that time. Noise is often related to the run-up of diesel equipment and the preparation and movement of tools and materials. No sound-generating activity is allowed to occur at the site prior to 7:00 a.m. **BED19**

Regular vacuum cleaning of streets and sidewalks in the project area should be employed to ensure that they remain free streets of dust and debris. The use of a vacuum cleaner is an important measure for preventing construction-related dust and debris from clogging storm drains. **BED20**

According to the Massachusetts Department of Environmental Protection (DEP), about 33 percent of mobile source particulate matter (PM) and ten percent of all nitrogen oxide (NO_x) pollution in the northeast is caused by construction vehicles. More than 90 percent of diesel engine particulate emissions are highly respirable and carry toxins deep into the lung, exacerbating human respiratory ailments. The U. S. Environmental Protection Agency (EPA) has proposed classification of diesel exhaust as "highly likely to be carcinogenic in humans." It estimates that diesel engines currently on the road can run for 1,000,000 miles and remain in operation for as long as 20 to 30 years. This amounts to 160 to 240 tons of pollution over the life of each engine.

The use of flow-through filters and, diesel particulate filters on pre-2007 diesel vehicles can reduce air quality degradation caused by emissions of carbon monoxide (CO), volatile organic compounds (VOC), NO_x and air toxins generated by heavy-duty equipment. Oxidation catalysts and catalyzed particulate filters reduce toxic emissions of formaldehyde, benzene, acrolein and 1-3 butadiene by as much as 70 percent, decrease localized adverse impacts and reduce dust and odor complaints from project abutters and regulatory agencies. Experience with a pilot project that retrofitted 83 pieces of equipment working on the Central Artery/Tunnel (CA/T) project showed that:

- Vehicles did not experience significant power loss.
- There are no additional operation and maintenance (O & M) or fuel costs.
- Engine manufacturers continue to honor vehicle warranties.

We ask that all pre-2007 diesel construction vehicles working on the project be retrofitted using retrofit technologies approved by the United States Environmental Protection Agency (EPA). **BED21**

Thank you for the opportunity to offer comment. We look forward to the DPIR.

Sincerely,

Bryan Glascock
Director

One Bromfield 12.08.doc.DBG:MTZ.mtz

BOSTON ENVIRONMENT DEPARTMENT

BED1 LEED Checklist

Please see Chapter 5.

BED2 Energy-saving elevator systems

The elevators being specified for the current design are similar to what was requested.

BED3 "Don't Dump: Drains to Boston Harbor" castings

The Proponent will install these castings.

BED4 Shadow study component

Please see Section 4.2.

BED5 Compliance with Anti-idling law

A plan will be developed to ensure compliance with the anti-idling law as part of the Construction Management Plan.

BED6 Exterior Lighting

The Project will comply with these recommendations.

BED7 'Save That Stuff' composting program

The Proponent is not anticipating any restaurant or food tenants as part of the Project.

BED8 Preservation and rehabilitation of historic buildings

The varying construction dates, methods of construction as well as the varying heights and types of buildings make incorporation of the existing structures into the proposed Project unfeasible. Additionally, as noted by the BLC in its inventories of the buildings, there have been significant alterations to the buildings on site as well as a loss of historic fabric. One building is described as "altered beyond recognition" in the Inventory. Given the alterations that have already occurred as well as the building code compliance and engineering challenges involved, rehabilitation of the existing buildings is unable to be included in the proposed Project.

BED9 Article 85 Demolition Delay review

An Article 85 application will be filed for the four existing buildings. As noted by BLC, the original B forms on file are over 30-years old; however, forms were updated in 2009 for two of the four buildings (11-21 Bromfield Street and 363 Washington Street). Additionally, 1-9 Bromfield Street had its form amended in 2005 as BLC upgraded its category to IV. Though the buildings have aged, their architectural integrity has not improved and questions relating to their significance and architectural integrity will be addressed in the BLC's review of the Article 85 applications.

BED10 Visual impacts

As noted by BLC staff, the base or podium for the building relates to the streetscape in terms of scale and massing. The building also uses steel and glass cladding common to the area. Also as noted, the narrow frame of the tower will minimize its visual impact. Included in Chapter 6 are drawings of the proposed building outlining its character and construction as it relates to other buildings in the area.

BED11 Shadow and Wind Impacts

See Chapter 4 includes detailed shadow and wind studies showing that while the building will have an impact on the surrounding area, historic properties will not be adversely affected. Due to the presence of numerous multi-story buildings in this densely developed area, the proposed changes in wind conditions and shadow impacts will be minimized.

BED12 Aesthetics of building from pedestrian level

Current design deviates substantially from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

BED13 Building materials

The Project will be constructed with traditional building materials and techniques rather than synthetic composite materials.

BED14 Historical and architectural context

The Proponent will consider incorporating dated cornerstones into the Project.

BED15 **Transportation component**

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to reduce dependence on automobiles and will incorporate TDM commitments as described in Section 3.7. TDM measures to be undertaken by the Proponent include: providing one free monthly MBTA subway pass per residential unit for the first six months of operation, promoting transit services in marketing and orientation materials, providing adequate secure bicycle storage, joining the local Transportation Management Association, and designating a transportation coordinator. As required by the City, the Proponent will prepare a Transportation Access Plan Agreement (TAPA) that will codify the specific measures and agreements between the Proponent and the City of Boston.

BED16 **Vehicular circulation**

Vehicular access to the site, as shown in Figure 3-15, will be via Bromfield Street and the internal porte-cochere. The porte-cochere driveway will accommodate one-way (northbound) travel from Bromfield Street toward Province Court. One travel lane will be provided for through traffic and one curbside parking lane will be provided for valet staging and taxicab activity. The eastern curb of the internal porte-cochere has capacity for approximately six vehicles plus one space for a delivery vehicle.

During the a.m. peak hour, the Project will generate 60 vehicle trips (32 automobiles and 28 taxicabs). During the p.m. peak hour, the Project will generate 72 vehicle trips (40 automobiles and 32 taxicabs).

A resident will enter the porte-cochere via Bromfield Street, park in the curb lane, and a garage attendant will drive the vehicle to the garage. Vehicles will be transported via attendant-operated vehicular elevators accessed from Province Court. Garage attendants will also retrieve vehicles from the garage for residents when they depart. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. Vehicles exiting the porte-cochere will turn onto Province Court, either right toward the garage or left toward Province Street. Taxicab drop-offs and pick-ups will also occur within the porte-cochere.

The curbside capacity in the porte-cochere will accommodate the peak level of auto and taxicabs trips that will be generated by the Project (see Table 3-14). No queuing will occur on adjacent public streets, including Province Court, Province Street, or Bromfield Street. See Section 3.4.8. for further discussion of porte-cochere operations.

BED17 Extra Parking spaces not leased by tenants

The 235 on-site parking spaces will provide parking at about 0.56 space/residential unit. If not all spaces are leased to residents, the Proponent plans to make some of these spaces available for visitors of the on-site retail businesses. No public parking will be provided.

BED18 Donation of excess building materials

To the extent feasible, the Proponent will arrange for the donation of excess building materials to the appropriate non-profit organization.

BED19 Noise component

No sound-generating activity will occur at the site prior to 7:00 a.m.

BED20 Cleaning of construction-related dust and debris

Plans for controlling fugitive dust during demolition, excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks.

BED21 Construction vehicles compliance with the EPA

Equipment retrofitted with diesel emissions control devices will be utilized to the greatest extent practicable.

Boston

John FitzGerald
Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

November 5, 2008

Dear Mr. FitzGerald:

Regarding the Project Notification Form for the One Bromfield Street project submitted to the BRA on October 27, 2008 the Boston Fire Department requires the following issues addressed by a qualified individual.

1. Emergency vehicle site access to the new buildings as well as existing buildings that might be affected. BFD1
2. Impact on availability and accessibility of hydrant locations for new buildings as well as for any existing buildings that might be impacted. BFD2
3. Impact on availability and accessibility to siamese connection locations for new buildings as well as for any existing buildings that might be impacted. BFD3
4. Impact that a transformer vault fire or explosion will have on the fire safety of the building. Particularly as it relates to the location of the vault. BFD4
5. Need for Boston Fire Department permit requirements as outlined in the Boston Fire Prevention Code, the Massachusetts Fire Prevention Regulations (527 CMR), and the Massachusetts Fire Prevention Laws (MGL CH148). BFD5
6. For projects involving air-supported structures, it is critical that the impact of the design has on fire safety relative to the interaction of the area underneath the structure to the structure as well as to the interaction of the structure to the area underneath the structure. BFD6

These items should be analyzed for all phases of the construction as well as the final design stage. This project will need permits from the Boston Fire Department as well as the Inspectional Services Department.

Respectfully,

Frank M. Kodzis
Fire Marshal

Cc: Paul Donga, FPE, Plans Unit, BFD

BOSTON FIRE DEPARTMENT

BFD1 Site access for emergency vehicles

The proposed building will be accessible to all emergency vehicles. Emergency vehicle access to surrounding buildings will remain unchanged.

BFD2 Availability of and access to hydrant locations

Please see Section 8.3.1.

BFD3 Availability of and access to siamese connections

The building siamese connections will be located close to an existing hydrant.

BFD4 Fire safety related to the location of transformer vault

NEC transformer vaults are not required by the current design which is a dry type with primary under 35,000V. Transformers are part of substations on the basement level, 4th floor, 5th floor and 38th floor in rooms defined by concrete walls with a 2 hour fire rating.

BFD5 Boston Fire Department permit

The Proponent will comply with all Boston Fire Department permit requirements.

BFD6 Fire safety relative to area underneath structure

No air supported structures are proposed.

Fitzgerald, John BRA

From: Giers, Bob

Sent: Thursday, December 18, 2008 1:47 PM

To: Fitzgerald, John BRA

Cc: Jayasinghe, Para; Leo, Vincent; Banks, Joseph; Spinetto, Stephen; Crasco, Ken - Parks Dept.; McCarthy, Timothy (Public Works)

Subject: One Bromfield Street

Hi John,

Here are PWD comments for the subject project located at One Bromfield Street bounded by Washington, Bromfield and Province Streets in Downtown Boston, where the developer is estimating the cost of the project to be approximately $200,000,000:

Site Plan:
Developer must provide an engineer's site plan at an appropriate engineering scale, that shows curb functionality on both sides of all streets that abuts the property. **PWD1**

Sidewalks:
Developer is responsible for the reconstruction of the sidewalks abutting the project, and where appropriate, extend the limits to the nearest intersection. This effort may constitute a License, Maintenance and Indemnification (LM&I) agreement with the Public Improvement Commission (PIC). The reconstruction effort must meet current ADA/AAB guidelines, including the installation of new or reconstruction of existing compliant pedestrian ramps at all corners of all intersections, to encourage and compliment pedestrian improvements and travel along Bromfield, Province and Washington Streets. **PWD2**

Note: the Developer should be aware of the possible existence of areaways, (open space) building extensions under the sidewalk that are the responsibility of the abutting property owner.

Note: due to the limited street layout of Province Place, pedestrian safety and to provide adequate accessibility and meet current AAB guidelines it is requested the Developer look into the possibility of a coordinated effort with abutting property owners to consider mixed shared pedestrian and vehicular space. **PWD3**

Discontinuances:
Any and all discontinuances (sub-surface, surface or above surface) within the Public Right-of-Way (ROW) must be processed through the PIC. **PWD4**

Landscaping:
Developer must seek approval from Ken Crasco, Chief Landscape Architect with the Parks and Recreation Department for all landscape elements. Program must accompany a LM&I with the PIC. **PWD5**

Street Lighting:
Street lighting needs must be consulted with Mr.. Joe Banks of the Street Lighting Division with the PWD, and where needed, be installed by the developer, and must be consistent with the area lighting, to provide a consistent urban design. **PWD6**

Roadway:
Based on the extent of construction activity, including utility connections and taps, the Developer will be responsible for the reconstruction of the roadway sections that immediately abuts the property, and where appropriate, extend the limits on re-construction to the nearest intersection and to insure compliance to ADA/AAB guidelines. **PWD7**

Public Trash Receptacles:
Developer to consult with Tim McCarthy of BPWD, and is responsible for purchasing solar powered trash compactors to be used in Public space consistent with City of Boston's plan. **PWD8**

Public Art:
Developer is encouraged to contact the Boston Arts Commission to participate with the City's public arts program, creating notable art pieces in public spaces. **PWD9**

Groundwater:
Developer should install groundwater-monitoring wells in accordance to ISD standards, to monitor groundwater levels during construction, and convey the wells to the Groundwater Trust through the PIC after the completion of the project. **PWD10**

Note: these are the general standard BPWD requirements applicable to every project, more detailed comments will be addressed during the PIC review process;

Any questions please give me a call at 617-635-4966

Thank you, Bob Giers

BOSTON PUBLIC WORKS DEPARTMENT

PWD1 At-scale engineering site plan for abutting properties

See Figure 2-5 for a proposed site plan.

PWD2 Sidewalks

After construction of the building is complete, the Proponent will reconstruct sidewalks abutting the property on Bromfield Street and Washington Street in accordance with any applicable Public Improvement Commission approvals. These new sidewalks will be constructed to meet ADA/AAB guidelines. Pedestrian ramps required as part of the sidewalk reconstruction will also meet ADA/AAB guidelines.

PWD3 Pedestrian safety

With the Project, as is the case today, very limited public pedestrian activity is expected to occur along the eastern end of Province Court, where 333 Washington Street loading occurs and where the Project's loading bay and garage elevators will be located. Residents will drop-off and pick-up their vehicles in the internal porte-cochere and will not walk along Province Court. Garage attendants, though, will walk back and forth between the garage elevators off of Province Court and the porte-cochere.

Pedestrians along Province Street will continue to cross through the Province Court intersection as they do today. The existing raised sidewalk across Province Court, which provides a flush pavement for pedestrians, will be maintained.

PWD4 Discontinuances within the Public Right-of-Way

Comment noted.

PWD5 Landscaping

Comment noted.

PWD6 Street Lighting

Comment noted.

PWD7 Roadways

Comment noted.

PWD8 Public Trash Receptacles

Comment noted.

PWD9 Public Art

The Proponent will contact the Boston Arts Commission as the review process moves forward.

PWD10 Groundwater

The project site is not located within the Groundwater Conservation Overlay District (GCOD) such that the project is not subject to the requirements of Article 32 of the Boston Zoning Code. Further, there are no known wood pile supported buildings within close proximity to the Project site that would be susceptible to impacts of groundwater lowering.

As this area, Downtown Crossing, is not an area of concern relative to potential groundwater lowering, it is not an area monitored by the Boston Groundwater Trust (BGwT). Thus, the Project does not anticipate needing to install or turn over wells to the BGwT.

BOSTON
TRANSPORTATION
DEPARTMENT

ONE CITY HALL PLAZA/ROOM 721
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November 28, 2008

John FitzGerald
Project Manager
Boston Redevelopment Authority
One City Hall Square, 9th Floor
Boston, MA 02201

RE: One Bromfield Street – PNF

Dear Mr. FitzGerald:

Thank you for the opportunity to comment on the Project Notification Form (PNF) for One Bromfield Street. The mixed-use project will include 407,000 square feet (sf) of gross floor area, with approximately 49,000sf of retail space, adding 281,000sf of residential space (276 units), and 192 of new, above-ground parking spaces. Four existing buildings on the proposed site, at the corner of Bromfield and Washington Streets in the heart of Downtown Crossing, will be demolished and replaced by six base floors with a 22-story tower rising above.

The Boston Transportation Department (BTD) has reviewed the PNF and notes that existing transit and pedestrian accessibility, coupled with close proximity to other like-type, mixed-use residential buildings (such as 45 Province and One Franklin) make this project site an ideal location for a mixed-use residential development. The project's downtown location and access to the Orange, Red, Blue, Silver and Green Lines as well as multiple local and express bus route services make public transit an attractive mode choice for building tenants.

While this development seemingly poses no critical transportation impacts, as a next step the proponent will be required to execute a Transportation Access Plan Agreement (TAPA) which will codify the project's transportation-related elements including mitigation items. To further the discussion that will lead to the TAPA, the following comments identify issues needing clarification, additional submissions and proposed mitigation items. **BTD1**

Parking Spaces and Access

This project will add 192 above-ground parking spaces for residential units only, with up to five spaces designated for retail employees. The parking ratio for the completed project will be 0.70 adhering to the BTD parking ratio guidelines for the Downtown Crossing area of 0.5-1.0 spaces per residential unit. Since the primary use of the building is residential, a detailed parking management plan is not required. However, the proponent should think about how to most efficiently use parking spaces. For example, **BTD2** could some spaces within the structure be candidates for shared-use spaces to house Zipcars? Or will there be some spaces designated for electrical vehicles and Scooters (Vespas)? It is important to take these parking types into account given the steady increase of alternative vehicles. Additional information, given the garage is valet managed and private, will be needed to determine how Zipcars would be accessible to users. BTD3

BTD commends the proponent for thoughtful design of ingress and egress for parking and commercial loading areas. Due to the limited roadway capacity of Province Street and Province Court, more information regarding queuing during peak hours is needed to ensure that a bottleneck will not occur with a valet parking/ car elevator system. It is important to understand the waiting time associated with this type of a parking strategy. In particular, with the addition of 184 new public spaces at 45 Province Street with a similar elevator system and ingress and egress onto Province Street, traffic impacts during peak hours may be more serious than anticipated. It is likely that 45 Province will be a popular destination for people seeking public parking, since there are stringent parking restrictions within a quarter mile of the site and a limited number of on-street public parking spaces within the immediate area. BTD4

Service and Loading

We commend the proponents for providing off-street facilities for loading activity as part of BTD's effort to reduce traffic congestion caused by on-street truck maneuvering and loading activity. The proponent needs to be in compliance with BTD's "Off-Street Loading Guidelines' which can be accessed at: http://www.cityofboston.gov/transportation/off_street.asp. Additionally, the proponent is required to respond to the questions in the website's attached pdf. BTD5

The report designates a loading program of two loading bays - one for smaller vehicles such as vans, and one to accommodate larger vehicles like SU-35 trucks. This project is a 28-story, 320,000sf mixed-use deployment. According to our guidelines for buildings of this size, at a minimum the site should have three loading bays that can accommodate larger delivery trucks (WB-50 to a WB-35), including a separate trash facility bay. Given the point of access at Province Court, this will not be achievable based on the current building design and width of the street. Additionally, truck turning templates must be submitted for the above truck-size requirements and should be consistent with the new streetscape design being built by 45 Province. BTD6

BTD is also concerned that loading bays for trucks encroach on the public right-of-way. Although these vehicles will be parked here temporarily, this could pose a pedestrian hazard. One potential solution could be to make Province Court a shared space, eliminating curbs and varying the street material to make a more pedestrian-friendly environment. BTD looks forward to working with the proponent to mitigate any potential issues associated with service and loading in regards to traffic impact and pedestrian safety. BTD7

Finally, because car elevators will be used for loading vehicles for 192 parking spaces, how does the queuing occur? What is the operation plan for parking these vehicles? Will there be curbside valet for future restaurants programmed into this building? If so, how will this be done given the general traffic restriction at Franklin and Hawley Streets and Bromfield and Washington Streets? BTD8

Public Transportation

The project site is within a quarter mile from the Red, Green, Orange, Blue, and Silver lines as well as express and local buses. Overall, transit will increase by 688 trips with AM peak hour trips increasing by

38, PM peak hour trips increasing by 57, and Saturday mid-day peak hour trips increasing by 43. Given the multiple transit lines/routes within close proximity to the project site, BTD does not anticipate major impact to any one line/route.

Project Mitigation: Traffic Mitigation

While recognizing that direct access to public transportation will mitigate project generated traffic impacts, BTD looks forward to working with the proponent to develop a comprehensive analysis of transportation impacts that will include automobile traffic. The proponent has identified a primary vehicular route to on-site parking and loading facilities. Vehicles will enter the site via Tremont or Beacon Streets, proceeding onto School Street and then onto Province Street, accessing the covered vehicular drive via Province Court. Given new traffic demand generated by this project as well as 45 Province, BTD will work with the proponent to evaluate key intersections to determine impacts and resulting mitigation measures. We commend the proponent for committing to new traffic counts at these key intersections. In addition to intersection studies outlined by the proponent in the PNF, the intersection of Province Street and Province Court needs to be evaluated to determine vehicular/truck queuing during peak hours with loading and parking facilities next to each other. Also, the intersection of Bromfield and Washington Streets should be studied since this will become a key intersection once the One Franklin project is completed, in the case that Bromfield does not become part of the "Pedestrian Zone". **BTD9**

Due to calibration issues and user inputs in the capacity software program (Synchro), the proponent will be required to meet with BTD to come to consensus regarding acceptable input standards. After approval and acceptance of the Synchro capacity analysis, the proponent will provide BTD with a record copy of all associated capacity analysis data on a labeled CD. **BTD10**

The proponent may also be encouraged to provide and install Pan Tilt Zoom (PTZ) cameras at specific locations within the project vicinity to be determined with BTD, and upgrade pedestrian equipment (ie: countdown pedestrian signals) at locations with antiquated equipment. **BTD11**

Project Mitigation: Pedestrian Access

BTD will work with the proponent to develop a pedestrian study as part of the comprehensive transportation analysis previously mentioned, which will focus primarily on pedestrian access and safety. Although the proponent is focused on activating the streetscape on Bromfield and Washington Streets, attention must be paid to the sidewalk experience on Province Street since the addition of retail at 45 Province, existing retail and thru access will continue to draw pedestrians down the street. Due to the scale of the buildings relative to the street width, sidewalk widening is recommended to promote pedestrian comfort. The width of proposed sidewalks along Province Street needs to be clarified moving forward. **BTD12**

BTD commends the proponent for taking into account ongoing discussion about making Bromfield Street pedestrian access only. One possible alternative to mitigate both pedestrian and traffic access would be to make Province Street more pedestrian friendly by removing curbs and varying street and sidewalk materials to encourage only residents, service vehicles, delivery vehicles, and those using public parking at 45 Province Street to travel down Province Street. This type of intervention coupled with making the lower half of Bromfield St. pedestrian access only could discourage thru traffic and create a vibrant, pedestrian-dominant environment. This would not necessarily adhere to the existing "Pedestrian Zone" **BTD13** guidelines of Washington Street, but rather would be an urban design intervention and possibly a new type of street experience that could serve as a model for the future.

Project Mitigation: Transportation Demand Management

BTD applauds the proponent for proposing a Transportation Demand Management (TDM) program in the PNF. Using the PNF's proposed TDM program as a foundation, BTD will continue working with the proponent to determine the specifics to be codified in the TAPA.

We note that the proponent will provide one free monthly MBTA subway pass per residential unit for the first six months of each lease, and make available information on bus and subway routes/schedules. Additionally, we are pleased the proponent will encourage tenants to use public transit by including language in tenant leases that promotes transit, and will consider subsidizing employee use of transit. The proponent also will promote transit to commercial tenants, making them aware of tax incentives by offering subsidized public transit. These types of programs will be essential for improving traffic in Downtown Crossing as it rapidly becomes denser and includes more residents, businesses, and offices.

BTD is pleased the proponent intends to encourage bicycle trips by proving on-site bicycle racks and secure bicycle storage for residents. The proponent may want to consider other means of encouraging bicycle trips such as providing free shared bicycles for residents. More clarity is required regarding where on-site bicycle racks will be located. Reasonable options could be bike racks at the loading dock and public entrances for short-term messenger deliveries and visitors, as well as longer-term bicycle racks at designated locations within the parking structure. **BTD14**

BTD commends the proponent for including plans to promote ridesharing/carsharing in the PNF. The creation of almost exclusively residential parking, with only five employee spaces, encourages employees to use other modes of transportation. We note that the proponent plans to join the Transportation Management Association (TMA) in order to provide online registration for a ride-matching program, access to information on area carpool, and to organize an internal ridesharing program amongst employees.

Site Plan

The proponent is required to submit an engineered site plan within the context of the surrounding roadways at 1:20 scale depicting: **BTD15**

-Vehicular Circulation	-Service and Loading*
-Parking Layout and Circulation	-Roadways and Sidewalks
-Pedestrian Access and Circulation	-Building Layout
-Bus Terminal Access	-Bicycle Rack Locations

**Trash compactors/dumpsters need to be depicted as well*

Construction Management Plan

BTD notes that the proponent has addressed construction impacts in general terms within the PNF and will subsequently be required to develop and submit a detailed Construction Management Plan (CMP). The CMP will address TDM measures for construction workers, proposed street occupancies, equipment staging, sidewalk relocations and hours of construction work. BTD will work with the proponent to execute the CMP to mitigate construction impacts.

The issues raised above, should be addressed as part of the transportation analysis to be provided in the Draft Project Impact Report (DPIR) for the One Bromfield Street project. BTD looks forward to working collaboratively with the proponent and the community in review of this project and to address any outstanding concerns in the permitting process.

