Clippership Wharf Development

East Boston, Massachusetts

BRA Notice of Project Change

March 10, 2015

submitted to the **Boston Redevelopment Authority**

submitted by **Lend Lease Development, Inc.**
and Noddle Island Limited Partnership

prepared by **Fort Point Associates, Inc.**

in association with
The Architectural Team, Inc.
Nitsch Engineering
Haley & Aldrich
Halvorson Design Partnership, Inc.
Tech Environmental
Childs Engineering Corporation
Howard/Stein-Hudson Associates, Inc.
Cates Engineering
WSP
Goulston & Storrs

Fort Point Associates, Inc.
Urban Planning Environmental Consulting Project Permitting

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

CHAPTER 1

PROJECT DESCRIPTION

CHAPTER 1: PROJECT DESCRIPTION

1.1 **PROJECT BACKGROUND**

Lend Lease Development, Inc. and Noddle Island Limited Partnership (the "Proponent") submits this Notice of Project Change ("NPC") pursuant to Section 80A-6 of the Boston Zoning Code (the "Code") for the subject property at the Clippership Wharf property in East Boston (the "Site"). The Proponent seeks to develop the approximately 12-acre Site, which is located along the East Boston waterfront on Boston Inner Harbor. The Site includes approximately 295,518 square feet ("sf") of lot area (6.75 acres) above the mean high water mark (the "Lot Area").

On June 2, 2003, the original project proponent (Noddle Island Limited Partnership) filed a The Draft Project Impact Report/Draft Environmental Impact Report (DPIR) for the Project with the Boston Redevelopment Authority (BRA) and Massachusetts Environmental Policy Act Office ("MEPA"). Under the City of Boston's Article 80 process, notice of the receipt by the BRA of the DPIR was published in the Boston Herald on June 3, 2003, initiating a public comment period. Under the Massachusetts Environmental Policy Act, notice of the receipt by the MEPA Office of the ENF was published in the Environmental Monitor on June 10, 2003, initiating a public comment period. During these comment periods, a total of 29 comment letters were received by the BRA and/or the MEPA Office.

Located on abandoned waterfront property in East Boston just south of Maverick Square, the 2003 project consisted of a predominantly residential development of approximately 400 residential units in four buildings (including 8 artist live/work units) with a mix of retail, restaurant, arts and educational, community, and water-dependent uses on the ground floors and 670 underground parking spaces to serve residents and the site's commercial and community uses "Original Project"). Four aces of new public open space, including 3.3 acres of landscaped areas, sidewalks, and approximately 1,715 linear feet of harborwalk wrapping around the Site's waterfront edge, together with two new floating docks for water transportation vessels were also proposed at this Site. Approximately 1.8 acres of existing deteriorated pile fields and decking would have been removed from Boston Harbor as part of the Original Project.

Noddle Island Limited Partnership filed the comprehensive DPIR in 2003 detailing the potential environmental, tidelands, transportation, urban design, infrastructure, and historic resources impacts of the proposed development. The document satisfactorily responded to the BRA's Scoping Determination and provided sufficient documentation to support the conclusion that the Original Project would result in minimal environmental impacts (See Memorandum from Richard Mertens of BRA dated June 23, 2003, Attachment E).

By this Notice of Project Change, the Proponent proposes material but insignificant changes to the Original Project (the "Revised Project") and respectfully requests that the BRA make a determination that no further review is required under Section 80B of the Code. As shown in this NPC, the changes from the Original Project (the "Project Change") do not significantly increase those impacts of the Original Project.

Therefore, any change in the impacts studied under the DPIR from the Revised Project does not warrant resubmission of the PNF, rescoping of the Revised Project, supplementary documentation, and/or a further DPIR.

1.2 PROJECT CONTEXT

The Site is an approximately 12-acre parcel of land and water on the East Boston waterfront that has been vacant for over 25 years. The Site is bounded on the east by Lewis Street and on the north by Monsignor Jacobbe Road. The newly constructed Portside at East Pier development project is located to the east of the Site, the Harbor is to the south, the Hodge Boiler Works and the Carlton Wharf residential site are to the west, and the Heritage and Clippership Apartments are located to the north. See Figure 1-1, Locus Map. The property is located within walking distance of East Boston's Maverick Square, including the Massachusetts Bay Transportation Authority (MBTA) Blue Line's Maverick Station.

1.3 PROJECT OVERVIEW AND DEVELOPMENT PROGRAM

1.3.1 PROJECT SUMMARY

The Revised Project will transform an underutilized section of the East Boston Waterfront into an active, publicly accessible extension of Maverick Square and the surrounding East Boston neighborhood. The approximately 12 acre Site (including land and water) is currently an impediment to the access and enjoyment of the waterfront, and to some of the most striking views of downtown Boston available anywhere in Boston Harbor.

Lend Lease Development, Inc., in partnership with Noddle Island Limited Partnership, proposes to deliver a predominantly residential project, featuring both apartments and condominiums, comprised of approximately 492 housing units on the upper floors, and a mix of residential, community, restaurant, and recreational uses at the ground level.

The Site offers the opportunity to create a truly unique urban environment, with an abundance of open space and a variety of opportunities for public gathering, recreation, and the ability to interact with the water's edge through the reintroduction of a natural, living shoreline. The Site also benefits from exceptional

public transit access, with the Maverick Square MBTA station and the forthcoming Boston Harbor ferry service just steps from the Site.

The Revised Project will allow for seamless vehicular access from neighborhood roadways and will create a new network of pedestrian and bicycle movements that will both tie into the neighborhood's existing movements and provide access to an important stretch of the East Boston shoreline. The Revised Project will also deliver a key stretch of the Harborwalk, nearly completing the continuum between LoPresti Park and Piers Park.

In addition to its ample open space, the Site will feature Facilities of Public Accommodation that include a public social and fitness club, a destination restaurant, a commuter café, public parking, secure bicycle storage and boating and recreational uses meant to create a waterfront destination for the entire East Boston community (See Figure 1-2, Project Site Plan). Fitting in with Lend Lease's global commitments, the Revised Project has lofty sustainability goals embodied by the naturalization of the shoreline, the use of water sensitive design and limiting non-potable water for irrigation, reliance on public transit, renewable energy sources, and other sustainably driven commitments. The Revised Project will target a minimum of LEED Gold. The project is the first development project that Lend Lease Development, Inc. will undertake in Boston and is a natural fit with the company's global framework for sustainability, setting out firm commitments to drive environmental, social and economic outcomes within their urban regeneration strategy.

The Revised Project includes the development of approximately 525,000 gross square feet of residential units (a mix of condos and apartments), and approximately 30,200 gross square feet of retail and Facilities of Public Accommodation. There will be four six-story buildings (above grade) and underground parking with 300 spaces, including Zip Car spaces. In addition to the underground parking, there will be 21 surface parking spaces on the surface. There will be approximately 300 indoor bike storage spaces located within the buildings. For more information on the design of the Revised Project, see Figure 1-2, Project Site Plan.

The Revised Project will contain up to 492 studio, one-bedroom ("1BR"), and two bedroom ("2BR) units, a small café and restaurant; an outdoor seating area for the restaurant; a fitness center, lounge and club facility; a canoe/kayak rental facility, and a possible mooring field for sailing. The Revised Project will also include approximately 189,837 square feet of open space, including 1,381 linear feet of harborwalk, a new water transportation dock (in partnership with the Portside at East Pier Development project located east of the Site), and other waterfront improvements. See Figure 1-2, Project Site Plan, and Figures 1-3 to 1-6, Floor Plans.

The total gross floor area (GFA) of the Revised Project is approximately 555,000 square feet, with a total floor area ratio ("FAR") of approximately 2.2. See Table 1-1, Building Program. The total building footprint for the Revised Project is approximately 105,681 square feet, compared to approximately 118,528 square feet for the Original Project.

Table 1-1: Building Program

Building	Lot Area (sf)	Bldg. Footprint (sf)	Lot Coverage	Max. GFA (sf)	Max. FAR	Max. Bldg. Ht. (ft)	Garage Pkg. (spcs.)	Surface Pkg. (spcs.)
Total	295,518	105,681	36%	555,000	2.2	70′	300*	21*

*Parking Breakdown: Garage – 280 Private Spaces / 20 FPA Spaces: 300 Total
Surface Parking – 7 Private Spaces / 14 Public Spaces: 21 Total

1.3.2 PUBLIC BENEFITS

Completion of the Revised Project will help to revitalize an important part of the East Boston waterfront that has been underutilized and inaccessible to the public for decades. The public benefits of the project will make the area more appealing to both residents and visitors, whether arriving by land or water. Specifically, the Revised Project will provide the following substantial direct benefits for the City of Boston (the "City") and the wider region:

Public Access and Open Space

- Redevelopment and revitalization of an approximately 12 acre parcel along East Boston's waterfront that has not been accessible to the public for decades;
- Creation of approximately 189,837 square feet (just over 4 acres) of new open space on East Boston's waterfront, including approximately 1,381 linear feet of harborwalk at the very edge of Boston Inner Harbor;
- Inclusion of a restaurant with outdoor seating and a small café open to the general public;
- Enhancement of the waterfront property by rebuilding perimeter seawalls, providing public access to and along the water, adding substantial new open space, and creating public activity on the Site;
- Removal of approximately 1.8 acres of deteriorated wooden pile fields, piers, and decks from the Site's watersheet; and
- The Revised Project will provide new public access to and along the water with a kayak launch, a new dock for small vessels and short term tie-up, a dock for

pedestrian access, a pier overlook, and an interpretive ecological planting area to enliven the pedestrian environment surrounding the Site.

View Corridors

- Enhancement of the view corridor looking south to the Boston skyline and west along Marginal Street to the Bunker Hill Monument with upgraded landscaping, interpretive signage, and architectural features;

Transportation

- Promotion of Transit Oriented Development by creating 492 new residential units within walking distance of the MBTA's Maverick Station;
- Inclusion of shared car service, such as Zipcar, City CarShare, and/or smaller-sized "smart cars";
- Implementation of key Transportation Demand Measures (TDM) including installation of public and private bicycle racks and participation in a TDM Association;
- Support of water transportation by utilizing the water taxi dock and ferry landing built at the newly constructed Portside at East Pier development, located just east of the Site; and
- Inclusion of 14 surface parking spaces on the Site, available to the public, free of charge.

Housing

- Addition of up to 492 residential units of housing to the City's housing stock, thereby addressing a constrained housing market and contributing to Mayor Walsh's housing goals;
- Compliance with the affordable housing requirements of the Mayor of Boston's Inclusionary Housing Policy; and
- Creation of housing diversity through a mix of unit types and sizes at a unique waterfront location (both rental apartments and condominiums).

Financial

- Bring new residents to the area to support neighborhood businesses, thereby increasing commercial spending in the Maverick Square district of East Boston. The Project will also benefit area landowners by increasing property values in the area;
- Generation of new property tax revenues from the Project alone;
- Creation of employment opportunities and new permanent jobs on the Site;
- Incorporation of a concentration of retail services along Lewis Mall and Lewis Street to create a lively link between Maverick Square and the waterfront that supports a revitalized Maverick Square.

1.3.3 PUBLIC REALM IMPROVEMENTS

The Revised Project has been designed to provide outstanding public access to and along Boston Inner Harbor. Public access to the Site will be provided from sidewalks along Marginal Street, Lewis Street and Monsignor Jacobbe Road, as well as the Harborwalk along the waterfront. Approximately 189,837 square feet, or just over 4 acres of new open space will be made accessible to the public.

1.4 PROJECT CHANGES SINCE THE DPIR

The DPIR considered the Original Project to include: 400 residential units in four buildings which ranged in height from five to seven stories; 27,400 square feet of ground-floor commercial and community uses, including arts, retail, restaurant, community, education and water transportation support spaces; four acres of open space, 670 underground parking spaces, 34 two-hour on street parking spaces; and stabilization of the seawall to create a Harborwalk of approximately 1,715 linear feet wrapping around the Site's waterfront edge.

The Revised Project involves material but minor changes to the Original Project as it was described in the DPIR. The Revised Project involves the development of approximately 525,000 square feet of residential units (a mix of condominiums and apartments) and approximately 30,200 square feet of retail and Facilities of Public Accommodation, compared to 593,520 square feet of residential units and 27,400 square feet of retail and Facilities of Public Accommodation space in the Original Project. The buildings are six-story structures with the basement level used for below grade parking. The Revised Project includes approximately 189,837 square feet of public open space (excluding roadways and parking), compared to 174,240 square feet in the Original Project.

The Revised Project will contain up to 492 studio, one-bedroom, and two-bedroom units, a small café and restaurant, a fitness center, a lounge and club facility, a canoe/kayak rental facility, a water taxi dock, and a possible mooring field for sailing. See Figure 1-2, Project Site Plan. Table 1-2 outlines the project changes since the 2003 DPIR/FEIR.

The total GFA has been reduced from 620,920 to 555,000 with an FAR of 2.2. The total building footprint for the Revised Project will be 105,681 square feet compared to 118,528 square feet for the Original Project. The Original Project proposed 670 underground parking spaces and 34 surface spaces, whereas the Revised Project will provide approximately 300 underground spaces including Zip Car spaces and 21 surface spaces.

Overall, the building heights at the Site will be lower with the Revised Project. The height of the buildings in the Revised Project will be less than 70 feet above grade, compared to the Original Project, with a building height of approximately 86 feet above grade. The Revised Project contains 2,800 additional square feet of retail and Facilities of Public Accommodation. The most prominent change in the Site design of the Revised Project is the creation of a 28,200 square foot coastal wetland area comprised of land under the ocean, coastal banks, and tidal flats from existing solid fill at the end of the western wharf near the south side of Building 3 (the "Living Shoreline"). See Figure 1-2, Project Site Plan. Detailed evaluation of the Project Change follows in Chapter 2.

Table 1-2: Project Change since the 2003 DPIR

	2003 DPIR	2015 NPC	Net Change
Lot Area (sf)	295,518	295,518	0
GFA (sf)	620,920	555,000	-65,920
FAR	2.1	2.2	0.1
Building Footprint (sf)	118,528sf	105,681	-12,847
Stories	5-7	6	Varies
Height (ft)	86	<70"	-16
Units	400	492	*92
Parking Spaces	704	321	-383
Open Space	174,240	189,837	15,597

*While the residential unit count has increased, bedroom count has decreased.

CHAPTER 2

EVALUATION OF PROJECT CHANGES

CHAPTER 2: EVALUATION OF PROJECT CHANGES SINCE THE DPIR

2.1 URBAN DESIGN:

The primary urban design objectives of the Project to create an environment that respects the residential character of the surrounding neighborhood, complements the active commercial and community uses, and activates the waterfront still remain. The buildings and Site have been organized to complement the existing neighborhood and provide a variety of public experiences, activities and movement through the Site. It is the aim of the Project to seamlessly integrate and leverage the unique public, ecological, and transit opportunities of the Site to create a vibrant set of spaces which both complement and enhance the experience of the East Boston waterfront.

The Original Project as described in the DPIR included four, seven-story residential buildings with two levels of parking below existing grade. The Revised Project also has four residential buildings, but the buildings are six stories each (five stories of wood over two levels of podium with the lower podium below grade). The first floor level of the buildings has been raised from existing grade to accommodate the flood plain elevation and sea level rise. A one level garage connects all four buildings below grade.

Two buildings (Buildings 3 and 4) are located at the piers and reach out to address the waterfront in a similar fashion as the Original Project. The other two buildings, a bar building defining the southern boundary of Marginal Street extension (Building 2) and the "U" shaped building adjacent to Jacobbe Road and Lewis Mall (Building 1) create an elevated inner plateau (the "landing pad") that organizes the building entries, allows the buildings' public areas and amenity spaces to communicate with each other, provides clear way finding and site circulation, and opens to the perimeter of the Site and the City beyond in select areas. The character of the outdoor public spaces changes dramatically based on their orientation to the buildings and the harbor, and sponsors a variety of opportunities for public gathering, recreation and contemplation. Portions of Buildings 1 and 2, and all of Building 3 are canted from the Marginal Street grid to create a more dynamic relationship between the buildings and the Site, and to prioritize views from the apartment units and the courtyard space. The view corridor down Marginal Street has been maintained while the view corridor down Clipper Ship Lane has been improved from the Original Project.

The treatment and redevelopment of the inner cove and the western pier have changed dramatically from the DPIR. The Original Project featured an arts lawn at the western pier whereas the Revised Project provides an innovative "Living Shoreline" that will encourage direct engagement between the public and the waterfront. The design and orientation of

Building 3 and its surrounds enhances this interaction with an education and recreation based waterfront amenity area at the harborwalk level, including a kayak launch ramp and dock that allow direct access to the waterfront.

The inner cove has been redesigned to foster a seamless transition from the harborwalk and adjacent public gathering areas down to the watersheet by way of a landscaped stepped amphitheater that transitions into a grand granite block stair which cascades to the water's edge, the harborwalk passing overhead.

The building design provides the ability for the public to traverse beneath the building above while experiencing the harborwalk and views beyond. The inner cove has been redesigned to enhance public interaction with the waterfront by way of a granite stepped amphitheater that evolves into a granite stair which descends to the water's edge with the harborwalk passing overhead.

The end of the east pier is a similar arrangement to the Original Project with a proposed retail/restaurant space with an adjacent exterior patio and lawn extending to the harborwalk at the edge of the pier. The Revised Project provides covered public parking (motor vehicle and bicycle) towards the south end of Building 4, which will help support all of the proposed public uses at the Site. This parking area includes public access to the east and west sides of the building at grade, enhancing the connection through the Site.

The northern edge of the Site, particularly at its corners, also encourages public use and interaction. Building 1 has been oriented to reinforce the street edge at Jacobbe Road, with an at grade entrance that addresses the landscaped open space adjacent to and between the head of Jacobbe Road and the existing glass head house of the Maverick T station. A public retail space/café and secure public bicycle storage area are provided at the northeast corner of Building 1, connecting the building lobby with the community through the retail and community experience. A similar opportunity exists at the southern tip of Building 4, where restaurant uses and public vehicle and bicycle parking converge with the forthcoming ferry service at the end of Lewis Street. This will provide a destination at the water's edge and create a link between the water, Lewis Street, Lewis Mall and Maverick Square. See Figure 1-2, Project Site Plan.

The Revised Project has been designed to complement the massing of the surrounding structures and relate to its distinct location on the East Boston waterfront. The project relates to typical materials found in the neighborhood with the use of a masonry base at the pedestrian level. The upper levels are comprised of a combination of metal panel and manufactured stone panel that are used in a way that respects the existing context, but also evoke a marine industrial aesthetic. Building 1 consists of a punctuated metal wrap that relates to the surrounding urban scale and fabric. This wrap is meant to both embrace the building, in essence sheltering the courtyard, and to simultaneously reveal the materials used in the courtyard and elsewhere.

The metal wrapping element transforms as the buildings transition away from the community and towards Boston Harbor. Though similar in dimension on Buildings 2,3 and 4, the wrap reorients into folding planes that serve to provide movement and directionally for the buildings as they reach toward the waterfront and the downtown Boston skyline, highlighting important building elements and creating a thrust that mirrors the piers as they extend into the harbor. See Figure 1-2, Project Site Plan.

2.2 TRANSPORTATION:

The DPIR included a transportation analysis as requested by the Boston Transportation Department ("BTD") through their comment letter and in response to the MEPA Certificate on the ENF/PNF for the Original Project. The analysis was prepared in compliance with the Transportation Access Plan Guidelines, and the Code's Article 80 review process.

The Original Project was previously permitted for redevelopment in 2003. At that time, the redevelopment included 400 condominiums, a 4,500 square foot recreation center, 22,500 square feet of retail, and a 6,000 square foot restaurant. The mode shares utilized in the 2003 permitting were based on U.S. Census data, whereas the current mode shares are based on BTD data. The U.S. Census data relied more heavily on transit use and less on vehicle use. The U.S. Census data, therefore, potentially underestimates the traffic impacts on local roadways. The trip generation summary of each redevelopment is summarized in Table 3-10 of the Transportation Study (Appendix 3)

As documented in the transportation analysis for the Original Project, there were no significant transportation impacts associated with the construction or operation of the Clippership Wharf Project. The original proponent had planned to finalize a Transportation Access Plan Agreement ("TAPA") and Construction Management Plan ("CMP") with the Boston Transportation Department to address specific long term mitigation and construction period transportation requirements for the project. The TAPA would have included a transportation demand management (TDM) program and included minor improvements to the following intersections:

- Chelsea Street at Porter Street
- Meridian Street at Havre Street

The proponent had planned to investigate the feasibility of the recommended improvements in consultation with the BTD and would contribute to their implementation if they were considered feasible and desirable.

For the Revised Project, Howard/Stein Hudson Associates ("HSH") has conducted an evaluation of the transportation impacts of the proposed redevelopment of Clipperhsip Wharf. This transportation study adheres to the BTD Transportation Access Plan Guidelines and Boston Redevelopment Authority ("BRA") Article 80 development review process, as

well as following the guidelines of the EOEEA/MassDOT Guidelines for Environmental Impact Report/Environmental Impact Statement Traffic Impact Assessments ("TIA's") for MEPA review. This study includes an evaluation of existing conditions, future conditions with and without the Project projected parking demand, loading operations, transit services, and pedestrian activity.

The results of the 2020 Build Condition traffic analysis at study area intersections are presented in Table 3-11 and 3-12 of Appendix 3 for the a.m. and p.m. peak hours respectfully. In the Build Condition, the signalized intersection of Sumner Street/Maverick Square/Chelsea Street continues to operate at LOS C during the weekday a.m. peak hour and at LOS D during the weekday p.m. peak hour. The Sumner Street eastbound approach decreases from LOS C to LOS D during the weekday a.m. peak hour. All other approaches continue to operate at the same LOS as compared to the No-Build Condition. The longest queues continue to occur at the Chelsea Street southbound approach during both the weekday a.m. and p.m. peak hours.

In the Build Condition, all unsignalized intersection approaches continue to operate at the same LOS as compared to the No-Build Condition during both the weekday a.m. and p.m. peak hours with the exception of :

- **Sumner Street/Bremen Street**: The Bremen Street northbound approach decreases from LOS C to LOS D and the Bremen Street southbound approach decreases from LOS E to LOS F during the weekday a.m. peak hour.

- **Maverick Street/Bremen Street**: The Bremen Street northbound approach decreases from LOS A to LOS B during the weekday p.m. peak hour.

- **Meridian Street/Paris Street/Emmons Street**: The Paris Street southbound approach decreases from LOS C to LOS D during the weekday a.m. peak hour.

- **Meridian Street/Havre Street Decatur Street/Gove Street**: The Meridian Street southeastbound approach decreases to LOS A to LOS B during the weekday p.m. peak hour.

- **Meridian Street/London Street**: The London Street northbound approach decreases from LOS E to LOS F during the weekday a.m. peak hour.

While the traffic impacts associated with the Revised Project generated trips are minimal, the Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle usage. As part of the project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible; the installation of new, accessible ramps; improvements to

street lighting where necessary; planting of street trees; and providing bicycle storage racks surrounding the Site, where appropriate.

The Proponent will prepare a TAPA, a formal legal agreement between the Proponent and BTD. The transportation improvements to be undertaken as part of the Project will be defined and documented in the TAPA. The Proponent will also produce a Construction Management Plan for review and approval by BTD. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project. The Proponent is also committed to implementing TDM measures to reduce dependence on automobiles. See Section 3-8 of the Transportation Analysis in Appendix 3 for additional information related to the CMP and TDM measures.

2.3 ENVIRONMENTAL

2.3.1 **WIND**

A pedestrian level wind (PLW) assessment was conducted for the Original Project in 2003. This analysis was based on topographic and planimetric survey maps of the area provided by the BRA; architectural plans and elevations of the proposed project; an assessment of the pedestrian level winds for the Portside at Pier One Project; several site visits; photographic documentation; an evaluation of the urban context of the proposed Site; and a review of the Boston wind climate.

This qualitative assessment conducted in conjunction with the DPIR found that none of the 74 locations considered in either the existing or build conditions would have PLW's that exceed the BRA guideline wind speed of 31 miles per second more often than once in 100 hours.

It was determined that the Project would generally improve pedestrian-level wind conditions in the vicinity of the Site, and therefore no mitigation was proposed. The Revised Project is similar in massing to the Original Project; the building footprints and heights are less than what was approved for the Original Project. It is not anticipated that wind impacts will be increased by the Revised Project.

2.3.2 **SHADOW**

A shadow study was conducted for the Original Project as part of the DPIR. Three dimensional models of existing and proposed buildings on adjacent sites were conducted on top of a survey base map of the Site in AutoCAD format. Accurate computer generated shadows of each alternative were cast for specific dates and times using Autodesk3D Studio VIZ software. The following conclusions were made:

1. While some offsite shading of open space will occur for brief periods along Lewis Street, Lewis Mall and Monsignor Jacobbe Road, these limited impacts area compensated for by creation of the wind-protected sunny public open spaces at the cove and garden, and the wind protection along Lewis Street.

2. Lewis Street was considered a sunny but a Category 3 wind environment. The development changes these conditions to sometimes shaded but generally Category 1 in the lee of buildings and Category 2 across the street. These conditions present a far more comfortable situation for the pedestrian embarking on a five or ten minute walk from Maverick Square to the water transportation terminal at the end of Lewis Street. The Original Project had been specifically designed to minimize shadow impacts on public places, including walkways and open spaces along the waterfront.

Under the Revised Project, the highest building on the Site will be similar in massing (and shorter than the Original Project). Therefore, shadow impacts will be similar to the Original Project. See Appendix 4, Shadow Study.

2.3.3 DAYLIGHT

The objective of the day lighting analysis is to determine the relative amount of daylight that would be obstructed by a building or buildings, given the shape of those buildings and the reflectivity of the building materials. The percentage of the skyplane obstructed by existing and proposed structures was calculated using the Boston Redevelopment Authority Daylighting Analysis (BRADA) software application.

The amount of skyplane obstructed by the Original Project compared favorably with the skyplane obstruction of surrounding structures under the 2010 Build Conditions. The skydome obstruction for various study points varied from a low of 29.3 percent to a high of 61.4 percent.

It was determined in this study that while the development of the Clippership Wharf Site would obstruct some skydome, the resulting daylighting conditions will compare favorably with typical conditions in the surrounding neighborhood as well as daylighting conditions associated with the as of right development at the Site. It was determined in the DPIR that the Project would not constitute a significant impact to daylighting.

The Revised Project is expected to slightly reduce daylight obstruction due to slightly lower building heights, and will meet or exceed BRA expectations.

2.3.4 **SOLAR GLARE**

Because the Original Project was designed to use generally low-reflective materials, the DPIR did not anticipate adverse solar glare impacts onto its surroundings or the creation of solar heat buildup in adjacent buildings.

The Revised Project will also use low-reflective materials; it is not anticipated that reflective glass would be used. Therefore, the Project's solar glare is expected to be consistent with the Original Project as analyzed under the DPIR.

2.3.5 **AIR QUALITY**

Although more residential units are programmed for the Revised Project than in the Original Project, less bedroom units are proposed and less parking will be provided to encourage a greater modal share by alternative modes of transportation including walking, bicycling, car share, water transportation/taxi service and transit at the nearby MBTA station at Maverick Station.

The air quality study prepared for the Original Project demonstrated that the proposed Clippership Wharf Project complied with the 1990 Clean Air Act Amendments (CAAA) and the Massachusetts State Implementation Plan (SIP) requirements. The micro scale analysis, which included parking garage emissions, demonstrated that the 2001 Existing Condition, 2010 No-Build Condition, and 2010 Build Condition carbon monoxide (CO) concentrations were all below the National Ambient Air Quality Standards (NAAQS).

It was required by the Secretary of the Executive Office of Energy and Environmental Affairs that the Proponent would participate in the Department of Environmental Protection Clean Air Construction Initiative. The program involves retrofitting construction vehicles with emissions filters and utilizing low sulfur fuel to reduce emissions from diesel-powered equipment. The DPIR contained a draft Construction Management Plan (CMP) addressing truck routes and housekeeping measures to minimize adverse impacts from fugitive air emissions.

A Greenhouse Gas Analysis was prepared for the Revised Project and is included in Attachment F of this NPC. Compared to the previously approved project, the revised design has less building area and 40% fewer parking spaces. The Summary of Results and Mitigation Plan are detailed in Appendix 6.

2.3.6 **NOISE**

A noise monitoring program was conducted to measure existing noise conditions in the vicinity of the Project Site. Specifically, the monitoring program measured daytime, evening peak hour, and late night sound levels at four monitoring locations

within the study area to establish existing sounds levels. The noise analysis calculated future sound levels by adding building rooftop mechanical equipment and traffic noise. The noise analysis demonstrated that the Original Project would not create noise impacts at any receptor locations.

The Revised Project has a similar program of uses and will have similarly low noise effects relative to the existing condition.

2.3.7 GEOTECHNICAL AND FOUNDATION

It was determined in the DPIR that subsurface conditions on the Site are highly variable. From the surface down, the subsurface profile consists of miscellaneous fill, organic deposits, marine sand and clay deposits, glaciomarine deposits, glacial till, and bedrock. Construction of the parking garage would require excavation to approximately 25-30 feet below grade.

