Notice of Project Change

LOVEJOY WHARF

Submitted to:

BOSTON REDEVELOPMENT AUTHORITY
ONE CITY HALL SQUARE
BOSTON, MASSACHUSETTS 02201

Prepared by

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THE ARCHITECTURAL TEAM, INC.
VANASSE & ASSOCIATES, INC.

NOVEMBER 2, 2012

Epsilon
ASSOCIATES INC.

THE BEAL COMPANIES, LLP

RELATED

November 1, 2012

BY HAND

Mr. Peter Meade, Director
Boston Redevelopment Authority
Boston City Hall, 9th Floor
One City Hall Plaza
Boston, Massachusetts 02201

Re: Lovejoy Wharf Project – Notice of Project Change

Dear Director Meade:

On behalf of The Related Companies, L.P. and The Beal Companies, LLP (the "Proponent") we are pleased to submit the enclosed Notice of Project Change for the Lovejoy Wharf Project (the "Project") in accordance with the requirements of Section 80A-6 of the Boston Zoning Code (the "Code"). This filing is being provided pursuant to Section 80A-6 of the Code due to the fact that there have been more than three years since the issuance of the adequacy determination on January 12, 2007 and commencement of construction, and in an effort to update the Boston Redevelopment Authority ("BRA") and interested stakeholders as to the Project's status. As before, this Project will play a central role in rejuvenating Lovejoy Wharf and making it a vibrant waterfront center reflective of both its history and its distinguished location within the City of Boston. The Proponent is committed to proceeding with the Project in a manner which is consistent with that which was originally approved, and which includes the many public benefits and amenities contemplated for the Project.

The Project is a mixed-use redevelopment project for the long under-utilized 2.1-acre Lovejoy Wharf waterfront parcel. The Project includes the rehabilitation of the existing 160 North Washington Street Building, the demolition and replacement of the 131 Beverley Street Building, the reconstruction of the site wharf and the construction of a two-level Pavilion building linking North Washington Street to the wharf below. As reflected in this filing, the primary modification to the Project relates to the fact that the floors of the 160 North Washington Street Building, originally approved for residential purposes, are now anticipated to be used for office purposes. The residential use of the 131 Beverly Street Building remains as originally approved. Additional proposed modifications of the originally approved Project are limited to specific design changes of a scale typically associated with final design and engineering review. There are no changes proposed to the building footprint for either the existing 160 North Washington Street Building or the originally approved 131 Beverly Street Building, and there is no proposed change in height. The ground floors of the two buildings will continue to be

primarily devoted to a mix of Facilities of Public Accommodation (FPAs), including retail, special public destination facility space and restaurant uses.

The Project includes the replacement of the existing wharf and the provision of approximately three-quarters of an acre of publicly-accessible waterfront open space, including an extension of the City of Boston's Harborwalk along the water's edge of the parcel. Constructed in 1909, the wharf has never been open for public use, is in significant disrepair, and remains closed to the public except for limited surface parking. The Project will transform this dilapidated wharf into a fully restored, fully-activated, landscaped open space at the water's edge complete with seasonal market activities, retail vendors, seating, dining, performance space, temporary recreational boat dockage, and public water transportation facilities.

The purpose of this submission is to notify the BRA of the proposed modifications to the Project and to request that you determine, for the reasons set forth therein, that these modifications do not represent a "material" change, and that the time which has passed since the issuance of the PAD and the scheduled issuance of the building permit will not result in any significantly increased impacts which would require additional review in accordance with Section 80A-6 or Article 80B of the Code.

We appreciate your review of the enclosed. Please do not hesitate to contact Peter at 857-202-6011 or pspellios@bealco.com or Jennifer McCool at 212-801-3478 or jmccool@related.com should you have any questions or require anything additional with respect to the enclosed.

Very truly yours,

THE BEAL COMPANIES, LLP

By: _____
Name: Peter A. Spellios
Title: Senior Vice President

THE RELATED COMPANIES, L.P.

By: _____
Name: Jennifer A. McCool
Title: Senior Vice President

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Section 1.0

General Information and Project Description

1.0 GENERAL INFORMATION AND PROJECT DESCRIPTION

1.1 Introduction

The Beal Companies LLP and The Related Companies LP ("the Proponent"), as authorized agent of North Washington Wharf LLC and Beverly Wharf, LLC (together, "the Owner"), are pleased to submit this Notice of Project Change (NPC) for the Lovejoy Wharf Project (the "Project"), a project previously approved by the Boston Redevelopment Authority ("BRA") in December 2006, but the commencement of construction of which was delayed due to several external factors. The Proponent is committed to proceeding with the Project in a manner which is consistent with that which was originally approved, and which includes the many public benefits and amenities contemplated for the Project. This filing is being made in accordance with the provisions of Section 80A-6 of the Boston Zoning Code ("the Code") due to the fact that there have been more than three years since the issuance of the adequacy determination and commencement of construction, and in an effort to update the BRA and interested stakeholders as to the Project's status. As before, this Project will play a central role in rejuvenating Lovejoy Wharf and making it a vibrant waterfront center reflective of both its history and its distinguished location within the City of Boston.

The primary modification to the Project relates to the fact that the floors of the 160 North Washington Street Building originally approved for residential purposes are now anticipated to be used for office purposes. The residential use of the 131 Beverly Street Building remains as originally approved. Additional proposed modifications of the originally approved Project are limited to specific design changes of a scale typically associated with final design and engineering review. There are no changes proposed to the building footprint for either the existing 160 North Washington Street Building or the originally approved 131 Beverly Street Building, and there is no proposed change in height.

The Project is a mixed-use redevelopment project for the long under-utilized 2.1-acre Lovejoy Wharf waterfront parcel (see Figure 1-1 at the end of this chapter). The Project includes the rehabilitation of the existing 160 North Washington Street Building, the demolition and replacement of the 131 Beverley Street Building, the reconstruction of the site wharf and the construction of a two-level Pavilion building linking North Washington Street to the wharf below. An elevation drawing of the Project buildings is presented in Figure 1-2. The ground floors of the two buildings will continue to be primarily devoted to a mix of Facilities of Public Accommodation (FPAs), including retail, special public destination facility space, and restaurant uses.

Consistent with the original approval, the Project includes the replacement of the existing wharf and the provision of approximately three-quarters of an acre of publicly-accessible waterfront open space, including an extension of the City of Boston Harborwalk along the water's edge of the parcel. Constructed in 1909, the wharf has never been open for public use, is in significant disrepair, and remains closed to the public except for limited surface parking. The Project will transform this dilapidated wharf into a fully restored, fully-

activated, landscaped open space at the water's edge complete with seasonal market activities, retail vendors, seating, dining, performance space, temporary recreational boat dockage, and public water transportation facilities.

Finally, as per the original approval, the Project provides connections between the North Washington Street grade and the wharf level located a story below by way of a new two-story Pavilion structure connected to the North Washington Street Bridge and the 160 North Washington Street Building. This unique structure will include a public terrace overlooking the water and out to the Leonard P. Zakim Bunker Hill Bridge, FPA space on both levels, and both a public staircase and a public elevator connecting North Washington Street to the revitalized wharf below.

Project construction, including the wharf reconstruction and construction of the Pavilion, is expected to commence in 2013 and be completed within 36 months. Upon review of the information set forth herein, the Proponent respectfully requests that the BRA determine that there is no change or other material factors resulting in the need for additional review of the Project.

1.2 Project Team

Proponent:	The Related Companies, LP 60 Columbus Circle, 19th Floor New York, NY 10023 Jennifer A. McCool The Beal Companies, LLP 177 Milk Street Boston, MA 02109-3410 (617) 451-2100 Peter A. Spellios
Architect:	The Architectural Team, Inc. 50 Commandant's Way at Admiral's Hill Chelsea, MA 02150 (617) 889-4402 Jay Szymanski Tom Schultz
Legal Counsel:	Nutter McClennen & Fish LLP Seaport West 155 Seaport Boulevard Boston, MA 02210-2604 (617) 406-6000 Mary T. Marshall Colin C. Macdonald

Permitting and Historic Resource Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Andrew Magee Geoff Starsiak Taya Dixon
Transportation and Parking Consultant:	Vanasse and Associates 10 N.E. Business Center Drive Andover, MA 01810-1066 (978) 474-8800 Giles Ham Shaun P. Kelly
Civil Engineer:	Parsons Brinckerhoff 75 Arlington Street, 9th Floor Boston, MA 02116 (617) 338-0063 Andy Boyd
MEP Engineer:	AHA Consulting Engineers 24 Hartwell Avenue, Third Floor Lexington, MA 02421 781-372-3000 Daniel A. Campia
Geotechnical Consultant:	Haley & Aldrich 465 Medford Street, Suite 2200 Boston, MA 02129 (617) 886-7400 Eliot Steinberg Mark Haley
Marine Engineers:	Childs Engineering Corporation 34 William Way Bellingham, MA 02109 508-966-9092 David L. Porter
Construction Consultant:	Suffolk Construction 65 Allerton Street Boston, MA 02119 (617) 445-3500 Jim Grossman

Communications and Community Outreach	McDermott Ventures 30 Rowes Wharf Boston, MA 02110 (617) 557-9190 Pamela McDermott Carolyn Spicer

1.3 Project History

The Project represents a significant opportunity to restore the dilapidated Lovejoy Wharf and to rehabilitate and renew the buildings fronting the wharf at this gateway Boston waterfront location. In The Beal Companies LLP / The Related Companies LP team the Project has a strong sponsor dedicated to carrying the Project forward to completion in a timely manner. As summarized below and discussed throughout this document, the Project has undergone extensive public and City, State, and Federal review through both regulatory and planning processes.

The Project was originally presented for public review in December of 2004 through the submittal of a joint Project Notification Form/Environmental Notification Form to the Boston Redevelopment Authority (BRA) and the Massachusetts Executive Office of Environmental Affairs (now Energy and Environmental Affairs) – Massachusetts Environmental Policy Act (MEPA) office, respectively. These initial submittals were followed by the preparation and submittal of Draft and Final Project Impact Reports (PIRs) to the BRA, and Draft and Final Environmental Impact Reports (EIRs) to MEPA. In recognition of the Project's compliance with local zoning and local planning initiatives, the BRA Board voted on or about November of 2006 to authorize the issuance of an Adequacy Determination for the Final PIR for the Project and an Adequacy Determination was issued on January 12, 2007. Similarly, on December 1, 2006 the Secretary of Environmental Affairs issued a Certificate on the Final EIR finding that it complied with MEPA and its implementing regulations.

In addition to the above City and State planning and environmental reviews, the Project and Project site were the subject of an Amendment to the Boston Municipal Harbor Plan (MHP, or "the Harborpark Plan") issued by the Secretary of Environmental Affairs on October 12, 2006. Consistent with other approved MHP Amendments proximate to the Project site, including the adjacent development at 226-234 Causeway Street, the MHP Amendment for Lovejoy Wharf was approved in recognition of the Project site's unique existing conditions and significant potential for enhancing the City of Boston waterfront. The Secretary's decision found the MHP Amendment request for Lovejoy Wharf was adequate and adopted certain substitute conditions and off-setting amenities provided by the Project. The subsequent Final EIR and Chapter 91 License application included thorough analyses demonstrating the Project's consistency with the Lovejoy Wharf MHP Amendment.

Finally, the Project has also proceeded through several major permitting processes, including Chapter 91 review through the issuance of a Written Determination (a draft License), the co-signing of a Memorandum of Agreement with Massachusetts Historical Commission, the Massachusetts Department of Environmental Protection (MassDEP), and the Boston Landmarks Commission, the issuance of an Order of Conditions from the Boston Conservation Commission and subsequent Superseding Order of Conditions from MassDEP, and US Army Corps of Engineers Section 404/Section 10 permitting.

1.4 Project Description

The following section summarizes the Project as currently configured, which is consistent with the existing approval. Modifications to the use and contemplated design refinements are reviewed in Section 1.5 and are primarily associated with use of the 160 North Washington Street Building and are consistent with those typically associated with final design and engineering review. Most significantly, the Project retains its commitments to the overall program and the extensive public benefits described in the original filings for the Project.

1.4.1 Project Site

The Project site is an approximately 2.1 acre (91,390 square-foot) waterfront parcel that includes two adjoining buildings and a wharf structure currently in need of extensive repair and/or replacement. The site is generally bounded by North Washington Street to the east, Lovejoy Place to the south, Beverly Street to the west, and by the Boston Inner Harbor to the north. The location of the site is shown in Figure 1-1. A recent survey of the Project site is included in Attachment A.

The existing nine-story building at 160 North Washington Street was historically used for a variety of office and other commercial and industrial uses, but is no longer actively occupied or used, while the nine-story building at 131 Beverly Street is dilapidated and abandoned. In consideration of its condition and public safety, the 131 Beverly Street Building is scheduled for demolition in early 2013.

Approximately one-third of the existing wharf structure was until recently used for surface parking (along Beverly Street), while the remainder (towards North Washington Street) is deteriorated, fenced off, and unsafe for use.

The site also includes a portion of Lovejoy Place to the centerline, which represents approximately 9,508 square feet of the Project site. Lovejoy Place is a private way not open for public travel.

1.4.2 Site Context

The Project site is located within an area of the City of Boston that has experienced significant public and private investment and redevelopment. With its gateway location on the Boston waterfront the Project is an integral part of these on-going improvements. To the east of the Project site is the North End, with a mix of offices, residences, retail, and other uses. To the south is the Bulfinch Triangle with older buildings, new developments, and approved developments on the parcels left vacant by the depression of the central artery by the Central Artery/Tunnel (CA/T) project and the removal of the elevated MBTA Green Line along Causeway Street. To the west is the TD Garden, around which several projects have been completed, are under construction or proposed, and North Station.

1.4.3 Updates to Previously Approved Project

As described in the Final PIR, the Project is an approximately 448,000 square-foot mixed-use redevelopment project designed to revitalize this long under-utilized 2.1-acre waterfront site. The Project includes the construction of a new residential building at 131 Beverly Street and the rehabilitation of the 160 North Washington Street Building.

The primary modification to the Project relates to the fact that the floors originally approved for residential use in the 160 North Washington Street Building are now anticipated to be used for office purposes. The residential use of the 131 Beverly Street Building remains as originally approved. Additional proposed modifications of the originally approved Project are limited to specific design changes of a scale typically associated with final design and engineering review. There are no changes proposed to the building footprint for either the existing 160 North Washington Street Building or the originally approved 131 Beverly Street Building, and there is no proposed change in height.

All of the waterfront public amenities associated with the Project will be carried forward with the Project's implementation. These waterfront amenities are described in detail in the approved Final PIR, the City of Boston MHP Amendment for Lovejoy Wharf, and the Chapter 91 Written Determination for the Project, and are noted in Section 1.5.

1.5 Public Benefits

The Project offers the opportunity to revitalize a critical block on the Boston waterfront by preserving and substantially rehabilitating the historic 160 North Washington Street Building and providing a new complementary adjoining structure in place of the unsalvageable 131 Beverly Street Building. The benefits of this Project were described in detail in the Final PIR for the Project and all of those benefits will be carried forward with the Project's implementation. The Proponent is excited to be able to move forward with this long delayed Project, and to be able to provide the many benefits of the Project. Among the many benefits described previously, the Project will:

- Preserve and rehabilitate the 160 North Washington Street Building.

- Entirely replace and landscape the existing dilapidated wharf, providing approximately three-quarters of an acre of landscaped waterfront open space available to the public for formal and informal gatherings, seasonal markets/vending carts, events, public displays of music, art, and dance, and other events designed to enliven the waterfront.

- Create a pedestrian stair at the eastern side of the site along the Charlestown Bridge at the 160 North Washington Street Building that will connect the Bridge sidewalk to the wharf and Harborwalk below. An internal, prominently located and accessible elevator between the sidewalk and wharf levels will also be provided within the associated Pavilion structure.

- Create a new 12-foot wide Harborwalk connection along the entire length of the Project site's waterfront. The Harborwalk will be constructed at the elevation of the CA/T-constructed Harborwalk section passing under the North Washington Street/ Charlestown Bridge.

- Create an approximately 250-foot long floating dock at the edge of the wharf for touch-and-go dockage, on-call water taxi services, and other temporary boat docking.

- Provide a water transportation subsidy of approximately $794,000 as in-kind support for water transportation and operating subsidy for water transportation services.

- Provide approximately 100 residential units so as to contribute to the transformation of the neighborhood into a vibrant 24 hour mixed-use community.

- Pull back the 131 Beverly Street Building from Beverly Street, a significant architectural gesture that will improve pedestrian and visual access to the water. This corner of the site, which is now narrow, will thus be opened up at the pedestrian level and will become an easily accessible avenue from Causeway Street to the Boston waterfront.

- Provide 2,000 square feet of rent-free building space for use as a Visitor Center by a non-profit organization.

- Meet the requirements of the Mayor's Executive Order addressing the provision of affordable housing.

- Provide a Development Impact Project contribution to the Neighborhood Housing Trust and Neighborhood Jobs Trust.

- Prepare and implement a Transportation Demand Management program for the site targeted at reducing automobile dependency and encouraging transportation by other modes.

- Provide approximately 300 to 350 construction jobs.

1.6 Legal Information

1.6.1 Legal Judgments or Actions Pending Concerning the Project

The Proponent is not aware of any legal judgments in effect or actions pending with respect to the Project.

1.6.2 History of Tax Arrears on the Property Related

A review of the records of the City's Assessing Department and of the record title to the property has not revealed any evidence of taxes due and owing with respect to the Project. The Proponent does not have a history of tax arrears on any property it owns within the City of Boston.

1.6.3 Site Control / Legal Easements

The Project site consists of the site shown on a survey entitled "ALTA/ACSM Land Title Survey 160 North Washington Street and 131 Beverly Street Boston, Mass." dated August 20, 2012, prepared by Otte & Dwyer, Inc. ("the Survey"). A copy of this survey is provided in Attachment A. North Washington Wharf LLC holds title to the land identified as "Lot C" on the survey, and Beverly Wharf LLC holds title to the land identified as "Remainder of Lot D" on the survey. The metes and bounds description of the Project site are provided on the survey.

The Proponent has examined title to the Project, including easements on the site, and there are no easements or rights of others which would affect or otherwise preclude development and use of the Project. The Project site is owned by the Owner as defined above, but will be acquired by the Proponent prior to the commencement of construction of the Project.

1.6.4 Zoning

The Project site is located in its entirety within the General Area Subdistrict the North Station Economic Development Area ("North Station EDA"), as shown on Map 1B of the Boston Zoning Maps, and within the Restricted Parking Overlay District. Development and use of Property within the North Station EDA is governed by the provisions of Article 39 of the Boston Zoning Code. The relevant use and dimensional requirements are summarized as follows:

- *Uses:* Multifamily residential, office, retail and restaurant uses are allowed.

- *Parking:* Parking is allowed as-of-right only if accessory to a residential use, and not for retail and restaurant uses. Accessory parking uses (such as for restaurant or retail uses) or non-accessory parking (such as parking for the general public) can be provided as a conditional use under Article 6 of the Code. The Project has obtained conditional use permits which continue to be in effect.

- *Dimensions:* An as-of-right height of 125 feet is allowed, and a maximum as-of-right height of 155 feet is allowed for projects that undergo Article 80B Large Project Review. The maximum floor-area-ratio (FAR) is 8.0 as-of-right, with 10.0 as-of-right if the project is reviewed under Article 80B Large Project Review.

The Project will comply with all existing zoning requirements with the benefit of Large Project Review in accordance with Article 80B, and relief from the Board of Appeal. If any zoning non-conformity is identified in the future, the Proponent will seek relief from the BRA, Boston Zoning Board of Appeal or Boston Zoning Commission, as appropriate.

1.7 Regulatory Controls and Permits

As identified in the filings leading to the Project's approval, the Project is subject to a number of local, state and federal ordinances. The Project's status as regards BRA Article 80B, MEPA, Chapter 91, the MHP Amendment, and the Wetlands Protection Act are summarized In Section 1.3. No new permits or approvals are anticipated.

1.8 Schedule

It is anticipated that demolition of the 131 Beverly Street Building will commence in January of 2013. It is anticipated that the construction will commence in early 2013. Once begun, construction is expected to last approximately 36 months.

1.9 Public Communication

The Proponent is committed to effective community outreach and will continue to engage the community to insure public input on the Project. The Proponent will continue to undertake community outreach in connection with the Project, including working with the Impact Advisory Group for the Project.

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Epsilon Associates Inc.

Lovejoy Wharf

Aerial Locus Map
Figure 1-1

The Architectural Team, Inc. | *Architect*

Lovejoy Wharf

Lovejoy Wharf North Elevation
Figure 1-2

Section 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

In connection with the prior Final PIR filing and 2006 approvals for the Lovejoy Wharf Project, a transportation study was submitted and approved by the BRA (the "Approved Transportation Analysis"). In connection with this NPC filing, the Approved Transportation Analysis has been updated to address the impacts on the transportation system associated with Project as modified herein. Specifically, the Approved Transportation Analysis has been updated to address the use of the existing building at 160 North Washington Street for approximately 187,187 square feet of office space (the "Office Use"), and 20,543 square feet of commercial space, including restaurant space that would accommodate 300 seats. A copy of the updated Approved Transportation Analysis is included as Attachment B and summarized below. As described therein, the redevelopment program for the 131 Beverly Street property remains substantially unchanged since the Approved Traffic Analysis.

2.2 Summary

The updated traffic analysis presented in Attachment B was performed in accordance with the Executive Office of Energy and Environmental Affairs/Executive Office of Transportation (EEA/EOT) guidelines for the preparation of Traffic Impact Assessments (TIAs), and the Boston Redevelopment Authority requirements for the preparation of this filing. The scope of this transportation analysis was determined during meetings with Boston Transportation Department (BTD) officials.

The summary findings are as follows:

- The Project as modified by this filing does not result in a significant change in vehicular traffic operations (motorist delays or queuing) at the study area intersections over No-Build conditions.

- The Project as modified is projected to result in minimal increases to area transit ridership as compared to No-Build conditions, and is not anticipated to result in a significant impact on transit capacity in the area.

- The Project as modified is not projected to result in a significant increase to pedestrian activity over No-Build conditions, and is not expected to result in a notable impact to pedestrian traffic within the study area.

- Parking for the Project will be provided on-site, with a total of 315 parking spaces provided, including a proposed parking garage at 131 Beverly Street.

- Loading activities for the Project will occur as previously approved in designated off-street areas via Lovejoy Place and Beverly Street.

- The Proponent is committed to developing and implementing a comprehensive transportation demand management (TDM) program to reduce automobile dependency and encourage travel by non-automobile modes.

- The Proponent and general contractor will develop a comprehensive construction management plan to ensure safety and minimize the impact of construction activities on pedestrian and vehicular traffic.

2.3 Conclusion

The Project is uniquely designed and situated to take advantage of the existing and expanding transportation infrastructure in the North Station area, including enhanced and improved access to the regional roadway network, proximate public transportation access, and pedestrian facility improvements. It is expected that the availability of public transportation services in the vicinity of the Project site coupled with the implementation of a comprehensive TDM program as a part of the Project will minimize the potential traffic impacts associated with the Project. Finally, the Project Proponent will be required to formalize the commitments to Project mitigation with the City of Boston via a Transportation Access Plan Agreement (TAPA) to be entered into by the Proponent (or its affiliates) and the Boston Transportation Department.

Section 3.0

Development Review Component

3.0 DEVELOPMENT REVIEW COMPONENT

3.1 Introduction

As discussed in Section 1.0, the Lovejoy Wharf Project includes updates related to use - specifically, a change from residential to office space in the 160 North Washington Street building - and certain design refinements. As noted in Section 1.0, the Project and its impacts were previously reviewed and approved through the filings of a joint PNF/ENF, a Draft PIR and a Final PIR/Draft EIR. As described in this section the findings presented in those filings relating to development review remain valid for the Project as modified by this filing.

3.2 Wind

A qualitative assessment of Pedestrian-Level Winds (PLWs) was presented in the Final PIR that evaluated the effects of the proposed Project, a No Build Alternative (the existing condition), and a Chapter 91 Alternative on PLWs at 48 locations on and near the site. The results of the assessment were that none of the 48 locations were estimated to have PLWs that exceed the BRA guideline wind speed of 31 miles per hour (mph) more often than once in 100 hours for all three scenarios. All 48 locations were estimated to be a Category 3 (Comfortable for Walking) or better. On an annual basis, only six of the 48 locations were estimated to change category between the existing and proposed build conditions, and three of those represented improvements in wind conditions.

The Project as modified by this filing does not change the footprint of the existing 160 North Washington Street Building or the originally approved 131 Beverly Street Building. Additionally, the top floors will continue to be set back from the main facades. In light of the foregoing, the impact on PLWs is anticipated to be similar to that which was described in the Final PIR.

3.3 Shadow

An analysis of existing and future shadow conditions was conducted in accordance with the BRA Scoping Determination and presented in the Final PIR. The shadow study included an analysis of impacts to the area surrounding Lovejoy Wharf, including on-site and nearby open spaces. Results of the analysis indicated that the Project will not generate significant impacts to the surrounding area due to the fact that the site is currently fully developed and the approved Project represents only a minor increase in height.

As mentioned above, the Project as modified herein does not change the footprint of the existing 160 North Washington Street Building or the originally approved 131 Beverly Street Building, does not extend the existing façades of the North Washington Street Building higher than the existing building, and the top floors of the North Washington Street

Building will continue to be set back from the main facades. In light of the foregoing, the shadow impact from the Project is anticipated to be similar to that which was described in the Final PIR and to the existing condition.

3.4 Daylight

The purpose of the daylight analysis is to estimate the extent to which a proposed project affects the amount of daylight reaching the streets and pedestrian ways in the immediate vicinity of the project site. As required by the BRA Scoping Determination for the Final PIR, the daylight analysis for the Project considered the daylight obstruction values for the existing condition (a No Build Alternative), the proposed condition (the Project), and an as-of-right zoning condition (maximum height of 155 feet with no setbacks). The analysis also looked at the existing daylight conditions in the surrounding area.

The results of the daylight analysis conducted for the Project using the BRADA program indicated that the Project is generally consistent with both existing conditions at the Project site and daylight conditions in the surrounding area. Further, the results indicate that for seven of the eight viewpoints of the site the proposed Project results in lower daylight obstruction values than the as-of-right building condition.

As mentioned above, the Project as modified herein does not change the footprint of the existing 160 North Washington Street Building or the originally approved 131 Beverly Street Building, does not extend the existing façades of the North Washington Street Building higher than the existing building, and the top floors of the North Washington Street Building will continue to be set back from the main facades. In light of the foregoing, the daylight obstruction is anticipated to be similar to that which was described in the Final PIR and to the existing condition.

3.5 Solar Glare

An analysis of the potential for reflective glare from the Project's building facades was presented in the Final PIR for the Project. The analysis presented in the Final PIR was deemed conservative as it assumed the exterior skin of the Project buildings would be smooth, specular and 100 percent reflective glass. In reality, the exterior will be composed of varying materials (i.e., metal and glass), with approximately 72 percent of the façade glazed, and of a Low-E glass with a reflectivity that is less than 40 percent, substantially less than the 100 percent assumed in the analysis.

The solar glare analysis presented in the Final PIR concluded that the Project as analyzed would result in only minor solar glare impacts. This was in part due to the fact that, for the most part, any solar reflection would be outside the cone of vision for pedestrians and vehicular traffic. Additionally, the number of setbacks and changes in the façade surface of the proposed building would insure that any reflected glare would be diffused and scattered.

The Project refinements do not include additional areas of glass, and the glass is not anticipated to be highly reflective; therefore, it is anticipated that the solar glare impacts will be similar to those described in the Final PIR.

3.6 Air Quality

The Final PIR confirmed that the Project satisfied all applicable laws regarding air quality. Since the Final PIR, the Transportation Analysis has been revised and therefore a revised microscale analysis has been completed, as presented below. As discussed, the Project continues to satisfy applicable laws regarding air quality.

3.6.1 Introduction

A microscale analysis is typically performed to evaluate the potential air quality impacts of carbon monoxide (CO) due to traffic flow around a project area. The results of the analysis are added to monitored background values and compared to the Federal National Ambient Air Quality Standards (NAAQS) developed by the United States Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety.

The modeling methodology utilized herein was developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[1] The air quality analysis results show that CO concentrations at all receptors studied are well under NAAQS thresholds.

Modeling assumptions and backup data for results presented in this section are provided in the Attachment C.

3.6.2 Microscale Analysis

A microscale analysis is used to determine the effect on air quality of the increase in traffic generated by a project. A microscale analysis is typically required for a project at intersections where (1) project traffic would impact intersections or roadway links currently operating at Level of Service (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) a project will generate 3,000 or more new average daily trips on roadways providing access to a single location.[2] The microscale analysis involves modeling of carbon monoxide (CO)

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1 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

2 BRA, Development Review Guidelines, 2006.

emissions from vehicles idling at and traveling through signalized 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 breathing-level (1.8 meter) 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. NAAQS have been established by the EPA for CO to protect the public health (known as primary standards). These 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 late-model 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 followed the procedure outlined in EPA's intersection modeling guidance.[3]

The microscale analysis has been conducted using the latest versions of EPA MOBILE6.2 and CAL3QHC to estimate CO concentrations at sidewalk receptor locations.