Sincerely,

Rachel Mercier

Rachel Mercier
Transportation Planner
Boston Transportation Department
Policy and Planning Division

Cc: Vineet Gupta, Director of Policy and Planning
John DeBenedictis, Director of Engineering

BOSTON TRANSPORTATION DEPARTMENT

TRANSPORTATION ACCESS PLAN GUIDELINES

And

SCOPE OF WORK

For

ONE BROMFIELD STREET

Boston is a dense city, with high levels of vehicular congestion, pedestrian traffic, and parking demand. New development of all types increases travel demand, and will have transportation impacts that require analysis, review, and mitigation. Through the City of Boston's Article 80 development review process, the Boston Transportation Department (BTD) works with development team (the "project proponent") to ensure that they thoroughly evaluate the transportation impacts associated with the proposed project; propose and analyze ways to mitigate these transportation impacts, and implement appropriate mitigation measures.

The project proponent is responsible for assessing and mitigating the short-term and long-term impacts of the proposed project. submitting the following documentation to BTD:

1. Transportation Access Plan. The Transportation Access Plan shall fully describe all transportation-related issues surrounding the proposed project. It should include the following principal components: **BTD16**
   - Description of Existing Transportation Conditions. A summary of existing traffic, public transit, pedestrian, bicycle, and parking conditions in the study area.
   - Evaluation of the Proposed Project's Long-Term Transportation Impacts. A detailed description of the proposed project and a detailed analysis of the project's long-term impacts on traffic, public transit, pedestrian, bicycle, and parking conditions.
   - Mitigation of the Project's Long-Term Transportation Impacts. Identification of appropriate measures to mitigate project impacts, including physical and operational improvements, travel demand management (TDM), and long-term project impact monitoring.
   - Description of the Project's Short-Term Construction Impacts and Proposed Mitigation. General overview of the project's construction impacts, construction schedule and phasing, and measures to mitigate the short-term impacts. This is a summary of the more detailed Construction Management Plan (CMP) to be submitted to BTD under separate cover.

   The Access Plan typically comprises the transportation component(s) of the proposed project's various environment filings, such as the Draft Project Impact Report (DPIR) or the Final Project Impact Report (FPIR); in special cases, the Access Plan may be a separate document. In any case, the Access Plan should adhere to the guidelines and scope of work set forth below. The analysis and reporting guidelines below are designed to be general enough that they will apply to most or all major development projects; they are also designed to be specific enough to ensure adequate information and equitable review of all development projects. These guidelines shall be followed as closely as possible. If the project proponent believes that certain provisions are not applicable to the development in question, the proponent shall obtain BTD's explicit approval to forego those provisions.

2. Construction Management Plan. The Construction Management Plan (CMP) shall include a detailed proposal for the proposed project's construction: schedule, phasing, occupancy of the public right-of-way, access and delivery requirements, transportation impacts, and mitigation. The proponent shall submit the CMP to BTD, under separate cover from the Access Plan. The project's general contractor typically prepares the CMP. Guidelines for preparation of the CMP are available from BTD. The CMP shall be completed prior to the issuance of a Building Permit from the City of Boston's Inspectional Services Department (ISD). **BTD17**

3. Transportation Access Plan Agreement. The Transportation Access Plan Agreement (TAPA) is a formal legal agreement between the project developer and BTD. The TAPA formalizes the findings of the Access Plan, the mitigation commitments, elements of access and physical design, and any other responsibilities of the developer and BTD. Since the TAPA must incorporate the results of the technical analysis, physical design, and assessment of mitigation requirements, it must be executed after these processes have been completed. However, the TAPA must be executed prior to approval of the project's design through the City of Boston's Public Improvements Commissioner (PIC). An electronic copy of the basic TAPA form is available from BTD. It is the proponent's responsibility to complete the TAPA so that it reflects the specific findings and commitments for the project, and to get BTD review and approval of the document.

STUDY AREA

The Access Plan shall consist of a thorough analysis of the proposed project's transportation impacts throughout the relevant study area. The study area shall comprise the public right-of-way and important transportation elements of the area described by the following list of intersections: **BTD18**

a. Tremont St./School St./Beacon St.
b. Province St./School St.
c. Washington St./School St.
d. Province St./Bromfield St.
e. Tremont St./Bromfield St.
f. Tremont St./Park St.
g. Franklin St./Washington St.
h. Washington St./Bromfield St.
i. Province St./Province Ct.

The proponent shall review all relevant project proposals and planning studies that would affect the study area, and incorporate these into the transportation analysis, as appropriate. These include at minimum the following projects: **BTD19**

- 45 Province Street
- One Franklin/Filene's Redevelopment

DEFINITION OF TASKS

Task 1. Description of Existing Transportation Conditions

The Existing Conditions component shall summarize the current status of the transportation system within the study area. It shall focus on the issues listed below, and shall identify any existing problems or deficiencies in the transportation system. The Existing Conditions analysis will form the basis for projecting future conditions, and enable comprehensive assessment of the proposed project's transportation impacts. **BTD20**

1.1 Project Site Conditions. Describe general conditions in the vicinity of the project site, including:

- Existing land use, including existing site square footage, building square footage, number of employees or residents, zoning provisions, and other applicable information
- Physical condition of the site, existing access and egress
- Major streets and intersections in the vicinity of the site
- On-street regulations

Include a survey of existing conditions.

1.2 Traffic. The Access Plan shall include traffic volume counts at the study area intersections for weekday morning and evening peak periods under existing conditions. These shall be classification counts in areas with high volumes of heavy vehicles. The morning and evening peak volumes represent a minimum for traffic impact analysis.

Depending upon the nature of the proposed project or local conditions, BTD may require traffic analysis for additional conditions, such as the Saturday afternoon peak.

Existing capacity analyses shall be performed to determine level of service at all study area intersections. Analyses shall reflect realistic peak period characteristics, including pedestrian volumes, requirements for pedestrian phases, curb operations (bus stops, pick-up / drop-off), usable lanes, grade, and percentage of heavy vehicles. Appropriate traffic models will be discussed below.

1.3 Parking. The Access Plan shall summarize the parking supply within ¼ mile of the project site. The parking inventory shall focus on publicly-available spaces, but shall also include private resident or employee spaces as well, if the information is available. The parking inventory shall include:

a. Location (block face for on-street spaces, facility for off-street spaces). Include a graphic representation of the parking supply locations with respect to the project.
b. Type of Space
   - On-street (metered, resident parking, unregulated, etc.)
   - Off-street (surface lot or garage, user type: resident, employee, commercially-available, customer, etc.)
c. Parking Fees, by Type of Space
d. Percentage Utilization During Parking Peak (assume 12 noon).

This inventory can be supplemented with data from published sources such as the BTD's 1987 Downtown Parking Inventory Study, updated as necessary with survey data.

If there is currently parking associated with the project site, the Access Plan shall summarize the parking use and management. The description of existing on-site parking use shall include: number of spaces; occupation of spaces by user type, hour of peak occupancy, turnover rate, parking fees, and any high-occupancy vehicle spaces.

1.4 Transit. The Access Plan shall describe the study area's mass transit system:

a. Transit Supply
   - Massachusetts Bay Transportation Authority (MBTA) services, proximity to site
     - Service (mode of transit, line, closest station stop)
     - Service characteristics (frequency during peak periods, geographic connections)
     - Physical characteristics (station conditions, rolling stock)
   - Private transit services (summarize characteristics above)
   - Other transit and high-occupancy vehicle (HOV) services

b. System Utilization
   - Capacity by line during peak periods
   - Current ridership and percentage capacity utilization by line during peak periods

1.5 Pedestrians. The Access Plan shall include a description of pedestrian conditions on sidewalks and intersections adjacent to the site, including major pedestrian routes and desire lines in and around the site, volumes of pedestrians on these routes, and the conditions of these corridors, including any deficiencies or barriers.

Pedestrian volumes shall be counted and pedestrian level of service shall be calculated at the following intersection crossings and sidewalk locations:

a. Bromfield St./Province St.
b. Province St./Province Ct.
c. Bromfield St./Washington St./Franklin St.
d. Province St./School St.

Describe pedestrian accommodation at signalized intersections in the study area (i.e. exclusive vs. concurrent, crossing time provided).

1.6 Bicycles. The Access Plan shall describe existing bicycle usage, primary bicycle routes, accommodation of bicycles in the public right-of-way, and the current supply and location of any existing bicycle racks on or adjacent to the project site. On a day with good weather (record date and weather conditions), survey bicycle rack utilization by location. Document storage of bicycles in locations without bicycle racks. Include bicycle volume counts at the following intersections and bike routes:

a. Bromfield St./Province St.
b. Bromfield St./Washington St./Franklin St.
c. Province St./School St.
d. Tremont St./Beacon St./School St.

1.7 Loading and Service. The Access Plan shall describe any existing loading and service uses on the site, as well as any special conditions relative to loading and service in the surrounding area.

Task 2. Evaluation of Proposed Project's Long-Term Transportation Impacts

The central component of the Access Plan is the evaluation of the proposed project's long-term transportation impacts. The Access Plan must evaluate these impacts in detail, for all the transportation modes and aspects that will be affected, including traffic, parking, public transit, pedestrians, bicycles, and service and loading. These impacts must be compared to the appropriate baseline condition, the Future No-Build Condition. The following are the principal issues, modes, and conditions that must be analyzed. **BTD21**

2.1 Project Description. The Access Plan shall include a summary of the key project characteristics that are relevant to the project's transportation impacts. These include:

- Project name and street address
- Study area, including critical intersections
- Anticipated construction start and completion dates
- Relevant zoning regulations with respect to use, parking and other characteristics
- Required permits, variances, and licenses
- Site area
- Project's gross square footage and floor-area ratio (FAR)
- Gross square footage by use
- Other relevant variables (e.g. number of dwelling units, number of hotel rooms, number of employees)
- Number of parking spaces, specified by use type
- Number of loading bays, dimensions of bays, design loading vehicle

2.2 Trip Generation Analysis. The Access Plan shall include a clear and detailed trip generation analysis for the proposed uses of the site. This analysis shall include:

a. Person-Trip Generation. The Access Plan shall summarize the proposed project's person-trip generation, for daily, AM peak, and PM peak trips. For certain uses, person-trips shall also be calculated for other time periods, such as Saturday afternoon peak hour (e.g. cultural or entertainment use in an area with significant weekend congestion).

The person-trip calculations shall be based on appropriate trip generation rates, typically the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 6th Edition.* The ITE manual includes comprehensive vehicle-trip generation rates based on surveys in suburban locations throughout the United States. Because Boston benefits from an excellent public transit system and pedestrian access, ITE vehicle-trip generation rates are not directly applicable to resulting vehicle trips. ITE rates shall be used to generate total person-trips by correcting for vehicle occupancy rate (VOR). Appendix xx includes a compilation of the most common ITE trip generation rates and corresponding VOR. The proponent shall use these trip generation rates whenever possible. Where necessary, these trip generation rates may be supplemented by survey data or information from other sources (subject to BTD requirement and/or approval). The person-trip generation analysis shall be summarized in a clear table, in the body of the Access Plan, including all of the following information:

- Land use type
- Square footage, by land use type

- Vehicle-occupancy rate (VOR) assumption, by land use type (for translation of vehicle-trip rates to person-trip rates)
- Daily person-trip generation (by land use and overall)
    - Daily person-trip generation rate (per 1,000 square feet, or per unit)
    - Resulting daily person-trip ends
- AM peak hour person-trip generation (by land use and overall)
    - AM peak hour person-trip generation rate
    - AM peak hour person-trips, entering
    - AM peak hour person-trips, exiting
- PM Peak Hour person-trip generation (by land use and overall)
    - PM peak hour person-trip generation rate
    - PM peak hour person-trips, entering
    - PM peak hour person-trips, exiting
- Source for trip generation rates

b. Mode Split and Vehicle Occupancy Rate. Person-trips shall be apportioned among the various principal modes (automobile, public transit, walking, bicycling) using an appropriate mode split. The mode split shall be presented as percentages of automobile, public transit, and walk / bicycle travel. Working with BTD, the Central Transportation Planning Staff (CTPS) has compiled appropriate mode split assumptions for various sections of Boston, according to trip type. These mode splits, along with VOR for automobile trips, are included in Appendix xx. The mode split calculation shall be based upon these assumptions. If the proponent wishes to adjust these mode splits based upon specific project characteristics, the adjustment must be supported by accepted evidence and by appropriate mitigation commitments (e.g. enhanced travel demand management to justify a higher public transit mode share). BTD must approve any adjustments to the mode split and VOR assumptions in Appendix xx. The Access Plan shall include a clear, easily understood table that summarizes the assumptions and the resulting trips by land use type, by trip purpose, and by mode.

c. Trip Distribution. The trip distribution shall identify the directional split (i.e. north, south, west) of person-trips and vehicle-trips for the specific location and trip types of the proposed project. Detailed trip distribution information for trips to and from all areas of Boston is included in Appendix xx. The trip distribution is allocated by individual mode, and should be applied to the resulting trip totals by mode. The Access Plan shall use this information for trip distribution assumptions, unless BTD recommends or approves other trip distribution assumptions.

d. Trip Assignment. The distributed trips shall be assigned to the appropriate means of accessing the project: highway routes, surface streets, surface intersections, sidewalks, crosswalks, site access / egress points, and public transit lines. If the project expects to rely upon an off-site parking supply, trips shall be assigned appropriately to these locations. Drop-off, pick-up, and valet trips shall also be assigned appropriately, i.e. both entering and exiting the site access, and entering or exiting an off-site parking area.

Attached appendices include the base assumptions that the project proponent shall use for trip generation rates, mode splits, trip distribution, and vehicle occupancy rate for specified areas of Boston. The proponent may believe that other assumptions should be used due to specific circumstances, such as proximity to public transit (not relevant for downtown zones) or exceptional travel demand management commitments. Where such special circumstances warrant, the proponent may propose alternative assumptions, which are subject to explicit BTD approval.

2.3 Future No-Build Condition. The analysis of the proposed project's transportation impacts must be based on a comparison with an appropriate baseline condition. The proposed project's impacts would be felt fully during some future "horizon year" when the project is expected to be complete, occupied, and operating. The effects of the proposed project (under the "Future Build Condition") are most appropriately demonstrated in comparison to projected transportation conditions during the horizon year without the effects of the proposed project.

- The horizon year shall be five years in the future, unless specific circumstances require that a different time frame be used.
- The Future No-Build Condition shall be based on the Existing Conditions assessment, with the addition of development and infrastructure projects that have been proposed and are expected to be complete and operational by the horizon year (per BTD and BRA instructions).
- The Future No-Build Condition traffic, transit, and pedestrian volumes shall also include a background growth rate of 1 – 1 ½ % per year (depending upon local conditions) added to existing traffic volume counts, transit ridership, and pedestrian counts, unless otherwise specified by BTD.

2.4 Future Build Condition. The central component of the Access Plan is the assessment of the proposed project's long-term impacts. This shall include evaluations of the project's effects on all transportation modes and aspects, throughout the study area.

a. Traffic Impacts.

i) Traffic Volumes. The traffic analysis shall include diagrams of turning movement volumes generated by the proposed project at all study area intersections, and total turning movement volumes for the Future Build Condition. Therefore, the Access Plan shall include turning movement volume diagrams for AM peak volumes, PM peak volumes, and any other required period, of each of the following:

a) Existing Conditions (based on current traffic counts)
b) Future No-Build Conditions (Existing Conditions, plus appropriate future changes and growth factor)
c) Project-Generated Traffic Volumes (based on trip generation)
d) Future Build Conditions (Future No-Build Conditions, plus Project-Generated Traffic Volumes)
e) Future Build Conditions with Mitigation (if the proponent plans to undertake any roadway or signalization changes in order to mitigate traffic impacts of the proposed project)

ii) Traffic Capacity Analysis Software. The Access Plan shall include traffic capacity analyses for Existing Conditions, Future No-Build Conditions, and Future Build Conditions. The capacity analysis shall be performed using an approved and appropriate capacity analysis software program.

- For intersections that are widely spaced and will operate in isolation, the proponent shall use software based upon the *Highway Capacity Manual* (HCS), 1997 edition.
- For closely-spaced intersections with long queues that create interaction between intersections, the proponent shall use a computer model, such as Transyt-7F (version 8) or Synchro, that can accurately model these effects. In such cases, the proponent shall model all of the intersections that would interact.

The computer model output shall be attached to the Access Plan as an appendix.

iii) Traffic Capacity Analysis Results Summary. The Access Plan shall include a tabular summary of the traffic capacity analysis, for all conditions (Existing, No-Build, Build) for each intersection as a whole and for each approach of every intersection. The summary shall include the volume-to-capacity ratio (v/c), level of service (LOS), delay, and estimated queue lengths for each study intersection, and for each approach of every intersection. The summary table shall also highlight changes to intersection and individual approach LOS that result from site-generated traffic.

iv) Traffic Counts. The proponent shall submit, under separate cover, turning movement count summary sheets for each intersection in the study area.

b. Parking Impacts. The Access Plan shall include an analysis of projected parking demand and proposed parking supply.

i) Parking Demand Analysis. The Access Plan shall include an analysis of total parking demand in the horizon year, broken down by land use and user type (e.g. office employee vs. visitor, hotel employee vs. guest, retail employee vs. patron). The parking demand analysis shall include

- Daily vehicle-trip generation by land use and user type (consistent with mode split and VOR)
- Parking turnover by land use and user type (cite source)
- Parking demand peaks by land use and user type
- Overall parking demand and peak parking demand, based on shared parking among all land uses and user types included in the proposed projectd

ii) Proposed Parking Supply. The Access Plan shall include a summary of the project's proposed off-street parking supply. Parking supply, and parking costs, play a central role in determining mode split and vehicular traffic impact. In general, parking shall be limited to minimum supply that is appropriate to the neighborhood, the project's transit access, and the project's mode split. Appendix xx includes a map of parking ratio guidelines by land use and area of the city. The project's parking ratio shall remain within these guidelines. If the parking supply exceeds these guidelines, the proponent must justify the excess parking based on circumstances specific to the project. Higher parking ratios may increase transportation impacts, and necessitate enhanced mitigation measures. The information below shall be summarized in a clear table.

- Total Spaces
  - Existing

- Future No-Build (if applicable)
- Future Build Parking Conditions

- Parking Allocation
  - Space allocation among various land uses
  - Parking ratios: spaces per thousand square feet or per unit, by land use
  - Specially-designated parking spaces, e.g. vanpools, livery vehicles, rental cars, car-sharing
  - Treatment of existing parking spaces, including displacement of existing parking spaces and how the parking demand for these spaces would be met in the Future Build Condition
- Comparison of Parking Supply and Demand
  - Projected shortfall or surplus of parking spaces, by land use
  - Proposed management of shortfall or surplus
- Provide a plan of all parking facilities, including layout, access, and size of spaces.

iii) Off-Site Parking Supply. Describe any anticipated utilization of off-site parking supply (as described in the Existing Conditions section, amended to reflect Future No-Build Conditions) required to satisfy project-generated parking demand.

- On-Street Parking Supply
- Off-Street Parking Supply
  - Number and type of spaces required (i.e. publicly-available, employee, residential)
  - Resulting parking utilization at 12 noon on a weekday (additional parking survey times may be required, depending upon the nature of the project)

iv) Proposed Parking Management Plan

- Description of Proposed Parking Operations
  - Access control
  - Valet operations
  - Pass or payment medium
  - Management of operations to prevent illegal parking, violation of 5-minute idling law
- Parking Fees
- Management of Specially-Designated Parking Spaces (e.g. vanpool, carpools, rental cars, car-sharing)
  - Location
  - Parking fees
  - Accommodation of increased supply if demand warrants

c. Transit Impacts. Describe the anticipated impacts of the project on the mass transit system, based on the information about Existing Conditions and the projected transit person-trips (based on trip generation – trip distribution – mode split calculations). Future transit conditions shall be based on transit supply and capacity that is expected to be available in the horizon year; if there is some doubt, the proponent shall consult with BTD and/or the MBTA. The proponent may use generally available MBTA ridership data as a basis for this analysis. The Access Plan shall include the following information:

i) Transit Trip Distribution
   - Distribution of project-generated transit trips by zone
   - Distribution of project-generated transit trips by transit line / route

ii) System Utilization
   - Existing Conditions: Capacity and utilization by line
   - No-Build Conditions: Capacity and utilization by line
   - Build Conditions: Capacity and utilization by line

d. Pedestrian Impacts. Describe future pedestrian conditions in the study area:
   - Pedestrian access to and from the project, pedestrian circulation routes
   - Pedestrian accommodation in the project's public spaces (e.g. sidewalk, adjacent intersections, plaza spaces, benches, etc.)
   - Pedestrian level of service (LOS) at all surveyed crosswalks, sidewalks and other locations
     - Existing Conditions
     - Future No-Build Conditions
     - Future Build Conditions

   NOTE: The traffic capacity analyses must also assume appropriate accommodation of pedestrians in all signalization assumptions. The pedestrian impacts analysis shall describe the assumptions regarding accommodation of pedestrians in the traffic analysis, i.e. pedestrian walk rate and percentage of cycles in which pedestrian phase is called (verify with BTD).

e. Bicycles. Describe bicycle access to, from, and within the project site. Describe bicycle storage and other amenities (e.g. shower and changing facilities) to be provided. BTD will provide guidelines on bicycle storage requirements based on project type and size.

f. Loading and Service. The project must accommodate loading and service facilities in an off-street location. The loading and service plan shall not rely upon loading facilities and truck back-up maneuvers in the public right-of-way. Describe service and loading requirements:
   - Number of loading bays
   - Services to be provided (e.g. garbage compactor, garbage collection, restaurant service, move-in / move-out, etc.)
   - Level of loading and service activity (number of trucks per day or per week)
   - Loading and service schedule, schedule restrictions (proponent shall prohibit or strictly limit loading and service activities during peak periods)
   - Design vehicle(s)
   - Required truck turning movements (show design vehicle turning movements on site plan)
   - Major loading and service vehicle routes for site access and egress
   - Access for emergency vehicles

2.5 Site Plan. Provide an engineered site plan showing Build Conditions (contrast with existing conditions):
   - Public right-of-way layout

    - Roadways
    - Sidewalks
- Vehicular access and circulation
- Service and loading
- Parking
- Bicycle storage
- Proposed on-street regulations

Task 3. Mitigation of the Project's Long-Term Transportation Impacts

Major development projects offer benefits, but they also consume public services and create impacts on public resources. Chief among these impacts is a development's effect on the transportation system. The project proponent is required to quantify and analyze these impacts through the Access Plan. It is then the responsibility of the project proponent, working with BTD, to develop strategies for reducing and mitigating these impacts. These strategies will typically include travel demand management (TDM) measures and improvements to Boston's transportation system. **BTD22**

These transportation system improvements and mitigation measures have associated costs. The proponent should view these costs as an integral component of the overall project cost, necessary to enable the transportation system to accommodate the project's impacts. The mitigation measures benefit the users of the transportation system, in particular the new users associated with the proposed project. Project proponents shall allocate appropriate funding for the mitigation. The mitigation measures associated with a development project will be specified in the project's Transportation Access Plan Agreement (TAPA) between the proponent and BTD.

3.1 Travel Demand Management (TDM). Travel demand management comprises a variety of strategies designed to reduce single-occupancy vehicle (SOV) travel and encourage "alternate modes" of transportation (public transit, walking, bicycling). TDM programs are critical due to the disproportionate impacts of SOV travel on congestion, parking demand, air quality, and quality of life. TDM programs are especially important for projects that generate higher trip volumes, create concentrated peaks of demand, and create more impacts related to roadway congestion, parking demand, and vehicle emissions. TDM programs are required even when proponent uses the default analysis assumptions for mode split and VOR, since these default assumptions reflect long-standing TDM efforts and Transportation Management Association programs.

Appropriate TDM measures and requirements will vary depending upon the type of development, the neighborhood, the impact analysis assumptions, and other circumstances. For example, many of the measures below would not apply to a residential development. In the case of commercial office development, some (but not all) of the measures below would be the responsibility of the tenants, rather than the proponent. The proponent will be required to implement those TDM measures that are within its control, and should at least encourage and facilitate such measures. However, if the proponent seeks to base its impact analysis on aggressive assumptions (e.g. a high transit mode share), the proponent must require appropriate TDM measures in its lease agreements with tenants.