The Revised Project will not involve deep excavation for underground parking and no geotechnical impacts are anticipated as a result.

2.3.8 GROUNDWATER

As described in the DPIR, groundwater well readings obtained from borings at the Site indicate that groundwater levels in the area range from four to eight feet below existing ground level. Groundwater levels on the Site are subject to tidal influence. In addition, groundwater levels on the Site could also be influenced by local construction activity, leakage into and out of sewers, storm drains, and other below grade structures, as well as environmental factors such as precipitation, seasonal weather variation, and temperature.

It was concluded in the DPIR that the Original Project would not involve utilization of groundwater resources. The Site is not located atop a sole source aquifer or an aquifer that is recognized as an important present or future water supply.

The Revised Project construction will not involve deep excavation and is not anticipated to impact area groundwater levels. Groundwater levels at the Site are controlled by the proximity of Boston Harbor and the proposed construction is not anticipated to impact these levels.

2.3.9 FLOOD HAZARD DISTRICTS

According to the November 2, 1990 Flood Insurance Rate Map (FIRM) prepared by Federal Emergency Management Act (FEMA), there are several coastal floodplain zones within the Inner Boston Harbor in the vicinity of the Site. Zone A2, which is the calculated stillwater coastal 100-year floodplain, has an elevation of 10 feet

National Geodetic Vertical Datum (NGVD) or 15.65 Boston City Base (BCB). However, the Wetlands Protection Act (WPA) required the use of the storm of record, if available, to determine the limit of Land Subject to Coastal Storm Flowage, which is Elevation 10.4 feet NGVD (Elevation 16.05 feet BCB). Therefore, the elevation of 16.05 feet was used for the 100-year floodplain elevation in the analysis for the Original Project.

For the Original Project, work within the Flood Hazard District consisted of rock riprap placement, raising the seawall, site excavation, regrading, building construction, and Site landscaping. Development of the Clippership Wharf Site would raise the crest of the seawall to Elevation 16.5 feet BCB. The lowest habitable floor elevation of the buildings was going to be between Elevation 17.0 and 19.0 feet BCB. The grading would have elevated most of the Site out of the then existing Flood Hazard District. The lowest habitable floor elevation was planned to be approximately one foot above the 100-Year floodplain.

The Revised Project has been designed to account for climate change and to provide a high level of resiliency to potential climatic changes. In addition, the Revised Project accounts for the increase in the 100 year flood elevation from 15.65 in the 1990 FIRM to the 19.5 BCB in the preliminary FIRM released in November 2013.

The first floor of the buildings will be located at an elevation of approximately 24 feet above Boston City Base in order to account for current and future flood elevations and sea level rise. All important building infrastructure will be located above the 100-year flood level as represented on the FEMA Flood Insurance Rate Maps (FIRM) in order to prevent a loss of service in the event of a coastal storm. Garage levels will be flood-resilient to minimize the risk of property damage from coastal storms, and building systems will be designed to be resilient to loss of power and extreme heat conditions.

For these reasons, the risks to the Revised Project relative to flooding will be further reduced from what was described in the Original Project.

2.3.10 WETLAND RESOURCES

2.3.10.1 ORIGINAL PROJECT

In the Original Project, wetland resource areas at the Site included Land Under Ocean, Coastal Beach/Tidal Flat, Coastal Bank (Land Subject to Tidal Action), and Land Subject to Coastal Storm Flowage. The Original Project involved the removal of deteriorated wooden piles and wharf structures, rearmoring the existing seawall with riprap, construction of

buildings, roadways, landscaping, and installation of new steel piles. See Figure 1-7, DPIR Site Plan.

The proposed work activities within Land Under the Ocean would have enhanced the interests of the Wetlands Protection Act. Placement of rock riprap would offer additional habitat opportunities for feeding, resting, and escape cover. It was determined that the area in the vicinity of the Project Site was not considered significant for shellfish. Approximately 33,060 square feet of riprap was planned for the Original Project and would have improved storm damage prevention by strengthening the existing seawall and preventing erosion. The Land Under the Ocean around the Site would continue to offer some wildlife habitat, primarily feeding opportunities for waterfowl.

The proposed work within Coastal Bank for the Original Project consisted of the stabilization of approximately 1,600 linear feet of seawall with the placement of sloped rock riprap. Overall, the placement of riprap would have created approximately 27,640 square feet of new rocky intertidal bank around Clippership Wharf. The new rock riprap would have created an intertidal habitat around the Project Site, with additional areas for marine species commonly found in the inter tidal zone to attach. Strengthening the seawalls with riprap would have increased storm damage prevention and minimized erosion. Raising the Site would have prevented flooding at the Site, and since the Site is coastal, floodwaters would not be displaced to adjacent properties.

In the Original Project, proposed work within the Coastal Beach area would have consisted of the removal of the wharf and piles, placement of sloped riprap along the seawall, and cleanup of debris on the beach and tidal flat area. Riprap was planned to be placed as part of the seawall stabilization for the Site along the southeast and northeast sides of the beach. Approximately 2,410 square feet of Coastal Beach would have been impacted by the placement of riprap. No work was planned in the Tidal Flat area. However, the debris, tires, trash, brick, etc. that littered the ground surface would have been removed to enhance the tidal flat habitat. The Tidal Flat area provides some value for marine fisheries and would be enhanced by the clean up and removal of debris. The Project Site is not significant as land containing shellfish.

In the Original Project, work within Land Subject to Coastal Storm Flowage (LSCSF) would have consisted of rock riprap placement, raising of the seawall, Site excavation, re-grading, building construction, and

Site landscaping. Once the project was completed, LSCSF would have been limited to a portion of the riprap slope around the Site between Elevation 11.13 and 16.05 feet BCB. LSCSF would not have extended onto any portions of the Site that included habitable buildings, pedestrian walks, roads or landscaped area. There are no WPA performance standards for this resource area. It was determined that the Original Project would cause no significant impacts to wetland resources, therefore no mitigation was proposed.

2.3.10.2 **PROPOSED PROJECT**

Overall, the proposed project will enhance the wetland resources by improving the existing tidal flats to remain; adding a proposed "Living Shoreline" comprised of new tidal flats, salvaged granite stone coastal banks, and a new watersheet cove (Land Under Ocean); and eliminating sheeting from unstabilized surfaces that currently exist. In addition, the public will be encouraged to interact with the Living Shoreline and watersheet via locations along the harborwalk as well as a kayak launch ramp.

The most prominent change in the Site design is the creation of a 28,200 square foot coastal wetland area comprised of land under the ocean, coastal banks and tidal flats from existing solid fill at the end of the western wharf near the south side of Building 3. Wetlands will be created that allow users to interact with the water and the different intertidal wetland regimes ranging from the rocky shorelines to salt marsh areas to coastal bank plantings.

The existing granite seawalls will be stabilized with rip rap slopes throughout a majority of the Site except along the Living Shoreline at the end of the western pier in which minimal repair will be made to the existing walls. Existing timbers, piers, and wood piles will be removed, and the entire site (except for the Living Shoreline area at the end of the western pier) will be elevated out of the existing floodplain. The following describes the work occurring in each regulated resource area.

Land Under the Ocean

The work to be performed within this area includes removal of piles and deteriorated wharfs. Once timber structures are removed, riprap will be placed seaward of the seawalls around the perimeter to stabilize existing seawalls. This riprap will extend seaward and cover approximately 30,000 sf of Land Under the Ocean. In addition, the Living Shoreline will create approx 7,750 square feet of new Land Under the Ocean from

the excavation of existing fill. The Revised Project will have lesser impacts on Land Under the Ocean through the reduction of approximately 400 linear feet for rip rap.

Coastal Banks

The work to be performed within this area mainly includes the stabilization of approx 1,330 linear feet of seawall with the placement of sloped rip rap, while approx 330 linear feet of the existing seawall will remain exposed along the Living Shoreline portion of the western pier. On the eastern side of the western pier, approx 19,740 sf of coastal bank will be raised and located landward of the proposed seawall. In addition the "Living Shoreline" will consist of several salvaged granite sills/banks to create a variety of tidal flat terraces. The Revised Project will have approximately 330 linear feet less impact on coastal bank than the Original Project.

Coastal Beaches/Tidal Flats

The work to be performed within this area consists of cleaning the existing Coastal Beach and placement of riprap to stabilize the existing seawall. Approximately 2,410 sf of coastal beach will be impacted from the placement of riprap. In addition, approximately 9,000 sf of Tidal Flats will be created along the Living Shoreline and approximately 1,500 sf of Coastal Beach will be created at the northern end of the existing cove. The Revised Project will have approximately the same benefit from the removal of pilings and deck, the same impact from the placement of riprap and will provide new benefits from the creation of new tidal flats and coastal beach areas.

Land Subject to Coastal Storm Flowage

Work within this area will consist of placement of riprap, raising of seawall, regrading, and building/landscaping. Only the Living Shoreline (approx 28,200 square feet and a small area at the end of Building 3 (approximately 11,500 sf) will remain in the LSCSF based on existing flood levels. The Revised Project will have similar, but smaller impacts on LSCSF.

All performance standards will be met in accordance with state wetland regulations for the Revised Project. The Proponent will design the stormwater management system to comply with Coastal Zone Management (CZM) and the DEP Stormwater Management Policy. In

addition, the Proponent will implement erosion and sedimentation control measures during construction to minimize impacts to the harbor.

2.3.11 SOLID AND HAZARDOUS WASTE

As stated in the DPIR, recycling of solid waste and compliance with the City of Boston's recycling regulations would be integral components of the Revised Project. Information materials on recycling would be provided to all residential and ground-floor tenants. The Original Project was designed not only to accommodate recycling, but to make recycling convenient. Additionally, contractors involved in the construction of Clippership Wharf would recycle building materials and utilize recycled building materials, where feasible.

As reported in the PNF/ENF, a Release Notification Form (RNF), reporting the metals exceedances identified in the soil during the 1997 investigation and the historic exceedances in arsenic and selenium in groundwater at the Site was filed with the DEP on July 14, 1998. As a result, the DEP assigned a Release Tracking Number (RTN) 3-17034 to track the release.

Although no hazardous waste is expected to be generated during the construction of the Revised Project, there is potential that some of the soil displaced during the excavation could be categorized as a hazardous waste based on the results of a disposal characterization analysis. If such material is encountered, it will be characterized in advance of excavation, and capped onsite as required by DEP. Hazardous waste manifests, Bill of Landing, and other appropriate documentation would all be generated in accordance with applicable local, state and federal regulations.

The Revised Project includes all of these same procedures. Accordingly, the Revised Project is not expected to involve impacts from solid and hazardous waste different from those analyzed in the Original Project.

2.3.12 RODENT CONTROL

The DPIR reported that the Original Project would not have a significant impact on rodent populations. The rodent control program described in the DPIR will be followed for the Revised Project as well. No different impacts are expected.

2.3.13 CONSTRUCTION IMPACTS

Just as with the Original Project, details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes for the Revised Project will be addressed in detail in a Construction Management Plan (CMP). The Proponent will

file the CMP with the Boston Transportation Department (BTD) in accordance with the City's transportation maintenance plan requirements and prior to commencement of construction.

2.3.14 SUSTAINABLE DESIGN

The Scoping Determination in the DPIR listed several key sustainable design standards for the Original Project and incorporated by reference the sustainability guildelines promulgated by the City of Boston's Environment Department. The Proponent had taken these goals and guidelines into account in planning for the Original Project.

The Revised Project will achieve a much higher standard of sustainability and will target Leadership in Energy and Environmental Design ("LEED") Gold Certification (minimum) in accordance with the City of Boston's standards outlined under Article 37 Green Buildings. See Figures 2-7 and 2-8, LEED Checklist.

2.3.15 HISTORIC RESOURCES

According to the DPIR, the vacant Clippership Wharf Site does not contain any known structure, site, or building listed or potentially eligible for listing on the National Register of Historic Places or State Register of Historic Places. This Site is not within a National Register Historic District or within a historic district that has been identified as potentially eligible for the National Register. As is typical for a project of this size, an area of potential effect (APE) of one-half mile was established in the DEIR for the purposes of identifying historic resources and assessing potential project-related impacts. A review of the MHC Inventory revealed 35 historic properties within the APE.

According to the analysis prepared for the DPIR, the Original Project would not impact any of the 35 historic properties and districts identified within the area of potential effect.

Starting in the late 19th century, granite seawalls were constructed along the perimeter of the wharves on the Clippership Wharf Site. Similar granite seawalls are considered significant remains from the historic development of other sites; they were not identified as part of the 1989 BLC East Boston Survey.

The existing granite block seawall on the Site is over 100 years old and is significantly deteriorated in places. To reinforce the remaining seawalls and to stabilize them against future degradation and failure, the proponent of the Original Project planned to install a sloped stone riprap on the waterside face of the seawalls. The Proponent of the Revised Project plans to install riprap along the seawalls as well.

Similar riprap slopes have been used successfully to stabilize seawalls elsewhere along the Boston waterfront, including LoPresti Park and Liberty Plaza in East Boston, and are more in keeping with the historic character of the waterfront than other shoreline protection structures such as steel sheet pilings.

The Revised Project occupies a smaller building footprint and has similar massing to the Original Project. For this reason, no additional adverse impacts are anticipated to historic resources within the area of potential effect.

2.3.16 CLIMATE CHANGE ADAPTATION

As described in Section 2.3.9 and 2.3.14 above, the Revised Project will incorporate much higher standards for sustainable design and resiliency to climate change. Climate change adaptation is increasingly important as Boston prepares for rising sea levels and storms with greater frequency and intensity. Since the DPIR was filed in 2003 and the Planned Development Area approved in 2004, the City has begun requiring proposed projects to complete a Climate Change Resiliency and Preparedness Checklist. A checklist for the Revised Project is included with this NPC as Appendix 1, Climate Change Resiliency and Preparedness Checklist.

2.4 INFRASTRUCTURE

2.4.1 INTRODUCTION

The Infrastructure Systems section outlines the existing utilities surrounding the Project site, the connections required to provide service to the Project, and any impacts on the existing utility systems that may result from the construction of the Project. The following utility systems are discussed herein:

- Sewer;
- Domestic water;
- Fire protection;
- Drainage.

2.4.2 SANITARY SEWAGE

2.4.2.1 EXISTING SEWER INFRASTRUCTURE

The Boston Water and Sewer Commission (BWSC) has an existing sanitary sewer main adjacent to the Project Site. There is an existing BWSC 10-inch sanitary sewer main located in Monsignor Albert Jacobbe Road adjacent to the Project Site.

The 10-inch sanitary sewer main flows westerly to the 10-inch BWSC sanitary sewer main in Clipper Ship Lane. The 10-inch sanitary sewer main in Clipper Ship Lane flows northerly to the 24-inch by 30-inch BWSC sanitary sewer main in Sumner Street. The 24-inch by 30-inch BWSC sanitary sewer main in Sumner Street continues to the East Boston Branch Sewer which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal. The existing sewer system is illustrated in Figure 2-9.

2.4.2.2 WASTEWATER GENERATION

The Project's sewage generation rates were estimated using 314 CMR 07.00 and the proposed building program. 314 CMR 07.00 lists typical sewage generation values for the proposed building use, as shown in Table 2-1. Typical generation values are conservative values for estimating the sewage flows from new construction. 314 CMR 07.00 sewage generation values are used to evaluate new sewage flows or an increase in flows to existing connections. Table 2-1 describes the increased sewage generation in gallons per day (gpd) due to the Project.

Table 2-1: Proposed Building Water and Sewer Use

Room Use	GSF	Size		314 CMR Value (gpd/unit)		Total Flow (gpd)
Residential	684	525,000	sf	110	/bedroom	75,240
Retail	23,0000	23,000	sf	50	/1000 sf	1,150
Total Proposed Sewer Flows (gpd):						**76,390**

2.4.2.3 SEWAGE CAPACITY & IMPACTS

The Project's impact on the existing BWSC systems in Monsignor Albert Jacobbe Road was analyzed. The existing sewer system capacity calculations are presented in Table 2-2.

Table 2-2: Sewer Hydraulic Capacity Analysis

Manhole (BWSC Number)	Distance (feet)	Invert Elevation (up)	Invert Elevation (down)	Slope (%)	Diameter (inches)	Manning's Number	Flow Cap. (cfs)	Flow Cap. (MGD)
Jacobbe Road								
64 to 60	260	12.06	10.54	0.6%	10	0.013	1.68	1.08

Note: 1. Manhole numbers taken from BWSC Sewer system GIS Map received on 11/20/14.
2. Flow Calculations based on Manning Equation

2.4.2.4 PROPOSED CONDITIONS

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Project is expected to generate an increase in wastewater flows of approximately 76,390 gallons per day. Approval for the increase in sanitary flow will come from BWSC.

Sewer services for the existing buildings will be evaluated for capacity and condition, and will be replaced as necessary. New sewer services resulting from the Project will connect to the existing sanitary sewer main in Monsignor Albert Jacobbe Road.

Improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's site plan review process for the Project. This process will include a comprehensive design review of the proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts.

2.4.2.5 PROPOSED IMPACTS

The adjacent roadway sewer systems in Monsignor Albert Jacobbe Road, and potential building service connections to the sewer system were analyzed.

Table 2-2, Sewer Hydraulic Capacity Analysis, indicates the hydraulic capacity of the existing 10-inch sanitary sewer in Monsignor Albert Jacobbe Road. The minimum hydraulic capacity is 1.08 million gallons per day (MGD) or 1.68 cubic feet per second (cfs). Based on an average daily flow estimate for the Project of 76,390 GPD or 0.076 MGD; and with a factor of safety of 10 (total estimate = 0.076 MGD x 10 = 0.76 MGD), no capacity problems are expected in Monsignor Albert Jacobbe Road.

2.4.3 EXISTING WATER INFRASTRUCTURE

Water for the Project Site will be provided by the BWSC. There are five water systems within the City, and these provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high. There are existing BWSC water mains located in, Monsignor Albert Jacobbe Road and Lewis Street.

There is an 8-inch private Northern Low Main in the private water main within the Project Site. There is a 12-inch BWSC Northern Low Main in Monsignor Albert Jacobbe Road. There is also a 12-inch BWSC Northern Low Main in Lewis Street. The existing water system is illustrated in Figure 2-10, Existing Water System.

2.4.3.1 WATER CONSUMPTION

The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described in the previous section. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 07.00 values to account for consumption, system losses and other usages to estimate an average daily water demand. The Project's estimated domestic water demand is 84,029 gpd. The water for the Project will be supplied by the BWSC systems Monsignor Albert Jacobbe Road, Lewis Street, and/or the private way within the Project Site.

Efforts to reduce water consumption will be made. Aeration fixtures and appliances will be chosen for water conservation qualities. In public areas, sensor operated faucets and toilets will be installed.

New water services will be installed in accordance with the latest local, state, and federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC's Automatic Meter Reading (AMR) system.

2.4.3.2 WATER CAPACITY & IMPACTS

BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the Project site was requested by the Proponent. Hydrant flow data was available for three hydrants near the Project Site. The existing hydrant flow data is shown in Table 2-3. As the design progresses, the Proponent will request hydrant flows be conducted by BWSC adjacent to the Project.

Table 2-3: Existing Hydrant Flow Data

Hydrant	Date of Test	Static Pressure (psi)	Residual Pressure (psi)	Total Flow (gpm)	Flow (gpm) at 20 psi	Flow (gpm) at 10 psi
H30 Jacobbe Rd.	12/18/2014	68	62	2,126	6,525	7,238
H26 Lewis St.	12/18/2014	70	64	2,004	6,297	6,949
H26 Clipper Ship Lane	12/18/2014	68	62	2,004	6,160	6,823

Note: 1. Data provided by BWSC, December 26, 2014

2.4.3.3 PROPOSED CONDITIONS

The domestic and fire protection water services for the Project will connect to the existing BWSC water mains in Monsignor Albert Jacobbe Road and/or Lewis Street. The Revised Project's impacts to the existing water system will be reviewed as part of the BWSC's site plan review process.

The domestic and fire protection water service connections required for the Revised Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connection will be reviewed as part of BWSC's Site Plan Review Process. This review will include sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.

2.4.3.4 PROPOSED IMPACTS

Water capacity problems are not anticipated within this system as a result of the Revised Project's construction.

2.4.4 STORMWATER

2.4.4.1 EXISTING STORMWATER INFRASTRUCTURE

There are existing BWSC storm drain mains in Lewis Street. Existing stormwater is collected by catch basins and is directed to the 15-inch BWSC storm drain main in Lewis Street, which is directed to a stormwater outfall (SDO084) which discharges to the Boston Inner Harbor. Additional stormwater runoff sheets flows offsite directly to the Boston Inner Harbor. The existing BWSC storm drain system is illustrated in Figure 2-9, Existing Sewer and Storm Drain System.

The existing Site is comprised of paved areas, grass, and wooden piers, and is approximately 58-percent (58%) impervious cover.

2.4.4.2 PROPOSED CONDITIONS

The amount of impervious area at the Site will increase to approximately 67 percent (67%) compared to the existing condition. The Revised Project will reduce the existing peak rates of stormwater discharge and volumes of stormwater runoff from the Site and promote runoff recharge to the greatest extent possible.

The Revised Project will strive to infiltrate one-inch of stormwater runoff from impervious areas into the ground to the greatest extent possible. Different approaches to stormwater recharge will be assessed. It is anticipated that the stormwater recharge systems will work to passively infiltrate runoff into the ground with a gravity recharge system. The underground recharge system, and any required Site closed drainage systems, will be designed so that there will be no increase in the peak rate of stormwater discharge from the Project Site in the developed condition compared to the existing condition.

Improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's site plan review process. The process will include a comprehensive design review of the proposed service connections, and assessment of demands and system capacity.

If it is determined that groundwater recharge is not feasible, the Proponent will treat the stormwater runoff to adequately capture TSS and phosphorus prior to

discharging to the BWSC system.

2.4.4.3 WATER QUALITY IMPACTS

The Revised Project will not affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of Site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales and/or crushed stone, to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Revised Project will be in compliance with local and state stormwater management policies, as described below.

2.4.4.4 DEP STORMWATER MANAGEMENT POLICY STANDARDS

In March 1997, MassDEP adopted a new Stormwater Management Policy to address non-point source pollution. In 1997, DEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy, which was revised in February 2008. The policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The policy is administered locally pursuant to MGL Ch. 131, s. 40.

A brief explanation of each Policy Standard and the system compliance is provided below:

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

Compliance: The Revised Project design will comply with this Standard. The Project Site is located near the Boston Inner Harbor, and the design will incorporate the appropriate stormwater treatment and no new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

Standard #2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR.

Compliance: The Revised Project design will comply with this Standard. The existing discharge rate will be met or decreased as a result of the improvements associated with the Revised Project.

Standard #3: Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmental sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance: The Revised Project will comply with this standard to the maximum extent practicable.

Standard #4: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;

b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Compliance: The Revised Project design will comply with this standard. Within the Project's limit of work, there will be mostly building roof, paved sidewalk, roadway areas, harbor walk, and grass. Runoff from paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded

catch basins and conveyed through water quality units before discharging into the BWSC system.

Standard #5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Compliance: The Revised Project design will comply with this standard. The Revised Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-6).

Standard #6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Compliance: The Revised Project design will comply with this Standard. The Revised Project will not discharge untreated stormwater to a sensitive area or any other area.

Standard #7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Compliance: The Revised Project design will comply with this Standard. The Project complies with the Stormwater Management Standards as applicable to the redevelopment.

Standard #8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

Compliance: The Revised Project will comply with this standard. Sedimentation and erosion controls will be incorporated as part of the design of these projects and employed during construction.

Standard 9*: A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

Compliance: The Revised Project will comply with this standard. An O&M Plan including long-term BMP operation requirements will be prepared for the Revised Project and will assure proper maintenance and functioning of the stormwater management system.

Standard 10*: All illicit discharges to the stormwater management system are prohibited.*

Compliance: The Revised Project will comply with this standard. There will be no illicit connections associated with the Proposed Project.

2.4.5 ENERGY AND TELECOMMUNICATIONS

2.4.5.1 ENERGY USE AND IMPACTS

Eversource owns the electrical system in the vicinity of the Project Site. It is expected that adequate service is available in the existing electrical systems in the surrounding streets to serve the Revised Project. The Proponent will work with Eversource to confirm adequate system capacity as the design is finalized.

2.4.5.2 TELECOMMUNICATIONS SYSTEMS

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

2.4.5.3 GAS SYSTEMS

National Grid has gas services adjacent to the Project site. The Proponent will work with National Grid to confirm adequate system capacity as the design is finalized.

CHAPTER 3

COMPLIANCE WITH SECTION 80A-6 OF BOSTON ZONING CODE

CHAPTER 3: COMPLIANCE WITH SECTION 80A-6 OF THE BOSTON ZONING CODE

3.1 INCREASE IN PROJECT SIZE OR INTENSITY OF USE/EXPANSION OF PROJECT

The Revised Project will result in smaller buildings. Relative to the Original Project studied in the DPIR, the gross floor area will drop from 620,920 square feet to 555,000 square feet. While the number of residential units will increase from up to 400 units to up to 492, the size and configuration of the residential units will be such that the massing of the Project will actually be reduced. In addition, the bedroom count for the Revised Project has decreased from 717 in the Original Project to 684 in the current design. Building heights will be reduced from approximately 86 feet above grade to less than 70 feet above grade.

3.2 GENERATION OF ADDITIONAL OR GREATER IMPACTS

The Revised Project will not generate additional impacts relative to wind, shadow, the public realm, the urban design character of the area, or any of the other areas as described in Chapter 2 of the NPC. Furthermore, the Revised Project is anticipated to have reduced water consumption and sewage generation, and existing municipal services should have more than enough capacity to service the project.

3.3 INCREASE IN TRAFFIC IMPACTS OR THE NUMBER OF PARKING SPACES

The number of parking spaces will be significantly reduced from the DPIR from a total of 704 to 321 spaces (including garage and surface). As described in Section 2.2, above, the Revised Project will result in a higher number of calculated trips per day, however, the Proponent will work with the City of Boston to create a project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages bicycle and transit use.

3.4 CHANGE IN EXPECTED COMMENCEMENT OF COMPLETION DATE

The Original Project has been on hold since 2003 due to adverse economic conditions and a change in the development team. Lend Lease Development, Inc, in partnership with Noddle Island Limited Partnership will be able to obtain financing and take advantage of currently favorable construction pricing. The schedule for the Revised Project calls for construction to begin in the fall of 2015 and be completed by the fall of 2017.

3.5 CHANGE IN PROJECT SITE

The location of the Site has not changed. The total area of the Site has not changed either.

3.6 NEED FOR ADDITIONAL ZONING RELIEF/NEW PERMIT OR REQUEST FOR FINANCIAL ASSISTANCE OR LAND TRANSFER

Zoning relief was obtained for the Original Project through a Planned Development Area (PDA) Development Plan that the Boston Zoning Commission approved on January 21, 2004 and became effective on January 26, 2004. To undertake the Revised Project, the Proponent has submitted an amended and restated PDA Development Plan, concurrently with the NPC.