Future year (2017) emission factor data calculated from the MOBILE6.2 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 at the nearest CO monitor location (Kenmore Square) were obtained from MassDEP. CAL3QHC and AERMOD results were then added to background CO values of 1.9 ppm (one-hour) and 1.5 ppm (eight-hour), as provided by MassDEP, to determine total air quality impacts due to the Project. This value was compared to the NAAQS for CO of 35 ppm (one-hour) and 9 ppm (eight-hour).

3.6.2.1 Intersection Selection

An analysis of the five intersections from the Project traffic study was conducted (see Section 2.0). Microscale modeling was performed for the intersections that met the aforementioned criteria for microscale analyses, specifically:

- Causeway Street, Commercial Street, and North Washington Street;
- Causeway Street, Merrimac Street, Staniford Street and Lomasney Way; and,

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

- Causeway Street, Haverhill Street and Legends Way.

The traffic volumes and LOS calculations provided in Section 2.0 form the basis of evaluating the traffic data versus the microscale thresholds.

3.6.2.2 Emissions Calculations (MOBILE6.2)

The EPA MOBILE6.2 computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOBILE6.2 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 state specific vehicle age registration distribution. The input files for MOBILE6.2 for the build year (2017) are provided by MassDEP. As is typical, minor edits to the files were necessary to allow the program to output emission factors for the various speeds used in the analysis.

The current version of MOBILE6.2 does not explicitly calculate idle emissions. However, idle emissions can be obtained from a vehicle speed of 2.5 mph (the lowest speed MOBILE6 will model). The resulting emission rate given in (grams/mile) is then multiplied by 2.5 mph to estimate idle emissions (in grams/hour). Moving emissions are calculated based on actual speeds at which free-flowing vehicles travel through the intersections. 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.

Winter CO emission factors are typically higher than summer. Therefore, winter vehicular emission factors were conservatively used in the microscale analysis.

3.6.2.3 Receptors and Meteorology Inputs

Sets of up to 200 receptors were placed in the vicinity of each of the modeled intersections. Receptors extended approximately 500 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersections are presented in Figure 3-1 through 3-3.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[4], a wind speed of one m/s, stability class D (4), and a mixing height of 1,000 meters was used. To account for the intersection geometry, wind directions from 0° to 350°, every 10°, were selected. A surface roughness length of 321 cm was selected.[5]

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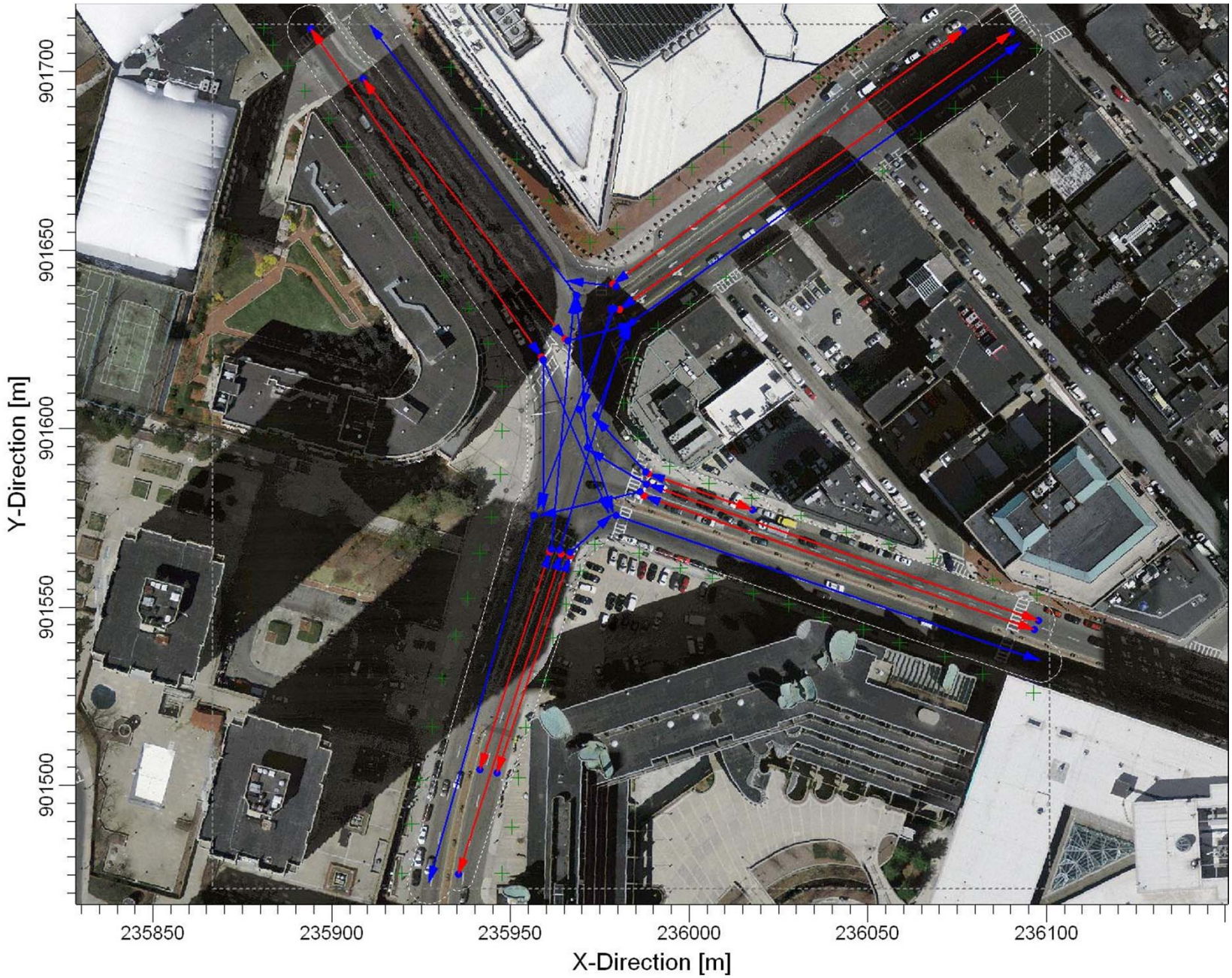
4 U.S. EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections.* EPA-454/R-92-005, November 1992.

5 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.

Epsilon ASSOCIATES INC.

Lovejoy Wharf

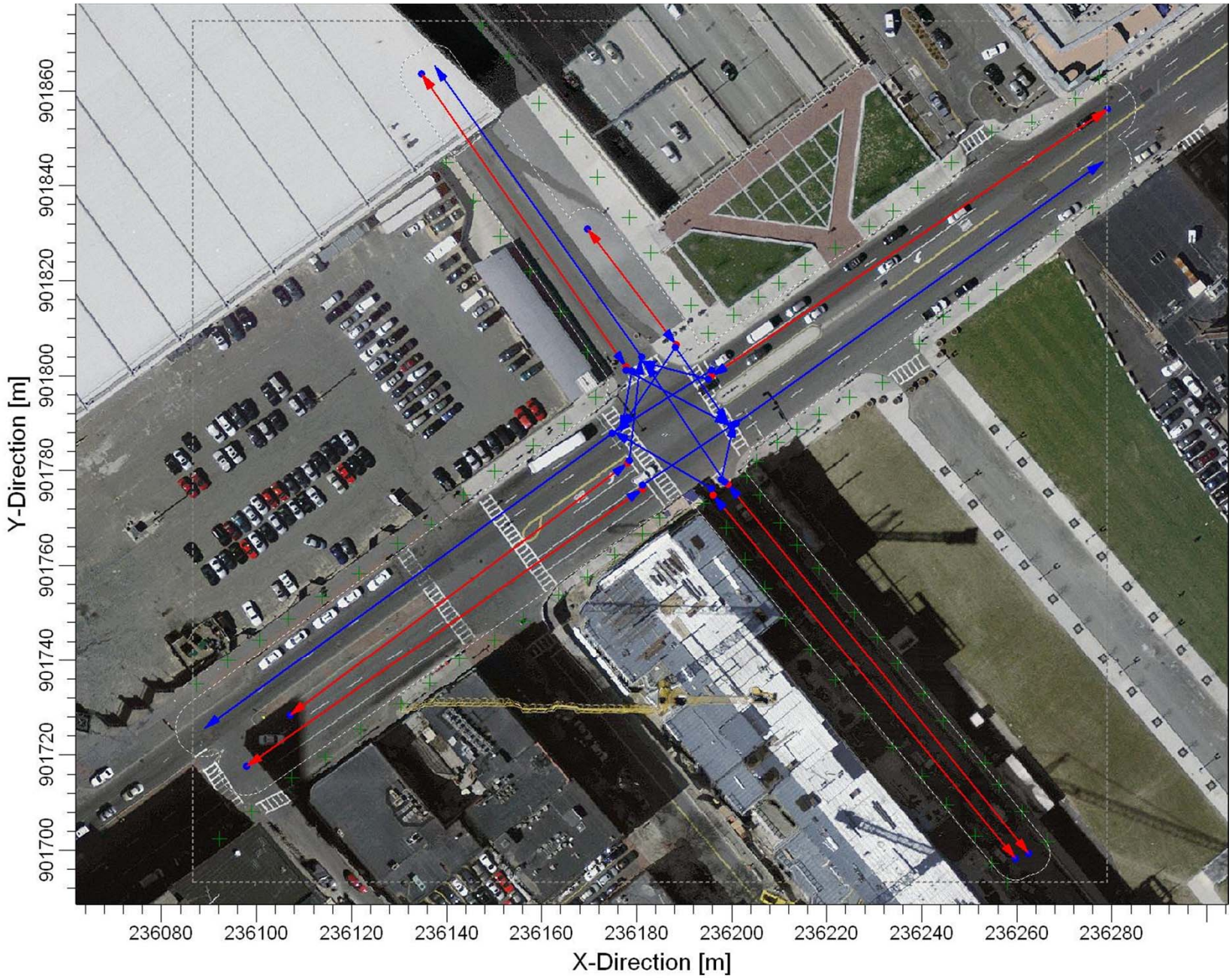
Causeway & North Washington Streets
Figure 3-1



Epsilon ASSOCIATES INC.

Lovejoy Wharf

Causeway, Staniford and Merrimac Streets
Figure 3-2



Epsilon ASSOCIATES INC.

Lovejoy Wharf

Causeway & Haverhill Streets
Figure 3-3

3.6.2.4 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 0.7 to estimate eight-hour concentrations.[6] The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling runs. The CAL3QHC input parameters are also described in Attachment C.

3.6.2.5 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 2007 to 2011. MassDEP guidance specifies the use of the latest three years of available monitoring data from within 10 km of the Project site. Since some pollutants are no longer monitored, data prior to the most recent three years is used.

The closest monitor is located 174 North Street in Boston with others at One City Square in Charlestown, and at Kenmore Square, in Boston. A summary of the background air quality concentrations are presented in Table 3-1. All observed concentrations are currently in compliance with applicable NAAQS.

Background CO concentrations were determined from the closest available monitoring stations to the proposed Project. For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 1.9 ppm for one-hour and 1.5 ppm for eight-hour CO.

3.6.3 Microscale Analysis Results

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3-2 and 3-3 for the 2017 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.7.[7]

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 (1.9 ppm) plus background (1.9 ppm) is 3.8

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6 U.S. EPA, Screening Procedures for Estimating the Air Quality Impact of Stationary Sources; EPA-454/R-92-019, October 1992

7 U.S. EPA, Screening Procedures for Estimating the Air Quality Impact of Stationary Sources; EPA-454/R-92-019, October 1992

ppm. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (1.3 ppm) plus background (1.5 ppm) is 2.8 ppm. Both concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

It would be expected that any other mitigation measures implemented to improve traffic flow at any of the modeled intersections would result in further improved air quality conditions.

3.6.4 Conclusions

Using conservative estimates, the CO concentrations at the nearest receptors for impacts from the intersection, plus monitored background values, are well under the CO NAAQS thresholds.

Table 3-1 Observed Ambient Air Quality Concentrations and Selected Background Levels

Pollutant	Averaging Time	2009	2010	2011	Background Concentration ($\mu g/m^3$)	NAAQS	Location
SO_2 [1,7,8]	1-Hour	65	69.94	127.4	127.4	195	KEN
	3-Hour	88.4	62.4	49.4	88.4	365	KEN
	24-Hour	23.4	21.84	31.46	31.5	1,300	KEN
	Annual	6.5	5.824	6.136	6.5	80	KEN
PM-10	24-Hour	44	32	39	44.0	150	CTY
	Annual	17.9	15.1	15.9	17.9	50	CTY
PM-2.5	24-Hour [4]	24.1	24.8	23.9	24.3	35	NTH
	Annual [5]	10.2	10.03	10.32	10.2	15	NTH
NO_2 [3]	1-Hour [6]	112.8	119.38	140.812	140.8	188	KEN
	Annual	37.788	35.908	38.2768	38.3	100	KEN
CO [2]	1-Hour	1596	2166	1710	2166	40,000	KEN
	8-Hour	1254	1710	1482	1710	10,000	KEN

From 2007-2011 MassDEP Annual Data Summaries

KEN = Kenmore Sq. Boston; CTY = 1 City Sq. Boston, NTH = 174 North St. Boston

[1] SO_2 reported in ppm or ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2600 $\mu g/m^3$.

[2] CO reported in ppm or ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1140 $\mu g/m^3$.

[3] NO_2 reported in ppm or ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1880 $\mu g/m^3$.

[4] Background level for 24-hour PM-2.5 is the average concentration of the 98th percentile for three years.

[5] Background level for annual PM-2.5 is the average for three years.

[6] Maximum annual 1-hr concentrations.

[7] The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.

[8] The 2010 & 2011 SO_2 3-hr value is not reported. Years 2007-2009 used instead.

Table 3-2 Summary of Microscale Modeling Analysis (No-Build 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
One-Hour					
Causeway Street, Commercial Street & North Washington Street	AM	1.8	1.9	3.7	35
	PM	1.9	1.9	3.8	35
Causeway Street, Staniford Street, Merrimac Street & Lomasney Way	AM	1.3	1.9	3.2	35
	PM	1.1	1.9	3.0	35
Causeway Street, Haverhill Street, & Legends Way	AM	1.1	1.9	3.0	35
	PM	1.2	1.9	3.1	35
Eight-Hour					
Causeway Street, Commercial Street & North Washington Street	AM	1.3	1.5	2.8	9
	PM	1.3	1.5	2.8	9
Causeway Street, Staniford Street, Merrimac Street & Lomasney Way	AM	0.9	1.5	2.4	9
	PM	0.8	1.5	2.3	9
Causeway Street, Haverhill Street, & Legends Way	AM	0.8	1.5	2.3	9
	PM	0.8	1.5	2.3	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.7.

Table 3-3 Summary of Microscale Modeling Analysis (Build 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
One-Hour					
Causeway Street, Commercial Street & North Washington Street	AM	1.9	1.9	3.8	35
	PM	1.9	1.9	3.8	35
Causeway Street, Staniford Street, Merrimac Street & Lomasney Way	AM	1.3	1.9	3.2	35
	PM	1.1	1.9	3.0	35
Causeway Street, Haverhill Street, & Legends Way	AM	1.1	1.9	3.0	35
	PM	1.2	1.9	3.1	35
Eight-Hour					
Causeway Street, Commercial Street & North Washington Street	AM	1.3	1.5	2.8	9
	PM	1.3	1.5	2.8	9
Causeway Street, Staniford Street, Merrimac Street & Lomasney Way	AM	0.9	1.5	2.4	9
	PM	0.8	1.5	2.3	9
Causeway Street, Haverhill Street, & Legends Way	AM	0.8	1.5	2.3	9
	PM	0.8	1.5	2.3	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.7.

3.7 Water Quality/Stormwater

The evaluations presented in the Final PIR regarding stormwater and water quality continue to be valid for the Project. Subsequent to the preparation of the Final PIR the Boston Water and Sewer Commission (BWSC) established an additional requirement for the removal of phosphorous from the discharge of stormwater associated with any development or redevelopment within the City. As discussed below, the Project will comply with this new requirement.

Stormwater flows from the existing buildings are currently discharged directly to the adjacent harbor waters. The stormwater flows from the proposed buildings will be discharged into a collection system constructed within the Project site where they will be treated using BWSC approved methodologies for the removal of phosphorous and suspended solids. This treated stormwater will then be discharged to the BWSC stormwater

collection system in Beverly Street which carries flows to the existing BWSC Outfall 35 where they are discharged to the harbor. The stormwater collection and discharge system for the wharf area will incorporate facilities to minimize the discharge of floatables to the harbor. All design and detailing of the stormwater collection and treatment systems will be developed to BWSC standards.

A maintenance and operation program will be implemented that requires periodic inspection and cleaning of all of the stormwater quality BMPs, including catchbasins, the phosphorous removal system, and oil/water separators.

3.8 Flood Hazard Zones/Wetlands

The flood hazard zones and wetland resources on or proximate to the Project site were reviewed in the Final PIR and in subsequent filings with the Boston Conservation Commission, as summarized below.

3.8.1 FEMA Flood Hazard Zones

Subsequent to the completion of the Final PIR for the Project, the Federal Emergency Management Agency (FEMA) has issued new Flood Insurance Rate Maps (FIRM) for the Boston area. However, a review of these maps indicates no change in the FIRM mapping of the Project site.

3.8.2 Wetland Resources

As reviewed in the Final PIR, the proposed wharf repairs will occur over or within several wetland resources areas, work within which is regulated under the Massachusetts Wetlands Protection Act (WPA). These resource areas include Coastal Bank, Land Subject to Coastal Storm Flowage (Elevation 9 feet NAVD), Fish Run, and Land Under the Ocean. Similarly, certain Project activities will occur within the 100-foot buffer zone of Coastal Bank.

The Project's relation to these resource areas and the methods proposed to preclude impact to these resource areas were reviewed in detail in the Final PIR. More significantly, subsequent to the filing of the Final PIR, the Project submitted a Notice of Intent under the WPA to the Boston Conservation Commission and received an Order of Conditions authorizing the work to proceed with certain conditions. On August 7, 2009, MassDEP issued a Superseding Order allowing the Project and adopting the Conservation Commission's original Order of Conditions.

3.9 Groundwater/Geotechnical

The hydrogeological and geotechnical characteristics of the Project site were reviewed in the Final PIR. These conditions have not changed and, as noted below, the Project does not contemplate new construction of any below-grade space. As a result, construction of the Project is not expected to have adverse short or long-term impact on groundwater

conditions and/or adjacent buildings. The following sections summarize the information presented in the Final PIR for the Project.

3.9.1 Groundwater

Because of the site's waterfront location on Boston's Inner Harbor, shallow groundwater levels are anticipated to be subject to tidal influence. In general, groundwater levels at the site are expected to reflect tide levels in the adjacent Harbor, which typically range from Elevation 0.8 to Elevation 10.2 Boston City Base (BCB). During the rising tide cycle, the basement level of the 131 Beverly Street building (Elevation 8.2 BCB) currently floods and one to two feet of water above the floor can result. As the tide regresses, the water drains back to the Harbor. As described in Section 3.10.3, groundwater is currently being treated at the site in accordance with MassDEP requirements.

3.9.2 Geotechnical

Some shallow subsurface explorations have been conducted at the site for previous environmental studies, and have provided information on the near surface fill soils across the site. Additionally, deep subsurface explorations were conducted for the adjacent Central Artery Project, which provide information on the underlying natural soils and bedrock conditions. Site ground surface elevation is relatively level at about Elevation 15 BCB.

As indicated by the borings itemized above and described in the Final PIR, the subsurface conditions of the site are anticipated to include miscellaneous fill underlain by marine organic deposits, alluvium and glaciomarine deposits, in that order. Thicknesses of these units are anticipated to range between 10 and 25 feet, 25 and 30 feet and 5 to 10 feet, respectively. The bedrock at the base of these units is identified as the Cambridge Argillite, a shale- or slate-like rock of sedimentary origin. The top of the bedrock beneath the site is anticipated to range from 60 to 70 feet below ground surface (Elevation –45 to –55 BCB).

3.9.3 Geotechnical and Groundwater Impacts

The Project includes demolishing the existing building at 131 Beverly Street down to the existing pile foundation and concrete mat structure, with subsequent building of a new structure on the existing foundation structure. At the 160 North Washington Street building, the existing structure will remain at the basement level and the remainder of the building will be rehabilitated.

A steel sheetpile wall will be installed immediately outshore of the existing timber sheetpile bulkhead on the Project site to replace the existing failing wall. Space between the existing bulkhead/building foundation will be filled with concrete to provide a watertight seal at the building basement floor level. This will prevent future tidal incursion into the 131 Beverly Street basement. As necessary prior to installation of the steel sheetpile wall, temporary site dewatering may occur during construction.

No new construction of any below-grade space is planned; hence, construction of the Project is not expected to have adverse short- or long-term impact on groundwater conditions and/or on adjacent buildings. Some reinforcement of the existing foundation at 131 Beverly Street may be required to take into account point loads anticipated as a result of relocating the loading dock and parking garage access within the building footprint, and this reinforcement could require additional piles. Should this be determined necessary, it is likely that drilled-in "mini-piles" would be utilized, which entail a low/non-vibratory and low-noise installation, with no impact on existing groundwater levels or nearby buildings.

As discussed in the Final PIR, groundwater levels on site will be monitored prior to, during and following Project implementation, and funding will be provided to the Boston Groundwater Trust to supplement groundwater monitoring instrumentation in the Bullfinch Triangle/North End monitoring zone.

3.10 Solid and Hazardous Wastes

The change in use proposed for the 160 North Washington Street Building from residential to corporate office will result in a change in the volume of solid waste generated by the Project. Waste generated by the Project is anticipated to be significantly offset by recycling and other green programs to be implemented in both buildings. Meanwhile the clean-up of the site has proceeded during the period in which Project implementation was delayed. The following sections include a review of the re-calculated solid waste volumes and a summary of the on-going site remediation efforts.

3.10.1 Solid Waste Generation During Operation

The Project will generate solid waste typical of other residential/mixed-use projects. As described in this NPC, the Project is proposing to utilize the 160 North Washington Street Building as corporate office space, reducing the number of residential bedrooms for the Project to approximately 180 bedrooms. This is likely to change the volume of solid waste.

Table 3-4 has been modified from that presented in the Final PIR so as to reflect the revised building usage and waste generation estimate.

Table 3-4 Solid Waste Generation

Use	Program	Generation Rate	Solid Waste (tons per year)
Residential	180 bedrooms	4 lbs/bedroom/day	131.4
Office	187,187 sf	1.3 tons/1,000 sf/year	243.3
Retail/Restaurant	34,867 sf	5.5 tons/1,000 sf/year	191.8
Total Solid Waste Generation			**566.5**

Solid waste generated by the Project is expected to be typical of other residential/mixed use projects and will include wastepaper, cardboard, glass, and bottles. A portion of the waste will be recycled as described below. The remainder of the waste will be compacted and removed by a waste hauler contracted by building management. With the exception of "household hazardous wastes" typical of residential development (for example, cleaning fluids and paint), the Project will not generate hazardous waste.

Additional waste will be generated by the general public enjoying the Project's open space on the wharf and at the Project perimeter. Trash receptacles will be provided in these public areas in locations that will not impede pedestrian circulation. Building management will ensure that these receptacles are emptied daily and will inspect the site for strewn trash daily.

3.10.2 Recycling During Operation

Recycling by residents, retail and office tenants will be encouraged, coordinated, and comprehensive. To encourage recycling, the Proponent will implement a recycling program throughout the Project. This will include space for recycling on each floor, while the loading/receiving area will include space for the storage and pick-up of recyclable materials. Recyclable materials will include newspaper, cardboard, cans, and bottles.

Building management will also provide residential tenants with the facilities and services necessary to recycle materials such as light bulbs, batteries, and paint cans. The residential recycling program will be conducted in accordance with the City of Boston's recycling regulations.

3.10.3 Hazardous Materials - Compliance with Massachusetts Contingency Plan

As discussed in the Final PIR, the Project site is listed with MassDEP as a location where a release of oil or hazardous materials has occurred. The site has been tracked by MassDEP through the Massachusetts Contingency Plan (MCP) regulatory system with Release Tracking Number 3-22351 and Spill Numbers N86-0135, -5007 and 3-0013185.

Environmental investigations conducted on the site in 2003 included the installation of soil borings and groundwater monitoring wells, and the laboratory analysis of soil and groundwater samples. Also in 2003 four No. 6 fuel oil underground storage tanks (USTs) discovered at the east end of Lovejoy Place were emptied, cleaned, and closed in place, as inspected and approved by the Boston Fire Department.

In the spring of 2004 a water treatment system was installed to recover tidal water entering the 160 North Washington Street building and petroleum-impacted groundwater. Additional environmental investigations conducted in 2004 as part of a Phase II Comprehensive Site Assessment concluded that the petroleum contamination under the building is limited to the 160 North Washington Street building and is likely attributed to the four No. 6 fuel oil USTs discovered in the east end of Lovejoy Place and potentially a historic release of No. 4 fuel oil in the basement.

Subsequent to the above activities a Class C Response Action Outcome (RAO) was submitted to MassDEP indicating that a temporary solution has been achieved. The temporary solution consists of operation of the current treatment system to prevent migration of contamination and achieve a level of "no substantial hazard". In August of 2007 a revised Release Notification Form was submitted to MassDEP for polychlorinated biphenyls (PCBs) and lead detected in the influent samples collected from the treatment system.

Under a Class C RAO, a periodic review of a Temporary Solution is required every fifth year after the date of filing the Class C RAO, until such time that a Permanent Solution is achieved. On May 25, 2011, a Periodic Review of Temporary Solution was submitted to MassDEP. The Periodic Review of Temporary Solution reported that an evaluation of system effectiveness was on-going and considerations were being made for the installation of additional recovery wells. In addition, the review noted that the planned installation of a steel sheetpile wall along the interface between 160 North Washington Street in association with the construction phase of the proposed Project would serve as an integral step in attaining a Permanent Solution for the disposal site. Specifically, the location of the new steel sheetpile immediately outshore of the existing timber sheetpile bulkhead has the potential to minimize or possibly eliminate tidewater influences on groundwater under the site building. This is deemed likely to enhance operational effectiveness of the current treatment system by reducing the volume of water being treated and, correspondingly, reduce the anticipated timeline for achieving a permanent solution.

As noted in the Final PIR, an Activity and Use Limitation (AUL) is not anticipated to be required following completion of the Project. In the meantime, should the presence of potentially hazardous conditions become evident during construction, the contractor shall be required to discontinue work in the area around the contamination. Per the Construction Management Plan for the Project, the contractor will be required to secure the area to prevent a health risk and prevent a release to the environment, following which the area will be evaluated by the Project's environmental consultant and a plan developed to remediate the contamination.

3.10.4 Potential Demolition Impacts

The existing 131 Beverly Street building will be demolished down to its existing pile foundation and concrete mat structure, while the 160 North Washington Street building's exterior walls and interior walls and columns will remain and the building will be rehabilitated as discussed herein.

As describe in the Final PIR, prior to demolition all hazardous materials in each structure will be removed as required by licensed abatement contractors. These materials will be identified prior to abatement and can include asbestos containing building materials

(ACBMs, caulk, mastic, floor tiles etc.), PCB's (ballasts, transformers and associated materials), mercury containing fluorescent bulbs and other wastes, should they exist. Once abated, the 131 Beverly Street building will be demolished. A similar abatement program will be undertaken at the 160 North Washington Street building.

Demolition or cleaning/clearing of buildings will be accomplished in accordance with specifications such that the site is not further degraded by releases generated during demolition.

3.10.4.1 Recycling During Construction

As presented in the Final PIR, the Proponent will take an active role with regard to the reprocessing and recycling of construction waste. Some waste, such as concrete from demolition will be recycled. An evaluation of the potential for recycling will occur before the construction commences. Construction will be conducted so that some materials that may be recycled are segregated from those materials not recyclable to enable disposal at an approved solid waste facility. A comprehensive recycling program will be included in the final Construction Management Plan.

3.11 Noise

Baseline noise levels were measured in the vicinity of the proposed Project in 2005 and were compared to predicted noise levels modeled in 2012 based on reference sound data for mechanical equipment identified by the Proponent. These predicted noise levels were compared to the City of Boston Zoning District Noise Standards and the MassDEP Noise Policy. The analysis indicates that predicted noise levels from Project mechanical equipment with appropriate noise attenuation measures will comply with both state and local regulations at all modeled locations. Please see Attachment D for the complete updated noise analysis.

3.12 Construction Impacts

Construction impacts and the mitigation of those impacts were detailed in the Final PIR for the Project. In that the Project has not significantly changed, the construction methodology and impact mitigation presented therein continues to be applicable. As noted in the Final PIR, the Proponent will prepare a detailed Construction Management Plan (CMP) to be filed with the Boston Transportation Department (BTD) once Project plans are more fully developed and the construction schedule is fixed. The CMP will include detailed information on construction activities, specific construction mitigation measures, and construction materials access and staging area plans to minimize impacts to abutters and the local community.

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

3.13 Tidelands – Chapter 91/Municipal Harbor Plan

As discussed in Section 1.0, the Project and Project site were the subject of an Amendment to the Boston MHP issued by the Secretary of Environmental Affairs on October 12, 2006. Consistent with other approved MHP Amendments proximate to the Project site, including the adjacent development at 226-234 Causeway Street, the MHP Amendment for Lovejoy Wharf was approved in recognition of the Project site's unique existing conditions and significant potential for enhancing the City of Boston waterfront. The Secretary's decision found the MHP Amendment request for Lovejoy Wharf was adequate and adopted certain substitute conditions and off-setting amenities provided by the Project. The subsequent Final EIR and Chapter 91 License application included thorough analyses demonstrating the Project's consistency with the Lovejoy Wharf MHP Amendment.