In the TAPA, the proponent will be required to implement the following TDM measures (as appropriate to the specific project):

a. Transportation Coordinator. Designate a full-time, on-site employee as the development's transportation coordinator. The transportation coordinator shall oversee all transportation issues. This includes managing vehicular operations, service and loading, parking, and TDM programs. In addition, the transportation coordinator will be responsible for the monitoring program and will serve as the contact and liaison for BTD and the Transportation Management Association (TMA).

b. Ridesharing / Carpooling. Facilitate ridesharing through geographic matching, parking fee discounts, and preferential parking for carpools / vanpools. May be accomplished through membership in a TMA, participation in CARAVAN for Commuters, and/or use of computerized ridesharing software.
c. Guaranteed Ride Home Program. Offer a "guaranteed ride home" in order to remove an obstacle to transit use and ridesharing
d. Transit Pass Programs. Encourage employees to use transit through the following measures:
   - Offer on-site transit pass sales or participate in the MBTA Corporate T-Pass Program
   - Offer federal "Commuter Choice" programs, including pre-tax deductions for transit passes and subsidized transit passes
e. Information and Promotion of Travel Alternatives
   - Provide employees and visitors with public transit system maps and other system information
   - Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options
   - Sponsor an annual (or more frequent) "Transportation Day" at which employees may obtain information on travel alternatives and register to participate in ridesharing programs
   - Provide information on travel alternatives for employees and visitors via the Internet
   - Provide information on travel alternatives to new employees
f. Transportation Management Association (TMA) Membership. Investigate joining a Transportation Management Association. Encourage tenants to join the TMA as well. If no TMA is established in the project area, investigate starting a new TMA or becoming affiliated with an existing TMA. A TMA can provide many of these TDM measures, including ridematching, guaranteed ride home, and transit information and promotional materials.
g. Bicycle Facilities and Promotion
   - Provide secure bicycle storage (number of spaces will be specified depending upon size of development and type of land use)
   - Provide additional publicly-accessible bicycle storage (number of spaces will be specified)
   - Provide shower and changing facilities for bicycle commuters
   - Promote bicycles as an alternative to SOV travel, provide promotional material on bicycle commuting and bicycle safety, and provide incentives for bicycle use
h. Parking Management
   - Charge market-rate parking fees
   - Offer preferential parking to carpools and vanpools
   - Offer reduced parking rates to carpools and vanpools
   - Offer parking "cash-out" option
   - Offer garage space for car rentals
   - Offer parking space for car-sharing
   - Offer parking space, charging facilities for electric vehicles
   - Offer parking / layover space for livery vehicles (hotel development)
   - Enforce a 5-minute limit on vehicle idling for all users of the Development, in accordance with Massachusetts state law

i. Trip Reduction Strategies. To the degree possible, the Developer shall implement the following strategies for its own on-site employees. The Developer shall also encourage tenants to implement these strategies as well.
   - Telecommuting. Reduce overall trip demand by enabling employees to telecommute.
   - Flexible Work Schedules. Reduce peak hour and overall trip demand by enabling employees to telecommute, work a compressed work week, or work hours that enable off-peak commuting.
   - Local Hiring. Recruit and hire employees from the local area. Such local employees can more easily use alternatives to SOV travel, including walking, bicycling, and transit.

j. Transportation Monitoring and Annual Reporting. Monitor transportation conditions, conduct employee transportation surveys, and provide BTD with an annual report on findings. This information will be useful to BTD in identifying and addressing issues with travel and access, including transit service, pedestrian and bicycle access, parking, and traffic. This information will enable BTD to pursue improved access for the project, and provide benefits to the proponent. BTD will provide employee survey forms and transportation monitoring forms to ensure uniformity of data.

3.2 Transportation System Improvements. In order to meet Boston's mobility needs as its population, density, and land development increase, Boston's transportation system requires improvements. These improvements offset the transportation impacts of new development. In addition, these improvements can make the traveling experience easier in the vicinity of the project, which accrues to the benefit of the proponent and the development's users.

a. Geometric Changes and Improvements to the Public Right-of-Way. The proponent may be required to make geometric changes and improvements to roadways, sidewalks, and other elements in the vicinity of the proposed project. These changes and improvements may be necessary in order to enable new circulation patterns resulting from the project and mitigate impacts of new vehicle or pedestrian trips. Changes and improvements shall be designed by the proponent's consultant in consultation with BTD. The project proponent will be required to directly fund and implement all changes and improvements to the public right-of-way, and to obtain any required permits. The proponent shall obtain the approval of the City of Boston's Public Improvements Commission (PIC) for any changes to the public right-of-way. These improvements shall be made with input from BTD, per specifications provided by BTD, by a contractor approved by BTD, and subject to final BTD inspection and approval.

b. Traffic Signal Improvements. BTD operates most of the traffic signals in Boston. Improvements to traffic signals in the vicinity of the proposed project may be necessary to manage the increased travel demands placed on the intersection. Improving the operations of these signals can reduce congestion and improve conditions for pedestrians, bicycles, transit vehicles, and general traffic. Typical traffic signal improvements that BTD may require include:

   i) Traffic signal equipment
      - Signal controller
      - Signal heads and pedestrian heads
      - Signal poles and mastarms

   ii) Traffic monitoring equipment

- System detectors
- Video monitoring cameras

iii) Traffic signal communications equipment

- Communications conduit (4" PVC)
- Signal interconnect cable

The project proponent will be required to directly fund and implement all traffic signal improvements, and to obtain any required permits. These improvements shall be made with input from BTD, per specifications provided by BTD, by a contractor approved by BTD, and subject to final BTD inspection and approval.

c. Public Transit System Improvements. New development can add significantly to public transit demand and have other impacts on the transit system. In order to manage this demand and mitigate the impacts, the proponent may be required to make or contribute to transit system improvements. These improvements shall be determined in consultation with BTD and the MBTA. Improvements may include:

- Physical improvements to MBTA system stations and stops
- Water transportation
  - Dock and/or landside infrastructure improvements
  - Operating subsidy for water transportation services
- Supplemental transit services. Public transit is the most desirable means of achieving transit access, and the proponent shall make every effort to facilitate transit access to the proposed project via public services. However, there may be some situations in which private supplemental transit services, such as shuttle buses, are necessary.
  - Overall transit demand in the area is too low to justify public transit service, but the proposed project requires transit access
  - The proposed project generates a concentration of trips to and from certain locations, such that a shuttle is feasible and useful in reducing auto trips (e.g. a hotel with airport and/or convention shuttles)

Task 4. Description of the Project's Short-Term Construction Impacts and Proposed Mitigation

The Access Plan shall include an overview of construction period transportation impacts and proposed short-term mitigation. This shall be a summary of the more detailed Construction Management Plan (CMP) that must be submitted to BTD under separate cover. The construction management summary in the Access Plan shall provide an appropriate level of information regarding the analysis and proposed management of the impacts of the project during the construction period, including: **BTD23**

- The need for full or partial street closures, street occupancy, sidewalk closures, and/or sidewalk occupancy during construction
- Frequency and schedule for truck movements and construction materials deliveries, including designated and prohibited delivery times
- Designated truck routes
- Plans for maintaining pedestrian and vehicle access during each phase of construction
- Parking provisions for construction workers
- Mode of transportation for construction workers, initiatives for reducing driving and parking demands
- Coordination with other construction projects in the area
- Distribution of information regarding construction conditions and impact mitigation to abutters

BOSTON TRANSPORTATION DEPARTMENT

BTD1 Transportation-related elements codified by TAPA

Comment noted.

BTD2 Efficiency and multi-use of parking spaces

In an earlier (2009) Project design, parking was to be provided at 0.70 spaces/unit. The current Project has a parking ratio of 0.56 spaces/unit, reflecting the documented trend toward lower automobile ownership rates in downtown Boston. Many residents will rely on local transit services and, for trips requiring a vehicle, taxicabs/Uber services. If not all spaces are leased to residents, the Proponent plans to make some of these spaces available for visitors to on-site retail businesses. No public parking will be provided.

BTD3 Accommodation for alternative vehicles

The nine existing Zipcar locations (see Figure 3-6) currently available within ¼ mile of the Project site provide significant choices for car-sharing.

BTD4 Vehicle queuing system and traffic impacts during peak hours

No queueing/stacking of garage vehicles will occur on Province Court at any time. A resident will enter the porte-cochere via Bromfield Street and a garage attendant will drive the vehicle to the garage. Vehicles will be transported via attendant-operated vehicular elevators (capacity for two vehicles) accessed from Province Court. Garage attendants will also retrieve vehicles from the garage when residents depart. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. The eastern curb of the internal porte-cochere has capacity for approximately six vehicles plus one space for a delivery vehicle.

The curbside capacity in the porte-cochere will accommodate the peak level of auto and taxicabs trips that will be generated by the Project (see Table 3-14). No queuing will occur on adjacent public streets, including Province Court, Province Street, or Bromfield Street. See Section 3.4.8 for a further discussion of porte-cochere operations.

BTD5 Compliance with "Off-Street Loading Guidelines"

The Proponent has developed a site design that provides for safe and efficient loading internal to the site. No on-street loading will occur. Delivery vehicles to the Project will utilize the loading bay on Province Court or the designated delivery space in the porte-cochere. Delivery vehicles to the Project's loading dock will need to back into Province Court to access the loading dock. This same maneuver is required under existing conditions to access the loading dock at 333 Washington Street. Delivery vehicles may also travel through the porte-cochere and park in the designated curbside loading space. All delivery vehicles will exit the site via Province Court toward Province Street. Truck travel paths have been assessed using AUTOTURN, software that allows engineers to model vehicle maneuvers, to ensure that all movements can be safely completed.

BTD6 Truck loading bays and trash facility bay

The site plan in Figure 2-5 shows the location of the Province Court loading bay, the two garage elevators, and the trash dumpster. The truck travel paths were assessed using AUTOTURN, software that allows engineers to model vehicle maneuvers, to ensure that all movements can be safely completed.

BTD7 Service and loading areas related to traffic impact and pedestrian safety

The Proponent has developed a design that provides for safe and efficient loading internal to the site. No on-street loading will occur on adjacent public streets, including Province Court, Province Street, or Bromfield Street. As today, very limited public pedestrian activity is expected to occur along the eastern end of Province Court, where 333 Washington Street loading occurs and where the Project's loading bay and garage elevators will be located.

BTD8 Queuing process used for car elevators

No queueing/stacking of garage vehicles will occur on Province Court at any time. A resident will enter the porte-cochere via Bromfield Street, park in the curb lane, and a garage attendant will drive the vehicle to the garage. Vehicles will be transported via attendant-operated vehicular elevators (capacity for two vehicles) accessed from Province Court. Garage attendants will also retrieve vehicles from the garage when residents depart. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. The eastern curb of the internal porte-cochere has capacity for approximately six vehicles plus one space for a delivery vehicle.

BTD9 Additional intersections

The intersection of Province Street/Province Court was included as a study area intersection and analysis results, as presented in Table 3.15 and Table 3.16 for Build (2021) Conditions, show that all moves operate at LOS A or LOS B. No queuing of delivery vehicles will occur on Province Court, as deliveries will be accommodated at the internal loading bay or the designated loading space within the porte-cochere.

The intersection of Washington Street/Franklin Street/Bromfield Street was included as a study area intersection and analysis results, as presented in Table 3-15 and Table 3-16 for Build (2021) Conditions, show that all moves operate at LOS A. Pedestrian level of service analysis results, as shown in Table 3-9, show that pedestrians experience LOS A at this location.

BTD10 Synchro Standards

The Project team will provide the Synchro traffic models to the BTD.

BTD11 Installation of PTZ cameras

The Proponent will discuss with BTD the possibility of pan-tilt-zoom (PTZ) camera installation. The signalized intersections in the study area already have countdown pedestrian signals.

BTD12 Sidewalk width along Province Street

Pedestrian level of service analysis results, as shown in Table 3-9, show that pedestrians experience LOS A along Province Street during the a.m. and p.m. peak hours. The Proponent will be replacing the sidewalks abutting the Project site along Bromfield Street and Washington Street, widening the Bromfield Street sidewalk via a pedestrian easement, and will discuss with the City the sidewalk environment along Province Street, which abuts the adjacent building.

BTD13 Pedestrian and traffic access

The Proponent seeks to change the travel direction of Bromfield Street between Washington Street and the Project site driveway to be one-way eastbound (toward Washington Street). Travel on this segment would continue to be restricted to commercial vehicles and taxicabs. This change would allow taxicabs and commercial vehicles to turn left from Province Street onto Bromfield Street and continue through to Washington Street. All vehicles travelling east on Bromfield Street would turn left onto Washington Street. The segment of Bromfield Street between Province Street and Tremont Street would remain one-way westbound (toward Tremont Street).

With the reversal of travel direction on this segment of Bromfield Street, some commercial vehicles and taxicabs in the area would travel different routes to reach destinations along Bromfield Street and Province Street. To account for this impact to non-Project vehicles, affected volumes were reassigned to anticipated new travel paths.

While general traffic is prohibited from travelling westbound on Franklin Street beyond Hawley Street, historical vehicle classification counts show that many vehicles through the Washington Street/Franklin Street/Bromfield Street intersection are not commercial vehicles or taxicabs and are travelling through this area illegally. Franklin Street is currently closed for construction of the Millennium Tower, but based on 2007 counts at the Washington Street/Franklin Street/Bromfield Street intersection, about 15% of a.m. peak hour vehicles were travelling illegally through this location. During the p.m. peak hour, this rate rose to about 60%. Most vehicles travelling illegally are originating on Franklin Street westbound and are destined through to Bromfield Street toward Tremont Street.

The travel direction change on Bromfield Street between the site driveway and Washington Street would help prevent these illegal movements and improve pedestrian safety by reducing traffic volumes.

BTD14 Bicycle access and parking

The Proponent will provide approximately 419 secure/covered bicycle parking spaces for residents and approximately six spaces for retail employees. Additionally, outdoor visitor bicycle parking, as appropriate, will be provided on-site near the public entrances to the building.

BTD15 Site Plan

The site plan is shown in Figure 2-5.

BTD16 Transportation Access Plan

A TAPA will be submitted in accordance with this scope of work.

Boston Water and
Sewer Commission

980 Harrison Avenue
Boston, MA 02119-2540
617-989-7000

December 2, 2008

Mr. John FitzGerald
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

Re: One Bromfield Street, PNF

Dear Mr. FitzGerald:

The Boston Water and Sewer Commission (Commission, BWSC) has reviewed the Project Notification Form (PNF) for the proposed Bromfield Street Project (the project). The proposed project site is located at the corner of Washington and Bromfield Streets in the Downtown Crossing area of Boston. The proposed project consists of the replacement of the four existing buildings on the site with a new, 28-story building, and a 22-story tower rising above. The mixed-use program includes a total of approximately 407,000 square feet (sf) of gross floor area, including approximately 276 residential units and residential amenities, 49,000 sf of retail space, and 192 parking spaces.

The project site is served by 12-inch water mains on Bromfield Street, Province Street and Province Court. There is also a 16-inch water main on Washington Street constructed in 1980. All of these water mains are owned by the BWSC. There are four 4-inch fire services and one 3-inch fire service that enter the site and feed the existing buildings. A fire flow test performed by the BWSC will confirm the ability of the water distribution system to service the proposed development. Proposed domestic water service will connect to one of the water mains on the adjacent streets.

Peak water demand for the proposed project is currently estimated at 42,515 gallons per day (gpd), based on estimated sewage generation with an added factor of 10 percent for consumption, system losses and other usage.

The project site is served by a BWSC owned 24"x27" combined sewer on Bromfield Street and a 12-inch combined sewer on Province Street. The PNF states that the MBTA owns, operates and **BWSC1** maintains a 15-inch combined sewer on Washington. However, the combined sewer on Washington Street is owned by the BWSC. For sewer service the proponent proposes to connect to the BWSC's combined sewers on Bromfield, Province and Washington Streets.

Estimates for sewage generation from the proposed project are based on DEP's State Environmental Code, Title V, 310 CMR 15.00. Sewage generation from the proposed project is estimated at 40,876 (gpd).

Currently, stormwater from the site is discharged to the BWSC's combined sewers on Bromfield, Washington and Province Street, and a storm drain on Ordway Place. The project site is currently 100 percent impervious; therefore the proposed project will not increase the amount of impervious area on the site, and consequently there will be no increase in the amount of stormwater runoff flowing to the combined sewer system. The project plans include construction of new roof drain connections to the adjacent BWSC system.

The Commission has the following comments regarding the proposed project:

General

1. Prior to demolition of the existing buildings and construction of the new buildings, the proponent must submit a site plan and a General Service Application to the BWSC for the project. The site plan must show the location of existing and proposed water mains, sewers and storm drains serving the project site, as well as the location of proposed service connections. **BWSC2**

2. Before the proponent demolishes the existing structure, existing water and sewer connections to the structure must be cut and capped in accordance with Commission standards. The proponent must complete a Termination Verification Approval Form for a Demolition Permit, available from the Commission. The completed form must be submitted to the City of Boston's Inspectional Services Department before a Demolition Permit will be issued. **BWSC3**

3. With the site plan, the proponent must provide detailed updated estimates for water demand, sanitary sewer flows and stormwater runoff generation for the proposed project. The amount of potable water required for landscape irrigation, if any, must be quantified and provided separately. **BWSC4**

4. It is the proponent's responsibility to evaluate the water, sewer and storm drainage systems serving the project site to determine if capacity is sufficient to meet project demands. The capacity analyses must be provided with the site plan for the proposed project. **BWSC5**

5. The proponent is advised that any new or reconstructed water, sanitary sewer and drain pipes required to accommodate the proposed project must be designed and constructed at the proponent's expense and in conformance with the Commission's Sewer Use and Water Distribution System regulations. **BWSC6**

6. To assure compliance with BWSC requirements, the proponent should submit the site plan and General Service Application to the Commission for review when project design is 50 percent complete. **BWSC7**

Sewage/Drainage

7. The proponent must fully investigate methods for retaining stormwater on site before the Commission will consider a request to discharge stormwater to the Commission's system. A feasibility assessment for retaining stormwater on site must be submitted with the site plan. **BWSC8**

8. The site plan must show in detail how drainage from building roofs and from other impervious areas will be managed. Within the new buildings, roof runoff and other stormwater runoff must be conveyed separately from sanitary waste at all times. The Commission will require the proponent to establish and maintain separate building sewers and building storm drains in accordance with Article III, Section I of the Boston Water and Sewer Commission's Regulations Governing the Use of Sanitary and Combined Sewers and Storm Drains. **BWSC9**

9. The proponent is advised that the discharge of any dewatering drainage to the combined sewer system, whether temporary or on a permanent basis, requires a Drainage Discharge Permit from the Commission. **BWSC10**

10. The EPA has issued a Remediation General Permit (RGP) for Groundwater Remediation, Contaminated Construction Dewatering, and Miscellaneous Surface Water Discharges. If groundwater contaminated with petroleum products, for example, is encountered, the proponent will be required to apply for a RGP to cover these discharges. **BWSC11**

11. In conjunction with the General Service Application submitted, the proponent will be required to submit a Stormwater Pollution Prevention Plan. Each plan must: **BWSC12**

    - Identify specific best management measures for controlling erosion and preventing the discharge of sediment, contaminated stormwater or construction debris to the Commission's drainage system when construction is underway.

    - Include a site map which shows, at a minimum, existing drainage patterns and areas used for storage or treatment of contaminated soils, groundwater or stormwater, and the location of major control or treatment structures to be utilized during construction.

    - Specifically identify how the project will comply with the Department of Environmental Protection's Performance Standards for Stormwater Management both during construction and after construction is complete.

12. The Commission requests that the proponent install a permanent casting stating: "Don't Dump: Drains to Boston Harbor" next to any new catch basin installed as part of this project. The proponent may contact the Commission's Operations Division for information regarding the purchase of the castings. **BWSC13**

13. Grease traps are required in all cafeteria or kitchen facilities, if any are included in the project, in accordance with the BWSC Sewer Use Regulations. The proponent is advised to consult with the BWSC prior to preparing plans for grease traps. **BWSC14**

14. The Department of Environmental Protection, in cooperation with the Massachusetts Water Resources Authority and its member communities, are implementing a coordinated approach to flow control in the MWRA regional wastewater system, particularly the removal of extraneous clean water (e.g., infiltration/ inflow (I/I)) in the system. In this regard, DEP has been routinely requiring pro-ponents proposing to add significant new wastewater flow to assist in the I/I reduction effort to ensure that the additional wastewater flows are offset by the removal of I/I. Currently, DEP is typically using a minimum 4:1 ratio for I/I removal to new wastewater flow added. The Commission supports the DEP/MWRA policy, and will require the proponent to develop a consistent inflow reduction plan. The 4:1 requirement should be addressed at least 90 days prior to activation of water service. **BWSC15**

Water

15. The Commission utilizes a Fixed Radio Meter Reading System to obtain water meter readings. For new water meters, the Commission will provide a Meter Transmitter Unit (MTU) and connect the device to the meter. For information regarding the installation of MTUs, the Proponents should contact the Commission's Meter installation Department. **BWSC16**

16. The proponent should explore opportunities for implementing water conservation measures in addition to those required by the State Plumbing Code. In particular the proponent should consider outdoor landscaping which requires minimal use of water to maintain. **BWSC17**

Thank you for the opportunity to comment on this project.

Yours truly,

John P. Sullivan, P.E.
Chief Engineer

JPS/as

cc: P. Davis, Midwood Management Corporation
M. Zlody, Boston Env. Dept.
P. Laroque, BWSC

BOSTON WATER AND SEWER COMMISION

BWSC1 Combined sewer on Washington Street

Comment noted.

BWSC2 Site plan and General Service Application to BWSC

A General Service Application will be submitted.

BWSC3 Termination Verification Approval for Demolition Permit

A Termination Verification Approval Form for a Demolition Permit will be submitted.

BWSC4 Water demand, sanitary sewer flows, and stormwater flows

Comment noted.

BWSC5 Sewer and storm drain connections

Comment noted.

BWSC6 Sewer Use and Water Distribution Systems regulations compliance

Comment noted.

BWSC7 Compliance with BWSC requirements

The Site Plan and General Services Agreement will be submitted at the appropriate time.

BWSC8 On-site stormwater retention

An assessment of retaining stormwater on-site will be submitted with the site plan.

BWSC9 Drainage of impervious areas

The design will be in compliance with Article III, Section I of the BWSC Regulations governing the use of Sanitary and combined sewers and storm drains.

BWSC10 Drainage Discharge Permit

Comment noted.

BWSC11 Remediation General Permit

Comment noted.

BWSC12 Stormwater Pollution Prevention Plan

The site is less than one acre and a SWPPP is not required.

BWSC13 "Don't Dump: Drains to Boston Harbor" castings

Castings will be added to any new installed catch basin.

BWSC14 Cafeteria or food service facilities on-site

Comment noted.

BWSC15 Wastewater flow

Comment noted.

BWSC16 Meter Transmitter Unit

Comment noted.

BWSC17 Water conservation

Comment noted.

January 23, 2009

Mr. John Fitzgerald
Project Manager
Boston Redevelopment Authority
City Hall, 9th floor
Boston, MA 02201

Dear Mr. Fitzgerald:

The Impact Advisory Group (IAG) for the One Bromfield project (the "Project") proposed by Midwood Management Corporation (the "Proponent") has prepared the following summary of our comments about the proposed project. These comments are based on our own evaluation of the Project Notification Form (PNF), the content of the Scoping Session and Community Meeting on 11/17, as well as on our conversations with various community groups in the impacted areas.

In general, the IAG believes that the development proposal has significant merit and has the potential to add much-needed residential activity and additional retail vitality to Downtown Crossing. The IAG further believes that the Proponent could significantly improve the proposed Project and effectively mitigate its impacts by carefully considering the following comments:

I. Comments on the scope of PNF Studies

In general, the scope of studies performed and included in the PNF represents an appropriate first step. The IAG suggests that the following additional studies and scope be incorporated into the Project's Draft Project Impact Report (DPIR), which should be required of the proponent.

1. Traffic: The intersections of Beacon/Somerset, Beacon/Bowdoin, and Beacon/Park should be included due to empirical evidence suggesting that failure **IAG1** of the Beacon/Tremont intersection frequently backs traffic up over the top of Beacon Hill and into the residential areas of the Beacon Hill community. A figure should be included showing access to/from I-93N, I-93S, and I-90E/W from the Project site, along with a clear diagram showing planned vehicular circulation in the immediate vicinity of the Project site. The DPIR should also include turning radius analyses demonstrating that delivery trucks up to SU35 length are able to **IAG2** easily navigate the geometry in Province Court, and should include a discussion of how move-ins/move-outs will be managed given the transient nature of the Project's rental residential use.