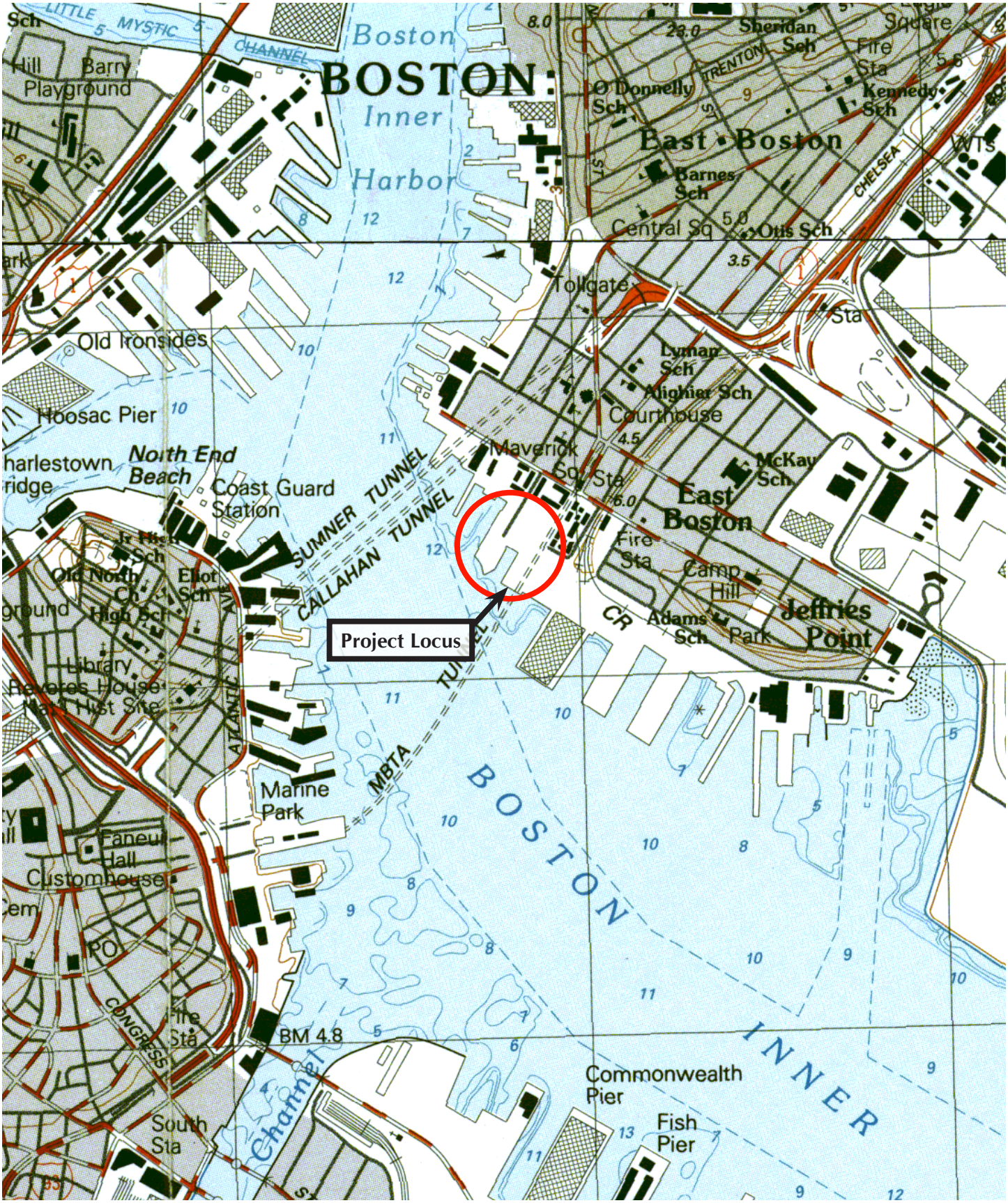
3.7 CHANGES IN SURROUNDING AREA/AMBIENT ENVIRONMENT

There have been some changes to the surrounding area since the City approved the Original Project in 2003. The first phase (Building 7) of the Portside at East Pier project, located east of the Site was constructed and opened in November of 2014. The Heritage and Clippership apartments located to the north of the Site have not changed. The Hodge Boiler Works buildings were demolished in 2006, and the Carlton Wharf residential project opened in 2005. Phase 1 of the Piers Park development (located east of the Site) was completed in 2004.

3.8 CONCLUSION

Based on the preceding analysis, the Proponent respectfully request a determination that no further review is required pursuant to Article 80, Section 80A-6.2 of the Code. The Proponent will continue to work with the BRA staff to refine the Revised Project as needed.

FIGURES



East Boston, Massachusetts

Figure 1-1
Locus Map
Source: USGS, 2015

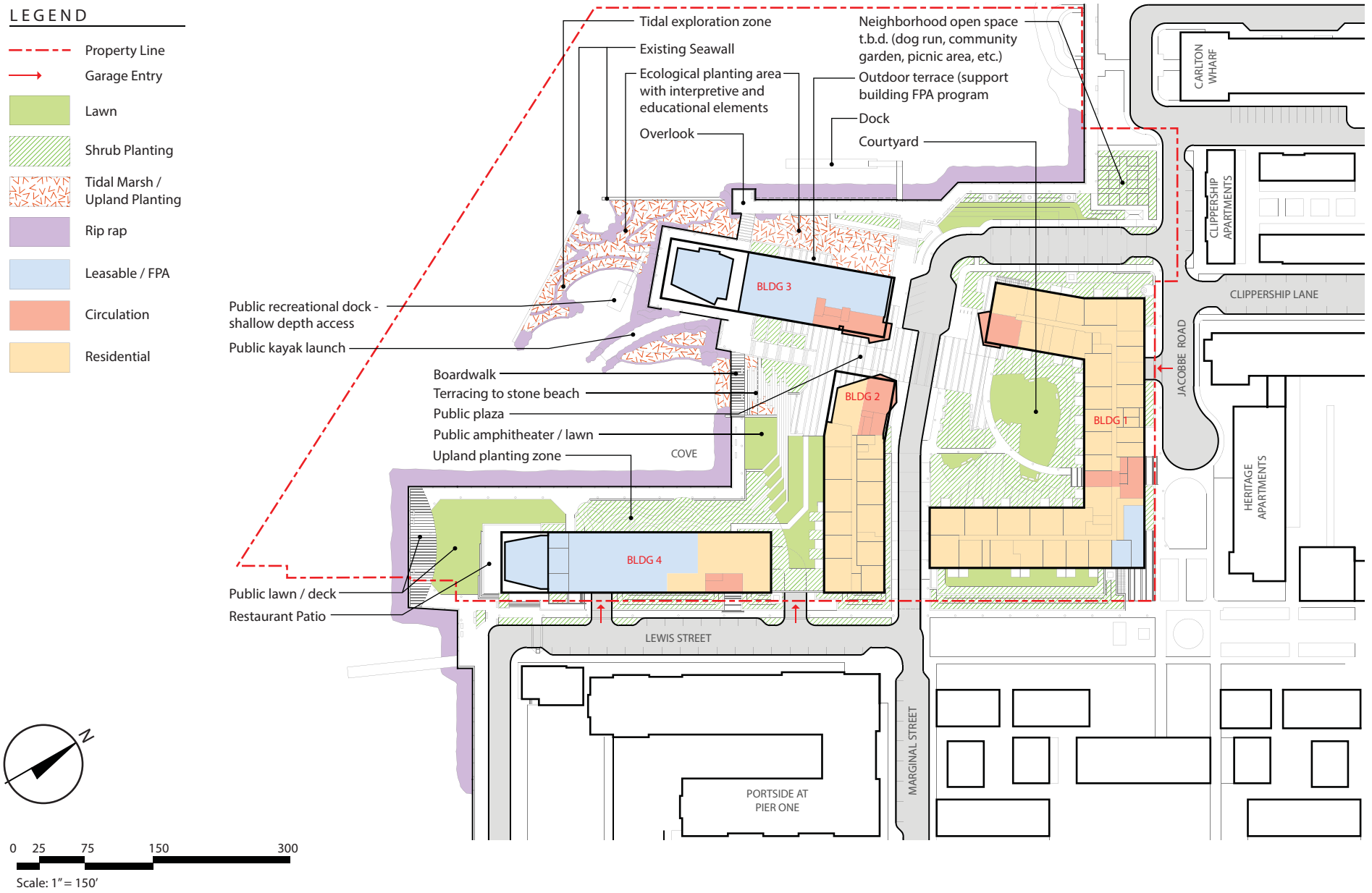


Figure 1-2
Project Site Plan
Source: Halvorson Design Partnership, Inc., 2015

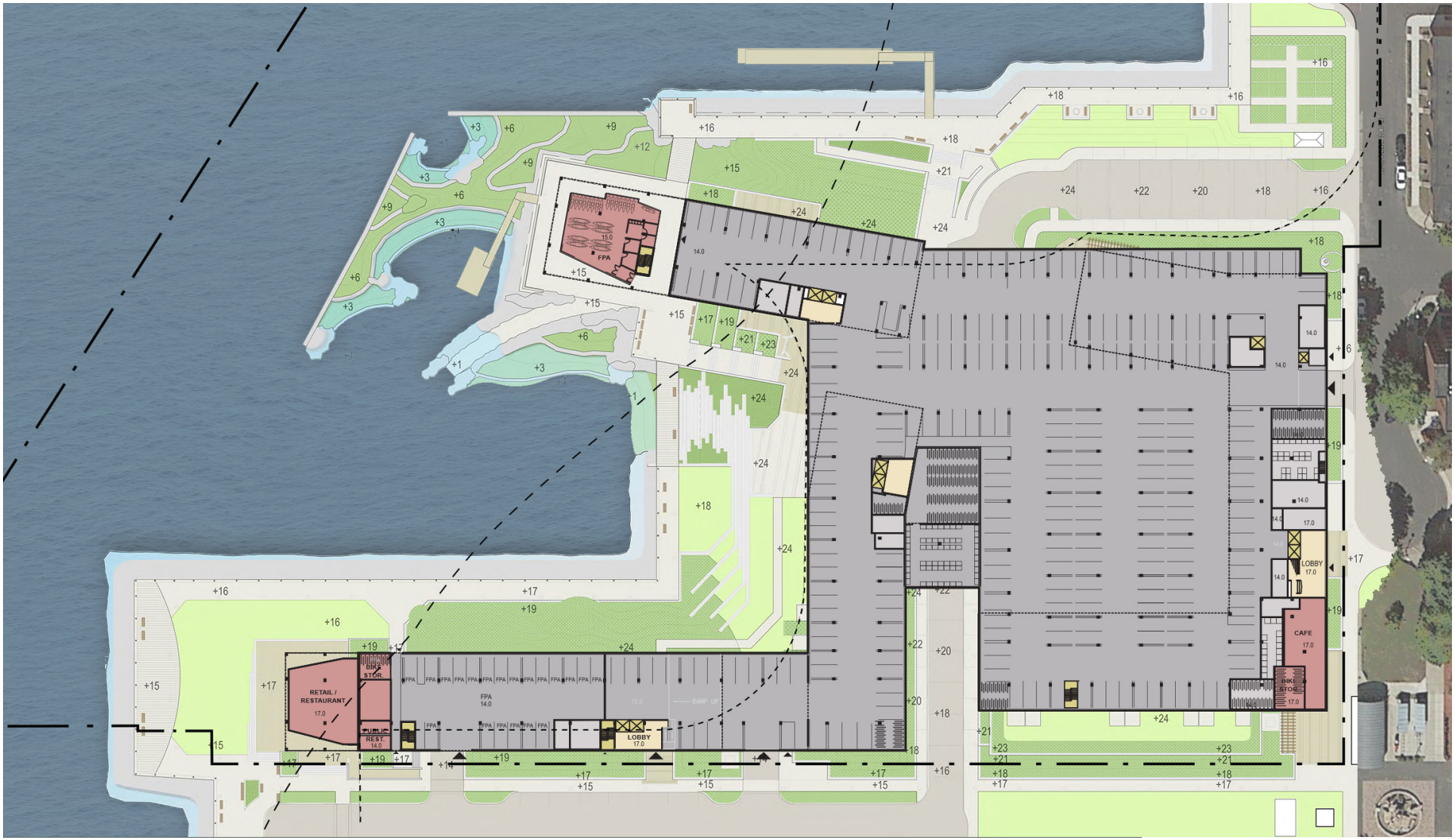


Figure 1-3
Garage/Basement Floor Plan
Source: The Architectural Team Inc., 2015

Figure 1-4
First Floor Plan
Source: The Architectural Team Inc., 2015

Figure 1-5
Typical Floor Plan
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 1-6
Roof Plan
Source: The Architectural Team Inc., 2015

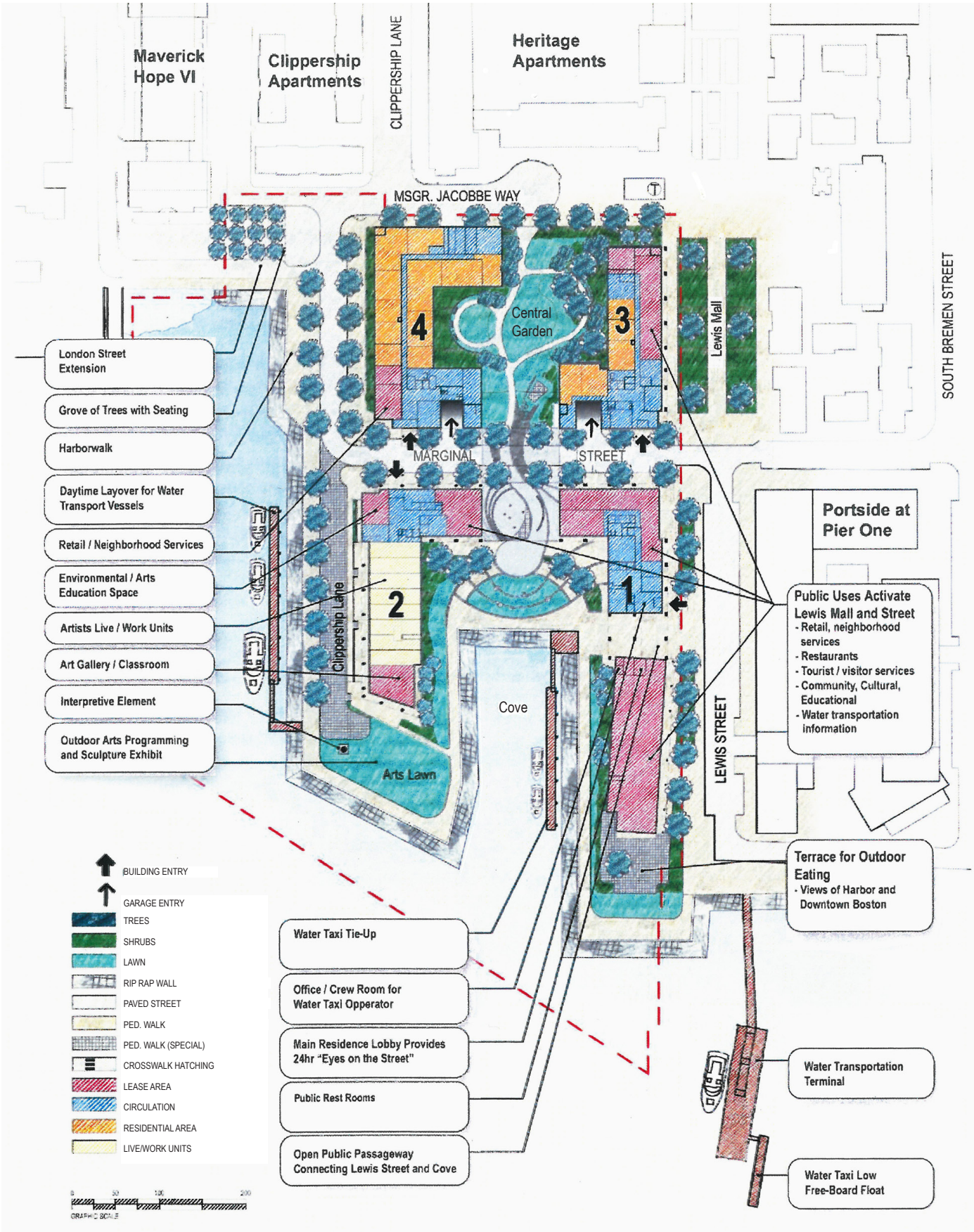


Figure 1-7
DPIR Site Plan
Source: Clippership Wharf DPIR, 2003

East Boston, Massachusetts

Figure 2-1
Perspective Looking North
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 2-2
Elevated Perspective Looking North
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 2-3
Perspective Looking South
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 2-4
Elevated Perspective Looking South
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 2-5
Perspective Looking West
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 2-6
Elevated Perspective Looking West
Source: The Architectural Team Inc., 2015

LEED for Homes Mid-rise Simplified Project Checklist

for Homes

Builder Name:	***Lend Lease Construction***
Project Team Leader (if different):	***Lend Lease***
Home Address (Street/City/State):	

Project Description:

Building type: ***Mid-rise multi-family*** # of stories: ***6***

# of units: ***492*** Avg. Home Size Adjustment: ***-8***

Adjusted Certification Thresholds

Certified: ***37.0*** Gold: ***67.0***

Silver: ***52.0*** Platinum: ***82.0***

Project Point Total

Prelim: *35.5 + 72 maybe pts* Final: *0*

Certification Level

Prelim: *Not Certified* Final: *Not Certified*

Final Credit Category Total Points

ID: 0 *SS: 0* *EA: 0* *EQ: 0*

LL: 0 *WE: 0* *MR: 0* *AE: 0*

Min. Point Thresholds Not Met for Prelim. OR Final Rating

date last updated :
last updated by :

					Max Pts	Project Points Preliminary Y/Pts	Maybe	No	Final Y/Pts
Innovation and Design Process (ID)			(No Minimum Points Required)		Max				
1. Integrated Project Planning		1.1	Preliminary Rating		Prereq	*Y*			***Y***
		1.2	Energy Expertise for MID-RISE		Prereq	*Y*			***Y***
		1.3	Professional Credentialed with Respect to LEED for Homes		1	*1*	*0*		***0***
		1.4	Design Charrette		1	*1*	*0*		***0***
		1.5	Building Orientation for Solar Design		1	*0*	*1*		***0***
		1.6	Trades Training for MID-RISE		1	*0*	*1*		***0***
2. Durability Management Process		2.1	Durability Planning		Prereq	*Y*			
		2.2	Durability Management		Prereq	*Y*			
		2.3	Third-Party Durability Management Verification		3	*3*	*0*		***0***
3.Innovative or Regional Design	✎	3.1	Innovation #1 _____		1	*0*	*1*		***0***
	✎	3.2	Innovation #2 _____		1	*0*	*1*		***0***
	✎	3.3	Innovation #3 _____		1	*0*	*1*		***0***
	✎	3.4	Innovation #4		1	*0*	*1*		***0***
				Sub-Total for ID Category:	***11***	*5*	*6*		***0***
Location and Linkages (LL)			(No Minimum Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. LEED ND		1	LEED for Neighborhood Development	**LL2-6**	10	*0*	*0*	*N*	***0***
2. Site Selection	✎	2	Site Selection		2	*2*	*0*		***0***
3. Preferred Locations		3.1	Edge Development		1	*0*	*0*		***0***
		3.2	Infill	**LL 3.1**	2	*2*	*0*		***0***
		3.3	Brownfield Redevelopment for MID-RISE		1	*1*	*0*		***0***
4. Infrastructure		4	Existing Infrastructure		1	*1*	*0*		***0***
5. Community Resources/ Transit		5.1	Basic Community Resources for MID-RISE		1	*0*	*0*		***0***
		5.2	Extensive Community Resources for MID-RISE	**LL 5.1, 5.3**	2	*0*	*0*		***0***
		5.3	Outstanding Community Resources for MID-RISE	**LL 5.1, 5.2**	3	*3*	*0*		***0***
6. Access to Open Space		6	Access to Open Space		1	*1*	*0*		***0***
				Sub-Total for LL Category:	***10***	*10*	*0*		***0***
Sustainable Sites (SS)			(Minimum of 5 SS Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. Site Stewardship		1.1	Erosion Controls During Construction		Prerequisite	*Y*			
		1.2	Minimize Disturbed Area of Site for MID-RISE		1	*1*	*0*		***0***
2. Landscaping	✎	2.1	No Invasive Plants		Prerequisite	*Y*			
	✎	2.2	Basic Landscape Design	**SS 2.5**	1	*1*	*0*		***0***
	✎	2.3	Limit Conventional Turf for MID-RISE	**SS 2.5**	2	*1*	*0*		***0***
	✎	2.4	Drought Tolerant Plants for MID-RISE	**SS 2.5**	1	*0*	*0*		***0***
	✎	2.5	Reduce Overall Irrigation Demand by at Least 20% for MID-RISE		3	*0*	*2*		***0***
3. Local Heat Island Effects	✎	3.1	Reduce Site Heat Island Effects for MID-RISE		1	*0*	*1*		***0***
	✎	3.2	Reduce Roof Heat Island Effects for MID-RISE		1	*0*	*1*		***0***
4. Surface Water Management	✎	4.1	Permeable Lot for MID-RISE		2	*0*	*1*		***0***
		4.2	Permanent Erosion Controls		1	*0*	*1*		***0***
	✎	4.3	Stormwater Quality Control for MID-RISE		2	*0*	*2*		***0***
5. Nontoxic Pest Control		5	Pest Control Alternatives		2	*0*	*2*		***0***
6. Compact Development		6.1	Moderate Density for MID-RISE		2	*0*	*0*		***0***
		6.2	High Density for MID-RISE	**SS 6.1, 6.3**	3	*0*	*0*		***0***
		6.3	Very High Density for MID-RISE	**SS 6.1, 6.2**	4	*0*	*4*		***0***
7. Alternative Transportation		7.1	Public Transit for MID-RISE		2	*2*	*0*		***0***
		7.2	Bicycle Storage for MID-RISE		1	*0*	*1*		***0***
		7.3	Parking Capacity/Low-Emitting Vehicles for MID-RISE		1	*0*	*1*		***0***
				Sub-Total for SS Category:	***22***	*5*	*16*		***0***

Figure 2-7
LEED Checklist
Source: The Architectural Team Inc., 2015

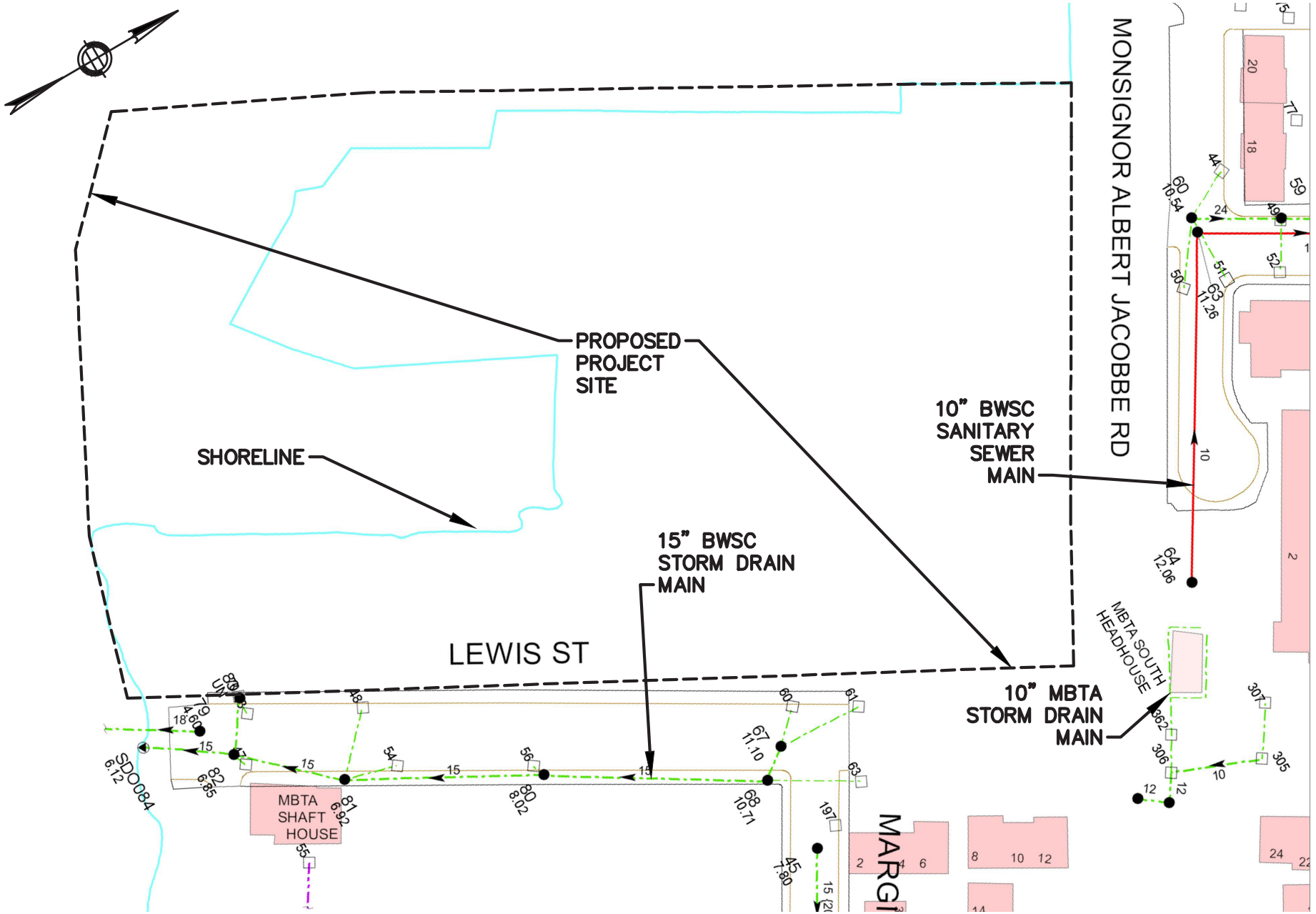
LEED for Homes Mid-rise Pilot Simplified Project Checklist (continued)

					Max Pts	Project Points Preliminary			Final
Water Efficiency (WE)			(Minimum of 3 WE Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. Water Reuse		1	Water Reuse for MID-RISE		5	0	2		0
2. Irrigation System		2.1	High Efficiency Irrigation System for MID-RISE	**WE 2.2**	2	0	2		0
		2.2	Reduce Overall Irrigation Demand by at Least 45% for MID-RISE		2	0	0		0
3. Indoor Water Use		3.1	High-Efficiency Fixtures and Fittings		3	0	3		0
		3.2	Very High Efficiency Fixtures and Fittings		6	0	2		0
		3.3	Water Efficient Appliances for MID-RISE		2	0	2		0
				Sub-Total for WE Category:	**15**	0	11		0
Energy and Atmosphere (EA)			(Minimum of 0 EA Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. Optimize Energy Performance		1.1	Minimum Energy Performance for MID-RISE		Prereq	Y			
		1.2	Testing and Verification for MID-RISE		Prereq	Y			
		1.3	Optimize Energy Performance for MID-RISE		34	7	5		0
7. Water Heating		7.1	Efficient Hot Water Distribution		2	0	2		0
		7.2	Pipe Insulation		1	0	1		0
11. Residential Refrigerant Management		11.1	Refrigerant Charge Test		Prereq	Y			
		11.2	Appropriate HVAC Refrigerants		1	1	0		0
				Sub-Total for EA Category:	**38**	8	8		0
Materials and Resources (MR)			(Minimum of 2 MR Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
1. Material-Efficient Framing		1.1	Framing Order Waste Factor Limit		Prereq	Y			
		1.2	Detailed Framing Documents	**MR 1.5**	1	0	1		0
		1.3	Detailed Cut List and Lumber Order	**MR 1.5**	1	0	1		0
		1.4	Framing Efficiencies	**MR 1.5**	3	0	3		0
		1.5	Off-site Fabrication		4	0	0		0
2. Environmentally Preferable Products		2.1	FSC Certified Tropical Wood		Prereq	Y			
		2.2	Environmentally Preferable Products		8	0	8		0
3. Waste Management		3.1	Construction Waste Management Planning		Prereq	Y			
		3.2	Construction Waste Reduction		3	0	3		0
				Sub-Total for MR Category:	**16**	0	16		0
Indoor Environmental Quality (EQ)			(Minimum of 6 EQ Points Required)	*OR*	Max	Y/Pts	Maybe	No	Y/Pts
2. Combustion Venting		2	Basic Combustion Venting Measures		Prereq	Y			
3. Moisture Control		3	Moisture Load Control		1	0	1		0
4. Outdoor Air Ventilation		4.1	Basic Outdoor Air Ventilation for MID-RISE		Prereq	Y			
		4.2	Enhanced Outdoor Air Ventilation for MID-RISE		2	0	2		0
		4.3	Third-Party Performance Testing for MID-RISE		1	1	0		0
5. Local Exhaust		5.1	Basic Local Exhaust		Prerequisite	Y			
		5.2	Enhanced Local Exhaust		1	0	1		0
		5.3	Third-Party Performance Testing		1	1	0		0
6. Distribution of Space Heating and Cooling		6.1	Room-by-Room Load Calculations		Prereq	Y			
		6.2	Return Air Flow / Room by Room Controls		1	0	1		0
		6.3	Third-Party Performance Test / Multiple Zones		2	2	0		0
7. Air Filtering		7.1	Good Filters		Prereq	Y			
		7.2	Better Filters	**EQ 7.3**	1	0	0		0
		7.3	Best Filters		2	0	2		0
8. Contaminant Control		8.1	Indoor Contaminant Control during Construction		1	0	1		0
		8.2	Indoor Contaminant Control for MID-RISE		2	0	2		0
		8.3	Preoccupancy Flush		1	0	1		0
9. Radon Protection		9.1	Radon-Resistant Construction in High-Risk Areas		Prereq	Y			
		9.2	Radon-Resistant Construction in Moderate-Risk Areas		1	0	1		0
10. Garage Pollutant Protection		10.1	No HVAC in Garage for MID-RISE		Prereq	Y			
		10.2	Minimize Pollutants from Garage for MID-RISE	**EQ 10.3**	2	0	2		0
		10.3	Detached Garage or No Garage for MID-RISE		3	0	0		0
11. ETS Control		11	Environnmental Tobacco Smoke Reduction for MID-RISE		1	0.5	0		0
12. Compartmentalization of Units		12.1	Compartmentalization of Units		Prereq	Y			
		12.2	Enhanced Compartmentalization of Units		1	0	1		0
				Sub-Total for EQ Category:	**21**	4.5	15		0
Awareness and Education (AE)			(Minimum of 0 AE Points Required)		Max	Y/Pts	Maybe	No	Y/Pts
1. Education of the Homeowner or Tenant		1.1	Basic Operations Training		Prereq	Y			
		1.2	Enhanced Training		1	1	0		0
		1.3	Public Awareness		1	1	0		0
2. Education of Building Manager		2	Education of Building Manager		1	1	0		0
				Sub-Total for AE Category:	**3**	3	0		0