Subsequent to the approval of the Secretary of Environmental Affairs of the MHP and the Final EIR for the Project, the Proponent submitted a Chapter 91 license application for the proposed improvements. This application was prepared in recognition of the conditions and provision of the MHP and the Chapter 91 waterways regulations at 310 CMR 9.00. Based upon this application, and in consideration of the conditions of the MHP, the MassDEP Wetlands and Waterways Program has issued a Chapter 91 Written Determination for the Project. In consultation with MassDEP the Proponent is currently preparing licensing plans that incorporate the conditions of the Written Determination so as to proceed to issuance of a final Chapter 91 license for the Project.

3.14 Sustainability

The Proponent is committed to developing an environmentally friendly Project and will achieve certifiability under the Leadership in Energy and Environmental Design (LEED) rating system appropriate for the component (LEED for Core and Shell for 160 North Washington Street and LEED for New Construction for 131 Beverly Street). A preliminary LEED checklist for each component and associated narrative are included in Attachment E.

3.15 Urban Design

The Final PIR included urban design goals that were informed by the input gathered at meetings with the BRA design staff, the Boston Civic Design Commission, and at a planning

charrette held in the community, as well as by the needs of the Project and constraints of the Project site.

Goals identified during the previous review of the Project included:

- Create a gateway entrance to City;
- Create a "crossroads" of pedestrian connections between the Harborwalk, The Freedom Trail, Rose Kennedy Greenway, Charles River Basin parklands, Causeway Street, North Washington Street, North Station, and other destinations, with improved signage/wayfinding;
- Activate the waterfront area with creative wharf design, a mix of ground floor uses, and public spaces that emphasize historic interpretation;
- Activate the street level and Lovejoy Wharf with retail and restaurant uses that create an urban destination;
- Create pedestrian access from North Washington Street down to Lovejoy Wharf; and
- Create visual and physical connections from Causeway Street to the water's edge.

The Final PIR provided a discussion of how the Project incorporates these goals, which includes:

- Creating a design which emphasizes the height of the southwest corner to create a visual gateway to the city which balances the TD Garden;
- Creating a design which emphasizes motion and movement at the southwest corner;
- Providing pedestrian access from North Washington Street with a plaza, stair and elevator access to the wharf level;
- Pulling back the west facade to allow visual and physical connections to the wharf from Causeway Street;
- Encouraging ground floor uses that enliven the wharf such as retail, restaurants, etc.;
- Providing touch-and-go boat access along the wharf edge;
- Extending the Harborwalk through the site; and
- Hosting markets and other events on the wharf.

The revisions to the Project continue to incorporate the goals as set in the Final PIR. In addition, the Project will create more activity during the daytime hours related to the new office space.

3.16 Historic and Archaeological Resources

The following sections include a summary of the Project's status as regards review by historical agencies and the protection of historical resources.

3.16.1 Status of Review with Historical Agencies

The Project was subject to review under Section 106 of the National Historic Preservation Act, State Register Review, MEPA and Article 85 of the Boston Zoning Code. The Project continues to be subject to the same regulatory reviews.

3.16.1.1 Section 106 Review

The Project was subject to review under Section 106 of the National Historic Preservation Act with the US Army Corps of Engineers (Corps) acting as the lead federal agency. The Corps determined its jurisdiction included only the replacement of the wharf and the installation of the steel sheet bulkhead. By letter dated, April 25, 2006, the Corps determined "that the jurisdictional work is not integrally related to the proposed upland redevelopment of the 160 North Washington Street and 131 Beverly Street Buildings." The Corps determined the Project would have "no adverse effect" on the Causeway/North Washington Street Area, an area previously determined eligible for listing in the National Register of Historic Places.

The scope of jurisdictional work subject to review under Section 106 with the Corps remains unchanged in the current Project. The Corps will be notified of the Project updates, and it is anticipated the Corps will continue to find "no adverse effect" as a result of the Project.

3.16.1.2 State Register Review

The Project was subject to review by the Massachusetts Historical Commission (MHC) in compliance with the MEPA process, as the Project involved the demolition of Inventoried properties; specifically, the 131 Beverly Street Building and a portion of the 160 North Washington Street Building. The MEPA regulations require that the Project be consistent with a Memorandum of Agreement (MOA) with the MHC that has been subject to public notice or a determination of no adverse effect. Although not specifically laid out in the MEPA regulations, the State Register Review regulations note "project proponents [subject to MEPA] will find it most convenient to follow the procedures outlined in these regulations [950 CMR 71.00] at the time MEPA reports are filed." Consistent with MEPA and State Register Review, the previous Project proponent entered into consultation with the MHC which resulted in a MOA being executed among the proponent, MHC and MassDEP on August 15, 2007.

Revised Project information will be submitted to the MHC, MassDEP and BLC for review. The nature of the refinements to the Project are not substantially different than those proposed in the Final PIR. It is anticipated the language included in the existing MOA will remain largely unchanged, with only the names of the parties involved being revised.

3.16.1.3 Article 85 of the Boston Zoning Code

The City of Boston Article 85 Application for the Project was submitted to the Boston Landmarks Commission (BLC) on June 6, 2006. A community meeting was held on June 28, 2006 followed by a public hearing on July 11, 2006. At the public hearing, the BLC voted "it is preferable that the penthouse addition at 160 North Washington Street and the warehouse building at 131 Beverly Street are preserved or rehabilitated rather than demolished." The BLC voted to invoke the 90-day demolition delay for the buildings, but not the wharf structure. Alternatives to demolition were also presented by the previous Project proponent at the hearing. The BLC declined to make a determination of no feasible alternatives, citing the lack of an MOA with the MHC regarding mitigation. The BLC invited the previous Project proponent to return to the Commission if an MOA with the MHC was signed prior to the conclusion of the 90-day delay period to pursue a finding of no feasible alternative. An MOA was not completed by October 9, 2006. The 90-day demolition delay expired on October 9, 2006. As described above, a MOA was executed on August 14, 2007.

The scope of demolition at 160 North Washington Street and 131 Beverly Street remains unchanged. No additional review is anticipated under Article 85.

3.16.2 Impacts to Historic Resources

The revisions to the design of the 160 North Washington Street Building are minor and result in no additional impacts to historic resources within the Project site or in the vicinity of the Project site. As described herein, and consistent with the Final PIR, the existing eighth and ninth floors will be replaced with additional floors which will remain set back from the main elevations of the existing 160 North Washington Street Building.

The limited modifications to the Project will result in no substantive new impacts to nearby historic properties.

3.17 Infrastructure

The Project's service requirements from the existing energy system, telecommunication systems and cable system are equivalent to those reported in the Final PIR. These systems continue to have adequate capacity to meet the requirements of the Project. As the Project design progresses, the specific locations and details for connection to the existing utility systems will be developed in conjunction with the appropriate utility agencies and owners.

3.17.1 Sanitary Sewer System

The existing sanitary sewer collection, transportation and treatment systems serving the Project area are equivalent to the system configurations evaluated in the Final PIR.

With the updated program proposed for the Project, the projected average sanitary flows based on the Title V guidelines contained in 310 CMR 15.00 are approximately 47,500 gallons per day (gpd). This is 10% less than the approximately 53,200 gpd projected for the Project in the Final PIR. The potential impact of the Project on the sanitary sewer system is anticipated to be similar to that determined in the evaluations reported in the Final PIR.

3.17.2 Water Supply System

The existing water distribution system in the Project remains as defined in the Final PIR.

With the updated program proposed for the Project, the projected average domestic water consumption is projected to be 10% lower than what was projected in the Final PIR. The potential impact of the Project on the water supply system on the Project area is anticipated to be similar to that determined in the evaluations reported in the Final PIR.

3.17.3 Stormwater Management

The evaluations presented in the Final PIR are valid for the Project for all elements associated with stormwater volume. The evaluations presented in the Final PIR relative to stormwater quality do not reflect the current BWSC requirements for phosphorous removal from stormwater associated with any development or redevelopment within the City limits. The evaluations presented in this section have been revised to reflect this requirement.

3.17.3.1 Existing Conditions

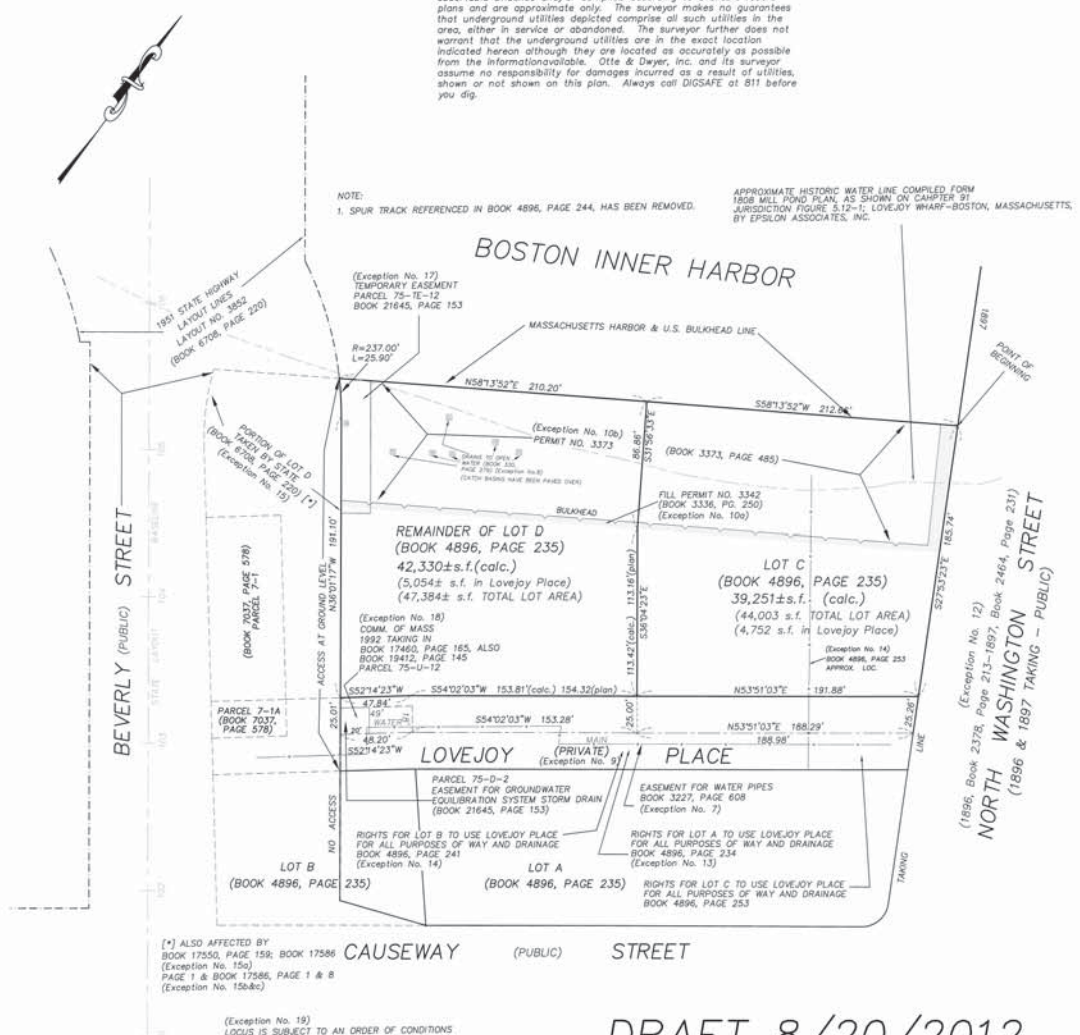
The existing stormwater collection and transportation system serving the Project area is equivalent to the system configurations and capacities reported in the Final PIR.

3.17.3.2 Proposed Conditions

The Project intends to modify the storm drainage collection and treatment systems for the site such that roof runoff from the buildings will be re-directed to the proposed stormwater collection system located on the Project site. Surface runoff from the wharf will discharge to the inner harbor. Flows collected in the proposed stormwater collection system will be directed to the existing BWSC storm drain system beneath Beverly Street. Catch basins incorporated in the new collection system will be standard BWSC catch basins with deep sediment sumps and traps. BWSC "Don't Dump – Drains to Charles River" plaques will be installed at new catch basins or at existing catch basins if not already present. All collected stormwater flows will be treated in a manner approved by BWSC to accomplish the required phosphorous removal prior to being discharged to the BWSC system.

Attachment A

Site Survey



GENERAL UTILITY NOTE

The underground utilities depicted hereon are from field locations of observable evidence and/or compiled according to available record plans and are approximate only. The surveyor makes no guarantees that underground utilities depicted comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities are in the exact location indicated hereon although they are located as accurately as possible from the informationavailable. Otte & Dwyer, inc. and its surveyor assume no responsibility for damages incurred as a result of utilities, shown or not shown on this plan. Always call DIGSAFE at 811 before you dig.

NOTE:
1. SPUR TRACK REFERENCED IN BOOK 4896, PAGE 244, HAS BEEN REMOVED.

APPROXIMATE HISTORIC WATER LINE COMPILED FORM 1808 MILL POND PLAN, AS SHOWN ON CAMPTER 91 JURISDICTION FIGURE 5.12-1; LOVEJOY WHARF-BOSTON, MASSACHUSETTS, BY EPSILON ASSOCIATES, INC.

[*] ALSO AFFECTED BY BOOK 17550, PAGE 159; BOOK 17586 (Exception No. 15a) PAGE 1 & BOOK 17586, PAGE 1 & 8 (Exception No. 15b&c)

(Exception No. 19) LOCUS IS SUBJECT TO AN ORDER OF CONDITIONS BOOK 29329, PAGE 162 AND EXTENSION PERMITS IN BOOK 33968, PAGE 43 AND BOOK 34505, PAGE 142.

(Exception No. 20) LOCUS IS SUBJECT TO FINAL ORDER OF CONDITIONS BOOK 45527, PAGE 99

DRAFT 8/20/2012

EXHIBIT "A" COMMITMENT No. 14892851

160 North Washington Street, Boston, MA:

That certain parcel of improved real property commonly known as 160 North Washington Street located in the City of Boston, County of Suffolk and Commonwealth of Massachusetts, legally described as follows:

A certain parcel of land with the buildings thereon situated and now numbered 160 on Washington Street North in said Boston, the same being shown as Lot C on a "Plan of Land in Boston-Mass." dated December 18, 1926, prepared by Aspinwall & Lincoln, Civil Engrs., recorded with Suffolk Registry of Deeds, Book 4896, Page 234, and being bounded and described as follows:

NORTHEASTERLY by said Washington Street North, 211 feet;

SOUTHEASTERLY by the center of a passageway approximately 50 feet wide known as Lovejoy Place, 188.285 feet;

SOUTHWESTERLY by Lot D on said plan by three lines measuring respectively, 25 feet, 113.16 feet and 86.86 feet (the first of said lines extends from the center line of Lovejoy Place to the Southeasterly end of the brick partition wall between the buildings on said Lot C and said Lot D, the second extends through said brick partition wall and the third extends to the harbor line in the Charles River and forms as interior angle with the Northwesterly boundary herein below satforth of 89 49' 35"); and

NORTHWESTERLY by the harbor line in the Charles River, 212.66 feet.

131 Beverly Street, Boston, MA

That certain parcel of improved real property commonly known as 131 Beverly Street located in the City of Boston, County of Suffolk and Commonwealth of Massachusetts, legally described as follows:

A certain parcel of land in said Boston with the buildings thereon shown as Lot D on a plan entitled "Plan of Land in Boston-Mass." made by Aspinwall & Lincoln, C.E., dated December 18, 1926, recorded in the Registry of Deeds for Suffolk County, in Book 4896, Page 234, and being bounded and described as follows:

SOUTHWESTERLY by Beverly Street by two (2) courses as shown on said Plan, in all two hundred fifty one and 49/100 (251.49) feet;

NORTHWESTERLY by the Charles River two hundred ninety six and 19/100 (296.19) feet;

NORTHEASTERLY by Lot C as shown on said Plan and also as shown on a plan entitled "Plan of Land in Boston-Mass." made by Aspinwall & Lincold, C.E., dated December 20, 1926, recorded in said Deeds in Book 4896, Page 252, by two (2) courses, in all two hundred twenty five and 02/100 (225.02) feet, said two (2) courses last above mentioned running in part parallel withh and three (3) feet southwesterly from a line marked by copper nails in the second floor of the three story building on Lot C and in part through a brick partition wall between the brick building on Said Lot C 67/100 (.67) feet northeasterly from the Southwesterly face of said brick partition wall;

SOUTHEASTERLY by the center line of the passageway fifty (50) feet in width called Lovejoy Place by two (2) lines one hundred fifty three and 97/100 (153.97) feet and one hundred thirty-five and 74/100 (135.74) feet respectively;

There is excluded from the foregoing described parcel of land so much of the land taken by the Commonwealth of Massachusetts by eminent domain as set forth and described in its: (a) Order of Taking dated June 29, 1951, recorded in said Registry of Deeds in Book 6708, Page 220, as affected by a deed dated February 21, 1955, recorded with said Deeds in Book 7037, Page 587; (b) an Order of Taking dated April 15, 1992, recorded with said Deeds in Book 17462, Page 165; and (c) and Orded of Taking dated August 6, 1997, recorded with said Deeds in Book 21645, Page 153.

Said premises has benefit of the rights to a private road known as Lovejoy Plane and rights and easements set forth in a deed dated December 26, 1986, recorded at Book 13271, Page 257.

Said premises has benefit of the terms and provisions of License 3342 dated January 6, 1909 recorded in Book 3336, Page 250; and License 3373 dated May 24, 1909 recorded in Book 3373, Page 485, in accordance with the terms thereof.

EXCEPTIONS
Exceptions, as numbered in Commitment for Title Insurance No.14892851, dated July 31, 2012, issued by Commonwealth Land Title Insurance Company.

With regard to exceptions 1-5. Our certification is limited to only matters observed on the ground or of record

No. 6	As noted on the survey (sheet 1)
No. 7	As noted on the survey (sheet 2)
No. 8	As shown on the survey (sheet 2)
No. 9	As noted on the survey (sheet 2)
No. 10	As noted on the survey (sheet 2)
No. 11	As noted on the survey (sheet 1)
No. 12	As noted ont the survey (sheet 2)
No. 13	As noted ont the survey (sheet 2)
No. 14	As shown on the survey (sheet 2)
No. 15	As noted ont the survey (sheet 2)
No. 16	Not plottable
No. 17	As shown on the survey (sheet 2)
No. 18	As noted ont the survey (sheet 2)
No. 19	As noted ont the survey (sheet 2)
No. 20	As noted ont the survey (sheet 2)

NOTE:
The surveyor has relied upon the Commitment for Title Insurance issued by Commonwealth Land Title Insurance Company Number 14892851, effective July 31, 2012 with regard to any recorded easements, rights of way or setbacks affecting the subject property.

ALTA/ACSM LAND TITLE SURVEY

160 NORTH WASHINGTON STREET & 131 BEVERLY STREET BOSTON, MASS. 02114

PREPARED FOR

THE BEAL COMPANIES

BY

OTTE & DWYER, INC.
LAND SURVEYORS
WWW.OTTEDWYER.COM
59 APPLETON STREET SAUGUS, MA 01906
P.O. BOX 982 (781)233-8155

SCALE: 1"=40' AUGUST 20, 2012
REVISED:

0' 40' 80' 120'
SCALE

SHEET 2 of 2 JN. 11444

LOCUS MAP N.T.S.

GENERAL NOTES

NORTH WASHINGTON WHARF, LLC
21 WORTHEN RD, SUITE 102, LEXINGTON, MA 02421
DEED REFERENCE: BOOK 35487 PAGE 347
PLAN REFERENCE: BOOK 4896 PAGE 234
TAX MAP REFERENCE: PARCEL I.D. 0303060000

ZONING DISTRICT:
NORTH STATION ECONOMIC DEVELOPMENT DISTRICT
GENERAL AREA SUBDISTRICT

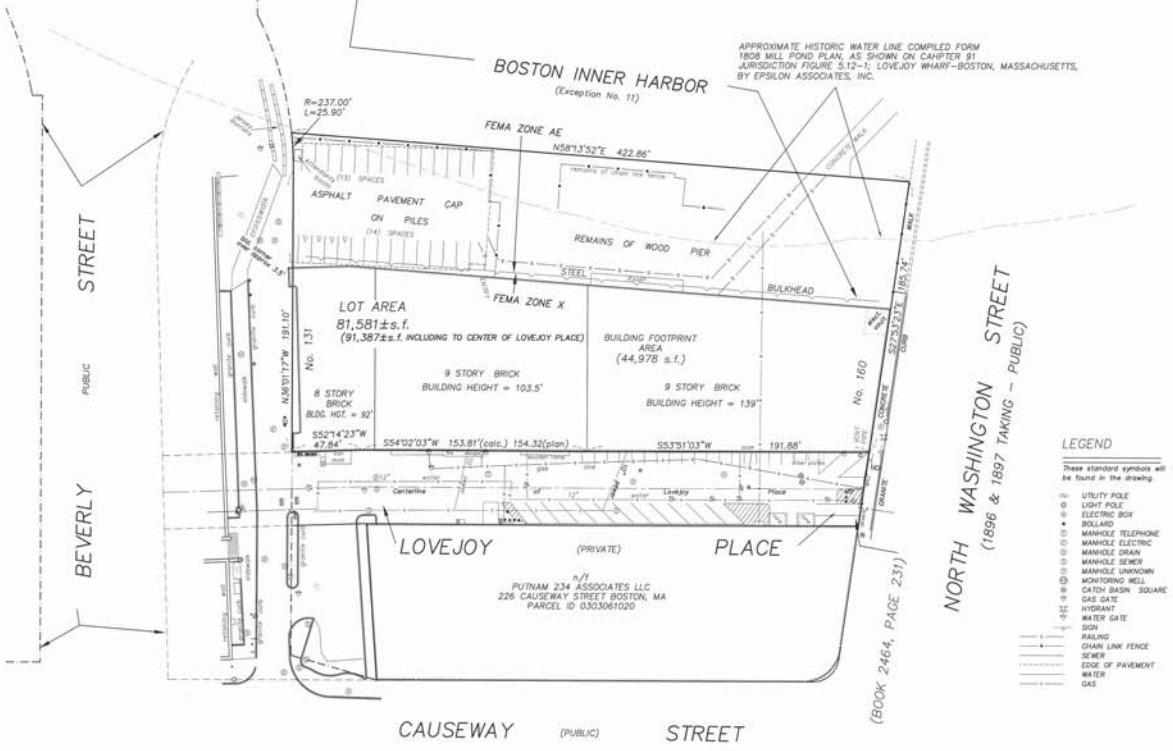
GENERAL NOTES

OWNER OF RECORD: BEVERLY WHARF, LLC
21 WORTHEN RD, SUITE 102, LEXINGTON, MA 02421
DEED REFERENCE: BOOK 35488 PAGE 1
PLAN REFERENCE: BOOK 4896 PAGE 234
TAX MAP REFERENCE: PARCEL I.D. 0303063000

ZONING DISTRICT:
NORTH STATION ECONOMIC DEVELOPMENT DISTRICT
GENERAL AREA SUBDISTRICT

n/f
COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION

DRAFT 8/20/2012



LEGEND

These standard symbols will be found in the drawing.

- UTILITY POLE
- LIGHT POLE
- ELECTRIC BOX
- BOLLARD
- MANHOLE TELEPHONE
- MANHOLE ELECTRIC
- MANHOLE DRAIN
- MANHOLE SEWER
- MANHOLE UNKNOWN
- MONITORING WELL
- CATCH BASIN SQUARE
- GAS GATE
- HYDRANT
- WATER GATE
- SIGN
- RAILING
- CHAIN LINK FENCE
- SEWER
- EDGE OF PAVEMENT
- WATER
- GAS

The Parcel shown on this survey lies within a Zone "AE & X", as described on the Flood Insurance Rate Map No. 25025C0081G, dated September 25, 2009, in which the property is located.

GENERAL UTILITY NOTE

The underground utilities depicted hereon are from field locations of observable evidence and/or compiled according to available record plans and are approximate only. The surveyor makes no guarantees that underground utilities depicted comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities are in the exact location indicated hereon although they are located as accurately as possible from the informationavailable. Otte & Dwyer, Inc. and its surveyor assume no responsibility for damages incurred as a result of utilities, shown or not shown on this plan. Always call DIGSAFE at 811 before you dig.

To The Beal Companies, LLP; Lender, its successors and/or assigns and to Commonwealth Land Title Insurance Company:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2011 "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys", jointly established and adopted by ALTA and NSPS, and includes items 2, 3, 4, 6(a), 7(a)(b1)(c), 8, 9, 11(b), 13 & 14 of Table A thereof. The field work was completed on August 17, 2012.

Name David A. Dwyer Jr., PLS
Licensed Land Surveyor No. 46707
ddwyer@ottedwyer.com

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ALTA/ACSM LAND TITLE SURVEY

160 NORTH WASHINGTON STREET & 131 BEVERLY STREET BOSTON, MASS. 02114

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SCALE: 1"=40' AUGUST 20, 2012
REVISED:

0' 40' 80' 120'
SCALE

SHEET 1 of 2 JN. 11444

Attachment B

Transportation

ATTACHMENT B TRANSPORTATION ANALYSIS

B.1 Executive Summary

In connection with the prior FPIR filing and 2006 approvals for the Project, a transportation study was submitted and approved by the Boston Redevelopment Authority (BRA) (the "Approved Transportation Analysis"). In connection with this filing, the Approved Transportation Analysis has been updated to address the impacts on the transportation system associated with Project as modified herein. Specifically, the Approved Transportation Analysis has been updated to address the use of the existing building at 160 North Washington Street for approximately (i) 187,187 square feet of office space (the "Office Use") , and (ii) 20,543 square feet of commercial space, including restaurant space that would accommodate 300 seats. The redevelopment program for the 131 Beverly Street property remains substantially unchanged since the Approved Traffic Analysis.

This updated traffic analysis was performed in accordance with the Executive Office of Energy and Environmental Affairs/Executive Office of Transportation (EEA/EOT) guidelines for the preparation of Traffic Impact Assessments (TIAs), and the Boston Redevelopment Authority requirements for the preparation of this filing. The scope of this transportation analysis was determined during meetings with the Boston Transportation Department (BTD) officials.

The summary findings are as follows:

- The Project as modified by this filing does not result in a significant change in vehicular traffic operations (motorist delays or queuing) at the study area intersections over No-Build conditions.

- The Project as modified is projected to result in minimal increases to area transit ridership as compared to No-Build conditions, and is not anticipated to result in a significant impact on transit capacity in the area.

- The Project as modified is not projected to result in a significant increase to pedestrian activity over No-Build conditions, and is not expected to result in a notable impact to pedestrian traffic within the study area.

- Parking for the Project will be provided on-site, with a total of 315 parking spaces provided, including a proposed parking garage at 131 Beverly Street.

- Loading activities for the Project will occur as previously approved in designated off-street areas via Lovejoy Place and Beverly Street.

- The proponent is committed to developing and implementing a comprehensive transportation demand management (TDM) program to reduce automobile dependency and encourage travel by non-automobile modes.

- The proponent and general contractor will develop a comprehensive construction management plan to ensure safety and minimize the impact of construction activities on pedestrian and vehicular traffic.

Conclusion

The Project is uniquely designed and situated to take advantage of the existing and expanding transportation infrastructure in the North Station area, including enhanced and improved access to the regional roadway network, proximate public transportation access, and pedestrian facility improvements. It is expected that the availability of public transportation services in the vicinity of the Project site coupled with the implementation of a comprehensive TDM program as a part of the Project will minimize the potential traffic impacts associated with the Project. Finally, the Project Proponent will be required to formalize the commitments to Project mitigation with the City of Boston via a Transportation Access Plan Agreement (TAPA) to be entered into by the Proponent (or its affiliates) and Boston Transportation Department.

B.2 Existing Conditions

B.2.1 Introduction

As previously noted, the Project will be located off Beverly Street, at 131 Beverly Street and 160 North Washington Street in the Bulfinch Triangle section of Boston. The Project is ideally situated from a public transportation perspective and is also located within a convenient walking distance to Government Center and the Financial District. A review of existing roadway, parking, pedestrian, and public transportation facilities was undertaken in October 2012 to assess the current availability of transportation resources in the vicinity of the Project site.

B.2.1.1 Study Methodology

As with the Approved Transportation Analysis, this updated transportation analysis was conducted in three distinct stages. The first stage involved an assessment of existing conditions within the study area including pedestrian and parking facilities and public transportation availability. Collection of existing peak-hour traffic pedestrian traffic volumes was updated. As documented in subsequent sections of this report, analysis of project-related impacts to vehicular traffic operations was conducted based on future year 2017 traffic volumes and roadway conditions following the completion of improvements to the Causeway Street corridor. Specifically, as with the original approvals, separate 2017 No-Build and 2017 Build condition analyses were updated in order to address the Office Use.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the project. The future design condition traffic volumes for proposed transportation improvements to the Causeway Street

corridor were utilized in the development of future traffic conditions, and include future traffic volumes associated with planned and approved area developments including all of the Bullfinch Triangle air rights parcels and the full-build out of the TD Garden site, including the proposed subsurface parking garage to be accessed via Causeway Street, opposite Haverhill Street. The 2017 future year condition was assessed in accordance with the BRA/BTD analysis protocol.