2. Parking: The DPIR should include a study evaluating the number of valet staging spaces in light of the proposed valet/elevator-operated parking arrangement. The **IAG3** IAG is concerned that there is an insufficient number of vehicle staging spaces for arriving resident vehicles, assuming the porte-cochere must be kept clear to

through-travel at all times. The DPIR should also include an estimate of vehicle delivery time at peak periods and compare that estimate to the estimated vehicular trip generation rates to ensure that backups onto Province Street (and by extension, School Street and/or circling movements) do not occur. **IAG4**

3. Shadow Impacts: The DPIR should include a more thorough analysis of shadow impacts on the Old South Meeting House and Old State House (if any), which the Proponent would likely need to prepare for MHC in any case. The DPIR should confirm that no net new shadow is cast on the Boston Common at any time during the year. **IAG5**

4. Daylight Impacts: The DPIR should include a comprehensive daylight analysis demonstrating the impacts that the Project would have on Bromfield and Washington Streets. The DPIR should also identify the horizontal distance between the Project's residential tower elements and the existing 45 Province Street tower. **IAG6**

5. Waste Management: The DPIR should include a discussion of how residential domestic waste and recycling will be handled within the Project. The PNF plans do not show the location of a trash compactor or recycling room, as is customary for a building of this size. **IAG7**

6. Noise: The DPIR should include a detailed noise analysis of the Project's rooftop and other above-grade mechanical equipment (garage fans, etc.) to ensure that the Project's mechanical equipment will not create a noise impact on the Project's residential neighbors at 45 Province Street. Any potential noise impacts should be thoroughly mitigated by screening, enclosure, or relocation of mechanical equipment to avoid impacts to the new homeowners at 45 Province. **IAG8**

7. Wind: The DPIR should include sufficient wind analyses to confirm that no extraordinary wind impacts will be created that affect the integrity and usability of the envelope and exterior residential spaces of the 45 Province residential building. The DPIR should further include sufficient wind analysis to demonstrate that the Project will mitigate the existing wind conditions on Bromfield Street, which are often uncomfortable to pedestrians. **IAG9**

8. Historic Resources: The Project is located in close proximity to the Freedom Trail and several historically significant destinations. The Proponent should assess impacts on Freedom Trail destinations located in Downtown Crossing (King's Chapel, the Old South Meeting House, and the Old State House) to determine how the Project could help to strengthen these national treasures and enhance their visitors' experiences. The Project should assist in ongoing preservation/capital maintenance efforts at these sites. **IAG10**

9. Construction Impacts: While we expect that the Project will take the customary series of construction impact mitigation measures associated with Large Projects

in the city, special care should be taken to avoid impacting the occupants of the Jeweler's Building (333 Washington Street). The jewelry and watch-making businesses in this building are a unique part of Downtown Crossing's business community and are likely to be especially sensitive to construction vibrations etc. The Project's proponent should examine the application of drilled caisson foundations instead of driven/vibrated piles in order to thoroughly mitigate construction vibration impacts to surrounding historic structures and sensitive occupancies. **IAG11** **IAG12**

II. Comments on Project Design

1. West Elevation: The DPIR should include greater design detail showing the proposed composition and appearance of the west elevation of all components of the Project, i.e. those facing the residential Beacon Hill community and the scenic Boston Common and Public Garden. **IAG13**

2. Garage Envelope Composition: The DPIR should include greater design detail showing the proposed materiality and appearance of the exterior envelope of the proposed above-grade parking garage. The IAG is especially concerned with the appearance of this programmatic element of the Project and believes that it should not be possible to tell that it is a garage from street-level. **IAG14**

3. Interior Corner Composition: The DPIR should include greater detail showing the proposed materials and composition of the "armpit" condition at the northeast interior corner on floors 7-24. The IAG is concerned that this partially blank elevation will detract from the Project's overall aesthetic. **IAG15**

4. Loading/Parking Sequence: The IAG is concerned that the location of the Project's loading bays may cause conflicts with the Project's valet operation during peak loading and parking periods, causing backups onto Province Street in cases where resident vehicles will be delayed by truck movements into and out of the Project's loading docks. The Proponent should investigate whether swapping the location of the loading bays and vehicular elevators would alleviate this condition and reduce the likelihood of residential vehicles backing up onto Province Street, by locating the resident vehicle elevators first in the queuing sequence along Province Court instead of behind the truck service as it is shown currently. **IAG16**

III. Other Comments

1. Boston Common Impacts: The IAG notes that the Project will be creating little or no new open space for the use and enjoyment of the residents and surrounding community. As a result, it is assumed that the Boston Common and Public Garden will become the *de facto* open space for the use and enjoyment of the Project's residents. The Boston Common has an extensive backlog of capital maintenance programs and an annual operating shortfall. The IAG suggests that the Proponent **IAG17**

work with the city and appropriate other groups to contribute to capital programs and ongoing upkeep of the Boston Common.

2. Retail Merchandising Plan: The IAG suggests that the Proponent coordinate with the sponsors of the Filene's project to ensure a balanced retail mix and appropriate diverse merchandising plan can be arranged between the two projects. The IAG strongly supports the significant retail component of the Project but feels that the retail mix in the Project should complement, not co-opt other existing and planned retailers in the Downtown Crossing area. Furthermore, every effort should be made to accommodate existing small businesses in the new development or assist them in identifying new spaces in Downtown Crossing into which they can locate if desired. **IAG18**

3. Commitment not to Demolish: In order to avoid a repeat of the Filene's scenario, the IAG believes strongly that the Proponent must commit to retaining all existing structures on the Project site and all remaining tenancies in place (so long as these tenants wish to remain in business) until such time as commitments for 100% of the Project's financing (equity, construction debt, and mezzanine debt or other capital structure as applicable) have been secured. These commitments should be evidenced by providing copies of executed commitment letters from capital sources and evidence that applicable commitment fees have been paid by the proponent. **IAG19**

4. Affordable Housing: The IAG applauds the Proponent's commitment to complying with the Mayor's Executive Order on Inclusionary Housing but does not have any specific observations or preference relating to on-site vs. off-site creation of these units. **IAG20**

5. Community Development: The IAG is strongly supportive of bringing new residential uses to Downtown Crossing as a means of continuing to build the area's growing residential community. To that end, we encourage the Proponent to commit to measures designed to foster community engagement and stakeholdership among residents, and we strongly discourage short-term leases. **IAG21**

Overall, the IAG is generally supportive of the Project and looks forward to continuing to advise the BRA and the city on its impacts and appropriate mitigation measures. We appreciate the opportunity to comment on the Project thus far and look forward to reviewing the DPIR and any other additional information provided by the Proponent in the months ahead.

Thank you,

The One Bromfield Street IAG

IMPACT ADVISORY GROUP

IAG1 Vehicular circulation

The study area intersections, as designated by the Boston Transportation Department, include the Beacon Street/Tremont Street/School Street intersection. Traffic operations were evaluated for Existing (2016) Conditions, No-Build (2021) Conditions, and Build (2021) Conditions. In the future, along the Beacon Street approach at this intersection, the average peak hour queue is about six vehicles and the 95% (longest) queue is about ten vehicles. These queues (and associated delays are acceptable.

Analysis results are presented in Table 3-15 and Table 3-16 for Build (2021) Conditions. See also Section 3.6.2 for a discussion of proposed signal improvements at this location that would reduce delays on all approaches, but particularly Tremont Street southbound.

The distribution of new Project vehicle trips to and from the site is shown in Figure 3-16 and Figure 3-17, for automobiles and taxicabs, respectively.

IAG2 Turning radius analyses

The proposed vehicle (automobile and truck) travel paths circulating into and out of the porte-cochere, the garage elevators, the loading bays, and Province Court, have been assessed using AUTOTURN, software that allows engineers to model vehicle maneuvers, to ensure that all movements can be safely completed.

Residential move-in/move-out activity will occur at the loading bay on Province Court and be managed by the on-site transportation coordinator.

IAG3 Vehicle staging spaces

The porte-cochere driveway will accommodate one-way (northbound) travel from Bromfield Street toward Province Court. One travel lane will be provided for through traffic and one curbside parking lane will be provided for valet staging and taxicab activity. The eastern curb of the internal porte-cochere has capacity for approximately six vehicles plus one space for a delivery vehicle.

The curbside lane in the porte-cochere will accommodate the peak level of auto and taxicabs trips that will be generated by the Project (see Table 3-14). No queuing will occur on adjacent public streets, including Province Court, Province Street, or Bromfield Street.

See Section 3.4.8 for additional information on porte-cochere operations.

IAG4 Vehicle delivery time and trip generation

As shown in Table 3-18, it is expected that the Project will generate, on average, six daily deliveries, with most occurring between 7:00 a.m. and 1:00 p.m. Some delivery vehicles may access/egress the loading bay at the same time that garage attendants are moving a vehicle to or from the garage. The garage attendant (driver) may need to wait until the delivery vehicle has completed its maneuver into/out of the loading bay, but this wait time will be minimal. The peak activity time at the residential garage will occur between 5:00 p.m. to 6:00 p.m., when no deliveries to the loading bay are expected.

IAG5 Shadow impacts

Please see Section 4.2 for a shadow study, and Chapter 7 for a discussion of impacts to historic resources.

IAG6 Daylight impacts

Please see Section 4.3.

IAG7 Waste management

The trash compactor and recycling room are located on Level 2. Dumpster storage for pickup will be located off of Province Court on Level 1, concealed within the building enclosure. See Figures 2-5 and 2-8.

IAG8 Noise impacts

Please see Section 4.8.

IAG9 Wind impacts

Please see Section 4.1.

IAG10 Historic resources

The proposed Project will be within the viewshed of some nearby destinations on the Freedom Trail as noted. The destinations will be minimally affected by changes to shadow and wind conditions. In some areas wind comfort levels will improve and in others they will be reduced slightly around the Old South Meeting House (please see Section 4.1). New net shadow will also be cast on the King's Chapel Burying Ground, Boston Common and Old South Meeting House but will be minimal as it will be mitigated by other existing multi-story buildings in the area already casting shadow.

The proposed mix-use Project will serve to enhance nearby historic resources through heritage tourism. By creating new retail locations and additional residences in Downtown Crossing, the Project will keep the area vibrant. Additionally, the proposed residents will help the local economy and historic sites through increased patronage and visitation.

IAG11 Construction impacts on the Jeweler's Building

Care will be taken to avoid impacting the businesses at the Jeweler's Building. Such efforts will include pre-construction geotechnical measurements prior to construction commencement (subject to appropriate approvals from the owners of 333 Washington Street), and construction period monitoring and appropriate adjustments in construction methods, if appropriate.

IAG12 Mitigation of construction vibration impacts

All means and methods for performing work at the site will be evaluated for potential vibration impacts on adjoining property, utilities, and adjacent existing structures. Acceptable vibration criteria will be established prior to construction, and vibration will be monitored, if required, during construction to ensure compliance with the agreed-upon standard.

IAG13 West elevation design

See Figure 2-15 and Section 6.2 for elevations and renderings of the proposed design.

IAG14 Garage envelope composition

See Figure 2-15 and Section 6.2 for elevations and renderings of the proposed design.

IAG15 Interior corner composition

Current design deviates substantially from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

IAG16 Loading/Parking sequence

As shown in Table 3-18, it is expected that the Project will generate, on average, six daily deliveries, with most occurring between 7:00 a.m. and 1:00 p.m. Some delivery vehicles may access/egress the loading bay at the same time that garage attendants are moving a vehicle to or from the garage. The garage attendant (driver) may need to wait until the delivery vehicle has completed its maneuver into/out of the loading bay, but this wait time will be minimal. The peak activity time at the residential garage will occur between 5:00 p.m. to 6:00 p.m., when no deliveries to the loading bay are expected.

No queueing/stacking of garage vehicles will occur on Province Court at any time.

IAG17 **Boston Common impacts**

As the review process moves forward, the Proponent will continue to work with the City and other appropriate parties to decide how the Proponent can best contribute to the surrounding neighborhood.

IAG18 **Retail Merchandising Plan**

The retail mix will be determined based on market conditions at the time, and the Proponent will make an effort to accommodate small businesses where feasible.

IAG19 **Commitment not to demolish**

The Project will involve the demolition of the existing buildings. The Proponent will submit to the BLC an Article 85 Application for the on-site buildings.

IAG20 **Community development**

A portion of the building will be dedicated to condominiums, increasing the number of permanent residents in the community. In addition, the Project's numerous shared amenity spaces, such as a landscaped rooftop, will foster engagement among the building residents. The Proponent does not anticipate engaging in short-term leases.

The Bostonian Society
BOSTON HISTORICAL

206 Washington Street
Boston, Massachusetts
02109
617.720.1713
bostonhistory.org

December 2, 2008

John Fitzgerald
Project Manager
Boston Redevelopment Authority
City Hall, 9th floor
Boston, MA 02201

Dear Mr. Fitzgerald,

I am writing after reviewing the Project Notification Form for the proposed One Bromfield development. The project is located in relatively close proximity to the Old State House, built in 1713 as the seat of British government in the colonies during the pre-revolutionary period. It subsequently served as Massachusetts' first state house, and then as Boston's first City Hall. Today the Old State House alone attracts over 100,000 visitors each year, bringing pedestrian vitality and substantial economic benefits to Downtown Crossing. As the stewards of one of the country's most significant colonial-era historic sites, the Bostonian Society is pleased that Washington Street continues to attract new private investment, which we hope will enhance the quality of the streetscape for both residents and visitors alike.

The Old State House presently finds itself in an improving, but still tenuous financial position. We have recently completed several important repairs that have stabilized the structure of the old landmark, but there are a number of other badly needed repairs and areas requiring restorations that we have had to place on hold, due to lack of funding. The day-to-day wear-and-tear on one of Boston's few early eighteenth-century structures is significant, and we believe that the positive new developments along Washington Street, which we support, will nonetheless continue to place stress on the historic fabric and integrity of the Old State House.

With the fragility of the Old State House in mind, I am writing to inquire whether the proposed One Bromfield project might provide some assistance in our ongoing, costly work **BHS1**
to preserve one of the city's most historic treasures. We here at the Bostonian Society, as well as over 100,000 annual visitors to the city who enjoy the Old State House, would certainly be grateful if the proposed project could help us in our mission to restore and protect this nationally significant icon of American colonial history.

Very truly yours,

Brian W. J. LeMay
Executive Director

BOSTON HISTORICAL SOCIETY

BHS1 Contribution to preserve the Old State House

As the review process moves forward, the Proponent will continue to work with the City and other appropriate parties to decide how the Proponent can best contribute to the surrounding neighborhood.

BOSTON PRESERVATION ALLIANCE

January 30, 2009

Mr. John Palmieri, Director
Boston Redevelopment Authority
Boston City Hall, Room 925
Boston, MA 02201
ATTN: John Fitzgerald

RE: One Bromfield Street

Dear Mr. Palmieri:

The Boston Preservation Alliance is very concerned about the proposed One Bromfield Street project. We look forward to the opportunity to work with the Boston Redevelopment Authority to address the matters outlined below.

Shadow and Wind Impacts

It has come to the attention of the Alliance that substantial new shadows will be created by the proposed project at One Bromfield Street. These shadows would have significant negative impacts on one of Boston's most important historic resources, the Old South Meeting House. **BPA1** Built in 1729, the Old South Meeting House is a National Historic Landmark, one of fewer than 2,300 such properties with this highest distinction for historic significance from the United States Department of Interior. Old South is a symbol of our nation's commitment to freedom and free speech, and it is a surviving architectural icon from a period of great importance to the city. The museum at Old South serves more than 75,000 children and adults annually and is open to the public 361 days each year.

New permanent shadows created by this project will have a substantial impact to the operations and preservation of the nearly 300 year old historic structure of Old South Meeting House. These shadows will affect the primary façade of the Meeting House on Washington Street. The impact of permanent new shadows to the historic masonry of the building, which is anticipated throughout the afternoon for many months of the year, is likely to cause costly, and potentially irreparable, damage to the structure. Old South already faces significant challenges to ongoing maintenance due to ice dams that have formed as a result of new shadow caused by the 33 Arch Street tower. The new shadows from One Bromfield Street will also create a visual impact that will be detrimental to the experience of visitors. In addition, the operations of the flower **BPA2** stand on the corner of Washington and Milk Streets, which is a significant source of revenue for the upkeep and operations of the building, would be hindered by the new shadow.

The Alliance believes that a comprehensive analysis of the shadow and wind impacts on historic properties identified in Section 3.4 of the Project Notification Form (PNF) must be conducted as part of the review of the One Bromfield Street proposal. In addition to Old South Meeting House, **BPA3** a number of other historic buildings of note in the vicinity of the project may also be placed in new shadow and experience new wind impacts, including the Old Corner Bookstore and other properties along the Freedom Trail. The shadow diagrams in the PNF must be expanded and a narrative explaining the anticipated impacts must be included. It is difficult to tell which of the buildings listed in Section 3.4 will be placed in new shadow. Buildings impacted should be more clearly identified in future documentation. The shadow impacts should be fully examined by a **BPA4** qualified preservation consultant and the results of this study should be made public.

Consultation with Historic Property Owners
Based on conversations over the past several days with historic property representatives, it does not appear that historic properties that would be impacted by shadows created by this development received a copy of the PNF. As a result, some have missed the deadline for comment on it. The Alliance did not hear the extent of the serious concerns about shadow impacts on these properties in advance of the public meeting or the end of the comment period. **BPA5**

The Alliance believes it is critically important that the owners, managers and stewards of all historic properties that are listed in Section 3.4 of the PNF and are adversely impacted by new shadow from the proposed project are added to the notification list for public meetings relating to One Bromfield Street. Representatives from these historic properties should also receive permitting documentation (including the Draft Project Impact Report) filed by the proponent. **BPA6**

Existing Buildings on the Project Site
The Alliance understands that the proposed project will involve the demolition of four existing buildings with varied levels of historic significance and integrity. The Alliance will actively participate in the Boston Landmarks Commission's Article 85 Demolition Delay process and the Massachusetts Historical Commission's review of the proposal, if required. The Alliance concurs with the statement by the Boston Landmarks Commission in their December 16, 2008 letter on the PNF that "the six story building at the prominent corner of Washington and Bromfield Streets appears to be the least altered of the four buildings proposed for demolition and retains historic presence and reinforces the scale of the streetscape." The Alliance requests that the project proponent to consider preservation issues and options before demolition is permitted. **BPA7**

The Alliance appreciates your attention to these matters. We look forward to participating in the ongoing review of the One Bromfield Street proposal.

Sincerely,

Sarah D. Kelly
Executive Director

Susan Park
President

cc: At-Large City Councilor Michael Flaherty
At-Large City Councilor John R. Connolly
At-Large City Councilor Stephen J. Murphy
At-Large City Councilor Sam Yoon
City Councilor Salvatore LaMattina
Heather Campisano, Boston Redevelopment Authority
David Carlson, Boston Redevelopment Authority
Brona Simon, Massachusetts Historical Commission
Ellen Lipsey, Boston Landmarks Commission
Emily Curran, Old South Meeting House
Kathy Kottaridis, Historic Boston Incorporated
Mimi LaCamera, Freedom Trail Foundation
Rosemarie Sansone, Downtown Crossing Partnership

BOSTON PRESERVATION ALLIANCE

BPA1 Shadow and wind impacts on the Old State Meeting House

Please see Sections 4.1 and 4.2 for wind and shadow impacts.

The Old South Meeting House will be minimally affected by changes to shadow and wind conditions. In some locations wind comfort levels will improve and in others they will be reduced slightly around the Old South Meeting House. New net shadow will also be cast on the Old South Meeting House, but will be minimal as it will be mitigated by other existing multi-story buildings in the area already casting shadow.

BPA2 Shadow and wind impacts on the experience of visitors

Please see Sections 4.1 and 4.2 for wind and shadow impacts.

The Old South Meeting House will be minimally affected by changes to shadow and wind conditions. In some areas wind comfort levels will improve and in others they will be reduced slightly around the Old South Meeting House. New net shadow will also be cast on the Old South Meeting House, but will be minimal as it will be mitigated by other existing multi-story buildings in the area already casting shadow. Additionally, new net shadow will be cast only at isolated times throughout the year.

BPA3 Shadow and wind impacts on historic buildings

Please see Sections 4.1 and 4.2 for wind and shadow impacts.

The nearby Freedom Trail destinations will be minimally affected by changes to shadow and wind conditions. In some areas wind comfort levels will improve and in others they will be reduced slightly around the Old South Meeting House (please see Section 4.1). No changes to wind conditions are anticipated at the Old Corner Bookstore or other Freedom Trail destinations.

New net shadow will be cast on the King's Chapel Burying Ground, Boston Common, Old Corner Bookstore and Old South Meeting House but will be minimal as it will be mitigated by other existing multi-story buildings in the area already casting shadow. Additionally, new net shadow will be cast only at isolated times throughout the year.

BPA4 Public notification of shadow and wind impacts

Please see Sections 4.1 and 4.2 for wind and shadow impacts.

The Article 80 review process provides for public comment. Property owners of historic buildings and other interested parties are afforded the opportunity to review the wind and shadow studies and provide comments. Based upon the limited nature of the proposed wind and shadow impacts no historic properties are expected to be adversely affected.

BPA5 Existing Buildings on the Project Site

The varying construction dates, methods of construction as well as the varying heights and types of buildings make incorporation of the existing structures into the proposed project unfeasible. Additionally, as noted by the BLC there have been significant alterations to the buildings on site as well as a loss of historic fabric. One building is described as "altered beyond recognition" in the Inventory. Given the alterations that have already occurred as well as the building code complaince and engineering challenges involved, rehabilitation of the existing buildings is unable to be included in the proposed project.

OLD SOUTH MEETING HOUSE

Mr. John Palmieri, Director
Boston Redevelopment Authority
One City Hall Plaza
Boston MA 02201

January 28, 2009

Dear Mr. Palmieri:

We are writing on behalf of the Old South Meeting House, a non-profit museum, historic site and cultural attraction in downtown Boston, to express our grave concern with the One Bromfield Street project and its public review process. The new 28 story tower proposed by this project will clearly have negative impacts on the Old South Meeting House. We have not received a copy of the Project Notification Form and we are astonished that a project with such significant impacts on this National Historical Landmark did not cause the BRA to ensure that the affected parties were contacted.

Since it was built in 1729, the Old South Meeting House has been one of Boston's most cherished and venerable historic treasures. As the site of the meetings that led to the Boston Tea Party, the Old South Meeting House played a pivotal role in the beginning of the American Revolution. Bostonians rallied to save the building from destruction in 1876, resulting in the first successful historic preservation effort in New England. Owned and operated as a museum by the private non-profit Old South Association since 1877, today the Old South Meeting House serves over 75,000 children, teachers, visitors and citizens each year with exhibits, educational programs, debates, concerts, performances and celebrations. The Old South Meeting House is open to the public 361 days each year as a key site on The Freedom Trail. It provides millions of passersby on historic Washington and Milk Streets with an iconic reminder of Boston's history, its commitment to freedom and free speech and to the City's stewardship of its historic fabric.

The proposed One Bromfield project is located less than a block away from Old South Meeting House, and it will have substantial and material impacts
to this National Historic Landmark. The project's own preliminary studies **OSMH1**
show that new shadows from the new 28 story tower will fall across the primary Washington Street façade of Old South Meeting House during the afternoon most of the year, casting the colonial era structure into darkness. After nearly 300 years in sunlight, the impact of permanent new shadows on the original brick masonry historic structure is of substantial concern to the

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www.oldsouthmeetinghouse.org

overall preservation and maintenance of the Meeting House. The results of these kinds of irreversible impacts cannot adequately be foreseen; for example an area of Old South affected by new shadows from 33 Arch Street developed an ice dam where none had previously been experienced. In addition, the shadows will negatively affect visitors' experiences of the primary façade of the Old South Meeting House on Washington Street, which is how visitors using the Freedom Trail view and enter our building. The shadows will also impact the Flower and Fruit Stand at the corner of Washington and Milk Streets. Insidethe meeting house, Old South will lose the daylight that has been the primary means of lighting the interior since it was constructed in 1729. The cumulative impact of these additional new shadows will place the Old South Meeting House substantially in shadow most of the time.

In addition to shadow impacts, we are also concerned about wind impacts as well as vibration during construction. **OSMH2**

As the stewards of this historic building, we must take all steps necessary to protect the Old South Meeting House and its colonial era historic interior from shadows and other negative impacts. We look forward to participating in the review of the One Bromfield Street project and thank you for your assistance in this important matter.

Sincerely,

Emily Curran

Emily Curran
Executive Director
Old South Meeting House
310 Washington Street
Boston MA 02108
Tel 617-482-6439
Email: ecurran@osmh.org
Website: www.oldsouthmeetinghouse.org

cc: Mr. John Fitzgerald, Boston Redevelopment Authority
Ms. Brona Simon, Massachusetts Historic Commission
Ms. Ellen Lipsey, Boston Landmarks Commission
Ms. Sarah Kelly, Boston Preservation Alliance
Mr. Buzz Constable, A.W. Perry
Mr. Paul Davis, Midwood Management Corporation
Mr. Kevin Cornell, Midwood Management Corporation
Mr. Mel Shulman, Wilmer Cutler Pickering Hale and Dorr LLP

OLD SOUTH MEETING HOUSE

OSMH1 Shadow impacts

Please see Section 4.2 for shadow impacts.