Figure 2-8

LEED Checklist Continued

Source: The Architectural Team Inc., 2015



East Boston, Massachusetts

Figure 2-9

Existing Sewer and Storm Drain System

Source: Nitsch Engineering, 2015

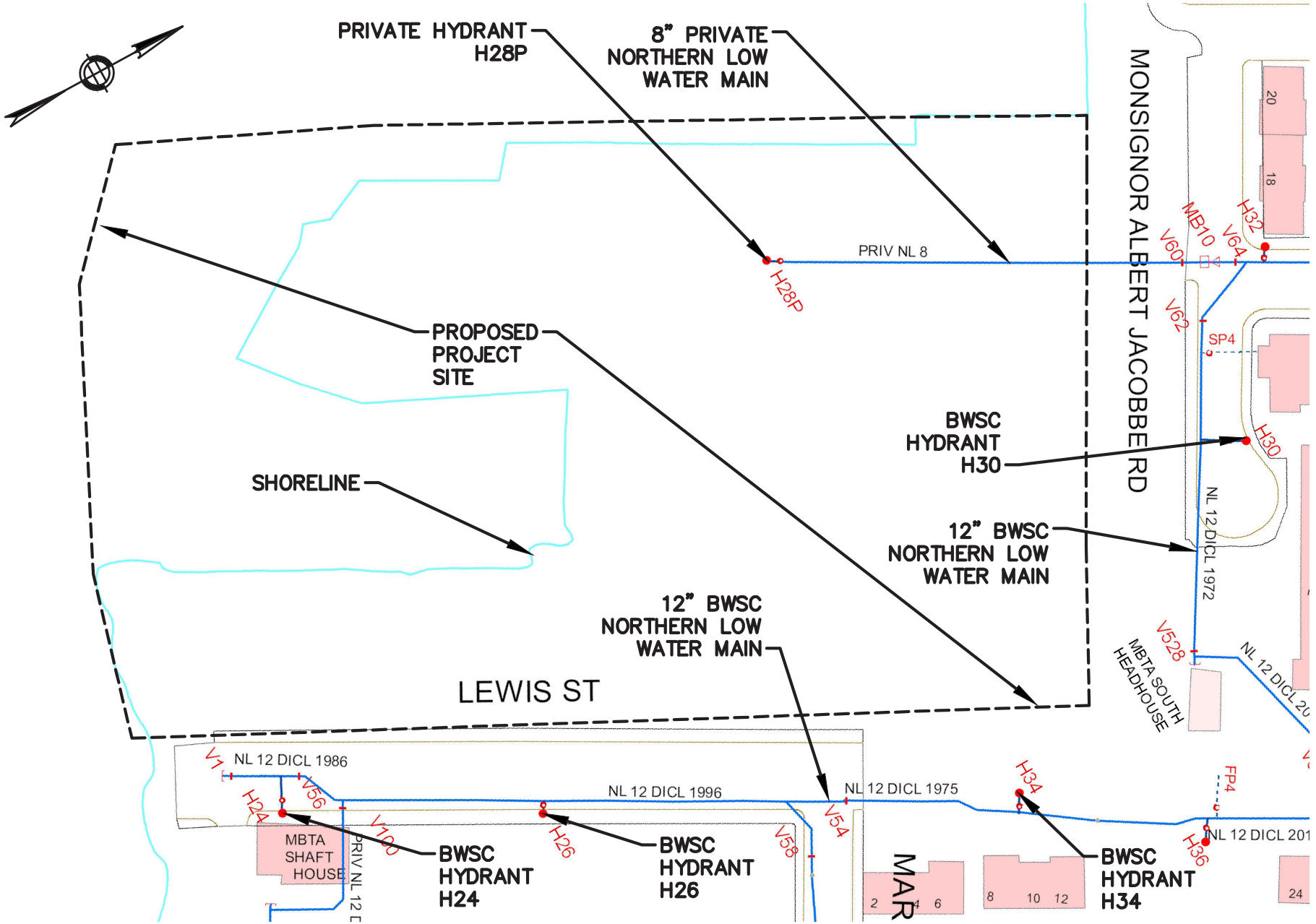


Figure 2-10
Existing Water System
Source: Nitsch Engineering, 2015

APPENDIX 1

CLIMATE CHANGE PREPAREDNESS AND RESILIENCY CHECKLIST

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	**Clippership Wharf**
Project Address Primary:	**25 & 65 Lewis Street**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Christine McVay/ Senior Associate/ Fort Point Associates, Inc./ cmcvay@fpa-inc.com/ 617-357-7044 x200**

A.2 - Team Description

Owner / Developer:	**Owner: Noddle Island Limited Partnership Developer: Lend Lease Development,Inc.**
Architect:	**The Architectural Team, Inc.**
Engineer (building systems):	**WSP**
Sustainability / LEED:	**Lend Lease/The Architectural Team, Inc**
Permitting:	**Fort Point Associates, Inc.**
Construction Management:	**Lend Lease Construction**
Climate Change Expert:	**Fort Point Associates, Inc.**

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	**Residential, Garage, Retail**
List the First Floor Uses:	**Residential , Amenity, FPA**

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

Wood Frame	Masonry	Steel Frame	**Concrete**

Describe the building?

Site Area:	***295, 518 SF***	Building Area:	***659,793 SF***
Building Height:	***69.5 Ft.***	Number of Stories:	***6 Flrs.***
First Floor Elevation (reference Boston City Base):	***24.33' Elev.***	Are there below grade spaces/levels, if yes how many:	***1 No / Number of Levels***

A.5 - Green Building

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

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

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

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

A.6 - Building Energy

An energy model shall be performed to demonstrate that the Project meets or exceeds the Stretch Code. Energy model will be provided prior to Building Permit submission.

What are the base and peak operating energy loads for the building? **See above.**

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
What is the planned building Energy Use Intensity:	*(kbut/SF or kWh/SF)*	Cooling:	*(Tons/hr)*

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

Electric:	***300*** *(kW)*	Heating:	***None*** *(MMBtu/hr)*
		Cooling:	***None*** *(Tons/hr)*

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

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

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

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

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

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

What time span of future Climate Conditions was considered?

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

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

7/88 */*	*Deg.*

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

0 Deg.	*0 Days*	*0 Events / yr.*

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

0 Days	*0 Events / yr.*

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

48 *Inches / yr.*	***7.2*** *Inches*	***2*** *Events / yr.*

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

105 *Peak Wind*	**3** *Secs*	**50 year storm**

B.2 - Mitigation Strategies

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

Building energy use below code:	***20*** *%*
How is performance determined:	**Energy modeling to ASHRAE 90.1 2007**

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

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

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

Roof:	*R = **30***	Walls / Curtain Wall Assembly:	*R = **20.35 cav +6.0 ci***
Foundation:	*R = **20***	Basement / Slab:	*R = **20***
Windows:	*R = **2.73** / U =.**366***	Doors:	*R = **2.04** / U =.**49***

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

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

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

Select all appropriate:	**Connected to local distributed electrical**	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

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

*Yes / **No***	If yes, for how long:	*Days*

If Yes, is building "Islandable?	**No**
If Yes, describe strategies:	

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

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

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

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

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

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

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

Select all appropriate:	Hardened building structure & elements	Buried utilities & hardened infrastructure	Hazard removal & protective landscapes	**Soft & permeable surfaces (water infiltration)**
Describe other strategies:	**Electrical rooms located on the first floor (above flood elevation)**			

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

Yes / ***No***

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base **15.0/24.0** Elev.(Ft.)*
Building Proximity to Water:	***12** Ft.*

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

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

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

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

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

***0** Ft.*

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

Sea Level Rise:	***2-4** Ft.*	Frequency of storms:	***1 per 100 years***

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation:	*Boston City Base **24.0'** Elev.(Ft.)*	First Floor Elevation:	*Boston City Base **24.0'** Elev. (Ft.)*

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

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

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

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

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

*Yes / **No***

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

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

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

Yes / No	
If Yes, describe:	**Rip rap and "Living Shoreline"**

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

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

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

Critical systems generator and habitable area located above flood levels and anticipating sea level rise of 2'-4'

C.4 - Building Resilience and Adaptability

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

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

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

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

Select appropriate:	*Yes / No*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:	**Harborwalk located at average elevation 6.5'above MHW**			

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

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

APPENDIX 2

ACCESSIBILITY CHECKLIST

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
    a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
    a. http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Boston Complete Street Guidelines
    a. http://bostoncompletestreets.org/
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
    a. http://www.cityofboston.gov/Disability
5. City of Boston – Public Works Sidewalk Reconstruction Policy
    a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
    a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations
    a. http://www.mbta.com/about_the_mbta/accessibility/

Project Information

Project Name:	**Clippership Wharf**
Project Address Primary:	**25 & 65 Lewis Street**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Christine McVay/ Senior Associate/ Fort Point Associates, Inc./ cmcvay@fpa-inc.com/ 617-357-7044 x200**

Team Description

Owner / Developer:	**Owner: Noddle Island Limited Partnership Developer: Lend Lease Development,Inc.**
Architect:	**The Architectural Team, Inc.**
Engineer (building systems):	**WSP**
Sustainability / LEED:	**Lend Lease/The Architectural Team, Inc**
Permitting:	**Fort Point Associates, Inc.**
Construction Management:	**Lend Lease Construction**

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

	Residential – One to Three Unit	**Residential - Multi-unit, Four +**	Institutional	Education
	Commercial	Office	Retail	Assembly
	Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	**Residential, Assembly**			

What is the Construction Type – select most appropriate type?

	Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	**295, 518** *SF*	Building Area:	**659,793** *SF*
Building Height:	**70** *Ft.*	Number of Stories:	**6** *Flrs.*
First Floor Elevation:	**24.33'** *Elev.*	Are there below grade spaces:	**Yes** / *No*

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.	Civil/Site **Residential Waterfront Neighborhood**
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus,	**Maverick Station is located approximately 500 feet from the site**

etc.	
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Civil/Site **Maverick Gardens: Mixed Income BHA Housing** **MBTA Maverick Station** **Lo Presti Park**
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	Civil/Site **No**

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?	Civil/Site **Yes**
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	Civil/Site **Clippership Lane, Jacobbe Road and Lewis Street have concrete sidewalks**
Are the sidewalks and pedestrian ramps existing-to-remain? **If yes,** have the sidewalks and pedestrian ramps been verified as compliant? **If yes,** please provide surveyors report.	Civil/Site **The non-compliant sidewalks and pedestrian ramps will be reconstructed, as needed.**
Is the development site within a historic district? **If yes,** please identify.	**No**

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	Civil/Site **Yes**
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Civil/Site **Residential**
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Civil/Site **Frontage: N/A** **Pedestrian: >5.0'** **Furnishing: >3.0'**
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	Civil/Site **Pedestrian: concrete** **Furnishing: Pervious Paver**
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	Civil/Site **An easement will be provided, as needed**
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	Civil/Site **No- not within the public sidewalk**
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance	Civil/Site **N/A**

be?	

Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?	**Approximately 280 resident garage spaces and approximately 20 public garage spaces are planned.**
What is the total number of accessible spaces provided at the development site?	**Project will meet the**
Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	Civil/Site **No**
Where is accessible visitor parking located?	Civil/Site **On-site: along surface driveway and within the garage**
Has a drop-off area been identified? **If yes,** will it be accessible?	**A drop of area has been identified and it will be accessible.**
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	Civil/Site

Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	Civil/Site
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	**Entries shall be flush condition.**
Are the accessible entrance and the standard entrance integrated?	**Accessible entrance and standard entrance are integrated.**
If no above, what is the reason?	**N/A**
Will there be a roof deck or outdoor courtyard space? **If yes,** include diagram of the accessible route.	Civil/Site **Yes; please see Figure 1-2, Project Site Plan**
Has an accessible routes way-finding and signage package been developed? **If yes,** please describe.	**Wayfinding and signage has not yet been developed.**

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

What is the total number of proposed units for the development?	**492 Units**
How many units are for sale; how many are for rent? What is the	**214 units for rent**

market value vs. affordable breakdown?	**278 units for sale** **Unknown at this stage of development; affordable housing delivery is under negotiation.**
How many accessible units are being proposed?	**Five percent of the units for rent will be accessible, which equals 11 units.**
Please provide plan and diagram of the accessible units.	**Not available at this stage of development.**
How many accessible units will also be affordable? If none, please describe reason.	**Five percent of the affordable units for rent will be provided. Affordable housing delivery is under negotiation.**
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	**No barriers.**
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	**No.**
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	**N/A**

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities

APPENDIX 3

TRANSPORTATION STUDY

APPENDIX 3: TRANSPORTATION

3.1 INTRODUCTION

3.1.1 PURPOSE OF THE TRANSPORTATION COMPONENT

Howard/Stein-Hudson Associates, Inc. (HSH) has conducted an evaluation of the transportation impacts of the proposed redevelopment of Clippership Wharf in East Boston (the "Project" and/or the "Site"). This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and Boston Redevelopment Authority (BRA) Article 80 development review process, as well as following the guidelines of the EOEEA/MassDOT Guidelines for Environmental Impact Report/Environmental Impact Statement Traffic Impact Assessments (TIAs) for Massachusetts Environmental Policy Act (MEPA) review. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, loading operations, transit services, and pedestrian activity.

3.1.2 PROJECT DESCRIPTION

The Site is located at the southern end of Clippership Lane in the East Boston neighborhood, bounded by Lewis Street (and Lewis Mall) to the east; Father Jacobbe Road to the north; and the Boston Harbor to the south and west. The Project site currently sits vacant.

The Project includes the construction of four new mixed-use buildings with 492 residential units comprising of 214 apartment units (Building 1) and 278 condominium units (Buildings 2, 3, and 4), and 21,000 square feet of ground floor retail space. The commercial spaces will consist of a 4,000 square restaurant, a 2,500 square foot café, and a 14,500 square foot recreational community center and a kayak/canoe boat rental facility. Parking will be provided in an underground garage for approximately 280 residential vehicles and an additional 21 spaces for the on-site FPA amenities. Fifteen surface spaces will supplement parking for visitors, retail shoppers, and other building needs. The project will also include secure storage for at least 300 bicycles.

Vehicular access/egress will be provided via a full service driveway with connections at the intersection of Clippership Lane/Father Jacobbe Road to the north of the Project site and the intersection of Marginal Street/Lewis Street to the east of the Project site. Access to the garage level parking will be provided via Father Jacobbe Road and Lewis Street.

3.1.3 STUDY AREA

The study area includes intersections along Meridian Street and Maverick Street and Sumner Street in the vicinity of the Site. As shown in **Figure 3-1**, the study area includes the following twelve intersections:

- Sumner Street/London Street (unsignalized);
- Sumner Street/Havre Street (unsignalized);
- Sumner Street/Clipper Ship Lane (unsignalized);
- Sumner Street/Paris Street (unsignalized);
- Sumner Street/Maverick Square/Chelsea Street (signalized);
- Sumner Street/Bremen Street (unsignalized);
- Maverick Street/Bremen Street (unsignalized);
- Meridian Street/Chelsea Street/Maverick Street/Maverick Square (unsignalized);
- Maverick Street/Paris Street (unsignalized);
- Maverick Street/Havre Street (unsignalized);
- Maverick Street/London Street (unsignalized);
- Meridian Street/Paris Street/Emmons Street (unsignalized);
- Meridian Street/Havre Street/Decatur Street/Gove Street (unsignalized); and
- Meridian Street/London Street (unsignalized);

3.1.4 STUDY METHODOLOGY

This transportation study and supporting analyses were conducted in accordance with BTD, BRA, MassDOT, and MEPA guidelines and is described below.

The existing conditions analysis includes an inventory of the existing (2015) transportation conditions such as roadway capacities, traffic characteristics, parking and curb usage, transit, pedestrian circulation, bicycle facilities, loading, and Site conditions. Existing vehicle, bicycle, and pedestrian counts were obtained from recent traffic counts conducted for this project and projects in the vicinity of the

East Boston, Massachusetts

Figure 3-1
Study Area Intersections
Howard/Stein-Hudson Associates, Inc.

study area. The traffic counts form the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2020, based on a five-year horizon from the existing year (2015). Expected roadway, parking, transit, pedestrian, bicycle accommodation, and loading capacities and deficiencies are identified. This section includes the following scenarios:

- The 2020 No-Build Conditions includes both general background traffic growth and traffic growth associated with specific developments that are planned in the vicinity of the Site. Transportation infrastructure improvements in the study area are identified and incorporated into the 2020 No-Build conditions.

- The 2020 Build Condition includes Project-generated traffic volume estimates added to the traffic volumes developed as part of the 2020 No-Build Condition.

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

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

3.2 EXISTING CONDITION

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

3.2.1 EXISTING ROADWAY CONDITIONS

The study area roadways are described below. The descriptions reflect functional classifications by the Massachusetts Department of Transportation (MassDOT) Highway Division's Office of Transportation Planning.

Sumner Street is a two-way, two-lane roadway located to the north of the Project site. Sumner Street is classified as an urban minor arterial roadway to the east of Maverick Square and as an urban local roadway to the west of Maverick Square under BTD jurisdiction. Sumner Street runs predominately in the east-west direction between the Boston Harbor Street to the east and New Street to the west. Within the

study area, on-street parking and sidewalks are provided on both sides of the roadway.

London Street is a one-way southbound, one-lane roadway located to the northwest of the Project site. London Street is classified as an urban local roadway under BTD jurisdiction that runs predominately in the north-south direction between Bennington Street to the north and Sumner Street to the south. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

Havre Street is a one-way northbound, one-lane roadway located to the northwest of the Project site. Havre Street is classified as an urban local roadway under BTD jurisdiction that runs predominately in the north-south direction between Route 1A to the north and Sumner Street to the south. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

Clipper Ship Lane is a two-way, two lane roadway located to the north of the Project site. Clipper Ship Lane is classified as an urban local roadway under BTD jurisdiction that runs in a predominately north-south direction between Sumner Street to the north and Father Jacobbe Road to the south. At Father Jacobbe Road, Clippership lane turns 90 degrees to the west and runs in the east-west direction until it dead ends.

Paris Street is a one-way southbound, one-lane roadway located to the northwest of the Project site. Paris Street is classified as an urban local roadway under BTD jurisdiction that runs predominately in the north-south direction between Porter Street to the north and Sumner Street to the south. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

Bremen Street is a two-way, two lane roadway located to the northeast of the Project site. Bremen Street is classified as an urban minor arterial roadway to the north of Sumner Street and as an urban local roadway to the south of Sumner Street (where it turns into South Bremen Street) under BTD jurisdiction. Bremen Street runs in a predominately north-south direction between Marginal Street to the south and Curtis Street to the north. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway, to the south of Sumner Street on South Bremen Street sidewalks are not provided on the east side of the roadway.

Maverick Street is a one-way westbound, one-lane roadway located to the north of the Project site. Maverick Street is classified as an urban minor arterial under BTD jurisdiction that runs predominantly in the east-west direction between Tomahawk Drive to the east and New Street to the west. Within the study area, on-street parking and sidewalks are provided on both sides of the roadway. A bike lane is also provided on the north side of the travel way.

Chelsea Street is a two-way, two lane roadway located to the northeast of the Project site. Chelsea Street is classified as an urban minor arterial under BTD jurisdiction that runs predominately in the north-south direction between Sumner Street to the south and Marginal Street (in Chelsea) to the north. Within the study area, on-street parking, bike lanes, and sidewalks are provided on both sides of the roadway.

Maverick Square is a one-way northbound, one lane roadway located to the north of the Project site. Maverick Square is classified as an urban minor arterial roadway under BTD jurisdiction that runs in a predominately north-south direction between Sumner Street to the south and Maverick Street to the north. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

Meridian Street is a two-way, two-lane roadway located to the north of the Project site. Meridian Street is classified as an urban minor arterial roadway under BTD jurisdiction that runs predominately in the southeast-northwest direction between the Andrew McArdle Bridge to the north and Maverick Square to the south. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

3.2.2 EXISTING INTERSECTION CONDITIONS

Sumner Street/London Street is a four legged, unsignalized intersection with three approaches. The Sumner Street eastbound approach is a free movement and consists of one lane, a shared through/right-turn lane. The Sumner Street westbound approach is a free movement and consists of one lane, a shared left-turn/through lane. The London Street southbound approach is stop controlled and consists of one lane, a shared left-turn/through/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across Sumner Street eastbound approach and the London Street southbound approach.

Sumner Street/Havre Street is a three legged, unsignalized intersection with two approaches. The Sumner Street eastbound approach is a free movement and consists of one lane, a shared left-turn/through lane. The Sumner Street westbound approach is a free movement and consists of one lane, a shared through/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across the Sumner Street eastbound approach and the Havre Street southbound approach.

Sumner Street/Clipper Ship Lane is a three legged, unsignalized intersection with three approaches. The Sumner Street eastbound approach is a free movement and consists of one lane, a shared through/right-turn lane. The Sumner Street westbound approach is a free movement and consists of one lane, a shared left-turn/through

lane. The Clippership Lane northbound approach is stop controlled and consists of one lane, a shared left-turn/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are only provided across the Clippership Lane northbound approach. The crosswalk is extremely faded.

Sumner Street/Paris Street is a three legged, unsignalized intersection with three approaches. The Sumner Street eastbound approach is a free movement and consists of one lane, a through only lane. The Sumner Street westbound approach is a free movement and consists of one lane, a through only lane. The Paris Street southbound approach is stop controlled and consists of one lane, a shared left-turn/right-turn lane. Crosswalks and wheelchair ramps are provided across all approaches to the intersection.

Sumner Street/Maverick Square/Chelsea Street is a four legged, signalized intersection with three approaches. The Sumner Street eastbound approach consists of one lane, a shared left-turn/through lane. The Sumner Street westbound approach consists of one lane, a shared through/right-turn lane. The Chelsea Street southbound approach consists of one shared left-turn/right-turn lane. Chelsea Street and Maverick Square, to the north of the intersection, are separated by a large median with the Maverick Station entrance, measuring approximately 50 feet wide. On-street parking is provided on all approaches to the intersection. Crosswalks, wheelchair ramps, and pedestrian signal indications are provided across all approaches to the intersection.

Sumner Street/Bremen Street is a four legged, unsignalized intersection with four approaches. The Sumner Street eastbound approach is a free movement and consists of one lane, a shared left-turn/through/right-turn lane. The Sumner Street westbound approach is a free movement and consists of one lane, a shared left-turn/through/right-turn lane. The Bermen Street northbound approach is stop controlled and consists of one lane, a shared left-turn/through/right-turn lane. The Bermen Street southbound approach is stop controlled and consists of one lane, a shared left-turn/through/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across all approaches to the intersection.

Maverick Street/Bremen Street is a four legged, unsignalized intersection with three approaches. The Maverick Street westbound approach is stop controlled and consists of one lane, a shared left-turn/through/right-turn lane. The Bermen Street northbound approach is stop controlled and consists of one lane, a shared left-turn/through lane. The Bermen Street southbound approach is stop controlled and consists of one lane, a shared through/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are

provided across all approaches to the intersection. The crosswalks are completely faded.

Meridian Street/Chelsea Street/Maverick Street/Maverick Square is a six-legged, unsignalized intersection with four approaches. The Maverick Street westbound approach is stop controlled and consists of one lane, a shared left-turn/through/slight right-turn/hard right-turn lane. The Maverick Square northbound approach is stop controlled and consists of one lane, a shared left-turn/slight left-turn/sight right-turn/u-turn lane. The Chelsea Street southbound approach is stop controlled and consists of one lane, a shared slight left-turn/slight right-turn/right-turn lane. The Meridian Street south-eastbound approach is stop controlled and consists of one lane, a shared left-turn/slight right-turn/hard right-turn lane. Chelsea Street and Maverick Square, to the south of the intersection, are separated by a large median, measuring approximately 24 feet. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across all approaches to the intersection.

Maverick Street/Paris Street is a four legged, unsignalized intersection with two approaches. The Maverick Street westbound approach is stop controlled and consists of one lane, a shared left-turn/through lane. The Paris Street southbound approach is stop controlled and consists of one lane, a shared through/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across all approaches to the intersection.

Maverick Street/Havre Street is a four legged, unsignalized intersection with two approaches. The Maverick Street westbound approach is stop controlled and consists of one lane, a shared through/right-turn lane. The Havre Street northbound approach is stop controlled and consists of one lane, a shared left-turn/through lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across all approaches to the intersection.

Maverick Street/London Street is a four legged, unsignalized intersection with two approaches. The Maverick Street westbound approach is a free movement and consists of one lane, a shared left-turn/through lane. The London Street southbound approach is stop controlled and consists of one lane, a shared through/right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across Maverick Street eastbound and westbound approaches and the London Street northbound approach.

Meridian Street/Paris Street/Emmons Street is a four-legged unsignalized intersection with three approaches. The Paris Street southbound approach is stop controlled and consists of one lane, a shared slight left-turn/through/hard right-turn

lane. The Meridian Street south-eastbound approach is a free movement and consists of one lane, a shared hard left-turn/through/slight right-turn lane. The Meridian Street north-westbound approach is a free movement and consists of one lane, a shared hard left-turn/through/slight right-turn lane. The Emmons Street westbound approach is offset to the north of Meridian Street by approximately 50 feet. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across the Paris Street southbound approach and the Meridian Street southeast/northwest approaches, connecting the southeast corner with the northwest corner of the roadway.

Meridian Street/Havre Street/Decatur Street/Gove Street is a six-legged, unsignalized intersection with four approaches. The Decatur Street eastbound approach is stop controlled and consists of one lane, a shared hard left-turn/left-turn/through/slight right-turn lane. The Havre Street northbound approach is stop controlled and consists of one lane, a shared left-turn/slight left-turn/through/right-turn/hard right-turn lane. The Meridian Street south-eastbound approach is a free movement and consists of one lane, a shared hard left-turn/slight left-turn/through/hard right-turn lane. The Meridian Street north-westbound approach is a free movement and consists of one lane, a shared slight left-turn/through/slight right-turn/hard right-turn lane. The Decatur Street eastbound approach is offset to the south of Meridian Street approximately 75 feet and the Gove Street westbound approach is offset to the north of Meridian Street by approximately 50 feet. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across all stop controlled approaches to the intersection and Meridian Street southeast/northwest approaches, connecting the southeast corner with the northwest corner of the roadway.

Meridian Street/London Street is a four-legged, unsignalized intersection with four approaches that meet at a skewed angle. The London Street northbound approach is stop controlled and consists of one lane, a shared slight left-turn/through/hard right-turn lane. The London Street southbound approach is stop controlled and consists of one lane, a shared slight left-turn/through/hard right-turn lane. The Meridian Street south-eastbound approach is a free movement and consists of one lane, a shared hard left-turn/through/slight right-turn lane. The Meridian Street north-westbound approach is a free movement and consists of one lane, a shared hard left-turn/through/slight right-turn lane. On-street parking is provided on all approaches to the intersection. Crosswalks and wheelchair ramps are provided across the London Street northbound and southbound approach and Meridian Street southeast/northwest approaches, connecting the southeast corner with the northwest corner of the roadway.

3.2.3 EXISTING PARKING AND CURB USE

Curb use regulations near the Project site include mostly 2-hour commercial parking, resident only parking, and 2-hour parking except with resident sticker. Handicapped parking is provided as needed. Almost every street had on-street parking along both sides of the roadway. **Figure 3-2** illustrates the on-street parking regulations in the vicinity of the study area.