The third stage of the study update presents and evaluates the traffic, pedestrian, parking, and public transportation impacts of the project, and provides recommendations as necessary for improvements to accommodate the current redevelopment project.

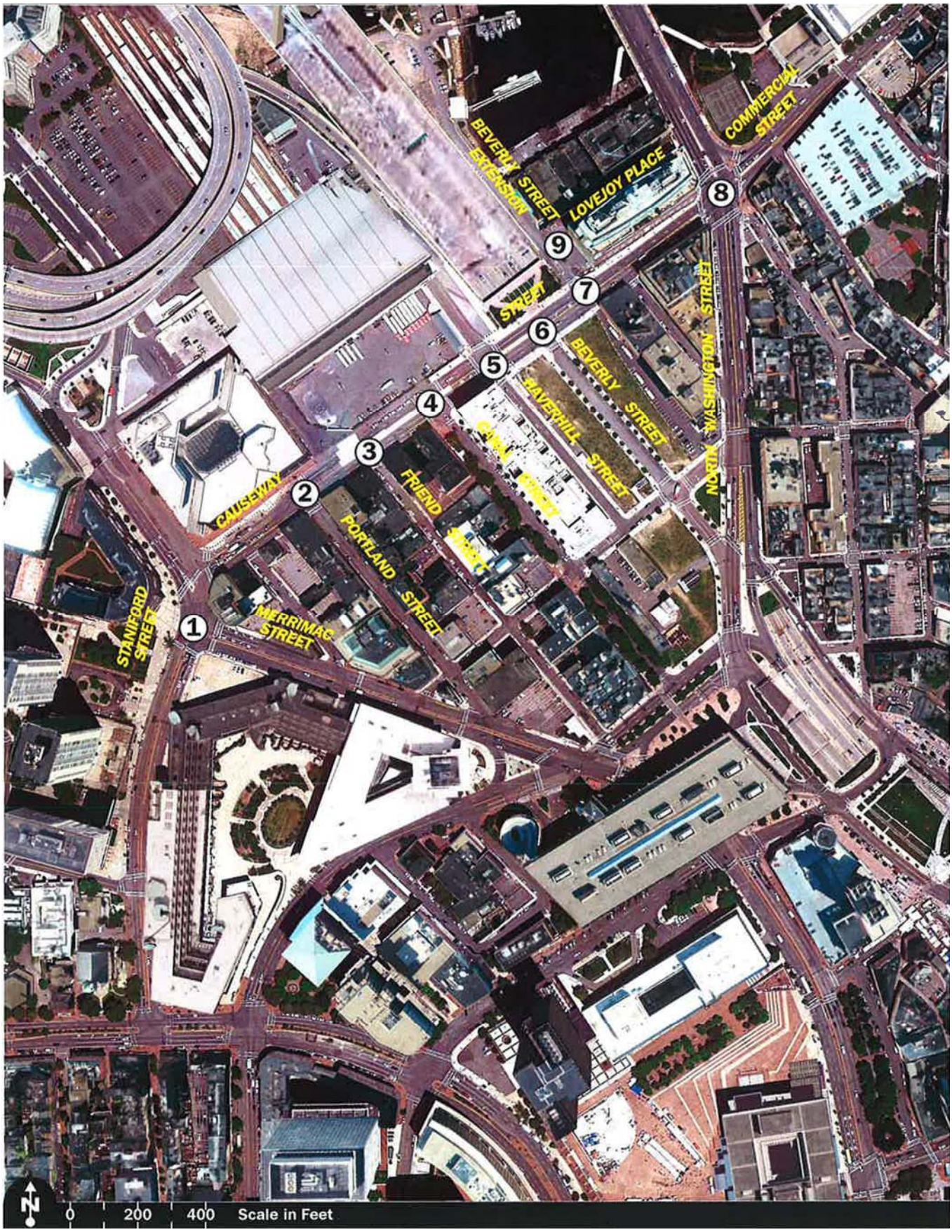
B.2.2 Study Area

The study area for the Project was developed in consultation with the Boston Transportation Department; and contains critical signalized and unsignalized intersections in the vicinity of the Project site. Specifically, the study area was selected to contain the major surface roadways adjacent to the Project site including Beverly Street, North Washington Street, Causeway Street, Lomasney Way, and Merrimac Street; as well as the nine intersections expected to accommodate the majority of project-related traffic along these roadways. Study area intersections are displayed on Figure B-1 and are summarized below.

1. Causeway Street and Staniford Street at Lomasney Way and Merrimac Street
2. Causeway Street at Portland Street
3. Causeway Street at Friend Street
4. Causeway Street at Canal Street
5. Causeway Street at Haverhill Street, Legends Way and TD Garden Garage driveway (future)
6. Causeway Street at Beverly Street
7. Causeway Street at Beverly Street Extension
8. Causeway Street at North Washington Street and Commercial Street
9. Beverly Street at Lovejoy Place

B.2.3 Geometrics

The roadway and intersection geometrics utilized in this report reflect future year 2017 conditions following the completion of the Causeway Street improvement project, and other construction activities associated with area development within the study area. The following summarizes the geometrics utilized for analysis purposes.



Vanasse & Associates, Inc.
Transportation Engineers & Planners

Lovejoy Wharf

Study Area Intersections
Figure B-1

Roadways

Causeway Street. Causeway Street is a four-lane, partially median divided, urban collector roadway under the jurisdiction of the City of Boston, which traverses the study area in a general east-west orientation between Merrimac Street to the west and North Washington Street to the east. Within the study area, land use along Causeway Street consists of the TD Garden, the O'Neill Federal Building, various commercial and office developments, residential developments and the MBTA North Station commuter rail station and the Green Line/Orange Line "Super Station". Taxi stands are located on both the northern and southern sides of the corridor, in the vicinity of the TD Garden. Sidewalks are provided along both sides of Causeway Street, with illumination provided by way of street lights mounted on steel poles. Head houses to the MBTA Orange and Green Lines are located on Causeway Street proximate to Canal Street and the TD Garden.

Beverly Street. Beverly Street is a two-lane roadway under the jurisdiction of the City of Boston which traverses the study area in a general north-south orientation between the State Police and DCR facilities and Causeway Street. Within the study area, land use along Beverly Street consists of a mix of commercial, office, and residential space.

Lomasney Way. Lomasney Way is a four-lane, median divided, urban collector roadway under the jurisdiction of the City of Boston which traverses the study area in a general north-south orientation between Merrimac Street and Nashua Street. Within the study area, land use along Lomasney Way consists of the TD Garden Garage, the O'Neill Federal Building and residential developments. Sidewalks are provided along both sides of Lomasney Way, with illumination provided by way of street lights mounted on steel poles.

Merrimac Street. Merrimac Street is a four-lane, median divided, urban collector roadway under the jurisdiction of the City of Boston which traverses the study area in a general northwest-southeast direction between New Chardon Street and Staniford Street. Within the study area, land use along Merrimac Street consists of commercial and office developments, as well as the Suffolk County Courthouse. Sidewalks are provided along both sides of Merrimac Street, with illumination provided by way of street lights mounted on steel poles.

North Washington Street. North Washington Street is a four-lane urban collector roadway under the jurisdiction of the City of Boston which traverses the study area in a general northeast-southwest direction between New Chardon Street and Causeway Street. Within the study area, land use along North Washington Street consists of commercial and office developments. Sidewalks are provided along both sides of North Washington Street, with illumination provided by way of street lights mounted on steel poles.

Intersections

The following section identified the intersection geometry at each study area location, following the completion of the proposed Causeway Street improvement project.

1). ***Causeway Street and Staniford Street at Lomasney Way and Merrimac Street.*** Lomasney Way and Merrimac Street intersect Causeway Street and Staniford Street from the north and south, respectively, to form a skewed four-legged intersection under traffic signal control. The eastbound Staniford Street and westbound Causeway Street approaches consist of two general-purpose travel lanes and an exclusive right turn lane. The northbound Merrimac Street approach consists of an exclusive left turn lane, through lane, and an exclusive right turn lane. The Lomasney Way southbound approach consists of an exclusive left turn lane and two general-purpose travel lanes. Bituminous concrete sidewalks are provided along both sides of the road way for all four intersection approaches. Crosswalks are provided across every intersection approach. The traffic signal at this intersection operates under a four-phase, actuated signal operation, with an exclusive left turn phase provided for northbound and southbound traffic and an exclusive pedestrian phase.

2). ***Causeway Street at Portland Street.*** Portland Street intersects Causeway Street from the south to form a three-legged intersection under traffic signal control. The eastbound and westbound Causeway Street approaches consist of two general-purpose travel lanes in each direction. The northbound Portland Street approach consists of a general purpose travel lane. Bituminous concrete sidewalks are provided along both sides of the roadway. Crosswalks are provided across every intersection approach. The Traffic signal at this intersection operates under a three-phase, coordinated signal operation, with an exclusive pedestrian phase provided.

3). ***Causeway Street at Friend Street.*** Friend Street intersects Causeway Street from the south to form a three-legged unsignalized intersection. The eastbound and westbound Causeway Street approach consists of two general purpose travel lanes in each direction. The northbound Friend Street approach consists of a single receiving lane and operates as a one way street in the southbound direction. Bituminous concrete sidewalks are provided along both sides of the road way for all three intersection approaches. Under future conditions this location will be reconstructed as a raised intersection, with crosswalks provided across both the eastbound and westbound Causeway Street approaches and northbound Friend Street approach.

4). *Causeway Street at Canal Street.* Canal Street intersects Causeway Street from the south to form a three-legged intersection under STOP-sign control. The eastbound and westbound Causeway Street approaches consists of two general purpose travel lanes. The northbound Canal Street approach consists of a shared exclusive left turn and right turn lane. Bituminous concrete sidewalks are provided along both sides of the road way for all three intersection approaches. Under future conditions this location will be reconstructed as a raised intersection, with crosswalks provided across both the eastbound and westbound Causeway Street approaches and northbound Canal Street approach.

5). *Causeway Street at Haverhill Street and TD Garden Drive.* The TD Garden Drive and Haverhill Street intersect Causeway Street from the north and south, respectively, to form a four-legged intersection under traffic signal control. Under future conditions a fifth southbound leg will be constructed to this intersection to accommodate the TD Garden garage entrance. The eastbound Causeway Street approach consists of an exclusive left-turn lane and two general purpose lanes. The westbound Causeway Street approach consists of two general purpose travel lanes. The northbound Haverhill Street approach consists of an exclusive left-turn lane and a shared through/right-turn lane, and operates as a one way street in the northbound direction. The Legends Way and TD Garden Garage drive southbound approaches each provide a single general purpose travel lane. Bituminous concrete sidewalks are provided along both sides of the road way for all four intersection approaches. Crosswalks are provided across every intersection approach. The traffic signal at this intersection operates under a four-phase, coordinated signal operation, with an exclusive left turn lead phase provided for eastbound traffic.

6). *Causeway Street at Beverly Street.* Under future conditions, Beverly Street will intersect Causeway Street from the south to form a three-legged unsignalized intersection. The eastbound Causeway Street approach consists of two through lanes and a shared through/right turn lane. The westbound Causeway Street approach consists of two general purpose travel lanes. The northbound Beverly Street approach consists of a receiving lane and operates as a one way street in the southbound direction. Bituminous concrete sidewalks are provided along both sides of the road way for all three intersection approaches.

7). *Causeway Street at Beverly Street Extension.* Beverly Street Extension currently intersects Causeway Street from the north to form a three-legged unsignalized intersection. The eastbound Causeway Street approach consists of a shared left turn/through lane and two through lanes. The westbound Causeway Street approach consists of a through lane and a shared through/right turn lane. The southbound Beverly Street Extension approach consist of a shared left turn/right turn lane and operates under STOP sign control. Bituminous concrete sidewalks

are provided along both sides of the road way for all three intersection approaches. Crosswalks are provided across the eastbound Causeway Street and southbound Beverly Street Extension approaches.

8). *North Washington Street at Causeway Street and Commercial Street.* Commercial Street and Causeway Street intersect North Washington Street from the east and west, respectively, to form a four-legged intersection under traffic signal control. Under improved conditions, the eastbound Causeway Street approach consists of two exclusive left turn lanes and a shared through/right turn lane. The westbound Causeway Street approach consists of two general-purpose lanes and an exclusive right turn lane. The northbound North Washington Street approach consists of two general-purpose lanes. The North Washington Street southbound approach consists of an exclusive left turn lane, two through lanes and an exclusive right-turn lane. Bituminous concrete sidewalks are provided along both sides of the road way for all four intersection approaches. Crosswalks are provided across every intersection approach. The traffic signal at this intersection operates under a four-phase, coordinated signal operation

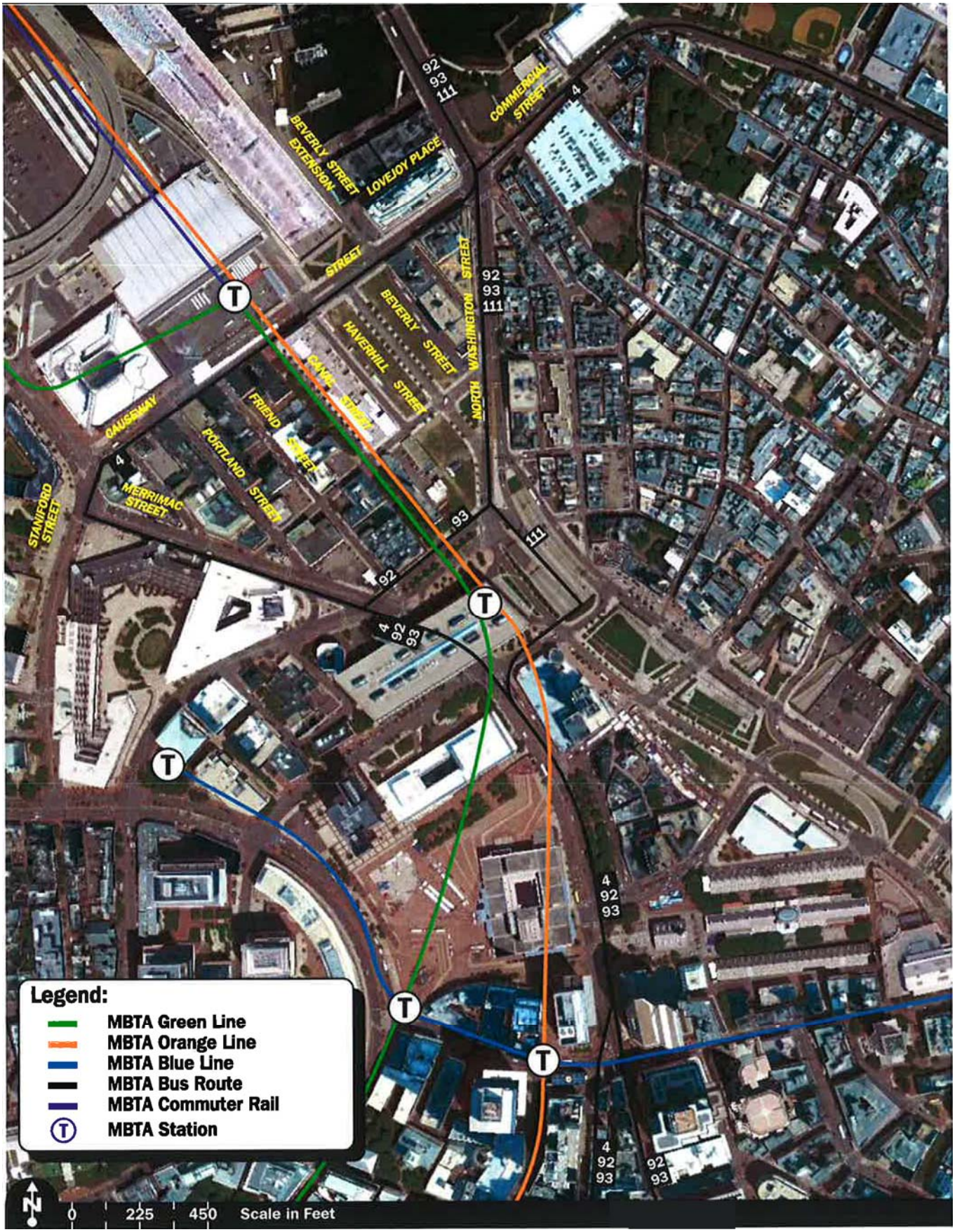
9). *Beverly Street Extension at Lovejoy Place*. Lovejoy Place intersects Beverly Street Extension from the east to form a four-way unsignalized intersection. All three intersection approaches provide a single general purpose travel lane. Sidewalk is provided along the western side of Beverly Street Extension at this location.

B.2.4 Existing Traffic Volumes

As mentioned previously, traffic volumes within the study area are currently impacted by ongoing construction activity, which has resulted in street closures within the study area. An analysis of future traffic operations is provided which provides a comparison of future 2017 No-Build conditions, with the prior BRA approved development project, and 2017 Build conditions with the currently proposed Project.

B.2.5 Existing Public Transportation

North Station is one of the principle transportation centers in the City of Boston. It provides connections to the Massachusetts Bay Transit Authority Orange Line and Green Line subway service, to commuter rail and to Amtrak's regional rail service to New Hampshire and Maine. Figure B-2 depicts the available public transit routes and facilities within the study area.



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Public Transportation Map
Figure B-2

Commuter Rail

There are four MBTA Commuter Rail lines serving North Station providing service to:

- Newburyport/Rockport
- Haverhill/Reading
- Lowell
- Fitchburg/South Acton

These four commuter lines serve the North Shore communities and the northwestern suburbs of Boston. Table B.2-1 summarizes the peak-period capacity for the four commuter rail lines serving North Station, as well as the latest MBTA ridership information during the peak-commuter periods.

Rapid Transit

The rapid transit subway system is accessible from North Station by way of the Orange and Green Lines, with connections provided by way of head houses located off Causeway Street proximate to Canal Street and the TD Garden. From North Station, the Orange Line provides service to the south to Forest Hill and north to Oak Grove. The Orange Line also provides connections to the Blue Line at State Street and to the Red Line at Downtown Crossing. The Green Line provides service to the north to Lechmere and to the west to Boston College via the B Line and to Heath via the E Line. Access to the C Line branch of the Green Line to Cleveland Circle and to the D Line branch to Riverside is available via a transfer at Government Center station. The Green Line also provides connection to the Blue Line at Government Center and to the Red Line at Park Street.

Bus Service

MBTA bus service within the study area is provided via several local bus routes, including Bus Route 4, Bus Route 92, Bus Route 93 and Bus Route 111.

Existing public transportation serving the immediate study area is summarized in Table B.2-1.

Table B.2-1 MBTA Transit Service

Service	Origin/Destination	Rush-Hour Headway (minutes)
	Rapid Transit Routes	
Orange Line Subway	Forest Hills-Oak Grove	4-5
Green Line Subway	Boston College-Lechmere	5-7
	Cleveland Circle-Lechmere	5-7
	Riverside-Lechmere	5-7
	Heath Street-Lechmere	5-7
Blue Line Subway	Bowdoin-Wonderland	3-4
	Local Bus Routes	
Bus Route 4	North Station-World Trade Center via Federal Courthouse and South Station	16
Bus Route 92	Assembly Square Mall-Downtown via Sullivan Square, Main Street and Haymarket	7-8
Bus Route 93	Sullivan Square-Downtown via Bunker Hill Street and Haymarket	7-8
Bus Route 111	Woodlawn or Broadway and Park Avenue-Haymarket via Tobin Bridge	10

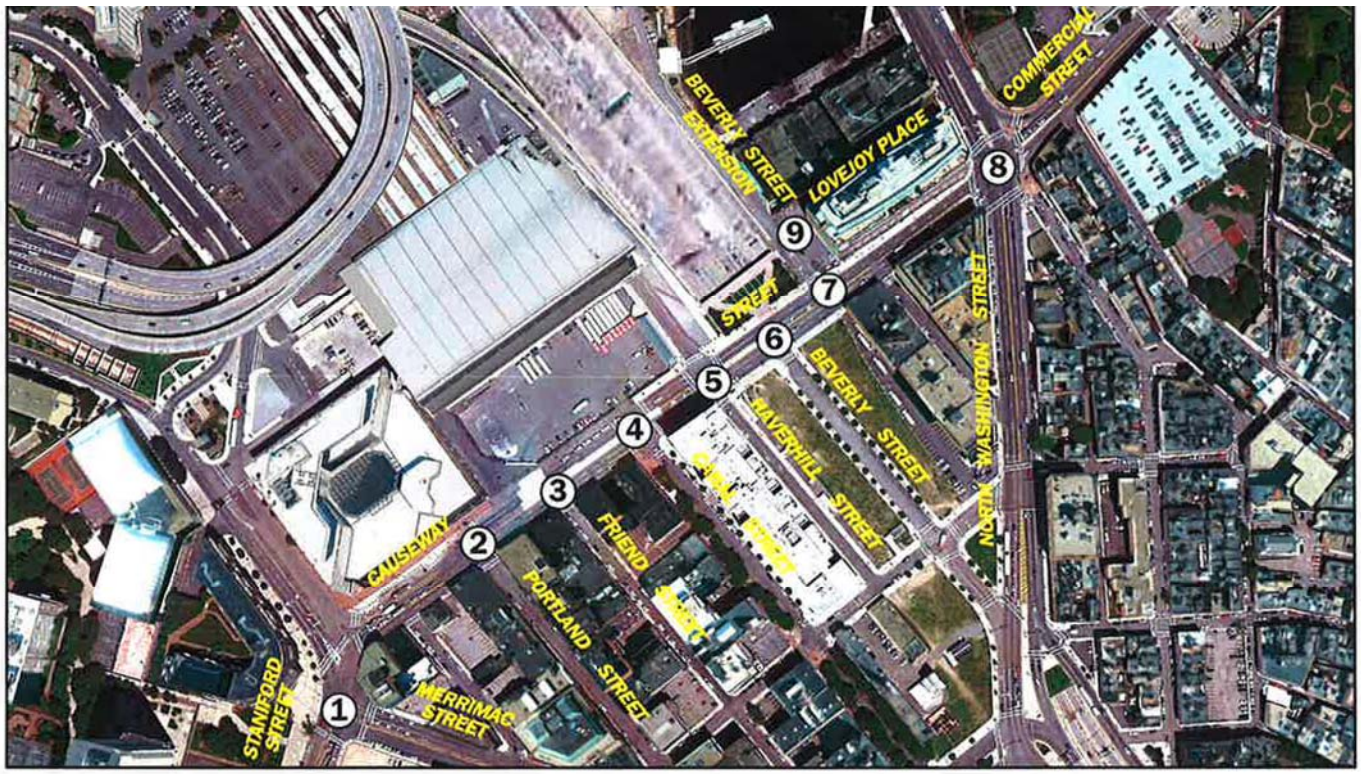
Source: Massachusetts Bay Transit Authority.

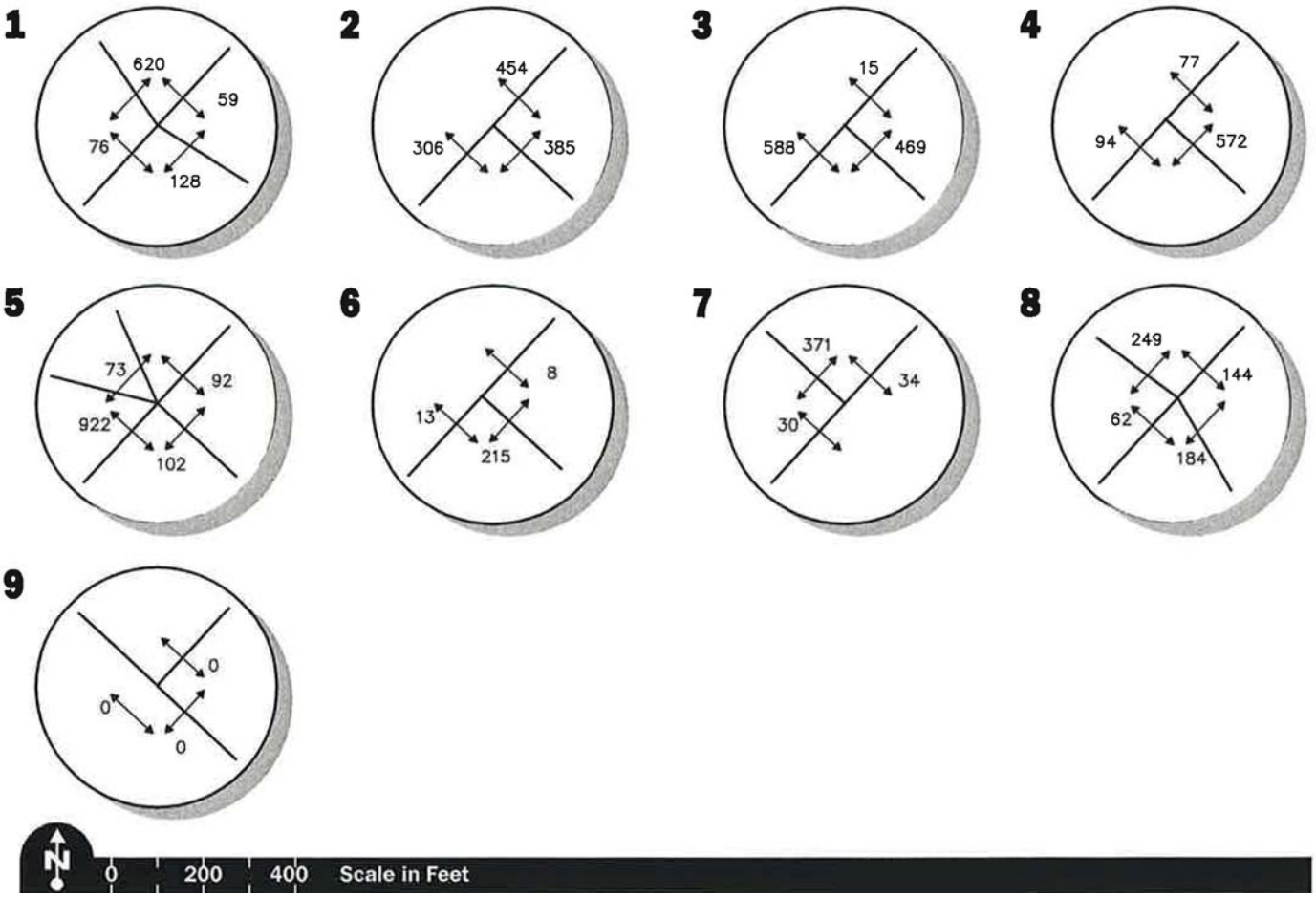
B.2.6 Existing Pedestrian Volumes

The Project is served by an expansive network of pedestrian sidewalks, with controlled crossings provided at signalized intersections. Existing pedestrian volumes were collected at the nine study area intersections in October 2012. The existing 2017 weekday morning and evening peak hour pedestrian counts are depicted on Figure B-3 and Figure B-4, respectively.