The Old South Meeting House will be minimally affected by changes to shadow and wind conditions. In some areas wind comfort levels will improve and in others they will be reduced slightly around the Old South Meeting House. New net shadow will also be cast on the Old South Meeting House, but will be minimal as it will be mitigated by other existing multi-story buildings in the area already casting shadow. Additionally, new net shadow will be cast only at isolated times throughout the year.

OSMH2 Wind impacts

Please see Section 4.1 for the wind analysis, and Section 4.10.10 for a discussion on monitoring construction vibration.

B.R.A.

2008 DEC -1 P 12: 10

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December 1, 2008

VIA HAND DELIVERY

John F. Palmieri, Director
Boston Redevelopment Authority
City Hall, 9th Floor
Boston, MA 02210

Re: One Bromfield Street, Project Notification Form

Dear Director Palmieri:

This office is counsel to Province Development Partnership and the Abbey Group ("Abbey Group"), the developer of the 45 Province Street Residences.

This letter is submitted on behalf of the Abbey Group to provide written comments on the Project Notification Form ("PNF") filed with the Authority by Midwood Management Corporation dated October 27, 2008 for the One Bromfield Street Project (the "Project"). As the developer of the 45 Province Street Residences, the Abbey Group has a sizable investment in the Downtown Crossing area and is now fulfilling a commitment made to the City to redevelop a mechanical garage into a first class residential project. The Abbey Group is pleased that construction is scheduled to be completed in May, 2009.

The Abbey Group was surprised to learn of the filing of the PNF for the Project. The Abbey Group has not been contacted by the developer of the Project or its representatives. As the BRA is aware, the planning for the 45 Province Street Residences involved extensive community, neighborhood and abutter outreach to address potential development issues as well as real day-to-day construction issues which impact any development in the city. As a result of those early and continuous outreach efforts and meetings with the neighborhood and abutters, the Abbey Group was able to undertake a project with the full support of the neighbors and its abutters as well as the BRA and the City agencies.

It is therefore a concern to the Abbey Group that a major proposal as outlined in the PNF has not had any early neighborhood outreach or abutter consultations. Perhaps some of the comments that are expressed below could have been averted had a more thorough planning and AGP1 community outreach been undertaken with respect to the Project. The following are our initial concerns after reviewing the PNF:

1. Increased Use of Province Court. The orientation and programming of the Project requires that Province Court serve as the only vehicular access point for parking and for service/delivery traffic generated by the new large retail operations. Province Court is a short, narrow alley. The Abbey Group is concerned with its ability to function as the only access point for a development of this size with multiple uses. The Abbey Group is also concerned that the operations for the Project will cause traffic congestion on Province Street and adversely impact the entrance and access for 45 Province Street. None of the renderings included in the PNF take into account the traffic patterns of Province Street and the development of the 45 Province Street Residences. Further, my client has been working with the City for several months to improve Province Court, which has been neglected by the property owner for years and has become a blighting influence on the surrounding area. The developer must have an obligation to significantly improve the aesthetics and cleanliness of the alley. **AGP2** **AGP3**

2. Traffic on Province Street. Our main concern regarding Province Street is the added traffic generated by the development both with respect to operations and construction. The Abbey Group is making a significant investment for the length of Province Street to create an attractive residential and pedestrian environment, including sidewalk bump-outs and new trees. The current proposal makes no effort to evaluate how these improvements to the street may be affected by their service operations and construction phase operations. **AGP4**

3. Development Densely/Proximity. The Abbey Group is concerned that the 407,000 square foot program which includes 50,000 square feet of retail and 276 apartments is more than the site and its Province Court access can handle. Also, given the very close proximity of the Project to the 45 Province Street Residences, there needs to be some form of massing and height reduction to provide visual relief within the sky plane of this neighborhood. **AGP5** **AGP6**

4. Shadow Impacts. Due to the massive structure of the tower and its height, the shadow impacts as stated in the PNF appear to seriously impact adjoining buildings. Further shadow studies of a sequential nature should be provided to the BRA and a redesign of the massing or alternatives to the tower element should be encouraged. **AGP7**

5. Historical and Design Elements. Downtown Crossing is home to a beautiful patchwork of historic buildings. There is no effort by this developer to demonstrate how the new tower shows sensitivity of scale and materials and how it would relate to neighboring historic buildings at street level. In fact, the street level facades of the Project do not take into account any of the neighboring historic structures or the scale of the existing buildings along Province Street and Bromfield Street. While the Abbey Group understands that the developer would like to make a visual impact at the corner of Bromfield Street and Washington Street, there is no effort to match the size or the scale of the Project's retail spaces to the adjacent retail spaces on this block. Furthermore, the design of the tower also does not appear to further any design guidelines for the Downtown Crossing area. There is no attempt to honor the historic buildings and historic streetscapes on Province Street, Bromfield Street and Washington Street and there is **AGP8** **AGP9** **AGP10**

no attempt to activate the pedestrian environment – all key principles of the City's vision for Downtown Crossing.

If the developer of the Project had seriously considered improving this block on Bromfield Street, the development team would have met with the Downtown Crossing Association, other interested parties and abutters and participated in a real design dialogue through meetings and conversations to solicit input concerning improvement to the block and appropriate height additions which would not adversely impact surrounding buildings. Based upon the present design and submission in the PNF, the Project appears to be merely a project to "enhance" the property value potential of the site and not a serious effort to redevelop the site in concert with good urban planning or concern for its neighbors and the Downtown Crossing area.

The Abbey Group appreciates the opportunity to comment with respect to the Project and requests that the BRA require that the developer address these comments and undertake additional studies of the projected impacts of the Project on the surrounding areas. Additionally, due to the size and impacts of the Project, members of the community should be involved in the on-going review process in a meaningful way and be informed of all future meetings and potential filings for the Project.

Thank you for the opportunity to comment.

Very truly yours,
The Abbey Group
By its attorney
Paula M. Devereaux
Paula M. Devereaux

PMD/sw
cc: Mayor Thomas M. Menino
Randi Lathrop
Heather Campisano
Rosemarie Sansone
David Epstein
Jason Epstein

THE ABBEY GROUP

AGP1 Increased vehicular use of Province Court

To better understand the existing activity on Province Court generated by the abutting buildings, observations were made via 24/7 video footage (placed on the Proponent's property) from Tuesday, September 8, through Thursday, September 10, 2015. Most of the activity in the alley was short-term parking by automobiles, single-unit trucks, vans, and pick-up trucks that parked at the end of Province Court, closest to Province Street. Drivers were observed exiting their vehicle, sometimes gathering goods from their vehicles, and proceeding along Province Street out of view of the video camera. Some drivers were likely delivering/picking-up small packages at businesses with front doors along Province Street. Alternatively, some drivers may have been running personal errands. Whether the activity for these vehicles was related to deliveries or to personal business could not be determined from the video footage. While Province Court is clearly signed as a "No-Parking – Loading Zone", it is apparent that the end of Province Court close to Province Street is well-used (about 20 vehicles per day) as a short-term, unauthorized parking area for nearby deliveries and errands. This unauthorized use of Province Court will discontinue when the Project is complete. These displaced vehicles will need to find legal loading and parking spaces in the area.

Observations showed that, on average, one delivery per day was made to the loading dock for 333 Washington Street within Province Court. In the future, these authorized deliveries will continue to occur in Province Court. Province Court will also serve as vehicular access to the Project's new internal loading dock and the vehicular elevators. As today, very limited public pedestrian activity is expected to occur internally on Province Court.

As shown on the Project site plan in Figure 3-15, vehicular access to the site will be via Bromfield Street and the internal porte-cochere, which will operate with one-way northbound travel flow. A resident will enter the porte-cochere via Bromfield Street, park in the curb lane and a garage attendant will drive the vehicle to the garage. Vehicles will be transported via attendant-operated vehicular elevators (capacity for two vehicles) accessed from Province Court. Garage attendants will also retrieve vehicles from the garage for residents when they depart.

No queueing/stacking of garage vehicles will occur on Province Court at any time. As needed, staging of vehicles waiting to be picked-up by residents or serviced by the garage elevators will occur curbside within the porte-cochere. The eastern curb of the internal porte-cochere has capacity for approximately six vehicles plus one space for delivery vehicle. Vehicles exiting the porte-cochere will turn onto Province Court, either right toward the garage or left toward Province Street. Taxicab drop-offs and pick-ups will also occur within the porte-cochere.

The Proponent has developed a site design that provides for safe and efficient loading internal to the site. Delivery vehicles to the Project will utilize the loading bay on Province Court or the designated delivery space in the porte-cochere. Delivery vehicles to the Project's loading dock will need to back into Province Court to access the loading dock. This same maneuver is required under existing conditions to access the loading dock at 333 Washington Street. Delivery vehicles may also travel through the porte-cochere and park in the designated curbside loading space. All delivery vehicles will exit the site via Province Court toward Province Street. No on-street loading will occur on adjacent public streets, including Province Court, Province Street, or Bromfield Street.

The proposed delivery truck travel paths have been assessed using AUTOTURN, software that allows engineers to model vehicle maneuvers, to ensure that all movements can be safely completed. No queueing/stacking of garage vehicles will occur on Province Court at any time.

The intersection of Province Street/Province Court was analyzed for a.m. and p.m. peak hour conditions. Under Build Conditions, all moves will operate at LOS A or LOS B.

AGP2 Development of 45 Province Street Residences

The 45 Province Street residential building was completed in 2009. The activity associated with the development is reflected in the traffic and pedestrian counts conducted in 2015 for this study.

AGP3 Traffic on Province Street

Traffic operations along Province Street were evaluated for Existing (2016) Conditions, No-Build (2021) Conditions, and Build (2021) Conditions. Key intersections include Province Street/School Street, Province Street/Province Court, and Bromfield Street/Province Street. The additional traffic generated by the Project has been incorporated into the Build Conditions. Under Build Conditions, peak hour operations will be maintained at LOS C or better. See Chapter 3 for a detailed transportation analysis of these and other study area locations.

AGP4 Site capacity of Province Court

The Project's transportation analysis results, as documented in Chapter 3, show that Province Court has adequate capacity to operate as planned.

AGP5 **Shadow impacts**

Please see Section 4.2.

AGP6 **Contextual design**

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

AGP7 **Retail space scale**

The current design deviates in numerous ways from the previously submitted design. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

The Druker Company, Ltd., Suite 1000, 50 Federal Street, Boston, Massachusetts 02110-2585

January 23, 2009

Mr. John Fitzgerald
Senior Project Manager
Boston Redevelopment Authority
One City Hall Plaza
Boston Massachusetts 02201

RE: One Bromfield Street
<u>Comments on the Project Notification Form</u>

Dear Mr. Fitzgerald:

I am writing to you to express our serious concern about the massing proposed for One Bromfield Street (the "Project").

The proponents met with us in November 2008 to present their building concept, massing and design depicted in their Project Notification Form submitted to the BRA on October 27, 2008. We were primarily concerned about the impact of the Project on Bromfield Street which is an important retail street in Downtown Crossing. Bromfield Street is a narrow one-way street and we were concerned that it might feel like an alley due to the height and massing of this Project. The proponents explained that Bromfield was a very important retail street for their Project, as well, and that the loading and garage access were off Province Court. They were especially excited to discuss the angle that the residential tower was set back from their Bromfield Street property line, setback 15 feet near the corner with Washington Street increasing to approximately 45 feet at the westerly property line near Province Street. This angled setback provided relief from the additional height proposed for the tower and allowed more light and air to reach Bromfield Street. We were generally pleased with the thoughtful planning that had gone into the Project and said that we would be supportive.

We were very surprised to discover that at the January 14, 2009 public meeting a <u>new</u> massing for the residential tower portion of the Project was presented that paralleled the Bromfield Street property line at the minimum 15 foot setback that had originally been proposed. We contacted the proponents immediately and they met with us yesterday to explain the changes **DC1** to the project. We are very concerned that this minimal setback of the residential tower from Bromfield Street will create a canyonization of this integral, historic portion of Downtown Crossing. The original massing gave the building character and provided space to "breathe" on Bromfield Street. We do not want to see the Manhattaniztion of our downtown retail district.

The proponents have agreed to study their ability to increase the setback of the residential tower from Bromfield Street to address our concerns and to help insure an active retail

Telephone: (617) 357-5700 Telefax: (617) 357-6494

environment on Bromfield. The proponent said that they will get back to us early next week on their ability to increase this setback. We hope that a compromise can be reached on this issue so that Bromfield Street can become an even more vibrant retail street and we can support the Project. However, we do want to emphasize that we are very seriously concerned about the design as it is currently proposed.

Sincerely,

Ronald M Druker
President

CC: Mr. John Palmieri
Mr. Paul McCann
Mr. Kairos Shen
Mr. John Usdan
Mr. Paul Davis

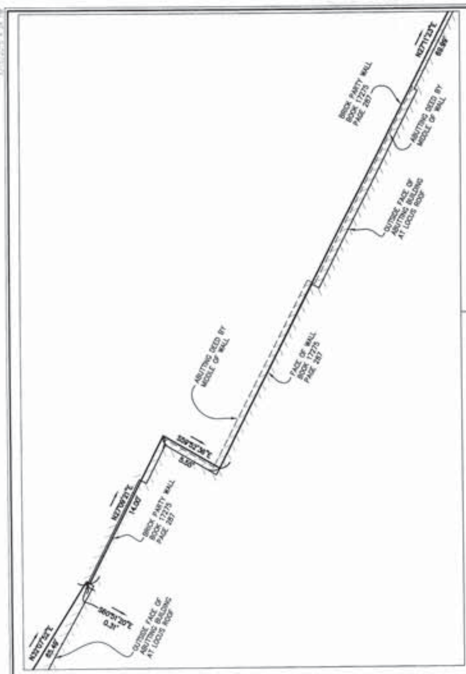
THE DRUKER COMPANY, LTD

DC1 Setback

Proposed design changes specifically address this issue. Massing moves and setbacks provide greater access to daylight for the street level. Refer to written description, elevations and renderings for proposed design resolution. See Figure 2-15 and Section 6.2.

Appendix A

Site Survey



DETAIL "A"
1" = 5'

REFERENCES:

DEED REFERENCES:

BOOK 41531 PAGE 258
BOOK 33709 PAGE 174
BOOK 38399 PAGE 270
BOOK 9191 PAGE 99
BOOK 17275 PAGE 287
BOOK 8960 PAGE 280

PLAN REFERENCES:

BOOK 9091 PAGE 471
BOOK 3010 PAGE 476
BOOK 4076 PAGE 326
BOOK 4703 PAGE 384
BOOK 5016 PAGE 561

LEGEND

	CATCH BASIN
	DRAIN MANHOLE
	ELECTRIC MANHOLE
	MISCELLANEOUS MANHOLE
	SEWER MANHOLE
	TELEPHONE MANHOLE
	WATER MANHOLE
GSO	GAS SHUT-OFF
WSO	WATER SHUT-OFF
GG	GAS GATE
WG	WATER GATE
BWW	BOSTON WATER WORKS
BWSC	BOSTON WATER AND SEWER COMMISSION
	FIRE HYDRANT
	LIGHT POLE
HH	HAND HOLE
FBOX	FIRE PULL BOX
FA	FIRE ALARM
PM	PARKING METER
S	SIGN POST
B	BOLLARD
ENT	ENTRANCE
CLF	CHAIN LINK FENCE
VGC	VERTICAL GRANITE CURB
VCC	VERTICAL CONCRETE CURB
WCR	WHEELCHAIR RAMP
CONC.	CONCRETE
DWP	DETECTION WARNING PANEL
N/F	NOW OR FORMERLY
	DECIDUOUS TREE

NOTES

1.) THE INFORMATION CONTAINED ON THE DISK OR ELECTRONIC DRAWING FILE ACCOMPANYING THIS PLAN MUST BE COMPARED TO THE SEALED AND SIGNED HARD COPY OF THE PLAN TO ENSURE THE ACCURACY OF ALL INFORMATION AND TO ENSURE NO CHANGES, ALTERATIONS, OR MODIFICATIONS HAVE BEEN MADE. RELIANCE SHALL NOT BE MADE ON A DOCUMENT TRANSMITTED BY COMPUTER OR OTHER ELECTRONIC MEANS UNLESS FIRST COMPARED TO THE ORIGINAL SEALED DOCUMENT ISSUED AT THE TIME OF THE SURVEY. DUE TO THE CRITICAL NATURE OF SURVEYING, DATA ACQUISITION, AND AUTOCAD PLAN DEVELOPMENT, IF CRITICAL DIMENSIONAL INFORMATION IS NEEDED AND IS NOT SPECIFICALLY SHOWN ON THE ELECTRONIC DRAWING FILE, PLEASE CONTACT NITSCH ENGINEERING.

2.) AREAWAYS WERE NOT DELINEATED AS PART OF THIS SURVEY.

PAUL R. LeBATION NO. 47567

SEE SHEET 2 FOR LEGAL DESCRIPTIONS, EXCEPTIONS, LOCUS MAP, CERTIFICATION, AND FLOOD ZONE INFORMATION

FIDELITY NATIONAL TITLE INSURANCE COMPANY
FILE NO. 14-0210KC-FN(MA)
EFFECTIVE DATE: JULY 24, 2014

GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"=20'

Nitsch Engineering

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2 Center Plaza, Suite 430
Boston, MA 02108
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F: (617) 338-6472

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Sustainable Site Consulting
- Planning
- GIS

PROJECT # 6935.2
FILE: 6935.2_ALTA1.dwg
SCALE: 1"=20'
DATE: AUGUST 14, 2014
PROJECT MANAGER: PRL
FIELD BOOK: 595
DRAFTED BY: PRL
CHECKED BY:

REV.	COMMENTS	DATE
1	REMOVED 5 AC UNITS	12/10/14

REVISIONS

ALTA/ACSM LAND TITLE SURVEY

BROMFIELD STREET
BOSTON, MASSACHUSETTS

PREPARED FOR:
MIDWOOD MANAGEMENT CORPORATION
430 PARK AVENUE, SUITE 505, NEW YORK, NEW YORK 10022

SHEET: 1

EX-1

OF 2

REV.

EXHIBIT A - LEGAL DESCRIPTION

11-21 BROMFIELD STREET AND 8 AND 10 PROVINCE COURT

A PARCEL OF LAND WITH THE BUILDINGS THEREON SITUATE AND NOW NUMBERED 11, 13, 15, 17, 19 AND 21 ON BROMFIELD STREET AND 8 AND 10 ON PROVINCE COURT IN BOSTON, COUNTY OF SUFFOLK AND COMMONWEALTH OF MASSACHUSETTS, BEING THE LOT MARKED "8544 5/10 SQ. FT." ON PLAN OF LAND IN WARD 5, BOSTON, DATED JULY 19, 1917 BY ASPINWALL & LINCOLN, CIVIL ENGINEERS, RECORDED WITH THE SUFFOLK DEEDS BOOK 4076, PAGE 326, BOUNDED AND DESCRIBED AS FOLLOWS:

SOUTHERLY ON SAID BROMFIELD STREET, SEVENTY-THREE AND 73/100 FEET;

WESTERLY ON LAND NOW OR FORMERLY OF GEORGE URIEL CROCKER AND OTHERS, TRUSTEES BY A LINE RUNNING THROUGH THE MIDDLE OF THE BRICK PARTY WALL, SIXTY-FIVE AND 44/100 FEET;

NORTHERLY ON THE SAME LAND 31/100 OF A FOOT;

WESTERLY AGAIN ON THE SAME LAND BY A LINE RUNNING THROUGH THE MIDDLE OF THE BRICK PARTY WALL, FOURTEEN FEET;

NORTHERLY AGAIN ON THE SAME BY THE NORTH FACE OF A WALL, FIVE AND 55/100 FEET;

WESTERLY AGAIN ON THE SAME LAND BY A LINE RUNNING IN PART ALONG THE EAST FACE OF A WALL WHICH IS ON SAID ADJOINING LAND SEVENTEEN AND 59/100 FEET, AND IN PART ON THE WEST FACE OF A WALL WHICH IS ON THE DEMISED PREMISES EIGHTEEN AND 70/100 FEET, AND IN PART THROUGH THE MIDDLE OF A BRICK PARTY WALL EIGHT INCHES THICK THIRTY-THREE AND 67/100 FEET;

NORTHERLY ON SAID PROVINCE COURT, THIRTY-NINE AND 95/100 FEET;

EASTERLY ON LAND NOW OR FORMERLY OF FANNIE E. MORRISON BY TWO LINES PASSING THROUGH THE MIDDLE OF PARTY WALLS MEASURING RESPECTIVELY THIRTY-TWO AND 80/100 FEET AND THIRTY-SEVEN AND 88/100 FEET;

NORTHERLY AGAIN ON THE SAME LAND, TWENTY AND 27/100 FEET;

EASTERLY AGAIN ON THE SAME LAND, FOURTEEN AND 08/100 FEET;

NORTHERLY AGAIN ON THE SAME LAND SEVEN AND 15/100 FEET; AND

EASTERLY IN PART ON THE SAME LAND AND IN PART ON LAND NOW OR FORMERLY OF RATSHESKY BY A LINE RUNNING IN PART THROUGH A BRICK PARTY WALL, SIXTY-EIGHT AND 10/100 FEET.

EXHIBIT A-2 - PARCEL II

1-9 BROMFIELD STREET AND 367-369 WASHINGTON STREET

THE LAND IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, BOUNDED AND DESCRIBED AS FOLLOWS: TWO CERTAIN PARCELS OF LAND SITUATED ON WASHINGTON STREET AND BROMFIELD STREET IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, AS FOLLOWS.

PARCEL ONE

SOUTHEASTERLY BY WASHINGTON STREET, TWENTY-SIX AND 17.100 (26.17) FEET;

SOUTHWESTERLY BY BROMFIELD STREET, SIXTY-NINE AND 25/100 (69.25) FEET;

NORTHWESTERLY BY PARCEL TWO HEREINAFTER DESCRIBED, THIRTY-ONE AND 18/100 (31.18) FEET; AND

NORTHEASTERLY BY LAND NOW OR FORMERLY OF NELSON, BY TWO LINES PASSING THROUGH A BRICK PARTITION WALL, SEVENTY-SIX AND 4/100 (76.04) FEET,

CONTAINING APPROXIMATELY 2,127.3 FEET.

PARCEL TWO

A CERTAIN PARCEL OF LAND SITUATED ON BROMFIELD STREET IN SAID BOSTON, TOGETHER WITH THE BUILDINGS THEREON, NUMBERED 7 AND 9 BROMFIELD STREET, BOUNDED AND DESCRIBED AS FOLLOWS:

SOUTHWESTERLY BY SAID BROMFIELD STREET, TWENTY-FOUR AND 34/100 (24.34) FEET;

SOUTHEASTERLY BY PARCEL ONE ABOVE DESCRIBED, THIRTY-ONE AND 18/100 (31.18) FEET;

NORTHEASTERLY BY LAND FORMERLY OF HOLKER NOW OR LATE OF NELSON BY A LINE PASSING THROUGH THE BRICK PARTITION WALL, TWELVE AND 34/100 (12.34) FEET;

SOUTHEASTERLY AGAIN IN PART BY THE SAME LAND AND IN PART BY LAND CONVEYED BY CHARLES G. SMITH AND OTHERS, COMMISSIONERS, BY DEED RECORDED WITH SUFFOLK DEEDS, LIB. 2865, PAGE 9, TWENTY-ONE AND 62/100 (21.62) FEET;

NORTHEASTERLY AGAIN BY SAID LAST MENTIONED LAND, THIRTEEN AND 4/10 (13.4) FEET; NORTHWESTERLY BY LAND FORMERLY OF CROCKER AND OTHERS, TRUSTEES, FIFTY-TWO AND 85/100 (52.85) FEET,

CONTAINING 1,028.8 SQUARE FEET.