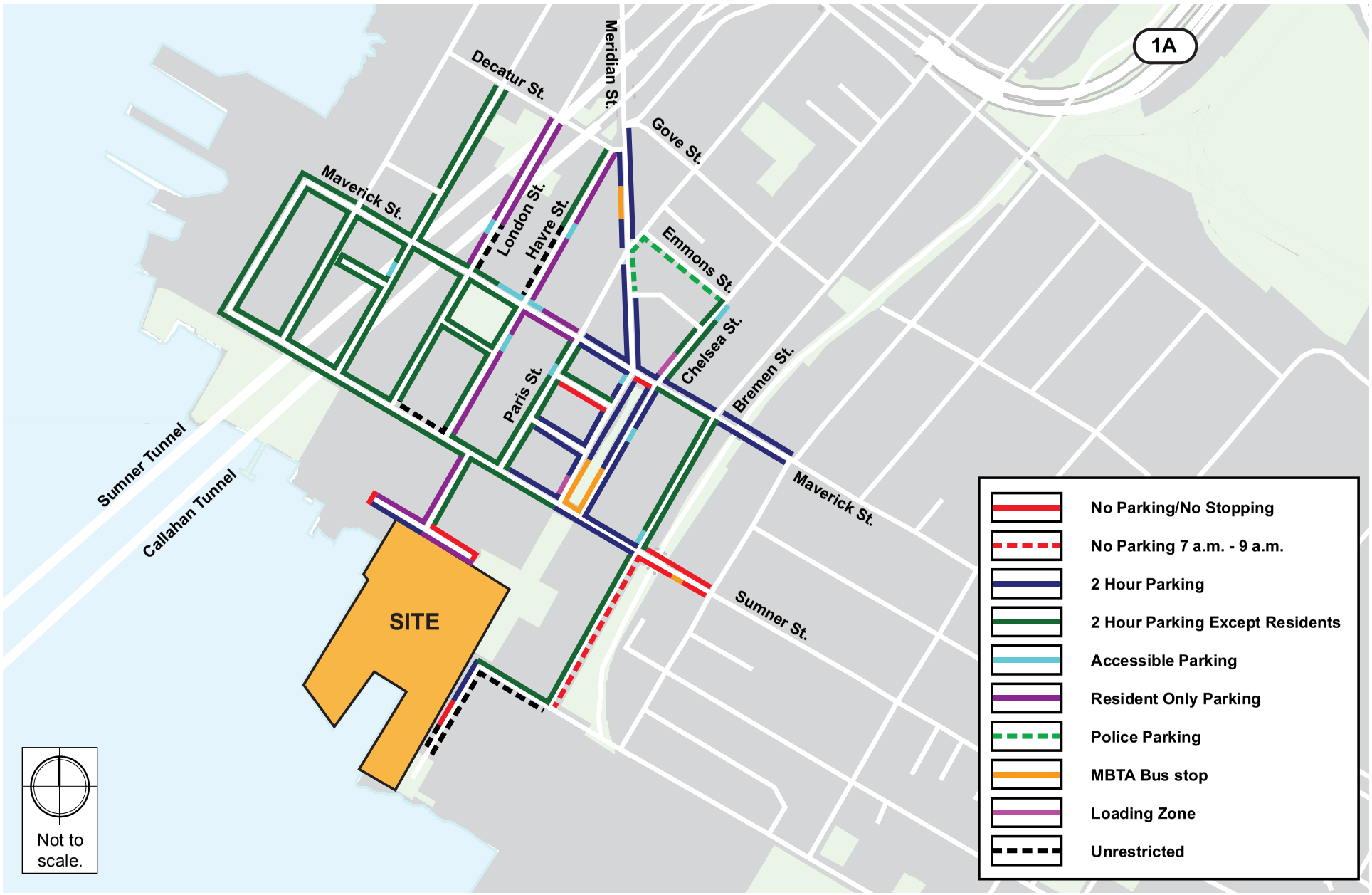


Figure 3-2
On-Street Parking Regulations
Howard/Stein-Hudson Associates, Inc.

3.2.4 CAR SHARING SERVICES

Car sharing enables easy access to short term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. Zipcar is the only company that provides car sharing services within the project area. There are two Zipcar locations located in close proximity of the project site. They are located at 150 Orleans Street and 197 Maverick Street. The nearby Zipcar locations are shown in **Figure 3-3**.

3.2.5 EXISTING TRAFFIC DATA

Traffic volume data have been collected at the study area intersections. Turning Movement Counts (TMCs) and vehicle classification counts were conducted on Thursday, January 8, 2015 during the weekday a.m. and p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively). The traffic classification counts included car, truck, pedestrian, and bicycle movements. Based on the TMCs, the peak hours of vehicular traffic throughout the study area are 7:15 a.m. to 8:15 a.m. and 4:15 p.m. to 5:15 p.m.

Seasonal Adjustment

In order to account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the January 2015 TMCs. The seasonal adjustment factor during January for roadways similar to the study area (Group 6) is 1.03. This indicates that average month traffic volumes are approximately three percent higher than the traffic volumes that were collected. The traffic counts were increased to reflect the average month conditions. The MassDOT 2011 Weekday Seasonal Factors table is provided in Appendix.

3.2.6 EXISTING TRAFFIC VOLUMES

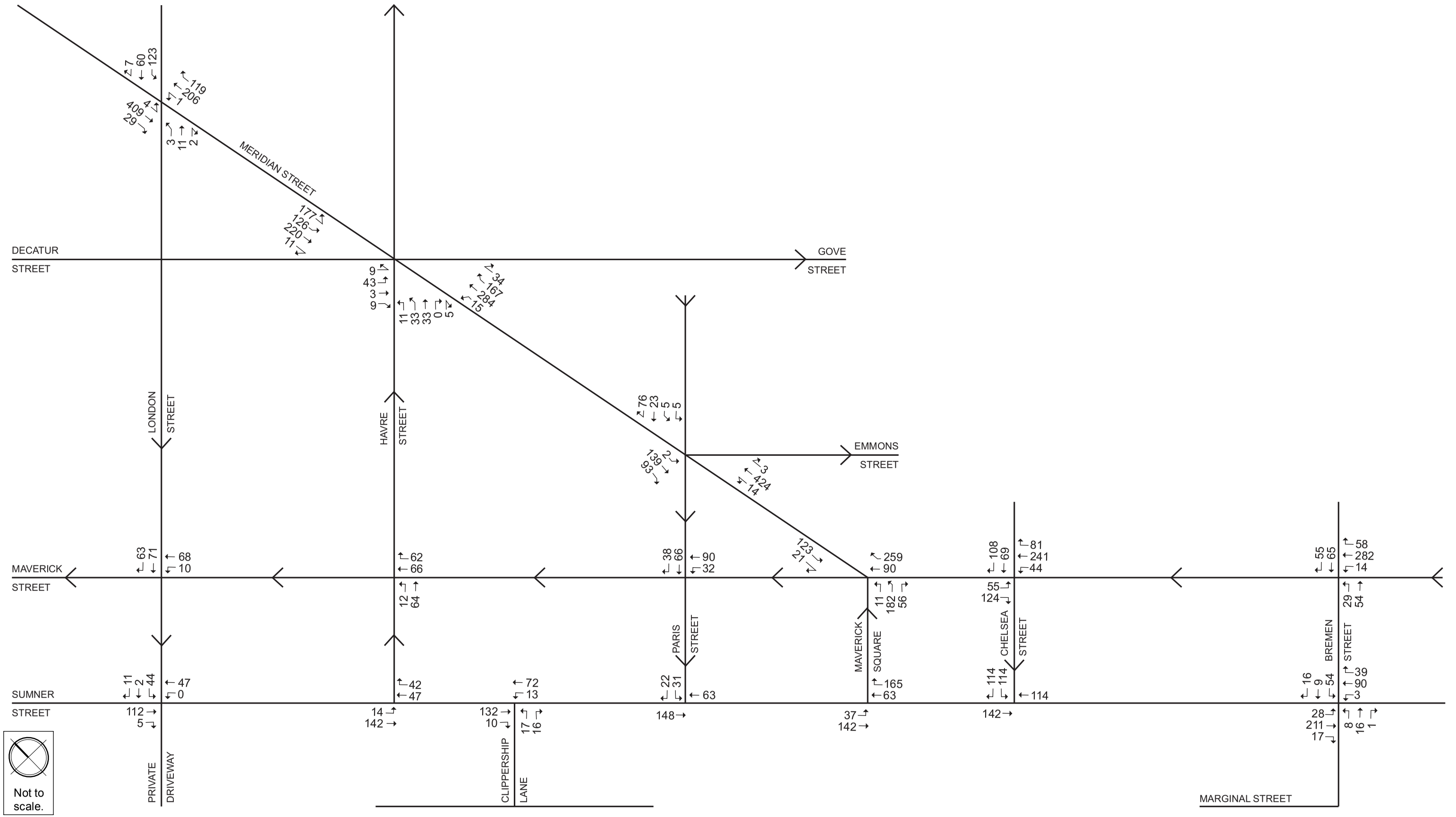
The existing vehicular traffic volumes were balanced with each other to develop the 2015 Existing Condition vehicular traffic volumes. The 2015 Existing weekday morning and evening peak hour traffic volumes are shown in **Figure 3-4**, and **Figure 3-5**, respectively.

3.2.7 EXISTING TRANSIT SERVICES

The Project site is located approximately 500 feet away from Maverick Station. Maverick Station provides access to the MBTA's Blue Line and five MBTA bus routes. The following describes each public transportation route served by the

East Boston, Massachusetts

Figure 3-3
Car Sharing Locations
Howard/Stein-Hudson Associates, Inc.



East Boston, Massachusetts

Figure 3-4
Existing Condition (2015) Vehicular Volumes, a.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.

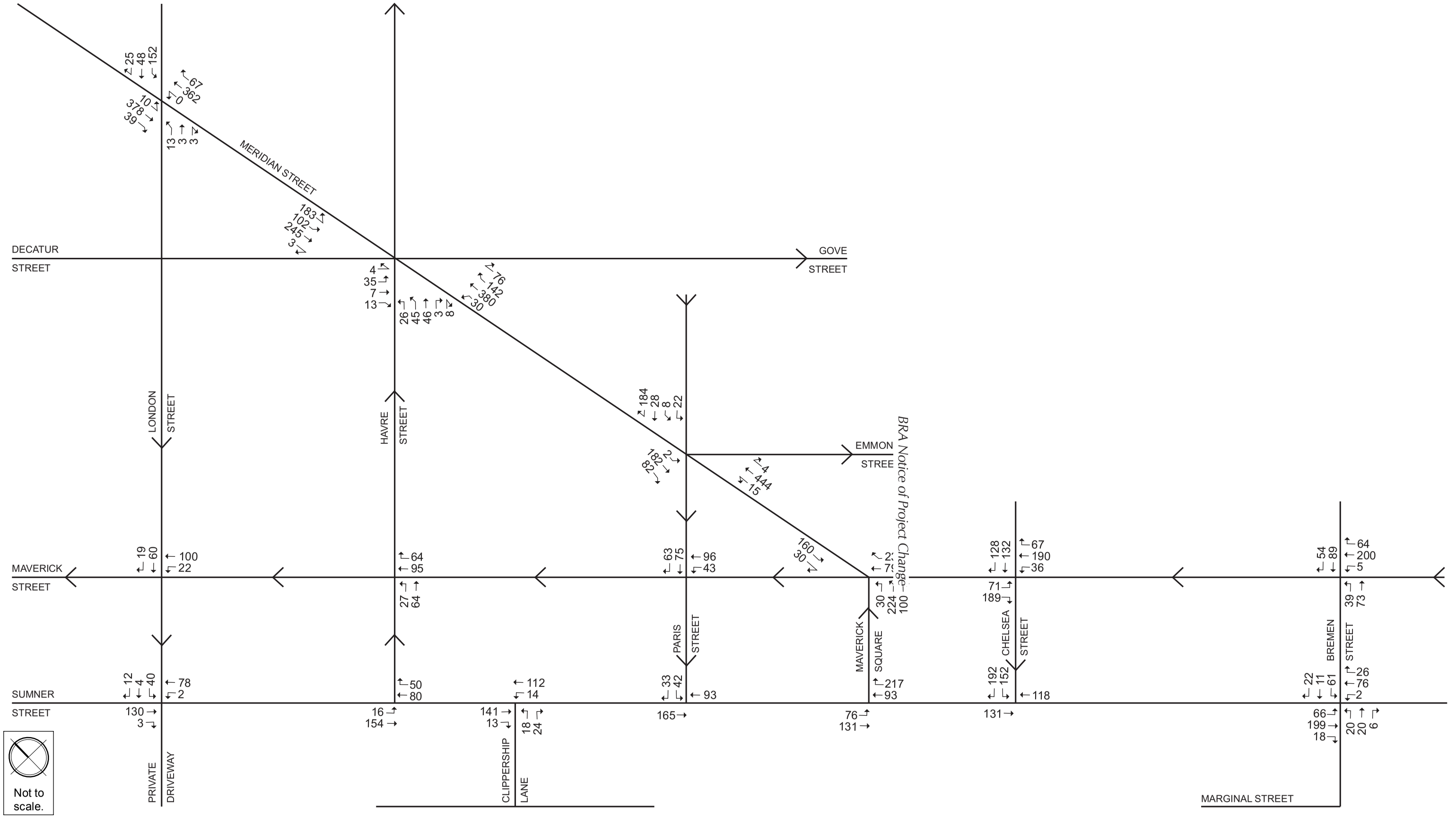


Figure 3-5
Existing Condition (2015) Vehicular Volumes, p.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.

Maverick MBTA station. **Figure 3-6** shows a map of all public transportation service located in close proximity of the Project Site.

MBTA Blue Line – The Blue Line branch of the MBTA subway system stops at Maverick Station. The Blue Line provides access between Bowdoin Station in downtown Boston to the southwest and Wonderland Station in Revere to the northeast. The Blue Line operates with headways of approximately 5 to 8 minutes.

MBTA Bus Route 114 – This route provides service between Maverick Station in East Boston and Bellingham Square in Chelsea. Weekday service runs from approximately 9:00 AM to 4:16 PM, with headways ranging from approximately 50 minutes to 55 minutes. MBTA Bus Route 114 does not provide weekend bus service.

MBTA Bus Route 116 – This route provides service between Maverick Station in East Boston and Wonderland Station in the Revere via Revere Street. Weekday service runs from approximately 5:15 AM to 2:50 AM, with headways ranging from approximately 20 minutes to 30 minutes. Saturday and Sunday service from approximately 5:25 AM to 1:23 AM, with headways ranging from approximately 30 minutes to 40 minutes.

MBTA Bus Route 120 – This route provides service between Maverick Station in East Boston and Orient Heights Station in East Boston. Weekday service runs from approximately 5:25 AM to 1:18 AM, with headways ranging from approximately 20 minutes to 25 minutes. Saturday and Sunday service from approximately 5:25 AM to 1:17 AM, with headways ranging from approximately 25 minutes to 30 minutes.

MBTA Bus Route 121 – This route provides service between Maverick Station in East Boston and Wood Island in East Boston. Weekday service runs from approximately 6:00 AM to 6:46 PM, with headways of approximately 30 minutes. MBTA Bus Route 121 does not provide weekend bus service.

3.2.8 EXISTING BICYCLE VOLUMES AND ACCOMODATIONS

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located in close proximity to several bicycle facilities. The City of Boston's "Bike Routes of Boston" map indicates that The East Boston Greenway and Marginal Street are designated as beginner routes suitable for all types of bicyclists including newer cyclists, cyclists with limited on-road experience and/or children. Additionally, Sumner Street and Maverick Street are designated as intermediate routes, suitable for riders with some on-road experience.

East Boston, Massachusetts

Figure 3-6
Existing Transit Service
Howard/Stein-Hudson Associates, Inc.

Bicycle counts were conducted concurrent with the vehicular TMCs, and are presented in **Figure 3-7.** As shown in the figure, bicycle volumes are heaviest along Meridian Street and Sumner Street.

3.2.9 EXISTING PEDESTRIAN VOLUMES AND ACCOMMODATIONS

In general, sidewalks are provided along all roadways and are in good condition. Crosswalks and pedestrian signal equipment are also provided at the study area intersections. Adjacent to the Project site, the sidewalks are approximately 14 feet in width along Clipper Ship Lane. The East Boston Greenway is also located in close proximity to the project site and provides direct access from the Site to East Boston.

Pedestrian counts were conducted concurrent with the vehicular TMCs, and are presented in **Figure 3-8**. As shown in the figure, pedestrian volumes are heaviest around Maverick Square with pedestrian volumes exceeding 200 pedestrians per hour during both the a.m. and p.m. peak hour.

3.2.10 CRASH DATA

HSH compiled motor vehicle crash data from the MassDOT Crash Records System for the most recent three-year period for which they are available (2010–2012). Crash rates are determined based on the number of crashes per million vehicles entering (MEV) an intersection. In District 6 the average crash rate for a signalized intersection is 0.76 crashes per MEV and the average crash rate for an unsignalized intersection is 0.58 crashes per MEV. The detailed crash data summary and intersection crash rate worksheets are included in the **Appendix**.

There were 3 crashes at the 14 study area intersections over the three-year period, including one reported fatality. **Table 3-1** displays the crash rates for the study area intersections.

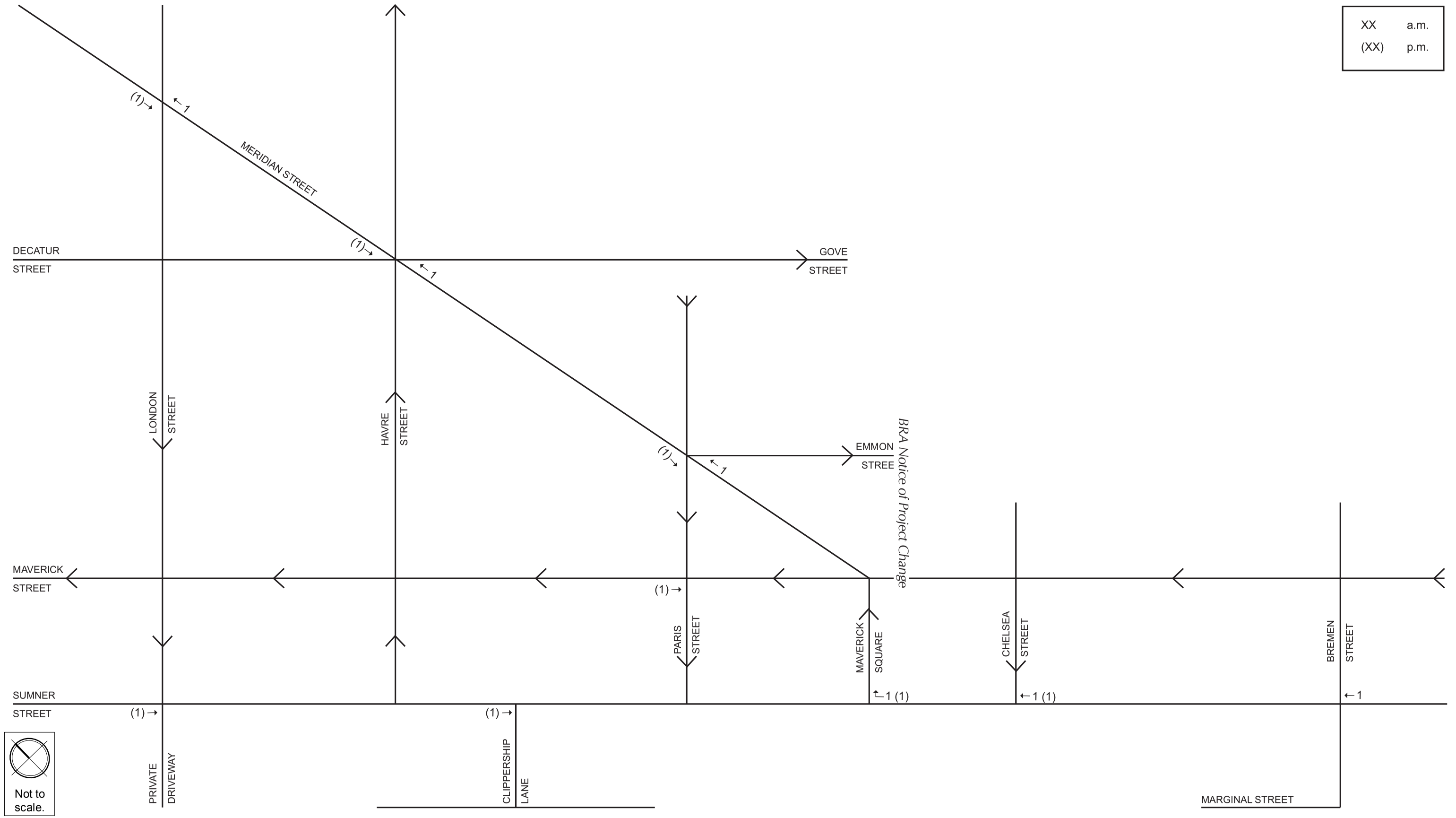
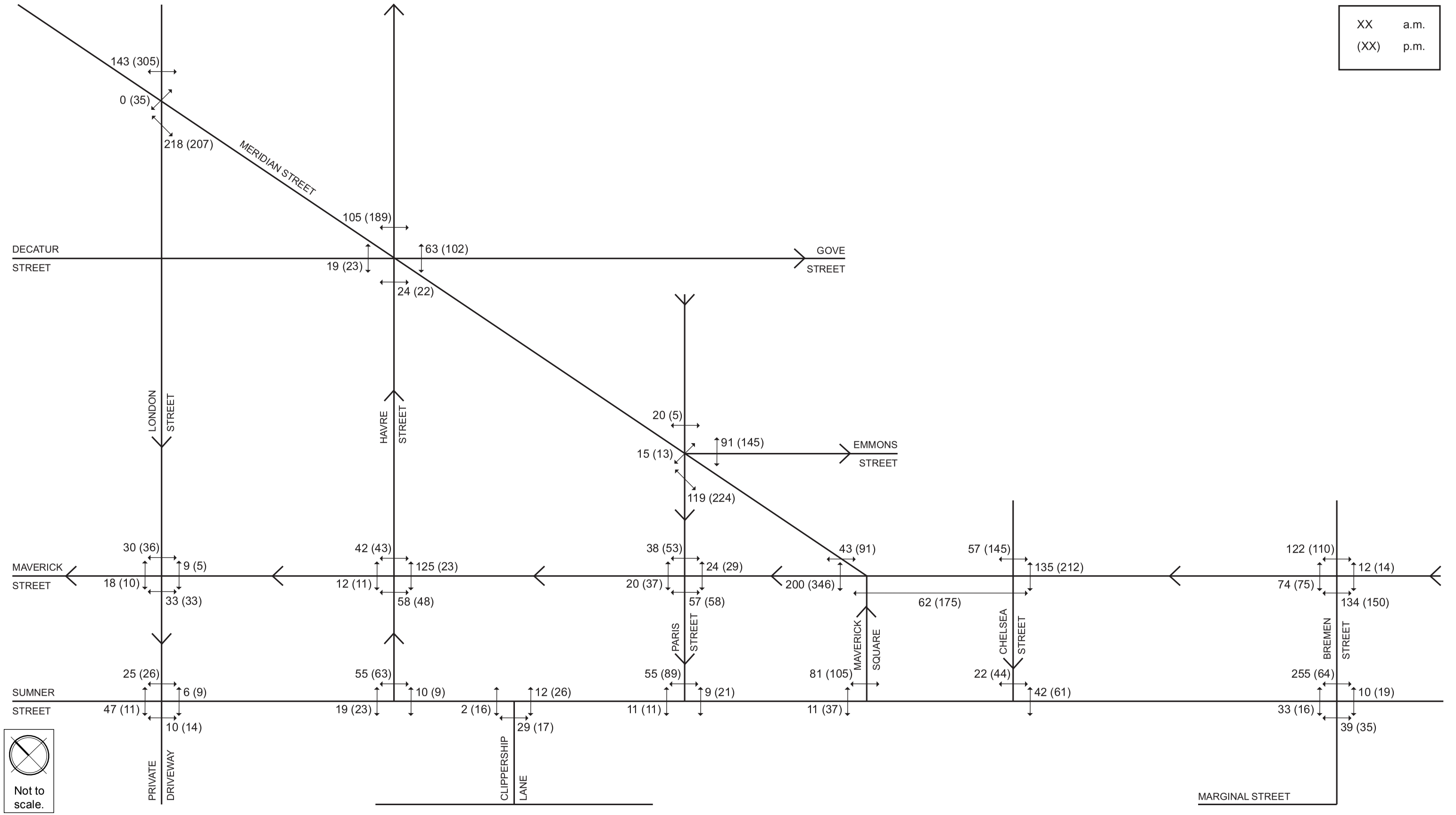


Figure 3-7

Existing 2015 Bicycle Volumes, a.m. and p.m. Peak Hours

Howard/Stein-Hudson Associates, Inc.



East Boston, Massachusetts

Figure 3-8
Existing 2015 Pedestrian Volumes, a.m. and p.m. Peak Hours
Howard/Stein-Hudson Associates, Inc.

Table 3-1, Study Area Intersections Crash Rates

Intersection	Crash Rate
Sumner Street/London Street	0.00
Sumner Street/Havre Street	0.00
Sumner Street/Clipper Ship Lane	0.00
Sumner Street/Paris Street	0.00
Sumner Street/Maverick Square/Chelsea Street (signalized)	0.00
Sumner Street/Bremen Street	0.00
Maverick Street/Bremen Street	0.00
Meridian Street/Chelsea Street/Maverick Street/Maverick	0.09
Maverick Street/Paris Street	0.00
Maverick Street/Havre Street	0.00
Maverick Street/London Street	0.16
Meridian Street/Paris Street/Emmons Street	0.00
Meridian Street/Havre Street/Decatur Street/Gove Street	0.00
Meridian Street/London Street	0.00

As shown in **Table 3-1**, the crash rates at the study area intersections are below the MassDOT District 6 average crash rates for signalized intersections (0.76) and unsignalized intersections (0.58). The only two intersections with crash data are Meridian Street/Chelsea Street/Maverick Street/Maverick Square with 1 crash over the three-year period and Meridian Street/London Street with 2 crashes over the three-year period. These two intersections have crash rates of 0.09 and 0.16 crashes per million entering vehicles, respectively. All intersections have crash rates significantly below the District average.

3.2.11 EXISTING CONDITION TRAFFIC OPERATIONS

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 8) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 *Highway Capacity Manual* (HCM). Field observations were performed by HSH to collect intersection geometry such as number of turning lanes, lane length, and lane width that were then incorporated into the operations analysis.

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 3-2** displays the intersection level of service criteria. LOS A

indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway and does not necessarily indicate that the operations at the intersection are poor or failing.

Table 3-2, Level of Service Criteria (HCM Excerpt)

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

Source: *2000 Highway Capacity Manual,* Transportation Research Board.

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

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

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

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

Table 3-3 and **Table 3-4** present the 2015 Existing Condition operational analysis for the study area intersections during the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in the **Appendix**.

Several minor street approaches, as discussed below, are forecast to operate at LOS E or LOS F under Build Conditions. This level of operation is not uncommon for stop controlled approaches to urban arterial roadways. The HCM analysis for unsignalized intersections incorporates more conservative parameters than what is typically experienced in an urban environment, such as critical gap.[1] Given the methodology, it is important to recognize that the forecasted delays/queues under LOS E or LOS F are overestimated when compared to observations made in real world conditions.

[1] The critical gap is the minimum interval in the major street traffic stream that a minor-street vehicle can make a maneuver into the intersection.

Table 3-3, Existing Condition (2015) Capacity Analysis Summary, a.m. Peak Hour

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Sumner Street/London Street	-	-	-	-	-
Sumner Street EB thru/right	A	0.0	0.09	-	0
Sumner Street WB left/thru	A	0.0	0.00	-	0
London Street SB left/thru/right	B	10.7	0.10	-	8
Sumner Street/Havre Street	-	-	-	-	-
Sumner Street EB left/thru	A	0.8	0.01	-	1
Sumner Street WB thru/right	A	0.0	0.06	-	0
Sumner Street/Clipper Ship Lane	-	-	-	-	-
Sumner Street EB thru/right	A	0.0	0.10	-	0
Sumner Street WB left/thru	A	1.3	0.01	-	1
Clipper Ship Lane NB left/right	B	10.5	0.07	-	6
Sumner Street/Paris Street	-	-	-	-	-
Sumner Street EB thru	A	0.0	0.11	-	0
Sumner Street WB thru	A	0.0	0.05	-	0
Paris Street SB left/right	B	10.7	0.10	-	8
Sumner St/Maverick Sq/Chelsea St (signalized)	**C**	**32.2**	**0.86**	-	-
Sumner Street EB left/thru	C	25.2	0.46	79	136
Sumner Street WB thru/right	C	21.6	0.27	53	83
Chelsea Street SB left/right/u-turn	E	56.4	0.86	110	#222
Sumner Street/Bremen Street	-	-	-	-	-
Sumner Street EB left/thru/right	A	1.3	0.03	-	3
Sumner Street WB left/thru/right	A	0.2	0.00	-	0
Bremen Street NB left/thru/right	C	20.4	0.16	-	14
Bremen Street SB left/thru/right	D	30.4	0.40	-	45
Maverick Street/Bremen Street	-	-	-	-	-
Maverick Street WB left/thru/right	B	11.2	0.46	-	60
Bremen Street NB left/thru	A	9.2	0.16	-	15
Bremen Street SB thru/right	A	8.9	0.20	-	18
Meridian St/Chelsea St/Maverick St/Maverick Sq	-	-	-	-	-
Maverick Street WB left/thru/slight right/right	B	14.6	0.57	-	93
Maverick Square NB left/slight left/slight right/u-turn	B	11.9	0.41	-	50
Chelsea Street SB thru/right/hard right	B	10.3	0.29	-	30
Meridian St SEB hard left/slight left/slight right/hard right	B	11.5	0.33	-	35
Maverick Street/Paris Street	-	-	-	-	-
Maverick Street WB left/thru	A	8.2	0.16	-	15
Paris Street SB thru/right	A	7.9	0.15	-	13
Maverick Street/Havre Street	-	-	-	-	-
Maverick Street WB thru/right	A	7.8	0.16	-	15
Havre Street NB left/thru	A	8.0	0.12	-	10

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Maverick Street/London Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	1.0	0.01	-	1
London Street SB thru/right	B	11.4	0.29	-	30
Meridian Street/Paris Street/Emmons Street	**-**	**-**	**-**	**-**	**-**
Paris Street SB slight left/thru/hard right	C	21.0	0.40	-	47
Meridian Street SEB slight left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/hard right	A	0.4	0.01	-	1
Meridian Street/Havre Street/Decatur Street/Gove Street	**-**	**-**	**-**	**-**	**-**
Havre Street NB slight left/thru/right/hard right	F	>100	>1.50	-	454
Meridian Street SEB hard left/slight left/thru/hard right	A	8.1	0.35	-	39
Meridian Street NWB slight left/thru/slight right/hard right	A	0.4	0.01	-	1
Meridian Street/London Street	**-**	**-**	**-**	**-**	**-**
London Street NB slight left/thru/hard right	E	41.4	0.22	-	20
London Street SB slight left/thru/hard right	F	>100	>1.41	-	338
Meridian Street SEB hard left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/slight right	A	0.0	0.00	-	0

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
Grey shading indicates LOS E or LOS F.