B.2.7 Existing Parking Supply

As with the Approved Traffic Analysis, the development program for the Project includes the provision of on-site parking that is intended to meet the parking demands of both the proposed residential and office components of the development program. In order to assess the availability of off-site parking within the vicinity of the site, an updated inventory of on-street and off-street public parking supply in the vicinity of the Project site was





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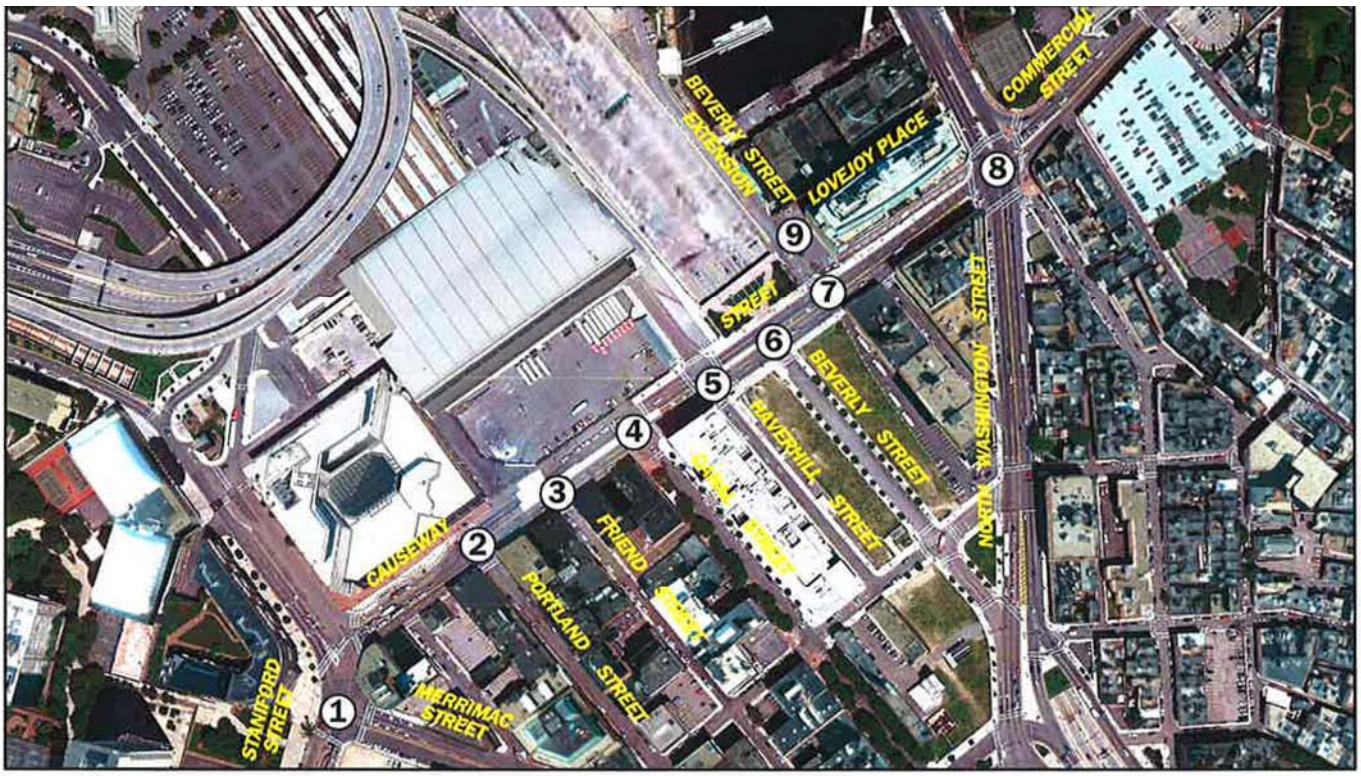
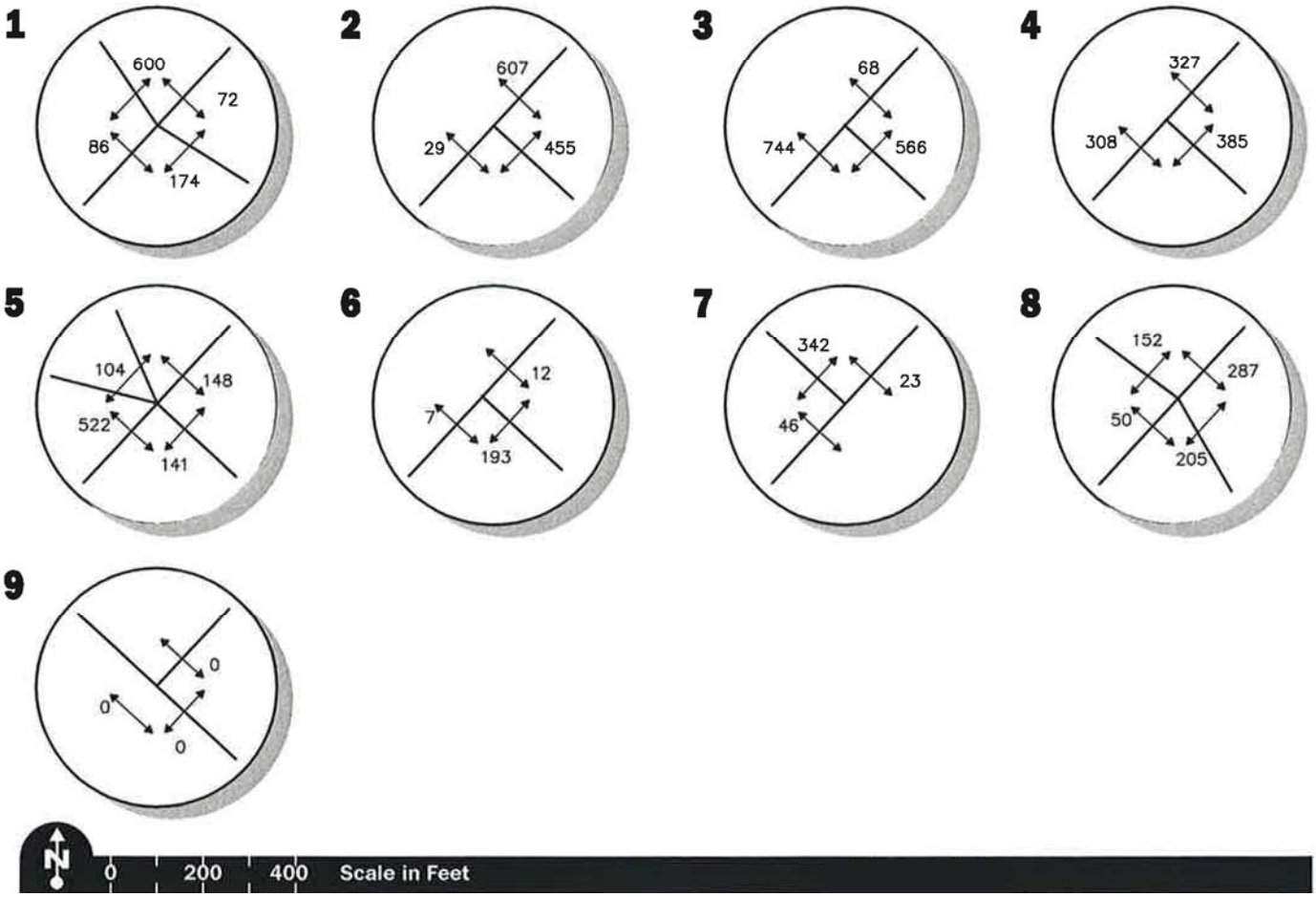
2012 Existing Weekday Morning Peak Hour Pedestrian Volumes
Figure B-3





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2012 Existing Weekday Evening Peak Hour Pedestrian Volumes
Figure B-4

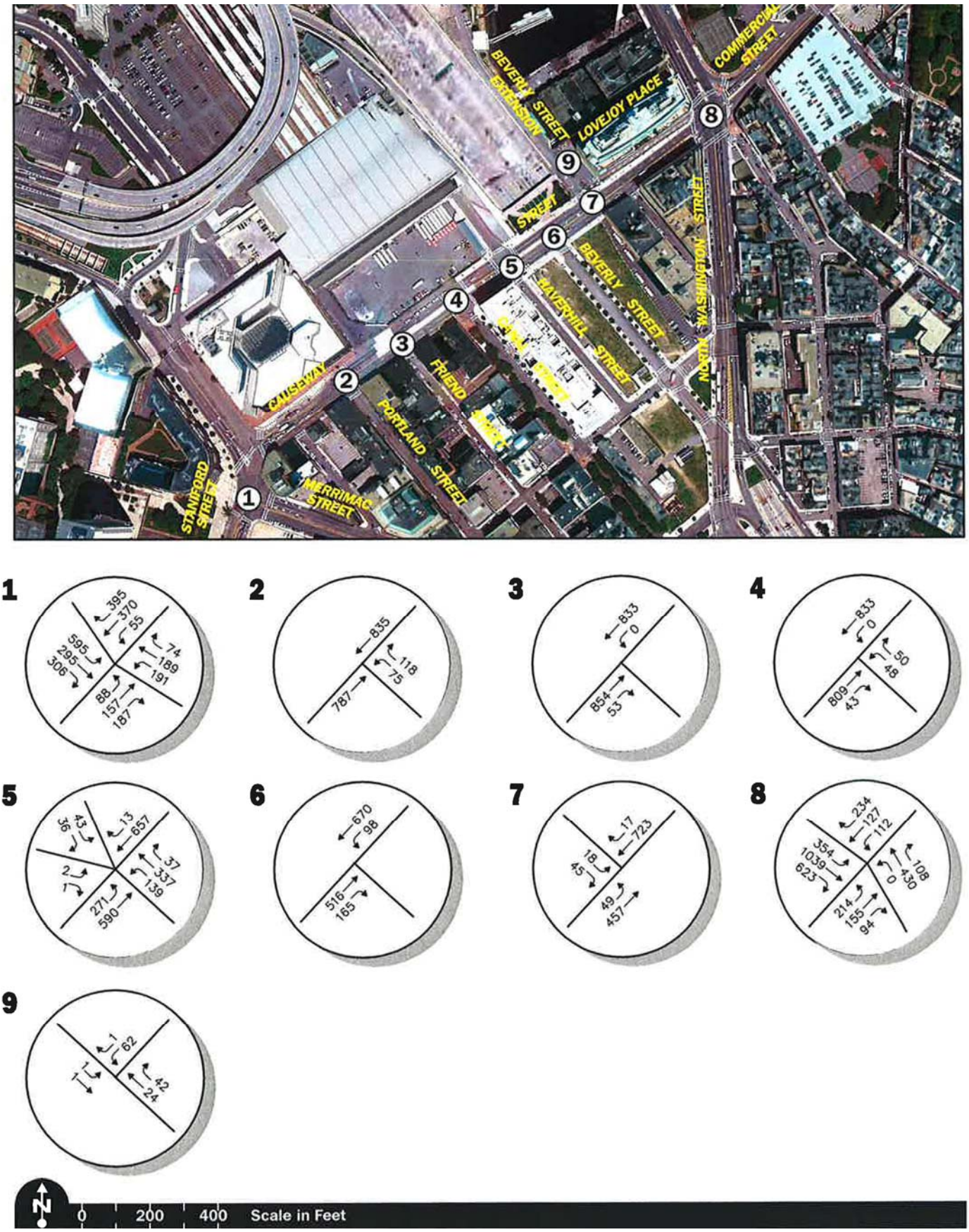
conducted. The updated inventory of on-street parking supply within the study area indicates that short-term on-street metered parking is available along a number of corridors within a five minute, or quarter-mile distance of the Project site, including portions of the Merrimac Street, Portland Street, Friend Street, Canal Street and Medford Street corridors. On-street parking restrictions in the vicinity of the Project site are depicted on Figure B-5.

In addition to the aforementioned short-term parking, a number of off-street parking lots and garages provide additional long-term public parking within walking distance of the Project site. Off-street parking lots and garages that provide public parking within a short walking distance of the Project site are depicted in Figure B-6. Table B.2-2 provides a summary of available area public parking located proximate to the site, based on data collected as part of recent City of Boston BRA filings. As noted in Table B.2-2, in excess of 2,500 public parking spaces are provided, which is expected to well exceed any project-related parking demand that is not accommodate on site.

Table B.2-2 Off-Street Parking Supply Summary

Map #	Address	Parking Facility	Public Space Capacity
		Parking Garage Facilities	
1	35 Lomasney Way	Garden Garage	710
2	101 Merrimac Street	101 Merrimac Street Garage	70
3	80 Causeway Street	MBTA North Station/Garden Garage	1,221
4	600 Commercial Street	North End Garage	200
		Parking Lot Facilities	
5	26-28 Lancaster Street	VIP Parking Lot	26
6	70 Lancaster Street	Stanihope – Lancaster Street	50
7	235-239 Friend Street	J & O Lot	26
8	302-320 Friend Street	Friend Street Lot	41
9	37 Merrimac Street	Rapids Parking Lot	45
10	37 Merrimac Street	P&P Parking Lot	83
11	90 N. Washington Street	Pinstripe Parking	47
12	181-183 N. Washington Street	Ruggiero Lot	7
13	580 Commercial Street	Commercial at Charter Street	49
	TOTAL		**2,575**

Source: *Project Notification Form – One Canal*. Epsilon Associates, Inc. October 2011



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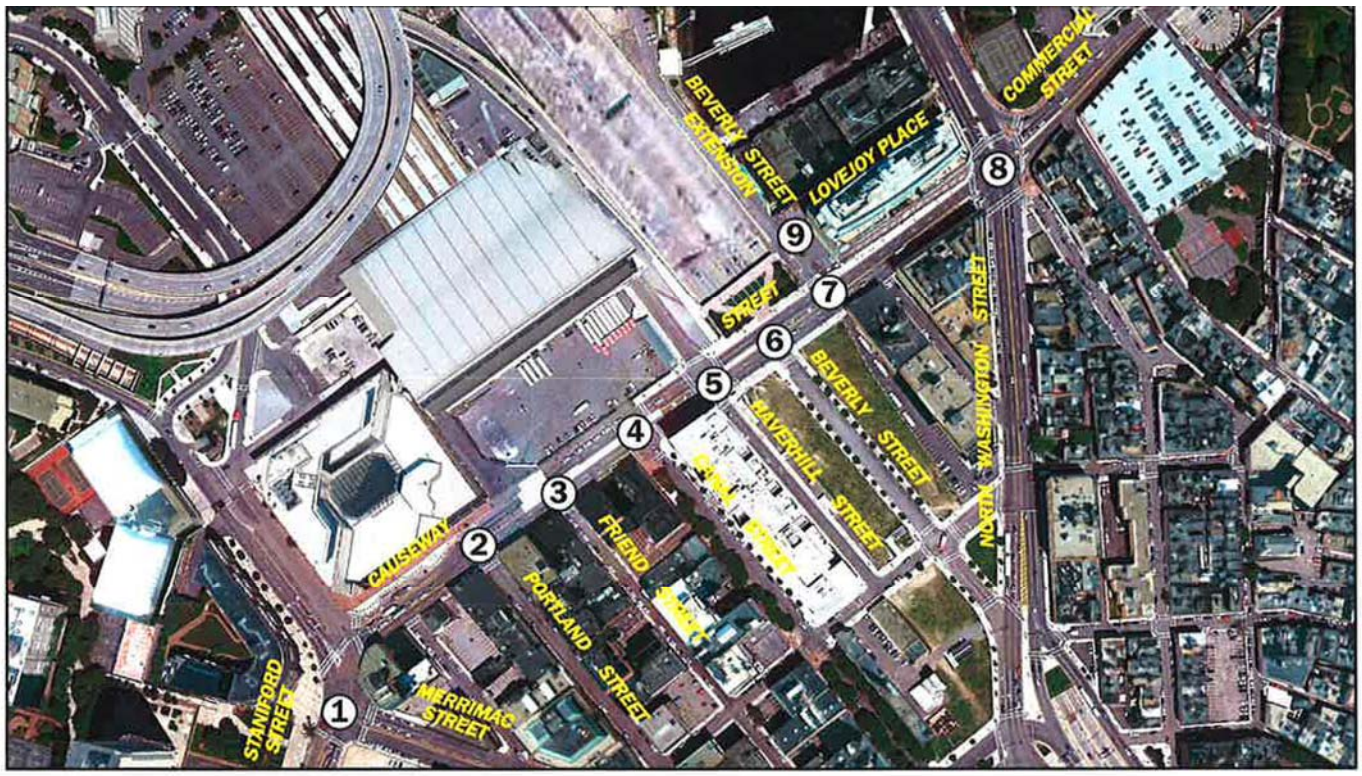
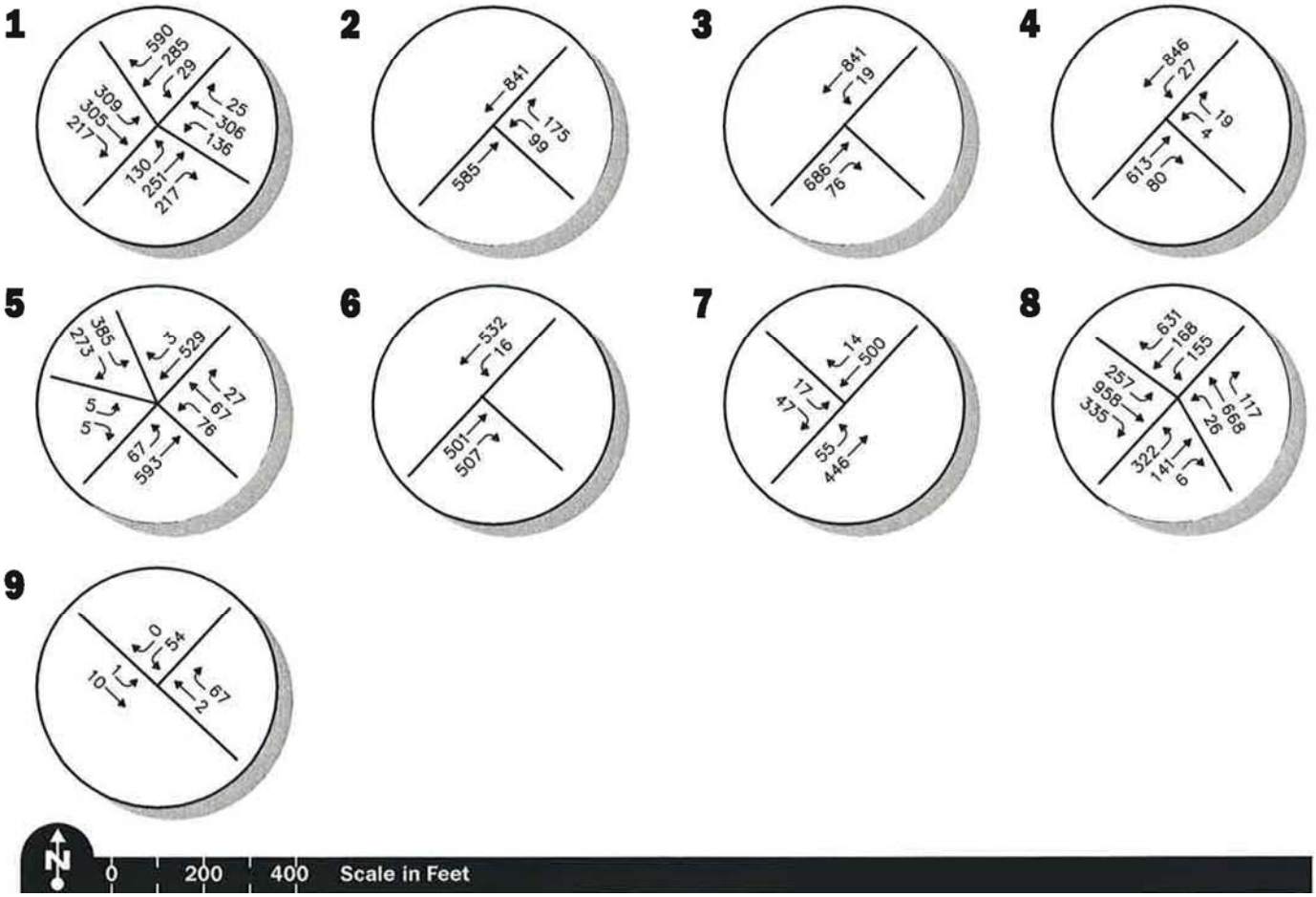
2017 No-Build Weekday Morning Peak Hour Traffic Volumes
Figure B-5





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2017 No-Build Weekday Evening Peak Hour Traffic Volumes
Figure B-6

B.3 Future Conditions

B.3.1 Introduction

This section of the report includes a description of planned roadway and traffic signal improvements within the study area. As mentioned previously, the study area will undergo significant transportation improvements in conjunction with the Causeway Street improvement project. The following sections provide an update of the planned transportation infrastructure projects in the vicinity of the Project.

B.3.2 Transportation Infrastructure Improvements

B.3.2.1 Causeway Street Improvement Project

The Massachusetts Department of Transportation (MassDOT) is currently in the process of designing roadway, traffic signal and pedestrian improvements along the Causeway Street corridor, as well as portions of Lomasney Way and North Washington Street as part of the Crossroads Initiative project. The purpose of the improvements is to transform the Causeway Street corridor into a more pedestrian and bicycle friendly corridor, consistent with MassDOT's Complete Streets design objectives. The Causeway Street corridor serves as an important pedestrian and vehicular connection between the North End and West End neighborhoods of Boston, and is also a critical access route for the Bullfinch Triangle business and entertainment district. Key elements of the project include:

- Reconstruction of the Lowell Square intersection (Causeway Street at Merrimac Street, Staniford Street and Lomasney Way) to enhance vehicular and pedestrian traffic, including reconstructed pedestrian crossings and intersection geometry to enhance vehicular, bicycle and pedestrian activity at this location

- Reconstruction of the Causeway Street core area, between Lomasney Way and North Washington Street, to improve pedestrian and bicycle travel, including the reconstruction of Causeway Street at Friend Street and Causeway Street at Canal Street in order to provide raised intersections to improve pedestrian safety.

- Reconstruction of Keany Square (Causeway Street at North Washington Street and Commercial Street) to enhance vehicular and pedestrian crossings and intersection geometry to enhance vehicular, bicycle and pedestrian activity at this location.

- Modifications to the Medford Street corridor to reverse direction of traffic flow from one-way northbound to one-way southbound.

Future year 2017 traffic analyses reflect proposed roadway and traffic signal improvements associated with this project.

B.3.2.2 North Station Garage Improvements

As part of the North Station Garage Improvement project, modifications are proposed to the intersection of Causeway Street with Legends Way and Haverhill Street in order to provide a fifth intersection leg that will serve traffic entering and exiting the North Station garage. Future year 2017 traffic analyses reflect proposed roadway and traffic signal improvements associated with this project.

B.4 Impacts Of The Project

B.4.1 Introduction

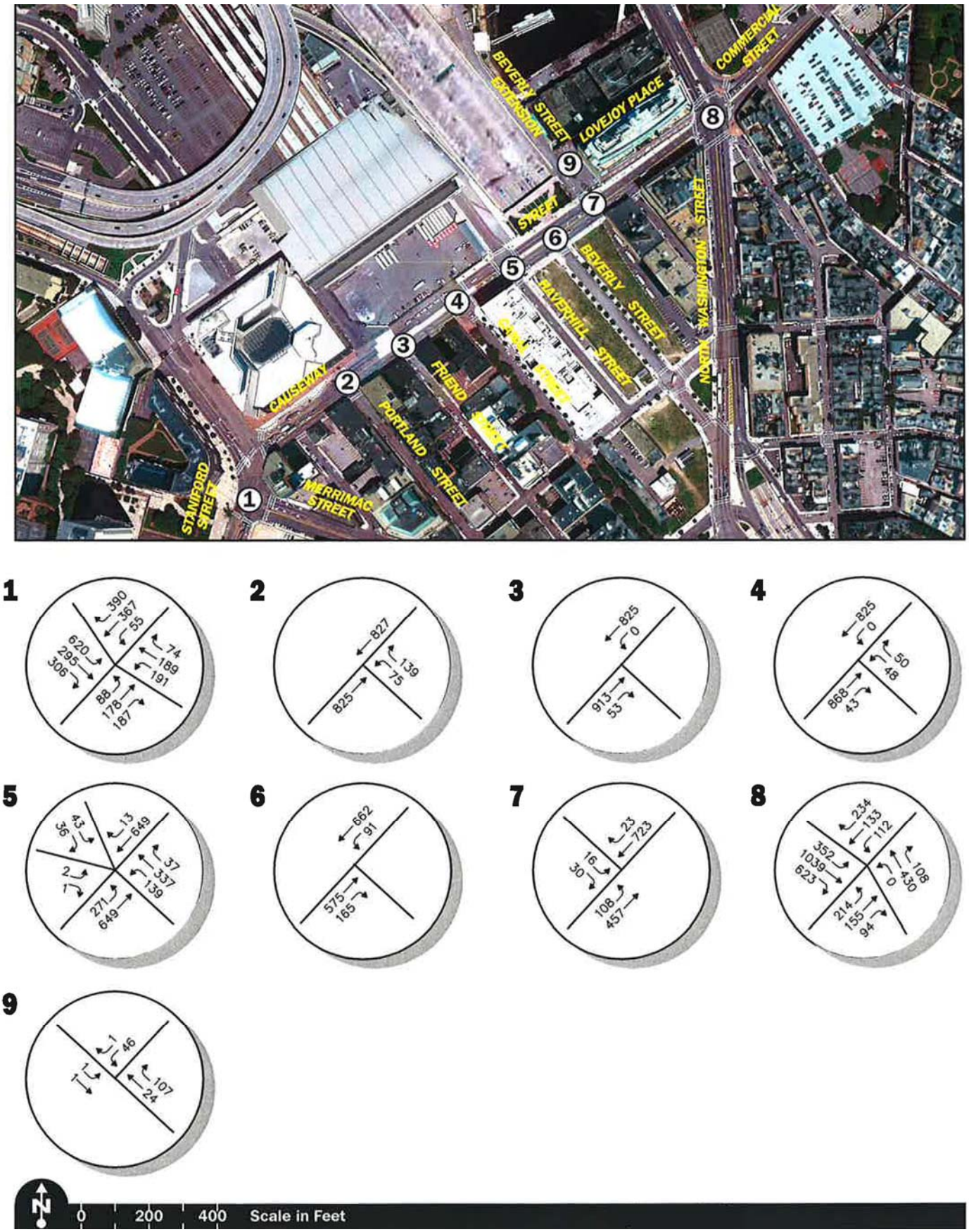
As with the Approved Traffic Analysis, this updated Traffic Analysis reviews the probable impacts associated with the Project (as modified by this filing) in relation to traffic volumes, pedestrian flow, public transportation use, and parking demand. Specific attention is focused on the incremental impacts of the office use.

As previously noted, in accordance with the MEPA and BRA/BTD requirements, two future conditions were evaluated in conjunction with the original approvals: 2017 No-Build (with the BRA approved project) and 2017 Build (with the Project). Independent of the Project, traffic volumes on the future roadway networks, under No-Build conditions, include all existing traffic and new traffic resulting from background traffic growth; land use traffic projections including the development of all of the Bulfinch Triangle air rights parcels, and traffic associated with the BRA approved redevelopment of the Project site. Future 2017 Build conditions include traffic identified in the 2017 No-Build scenario, as well as the incremental traffic increases associated with the Office Use.

B.4.2 2017 No-Build Traffic Networks

The future 2017 No-Build traffic conditions for the Project were obtained from the analysis of future traffic conditions utilized in the design of the Causeway Street improvement project. As previously noted, these volumes include existing traffic volumes as well as anticipated growth in traffic over a five-year planning horizon, including traffic associated with the Bulfinch Triangle air rights parcels, development at the TD Garden including the subsurface garage project and the approved redevelopment of the existing site at 131 Beverly Street/160 North Washington Street as a residential use.

Figures B-7 and B-8 depict the 2017 No-Build weekday morning and evening peak-hour traffic-volume networks, respectively.