EXHIBIT A - LEGAL DESCRIPTION (CONTINUED)

EXHIBIT A-3 - PARCEL III

349-363 WASHINGTON STREET

CERTAIN REAL ESTATE SITUATED IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, WITH BUILDING THEREON NOW NUMBERED 349-363 BOTH INCLUSIVE ON WASHINGTON STREET, BOUNDED AND DESCRIBED AS FOLLOWS:

SOUTHEASTERLY BY WASHINGTON STREET SIXTY-THREE AND 3/100 (63-3/100) FEET; SOUTHWESTERLY BY LAND NOW OR FORMERLY OF HUGH M. NELSON BY A LINE RUNNING THROUGH A BRICK PARTITION WALL FORTY-EIGHT (48) FEET; SOUTHWESTERLY AGAIN BY SAID LAND NOW OR FORMERLY OF NELSON ON A LINE EXTENDING IN PART THROUGH A BRICK PARTITION WALL TWELVE AND 73/100 (12-73/100) FEET; SOUTHEASTERLY AGAIN BY LAND NOW OR FORMERLY OF NELSON FIFTY ONE HUNDREDTHS (50/100) OF FEET; SOUTHWESTERLY AGAIN BY SAID LAND OF NELSON ON TWO LINES THREE (3) FEET AND TWENTY-EIGHT AND 67/100 (28-67/100) FEET RESPECTIVELY; NORTHWESTERLY BY LAND NOW OR FORMERLY OF RATSHESKY, ONE AND 48/100 (1-48/100) FEET, SOUTHWESTERLY BY SAID LAND NOW OR FORMERLY OF RATSHESKY, THIRTEEN AND 4/100 (13-4/100) FEET BY A LINE RUNNING ALONG THE NORTHEASTERLY FACE OF A WALL; NORTHWESTERLY BY LAND NOW OR FORMERLY OF CHARLES F. AND ARTHUR ADAMS FORMERLY OF BALLARD FIFTEEN AND 25/100 (15-25/100) FEET; SOUTHWESTERLY AGAIN BY SAID LAND NOW OR FORMERLY OF ADAMS SEVEN AND 15/100 (7-15/100) FEET; NORTHWESTERLY AGAIN BY SAID LAND NOW OR FORMERLY OF ADAMS FOURTEEN AND 8/100 (14-8/100) FEET; SOUTHWESTERLY AGAIN BY SAID LAND OF ADAMS TWENTY AND 27/100 (20-27/100) FEET, NORTHWESTERLY AGAIN BY SAID LAND OF ADAMS ON TWO LINES MEASURING RESPECTIVELY THIRTY-SEVEN AND 88/100 (37-88/100) FEET AND THIRTY-TWO AND 80/100 (32-80/100) FEET; NORTHEASTERLY BY PROVINCE COURT SIXTY AND 59/100 (60-59/100) FEET; SOUTHEASTERLY BY ORDWAY PLACE FORTY-FOUR AND 55/100 (44-55/100) FEET; NORTHEASTERLY BY SAID ORDWAY PLACE EIGHTY-EIGHT AND 65/100 (88-65/100) FEET.

CONTAINING TEN THOUSAND THREE HUNDRED FIFTEEN AND 6/10 (10,315-6/10) SQUARE FEET. BE ANY OR ALL OF SAID MEASUREMENTS AND CONTENTS MORE OR LESS.

THE ABOVE DESCRIBED PREMISES ARE SHOWN ON A PLAN MADE BY ASPINWALL & LINCOLN, C. E. DATED JUNE 27, 1925, RECORDED AT BOOK 4703, PAGE 384, WHICH PLAN IS REVISED BY ADDITIONS MADE TO TRACING NOVEMBER 15, 1927. THE TRACING WAS REVISED JUNE 20, 1928 AND RECORDED AT BOOK 5016, PAGE 561.

EXCEPTING FROM THE ABOVE DESCRIBED PREMISES THE TRIANGULAR PARCEL OF LAND CONVEYED TO THE CITY OF BOSTON FOR THE PURPOSE OF WIDENING WASHINGTON STREET, BY DEED DATED DECEMBER 17, 1930, RECORDED AT BOOK 5233, PAGE 66.

EXHIBIT A-4 - PARCEL IV

365 WASHINGTON STREET

A CERTAIN PARCEL OF LAND WITH BUILDINGS THEREON SITUATED AND NOW NUMBERED 365 ON WASHINGTON STREET IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, AND BOUNDED AND DESCRIBED AS FOLLOWS:

SOUTHEASTERLY ON SAID WASHINGTON STREET, 21 FEET, 9 INCHES;

NORTHEASTERLY ON LAND FORMERLY OF ALPHEUS BIGELOW AND WIFE BY A LINE RUNNING THROUGH THE CENTER OF A TWELVE INCH WALL, 48 FEET

NORTHEASTERLY AGAIN ON THE SAME BY A LINE RUNNING THROUGH AN EIGHT INCH WALL, TWO INCHES SOUTHWESTERLY OF THE NORTHEASTERLY FACE OF SAID WALL, 12 FEET, 9 INCHES

NORTHWESTERLY ON THE SAME, 6 INCHES;

NORTHEASTERLY AGAIN ON THE SAME BY A LINE RUNNING IN PART ALONG THE NORTHEASTERLY FACE OF THE WALL, 31 FEET, 8 INCHES;

NORTHWESTERLY ON THE SAME, 20 FEET, 9 INCHES; AND

SOUTHWESTERLY IN PART ON THE SAME AND IN PART ON LAND FORMERLY OF THE HEIRS OF JOHN BOYLE, 90 FEET, 3 INCHES.

OR HOWEVER OTHERWISE SAID PREMISES MAYBE BOUNDED OR DESCRIBED AND BE ALL OR ANY OF SAID MEASUREMENTS MORE OR LESS.

TOGETHER WITH (A) THE BENEFIT OF AN AGREEMENT BETWEEN UNITED STATES TRUST COMPANY AND OTHERS, TRUSTEES UNDER THE WILL OF I.A. RATSHESKY AND ANOTHER AND E. SOHIER WELCH AND ANOTHER, TRUSTEES, DATED APRIL 30, 1942, AND RECORDED AT BOOK 6006, PAGE 431, SO FAR AS IN FORCE AND APPLICABLE AND (B) CERTAIN "EASEMENT AGREEMENT" DATED JUNE 13, 1978 BY AND BETWEEN JUDITH S. SCHWARTZ AND GLORIA J. BARDEN, TRUSTEES OF WASHINGFIELD REALTY TRUST AND GRANTOR RECORDED AT BOOK 9091, PAGE 471.

SCHEDULE B II - EXCEPTIONS

1. DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS, IF ANY, CREATED FIRST APPEARING IN THE PUBLIC RECORDS OR ATTACHING SUBSEQUENT TO THE EFFECTIVE DATE HEREOF, BUT PRIOR TO THE DATE OF THE PROPOSED INSURED ACQUIRES FOR VALUE OF RECORD THE ESTATE OR INTEREST OR MORTGAGE THEREON COVERED BY THIS COMMITMENT. (NOT A SURVEY MATTER)

2. RIGHTS OR CLAIMS OF PARTIES IN POSSESSION. (NOT A SURVEY MATTER)

3. NOTWITHSTANDING COVERAGE PROVISIONS TO THE CONTRARY CONTAINED HEREIN ANY ENCROACHMENT, ENCUMBRANCE, VIOLATION, VARIATION, OR ADVERSE CIRCUMSTANCE AFFECTING THE TITLE, ARISING SUBSEQUENT TO MARCH, 2007, THAT WOULD BE DISCLOSED BY AN ACCURATE AND COMPLETE LAND SURVEY OF THE LAND. (ENCROACHMENTS AND SURFACE FEATURES AS SHOWN ON THE SURVEY)

THE TERM "ENCROACHMENT" INCLUDES ENCROACHMENTS OF EXISTING IMPROVEMENTS LOCATED ON THE LAND ONTO ADJOINING LAND, AND ENCROACHMENTS ONTO THE LAND OF EXISTING IMPROVEMENTS LOCATED ON ADJOINING LAND.

4. ANY LIEN, OR RIGHT TO A LIEN, FOR SERVICES, LABOR OR MATERIALS HERETOFORE OR HEREAFTER FURNISHED, IMPOSED BY LAW AND NOT SHOWN BY THE PUBLIC RECORDS. (NOT A SURVEY MATTER)

5. SUCH MATTERS AS WOULD BE DISCLOSED BY A CURRENT CERTIFICATE OF MUNICIPAL LIENS. (NOT A SURVEY MATTER)

NOTE(I): ITEMS 2 AND 4 WILL BE REVISED OR DELETED UPON RECEIPT OF A SATISFACTORY AFFIDAVIT AS TO PARTIES IN POSSESSION AND MECHANICS' LIENS. ITEM 3 WILL BE DELETED AND ITEM 14 REVISED UPON RECEIPT OF A SATISFACTORY SURVEY AND SURVEYOR'S REPORT. ITEM 5 WILL BE REVISED UPON RECEIPT OF CERTIFICATE OF MUNICIPAL LIENS.

6. PARTY WALL AND BOUNDARY AGREEMENT DATED JANUARY 20, 1925 RECORDED AT BOOK 4676, PAGE 416 (THE "AGREEMENT"). (PARCEL I) (AS SHOWN ON THE SURVEY)

SEE ENDORSEMENT 1.

7. AGREEMENT DATED APRIL 1, 1944 RECORDED AT BOOK 6097, PAGE 8 (THE 1944 AGREEMENT"). (PARCEL I) (NOT A SURVEY MATTER)

SEE ENDORSEMENT 1.

8. EASEMENT AGREEMENT DATED JUNE 13, 1978 RECORDED AT BOOK 9091, PAGE 471 ("EASEMENT AGREEMENT"). (PARCEL II) (AS SHOWN ON THE SURVEY)

SEE ENDORSEMENT 1.

9. AGREEMENT DATED APRIL 30, 1942, RECORDED AT BOOK 6006, PAGE 431 (THE "1942 AGREEMENT"). (PARCEL II) (NOT A SURVEY MATTER)

SEE ENDORSEMENT 1.

10. COMMON LAW PARTY WALL RIGHTS. (PARTY WALLS ALONG PERIMETER OF THE PREMISES AS SHOWN ON THE SURVEY)

SEE ENDORSEMENT 1.

11. TITLE TO AND RIGHTS OF THE PUBLIC AND OTHERS ENTITLED THERETO IN AND TO THOSE PORTIONS OF THE INSURED PREMISES LYING WITHIN THE BOUNDS OF ORDWAY PLACE. (PARCEL III) (ORDWAY PLACE AS SHOWN ON THE SURVEY)

SEE ENDORSEMENT 1.

12. RIGHTS GRANTED TO THE CITY OF BOSTON TO SLOPE OR BANK THE FILLING OF THAT PORTION OF THE INSURED PREMISES ABUTTING UPON WASHINGTON STREET WHERE REQUIRED FOR THE GRADING OF WASHINGTON STREET AS SET FORTH IN THE DEED OF CHARLES W. ROWELL DATED DECEMBER 17, 1930 AND RECORDED AT BOOK 5233, PAGE 66. (PARCEL III) (LINES OF WASHINGTON STREET AND ORDWAY PLACE AS SHOWN ON THE SURVEY)

SEE ENDORSEMENT 1.

13. TERMS AND PROVISIONS OF AN INDENTURE BETWEEN NANCY HOLKER AND OTHERS RECORDED AT BOOK 378, PAGE 86. (PARCEL IV) (NOT A SURVEY MATTER)

SEE ENDORSEMENT 1.

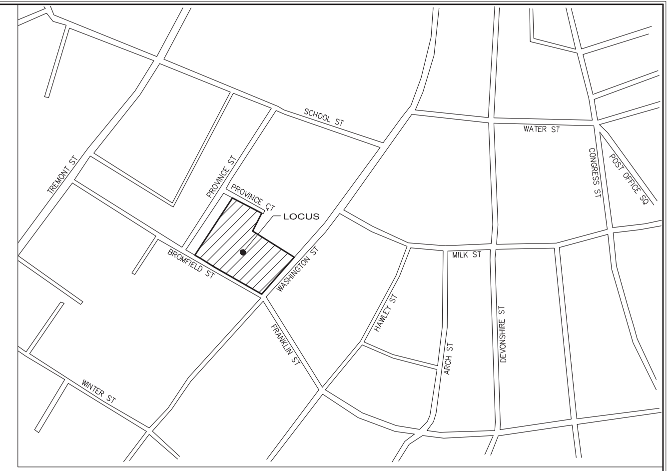
14. ALTA/ACSM LAND TITLE SURVEY (A) 11-21 BROMFIELD STREET AND 8 AND 10 PROVINCE COURT, (B) 1-9 BROMFIELD STREET AND 367-369 WASHINGTON STREET, (C) 349-363 WASHINGTON STREET, AND (D) 365 WASHINGTON STREET, BOSTON, MASS.", PREPARED FOR: 11 BROMFIELD DEVELOPMENT PARTNERS LLC, 367 LLC, 349 ASSOCIATES, M.K. REALTY L.P., AND BOSTON SYNDICATE BY OTTE & DWYER, LAND SURVEYORS, DATED MARCH 1, 2007, PLAT DATED MARCH 26, 2007, SHOWS:

A) WESTERLY WALL OF THE ONE-STORY MASONRY BUILDING (NO. 11-21) IS A PARTY WALL. (AS SHOWN ON THE SURVEY)

B) AIR CONDITIONING UNITS AND VENTS ENCROACH AND/OR PROJECT INTO THE BED OF ORDWAY PLACE, A PRIVATE RIGHT OF WAY. POLICY INSURES AGAINST MONETARY LOSS ARISING FROM THE FORCED REMOVAL THEREOF.

C) ORDWAY PLACE (AS SHOWN ON THE BOSTON CITY ENGINEERING BOOK) EXTENDS INTO THE LAND, AND THE THREE-STORY MASONRY BUILDING (NO. 349-363) ENCROACHES ONTO SAME. POLICY INSURES THAT THE BUILDING MAY REMAIN UNDISTURBED AS LONG AS IT SHALL STAND.

15. RIGHTS OF TENANT, AS TENANT ONLY, UNDER THAT CERTAIN LEASE TO CITY SPORTS, NOTICE OF WHICH IS DATED OCTOBER 31, 1997 AND RECORDED AT BOOK 22461, PAGE 263 WITH NO RIGHTS OF FIRST REFUSAL OR OPTIONS TO PURCHASE, AS AFFECTED BY LEASE SUBORDINATION, ATTORNMENT AND RATIFICATION AND NON-DISTURBANCE AGREEMENT DATED AS OF DECEMBER 29, 2011, BETWEEN WEBSTER BANK NATIONAL ASSOCIATION AND CITY SPORTS, INC., RECORDED JANUARY 6, 2012 IN BOOK 48912, PAGE 318. (PARCEL I) (NOT A SURVEY MATTER)



LOCUS MAP
NOT TO SCALE

FLOOD ZONE INFORMATION

THE PARCELS SHOWN HEREON LIE WITHIN A ZONE "X" (AREAS TO BE DETERMINED OUTSIDE OF THE 0.2% CHANCE ANNUAL FLOODPLAIN) AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR THE COUNTY OF SUFFOLK, MASSACHUSETTS. COMMUNITY PANEL NO. 25025C0081G, EFFECTIVE DATE: SEPTEMBER 25, 2009.

TO: 349 ASSOCIATES LP;
M.K. REALTY LP;
367 (THREE SIXTY SEVEN) LLC;
BOSTON SYNDICATE; AND
FIDELITY NATIONAL TITLE INSURANCE COMPANY
11 BROMFIELD DEVELOPMENT PARTNERS
MIDWOOD MANAGEMENT CORPORATION
LOCKE LORD LLP

THIS IS TO CERTIFY TO THE BEST OF MY KNOWLEDGE INFORMATION AND BELIEF THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 7(b)(1), 8, 9, 11(a), 13 & 14 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON AUGUST 14, 2014. THAT THE PROPERTY IS THE SAME AS THE PROPERTY IN THE LEGAL DESCRIPTION SET FORTH IN THE COMMITMENT.

PAUL R. LEBARON, P.L.S. DATE

Nitsch Engineering
www.nitscheng.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Sustainable Site Consulting
- Planning
- GIS

PROJECT # 6935.2
FILE: 6935.2_ALTA1.dwg
SCALE: 1"=20"
DATE: AUGUST 14, 2014
PROJECT MANAGER: PRL
FIELD BOOK: 595
DRAFTED BY: PRL
CHECKED BY:

REV.	COMMENTS	DATE
1	EDIT CERT	12/14/14

REVISIONS

ALTA/ACSM LAND TITLE SURVEY
BROMFIELD STREET
BOSTON, MASSACHUSETTS

PREPARED FOR:
MIDWOOD MANAGEMENT CORPORATION
430 PARK AVENUE, SUITE 505, NEW YORK, NEW YORK 10022

SHEET: 1
EX-1
OF 2 REV.

Appendix B

Transportation Appendix

Available Upon Request

Appendix C

Wind

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
7	A	Data Not Available						
	B	Data Not Applicable						
8	A	Data Not Available						
	B	Spring	14		Standing	18		Acceptable
		Summer	12		Sitting	15		Acceptable
		Fall	14		Standing	17		Acceptable
		Winter	15		Standing	19		Acceptable
		Annual	14		9	-25%	Acceptable	
		Fall	7	-22%	Sitting	11	-21%	Acceptable
		Winter	8	-27%	Sitting	12	-25%	Acceptable
		Annual	7	-22%	Sitting	11	-21%	Acceptable
10	A	Spring	9		Sitting	15		Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	15		Acceptable
	B	Spring	13	+44%	Standing	18	+20%	Acceptable
		Summer	12	+50%	Sitting	15	+25%	Acceptable
		Fall	13	+44%	Standing	17	+21%	Acceptable
		Winter	14	+40%	Standing	19	+19%	Acceptable
		Annual	13	+44%	Standing	17	+13%	Acceptable
11	A	Spring	15		Standing	Standing	18	Acceptable
9	A	Spring	10		Sitting	15		Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	11		Sitting	16		Acceptable
		Annual	9		Sitting	14		Acceptable
	B	Spring	8	-20%	Sitting	12	-20%	Acceptable
		Summer	6	-25%	Sitting			
22		Acceptable						
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	21		Acceptable
	B	Spring	14		Standing	19	-14%	Acceptable
		Summer	13		Standing	16	-16%	Acceptable
		Fall	14		Standing	19		Acceptable
		Winter	15		Standing	20	-13%	Acceptable
		Annual	14		Standing	19		Acceptable
12	A	Spring	11		Sitting	17		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	16		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	19	+73%	Walking	25	+47%	Acceptable
		Summer	16	+60%	Walking	20	+33%	Acceptable
		Fall	19	+73%	Walking	24	+50%	Acceptable
		Winter	21	+91%	Uncomfortable	26	+44%	Acceptable
		Annual	19	+73%	Walking	24	+41%	Acceptable
13	A	Spring	10		Sitting	16		Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	15	+50%	Standing	21	+31%	Acceptable
		Summer	12	+50%	Sitting	17	+42%	Acceptable
		Fall	14	+40%	Standing	20	+33%	Acceptable
		Winter	16	+45%	Walking	22	+29%	Acceptable
		Annual	15	+50%	Standing	21	+31%	Acceptable
14	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
	B	Spring	10		Sitting	14	-18%	Acceptable
		Summer	8	-11%	Sitting	12	-14%	Acceptable
		Fall	9	-18%	Sitting	14	-12%	Acceptable
		Winter	10	-17%	Sitting	15	-12%	Acceptable
		Annual	9	-18%	Sitting	14	-12%	Acceptable
15	A	Spring	17		Walking	22		Acceptable
		Summer	14		Standing	18		Acceptable
		Fall	16		Walking	21		Acceptable
		Winter	18		Walking	23		Acceptable
		Annual	17		Walking	22		Acceptable
	B	Spring	15	-12%	Standing	20		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	14	-12%	Standing	19		Acceptable
		Winter	15	-17%	Standing	21		Acceptable
		Annual	14	-18%	Standing	19	-14%	Acceptable
16	A	Spring	14		Standing	20		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	16		Walking	21		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	21	+50%	Uncomfortable	26	+30%	Acceptable
		Summer	18	+38%	Walking	22	+22%	Acceptable
		Fall	21	+50%	Uncomfortable	25	+32%	Acceptable
		Winter	23	+44%	Uncomfortable	28	+33%	Acceptable
		Annual	21	+50%	Uncomfortable	26	+30%	Acceptable
17	A	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	14		Standing	19		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	14		Standing	18		Acceptable
18	A	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	16		Walking	22		Acceptable
	B	Spring	14	-12%	Standing	21		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	13	-13%	Standing	20		Acceptable
		Winter	14	-12%	Standing	21		Acceptable
		Annual	14	-12%	Standing	20		Acceptable
19	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	13		Standing	18	-14%	Acceptable
		Summer	11		Sitting	16	-11%	Acceptable
		Fall	11	-15%	Sitting	17	-11%	Acceptable
		Winter	11	-21%	Sitting	17	-15%	Acceptable
		Annual	12	-14%	Sitting	17	-15%	Acceptable
20	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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 Conditions: > 27 mph

Effective Gust Criteria

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
21	A	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	14	-12%	Standing	21		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	13	-13%	Standing	19		Acceptable
		Winter	13	-13%	Standing	20		Acceptable
		Annual	13	-13%	Standing	20		Acceptable
22	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
23	A	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	9		Sitting	16		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	9	+12%	Sitting	14		Acceptable
		Fall	10	+11%	Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
24	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	15		Standing	25		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	13		Standing	21		Acceptable
25	A	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
26	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	8	-11%	Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	10		Sitting	16		Acceptable
27	A	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15	+15%	Standing	21		Acceptable
28	A	Spring	23		Uncomfortable	33		Unacceptable
		Summer	17		Walking	26		Acceptable
		Fall	21		Uncomfortable	31		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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 Conditions:	> 27 mph

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	25		Uncomfortable	36		Unacceptable
		Annual	22		Uncomfortable	33		Unacceptable
	B	Spring	22		Uncomfortable	33		Unacceptable
		Summer	17		Walking	26		Acceptable
		Fall	21		Uncomfortable	31		Acceptable
		Winter	25		Uncomfortable	36		Unacceptable
		Annual	22		Uncomfortable	33		Unacceptable
29	A	Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	11		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	17		Acceptable
30	A	Spring	25		Uncomfortable	33		Unacceptable
		Summer	22		Uncomfortable	29		Acceptable
		Fall	23		Uncomfortable	31		Acceptable
		Winter	25		Uncomfortable	33		Unacceptable
		Annual	24		Uncomfortable	32		Unacceptable
	B	Spring	25		Uncomfortable	33		Unacceptable
		Summer	22		Uncomfortable	29		Acceptable
		Fall	24		Uncomfortable	32		Unacceptable
		Winter	25		Uncomfortable	33		Unacceptable
		Annual	24		Uncomfortable	32		Unacceptable
31	A	Spring	21		Uncomfortable	28		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	26		Acceptable
		Winter	22		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
	B	Spring	22		Uncomfortable	28		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	22		Uncomfortable	29		Acceptable
		Annual	21		Uncomfortable	27		Acceptable
32	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	21		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	21		Acceptable
33	A	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
34	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	25		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	13		Standing	22		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	14		Standing	24		Acceptable
		Annual	13		Standing	21		Acceptable
35	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	11		Sitting	18		Acceptable
36	A	Spring	15		Standing	24		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	16		Walking	26		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
37	A	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
38	A	Spring	10		Sitting	18		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	10		Sitting	18		Acceptable
		Winter	11		Sitting	20		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	9		Sitting	17		Acceptable
		Summer	8	-20%	Sitting	15		Acceptable
		Fall	9		Sitting	17		Acceptable
		Winter	10		Sitting	18		Acceptable
		Annual	9	-18%	Sitting	17		Acceptable
39	A	Spring	17		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	15	-12%	Standing	22		Acceptable
		Summer	11	-15%	Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16	-11%	Walking	24		Acceptable
		Annual	15		Standing	21		Acceptable
40	A	Spring	16		Walking	21		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	15		Standing	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	18		Walking	23		Acceptable
		Annual	16		Walking	21		Acceptable
	B	Spring	14	-12%	Standing	19		Acceptable
		Summer	11	-15%	Sitting	15	-12%	Acceptable
		Fall	13	-13%	Standing	18		Acceptable
		Winter	15	-17%	Standing	21		Acceptable
		Annual	14	-12%	Standing	19		Acceptable
41	A	Spring	14		Standing	19		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	14		Standing	19		Acceptable
	B	Spring	10	-29%	Sitting	15	-21%	Acceptable
		Summer	9	-25%	Sitting	13	-19%	Acceptable
		Fall	9	-31%	Sitting	14	-22%	Acceptable
		Winter	10	-29%	Sitting	15	-25%	Acceptable
		Annual	9	-36%	Sitting	14	-26%	Acceptable
42	A	Spring	12		Sitting	17		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	13		Standing	18		Acceptable
		Annual	12		Sitting	17		Acceptable
	B	Spring	16	+33%	Walking	21	+24%	Acceptable
		Summer	13	+30%	Standing	17	+13%	Acceptable
		Fall	15	+36%	Standing	20	+18%	Acceptable
		Winter	17	+31%	Walking	23	+28%	Acceptable
		Annual	16	+33%	Walking	21	+24%	Acceptable
43	A	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15	-17%	Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
44	A	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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 Conditions:	> 27 mph