Table 3-4, Existing Condition (2015) Capacity Analysis Summary, p.m. Peak Hour

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Sumner Street/London Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.09	-	0
Sumner Street WB left/thru	A	0.2	0.00	-	0
London Street SB left/thru/right	B	11.0	0.11	-	9
Sumner Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru	A	0.8	0.01	-	1
Sumner Street WB thru/right	A	0.0	0.09	-	0
Sumner Street/Clipper Ship Lane	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.10	-	0
Sumner Street WB left/thru	A	0.9	0.01	-	1
Clipper Ship Lane NB left/right	B	10.5	0.07	-	5
Sumner Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru	A	0.0	0.10	-	0
Sumner Street WB thru	A	0.0	0.06	-	0
Paris Street SB left/right	B	11.4	0.12	-	10
Sumner St/Maverick Sq/Chelsea St (signalized)	**D**	**36.7**	**0.92**	**-**	**-**
Sumner Street EB left/thru	C	31.2	0.61	86	159
Sumner Street WB thru/right	C	22.0	0.28	52	87
Chelsea Street SB left/right/u-turn	D	55.0	0.92	127	#281
Sumner Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru/right	A	2.3	0.06	-	5
Sumner Street WB left/thru/right	A	0.2	0.00	-	0
Bremen Street NB left/thru/right	C	16.1	0.14	-	12
Bremen Street SB left/thru/right	C	18.1	0.29	-	30
Maverick Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/right	B	10.6	0.40	-	48
Bremen Street NB left/thru	A	9.4	0.21	-	20
Bremen Street SB thru/right	A	9.1	0.23	-	23
Meridian St/Chelsea St/Maverick St/Maverick Sq	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/slight right/right	B	12.7	0.46	-	60
Maverick Square NB left/slight left/slight right/u-turn	C	15.2	0.58	-	95
Chelsea Street SB thru/right/hard right	B	11.7	0.41	-	50
Meridian St SEB hard left/slight left/slight right/hard right	B	11.6	0.33	-	35
Maverick Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	8.4	0.20	-	18
Paris Street SB thru/right	A	8.1	0.21	-	20
Maverick Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB thru/right	A	8.0	0.20	-	18
Havre Street NB left/thru	A	8.1	0.14	-	13

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Maverick Street/London Street	-	-	-	-	-
Maverick Street WB left/thru	A	1.4	0.02	-	1
London Street SB thru/right	B	11.2	0.14	-	12
Meridian Street/Paris Street/Emmons Street	-	-	-	-	-
Paris Street SB slight left/thru/hard right	E	46.7	0.79	-	160
Meridian Street SEB slight left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/hard right	A	0.5	0.02	-	1
Meridian Street/Havre Street/Decatur Street/Gove Street	-	-	-	-	-
Havre Street NB slight left/thru/right/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/slight left/thru/hard right	A	9.2	0.38	-	45
Meridian Street NWB slight left/thru/slight right/hard right	A	0.7	0.03	-	2
Meridian Street/London Street	-	-	-	-	-
London Street NB slight left/thru/hard right	F	>100	0.42	-	40
London Street SB slight left/thru/hard right	F	>100	>1.50	-	590
Meridian Street SEB hard left/thru/slight right	A	0.5	0.02	-	1
Meridian Street NWB hard left/thru/slight right	A	0.0	0.00	-	0

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
Grey shading indicates LOS E or LOS F.

The signalized intersection of **Sumner Street/Maverick Square/Chelsea Street** currently operates at LOS C during the weekday a.m. peak hour and at LOS D during the weekday p.m. peak hour. The Chelsea Street southbound approach currently operates at LOS E during the weekday a.m. peak hour. All other approaches operate better than LOS E during both the weekday a.m. and p.m. peak hours. The longest queues occur at the Chelsea Street southbound approach during both the weekday a.m. and p.m. peak hours.

In the Existing Condition, all unsignalized intersection approaches operate better than LOS E during both the weekday a.m. and p.m. peak hours with the exception of:

Meridian Street/Paris Street/Emmons Street – The Paris Street southbound approach operates at LOS E during the weekday p.m. peak hour.

Meridian Street/Havre Street/Decatur Street/Gove Street – The Havre Street northbound approach operates at LOS F during both the weekday a.m. and p.m. peak hours.

Meridian Street/London Street – The London Street northbound approach operates at LOS E during the weekday a.m. peak hour and at LOS F during the weekday p.m.

peak hour. The London Street southbound approach operates at LOS F during both the weekday a.m. and p.m. peak hours.

3.3 NO-BUILD CONDITION

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

3.3.1 BACKGROUND TRAFFIC GROWTH

In order to account for generic future background traffic growth (vehicular and pedestrian), independent of this Project, which may be affected by changes in demographics, smaller scale development projects, or projects unforeseen at this time a generic growth rate was applied to the existing traffic volumes. Based on a review of recent and historic traffic data collected recently and to account for any additional unforeseen traffic growth, a one-half percent per year annual traffic growth rate was used.

3.3.2 SPECIFIC DEVELOPMENT TRAFFIC GROWTH

Traffic volumes associated with the known development projects that will more directly affect traffic patterns throughout the study area within the future analysis time horizon were specifically accounted for in the future scenarios. The following projects are located in the vicinity of the study area (the locations of these projects are shown in **Figure 3-9**).

- ***New Street Development.*** This proposed mixed-use building will consist of the construction of a new 6-story residential building as well as the addition of six new stories on top of the existing 9-story building to accommodate approximately 238 residential units, approximately 6,000 sf of restaurant space, parking for approximately 164-193 vehicles and boat parking for approximately 36 slips. Currently this project is under construction.

- ***Portside at Pier 1.*** This project calls for the construction of seven buildings consisting of approximately 454 rental apartments, 103 condominium units, and 754 parking spaces. The site will also consist of an extended stay hotel, a restaurant, and a health club. *Phase 1* of this project is constructed and has leased 30 units.

East Boston, Massachusetts

Figure 3-9
Background Project Locations
Howard/Stein-Hudson Associates, Inc.

- ***Hodge Boiler Works.*** This proposed mixed-use building consists of 95 apartment units, a 6-room bed and breakfast, a 740 sf café and a 740 sf parking building with 75 parking spaces and access to the Harborwalk. Currently this project has been approved by the BRA.

- ***Coppersmith Village Development.*** This proposed project consists of 56 rental apartments located at 75 Boarder Street and 15 condominium units located at 80 Liverpool Street. Currently this project has been approved by the BRA.

- **Boston East.** This proposed project consists of approximately 200 residential units with 120 underground parking spaces, a maritime park, a community gallery, and the extension of the Harborwalk. Currently this project has been approved by the BRA.

- **135 Bremen Street.** This proposed project consists of approximately 94 residential units, 7,790 sf of ground floor retail space, and 126 underground parking spaces in two underground parking levels. Currently this project has been approved by the BRA.

3.3.3 PLANNED INFRASTRUCTURE IMPROVEMENTS

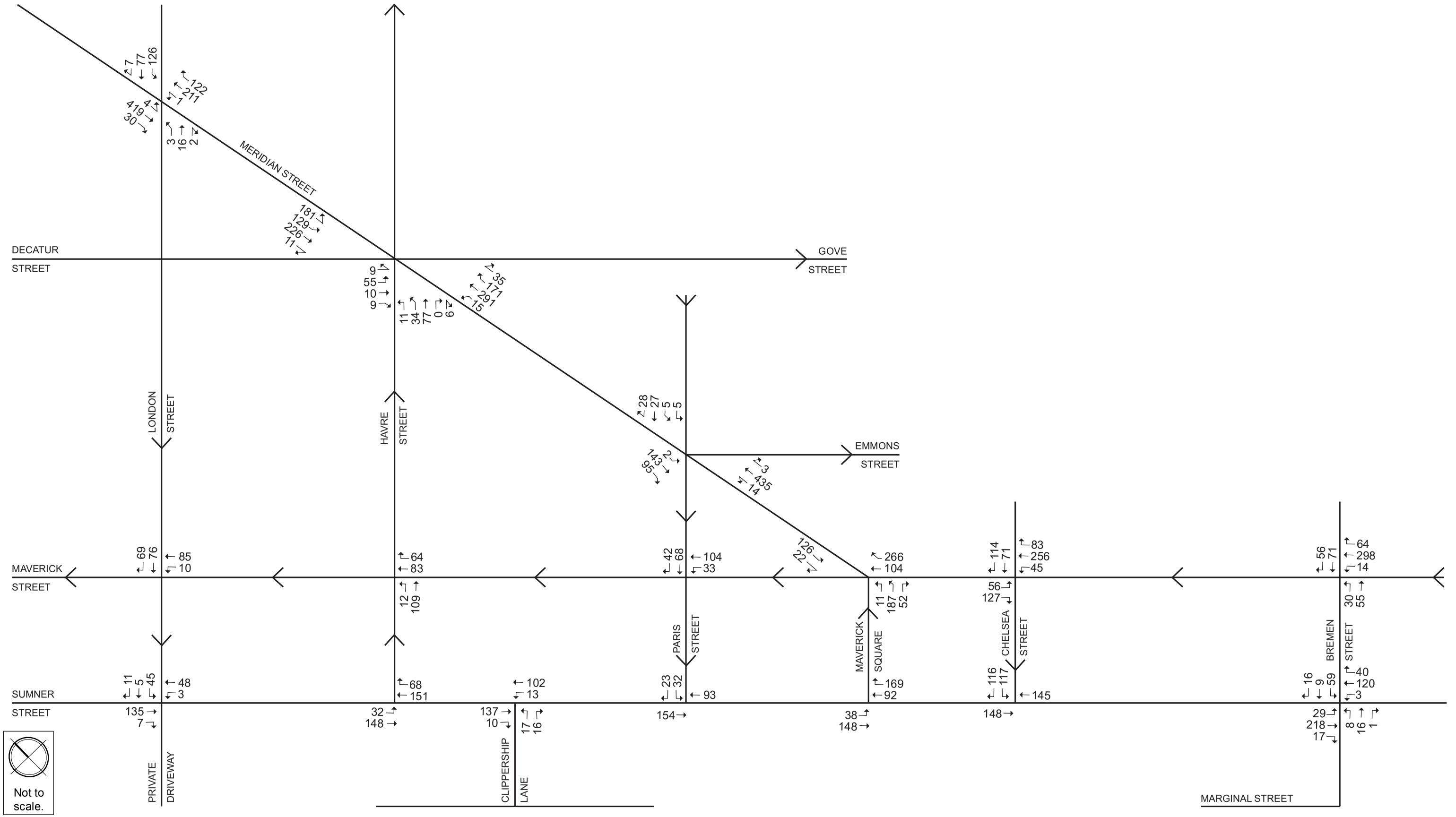
A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. The following public infrastructure project is planned to be implemented within the five-year analysis horizon of this traffic study.

The City of Boston is in the process of acquiring ferry boats in order to provide service between East Boston and Seaport District. The East Boston dock will be located on the east side of the site at Lewis Street. Although it is likely this service will be in place within 5 years, providing an additional transit option in the area, the transit mode share was not increased (decreasing vehicle mode share) to account for this new service.

3.3.4 NO-BUILD TRAFFIC VOLUMES

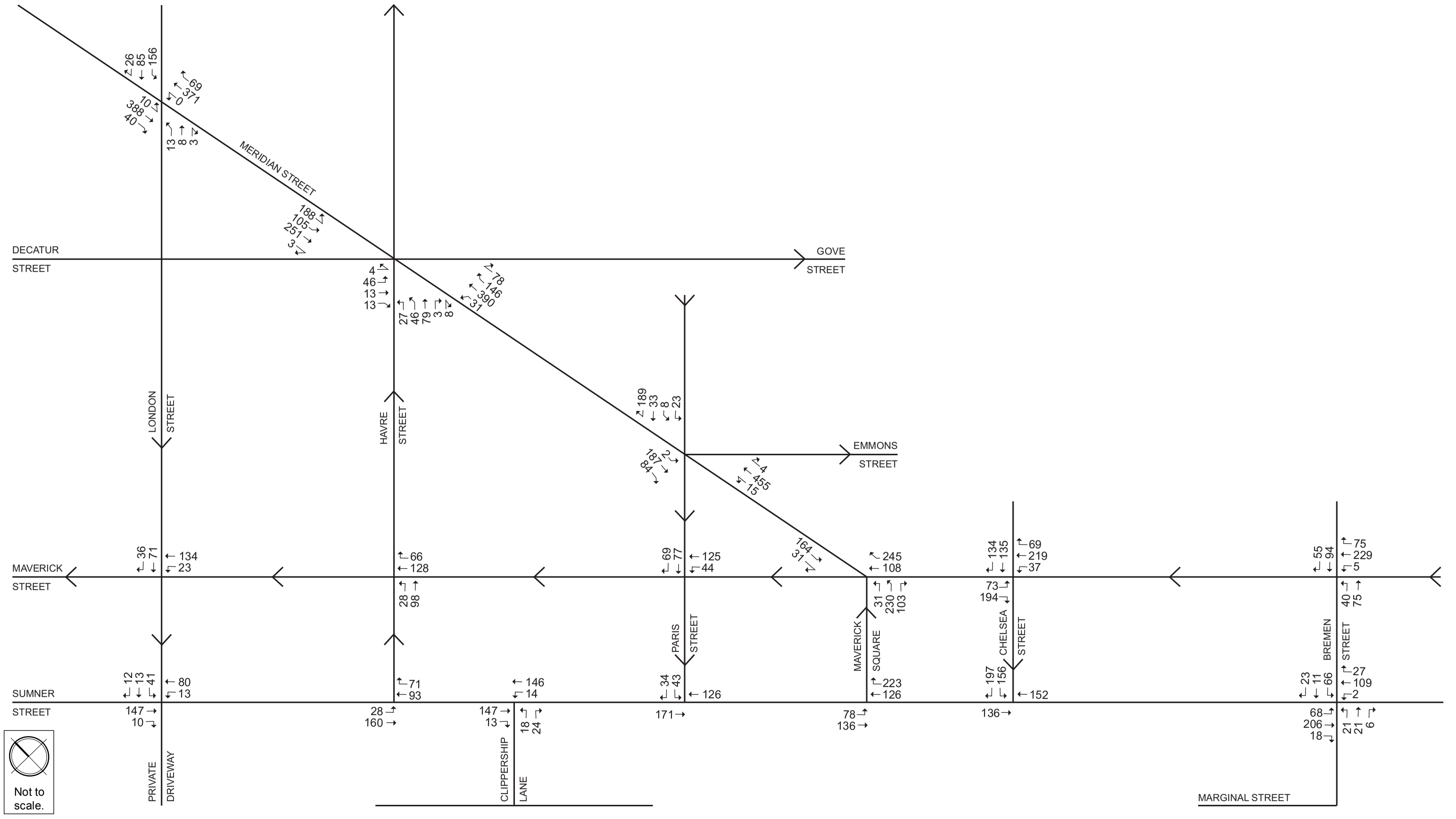
To develop the 2020 No-Build Condition traffic volumes at the study area intersections a half-percent per year annual growth rate was applied to the 2015 Existing Condition traffic volumes, then the traffic volumes associated with the background development projects listed above were added.

The 2020 No-Build a.m. and p.m. peak hour traffic volumes are show in **Figure 3-10** and **Figure 3-11**, respectively.



East Boston, Massachusetts

Figure 3-10
No-Build Condition (2020) Vehicle Turning Volumes, a.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.



East Boston, Massachusetts

Figure 3-11
No-Build Condition (2020) Vehicle Turning Volumes, p.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.

3.3.5 NO-BUILD CONDITION TRAFFIC OPERATIONS ANALYSIS

The 2020 No-Build Condition traffic operations analysis uses the same methodology as the 2015 Existing Condition analysis. **Table 3-5** and **Table 3-6** present the 2020 No-Build Condition operations analysis for the a.m. and p.m. peak hours, respectively. The shaded cells in the tables indicate a worsening in LOS between the 2015 Existing Condition and the 2020 No-Build Condition. The detailed analysis sheets are provided in the **Appendix**.

Table 3-5, No-Build Condition (2020) Capacity Analysis Summary, a.m. Peak Hour

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Sumner Street/London Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.11	-	0
Sumner Street WB left/thru	A	0.5	0.00	-	0
London Street SB left/thru/right	B	11.2	0.11	-	10
Sumner Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru	A	1.6	0.03	-	2
Sumner Street WB thru/right	A	0.0	0.08	-	0
Sumner Street/Clipper Ship Lane	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.11	-	0
Sumner Street WB left/thru	A	1.0	0.01	-	1
Clipper Ship Lane NB left/right	B	10.7	0.08	-	6
Sumner Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru	A	0.0	0.12	-	0
Sumner Street WB thru	A	0.0	0.07	-	0
Paris Street SB left/right	B	11.1	0.11	-	9
Sumner St/Maverick Sq/Chelsea St (signalized)	**C**	**32.0**	**0.86**	**-**	**-**
Sumner Street EB left/thru	C	25.8	0.48	83	142
Sumner Street WB thru/right	C	22.8	0.35	69	103
Chelsea Street SB left/right/u-turn	E	57.1	0.86	112	#229
Sumner Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru/right	A	1.4	0.04	-	3
Sumner Street WB left/thru/right	A	0.2	0.00	-	0
Bremen Street NB left/thru/right	C	21.8	0.17	-	15
Bremen Street SB left/thru/right	E	35.8	0.46	-	56
Maverick Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/right	B	11.7	0.49	-	68
Bremen Street NB left/thru	A	9.3	0.17	-	15
Bremen Street SB thru/right	A	9.2	0.21	-	20
Meridian St/Chelsea St/Maverick St/Maverick Sq	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/slight right/right	C	15.6	0.61	-	103
Maverick Square NB left/slight left/slight right/u-turn	B	12.4	0.43	-	55
Chelsea Street SB thru/right/hard right	B	10.6	0.31	-	33
Meridian St SEB hard left/slight left/slight right/hard right	B	11.8	0.34	-	38
Maverick Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	8.3	0.18	-	18
Paris Street SB thru/right	A	8.0	0.16	-	13
Maverick Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB thru/right	A	8.2	0.19	-	18
Havre Street NB left/thru	A	8.5	0.19	-	18

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Maverick Street/London Street	-	-	-	-	-
Maverick Street WB left/thru	A	0.8	0.01	-	1
London Street SB thru/right	B	11.9	0.32	-	35
Meridian Street/Paris Street/Emmons Street	-	-	-	-	-
Paris Street SB slight left/thru/hard right	C	22.8	0.44	-	54
Meridian Street SEB slight left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/hard right	A	0.4	0.01	-	1
Meridian Street/Havre Street/Decatur Street/Gove Street	-	-	-	-	-
Havre Street NB slight left/thru/right/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/slight left/thru/hard right	A	8.3	0.36	-	41
Meridian Street NWB slight left/thru/slight right/hard right	A	0.4	0.01	-	1
Meridian Street/London Street	-	-	-	-	-
London Street NB slight left/thru/hard right	E	49.4	0.32	-	31
London Street SB slight left/thru/hard right	F	>100	>1.50	-	425
Meridian Street SEB hard left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/slight right	A	0.0	0.00	-	0

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
Grey shading indicates a decrease to LOS E or F when compared to the Existing Condition analysis

Table 3-6, No-Build Condition (2020) Capacity Analysis Summary, p.m. Peak Hour

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Sumner Street/London Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.11	-	0
Sumner Street WB left/thru	A	1.1	0.01	-	1
London Street SB left/thru/right	B	11.8	0.14	-	12
Sumner Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru	A	1.3	0.02	-	2
Sumner Street WB thru/right	A	0.0	0.11	-	0
Sumner Street/Clipper Ship Lane	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.10	-	0
Sumner Street WB left/thru	A	0.8	0.01	-	1
Clipper Ship Lane NB left/right	B	10.7	0.07	-	6
Sumner Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru	A	0.0	0.10	-	0
Sumner Street WB thru	A	0.0	0.08	-	0
Paris Street SB left/right	B	11.8	0.13	-	11
Sumner St/Maverick Sq/Chelsea St (signalized)	**D**	**37.8**	**0.94**	**-**	**-**
Sumner Street EB left/thru	D	36.1	0.68	92	#192
Sumner Street WB thru/right	C	23.3	0.37	69	109
Chelsea Street SB left/right/u-turn	E	57.7	0.94	132	#293
Sumner Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru/right	A	2.3	0.06	-	5
Sumner Street WB left/thru/right	A	0.1	0.00	-	0
Bremen Street NB left/thru/right	C	17.4	0.16	-	14
Bremen Street SB left/thru/right	C	20.5	0.34	-	37
Maverick Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/right	B	11.6	0.46	-	63
Bremen Street NB left/thru	A	9.7	0.23	-	23
Bremen Street SB thru/right	A	9.4	0.25	-	25
Meridian St/Chelsea St/Maverick St/Maverick Sq	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/slight right/right	B	14.0	0.52	-	75
Maverick Square NB left/slight left/slight right/u-turn	C	16.7	0.62	-	108
Chelsea Street SB thru/right/hard right	B	12.4	0.44	-	58
Meridian St SEB hard left/slight left/slight right/hard right	B	12.2	0.35	-	40
Maverick Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	8.8	0.24	-	23
Paris Street SB thru/right	A	8.3	0.22	-	23
Maverick Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB thru/right	A	8.5	0.25	-	25
Havre Street NB left/thru	A	8.6	0.20	-	18

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Maverick Street/London Street	-	-	-	-	-
Maverick Street WB left/thru	A	1.2	0.02	-	1
London Street SB thru/right	B	11.8	0.19	-	17
Meridian Street/Paris Street/Emmons Street	-	-	-	-	-
Paris Street SB slight left/thru/hard right	F	57.9	0.86	-	191
Meridian Street SEB slight left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/hard right	A	0.4	0.02	-	1
Meridian Street/Havre Street/Decatur Street/Gove Street	-	-	-	-	-
Havre Street NB slight left/thru/right/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/slight left/thru/hard right	A	9.5	0.40	-	48
Meridian Street NWB slight left/thru/slight right/hard right	A	0.7	0.03	-	2
Meridian Street/London Street	-	-	-	-	-
London Street NB slight left/thru/hard right	F	>100	>1.50	-	Err
London Street SB slight left/thru/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/thru/slight right	A	0.5	0.02	-	1
Meridian Street NWB hard left/thru/slight right	A	0.0	0.00	-	0

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
Grey shading indicates a decrease to LOS E or F when compared to the Existing Condition analysis

In the No-Build Condition, the signalized intersection of **Sumner Street/Maverick Square/Chelsea Street** is expected to continue to operate at LOS C during the weekday a.m. peak hour and at LOS D during the weekday p.m. peak hour. The Chelsea Street southbound approach decreases from LOS D to LOS E during the weekday p.m. peak hour. All other approaches continue to operate at the same LOS as compared to the Existing Condition. The longest queues continue to occur at the Chelsea Street southbound approach during both the weekday a.m. and p.m. peak hours.

In the No-Build Condition, all unsignalized intersection approaches continue to operate at the same LOS as compared to the Existing Condition during both the weekday a.m. and p.m. peak hours with the exception of:

Sumner Street/Bremen Street – The Bremen Street southbound approach decreases from LOS D to LOS E during the weekday a.m. peak hour.

Meridian Street/Paris Street/Emmons Street – The Paris Street southbound approach decreases from LOS E to LOS F during the weekday p.m. peak hour.

3.4 BUILD CONDITION

As previously summarized, the Clippership Wharf development will consist of 492 residential units comprising of 214 apartment units and 278 condominium units, and 21,000 sf of ground floor retail space consisting of a restaurant, a café, a community recreation center and a kayak/canoe boat rental. Parking will be provided in an underground garage for approximately 280 residential vehicles and an additional 20 spaces for the on site FPA amenities. Fifteen surface spaces will supplement parking for visitors, retail shoppers, and other building needs. Secure bicycle storage for at least 300 bicycles will be provided. The 2020 Build Condition reflects a future scenario that adds anticipated Project-generated trips to the 2020 No-Build Condition traffic volumes.

3.4.1 VEHICLE SITE ACCESS AND CIRCULATION

Vehicular access/egress will be provided via a full service driveway with connections at the intersection of Clippership Lane/Father Jacobbe Road to the north of the Project site and the intersection of Marginal Street/Lewis Street to the east of the Project site. Access to the garage level parking will be provided via Father Jacobbe Road and Lewis Street. The proposed site access plan is illustrated in **Figure 3-12**.

3.4.2 PARKING

The Project will provide 280 parking spaces for the residential units and 20 FPA spaces in a below grade garage and 15 spaces located along the internal roadway serving as visitor spaces, and spaces for the retail/restaurant uses.

The parking goals developed by the BTD for this section of East Boston are a ***maximum*** of 0.75 to 1.25 parking spaces per residential unit and a maximum of 0.75 to 1.25 parking spaces per 1,000 sf retail space for buildings. The parking ratio of 0.57 spaces per residential unit and 1.2 spaces per 1,000 square feet of commercial space (retail/office and restaurant) is consistent with the district-based parking goals.

3.4.3 LOADING AND SERVICE ACCOMMODATIONS

Loading and service operations can be accommodated on-site along the internal driveway. This includes trash truck activity with trashed wheeled out from the garage level and residential move-in/move-out activity.

Delivery trip estimates were based on data provided in the Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area report. Deliveries to the Project site will be limited to SU-36 trucks and smaller delivery vehicles.

Figure 3-12
Site Plan
Howard/Stein-Hudson Associates, Inc.

Residential units primarily generate delivery trips related to small packages and prepared food. Based on the CTPS report, residential uses generate approximately 0.01 light truck trips per 1,000 square feet of gross floor area and 0.001 medium/heavy truck trips per 1,000 square feet of gross floor area.

Restaurant deliveries include primarily linens and specialty food vendors. Based on the CTPS report, the restaurant space generate approximately 0.70 light truck trips per 1,000 square feet and 0.07 heavy trucks per 1,000 square feet.

Retail/Commercial uses depend on more frequent deliveries from smaller trucks. Based on the CTPS report, retail/commercial uses generate approximately 0.15 light truck trips per 1,000 sf of floor area and 0.15 medium/heavy truck trips per 1,000 sf of gross floor area. A summary of anticipated loading/service activity by land use is presented in **Table 3-7**.

Table 3-7, Expected Delivery Activity

Land Use	Number of Deliveries	General Delivery Times
Residential	5	10% before 7:00 a.m. 70% between 7:00 a.m. and 1:00 p.m. 20% after 1:00 p.m.
Restaurant	5	
Commercial	4	
Total	14	

The Project is expected to generate approximately 14 deliveries per day. It is anticipated that the majority of these deliveries will occur between 7:00 a.m. and 1:00 p.m. These numbers do not include trash truck trips. For this area, trash truck trips generally occur between 5:00 a.m. and 7:00 a.m. and do not coincide with the regular delivery activities. The low number of anticipated deliveries will have minimal impact on the vehicular operations in the study area.

3.4.4 TRIP GENERATION METHODOLOGY

Trip generation is a complex, multi-step process that produces an estimate of vehicle trips, transit trips, walk trips, and bicycle trips associated with a proposed project and a specific land use program. A project's location and proximity to different modes determines how people will travel to and from that project site.

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[2] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well served by

[2] *Trip Generation Manual*, 9th Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

Trip generation estimates for the Project were derived using the following Land Use Codes (LUC):

LUC 220 – Apartment. The apartment land use includes rental dwelling units located within the same building with at least three other dwelling units.

LUC 230 – Condominium/Townhouse. The residential condominium townhouse land use is defined as ownership units that have at least one other owned unit within the same building structure.

LUC 495 – Recreational Community Center. The recreational community center land use consists of stand-alone public facilities These facilities often include classes and clubs for adults and children; meeting rooms; swimming pools and whirlpools; saunas; exercise classes; weightlifting and gymnastics equipment; locker rooms; and a restaurant or snack bar.

LUC 931 – Quality Restaurant. The quality restaurant land use consists of high quality, full-service eating establishments with typical duration of stay of at least one hour. Quality restaurants generally do not serve breakfast; some do not serve lunch; all serve dinner. This type of restaurant often requests and sometimes requires reservations and is generally not part of a chain.

LUC 932 – High-Turnover Restaurant. The high-turnover restaurant land use consists of eating establishments usually moderately priced serving lunch and dinner; they may also be open for breakfast and are sometimes open 24 hours per day.

3.4.5 TRAVEL MODE SHARES

The BTD publishes vehicle, transit, and walking mode split rates for different areas of Boston. The Project is located within designated Area 7 – East Boston. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[3]. The BTD's travel mode share data for Area 7 are shown in **Table 3-8**.