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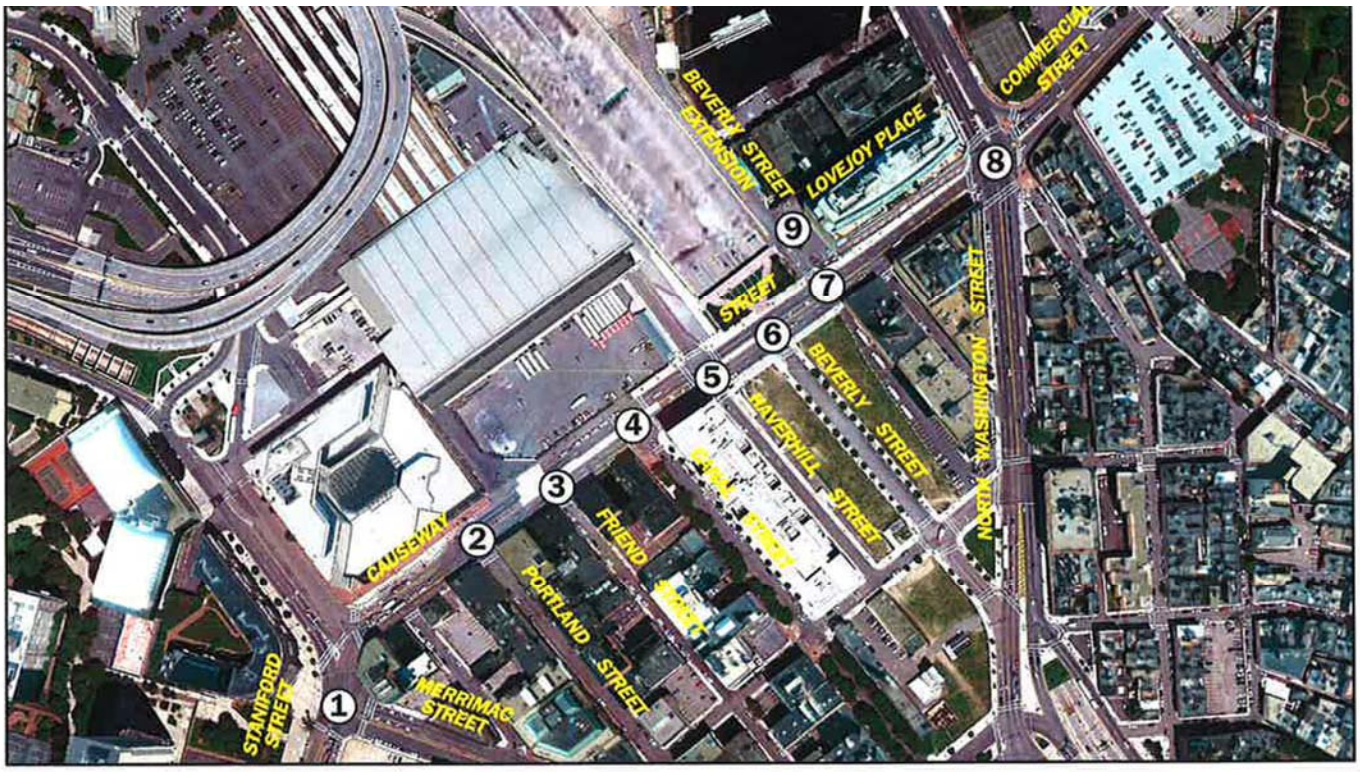
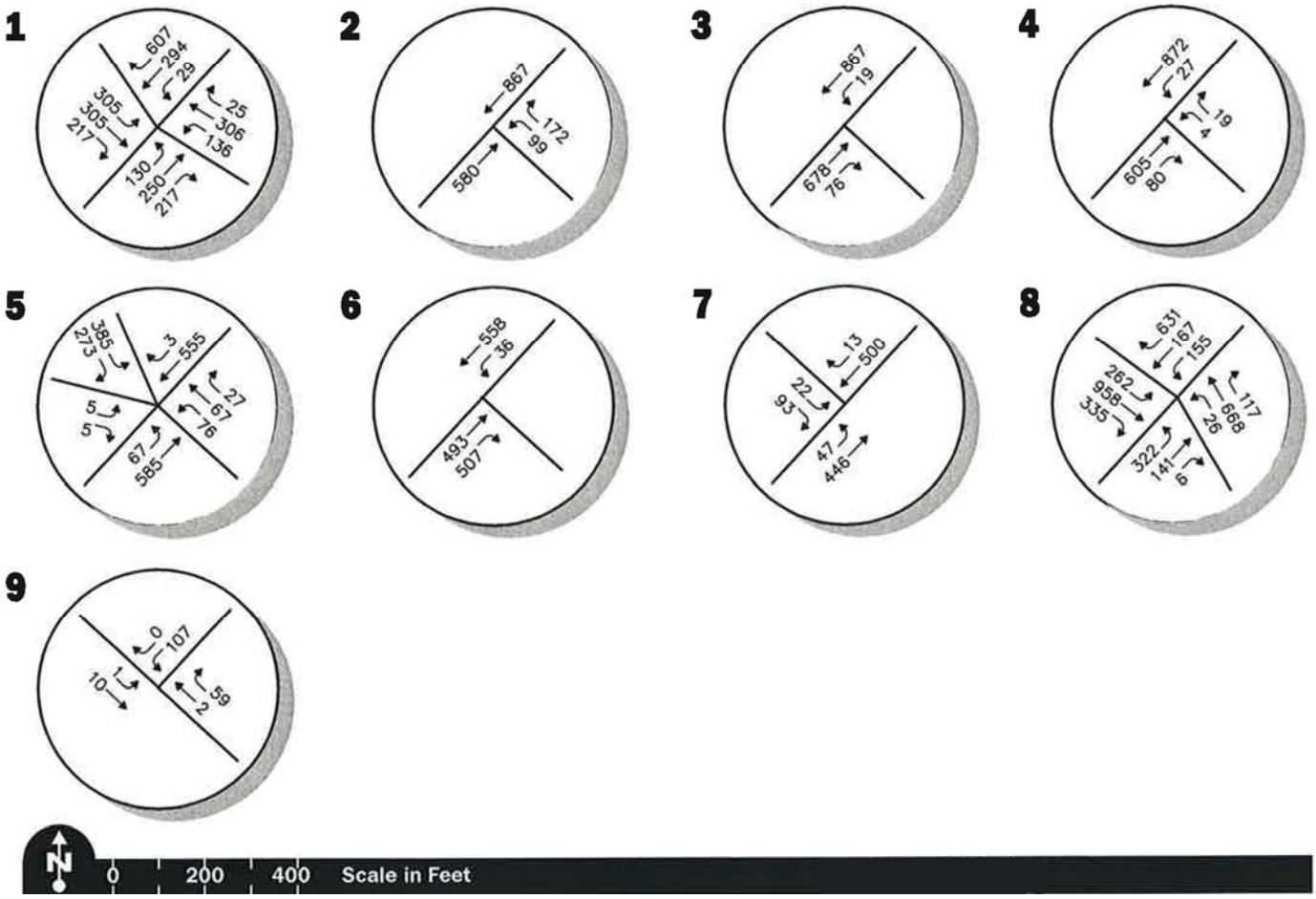
2017 Build Weekday Morning
Peak Hour Traffic Volumes
Figure B-7





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2017 Build Weekday Evening Peak Hour Traffic Volumes
Figure B-8

B.4.3 Project Trip-Generation

Consistent with industry and City of Boston guidelines, the trip-generation characteristics for the Project were developed using statistics published by the Institute of Transportation Engineers (ITE)[1] for similar land uses as those proposed. ITE Land Use Codes (LUC) 230 – Residential Condominium/ Townhouse, LUC 714 – Corporate Headquarters Building, LUC 814 – Specialty Retail, and LUC 932 – High Turnover Sit-Down Restaurant were utilized to develop the trip generation characteristics of the development.

Specifically, the trip generation projections for the 131 Beverly Street redevelopment are based on approximately 104 residential units and approximately 10,340 sf of commercial space. The trip generation projections for the 160 North Washington Street building are based on approximately 20,543 sf of commercial space (for the Office Use), 10,000 sf of which would accommodate restaurant space that provides 300 seats. Based on consultation with the project proponent, the proposed office space in the 160 North Washington Street facility would be leased to a single tenant, with an anticipated 300 employees expected to initially occupy the building. In order to provide a conservative assessment of impacts of the Project and account for future expansion of the existing number of employees, this analysis is based on a future expansion to 450 employees.

The expected travel mode split and vehicle occupancy ratio for the residential community were developed based on the City of Boston's Access Boston 2000 – 2010, Boston's City Wide Transportation Plan[2] and discussions with BTD.

Table B.4-1 summarizes the trip-generation characteristics of the proposed residential development utilizing the ITE data, unadjusted to account for modal splits in travel type.

[1] *Trip Generation,* Eighth Edition; Institute of Transportation Engineers; Washington, DC; 2003.

[2] Boston Transportation Fact Book and Neighborhood Profiles, Access Boston 2000-2010, Boston's City Wide Transportation Plan; City of Boston; May 2002.

Table B.4-1 Trip-Generation Summary Proposed Lovejoy Wharf Development

Time Period/Direction	Residential Units	Office Space	Commercial/ Restaurant	TOTAL
Average Weekday Daily:				
Entering	333	524	892	1,749
Exiting	333	524	892	1,749
Total	666	1,048	1,784	3,498
Weekday Morning Peak Hour:				
Entering	9	189	19	217
Exiting	44	14	12	70
Total	53	203	31	287
Weekday Evening Peak Hour :				
Entering	42	19	84	145
Exiting	20	152	66	238
Total	62	171	150	383

[a]Based on ITE Land Use Codes (LUC) 230 – Residential Condominium/Townhouse, LUC 714 – Corporate Headquarters Building, LUC 814 – Specialty Retail, and LUC 932 – High Turnover Sit-Down Restaurant.

The expected travel mode split and vehicle occupancy ratio for the residential and commercial components of the Project were developed based on data supplied by BTD and the Central Transportation Planning Staff (CTPS) for the appropriate subsection of the Boston Metro area for the Project. The information provides mode share usage by location and trip purposes (work, home, other) for the study area, as summarized in Table B.4-2.

Table B.4-2 Travel Mode Split Assumptions

Trip Classification/Mode	Average Weekday Daily	Weekday Morning Peak Hour (Entering)	Weekday Morning Peak Hour (Exiting)	Weekday Evening Peak Hour (Entering)	Weekday Evening Peak Hour (Exiting)
Residential-Based Person Trips :					
Pedestrian	65%	65%	65%	65%	65%
Transit	15%	15%	15%	15%	15%
Automobile	20%	20%	20%	20%	20%
Automobile Occupancy Rate	1.1	1.1	1.1	1.1	1.1
Office-Based Person Trips :					
Pedestrian	27%	27%	27%	27%	27%
Transit	15%	30%	30%	30%	30%
Automobile	43%	43%	43%	43%	43%
Automobile Occupancy Rate	1.1	1.1	1.1	1.1	1.1
Commercial-Based Person Trips :					
Pedestrian	59%	59%	59%	59%	59%
Transit	13%	13%	13%	13%	13%
Automobile	28%	28%	28%	28%	28%
Automobile Occupancy Rate	2.1	2.1	2.1	2.1	2.1

Source: BTD and modal split data for North End/West End.

Using the ITE trip-generation results identified in Table B.4-1 and the travel mode splits and vehicle occupancy ratios shown in Table B.4-2, the trip-generation characteristics of the proposed Project were developed and are summarized in Table B.4-3.

Table B.4-3 Proposed Lovejoy Wharf Development Trip Generation Summary

Trip Classification/Mode	ITE Trips	Person Trips: Total Trips	Automobile Trips	Transit Trips	Pedestrian Trips	Vehicle Trips
Average Weekday Daily:						
Entering	1,749	2,815	845	471	1,499	541
Exiting	1,749	2,815	845	471	1,499	541
Total	3,498	5,630	1,690	942	2,998	1,082
Weekday Morning Peak Hour:						
Entering	217	258	102	69	87	89
Exiting	70	87	23	15	49	17
Total	287	345	125	84	136	106
Weekday Evening Peak Hour:						
Entering	145	243	67	36	140	40
Exiting	238	328	116	71	141	89
Total	383	571	183	107	281	129

As indicated in Table B.4-3, the Project is expected to result in 1,690 new automobile person trips (845 entering and 845 exiting) on an average weekday, with 942 transit trips (471 entering and 471 exiting) and 2,998 pedestrian trips (1,499 entering and 1,499 exiting). During the weekday morning peak hour, the Project is expected to generate 125 automobile trips (102 entering and 23 exiting), with 84 transit trips (69 entering and 15 exiting), and 136 pedestrian trips (87 entering and 49 exiting). During the weekday evening peak hour, the Project is expected to generate 183 automobile trips (67 entering and 116 exiting), with 107 transit trips (36 entering and 71 exiting) and 281 pedestrian trips (140 entering and 141 exiting). Applying the anticipated occupancy rate to the automobile person trips the Project is expected to generate 1,082 daily vehicle trips (541 entering and 541 exiting) with 106 vehicle trips (89 entering and 17 exiting) during the weekday morning peak hour and 129 vehicle trips (40 entering and 89 exiting) during the weekday evening peak hour. Detailed trip generation calculations with modal splits are provided in the appendix of this report.

In order to provide a comparison between the peak hour trip generation characteristics of the currently proposed development and prior BRA approved development program, the daily and peak hour trip generation projections were compared, as summarized in Table B.4-4.

Table B.4-4 Vehicular Trip-Generation Comparison

Time Period/Direction	BRA Approved Development Project[a]	Updated Development Project	Delta
Weekday Morning Peak Hour:			
Entering	24	89	+65
Exiting	33	17	-16
Total	57	106	+49
Weekday Evening Peak Hour :			
Entering	48	40	-8
Exiting	36	89	+53
Total	84	129	+45
Weekday Daily :	1,134	1,082	-52

[a]Source: *Draft Environmental Impact Report/Final Project Impact Report – Lovejoy Wharf*, Epsilon Associates Inc. March 2006.

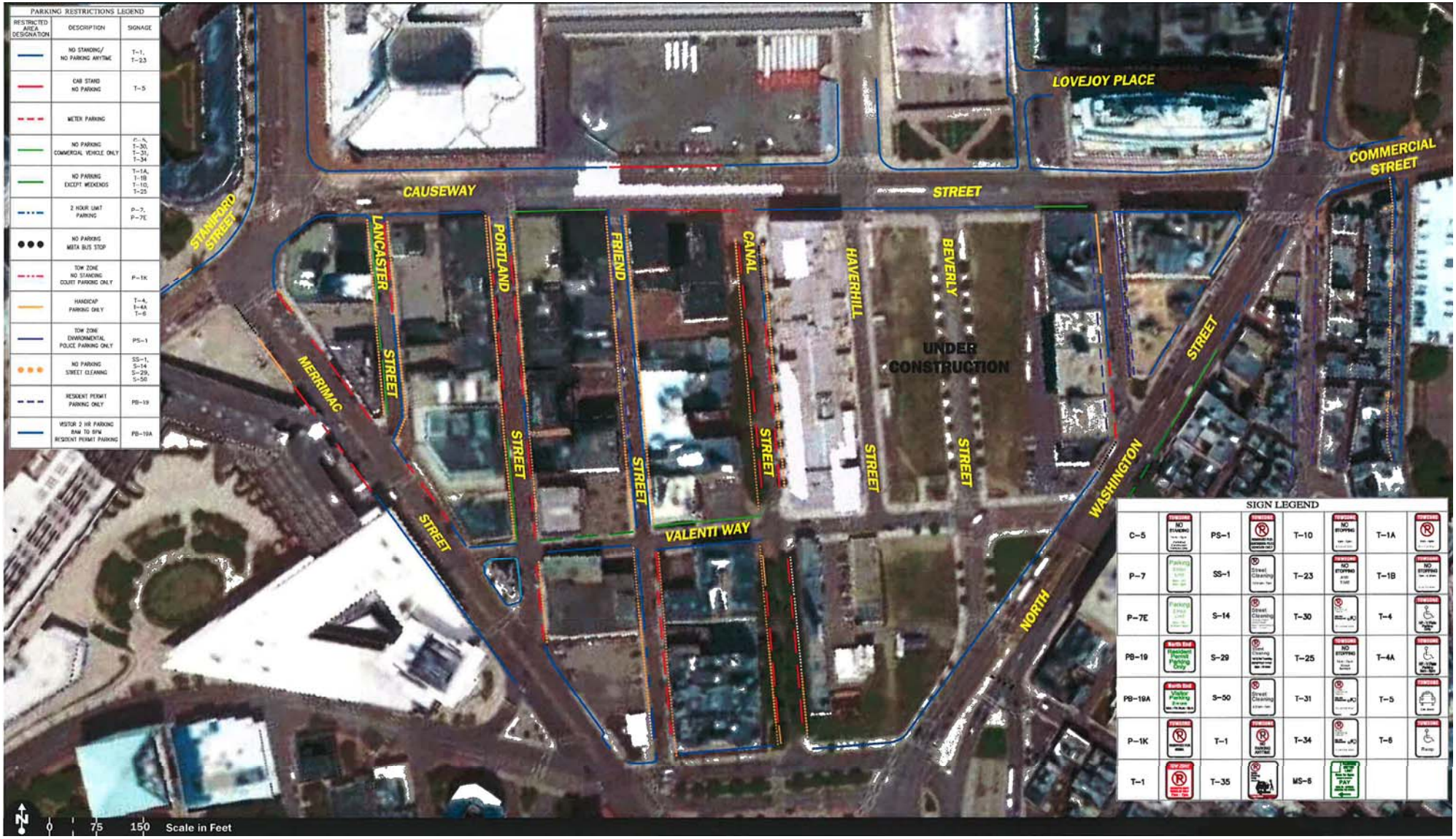
As indicated in Table B.4-4, during peak commuter hours the proposed development is expected to generate between 45 and 49 additional peak hour vehicle trips as compared to the BRA approved project. On a daily basis the proposed project is projected to result in 52 fewer weekday trips.

B.4.5 Project Trip Distribution

The distribution of project-generated automobile trips to the regional roadway network was based on the BRA approved trip distribution patterns identified in the prior DPIR. Specifically, approximately 79 percent of entering traffic is expected to arrive from Causeway Street, west of the Project site, including 20 percent from Staniford Street, 20 percent from Portland Street and 39 percent from Lomasney Way. The remaining 21 percent of entering traffic has been assigned via Causeway Street, east of the Project site, consistent with the prior DPIR. Approximately 90 percent of exiting traffic is projected to depart to Causeway Street, west of the Project site, including 31 percent to Beverly Street, south of Causeway Street, 20 percent to Staniford Street and 39 percent to Lomasney Way. The remaining 10 percent of exiting traffic was assigned to Causeway Street east of the Project site, which reflects existing activity from Beverly Street, where exiting left-turns currently occur despite a right-turn only restriction for the corridor.

B.4.6 Build Traffic Networks

The 2017 Build condition networks consist of the 2017 No-Build traffic volumes, which include traffic associated with the BRA approved redevelopment Project for the site. The 2017 Build condition traffic volumes were developed by applying the increase (or decrease) in traffic associated with the current development program in accordance with the aforementioned distribution patterns. The 2017 Build weekday morning and evening peak-hour traffic-volume networks are graphically depicted on Figure B-9 and Figure B-10, respectively. A summary of peak-hour projected traffic-volume increases in the site proximity is shown in Table B.4-6. These volumes are based on anticipated increases from the Project and are expected to range from 0.1 to 4.2 percent as compared to future No-Build conditions.



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Parking Restrictions
Figure B-9

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Off-Street Parking
Figure B-10

Table B.4-6 Traffic Volume Increases

Intersection/Peak Hour	2017 No-Build	2017 Build	Volume Increase Over No-Build	Percent Increase Over No-Build
Causeway Street at Beverly Street Extension:				
Weekday Morning	1,309	1,358	49	3.7
Weekday Evening	1,079	1,124	45	4.2
Causeway at Beverly Street:				
Weekday Morning	1,449	1,494	45	3.1
Weekday Evening	1,556	1,597	41	2.6
Causeway Street at Canal Street:				
Weekday Morning	1,783	1,834	51	2.9
Weekday Evening	1,589	1,609	20	1.3
Causeway Street at Friend Street:				
Weekday Morning	1,740	1,791	51	2.9
Weekday Evening	1,622	1,642	20	1.2
Causeway Street at Portland Street:				
Weekday Morning	1,815	1,866	51	2.8
Weekday Evening	1,700	1,720	20	1.2
Causeway Street at Lomasney Way, Merrimac Street and Staniford Street:				
Weekday Morning	2,902	2,932	30	1.0
Weekday Evening	2,800	2,822	22	0.8
Causeway Street at North Washington Street:				
Weekday Morning	3,490	3,494	4	0.1
Weekday Evening	3,784	3,788	4	0.1

B.5 Traffic Operations Analysis

B.5.1 Introduction

To assess quality of traffic flow, intersection capacity analyses were conducted under 2017 No-Build and 2017 Build traffic-volume and future roadway conditions. An existing (2012) traffic operations analysis was not performed due to on-going construction activities within the study area. The study area intersections requiring capacity analyses were determined based on additional meetings with the BTD to clarify the study area scope. Capacity analyses provide an indication of how well the roadway facilities will serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection. The analysis methodology and procedures used in the preparation of this study are based on the concepts presented in the 2000 *Highway Capacity Manual* (HCM).[3]

B.5.2 Methodology

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[4] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing the worst.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

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[3] *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000.

[4] The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000.

Signalized Intersections. The six levels of service for signalized intersections may be described as follows:

- *LOS A* describes operations with very low delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low delay. However, more vehicles stop than LOS A.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of service for signalized intersections are calculated using the operational analysis methodology of the 2000 *Highway Capacity Manual*. This method assess the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table B.5-1 summarizes the relationship between level of service and control delay. The tabulated control delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table B.5-1 Level-Of-Service Criteria For Signalized Intersections

Level of Service	Control (Signal) Delay per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000; page 16-2.

Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- LOS A represents a condition with little or no control delay to minor street traffic.
- LOS B represents a condition with short control delays to minor street traffic.
- LOS C represents a condition with average control delays to minor street traffic.
- LOS D represents a condition with long control delays to minor street traffic.
- LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2000 Highway Capacity Manual.[5] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the affects of initial deceleration delay approaching

[5] Ibid 8.

a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2000 Highway Capacity Manual. Table B.5-2 summarizes the relationship between level of service and average control delay.

Table B.5-2 Level-Of-Service Criteria For Unsignalized Intersections[a]

Level of Service	Average Control Delay (seconds per vehicle)
A	≤ 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.0

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000; page 17-2.

Vehicle Queue Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro intersection capacity analysis software which is based upon the methodology and procedures presented in the 2000 Highway Capacity Manual. The Synchro vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of six seconds or more at an intersection. For signalized intersections, Synchro reports both the 50th (average) and 95th percentile vehicle queues. For unsignalized intersections, Synchro reports the 95th percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time, or approximately three minutes out of sixty minutes during the peak one hour of the day (during the remaining fifty-seven minutes, the vehicle queue length will be less than the 95th percentile queue length).

B.5.3 Analysis Results

Level-of-service and vehicle queue analyses were conducted for 2017 No-Build and 2017 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized for signalized and unsignalized intersections in Tables B.5-3 and B.5-4, respectively.

In summary, the Project as modified by this filing does not result in a significant change in traffic operations (motorist delays or vehicle queuing) at the study area intersections over No-Build conditions.

Signalized Intersections

Causeway Street at Merrimac Street, Staniford Street and Lomasney Way. Under 2017 No-Build and Build conditions, this signalized intersection was shown to operate at an overall LOS F during both the weekday morning and evening peak hours. The proposed Project was not shown to result in a significant increase in vehicle delays or queuing at this intersection over 2017 No-Build conditions.

Causeway Street at Portland Street. Under 2017 No-Build and Build conditions, this signalized intersection was shown to operate at an overall LOS B during the weekday morning peak hour and at LOS C during the weekday evening peak hour. The proposed Project was not shown to result in a significant increase in vehicle delays or queuing at this intersection over 2017 No-Build conditions.

Causeway Street at Haverhill Street and Legends Way. Under 2017 No-Build and Build conditions, this signalized intersection was shown to operate at an overall LOS C during the weekday morning peak hour and at LOS D during the weekday evening peak hour. The proposed Project was not shown to result in a significant increase in vehicle delays or queuing at this intersection over 2017 No-Build conditions.

Causeway Street at Commercial Street and North Washington Street. Under 2017 No-Build and Build conditions, this signalized intersection was shown to operate at an overall LOS E during the weekday morning peak hour and at LOS F during the weekday evening peak hour. The proposed Project was not shown to result in a significant increase in vehicle delays or queuing at this intersection over 2017 No-Build conditions.

Unsignalized Intersections

Causeway Street at South Beverly Street. Under 2017 No-Build conditions, the critical movements at this unsignalized intersection (westbound left turn movements from Causeway Street) were shown to operate at LOS A during the weekday morning and weekday evening peak hour. Under 2017 Build conditions, with the addition of Project-related traffic, the critical movements were shown to operate at LOS A during the weekday morning peak hour and at LOS A during the weekday evening peak hour.

Table B.5-3
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak Hour/Movement	2017 No-Build				2017 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th
Causeway Street at Merrimac Street, Staniford Street and Lomasney Way								
Weekday Morning:								
Staniford Street EB LT	>1.2	>80	F	71/171	>1.2	>80	F	71/171
Staniford Street EB LT/TH	1.06	>80	F	143/228	1.14	>80	F	163/249
Staniford Street EB RT	0.15	20	B	0/34	0.15	20	B	0/34
Causeway Street WB LT/TH	>1.2	>80	F	232/303	>1.2	>80	F	233/304
Causeway Street WB RT	0.25	>80	F	121/279	0.24	>80	F	124/272
Merrimac Street NB LT	0.97	>80	F	147/218	0.97	>80	F	147/218
Merrimac Street NB TH	0.52	34	C	99/169	0.52	34	C	99/169
Merrimac Street NB RT	0.41	33	C	53/73	0.41	33	C	53/73
Lomasney Way SB LT	>1.2	>80	F	672/825	>1.2	>80	F	707/862
Lomasney Way SB TH/RT	1.09	>80	F	245/264	1.09	>80	F	245/264
Overall	**>1.2**	**>80**	**F**	–	**>1.2**	**>80**	**F**	–
Weekday Evening:								
Staniford Street EB LT	0.85	71	E	80/185	0.86	74	E	80/188
Staniford Street EB LT/TH	0.86	56	E	180/317	0.85	55	E	178/315
Staniford Street EB RT	0.16	21	C	0/41	0.16	21	C	0/41
Causeway Street WB LT/TH	0.64	33	C	121/166	0.65	33	C	124/170
Causeway Street WB RT	0.40	>80	F	198/295	0.43	>80	F	212/295
Merrimac Street NB LT	0.66	46	D	90/152	0.66	46	D	90/152
Merrimac Street NB TH	0.93	70	E	209/376	0.93	70	E	209/376
Merrimac Street NB RT	0.11	32	C	14/37	0.11	32	C	14/37
Lomasney Way SB LT	1.08	>80	F	264/436	1.06	>80	F	255/426
Lomasney Way SB TH/RT	0.69	37	D	177/274	0.69	37	D	177/274
Overall	**0.95**	**65**	**E**	–	**0.94**	**62**	**E**	–

See notes at end of table.

Table B.5-3 (Continued)
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak Hour/Movement	2017 No-Build V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	2017 Build V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th
Causeway Street at Portland Street								
Weekday Morning:								
Causeway Street EB TH	0.59	13	B	178/243	0.63	14	B	184/266
Causeway Street WB TH	0.62	15	B	96/185	0.63	16	B	94/184
Portland Street NB LT/RT	0.69	43	D	80/141	0.71	43	D	86/153
Overall	**0.64**	**17**	**B**	–	**0.65**	**18**	**B**	–
Weekday Evening:								
Causeway Street EB TH/RT	0.40	22	C	220/242	0.40	22	C	217/242
Causeway Street WB LT/TH	0.58	10	B	114/129	0.59	10	A	114/127
Portland Street NB LT/RT	0.91	74	E	144/305	0.90	72	E	143/302
Overall	**0.65**	**24**	**C**	–	**0.67**	**24**	**C**	–
Causeway Street at Haverhill Street and Legends Way								
Weekday Morning:								
Causeway Street EB LT	0.83	44	D	104/241	0.82	42	D	106/237
Causeway Street EB TH	0.60	18	B	55/163	0.66	20	C	83/184
Causeway Street WB TH/RT	0.68	29	C	195/293	0.67	29	C	193/276
Haverhill Street NB LT	0.45	28	C	70/128	0.45	28	C	70/128
Haverhill Street NB TH/RT	0.92	57	E	218/384	0.92	57	E	217/384
Legends Way SB LT/RT	0.01	25	C	1/8	0.01	25	C	1/8
Garage Drive SB LT/RT	0.44	41	D	2/71	0.44	41	D	27/71
Overall	**0.82**	**33**	**C**	–	**0.82**	**33**	**C**	–
Weekday Evening:								
Causeway Street EB LT	0.39	19	B	11/32	0.41	21	C	11/35
Causeway Street EB TH	0.91	35	C	87/289	0.90	34	C	86/283
Causeway Street WB TH/RT	0.82	47	D	185/267	0.86	50	D	186/288
Haverhill Street NB LT	0.52	42	D	51/95	0.52	42	D	51/95
Haverhill Street NB TH/RT	0.42	41	D	50/97	0.42	41	D	50/97
Legends Way SB LT/RT	0.06	39	D	6/20	0.06	39	D	6/20
Garage Drive SB LT/RT	1.04	74	E	474/757	1.04	74	E	474/757
Overall	**0.87**	**51**	**D**	–	**0.87**	**51**	**D**	–

See notes at end of table.

Table B.5-3 (Continued)
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Signalized Intersection/Peak Hour/Movement	2017 No-Build V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	2017 Build V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th
Causeway Street at Commercial Street and North Washington Street								
Weekday Morning:								
Causeway Street EB LT	0.53	56	E	122/151	0.53	56	E	122/151
Causeway Street EB TH/RT	>1.2	>80	F	341/493	>1.2	>80	F	335/485
Commercial Street WB LT/TH	0.84	79	E	151/170	0.84	79	E	155/174
Commercial Street WB RT	0.36	20	B	116/144	0.36	20	B	115/144
North Washington Street NB LT/TH/RT	>1.2	>80	F	373/507	>1.2	>80	F	378/507
North Washington Street SB LT	0.68	32	C	271/401	0.68	32	C	272/401
North Washington Street SB TH	0.65	19	B	358/442	0.66	20	B	363/442
North Washington Street SB RT	0.95	49	D	663/851	0.95	50	D	671/851
Overall	**1.06**	**69**	**E**	–	**1.06**	**70**	**E**	–
Weekday Evening:								
Causeway Street EB LT	0.55	54	D	188/204	0.55	54	D	188/204
Causeway Street EB TH/RT	0.44	53	D	148/218	0.45	54	D	154/225
Commercial Street WB LT/TH	1.05	>80	F	188/299	1.05	>80	F	187/299
Commercial Street WB RT	>1.2	>80	F	942/1150	>1.2	>80	F	942/1150
North Washington Street NB LT/TH/RT	>1.2	>80	F	658/796	>1.2	>80	F	658/796
North Washington Street SB LT	0.73	51	D	210/320	0.73	51	D	210/320
North Washington Street SB TH	0.66	25	C	407/424	0.66	25	C	407/424
North Washington Street SB RT	0.58	27	C	279/304	0.58	27	C	279/304
Overall	**>1.2**	**>80**	**F**	–	**>1.2**	**>80**	**F**	–

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in feet.
EB = eastbound; WB = westbound; NB = northbound; SB = southbound; SEB = southeastbound; NWB = northwestbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table B.5-4
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2017 No-Build				2017 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th
Causeway Street at Beverly Street								
Weekday Morning:								
Causeway Street EB TH/RT	681	< 5	A	0	740	< 5	A	0
Causeway Street WB LT	98	9	B	8	92	9	B	8
Causeway Street WB TH	670	< 5	A	0	662	< 5	A	0
Weekday Evening:								
Causeway Street EB TH/RT	1,008	< 5	A	0	1,001	< 5	A	0
Causeway Street WB LT	16	9	A	1	37	9	A	3
Causeway Street WB TH	532	< 5	A	0	559	< 5	A	0
Causeway Street at Beverly Street Extension								
Weekday Morning:								
Causeway Street EB LT/TH	506	< 5	A	0	565	< 5	A	0
Causeway Street WB TH/RT	740	< 5	A	0	746	< 5	A	0
Beverly Street SB LT/RT	63	20	C	21	49	27	D	24
Weekday Evening:								
Causeway Street EB LT/TH	501	< 5	A	0	494	< 5	A	0
Causeway Street WB TH/RT	514	< 5	A	0	513	< 5	A	0
Beverly Street SB LT/RT	64	16	C	20	117	16	C	38

See notes at end of table.