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	15	+15%	Standing	22		Acceptable
		Summer	13	+18%	Standing	19	+12%	Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16	+14%	Walking	24		Acceptable
		Annual	15	+15%	Standing	22		Acceptable
45	A	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	16		Walking	25		Acceptable
	B	Spring	19	+12%	Walking	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	18	+12%	Walking	26		Acceptable
		Winter	21	+24%	Uncomfortable	30	+11%	Acceptable
		Annual	19	+19%	Walking	27		Acceptable
46	A	Spring	16		Walking	24		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
47	A	Spring	17		Walking	25		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	17		Walking	26		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	17		Walking	26	12%	Acceptable
		Winter	18	11%	Walking	28	14%	Acceptable
		Annual	17		Walking	26	12%	Acceptable
48	A	Spring	23		Uncomfortable	31		Acceptable
		Summer	19		Walking	25		Acceptable
		Fall	22		Uncomfortable	29		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	24		Uncomfortable	32		Unacceptable
		Annual	23		Uncomfortable	30		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	25		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
49	A	Spring	18		Walking	24		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	16	-11%	Walking	23		Acceptable
		Summer	13	-13%	Standing	19		Acceptable
		Fall	15	-12%	Standing	22		Acceptable
		Winter	16	-16%	Walking	24		Acceptable
		Annual	15	-12%	Standing	22		Acceptable
50	A	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
51	A	Spring	19		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	19		Walking	26		Acceptable
	B	Spring	20		Uncomfortable	27		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	22		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
52	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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 Conditions:	> 27 mph

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	11	-21%	Sitting	19	-14%	Acceptable
		Summer	9	-18%	Sitting	15	-12%	Acceptable
		Fall	11	-15%	Sitting	17	-15%	Acceptable
		Winter	12	-20%	Sitting	20	-13%	Acceptable
		Annual	11	-21%	Sitting	18	-14%	Acceptable
53	A	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable
54	A	Spring	17		Walking	26		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	17		Walking	26		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	18		Walking	29		Acceptable
		Annual	17		Walking	26		Acceptable
55	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
56	A	Spring	9		Sitting	14		Acceptable
		Summer	7		Sitting	12		Acceptable
		Fall	8		Sitting	14		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	9		Sitting	15		Acceptable
		Annual	9		Sitting	14		Acceptable
	B	Spring	9		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	8		Sitting	13		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	9		Sitting	14		Acceptable
57	A	Spring	15		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
58	A	Spring	29		Dangerous	37		Unacceptable
		Summer	22		Uncomfortable	29		Acceptable
		Fall	27		Uncomfortable	34		Unacceptable
		Winter	32		Dangerous	40		Unacceptable
		Annual	29		Dangerous	36		Unacceptable
	B	Spring	30		Dangerous	38		Unacceptable
		Summer	24		Uncomfortable	30		Acceptable
		Fall	28		Dangerous	36		Unacceptable
		Winter	33		Dangerous	41		Unacceptable
		Annual	30		Dangerous	37		Unacceptable
59	A	Spring	29		Dangerous	39		Unacceptable
		Summer	23		Uncomfortable	30		Acceptable
		Fall	27		Uncomfortable	36		Unacceptable
		Winter	32		Dangerous	42		Unacceptable
		Annual	29		Dangerous	38		Unacceptable
	B	Spring	31		Dangerous	40		Unacceptable
		Summer	24		Uncomfortable	31		Acceptable
		Fall	29		Dangerous	37		Unacceptable
		Winter	34		Dangerous	44		Unacceptable
		Annual	30		Dangerous	40		Unacceptable
60	A	Spring	13		Standing	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	12		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	13		Standing	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
61	A	Spring	11		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	12		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
	B	Spring	10		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	15		Acceptable
62	A	Spring	15		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	22		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	16		Walking	21		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	20		Acceptable
		Winter	17		Walking	22		Acceptable
		Annual	15		Standing	21		Acceptable
63	A	Spring	22		Uncomfortable	30		Acceptable
		Summer	19		Walking	26		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	19		Walking	25		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	22		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
64	A	Spring	18		Walking	24		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	20		Uncomfortable	26		Acceptable
		Annual	18		Walking	24		Acceptable
	B	Spring	20	+11%	Uncomfortable	26		Acceptable
		Summer	16		Walking	21		Acceptable
		Fall	19	+12%	Walking	24		Acceptable
		Winter	21		Uncomfortable	28		Acceptable
		Annual	20	+11%	Uncomfortable	26		Acceptable
65	A	Spring	18		Walking	24		Acceptable
		Summer	16		Walking	21		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	B	Spring	20	+11%	Uncomfortable	26		Acceptable
		Summer	18	+12%	Walking	23		Acceptable
		Fall	19	+12%	Walking	25		Acceptable
		Winter	20	+11%	Uncomfortable	26		Acceptable
		Annual	19	+12%	Walking	25		Acceptable
66	A	Spring	19		Walking	25		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18		Walking	24		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	18		Walking	24		Acceptable
67	A	Spring	16		Walking	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	15		Standing	21		Acceptable
	B	Spring	17		Walking	23		Acceptable
		Summer	15	+15%	Standing	20		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable
68	A	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	16	+14%	Walking	22		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
69	A	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	14		Standing	21	+11%	Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20	+11%	Acceptable
		Winter	14		Standing	21	+11%	Acceptable
		Annual	13		Standing	20	+11%	Acceptable
70	A	Spring	15		Standing	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
71	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
72	A	Spring	8		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	8		Sitting	13		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	9		Sitting	15		Acceptable
		Annual	8		Sitting	14		Acceptable
	B	Spring	9	+12%	Sitting	15		Acceptable
		Summer	8	+14%	Sitting	13	+18%	Acceptable
		Fall	9	+12%	Sitting	14		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	9	+12%	Sitting	15		Acceptable
73	A	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	13		Standing	19		Acceptable
74	A	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
75	A	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	12		Sitting	18		Acceptable
76	A	Spring	19		Walking	27		Acceptable
		Summer	17		Walking	22		Acceptable
		Fall	18		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	19		Walking	27		Acceptable
		Annual	19		Walking	25		Acceptable
	B	Spring	19		Walking	27		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	18		Walking	25		Acceptable
77	A	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
78	A	Spring	19		Walking	25		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	18		Walking	24		Acceptable
		Winter	20		Uncomfortable	27		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	20		Uncomfortable	27		Acceptable
		Annual	18		Walking	25		Acceptable
79	A	Spring	16		Walking	21		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	15		Standing	20		Acceptable
		Winter	17		Walking	22		Acceptable
		Annual	16		Walking	21		Acceptable
	B	Spring	14	-12%	Standing	20		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13	-13%	Standing	19		Acceptable
		Winter	15	-12%	Standing	21		Acceptable
		Annual	14	-12%	Standing	19		Acceptable
80	A	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	17		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
81	A	Spring	13		Standing	19		Acceptable
		Summer	11		Sitting	15		Acceptable
		Fall	13		Standing	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	9	-18%	Sitting	14		Acceptable
		Fall	11	-15%	Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
82	A	Spring	9		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	8		Sitting	13		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	8		Sitting	14		Acceptable
	B	Spring	9		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	8		Sitting	13		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	9	+12%	Sitting	14		Acceptable
83	A	Spring	15		Standing	25		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	16		Walking	27		Acceptable
		Annual	15		Standing	25		Acceptable
	B	Spring	15		Standing	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	15		Standing	24		Acceptable
84	A	Spring	15		Standing	24		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	17		Walking	26		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	15		Standing	24		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	15		Standing	23		Acceptable
85	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	18		Walking	25		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
86	A	Spring	21		Uncomfortable	28		Acceptable
		Summer	18		Walking	23		Acceptable
		Fall	20		Uncomfortable	26		Acceptable
		Winter	21		Uncomfortable	28		Acceptable
		Annual	20		Uncomfortable	26		Acceptable
	B	Spring	21		Uncomfortable	28		Acceptable
		Summer	18		Walking	23		Acceptable
		Fall	20		Uncomfortable	26		Acceptable
		Winter	21		Uncomfortable	28		Acceptable
		Annual	20		Uncomfortable	26		Acceptable
87	A	Spring	10		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	10		Sitting	15		Acceptable
	B	Spring	10		Sitting	16		Acceptable
		Summer	8	-11%	Sitting	13		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	15		Acceptable
		Annual	9		Sitting	15		Acceptable
88	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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 Conditions: > 27 mph

<u>Effective Gust Criteria</u>

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	13		Standing	22		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
89	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
90	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	12	-14%	Sitting	19	-14%	Acceptable
		Summer	10		Sitting	16	-11%	Acceptable
		Fall	11	-15%	Sitting	18	-14%	Acceptable
		Winter	12	-20%	Sitting	19	-21%	Acceptable
		Annual	12	-14%	Sitting	18	-14%	Acceptable
91	A	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
92	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
93	A	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	23		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	18		Walking	27		Acceptable
	B	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
94	A	Spring	18		Walking	25		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18		Walking	24		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	18		Walking	24		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18		Walking	24		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	18		Walking	24		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B - Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Appendix D

Shadow Studies

March 21st 8:06am - Shadow enters the Shadow Impact Area

March 21st 8:48am - Shadow exits the Shadow Impact Area

BOSTON COMMON

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

	March 21st	June 21st	October 21st
Boston Common	8:06am to 8:48am	8:00am to 9:20am	N/A
Park Street Church	N/A	8:20am to 9:44am	N/A
Old Granary Burial Ground	8:28am to 10:20am	8:50am to 10:40am	8:58am to 9:28am
King's Chapel	12:02 pm to 12:42pm	N/A	11:36am to 11:46am
Old City Hall Plaza	12:24pm to 2:02pm	N/A	12:50pm to 1:50pm
The Old Corner Bookstore	N/A	N/A	N/A
Irish Famine Memorial (Includes section of Washington St from Milk to School St)	N/A	1:54pm to 2:30pm	N/A
Old South Meeting House	N/A	2:28pm to 2:30pm	N/A
Shopper's Park	N/A	N/A	N/A
Winter Street - Between Tremont & Washington	N/A	N/A	N/A
Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

ADRIAN SMITH + GORDON GILL ARCHITECTURE

Article 38 Shadow Impact Areas

Analysis Zone

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

B Bus Stop

T MBTA Station

MIDWOOD INVESTMENT & DEVELOPMENT

March 21st 8:28am - Shadow enters the Shadow Impact Area

March 21st 10:20am - Shadow exits the Shadow Impact Area

OLD GRANARY BURIAL GROUND

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

	March 21st	June 21st	October 21st
Boston Common	8:06am to 8:48am	8:00am to 9:20am	N/A
Park Street Church	N/A	8:20am to 9:44am	N/A
Old Granary Burial Ground	8:28am to 10:20am	8:50am to 10:40am	8:58am to 9:28am
King's Chapel	12:02 pm to 12:42pm	N/A	11:36am to 11:46am
Old City Hall Plaza	12:24pm to 2:02pm	N/A	12:50pm to 1:50pm
The Old Corner Bookstore	N/A	N/A	N/A
Irish Famine Memorial (Includes section of Washington St from Milk to School St)	N/A	1:54pm to 2:30pm	N/A
Old South Meeting House	N/A	2:28pm to 2:30pm	N/A
Shopper's Park	N/A	N/A	N/A
Winter Street - Between Tremont & Washington	N/A	N/A	N/A
Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

ADRIAN SMITH + GORDON GILL ARCHITECTURE

Article 38 Shadow Impact Areas
Analysis Zone

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

B Bus Stop
T MBTA Station

MIDWOOD INVESTMENT & DEVELOPMENT

March 21st 12:02pm - Shadow enters the Shadow Impact Area

March 21st 12:42pm - Shadow exits the Shadow Impact Area

KING'S CHAPEL

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

	March 21st	June 21st	October 21st
Boston Common	8:06am to 8:48am	8:00am to 9:20am	N/A
Park Street Church	N/A	8:20am to 9:44am	N/A
Old Granary Burial Ground	8:28am to 10:20am	8:50am to 10:40am	8:58am to 9:28am
King's Chapel	12:02 pm to 12:42pm	N/A	11:36am to 11:46am
Old City Hall Plaza	12:24pm to 2:02pm	N/A	12:50pm to 1:50pm
The Old Corner Bookstore	N/A	N/A	N/A
Irish Famine Memorial (Includes section of Washington St from Milk to School St)	N/A	1:54pm to 2:30pm	N/A
Old South Meeting House	N/A	2:28pm to 2:30pm	N/A
Shopper's Park	N/A	N/A	N/A
Winter Street - Between Tremont & Washington	N/A	N/A	N/A
Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

Article 38 Shadow Impact Areas
Analysis Zone
New Shadows Cast by One Bromfield Proposed
New Shadows Cast by As Of Right Model
Shadows Cast by Other Urban Context
Bus Stop
MBTA Station

March 21st 12:24pm - Shadow enters the Shadow Impact Area

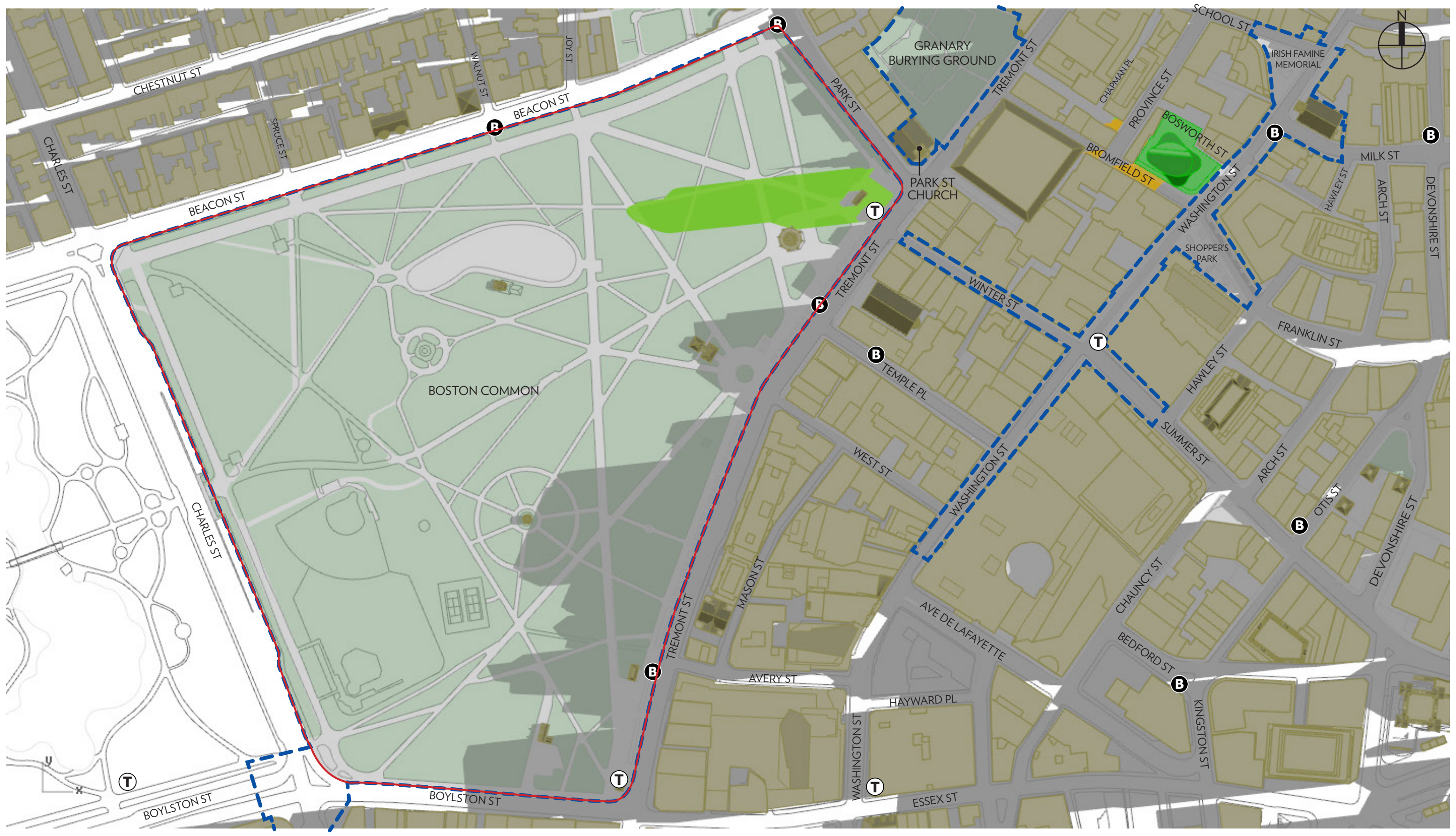
March 21st 2:02pm - Shadow exits the Shadow Impact Area

OLD CITY HALL PLAZA

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

	March 21st	June 21st	October 21st
Boston Common	8:06am to 8:48am	8:00am to 9:20am	N/A
Park Street Church	N/A	8:20am to 9:44am	N/A
Old Granary Burial Ground	8:28am to 10:20am	8:50am to 10:40am	8:58am to 9:28am
King's Chapel	12:02 pm to 12:42pm	N/A	11:36am to 11:46am
Old City Hall Plaza	12:24pm to 2:02pm	N/A	12:50pm to 1:50pm
The Old Corner Bookstore	N/A	N/A	N/A
Irish Famine Memorial (Includes section of Washington St from Milk to School St)	N/A	1:54pm to 2:30pm	N/A
Old South Meeting House	N/A	2:28pm to 2:30pm	N/A
Shopper's Park	N/A	N/A	N/A
Winter Street - Between Tremont & Washington	N/A	N/A	N/A
Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

Article 38 Shadow Impact Areas
Analysis Zone
New Shadows Cast by One Bromfield Proposed
New Shadows Cast by As Of Right Model
Shadows Cast by Other Urban Context
Bus Stop
MBTA Station



June 21st 8:00am - Shadow Impact Area analysis period begins

June 21st 9:20am - Shadow exits the Shadow Impact Area

BOSTON COMMON

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

	March 21st	June 21st	October 21st
Boston Common	8:06am to 8:48am	8:00am to 9:20am	N/A
Park Street Church	N/A	8:20am to 9:44am	N/A
Old Granary Burial Ground	8:28am to 10:20am	8:50am to 10:40am	8:58am to 9:28am
King's Chapel	12:02 pm to 12:42pm	N/A	11:36am to 11:46am
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Shopper's Park	N/A	N/A	N/A
Winter Street - Between Tremont & Washington	N/A	N/A	N/A
Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

Article 38 Shadow Impact Areas
Analysis Zone

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop
MBTA Station

June 21st 8:20am - Shadow enters the Shadow Impact Area

June 21st 9:44am - Shadow exits the Shadow Impact Area

PARK STREET CHURCH

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Old South Meeting House	N/A	2:28pm to 2:30pm	N/A
Shopper's Park	N/A	N/A	N/A
Winter Street - Between Tremont & Washington	N/A	N/A	N/A
Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

June 21st 8:50am - Shadow enters the Shadow Impact Area

June 21st 10:40am - Shadow exits the Shadow Impact Area

OLD GRANARY BURIAL GROUND

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

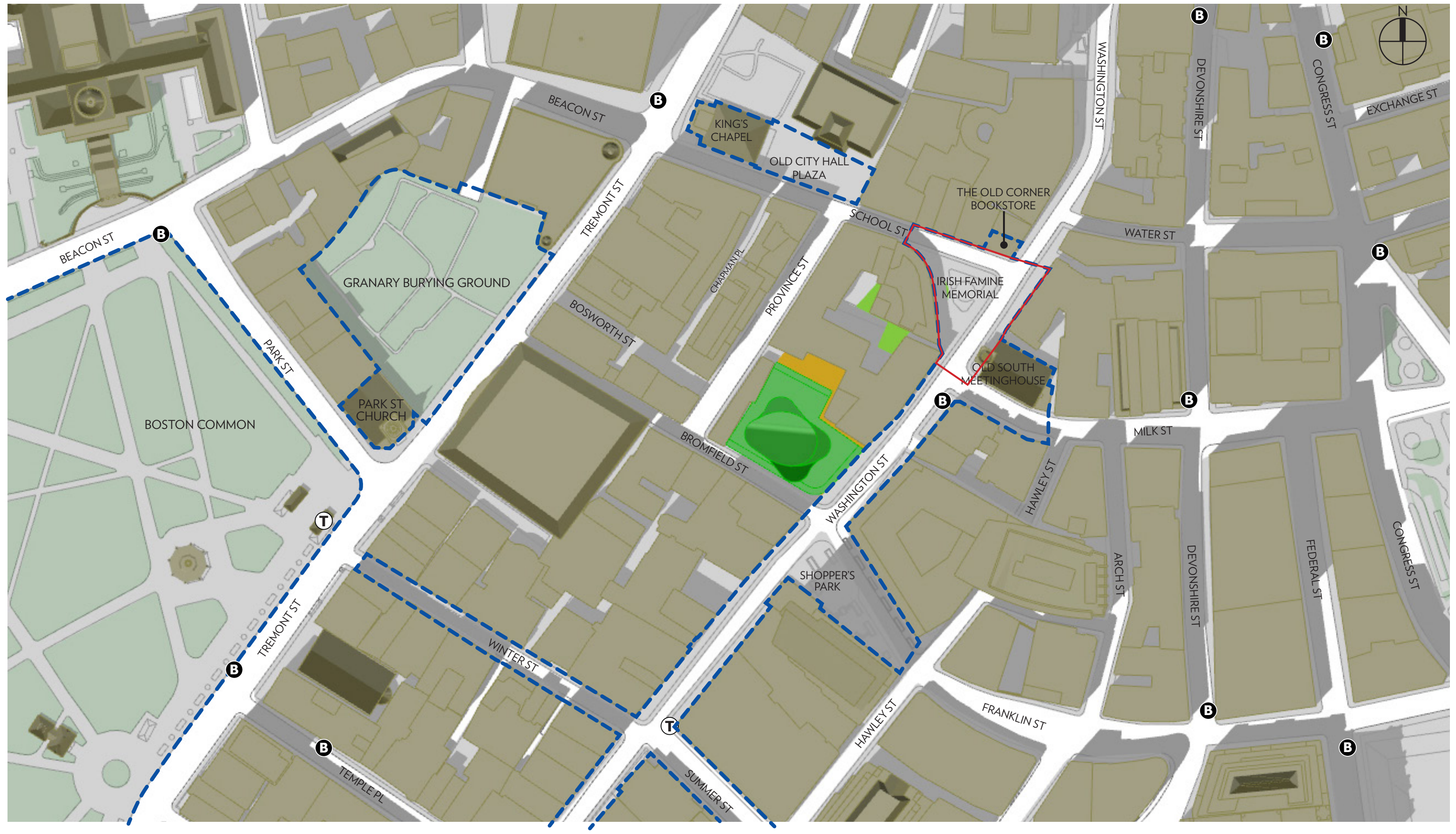
Article 38 Shadow Impact Areas
Analysis Zone

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

B Bus Stop
T MBTA Station



June 21st 1:54pm - Shadow enters the Shadow Impact Area

June 21st 2:30pm - Shadow Impact Area analysis period concludes

IRISH FAMINE MEMORIAL

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
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Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

Article 38 Shadow Impact Areas
Analysis Zone
New Shadows Cast by One Bromfield Proposed
New Shadows Cast by As Of Right Model
Shadows Cast by Other Urban Context
Bus Stop
MBTA Station

June 21st 2:28pm - Shadow enters the Shadow Impact Area

June 21st 2:30pm - Shadow Impact Area analysis period concludes

OLD SOUTH MEETING HOUSE

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Washington Street - Between Temple & Winter	N/A	N/A	N/A
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Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

June 21st 2:20pm - Shadow enters the Shadow Impact Area

June 21st 2:30pm - Shadow Impact Area analysis period concludes

WASHINGTON STREET - BETWEEN BROMFIELD & MILK

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
Washington Street - Between Winter & Bromfield	N/A	N/A	N/A
Washington Street - Between Bromfield & Milk Street	N/A	2:20pm to 2:30pm	N/A
Summer Street - Between Washington & Hawley	N/A	N/A	N/A
Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

ADRIAN SMITH + GORDON GILL
ARCHITECTURE

Article 38 Shadow Impact Areas
Analysis Zone

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

B Bus Stop
T MBTA Station

MIDWOOD
INVESTMENT & DEVELOPMENT

October 21st 8:58am - Shadow enters the Shadow Impact Area

October 21st 9:28am - Shadow exits the Shadow Impact Area

OLD GRANARY BURIAL GROUND

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Washington Street - Between Temple & Winter	N/A	N/A	N/A
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Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