[3] *Summary of Travel Trends: 2009 National Household Travel Survey*; FHWA; Washington, D.C.; June 2011.

Table 3-8, Travel Mode Shares

Land Use		Walk/Bike[1]	Transit[1]	Auto[1]	Local VOR[2]
Daily					
Residential	In	29%	17%	54%	1.13
	Out	29%	17%	54%	1.13
Commercial	In	52%	6%	42%	1.78
	Out	52%	6%	42%	1.78
a.m. Peak Hour					
Residential	In	34%	15%	51%	1.13
	Out	30%	25%	45%	1.13
Commercial	In	58%	5%	37%	1.78
	Out	56%	9%	35%	1.78
p.m. Peak Hour					
Residential	In	30%	25%	45%	1.13
	Out	34%	15%	51%	1.13
Commercial	In	56%	9%	35%	1.78
	Out	58%	5%	37%	1.78

1 Boston Transportation Department mode share data for Area 7 for the residential and retail use.
2 2009 National Household Travel Survey.

3.4.6 PROJECT TRIP GENERATION

The mode share percentages shown in **Table 3-8** were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The trip generation for the Project by mode is shown in **Table 3-9**. The detailed trip generation information is provided in **Appendix**.

Table 3-9, Trip Generation Summary

Time Period	Direction	Walk/Bike Trips	Transit Trips	Vehicle Trips
Daily				
Apartment[1]	In	233	136	383
	Out	233	136	383
	Total	**466**	**272**	**766**
Condominium[2]	In	257	150	423
	Out	257	150	423
	Total	**514**	**300**	**846**
Recreational Community Center[3]	In	210	24	77
	Out	210	24	77
	Total	**420**	**48**	**154**
Quality Restaurant[4]	In	185	21	68
	Out	185	21	68
	Total	**370**	**42**	**136**
High Turnover (Sit-Down) Restaurant[5]	In	136	16	50
	Out	136	16	50
	Total	**272**	**32**	**100**
a.m. Peak Hour				
Apartment[1]	In	8	4	11
	Out	29	25	39
	Total	**37**	**29**	**50**
Condominium[2]	In	8	3	10
	Out	33	27	44
	Total	**41**	**30**	**54**
Recreational Community Center[3]	In	19	2	6
	Out	9	1	3
	Total	**28**	**3**	**9**
Quality Restaurant[4]	In	2	0	1
	Out	1	0	0
	Total	**3**	**0**	**1**
High Turnover (Sit-Down) Restaurant[5]	In	14	1	4
	Out	11	2	3
	Total	**25**	**3**	**7**

Time Period	Direction	Walk/Bike Trips	Transit Trips	Vehicle Trips
p.m. Peak Hour				
Apartment[1]	In	30	25	40
	Out	18	8	24
	Total	**48**	**33**	**64**
Condominium[2]	In	32	26	42
	Out	18	8	23
	Total	**50**	**34**	**65**
Recreational Community Center[3]	In	18	3	5
	Out	19	2	6
	Total	**37**	**5**	**11**
Quality Restaurant[4]	In	22	4	6
	Out	11	1	3
	Total	**33**	**5**	**9**
High Turnover (Sit-Down) Restaurant[5]	In	14	2	4
	Out	10	1	3
	Total	**24**	**3**	**7**

1 Based on ITE LUC 220 – Apartment. Based on 214 units.
2 Based on ITE LUC 230 – Condominium/Townhouse. Based on 278 units.
3 Based on ITE LUC 495 – Recreational Community Center. Based on 14,500 square feet.
4 Based on ITE LUC 931 – Quality Restaurant. Based on 4,000 square feet.
5 Based on ITE LUC 932 – High Turnover Restaurant. Basd on 2,500 square feet.

3.4.7 TRIP GENERATION COMPARISON

Clippership Wharf was previously permitted for redevelopment in 2003. At that time, the redevelopment included 400 condominiums, a 4,500 square foot recreation center, 22,500 square feet of retail, and a 6,000 square foot restaurant. The mode shares utilized in the 2003 permitting were based on US Census data, whereas the current mode shares are based on BTD data. The US Census data relied more heavily on transit use and less on vehicle use. The US Census data, therefore, potentially could underestimate the traffic impacts on local roadways. The trip generation summary of each redevelopment is summarized in Table 3-10.

Table 3-10, Trip Generation Comparison

Time Period	Direction	Walk/Bike	Transit	Vehicle	Total
Daily					
2003 DPIR	In	807	755	700	2,262
	Out	807	755	700	2,262
	Total	**1,614**	**1,510**	**1,400**	**4,524**
2015 NPC	In	1,021	347	1,001	2,369
	Out	1,021	347	1,001	2,369
	Total	**2,042**	**694**	**2,002**	**4,738**
Net Increase	In	214	-408	301	107
	Out	214	-408	301	107
	Total	**428**	**-816**	**602**	**214**
a.m. Peak Hour					
2003 DPIR	In	19	18	18	55
	Out	31	89	57	177
	Total	**50**	**107**	**75**	**232**
2015 NPC	In	51	10	32	93
	Out	83	55	89	227
	Total	**134**	**65**	**121**	**320**
Net Increase	In	32	-8	14	38
	Out	52	-34	32	50
	Total	**84**	**-42**	**46**	**88**
p.m. Peak Hour					
2003 DPIR	In	22	86	50	158
	Out	11	43	25	79
	Total	**33**	**129**	**75**	**237**
2015 NPC	In	116	60	97	273
	Out	76	20	59	155
	Total	**192**	**80**	**156**	**428**
Net Increase	In	94	-26	47	115
	Out	65	-23	34	76
	Total	**159**	**-49**	**81**	**191**

3.4.8 TRIP DISTRIBUTION

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 7 – East Boston, and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in **Figure 3-13**.

3.4.9 BUILD TRAFFIC VOLUMES

The vehicle trips were distributed through the study area. The project-generated trips for the a.m. and p.m. peak hours are shown in **Figure 3-14** and **Figure 3-15**, respectively. The trip assignments were added to the 2020 No-Build Condition vehicular traffic volumes to develop the 2020 Build Condition vehicular traffic volumes. The 2020 Build a.m. and p.m. peak hour traffic volumes are shown on, **Figure 3-16** and **Figure 3-17**, respectively.

3.4.10 TRANSIT ACCOMMODATIONS

Based on the transit mode shares presented in **Table 3-8,** the future transit trips associated with the Project were estimated to be approximately 65 new transit trips occurring during the a.m. peak hour (10 alighting and 55 boarding), and 80 new trips occurring during the p.m. peak hour (60 alighting and 20 boarding). These transit trips will be made on the Blue Line at Maverick Station or one of the buses that stop in the vicinity of the Project. A reduction in vehicle trips due to the expected ferry service was not applied. However it should be expected that the transit mode share will increase was this service is provided by the City.

3.4.11 PEDESTRIANS ACCOMMODATIONS

Over the course of a day, the Project will generate an estimated 2,042 new pedestrian trips and an additional 694 new transit trips that will require a walk to or from the Site. Approximately 134 new pedestrian trips (with an additional 65 transit trips) will occur during the a.m. peak hour and 192 new pedestrian trips (with an additional 80 transit trips) will occur during the p.m. peak hour.

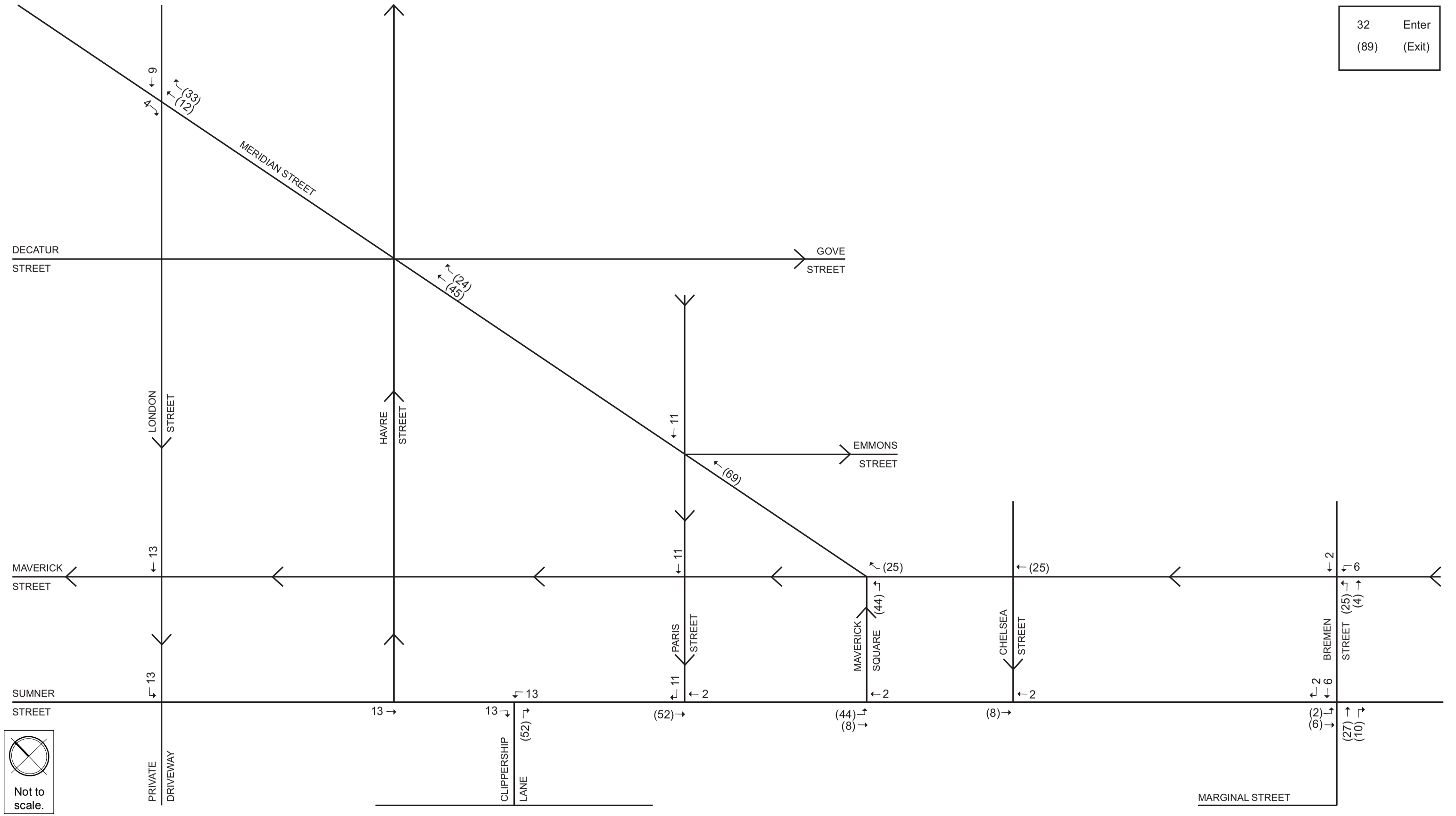
The additional pedestrian activity in the area can be accommodated by the existing amenities (sidewalks, crosswalks, etc). The pedestrian destined for the blue can access Maverick Station from the kiosk located adjacent to the project along Lewis Wharf.

3.4.12 BICYCLE ACCOMMODATIONS

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and employees and

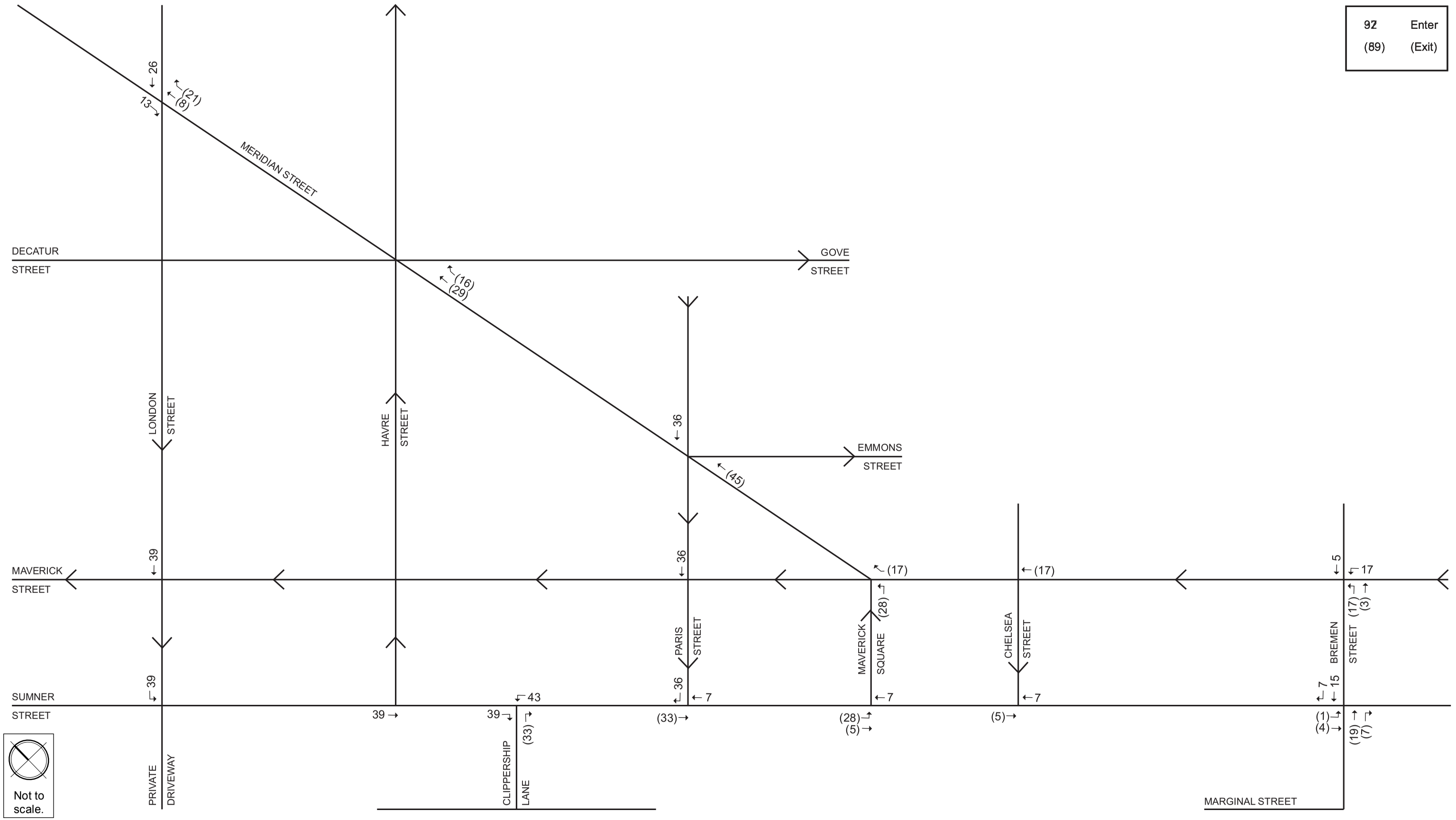
East Boston, Massachusetts

Figure 3-13
Trip Distribution
Howard/Stein-Hudson Associates, Inc.



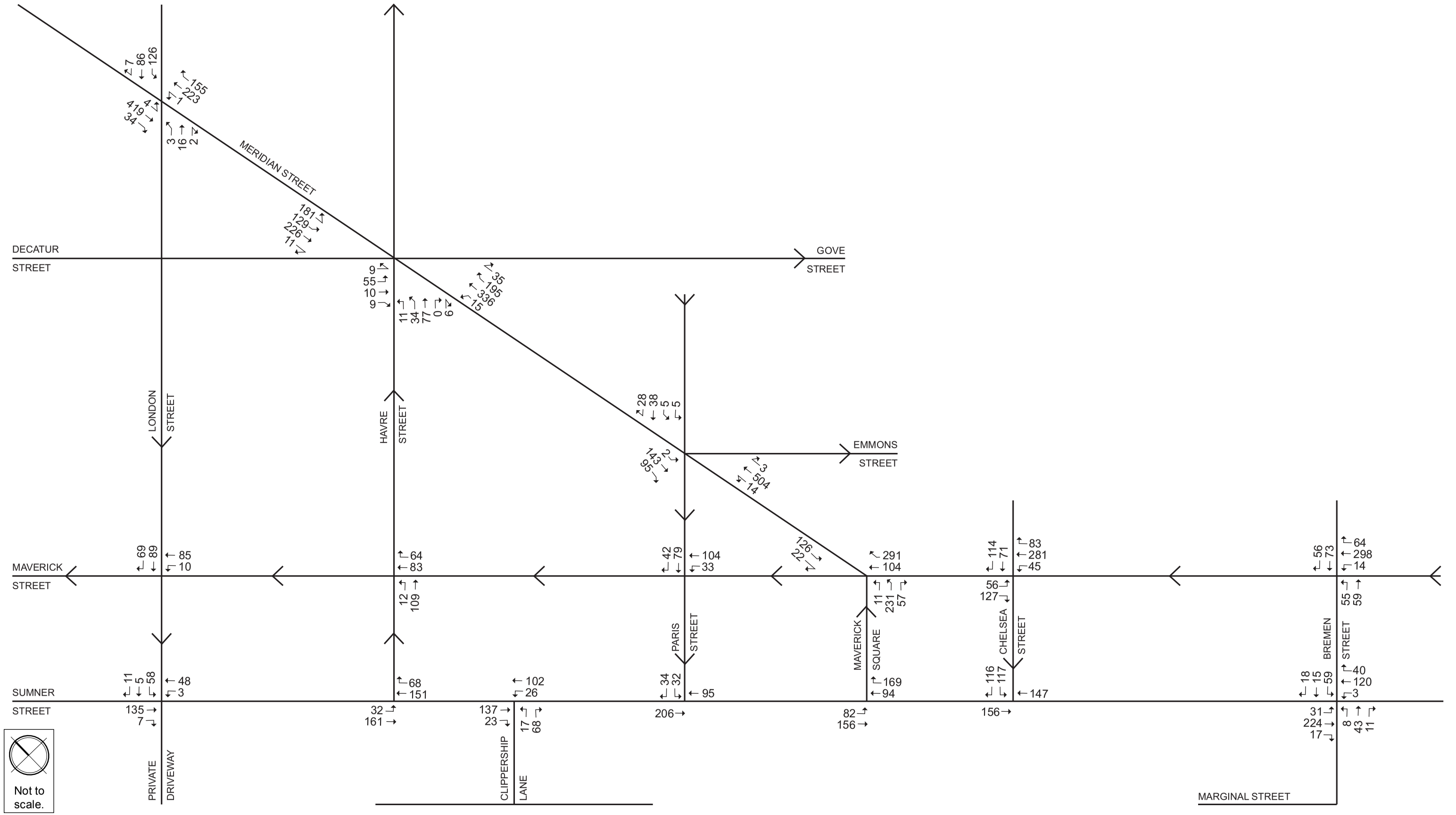
East Boston, Massachusetts

Figure 3-14
Project-generated Trips, a.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.



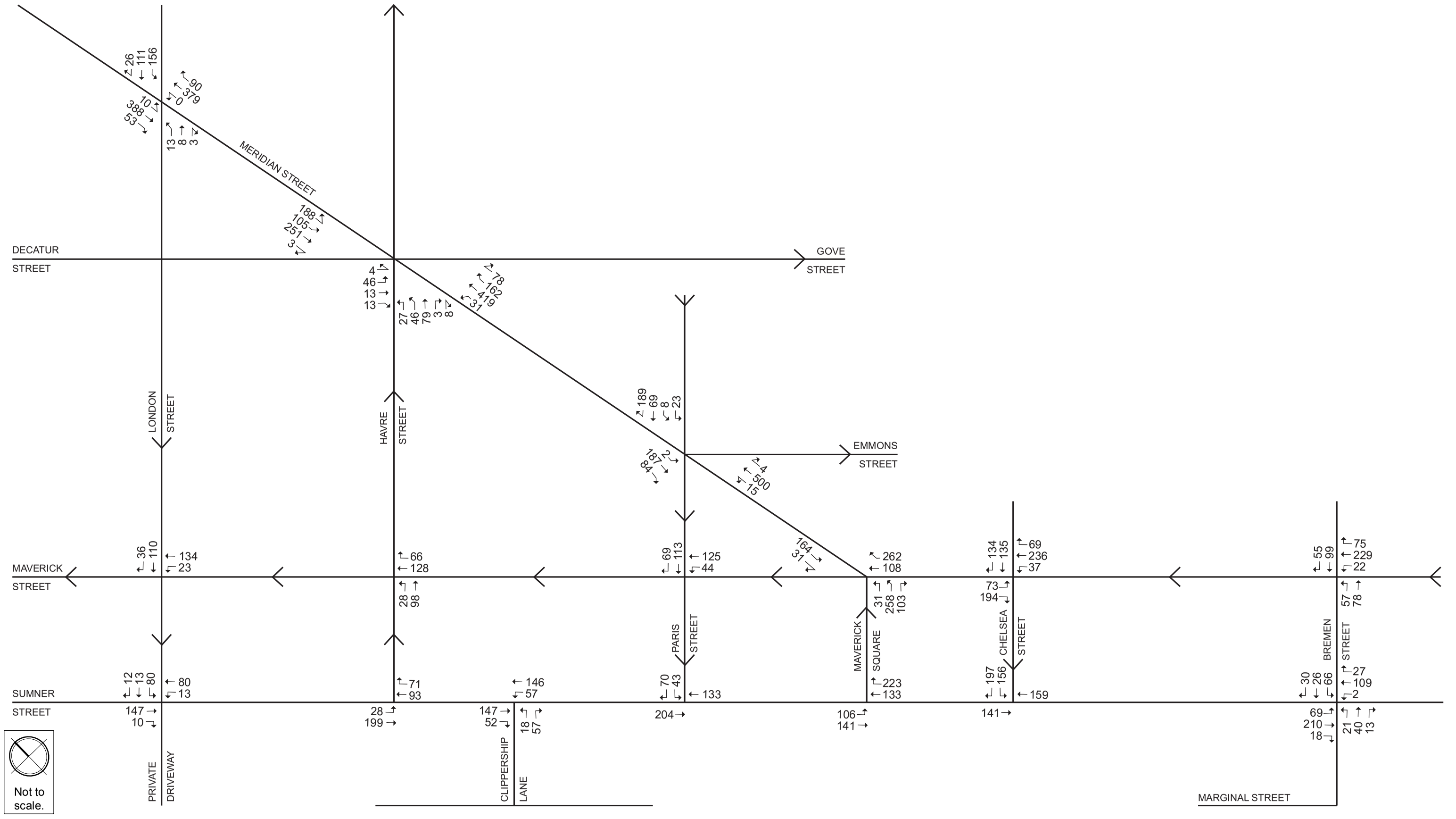
East Boston, Massachusetts

Figure 3-15
Project-generated Trips, p.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.



East Boston, Massachusetts

Figure 3-16
Build Condition (2020) Traffic Volumes, a.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.



East Boston, Massachusetts

Figure 3-17
Build Condition (2020) Traffic Volumes, p.m. Peak Hour
Howard/Stein-Hudson Associates, Inc.

secure bicycle storage spaces on-site. Additional storage will be provided by outdoor bicycle racks accessible to visitors to the site in accordance with BTD guidelines.

All bicycle racks, signs, and parking areas will conform to BTD guidelines and be located in safe, secure locations. The Proponent will work with BTD to identify the most appropriate quantity and location for bicycle racks on the Project Site as part of the Transportation Access Plan Agreement (TAPA) process.

3.4.13 BUILD CONDITION TRAFFIC OPERATIONS

The 2020 Build Condition traffic operations analyses use the same methodology as the 2015 Existing and 2020 No-Build Condition analyses. The results of the 2020 Build Condition traffic analysis at study area intersections are presented in **Table 3-11** and **3-12** for the a.m. and p.m. peak hours, respectively. The shaded cells in the tables indicate a decrease in LOS between the 2020 No-Build Condition and the 2020 Build Condition. The detailed analysis sheets are provided in the **Appendix**.

As discussed previously, it is important to recognize that the forecasted delays/queues under LOS E or LOS F are overestimated when compared to observations made in real world conditions. This is due to the HCM analysis for stop controlled intersections incorporating more conservative parameters than what is typically experienced in an urban environment.

Table 3-11, Build (2019) Level of Service Summary, a.m. Peak Hour

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Sumner Street/London Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.11	-	0
Sumner Street WB left/thru	A	0.5	0.00	-	0
London Street SB left/thru/right	B	11.4	0.14	-	12
Sumner Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru	A	1.5	0.03	-	2
Sumner Street WB thru/right	A	0.0	0.08	-	0
Sumner Street/Clipper Ship Lane	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.12	-	0
Sumner Street WB left/thru	A	1.8	0.03	-	2
Clipper Ship Lane NB left/right	B	11.1	0.19	-	17
Sumner Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru	A	0.0	0.16	-	0
Sumner Street WB thru	A	0.0	0.07	-	0
Paris Street SB left/right	B	11.5	0.13	-	11
Sumner St/Maverick Sq/Chelsea St (signalized)	**C**	**32.6**	**0.86**	**-**	**-**
Sumner Street EB left/thru	D	38.0	0.73	117	#226
Sumner Street WB thru/right	C	22.9	0.36	70	104
Chelsea Street SB left/right/u-turn	E	57.1	0.86	112	#229
Sumner Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru/right	A	1.4	0.04	-	3
Sumner Street WB left/thru/right	A	0.2	0.00	-	0
Bremen Street NB left/thru/right	D	27.5	0.41	-	47
Bremen Street SB left/thru/right	F	56.8	0.63	-	88
Maverick Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/right	B	12.3	0.51	-	73
Bremen Street NB left/thru	A	9.9	0.23	-	23
Bremen Street SB thru/right	A	9.4	0.22	-	20
Meridian St/Chelsea St/Maverick St/Maverick Sq	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/slight right/right	C	17.0	0.65	-	120
Maverick Square NB left/slight left/slight right/u-turn	B	14.4	0.52	-	75
Chelsea Street SB thru/right/hard right	B	10.7	0.31	-	33
Meridian St SEB hard left/slight left/slight right/hard right	B	12.4	0.35	-	40
Maverick Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	8.4	0.18	-	18
Paris Street SB thru/right	A	8.1	0.18	-	15
Maverick Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB thru/right	A	8.2	0.19	-	18
Havre Street NB left/thru	A	8.5	0.19	-	18

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Maverick Street/London Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	0.8	0.01	-	1
London Street SB thru/right	B	12.3	0.36	-	40
Meridian Street/Paris Street/Emmons Street	**-**	**-**	**-**	**-**	**-**
Paris Street SB slight left/thru/hard right	D	31.0	0.57	-	81
Meridian Street SEB slight left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/hard right	A	0.4	0.01	-	1
Meridian Street/Havre Street/Decatur Street/Gove Street	**-**	**-**	**-**	**-**	**-**
Havre Street NB slight left/thru/right/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/slight left/thru/hard right	A	8.9	0.38	-	46
Meridian Street NWB slight left/thru/slight right/hard right	A	0.4	0.01	-	1
Meridian Street/London Street	**-**	**-**	**-**	**-**	**-**
London Street NB slight left/thru/hard right	F	58.3	0.36	-	36
London Street SB slight left/thru/hard right	F	>100	>1.50	-	473
Meridian Street SEB hard left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/slight right	A	0.0	0.00	-	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by an upstream signal.
Grey shading indicates a decrease to LOS E or F when compared to the No-Build Condition analysis.