Table B.5-4 (Continued)
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2017 No-Build				2017 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th
Causeway Street at Canal Street								
Weekday Morning:								
Causeway Street EB TH/RT	852	< 5	A	0	911	< 5	A	0
Causeway Street WB LT/TH	833	< 5	A	0	825	< 5	A	0
Canal Street NB LT/RT	98	11	B	15	98	11	B	15
Weekday Evening:								
Causeway Street EB TH/RT	693	< 5	A	0	686	< 5	A	0
Causeway Street WB LT/TH	873	< 5	A	3	900	< 5	A	3
Canal Street NB LT/RT	23	11	B	5	23	11	B	5
Causeway Street at Friend Street								
Weekday Morning:								
Causeway Street EB TH/RT	907	< 5	A	0	966	< 5	A	0
Causeway Street WB LT/TH	833	< 5	A	0	825	< 5	A	0
Weekday Evening:								
Causeway Street EB TH/RT	762	< 5	A	0	755	< 5	A	0
Causeway Street WB LT/TH	860	< 5	A	3	887	< 5	A	3

See notes at end of table.

Table B.5-4 (Continued)
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2017 No-Build				2017 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th
Beverly Street Extension at Lovejoy Place								
Weekday Morning:								
Lovejoy Place EB LT/RT	63	9	A	6	47	9	A	4
Beverly Street NB TH/RT	66	<5	A	0	131	<5	A	0
Beverly Street SB LT/TH	2	<5	A	0	2	<5	A	0
Weekday Evening:								
Lovejoy Place EB LT/RT	54	9	A	5	107	9	A	10
Beverly Street NB TH/RT	68	<5	A	0	61	<5	A	0
Beverly Street SB LT/TH	11	<5	A	0	11	<5	A	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level-of-Service.
[d]Queue length in feet.
EB = eastbound; WB = westbound; NB = northbound; SB = southbound; SEB = southeastbound; LT = left-turning movements; TH = through movements
RT = right-turning movements.

The proposed Project was not shown to result in a significant increase in vehicle delays or queues at the intersection over No-Build conditions. Mainline traffic movements along Causeway Street were shown to operate at LOS A under all analysis scenarios.

Causeway Street at Beverly Street Extension. Under 2017 No-Build conditions, the critical movements at this unsignalized intersection (eastbound left turn movements from Causeway Street and southbound movements from Beverly Street Extension) were shown to operate at LOS A and C, respectively, during both the weekday morning and weekday evening peak hours. Under 2017 Build conditions, with the addition of Project-related traffic, the critical eastbound left-turn movements from Causeway Street were shown to continue to operate at LOS A during the weekday morning peak hour and weekday evening peak hour. Southbound traffic from Beverly Street Extension was shown to operate at LOS D during the weekday morning peak hour and at LOS C during the weekday evening peak hour. The proposed Project was not shown to result in a significant increase in vehicle delays or queues at the intersection over No-Build conditions, with approach delays increasing by 4 to 6 seconds as compared to No-Build conditions. Mainline traffic movements along Causeway Street were shown to operate at LOS A under all analysis scenarios.

Causeway Street at Canal Street. Under 2017 No-Build conditions, the critical movements at this unsignalized intersection (westbound left turn movements from Causeway Street and northbound movements from Canal Street) were shown to operate at LOS A and B, respectively, during both the weekday morning and weekday evening peak hours. Under 2017 Build conditions, with the addition of Project-related traffic, these movements were shown to continue to operate at LOS A and B, respectively, during both the weekday morning and weekday evening peak hours. The proposed Project was not shown to result in a significant increase in vehicle delays or queues at the intersection over No-Build conditions. Mainline traffic movements along Causeway Street were shown to operate at LOS A under all analysis scenarios.

Causeway Street at Friend Street. Under 2017 No-Build conditions, the critical movements at this unsignalized intersection (westbound left turn movements from Causeway Street) were shown to operate at LOS A during the weekday morning and weekday evening peak hour. Under 2017 Build conditions, with the addition of Project-related traffic, the critical movements were shown to operate at LOS A during the weekday morning peak hour and at LOS A during the weekday evening peak hour. The proposed Project was not shown to result in a significant increase in vehicle delays or queues at the intersection over No-Build conditions. Mainline traffic movements along Causeway Street were shown to operate at LOS A under all analysis scenarios.

Beverly Street Extension at Lovejoy Place. Under 2017 No-Build conditions, the critical movements at this unsignalized intersection (westbound movements from Lovejoy Place) were shown to operate at LOS A during the weekday morning and weekday evening peak hour. Under 2017 Build conditions, with the addition of Project-related traffic, the critical movements were shown to continue to operate at LOS A during the weekday morning peak

hour and at LOS A during the weekday evening peak hour. The proposed Project was not shown to result in a significant increase in vehicle delays or queues at the intersection over No-Build conditions. Mainline traffic movements along Beverly Street Extension were shown to operate at LOS A under all analysis scenarios.

B.5.4 Public Transportation Impact Analysis

Under 2017 Build conditions, the projected transit trips expected to be generated by the Project (84 trips during the weekday morning peak hour and 107 trips during the weekday evening peak hour) are not anticipated to result in an a significant impact on transit capacity in the area, particularly when distributed the various public transportation modes available in the vicinity of the Project site (commuter rail, subway and bus). It is noted that in comparison to the projected transit trips associated with the BRA approved development project, the current Project is expected to result in less than 1 additional transit trip per minute during peak hours of commuter activity.

B.5.5 Pedestrian Impact Analysis

Under 2017 Build conditions, the additional pedestrian trips expected to be generated by the proposed Project (136 trips during the weekday morning peak hour and 281 trips during the weekday evening peak hour) are not expected to result in a significant impact on the capacity of pedestrian facilities in the area. As compared to the prior development program, the proposed Project is projected to generate fewer pedestrian trips during the weekday morning peak hour and approximately one additional pedestrian trip every two minutes during the weekday evening peak hour. The Project site and the study area are currently served by an expansive network of pedestrian sidewalks, with controlled crossings provided at signalized intersections. Additional pedestrian facility improvements are being undertaken and will be completed as part of the Causeway Street improvement project. The reconstruction of Lovejoy Wharf will serve as a key pedestrian connection between the Harborwalk and Freedom Trail, as well as nearby Portal Park and Charles River Basin Parks.

B.5.6 Parking Demand Analysis

The proposed Project will provide 315 off-street parking spaces in a mechanical parking system that will be accessed via a two bay entrance from Lovejoy Place and 9 surface spaces along Lovejoy Place. The proposed parking supply will provide 104 spaces for exclusive use by building residents.

While it is anticipated that the parking demand for the Project will be adequately accommodated within the proposed parking garage on site, a review of available public parking facilities in vicinity of the site indicates that nearby parking is available to accommodate any additional parking demands associated with the project.

B.5.7 Loading/Delivery Impacts

All loading and delivery activities associated with the Project will occur in designated off-street areas via Lovejoy Place and Beverly Street. Larger truck activity, which is expected to occur infrequently, will occur via a proposed loading dock off Lovejoy Place, with smaller panel truck deliveries occurring via a drop-off area on Beverly Street.

Hours of deliveries will be coordinated with BTD officials to insure that truck activity impacts are minimized during commuter hours and to avoid sensitive streets in the city. Moving activities will be closely coordinated and managed by the property management team to ensure that public ways and sidewalks remain passable and unobstructed at all times.

B.6 Recommendations And Conclusions

The following section summarizes the proposed transportation demand management measures to minimize the vehicular traffic impacts of the Project, and construction management commitments by the proponent to minimize impacts to vehicular and pedestrian traffic during the construction of the Project.

B.6.1 Transportation Demand Management

The proposed Project is ideally situated in relation to the regional roadway network and the public transportation system to facilitate opportunities to reduce vehicle trips and encourage alternative modes of travel. Overall, the Project's impact relative to traffic, public transportation, and pedestrians are expected to be minor.

The Proponent is committed to developing and implementing a TDM program for the site that is targeted at reducing automobile dependency and that encourages travel by non-automobile modes for its employees. The Proponent is prepared to encourage all tenants to take advantage of the proximate transit access to market the residential and office space to future residents and tenants, and to work with them to implement measures that encourage the use of public transportation, ridesharing, bicycling, and walking. The specific elements of the TDM may include:

- Encourage commercial tenants to join in the A Better City Transportation Management Association (ABC TMA).
- On-site transit pass sales and distribution for tenants and employees.
- Provision of an on-site transportation coordinator with the responsibility of ensuring that transit information is properly posted and updated, and purchase/distribution of transit passes for tenants/employees. The coordinator will also serve as the central point of contact with the BTD.

- Provision of on-site bicycle storage facilities for building tenants and employees.

- The Project proponent will encourage and introduce to residents a car-sharing program, such as zip-car to reduce automobile trips and parking demands associated with the project. It is noted that existing zipcar services are provided in a number of locations proximate to the site including the Government Center Garage and North End Garage.

B.6.2 Construction Management

The Project proponent and the general contractor will use the following measures to minimize construction impacts on pedestrian and vehicular travel and to enhance safety during the project's construction phase:

- Construction worker parking will not be permitted on-site or immediately adjacent to the construction area. All construction workers will be required to access the site by public transportation, ridesharing, and/or by parking at off-site locations. A number of off-site parking facilities are located within a reasonable walking distance of the Project site in the North Station/Bulfinch Triangle area.

- Coordinate construction activities with the Causeway Street improvement project, BTD and the MBTA;

- Provide police details as required by the BTD;

- Coordinate with the BTD regarding all transportation-related construction impacts;

- Develop and enforce the use of designated truck routes approved by the BTD with the goal of minimizing the use of city streets to the extent possible; and

- Secure fencing and sidewalk staging protection will be provided in areas affected by each phase of construction in order to protect nearby pedestrian and vehicular traffic. Gated entrances into construction areas will be determined jointly with the BTD.

- Full or partial street closures will be avoided to the extent possible. Any possible street closures will be closely coordinated with 234 Strada, 226 Causeway, and the State Police. Should a partial street closure be necessary in order to off-load construction materials and/or complete construction-related activities, the closure will be limited to off-peak periods as defined by the BTD so as to minimize the impact on vehicular and pedestrian flow. Police details will be used as required by the BTD. Prior to the implementation of any planned construction activities within the public right-of-way, the contractor will submit to the BTD for review and approval a traffic and pedestrian management plan.

- Secure on-site storage will be provided for tools and equipment in an effort to minimize construction-related vehicle trips to the site.

B.7 Conclusions

The Project is uniquely designed and situated to take advantage of the existing and expanding transportation infrastructure in the North Station area, including enhanced and improved vehicular, bicycle and pedestrian facility improvements. As documented in this updated traffic analysis, the Project as modified by this filing is not projected to result in significant traffic impacts as compared to the Approved Traffic Analysis. It is expected that the availability of public transportation services in the vicinity of the Project, coupled with the implementation of a detailed TDM program as a part of the Project will result in a reduction of the traffic impacts associated with the project.

Attachment C

Air Quality

ATTACHMENT C AIR QUALITY

Introduction

This Air Quality Attachment provides modeling assumptions and backup for results presented in Section 3.6 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 analyses.

Motor Vehicle Emissions

The EPA MOBILE6.2 computer program generated motor vehicle emissions used in the mobile source CAL3QHC modeling. The model input parameters were provided by MassDEP. Emission rates were derived for 2017 for speed limits of 2.5, 10, 15, and 30 mph for use in the microscale analyses.

CAL3QHC

For the intersections studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOBILE6.2. 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 intersections. Idle emission rates for queue links were based on 2.5 mph emission rates derived in MOBILE6.2 and converted from grams per mile to grams per hour. Emission rates for speeds of 10, 15, and 30 mph were used for right turn, left turn, and free flow links, respectively.

Lovejoy Wharf - Boston, MA
Calculation of Microscale Modeling Emission Rates
Summary of MOBILE6.2 Output

Carbon Monoxide Only

Queues	Idle
Free Flow	30 mph
Right Turns	10 mph
Left Turns	15 mph

Summer	**2017**	**Units**
Idle	27.355	g/hr
2.5 mph	10.942	g/mile
10 mph	4.952	g/mile
15 mph	4.185	g/mile
30 mph	3.397	g/mile

Winter	**2017**	**Units**
Idle	43.320	g/hr
2.5 mph	17.328	g/mile
10 mph	9.468	g/mile
15 mph	8.531	g/mile
30 mph	7.636	g/mile

Due to excessive size CAL3QHC, and MOBILE6.2 input and output files are available on digital media upon request.

Attachment D

Noise

ATTACHMENT D NOISE

D.1 Introduction

This section describes a noise analysis conducted for the Project and an estimate of future sound levels when the Project is in operation. The scope of the analysis is consistent with BRA requirements for noise studies.

Baseline noise levels were measured in the vicinity of the proposed building in 2005 and were compared to predicted noise levels modeled in 2012 based on reference sound data for mechanical equipment identified by the client. These predicted noise levels were compared to the City of Boston Zoning District Noise Standards and the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy. The analysis indicates that predicted noise levels from Project mechanical equipment with appropriate noise attenuation measures will comply with both state and local regulations at all modeled locations.

D.2 Noise Terminology

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

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

Another property of decibels is that if one source of noise is 10 dB (or more) louder than another source, then the total sound level is simply the sound level of the higher source. For example, a source of sound at 60 dB plus another source of sound at 47 dB is 60 dB.

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

Because the sounds in our environment vary with time, they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n can have a value of 0 to 100 percent. For example:

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.

- L_{50} is the median sound level, the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.

- L_{max} is the maximum instantaneous sound level observed over a given period.

L_{eq}, the equivalent level, 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. The equivalent level is designated L_{eq} and is also A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud, intrusive noises.

By using various noise metrics it is possible to separate prevailing, steady sounds (the L_{90}) from occasional, louder sounds (L_{10}) in the noise environment or combined average levels (L_{eq}). This analysis of sounds expected from the Project treats all noises as though they will be steady and continuous, and hence the L_{90} exceedance level was used. In the design of noise control treatments, it is essential to know something about the frequency spectrum of the noise of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design. 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. 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.

D.3 Noise Regulations and Criteria

The primary set of regulations relating to the potential increase in noise levels is the City of Boston Zoning District Noise Standards (City of Boston Code – Ordinances: Section 16–26 Unreasonable Noise and City of Boston Air Pollution Control Commission Regulations for the Control of Noise in the City of Boston). Results of the baseline ambient noise level survey and the modeled noise levels were compared to the City of Boston Zoning District Noise Standards. Separate regulations within the Standards provide criteria to control different types of noise. Regulation 2 is applicable to the effects of the proposed buildings, as completed, and was considered in this noise study. Table D-1 includes the Zoning District Standards.

Additionally, MassDEP regulates community noise by its Noise Policy: DAQC policy 90-001. The MassDEP policy limits source sound levels to a 10-dBA increase in the ambient measured noise level (L_{90}) at the Project property line and at the nearest residences. The policy further prohibits pure tone conditions—when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by three decibels or more.

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

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

Notes: Noise standards are extracted from Regulation 2.5, City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976.

All standards apply at the property line of the receiving property.

dB and dBA based on a reference pressure of 20 micropascals.

Daytime refers to the period between 7:00 am and 6:00 pm daily except Sunday.

The HUD Environmental Criteria and Standards (24 CFR Part 51), Subpart B – "Noise Abatement and Control" specifies noise criteria for HUD-funded housing developments. This project is not a HUD-funded development, therefore, the HUD noise criteria do not apply. However, the HUD criteria are presented for informational purposes. The HUD exterior noise goal for residential construction is a day-night average sound level (L_{dn}) of 65 dBA or less. This is considered Acceptable. L_{dn} sound levels above 65 dBA but not exceeding 75 dBA are considered Normally Unacceptable, and L_{dn} levels above 75 dBA are considered Unacceptable. Funding for HUD approvals in Normally Unacceptable areas require a minimum of 10 dB of additional sound attenuation for buildings having noise-sensitive uses. The HUD interior noise goal is an L_{dn} of 45 dBA.

D.4 Existing Conditions

D.4.1 Baseline Noise Environment

An ambient noise level survey was conducted in March of 2005 to characterize the "baseline" acoustical environment in the vicinity of the Project. Existing noise sources at that time included: vehicular traffic (including trucks) on the local roadways including Interstate 93; construction activity; pedestrian traffic; mechanical equipment located on the surrounding buildings; backup alarms; and the general din of the City. It can be reasonably assumed that background sound levels in the area are similar or have increased since the initial ambient measurement program due to development in the nearby area.

D.4.2 Noise Measurement Locations

The selection of the sound monitoring receptor locations was based upon a review of the land use in the Project area at the time. Five noise-monitoring locations were selected at representative sites to obtain a sampling of the ambient baseline noise environment. The measurement locations are depicted on Figure D-1 and are described below. No sound level measurements were made to the west of the Expressway as this area is significantly removed from the Project site.

- Location 1 was located on Lovejoy Wharf in an area of the site where future open space will be located. Daytime noise sources at this location were traffic on Interstate 93 and construction activity. At night, traffic on the roadways and mechanical equipment contributed to ambient sound levels.

- Location 2 was in the Prince Street Park located in the northeast quadrant of the Commercial Street, Causeway Street and North Washington Street intersection. Ambient noise consisted of traffic on surface roadways, particularly the metal bridge on North Washington Street, and a backup alarm. Nighttime noise sources were the same as daytime sources.

- Location 3 was located in the southeast quadrant of the Commercial Street, Causeway Street, North Washington Street and Endicott Street intersection.

Ambient noise sources during the daytime and nighttime consisted of traffic on the local roadways.

- Location 4 was located immediately south of the Project directly across from the residential building at 226-234 Causeway Street. Ambient noise sources during the daytime and nighttime consisted of traffic on the local roadways.

- Location 5 was located along Causeway Street southwest of the Project in Portal Park. This is where Interstate 93 goes underground. Daytime noise sources at this location were traffic on Interstate 93 and construction activity. At night, traffic on the roadways and an ambulance siren contributed to ambient sound levels.

D.4.3 Noise Measurement Methodology

Sound level measurements were for 20 minutes per location during daytime (1:30 p.m. to 3:30 p.m.) and nighttime hours (12:00 a.m. to 2:00 a.m.) on Wednesday and Thursday, March 30-31, 2005.

Since noise impacts from the Project on the community are greatest when existing noise levels are 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.

The sound levels were measured at publicly accessible locations at a height of five feet above the ground and at locations where there were no large reflective surfaces to affect the measured levels. The measurements were made 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 Weksler Instruments model 317 glass sling 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.

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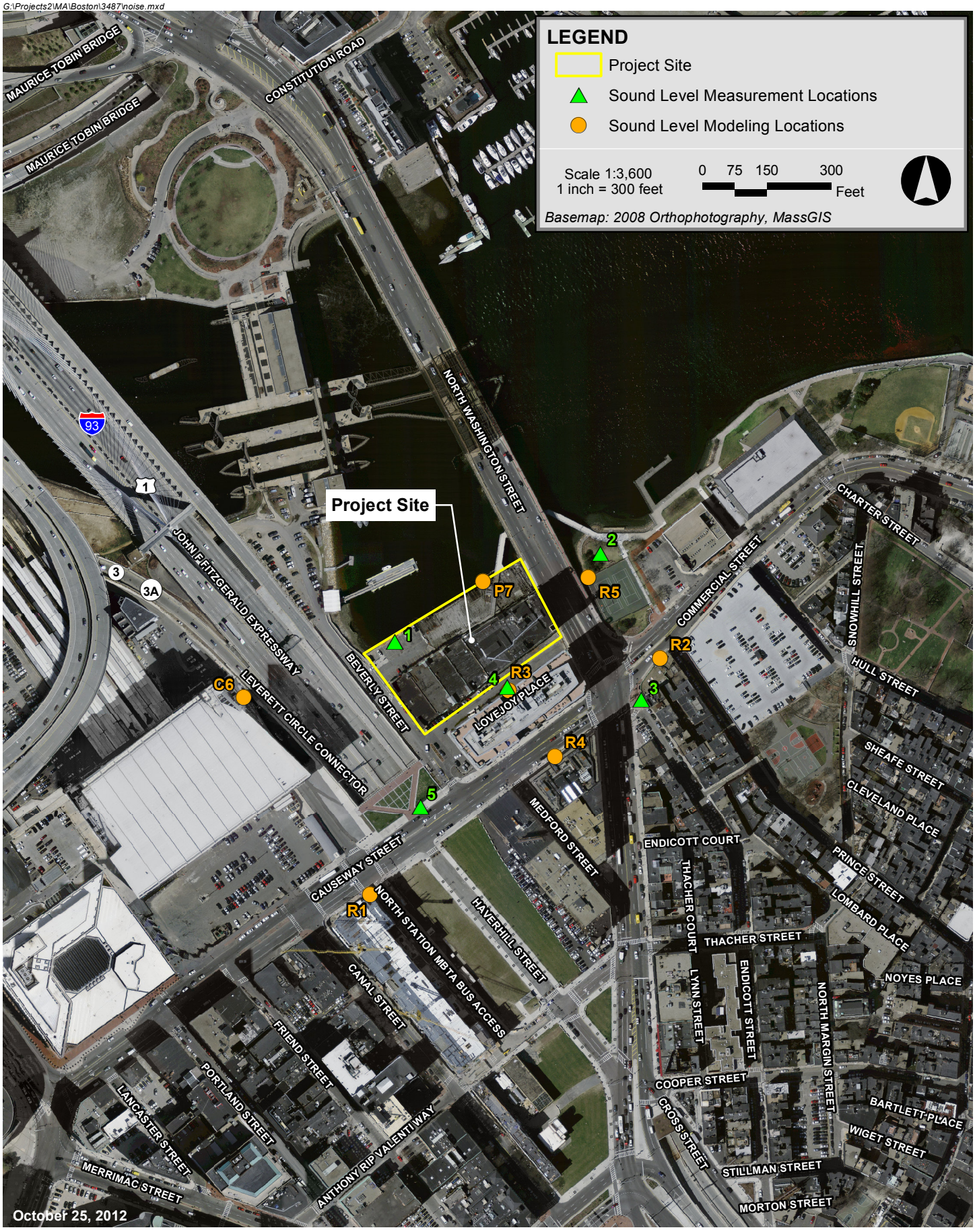

Epsilon Associates Inc.

Lovejoy Wharf

Sound Level Measurement & Modeling Locations
Figure D-1

D.4.4 Measurement Equipment

A CEL Instruments Model 593.C1 Precision Sound Level Analyzer equipped with a CEL-257 Type 1 Preamplifier, a CEL-250 half-inch microphone and a four-inch foam windscreen were used to collect broadband and octave band ambient sound pressure level data. The instrumentation meets the "Type 1 - Precision" requirements set forth in American National Standards Institute (ANSI) S1.4 for acoustical measuring devices. The meter was tripod-mounted at a height of five feet above ground. The meter was equipped with an internal octave band filter set along with data logging capabilities. The meter processed one sample per second using the "slow" response of the instrumentation.

Statistical levels were calculated from the 1200 sound levels collected during each 20-minute sampling period. Octave band levels for this study correspond to the same data set processed for the broadband levels. The measurement equipment was calibrated in the field before and after the surveys with a CEL-284/2 acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984.

D.4.5 Baseline Ambient Noise Levels

The existing ambient noise environment was impacted by area-wide vehicular traffic, including trucks; by construction activity during the daytime, and by general human activity during the daytime.

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

- The daytime residual background (L_{90} dBA) measurements ranged from 57 to 65 dBA;
- The nighttime residual background (L_{90} dBA) measurements ranged from 51 to 61 dBA;
- The daytime equivalent level (L_{eq} dBA) measurements ranged from 61 to 68 dBA;
- The nighttime equivalent level (L_{eq} dBA) measurements ranged from 57 to 68 dBA;

Based on the measured short-term L_{eq} values, the calculated L_{dn} values for the five locations are summarized below:

Location 1:	L_{dn}	=	67 dBA;
Location 2:	L_{dn}	=	66 dBA;
Location 3:	L_{dn}	=	74 dBA;
Location 4:	L_{dn}	=	66 dBA, and
Location 5:	L_{dn}	=	71 dBA.

Table D-2 Baseline Ambient Noise Measurements – Lovejoy Wharf, Boston, MA

							Octave Bands (Hz)								
Receptor I.D	Start Time	L_{10}	L_{50}	L_{90}	L_{eq}	L_{max}	31.5	63	125	250	500	1000	2000	4000	8000
		(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	L_{90}	L_{90}	L_{90}	L_{90}	L_{90}	L_{90}	L_{90}	L_{90}	L_{90}
Loc 1 Day	2:27 pm	68	67	65	67	73	68	69	64	61	62	65	60	54	51
Loc 1 Night	12:51 am	60	55	52	57	66	60	61	56	51	49	48	42	29	16
Loc 2 Day	3:18 pm	64	60	57	61	71	66	67	63	57	55	55	48	41	34
Loc 2 Night	1:44 am	63	57	51	59	69	61	63	58	51	47	46	39	27	16
Loc 3 Day	1:36 pm	70	67	62	68	80	68	68	67	63	61	61	59	55	52
Loc 3 Night	11:58 pm	71	66	61	68	76	67	69	65	60	58	58	54	46	39
Loc 4 Day	2:51 pm	65	63	60	63	71	65	66	64	61	60	61	57	52	49
Loc 4 Night	1:15 am	61	56	51	58	72	58	59	54	50	48	47	41	29	17
Loc 5 Day	2:03 pm	68	65	62	66	73	66	68	65	63	62	63	60	56	53
Loc 5 Night	12:28 am	68	61	56	64	76	65	64	59	55	52	52	46	35	20

Notes:

1. Daytime weather: Temperature = 55°F, RH = 59%, skies sunny, winds 5 – 8 mph.
   Nighttime weather – Temperature = 47°F, RH = 59%, clear skies, winds 0-3 mph.
2. Road Surfaces were dry during all periods.
3. All sampling periods were approximately 20 minutes duration.
4. Daytime measurements were collected on March 30, 2005.
   Nighttime measurements were collected on March 30-31, 2005.

D.5 Overview of Potential Project Noise Sources

The primary source of sound exterior to the Project will be a 2-cell cooling tower located on the roof at an elevation of approximately 145 feet AGL and is assumed to be screened within a 15-foot high mechanical penthouse (open to the top). There will also be two energy recovery ventilators (ERVs) and a roof top unit (RTU) along with several exhaust fans for the bathrooms, electric room, and kitchen. Louvered ventilation fans for the sub-basement and NSTAR vault will be located at ground level in the alleyway immediately south of 160 North Washington Street. Rooftop stair pressurization fans would only run in an emergency and are not anticipated to be a steady or significant source of noise.

One emergency diesel generator (assumed 700 kW) will be located on the roof in a dedicated weather-proof enclosure, exhausted vertically. It is assumed that this generator will only operate during the day for brief, routine testing when the background sound levels are higher, or during an interruption of the electrical grid, in which case the rooftop mechanical equipment will not be operating.

Mitigation will be applied to multiple sources as needed, to ensure compliance with the noise regulations. The noise control features assumed for this analysis were a mechanical penthouse wall, alleyway ventilation louvers, and an enclosure and exhaust silencer on the emergency generator.

A summary of the major mechanical equipment and noise attenuation measures proposed for the Project are presented below in Tables D-3 and D-4, respectively. The approximate locations of the mechanical equipment were provided in a preliminary roof plan dated October 11, 2012.