ADRIAN SMITH + GORDON GILL ARCHITECTURE

Article 38 Shadow Impact Areas
Analysis Zone

New Shadows Cast by One Bromfield Proposed

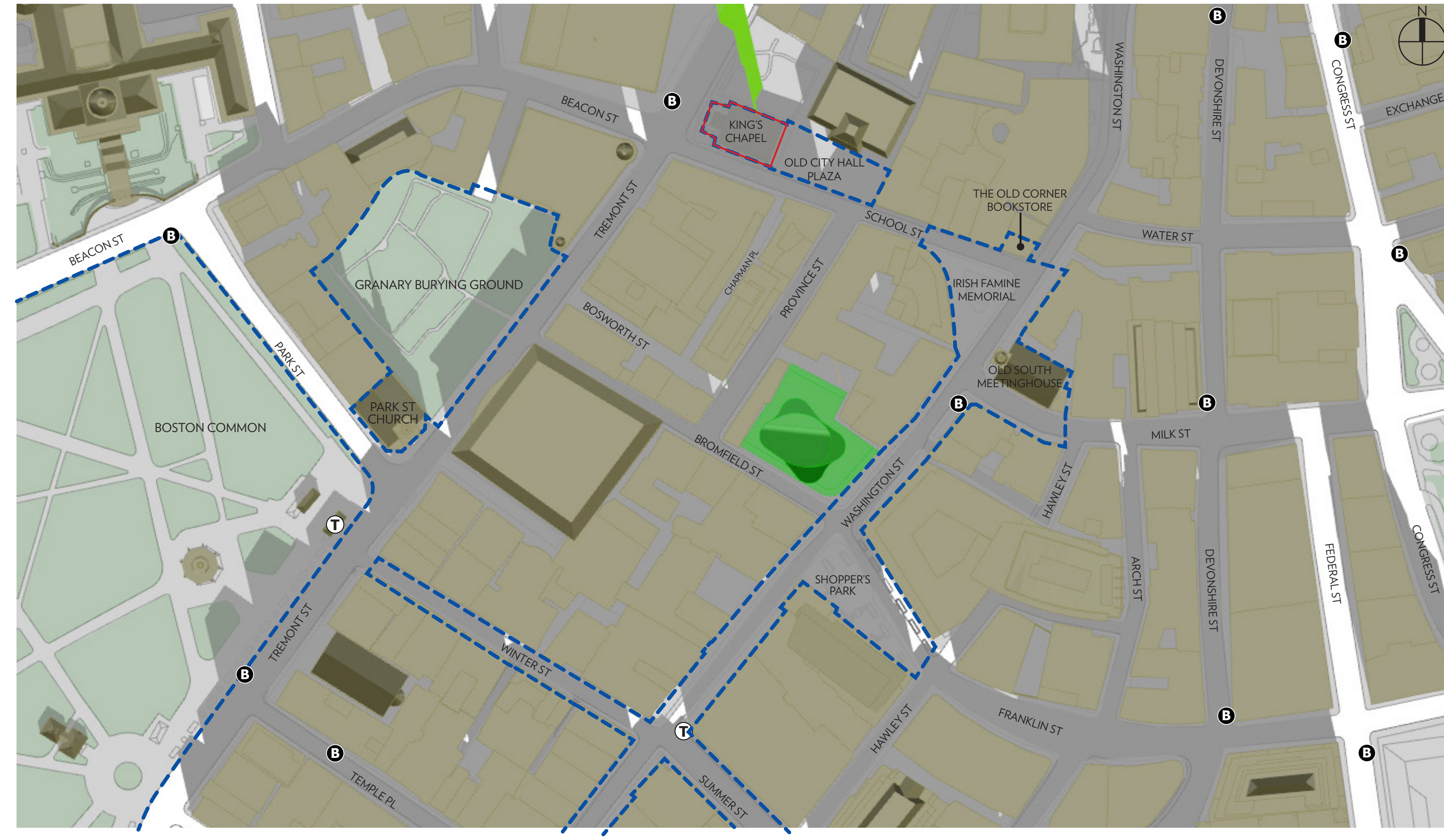
New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

Bus Stop
MBTA Station

MIDWOOD INVESTMENT & DEVELOPMENT

October 21st 11:36am - Shadow enters the Shadow Impact Area



October 21st 11:46am - Shadow exits the Shadow Impact Area

KING'S CHAPEL

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

Article 38 Shadow Impact Areas
Analysis Zone

New Shadows Cast by One Bromfield Proposed

New Shadows Cast by As Of Right Model

Shadows Cast by Other Urban Context

B Bus Stop
T MBTA Station

October 21st 12:50pm - Shadow enters the Shadow Impact Area

October 21st 1:50pm - Shadow exits the Shadow Impact Area

OLD CITY HALL PLAZA

For the Article 38 shadow study, a 3D model of the Project was inserted into the 3D model of the City of Boston distributed by the BRA. Snapshot plan images were rendered of the area at the times when the net new shadow impacts from the Project, when compared with the as-of-right height allowed for the site, occurred on Shadow Impact Areas between the times of 8:00am to 2:30pm, from March 21st through October 21st. Two images are provided: the first image shows the period indicating the beginning of the shadow impact, and the second image shows when the shadow impact is over. Daylight Savings Time was used in order that the shadow study is consistent with previous shadow study criteria.

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Washington Street - Between West Street & Temple	N/A	N/A	N/A
Washington Street - Between Temple & Winter	N/A	N/A	N/A
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Franklin Street - Between Washington & Hawley	N/A	N/A	N/A
Milk Street - Between Washington & Hawley	N/A	N/A	N/A

Article 38 Shadow Impact Areas
Analysis Zone
New Shadows Cast by One Bromfield Proposed
New Shadows Cast by As Of Right Model
Shadows Cast by Other Urban Context
Bus Stop
MBTA Station

Appendix E

Air Quality

AIR QUALITY APPENDIX

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale air quality analysis.

Motor Vehicle Emissions

The EPA MOVES computer program generated motor vehicle emissions used in the garage stationary source analysis along with the mobile source CAL3QHC modeling and mesoscale analysis. The model input parameters were provided by MassDEP. Emission rates were derived for 2015 and 2020 for speed limits of idle, 10, 15, and 30 mph for use in the microscale analyses.

MOVES CO Emission Factor Summary

Carbon Monoxide Only

		2016	2021
Free Flow	30 mph	2.697	2.165
Right Turns	10 mph	4.447	3.478
Left Turns	15 mph	3.823	3.039
Queues	Idle	9.997	5.032

Notes: Winter CO emission factors are higher than Summer and are conservatively used
Urban Unrestricted Roadway type used

CAL3QHC

For the intersection studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOVES. The intersection's queue links and free flow links were input to the model along with sensitive receptors at all locations nearby each intersection. The meteorological assumptions input into the model were a 1.0 meter per second wind speed, Pasquill-Gifford Class D stability combined with a mixing height of 1000 meters. For each direction, the full range of wind directions at 10 degree intervals was examined. In addition, a surface roughness (z_0) of 321 cm was used for the intersection. Idle emission rates for queue links were based on 0 mph emission rates derived in MOVES. Emission rates for speeds of 10, 15, and 30 mph were used for right turn, left turn, and free flow links, respectively.

One Bromfield, Boston
Background Concentrations

POLLUTANT	AVERAGING TIME	Form	2012	2013	2014	Units	ppm/ppb to $\mu g/m^3$ Conversion Factor	2012-2014 Background Concentration ($\mu g/m^3$)	Location
SO_2 (1)(5)	1-Hour (4)	99th %	13.2	12	9.7	ppb	2.62	30.5	Kenmore Sq., Boston
	3-Hour (6)	H2H	10.6	13.9	9.4	ppb	2.62	36.4	Kenmore Sq., Boston
	24-Hour	H2H	5.4	6	5	ppb	2.62	15.7	Kenmore Sq., Boston
	Annual	H	1.87	1	0.94	ppb	2.62	4.9	Kenmore Sq., Boston
PM-10	24-Hour	H2H	28.0	50	53	$\mu g/m^3$	1	53	Kenmore Sq., Boston
	Annual	H	15.7	19	14.9	$\mu g/m^3$	1	19.0	Kenmore Sq., Boston
PM-2.5	24-Hour (4)	98th %	20.9	19.9	14.5	$\mu g/m^3$	1	18.4	174 North St, Boston
	Annual (4)	H	9.5	8.8	7.1	$\mu g/m^3$	1	8.5	174 North St, Boston
NO_2 (3)	1-Hour (4)	98th %	49	48	49	ppb	1.88	91.5	Kenmore Sq., Boston
	Annual	H	19.1	17.78	17.17	ppb	1.88	35.9	Kenmore Sq., Boston
CO (2)	1-Hour	H2H	1.3	1.3	1.3	ppm	1146	1489.8	Kenmore Sq., Boston
	8-Hour	H2H	0.9	0.9	0.9	ppm	1146	1031.4	Kenmore Sq., Boston
Ozone	8-Hour	H4H	0.078	0.059	0.054	ppm	1963	153.1	Harrison Ave., Boston
Lead	Rolling 3-Month	H	0.014	0.006	0.014	$\mu g/m^3$	1	0.014	Harrison Ave., Boston

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

Model Input/Output Files

Due to excessive size CAL3QHC, and MOVES input and output files are available on digital media upon request.

Appendix F

Climate Change Preparedness Checklist

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:	One Bromfield
Project Address Primary:	One Bromfield St. Boston, MA 02108
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	

A.2 - Team Description

Owner / Developer:	One Bromfield LLC
Architect:	Adrian Smith + Gordon Gill Architecture
Engineer (building systems):	PositivEnergy Practice, Halvorson & Partners
Sustainability / LEED:	Adrian Smith + Gordon Gill Architecture
Permitting:	Epsilon Associates
Construction Management:	Turner Construction (Pre-construction advisory services)
Climate Change Expert:	

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	Residential condo, residential rental, retail
List the First Floor Uses:	Retail, Residential Lobbies, Loading, Parking Entrance

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

Wood Frame	Masonry	Steel Frame	☑Concrete

Describe the building?

Site Area:	*23,768 SF*	Building Area:	*605,000 SF*
Building Height:	*683 Ft.*	Number of Stories:	*59 Flrs.*
First Floor Elevation (reference Boston City Base):	*41.66 Elev.*	Are there below grade spaces/levels, if yes how many:	*Yes* *Number of Levels* 2

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*
	TBD		*TBD*

A.6 - Building Energy

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

Electric:	*1648 kW*	Heating:	*6.35 MMBtu/hr*
What is the planned building Energy Use Intensity:	*56 kbtu/SF*	Cooling:	*112 Tons/hr*

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

Electric:	*695 kW*	Heating:	*0 MMBtu/hr*
		Cooling:	*0 Tons/hr*

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

Electrical Generation:	*1,000 kW*		Fuel Source:	*Diesel*
System Type and Number of Units:	☑Combustion Engine	Gas Turbine	Combine Heat and Power	*(Units)*

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

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

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

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

What time span of future Climate Conditions was considered?

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

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

L: 0° F, H: 87.6° F dry bulb / 71.7° F wet bulb

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

88 Deg.	*3 Days*	*2 Events / yr.*

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

60 Days	*1 Events / yr.*

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

45 Inches/ yr.	*3.5/5/9 Inches*	*2yr/10yr/100yr frequency*

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?

105 Peak Wind	*Hours*	*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:	*20*
How is performance determined:	Performance based energy model using IES Virtual Environment software

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

Select all appropriate:	☑High performance building envelop	☑High performance lighting & controls	☑Building day lighting	☑EnergyStar equip. / appliances
	☑High performance HVAC equipment	☑Energy recovery ventilation	No active cooling	No active heating
Describe any added measures:	Building massing provides self-shading			

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

Roof:	*R=30*	Walls / Curtain Wall Assembly:	*R=3.7*
Foundation:	*R=7.5*	Basement / Slab:	*R=10*
Windows:	*R= /U=*	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	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 local distributed electrical	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

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

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

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

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

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

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

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

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

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

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

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

	No

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base 41.58 & 54.62 Elev.(Ft.)*
Building Proximity to Water:	*2,455 Ft.*

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

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

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

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

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

1,750 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.BRA@cityofboston.gov

Appendix G

Accessibility Checklist

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
    a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
    a. http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Boston Complete Street Guidelines
    a. http://bostoncompletestreets.org/
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
    a. http://www.cityofboston.gov/Disability
5. City of Boston – Public Works Sidewalk Reconstruction Policy
    a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
    a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations
    a. http://www.mbta.com/about_the_mbta/accessibility/

Article 80 | ACCESSIBILTY CHECKLIST

Project Information

Project Name:	One Bromfield
Project Address Primary:	One Bromfield St. Boston, MA 02108
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	

Team Description

Owner / Developer:	One Bromfield LLC
Architect:	Adrian Smith + Gordon Gill Architecture
Engineer (building systems):	PositivEnergy Practice, Halvorson & Partners
Sustainability / LEED:	Adrian Smith + Gordon Gill Architecture
Permitting:	Epsilon Associates
Construction Management:	Turner Construction (Pre-construction advisory services)

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	☑Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One to Three Unit	☑Residential - Multi-unit, Four +	Institutional	Education

	Commercial	Office	☑Retail	Assembly
	Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	*Retail, Residential Lobbies, Loading, Parking Entrance*			

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	☑Concrete

Describe the building?

Site Area:	*23,768 SF*	Building Area:	*605,000 SF*
Building Height:	*683 Ft.*	Number of Stories:	*59 Flrs.*
First Floor Elevation:	*0'-0"/5'-0"/9'-0" Elev.*	Are there below grade spaces:	*Yes*

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.	The Project site is located in the Downtown Crossing area of Boston. The site is immediately adjacent to office, commercial and residential uses, and has excellent access to public transportation and vehicular transportation systems.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	The Project site is located one block away from the Downtown Crossing Station, which provides access to the MBTA Orange and Red lines. The site is also less than a quarter mile from the Park Street and Government Center Stations, providing access to the MBTA Green Line
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Suffolk University, Suffolk University School of Law
Is the proposed development on a priority accessible route to a key public use facility? List the	No

surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?	Yes
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	The existing sidewalks are composed of bituminous concrete, concrete and unit pavers. The pedestrian curb ramp at Bromfield and Washington Streets is concrete with a polymer detectable warning pavers. The condition of the existing sidewalks and pedestrian curb ramps is fair.
Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have the sidewalks and pedestrian ramps been verified as compliant? If yes, please provide surveyors report.	The existing sidewalks and pedestrian curb ramps will be replaced. The proposed sidewalks and pedestrian curb ramps will be compliant.
Is the development site within a historic district? If yes, please identify.	No

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	The proposed sidewalks will be consistent with the Boston Complete Street Guidelines.

If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Washington St. – Downtown Commercial Bromfield St. – Downtown Commercial
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	WASHINGTON ST. Frontage Zone – varies, 0 - 5 feet Pedestrian Zone – 12 feet minimum Greenscape/Furniture Zone – 6ft minimum Curb Zone – 6 inches Total Width – varies 19 to 26 feet BROMFIELD ST. Frontage Zone – varies 0 to 15 feet Pedestrian Zone – 6 feet minimum, 8 feet typical Greenscape/Furniture Zone – 18 inches Curb Zone – 6 inches Total Width – varies 8 to 10 feet
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	WASHINGTON ST. Frontage Zone – Concrete Pedestrian Zone – Concrete Greenscape/Furniture Zone – Unit Pavers Curb Zone – Existing Granite Curb BROMFIELD ST. Frontage Zone – Unit Pavers Pedestrian Zone – Concrete Greenscape/Furniture Zone – Concrete Curb Zone – Existing Granite Curb
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	Yes
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	No
If yes above, what are the proposed dimensions of the sidewalk café or	N/A

furnishings and what will the right-of-way clearance be?	

Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?	235
What is the total number of accessible spaces provided at the development site?	All parking is valet
Will any on street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	No public parking. ADA drop-off will be provided.
Where is accessible visitor parking located?	Parking will be provided for occupants only.
Has a drop-off area been identified? If yes, will it be accessible?	Yes. It will be accessible.
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	

Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

Article 80 | ACCESSIBILTY CHECKLIST

**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	See attached
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Conditions at each entryway to be flush
Are the accessible entrance and the standard entrance integrated?	Yes
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	No

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

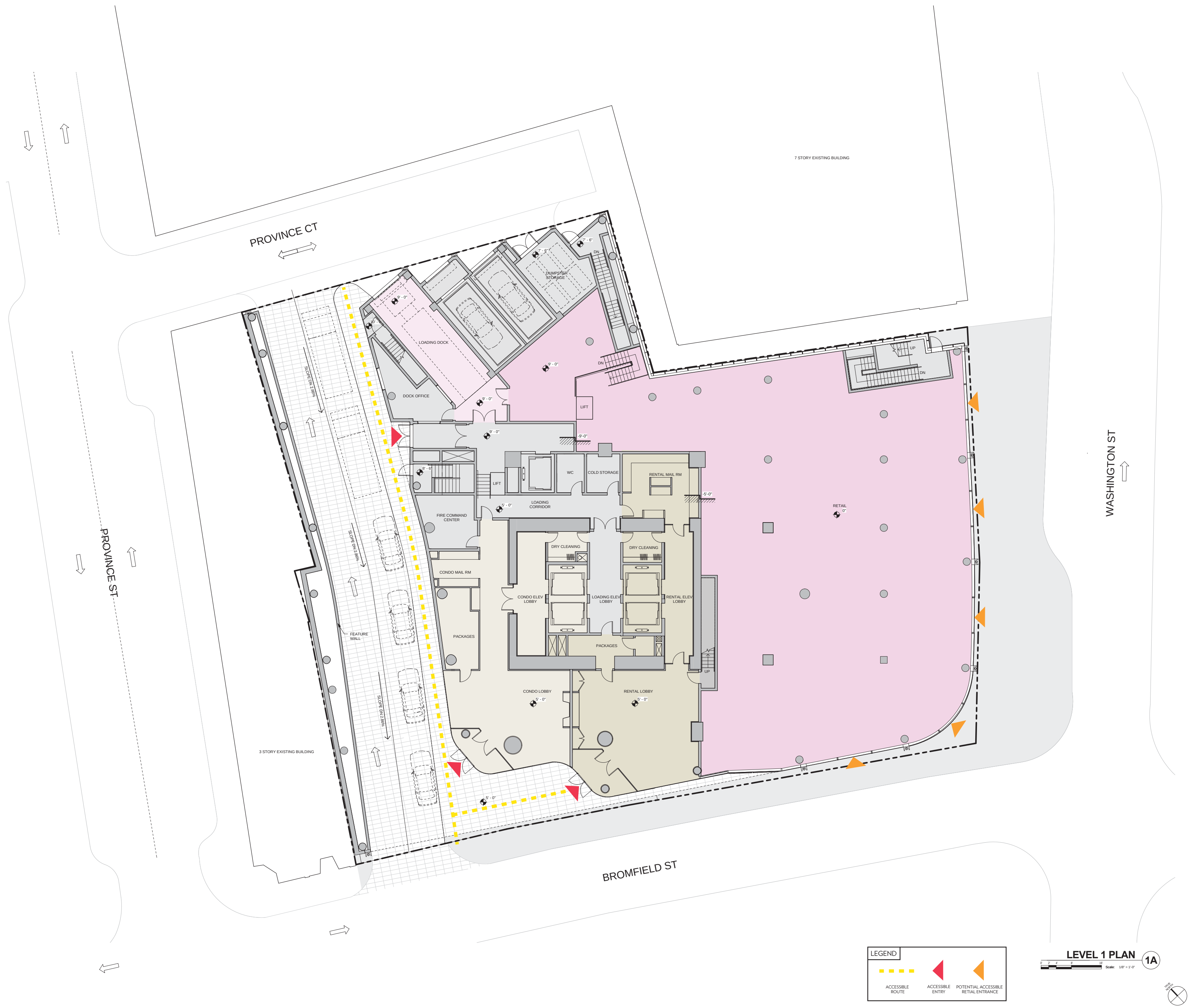
What is the total number of proposed units for the development?	419
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	For sale – 119 units For rent – 300 units 246 market value rental units 54 affordable rental units
How many accessible units are being proposed?	419 (100%) Condos = 119 Group 1 (100%) Rental Units = 285 Group 1 (95%) 15 Group 2A (5%)

Please provide plan and diagram of the accessible units.	Group 2A designated accessible units to be proportionally distributed amongst the various types of dwelling units based on characteristics including, but not limited to: number of bedrooms, unit size, views, unit amenities, bonus features/ rooms offered, units with balconies, etc. within the rental portion of the tower.
How many accessible units will also be affordable? If none, please describe reason.	35 total (100%) 33 Group 1 (95%) 2 Group 2A (5%)
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. If yes, please provide reason.	No
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	No
Did the Advisory Board vote to support this project? If no, what recommendations did the Advisory Board give to make this project more accessible?	

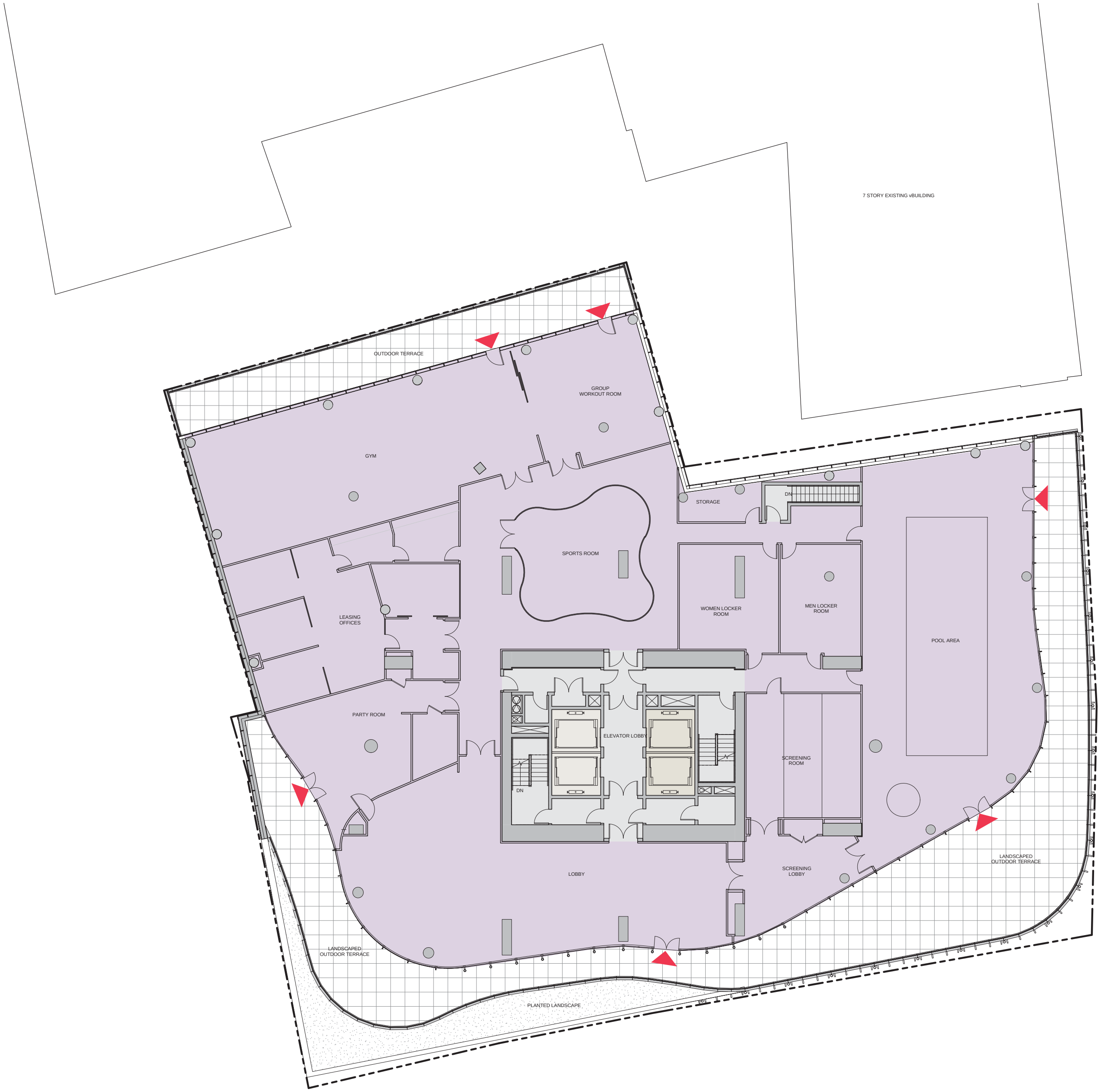
Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities



PROVINCE CT
PROVINCE ST
BROMFIELD ST
WASHINGTON ST
7 STORY EXISTING BUILDING
3 STORY EXISTING BUILDING
LOADING DOCK
DUMPSTER STORAGE
DOCK OFFICE
LIFT
FIRE COMMAND CENTER
LOADING CORRIDOR
WC
COLD STORAGE
RENTAL MAIL RM
CONDO MAIL RM
DRY CLEANING
CONDO ELEV LOBBY
LOADING ELEV LOBBY
RENTAL ELEV LOBBY
PACKAGES
CONDO LOBBY
RENTAL LOBBY
RETAIL
FEATURE WALL
UP
DN
LEGEND
ACCESSIBLE ROUTE
ACCESSIBLE ENTRY
POTENTIAL ACCESSIBLE RETAIL ENTRANCE
LEVEL 1 PLAN
1A



LEGEND

ACCESSIBLE ENTRY

LEVEL 6 PLAN 1A

Scale: 1/8" = 1'-0"