Table D-3 Reference Equipment Noise Levels – Per Unit

Noise Source	Form of Data	Ref. Distance (feet)	Overall Level	Sound Levels (dB) per Octave Band Center Frequency (Hz)									No.	Location
			(dBA)	32	63	125	250	500	1000	2000	4000	8000		
Emergency Generator - 700kW (Enclosed) – Mechanical[1]	Sound Pressure	1m	96	95	95	97	94	92	91	89	89	83	1	Roof
Emergency Generator - 700kW (Unsilenced) – Exhaust[2]	Sound Pressure	1m	112	74	74	100	110	106	105	104	95	76	1	Roof
Cooling Tower - 900 ton[3]	Sound Power	-	103	107	107	106	106	101	96	90	85	81	1	Roof
Energy Recovery Ventilator (ERV) - 12,000 cfm[4]	Sound Power	-	85	87	87	89	85	84	80	76	72	67	2	Roof
Roof Top Unit (RTU)[5]	Sound Power	-	99	99	99	96	97	98	91	89	89	82	1	Roof
Toilet Exhaust Fan[6]	Sound Power	-	92	100	100	92	94	91	87	82	79	77	1	Roof
Electric Room Fan - 9,000 cfm[7]	Sound Power	-	87	93	93	91	88	85	82	79	75	71	1	Roof
Kitchen Exhaust Fan - 10,000 cfm[8]	Sound Power	-	92	100	100	92	94	91	87	82	79	77	1	Roof
Restaurant MAU - 7,500 cfm[9]	Sound Power	-	83	93	93	83	80	80	76	76	71	66	1	Roof
Sub-Basement Vent - 7,500 cfm[10]	Sound Power	-	83	93	93	83	80	80	76	76	71	66	1	Alley
NSTAR Vault Vent - 30,000 cfm[11]	Sound Power	-	94	97	97	103	94	89	89	83	79	76	1	Alley

Notes:

1. Caterpillar DM9075 Standby Diesel Generator Set, 700 kW Model C27 DITA, WP Canopy
2. Caterpillar DM9075 Standby Diesel Generator Set, 700 kW Model C27 DITA, Open Exhaust
3. BAC Series 3000 Model 3482C 2-Cell 900 ton Cooling Tower
4. Assumed Greenheck QEI-30-I-75 (12,000 CFM)
5. Mammoth 120-ton Evaporative RTU, Fan Sound Power with Coplanar Silencer
6. Assumed Greenheck 22-AFDW-21 (10,000 CFM)
7. Assumed Greenheck 27-PLG-I (9,000 CFM)
8. Assumed Greenheck 22-AFDW-21 (10,000 CFM)
9. Assumed Greenheck DG-118-H30 Tempered Supply Fan (7500 CFM)
10. Assumed Greenheck DG-118-H30 Tempered Supply Fan (7500 CFM)
11. Assumed Greenheck 36-AFDW-21 (30,000 CFM)

Table D-4 Attenuation Values Used for Sound Level Modeling (dB)

Noise Source	Form of Mitigation	Octave Band Center Frequency (Hz)								
		32	63	125	250	500	1000	2000	4000	8000
Emergency Diesel Generator Exhaust[1]	Exhaust Silencer	12.5	25	39	35	20	21	21	20	20
NSTAR Vault and Sub-Basement Vents[2]	Acoustical Louvers	7	15	14	15	19	30	31	29	29

1. Assumed Maxim Super Critical Grade Chamber Type M42 Silencer, 18" dia
2. Assumed Safe Air Dowco UFD-12 Acoustical Louver

D.6 Modeling Methodology

Anticipated noise impacts associated with the Project were predicted at the nearest noise-sensitive receptors surrounding the Project using the CadnaA noise calculation software. This software uses the ISO 9613-2 industrial noise calculation methodology. CadnaA allows for octave band calculation of noise from multiple noise sources, as well as for computation of diffraction around building edges and multiple reflections off parallel buildings and solid ground areas. In this manner, all significant noise sources and geometric propagation effects are accounted for in the noise modeling.

D.7 Future Sound Level of Project

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 generators, to reflect worse-case conditions during brief, routine, testing of the generators. The results with and without the emergency generators as compared to existing ambient levels and the MassDEP criteria are shown in Tables D-5 and D-6, respectively, for receptors located 1.5 meters above-grade. Figure D-1 shows the locations of each modeled receptor as well as the monitoring locations selected for background measurements. Predicted mechanical equipment noise levels from the Project at each receptor location, taking into account attenuation due to distance, structures, and noise control measures listed in section D-8, are all well below the MassDEP criteria of 10 dBA over the quietest nighttime sound levels measured in 2005. Additionally, no "pure-tone" conditions as defined by the MassDEP are present in the combined future levels.

The predicted Project-generated exterior sound levels with appropriate mitigation measures are expected to remain below 50 dBA with and without the emergency generator running, within the most stringent nighttime zoning limits, for the City of Boston at all nearby sensitive receptors. It should also be noted that the existing nighttime background levels measured in 2005 already exceed the nighttime residential limit of 50 dBA at all five locations studied due to existing sources unrelated to the Project. Sound levels at the modeling receptor representing the tennis court/park due east of the project were compared with the daytime "residential" limit given its daytime-only use. Additionally, the commercial

building due west, and the property-line location due north were compared to the applicable "business" noise limit at these locations. Octave-band sound levels at each of these modeling receptors presented in Tables D-7 and D-8 are at or below applicable city limits described in Table D-1.

All L_{dn} sound levels from the Project will be less than 55 dBA and will not increase the existing L_{dn} in the Project area. Therefore, the Project will not affect the area's compliance with the HUD Residential Site Acceptability Standards after the Project is completed. With regard to the future residents of Lovejoy Wharf itself, Locations R3 and P7 represent analysis points close to the Project with existing L_{dn} levels of 55 and 52 dBA respectively. Assuming an indoor to outdoor sound level reduction of 20 dBA from typical construction materials yields an interior L_{dn} of 35 and 32 dBA. The HUD goal for interior noise levels is 45 dBA. Careful attention to noise reduction from outside to inside will be needed to ensure an interior sound level of 45 dBA. This will be incorporated into the building design details.

Table D-5 Comparison of Future Predicted Sound Levels with Existing Background – Without Emergency Generator

Modeling Location	Ambient ID	Representative Background Location	Project Only Sound Level (dBA)	Meets Boston Noise Policy?	L_{90} Background (dBA)	Total: Project + L_{90} Background (dBA)	Increase Over Background (dBA)[1]	Meets MassDEP Noise Policy?
R1	ST-5	Night	40	YES	56	56	0	YES
R2	ST-3	Night	42	YES	61	61	0	YES
R3	ST-4	Night	47	YES	51	52	1	YES
R4	ST-5	Night	35	YES	56	56	0	YES
R5	ST-2	Day	40	YES	57	57	0	YES
C6	ST-1	Day	43	YES	65	65	0	YES
P7	ST-1	Day	45	YES	65	65	0	YES

1. Calculation performed using data rounded to nearest whole decibel

Table D-6 Comparison of Future Predicted Sound Levels with Existing Background –With Emergency Generator

Modeling Location	Ambient ID	Representative Background Location	Project Only Sound Level (dBA)	Meets Boston Noise Policy?	L_{90} Background (dBA)	Total: Project + L_{90} Background (dBA)	Increase Over Background (dBA)[1]	Meets MassDEP Noise Policy?
R1	ST-5	Day	41	YES	62	62	0	YES
R2	ST-3	Day	44	YES	62	62	0	YES
R3	ST-4	Day	49	YES	60	60	0	YES
R4	ST-5	Day	38	YES	62	62	0	YES
R5	ST-2	Day	43	YES	57	57	0	YES
C6	ST-1	Day	44	YES	65	65	0	YES
P7	ST-1	Day	46	YES	65	65	0	YES

1. Calculation performed using data rounded to nearest whole decibel

Table D-7 Modeling Results – Without Emergency Generator

Project Only

Modeling Receptor	Land Use	LA90	Octave-Band Sound Pressure Level, L90								
			31.5	63.0	125	250	500	1000	2000	4000	8000
		(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
R1	Residential/Night	40	51	50	47	45	38	30	21	12	-12
R2	Residential/Night	42	55	53	49	46	40	34	28	22	6
R3	Residential/Night	47	62	57	58	50	43	37	31	27	18
R4	Residential/Night	35	48	44	38	37	34	28	23	18	3
R5	Residential/Day	40	55	52	47	44	38	32	27	21	8
C6	Business	43	53	53	50	48	41	33	25	16	-7
P7	Business	45	58	56	52	49	43	36	31	28	16
City of Boston Limits	**Residential/Day**	**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Residential/Night	**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

Combined Levels

Modeling Receptor	Land Use	LA90	Octave-Band Sound Pressure Level, L90								
			31.5	63.0	125	250	500	1000	2000	4000	8000
		(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
R1	Residential/Night	40	51	50	47	45	38	30	21	12	-12
R2	Residential/Night	42	55	53	49	46	40	34	28	22	6
R3	Residential/Night	47	62	57	58	50	43	37	31	27	18
R4	Residential/Night	35	48	44	38	37	34	28	23	18	3
R5	Residential/Day	40	55	52	47	44	38	32	27	21	8
C6	Business	43	53	53	50	48	41	33	25	16	-7
P7	Business	45	58	56	52	49	43	36	31	28	16
City of Boston Limits	**Residential/Day**	**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Residential/Night	**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

Table D-8 Modeling Results – With Emergency Generator

Project Only

Modeling Receptor	Land Use	LA90	Octave-Band Sound Pressure Level, L90								
			31.5	63.0	125	250	500	1000	2000	4000	8000
		(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
R1	Residential/Day	41	51	50	48	45	39	31	24	17	-8
R2	Residential/Day	44	56	54	51	47	42	37	33	28	10
R3	Residential/Day	49	63	58	59	51	45	41	37	35	23
R4	Residential/Day	38	49	45	40	39	36	32	29	25	10
R5	Residential/Day	43	56	53	49	45	40	36	32	28	14
C6	Business	44	54	53	51	48	43	36	30	24	1
P7	Business	46	59	57	53	49	44	39	36	32	19
City of Boston Limits	**Residential/Day**	**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Residential/Night	**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

Combined Levels

Modeling Receptor	Land Use	LA90	Octave-Band Sound Pressure Level, L90								
			31.5	63.0	125	250	500	1000	2000	4000	8000
		(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
R1	Residential/Day	62	66	68	65	63	62	63	60	56.0	53
R2	Residential/Day	62	68	68	67	63	61	61	59	55.0	52
R3	Residential/Day	60	67	67	65	61	60	61	57	52.1	49
R4	Residential/Day	62	66	68	65	63	62	63	60	56.0	53
R5	Residential/Day	57	66	67	63	57	55	55	48	41.2	34
C6	Business	65	68	69	64	61	62	65	60	54.0	51
P7	Business	65	68	69	64	61	62	65	60	54.0	51
City of Boston Limits	**Residential/Day**	**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Residential/Night	**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

D.8 Conclusions

Baseline noise levels were measured in the vicinity of the proposed Project in March of 2005 and were compared to predicted noise levels that were derived based on information provided by the manufacturers of representative mechanical equipment or estimated from the equipment's capacity. The proposed Project, with the assumed equipment shown in Table D-3 and appropriate mitigation shown in Table D-4, will not introduce significant outdoor mechanical equipment noise into the surrounding community.

Predicted mechanical equipment noise levels from the Project at each receptor location, taking into account attenuation due to distance, structures, and noise control measures, will be equal to or below the City of Boston Noise Zoning broadband requirements based on land-use, and will comply with all MassDEP A-weighted noise limits. When the aforementioned mitigation efforts are included, the predicted sound levels from Project-related equipment are expected to remain below 50 dBA, within the most stringent nighttime residential zoning limits for the City of Boston at the nearest "residential" receptors. It should be noted that the existing ambient background levels immediately surrounding the Project already exceeded 50 dBA in 2005 without any contribution from the Project. The results in Section D.7 indicate that the proposed Project can operate without significant impact on the existing acoustical environment.

At this time, the mechanical equipment and noise controls are conceptual in nature. During the final design phase of the Project, mechanical equipment and noise controls will be specified and designed to meet the applicable City of Boston broadband noise limit and the corresponding octave band limits, as well as the MassDEP noise criteria and HUD noise goals. Additional mitigation may include the selection of quieter units, acoustical louvers, screening walls, mufflers, or equipment enclosures, as needed.

Attachment E

Sustainability and LEED Checklists

ATTACHMENT E SUSTAINABILITY

Below is a preliminary description of how the Project will achieve Leadership in Energy and Environmental Design (LEED) certifiability for each building, as required by Article 37 of the Boston Zoning Code. As the design of the Project is refined, these credits will be reassessed.

160 North Washington Street

Sustainable Sites (SS)

SS Prerequisite 1 - Construction Activity Pollution Prevention

An Erosion and Sedimentation Control Plan will be drafted by the construction manager. The construction manager will ensure that all of the subcontractors adhere to the plan.

SS Credit 2 – Development Density/Community Connectivity

The site is located adjacent to the North End neighborhood and Bulfinch Triangle area of Boston which are densely developed. The Project site (when the Project is constructed) and its surroundings include more than 60,000 sf per acre.

SS Credit 3 – Brownfield Redevelopment

A Phase II assessment was conducted in 2004 that indicated contamination. Clean-up of the site was started previously, and the Proponent will continue these efforts as required.

SS Credit 4.1 – Alternate Transportation, Public Transportation

The site is located less than ½ mile from North Station, which serves the MBTA Green and Orange lines, as well as commuter rail and Amtrak. Four bus lines also run adjacent to the site.

SS Credit 4.2 – Alternate Transportation, Bike Storage/Changing Room

Bicycle racks will be included inside and adjacent to the building. A shower will be located in the building for use by employees biking to work.

SS Credit 4.4 – Alternate Transportation, Parking Capacity

No parking will be included at the site.

SS Credit 6.1 – Stormwater Design, Quantity Control

The development may implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the two-year, 24-hour design storm.

SS Credit 6.2 – Stormwater Design, Quality Control

The development may consider treating captured stormwater prior to release into the municipal storm sewer system.

SS Credit 7.1 – Heat Island Effect, NonRoof

The development will study the amount of hardscape on the site and may use sidewalk surfacing materials that meet or exceed SRI value limits.

SS Credit 7.2 – Heat Island Effect, Roof

The development will be use roofing materials that meet or exceed SRI value limits.

Water Efficiency (WE)

WE Prerequisite 1 – Water Use Reduction

Through the use of low flow and high efficiency plumbing fixtures, the development will implement water use reduction strategies that use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

WE Credit 3 – Water Use Reduction

The development may include additional water saving measures to further reduce the use of potable water.

Energy and Atmosphere (EA)

EA Prerequisite 1 – Fundamental Building Systems Commissioning

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 performing to the building owner's requirements.

EA Prerequisite 2 – Minimum Energy Performance

The design will incorporate a highly efficient mechanical system design in order to comply with the stringent Stretch Code provisions of the Massachusetts Building Code as well as the LEED requirements.

EA Prerequisite 3 – CFC Reduction in HVAC & R Equipment

The specifications for refrigerants used in the building HVAC & R systems will not permit the use of CFC based refrigerants.

EA Credit 1 – Optimize Energy Performance

The building systems will target a performance level of a minimum of 20% improvement over a baseline building performance rating. The team will develop a whole building energy model to demonstrate the expected performance rating of the designed building systems.

EA Credit 3 – Enhanced Commissioning

The CxA may be engaged during the design process for enhanced commissioning. The CxA's role would include reviewing the owner's building requirements, creating, distributing and implementing a commissioning plan, and performing a design review of the design development and construction documents.

EA Credit 4 – Enhanced Refrigerant Management

The HVAC design will include equipment with refrigerants that minimize the emission of compounds that contribute to ozone depletion and global climate change to the limits required by LEED.

EA Credit 5.1 - Measurement and Verification-Base Building

A measurement and verification plan may be developed and implemented for the building.

Materials and Resources (MR)

MR Prerequisite 1 – Storage and Collection of Recyclables

Storage of collected recyclables will be accommodated within the building.

MR Credit 1 – Building Reuse, Maintain Existing Walls, Floor and Roof

The site includes is an existing structure and the facades and some other portions are anticipated to be reused.

MR Credit 2 – Construction Waste Management

The general contractor will provide a construction waste management plan that will ensure that 75% of all waste and debris is directed to be recycled.

MR Credit 3 – Materials Reuse

The development may use salvaged, refurbished or reused materials in the building.

MR Credit 4 – Recycled Content

The development specifications will specify materials to include pre- and or post-consumer recycled content. It is anticipated that the development will include 10% recycled-content materials based on overall materials costs.

MR Credit 5 – Regional Materials

The development specifications will indicate which materials are to be extracted, harvested, recovered and manufactured within a 500 mile radius of the site. The development team's goal is that 10% of the materials used (based on materials costs) be regional materials.

MR Credit 6 – Certified Wood

The development will use a minimum of 50% FSC certified wood for wood permanently installed inside the building envelope.

Indoor Environmental Air Quality (EQ)

EQ Prerequisite 1 – Minimum IAQ Performance

The building mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standard 61.1-2007 sections 4 through 7 and/or applicable building codes.

EQ Prerequisite 2 – Environmental Tobacco Smoke

The building will be a non-smoking environment.

EQ Credit 1 – Outdoor Air Delivery Monitoring

Demand control ventilation may be incorporated in the HVAC design. CO_2 sensors would be installed to monitor the outdoor air quality throughout the building.

EQ Credit 2 – Increased Ventilation

The development may incorporate measures that meet the requirements of providing additional outdoor air ventilation to improving indoor air quality.

EQ Credit 3 – Construction IAQ Management Plan, During Construction

The construction manager will develop and implement an IAQ management plan for the construction phases of the development. This will include the proper storage of absorptive

materials to prevent moisture damage. Air handlers used during construction will have MERV 8 filtration media that will be replaced before occupancy. The SMACNA sheet metal guides concerning IAQ will be strictly adhered to.

EQ Credit 4 – Low Emitting Materials

The architect will specify all adhesives, sealants, paints, coatings, flooring systems, and composite wood in such a manner that the LEED requirements are met with regard to off-gassing, VOC contents, formaldehydes, etc.

EQ Credit 5 – Indoor Chemical and Pollutant Source Control

The development team will design the building to minimize and control the entry of pollutants into the building.

EQ Credit 6 – Controllability of Systems, Thermal Comfort

It is the intent of the design to provide individual temperature controls for regularly occupied spaces.

EQ Credit 7 – Thermal Comfort, Design

The HVAC system will be designed to meet ASHRAE 55-2004.

EQ Credit 8.2 – Daylight and Views, Views

The development team may develop the design to locate regularly occupied spaces along the perimeter of the floor plate with ample vision glass to achieve views for 90% of the areas, below-grade areas excepted.

Innovation and Design Process (ID)

ID Credit 1.1 – Development Density and Community Connectivity, Exemplary Performance

Option 1 of Credit 2 requires that a new building or renovation project on a previously developed site and in a community with a minimum density of 60,000 sf per acre. An exemplary performance credit can be achieved for a new building or renovation project on a previously developed site and in a community with a minimum density of 120,000 sf per acre. The site and the surrounding area have a density greater than 120,000 sf per acre.

ID Credit 1.2 – Alternative Transportation-Public Transportation Access, Exemplary Performance

The site is located adjacent to North Station which serves the MBTA Green and Orange lines, as well as commuter rail with a frequency of service resulting in over 200 transit rides per day.

ID Credit 2 LEED Accredited Professional

A LEED accredited professional will be part of the development team.

Regional Priority Credits

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. The development anticipates two RPCs: SSc3 Brownfield Redevelopment and SSc7.2-Heat Island Effect, Roof.

131 Beverly Street

Sustainable Sites (SS)

SS Prerequisite 1 - Construction Activity Pollution Prevention

An Erosion and Sedimentation Control Plan will be drafted by the construction manager. The construction manager will ensure that all of the subcontractors adhere to the plan.

SS Credit 2 – Development Density/Community Connectivity

The site is located adjacent to the North End neighborhood and Bulfinch Triangle area of Boston which are densely developed. The Project site (when the Project is constructed) and its surroundings include more than 60,000 sf per acre.

SS Credit 4.1 – Alternate Transportation, Public Transportation

The site is located less than ½ mile from North Station, which serves the MBTA Green and Orange lines, as well as commuter rail and Amtrak. Four bus lines also run adjacent to the site.

SS Credit 4.2 – Alternate Transportation, Bike Storage/Changing Room

The development will include secure bicycle storage for more than 15% of the building occupants.

SS Credit 4.3 – Alternate Transportation, Low Emitting and Fuel Efficient Vehicles

A portion of the parking spaces will be reserved for low emitting and fuel efficient vehicles. This will either be done by strategically locating the spaces or by allowing the spaces at a discounted rate for a minimum of two years.

SS Credit 4.4 – Alternate Transportation, Parking Capacity

The development includes a number of parking spaces consistent with BTD guidelines. The development will include a comprehensive transportation demand management program to minimize the number of single-occupancy vehicle trips related to the site.

Credit 6.1 – Stormwater Design, Quantity Control

The development may implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the two-year, 24-hour design storm.

Credit 6.2 – Stormwater Design, Quality Control

The development may consider treating captured stormwater prior to release into the municipal storm sewer system.

Credit 7.1 – Heat Island Effect, NonRoof

The parking will be located within the building, and the rooftop of the building will have materials that meet or exceed the SRI value limits.

SS Credit 7.2 – Heat Island Effect, Roof

The development will be use roofing materials that meet or exceed the SRI value limits.

Water Efficiency (WE)

WE Prerequisite 1 – Water Use Reduction

Through the use of low flow and high efficiency plumbing fixtures, the development will implement water use reduction strategies that use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

WE Credit 3 – Water Use Reduction

The development may include additional water saving measures to further reduce the use of potable water.

Energy and Atmosphere (EA)

EA Prerequisite 1 – Fundamental Building Systems Commissioning

A third party commissioning agent (CxA) will be engaged by the Proponent 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 performing to the building owner's requirements.

EA Prerequisite 2 – Minimum Energy Performance

The design will incorporate a highly efficient mechanical system design in order to comply with the stringent Stretch Code provisions of the Massachusetts Building Code as well as the LEED requirements.

EA Prerequisite 3 – CFC Reduction in HVAC & R Equipment

The specifications for refrigerants used in the building HVAC & R systems will not permit the use of CFC based refrigerants.

EA Credit 1 – Optimize Energy Performance

The building will be subject to the Stretch Code provision of the Massachusetts Building Code, which requires a 20% improvement over a baseline building performance rating. The team will develop a whole building energy model to demonstrate the expected performance rating of the designed building systems. As the design progresses, it may achieve an even greater level of performance.

EA Credit 3 – Enhanced Commissioning

The CxA may be engaged during the design process for enhanced commissioning. The CxA's role would include reviewing the owner's building requirements, creating, distributing and implementing a commissioning plan, and performing a design review of the design development and construction documents.

EA Credit 4 – Enhanced Refrigerant Management

The HVAC design will include equipment with refrigerants that minimize the emission of compounds that contribute to ozone depletion and global climate change to the limits required by LEED.

EA Credit 5 - Measurement and Verification

A measurement and verification plan may be developed and implemented for the building.

Materials and Resources (MR)

MR Prerequisite 1 – Storage and Collection of Recyclables

Storage of collected recyclables will be accommodated within the building.

MR Credit 2 – Construction Waste Management

The general contractor will provide a construction waste management plan that will ensure that 50% of all waste and debris is directed to be recycled.

MR Credit 3 – Materials Reuse

The development may use salvaged, refurbished or reused materials in the building.

MR Credit 4 – Recycled Content

The development specifications will specify materials to include pre- and or post-consumer recycled content. It is anticipated that the development will include 10% recycled-content materials based on overall materials costs.

MR Credit 5 – Regional Materials

The development specifications will indicate which materials are to be extracted, harvested, recovered and manufactured within a 500 mile radius of the site. The development team's goal is that 10% of the materials used (based on materials costs) be regional materials.

MR Credit 6 – Rapidly Renewable Materials

The development may specify rapidly renewable building materials and products for 2.5% of the total value of all building materials and products used.

MR Credit 7 – Certified Wood

The development will use a minimum of 50% FSC certified wood for wood permanently installed inside the building envelope.

Indoor Environmental Air Quality (EQ)

EQ Prerequisite 1 – Minimum IAQ Performance

The building mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standard 61.1-2007 sections 4 through 7 and/or applicable building codes.

EQ Prerequisite 2 – Environmental Tobacco Smoke

All common areas in the building will be No Smoking areas.

EQ Credit 2 – Increased Ventilation

The development may incorporate measures that meet the requirements of providing additional outdoor air ventilation to improving indoor air quality.

EQ Credit 3.1 – Construction IAQ Management Plan, During Construction

The construction manager will develop and implement an IAQ management plan for the construction phases of the development. This will include the proper storage of absorptive materials to prevent moisture damage. Air handlers used during construction will have MERV 8 filtration media that will be replaced before occupancy. The SMACNA sheet metal guides concerning IAQ will be strictly adhered to.

EQ Credit 4 – Low Emitting Materials

The architect will specify all adhesives, sealants, paints, coatings, flooring systems, and composite wood in such a manner that the LEED requirements are met with regard to off-gassing, VOC contents, formaldehydes, etc.

EQ Credit 5 – Indoor Chemical and Pollutant Source Control

The development team will consider options to minimize and control the entry of pollutants into the building.

EQ Credit 6.1 – Controllability of Systems, Lighting

It is the intent of the design to provide individual lighting controls for regularly occupied spaces and all units. The controls may include vacancy/occupancy sensors and day light dimming controls. Multi-occupant user spaces such as lobbies/club rooms will have multi-level lighting controls for modifying light levels as necessary for the various uses.

EQ Credit 6.2 – Controllability of Systems, Thermal Comfort

It is the intent of the design to provide individual temperature controls for regularly occupied spaces.

EQ Credit 7.1 – Thermal Comfort, Design

The development may design HVAC systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004.

EQ Credit 7.2 – Thermal Comfort, Verification

If the development meets the requirements for EQc7.1, the team will evaluate the feasibility of this credit.

EQ Credit 8.2 – Daylight and Views, Views

It is the intent of the design to locate regularly occupied spaces along the perimeter of the floor plate with ample vision glass to achieve views for 90% of the areas.

Innovation and Design Process (ID)

ID Credit 1.1 – Development Density and Community Connectivity, Exemplary Performance

Option 1 of Credit 2 requires that a new building or renovation project on a previously developed site and in a community with a minimum density of 60,000 sf per acre. An exemplary performance credit can be achieved for a new building or renovation project on a previously developed site and in a community with a minimum density of 120,000 sf per acre. The site and the surrounding area have a density greater than 120,000 sf per acre.

ID Credit 1.2 – Alternative Transportation-Public Transportation Access, Exemplary Performance

The site is located adjacent to North Station which serves the MBTA Green and Orange lines, as well as commuter rail with a frequency of service resulting in over 200 transit rides per day.

ID Credit 1.3 – Heat Island Effect-Nonroof, Exemplary Performance

The parking will be located within the building, and the rooftop of the building will have materials that meet or exceed the SRI value limits.

ID Credit 2 LEED Accredited Professional

A LEED accredited professional will be part of the development team.

Regional Priority Credits

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. The development anticipates two RPCs: SSc7.1-Heat Island Effect, Nonroof and SSc7.2-Heat Island Effect, Roof.

LEED 2009 for Core and Shell Development

Project Checklist

Lovejoy Wharf - 160 Washington St

10.16.12

Sustainable Sites — Possible Points: 28

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
		1	Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
1			Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
2			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	2
		3	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
	1		Credit 6.1	Stormwater Design—Quantity Control	1
	1		Credit 6.2	Stormwater Design—Quality Control	1
	1		Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1
		1	Credit 9	Tenant Design and Construction Guidelines	1

Water Efficiency — Possible Points: 10

Y			Prereq 1	Water Use Reduction—20% Reduction	
		4	Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
	2	2	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 37

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
7		19	Credit 1	Optimize Energy Performance	3 to 21
		4	Credit 2	On-Site Renewable Energy	4
	2		Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5.1	Measurement and Verification—Base Building	3
		3	Credit 5.2	Measurement and Verification—Tenant Submetering	3
	2		Credit 6	Green Power	2

Materials and Resources — Possible Points: 13

Y	?	N			
Y			Prereq 1	Storage and Collection of Recyclables	
2	2	1	Credit 1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 5
1	1		Credit 2	Construction Waste Management	1 to 2
	1		Credit 3	Materials Reuse	1
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
1			Credit 6	Certified Wood	1

Indoor Environmental Quality — Possible Points: 12

Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
	1		Credit 1	Outdoor Air Delivery Monitoring	1
	1		Credit 2	Increased Ventilation	1
1			Credit 3	Construction IAQ Management Plan—During Construction	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6	Controllability of Systems—Thermal Comfort	1
1			Credit 7	Thermal Comfort—Design	1
		1	Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

1			Credit 1.1	Innovation in Design: SSc2	1
1			Credit 1.2	Innovation in Design: SSc4.1	1
		1	Credit 1.3	Innovation in Design: Specific Title	1
		1	Credit 1.4	Innovation in Design: Specific Title	1
		1	Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: SSc7.2	1
1			Credit 1.2	Regional Priority: SSc3	1
		1	Credit 1.3	Regional Priority: Specific Credit	1
		1	Credit 1.4	Regional Priority: Specific Credit	1

Total — Possible Points: 110

45	21	49	

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

LEED 2009 for New Construction and Major Renovations

Project Checklist

Lovejoy Wharf - 131 Beverly St

10.16.12

Sustainable Sites — Possible Points: 26

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
		1	Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
	1		Credit 6.1	Stormwater Design—Quantity Control	1
	1		Credit 6.2	Stormwater Design—Quality Control	1
	1		Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y			Prereq 1	Water Use Reduction—20% Reduction	
		4	Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
	2	2	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5	2	12	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
	2		Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
1	1		Credit 2	Construction Waste Management	1 to 2
	2		Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
		1	Credit 1	Outdoor Air Delivery Monitoring	1
	1		Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
		1	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
	1		Credit 7.1	Thermal Comfort—Design	1
	1		Credit 7.2	Thermal Comfort—Verification	1
		1	Credit 8.1	Daylight and Views—Daylight	1
1			Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

1			Credit 1.1	Innovation in Design: SSc2	1
1			Credit 1.2	Innovation in Design: SSc4.1	1
1			Credit 1.3	Innovation in Design: SSc7.1	1
1			Credit 1.4	Innovation in Design: Low Mercury Lighting	1
		1	Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: SSc7.1	1
1			Credit 1.2	Regional Priority: SSc7.2	1
		1	Credit 1.3	Regional Priority: Specific Credit	1
		1	Credit 1.4	Regional Priority: Specific Credit	1

44	22	44	**Total**	Possible Points: **110**

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