Table 3-12, Build (2019) Level of Service Summary, p.m. Peak Hour

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Sumner Street/London Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.11	-	0
Sumner Street WB left/thru	A	1.1	0.01	-	1
London Street SB left/thru/right	B	12.7	0.23	-	22
Sumner Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru	A	1.1	0.02	-	2
Sumner Street WB thru/right	A	0.0	0.11	-	0
Sumner Street/Clipper Ship Lane	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru/right	A	0.0	0.13	-	0
Sumner Street WB left/thru	A	2.5	0.05	-	4
Clipper Ship Lane NB left/right	B	11.2	0.13	-	11
Sumner Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB thru	A	0.0	0.13	-	0
Sumner Street WB thru	A	0.0	0.09	-	0
Paris Street SB left/right	B	12.1	0.09	-	17
Sumner St/Maverick Sq/Chelsea St (signalized)	**D**	**38.5**	**0.94**	**-**	**-**
Sumner Street EB left/thru	D	51.5	0.84	113	#244
Sumner Street WB thru/right	C	23.6	0.38	72	114
Chelsea Street SB left/right/u-turn	E	57.7	0.94	132	#293
Sumner Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Sumner Street EB left/thru/right	A	2.3	0.06	-	5
Sumner Street WB left/thru/right	A	0.1	0.00	-	0
Bremen Street NB left/thru/right	C	18.7	0.24	-	23
Bremen Street SB left/thru/right	C	23.6	0.43	-	52
Maverick Street/Bremen Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/right	B	12.4	0.50	-	70
Bremen Street NB left/thru	B	10.2	0.27	-	28
Bremen Street SB thru/right	A	9.7	0.26	-	25
Meridian St/Chelsea St/Maverick St/Maverick Sq	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru/slight right/right	B	14.7	0.55	-	83
Maverick Square NB left/slight left/slight right/u-turn	C	19.2	0.68	-	133
Chelsea Street SB thru/right/hard right	B	12.6	0.45	-	58
Meridian St SEB hard left/slight left/slight right/hard right	B	12.5	0.36	-	40
Maverick Street/Paris Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB left/thru	A	9.0	0.25	-	25
Paris Street SB thru/right	A	8.9	0.29	-	30
Maverick Street/Havre Street	**-**	**-**	**-**	**-**	**-**
Maverick Street WB thru/right	A	8.5	0.25	-	25
Havre Street NB left/thru	A	8.6	0.20	-	18

Intersection/Approach	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue length (feet)	95th Percentile Queue length (feet)
Maverick Street/London Street	-	-	-	-	-
Maverick Street WB left/thru	A	1.2	0.02	-	1
London Street SB thru/right	B	12.6	0.27	-	27
Meridian Street/Paris Street/Emmons Street	-	-	-	-	-
Paris Street SB slight left/thru/hard right	F	>100	1.14	-	336
Meridian Street SEB slight left/thru/slight right	A	0.1	0.00	-	0
Meridian Street NWB hard left/thru/hard right	A	0.4	0.02	-	1
Meridian Street/Havre Street/Decatur Street/Gove Street	-	-	-	-	-
Havre Street NB slight left/thru/right/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/slight left/thru/hard right	B	10.1	0.42	-	52
Meridian Street NWB slight left/thru/slight right/hard right	A	0.7	0.03	-	2
Meridian Street/London Street	-	-	-	-	-
London Street NB slight left/thru/hard right	F	>100	>1.50	-	Err
London Street SB slight left/thru/hard right	F	>100	>1.50	-	Err
Meridian Street SEB hard left/thru/slight right	A	0.5	0.02	-	1
Meridian Street NWB hard left/thru/slight right	A	0.0	0.00	-	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by an upstream signal.
Grey shading indicates a decrease to LOS E or F when compared to the No-Build Condition analysis.

In the Build Condition, the signalized intersection of **Sumner Street/Maverick Square/Chelsea Street** continues to operate at LOS C during the weekday a.m. peak hour and at LOS D during the weekday p.m. peak hour. The Sumner Street eastbound approach decreases from LOS C to LOS D during the weekday a.m. peak hour. All other approaches continue to operate at the same LOS as compared to the No-Build Condition. The longest queues continue to occur at the Chelsea Street southbound approach during both the weekday a.m. and p.m. peak hours.

In the Build Condition, all unsignalized intersection approaches continue to operate at the same LOS as compared to the No-Build Condition during both the weekday a.m. and p.m. peak hours with the exception of:

Sumner Street/Bremen Street – The Bremen Street northbound approach decreases from LOS C to LOS D and the Bremen Street southbound approach decreases from LOS E to LOS F during the weekday a.m. peak hour.

Maverick Street/Bremen Street – The Bremen Street northbound approach decreases from LOS A to LOS B during the weekday p.m. peak hour.

Meridian Street/Paris Street/Emmons Street – The Paris Street southbound approach decreases from LOS C to LOS D during the weekday a.m. peak hour.

Meridian Street/Havre Street/Decatur Street/Gove Street – The Meridian Street southeast bound approach decreases from LOS A to LOS B during the weekday p.m. peak hour.

Meridian Street/London Street– The London Street northbound approach decreases from LOS E to LOS F during the weekday a.m. peak hour.

3.5 TRANSPORTATION MITIGATION MEASURES

While the traffic impacts associated with the new Project generated trips are minimal, the Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle usage. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible; the installation of new, accessible ramps; improvements to street lighting where necessary; planting of street trees; and providing bicycle storage racks surrounding the site, where appropriate.

During field visits it was noted that the southbound Meridien Street approach at Havre Street will back up due to vehicles turning left onto Havre Street to access Route 1A North. A left turn lane could be provided within the existing roadway width. This would require the removal of parking on the west side of Meridien Street; however it would alleviate some of the congestion for motorists traveling southbound through the intersection.

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

The Proponent will also produce a Construction Management Plan (CMP) for review and approval by BTD. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project. See **Section 3.8** for additional information related to the CMP.

3.6 TRANSPORTATION DEMAND MANAGEMENT

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to reduce dependence on automobiles. TDM will be facilitated by the nature and location of the Project.

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

The Proponent is prepared to take advantage of the good transit access in marketing the site to future residents by working with them to implement the following demand management measures to encourage the use of non-vehicular modes of travel.

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

- Orientation Packets**:** The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby Zipcar locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.

- Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ride-sharing, bicycling, alternative work schedules, and other travel options.

- Transportation Coordinator: The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries, and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.

- Bicycle Accommodation: The Proponent will provide bicycle storage in secure, sheltered areas for residents. Secure bicycle storage will also be made available to employees and visitors of the commercial portion of the site to encourage bicycling as an alternative mode of transportation. Subject to necessary approvals, public use bicycle racks for visitors will be placed near building entrances.

- Electric Vehicle Charging: The Proponent is currently exploring the feasibility of providing electric vehicle charging stations on-Site.

- Zipcar Facilities: The Proponent is committed to working with Zipcar to provide on-site spaces that will be easily accessible to the residents of the Site.

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

3.7 EVALUATION OF SHORT-TERM CONSTRUCTION IMPACTS

Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (CMP) to be filed with BTD in accordance with the City's transportation maintenance plan requirements. The CMP will also address the need for pedestrian detours, lanes closures, and/or parking restrictions, if necessary, to accommodate a safe and secure work zone.

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

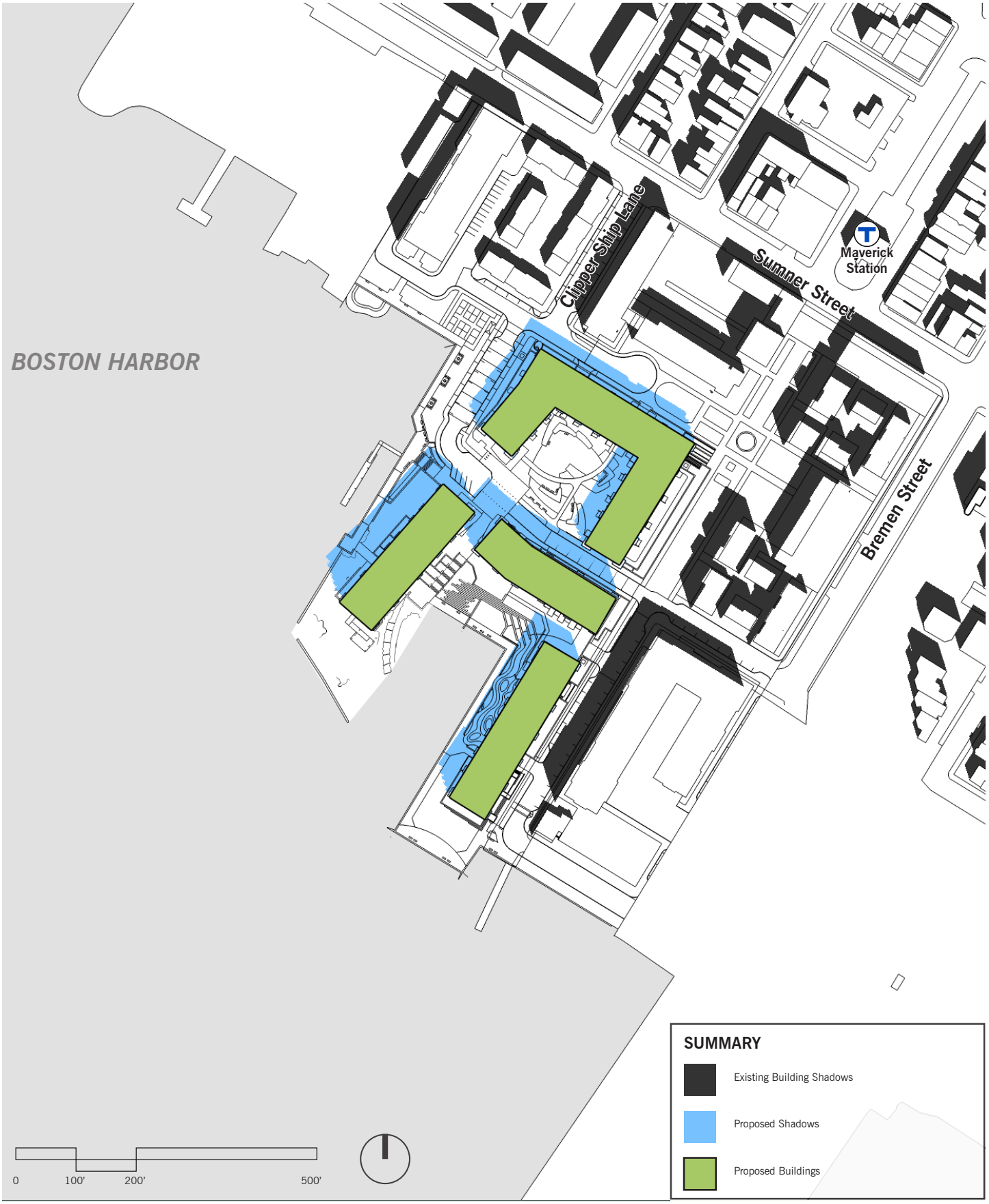
- Construction workers will be encouraged to use public transportation and/or carpool.
- A subsidy for MBTA passes will be considered for full-time employees; and
- Secure spaces will be provided on-site for workers' supplies and tools so they do not have to be brought to the site each day.

APPENDIX 4

SHADOW STUDY

East Boston, Massachusetts

Figure 4-1
Shadow Study - March 21, 9am
Source: The Architectural Team Inc., 2015



East Boston, Massachusetts

Figure 4-2
Shadow Study - March 21, 12pm
Source: The Architectural Team Inc., 2015

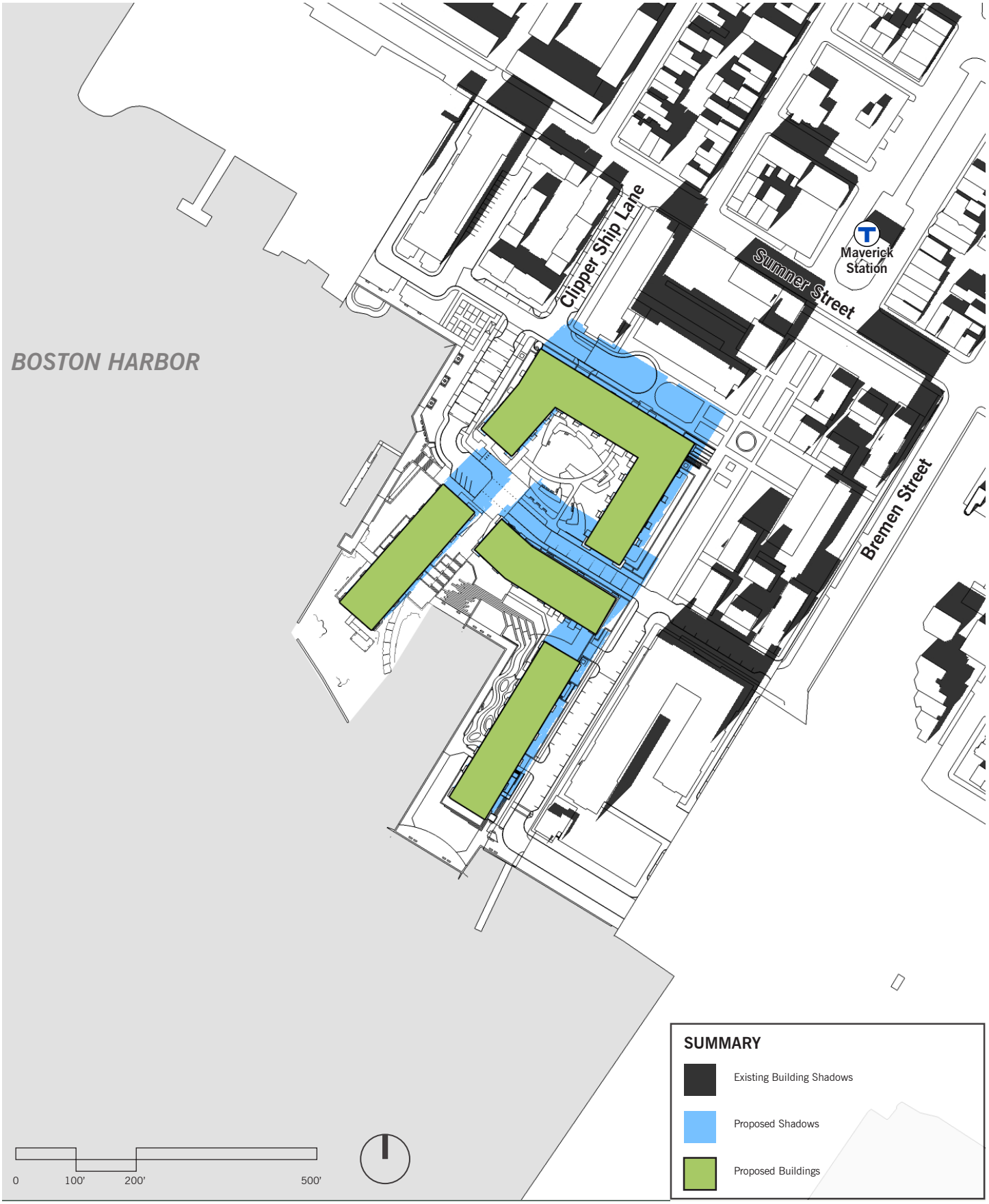


Figure 4-3
Shadow Study - March 21, 3pm
Source: The Architectural Team Inc., 2015

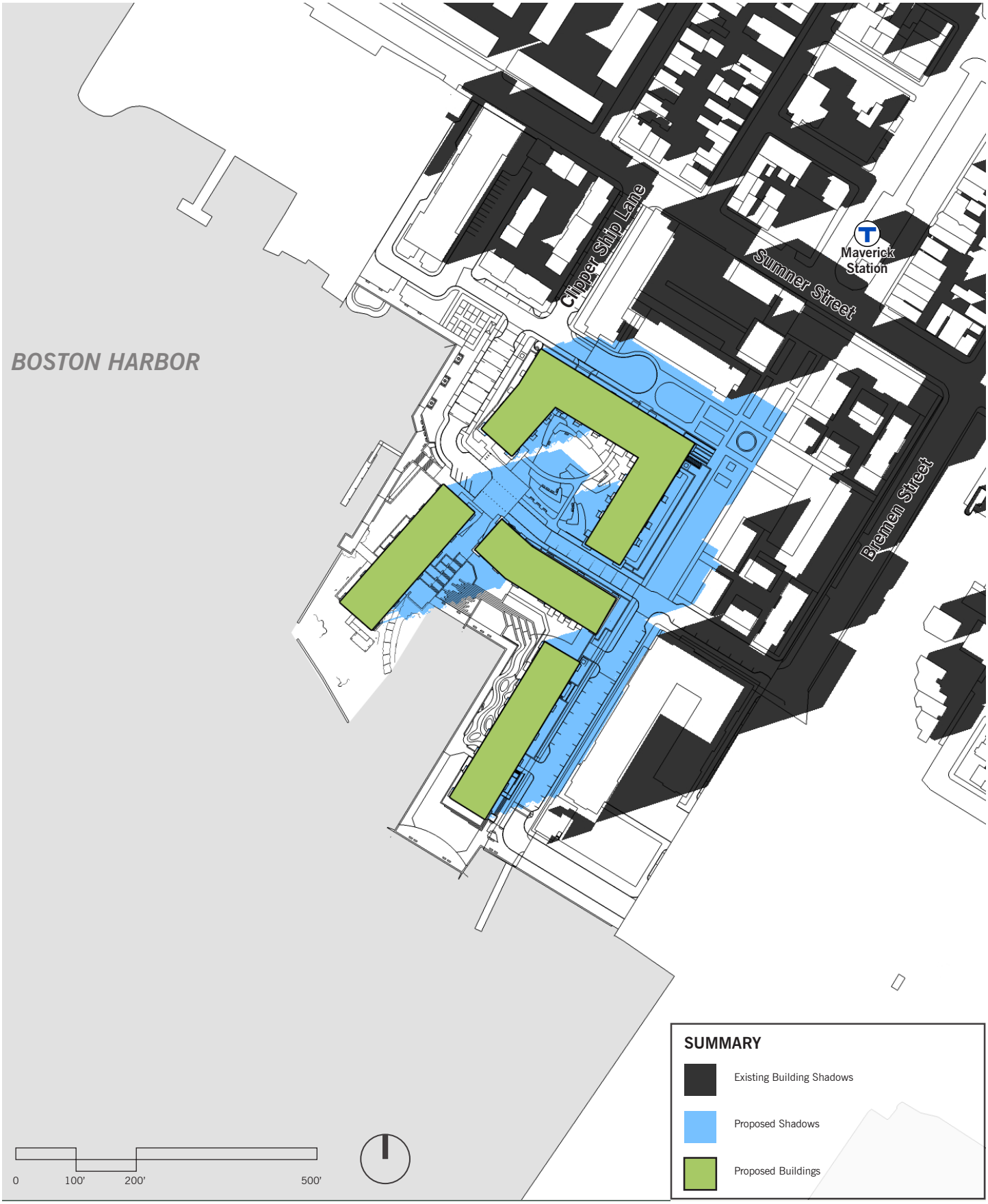
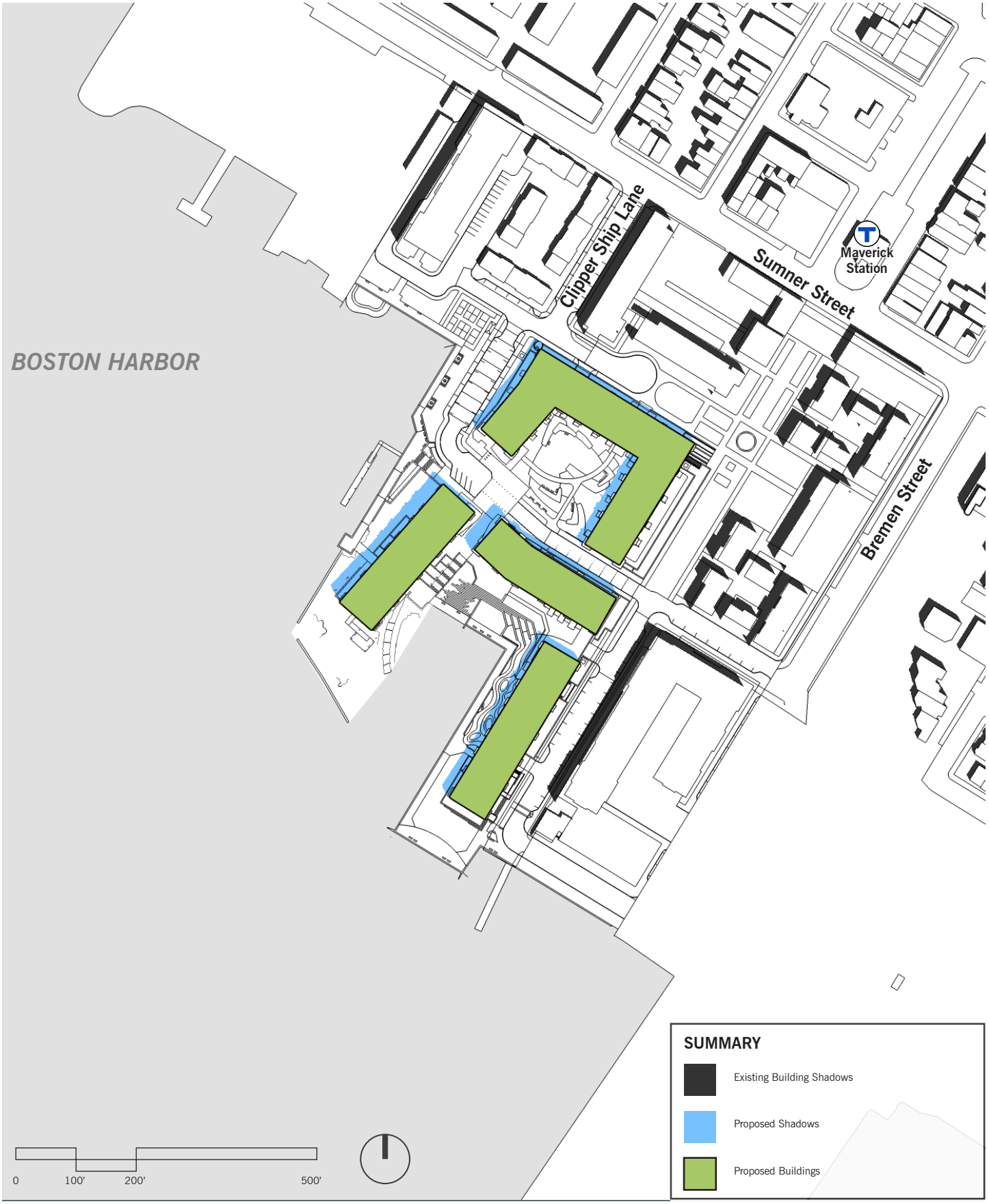


Figure 4-4
Shadow Study - March 21, 5pm
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 4-5
Shadow Study - June 21, 9am
Source: The Architectural Team Inc., 2015



East Boston, Massachusetts

Figure 4-6
Shadow Study - June 21, 12pm
Source: The Architectural Team Inc., 2015

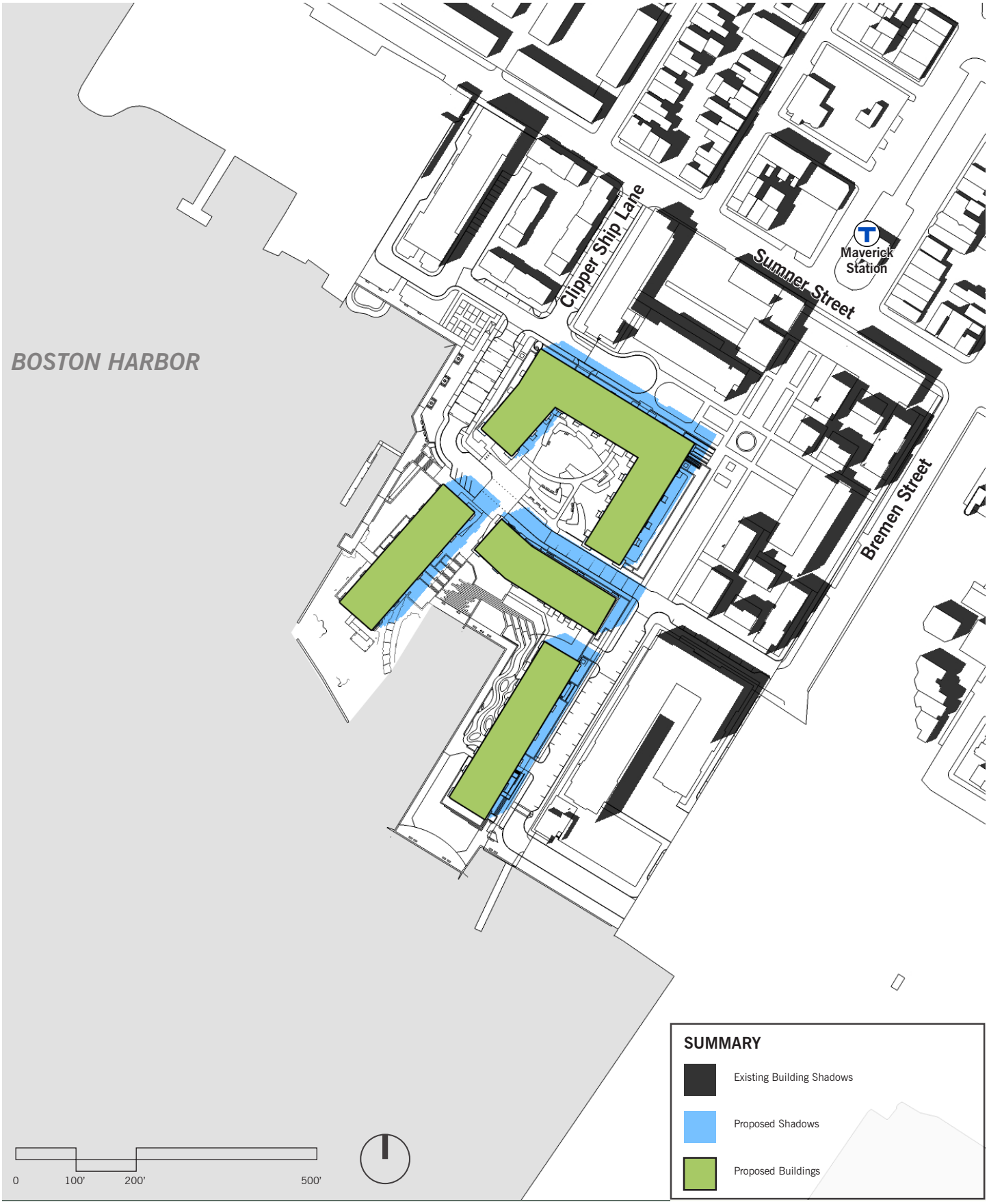


Figure 4-7
Shadow Study - June 21, 3pm
Source: The Architectural Team Inc., 2015

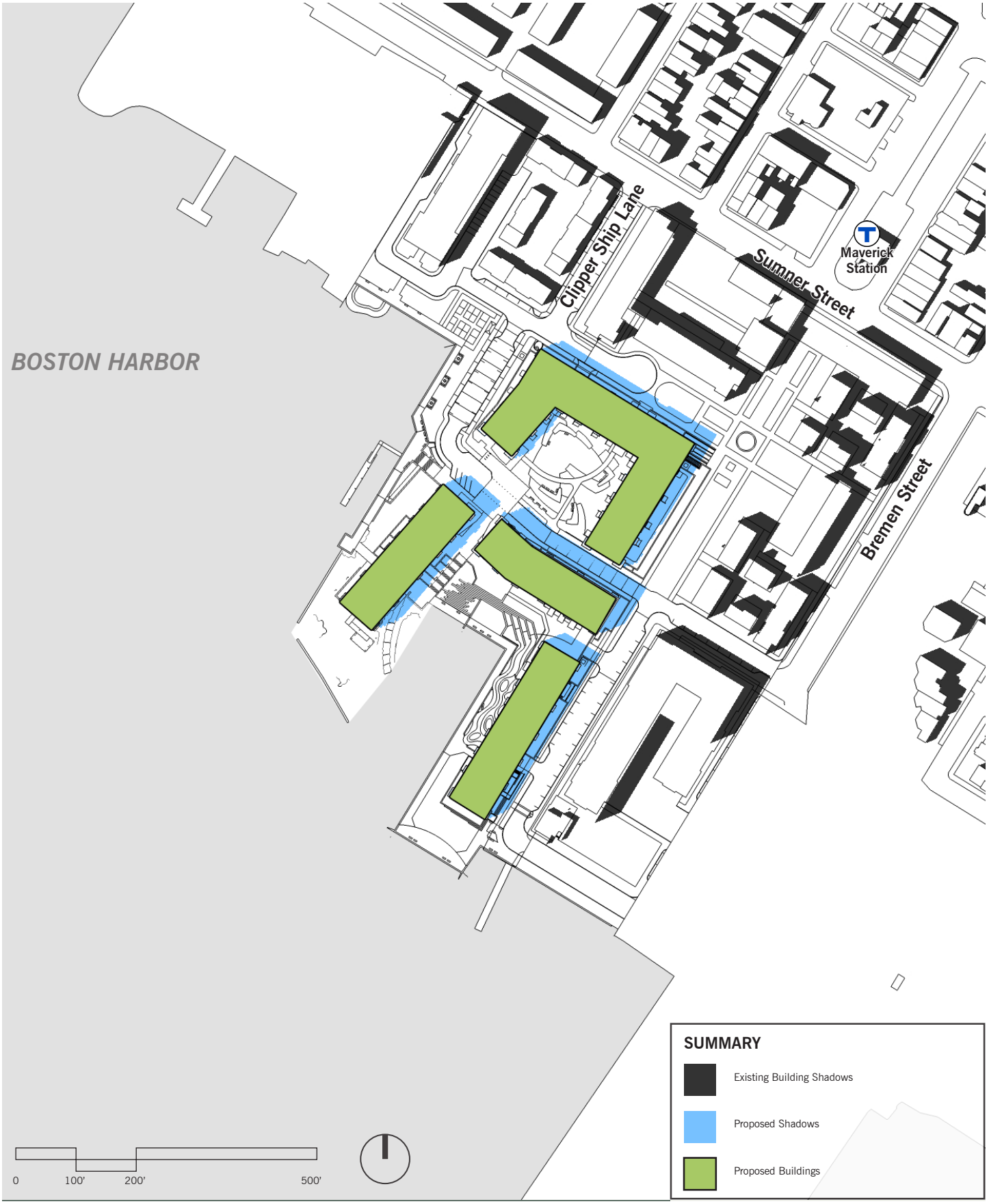
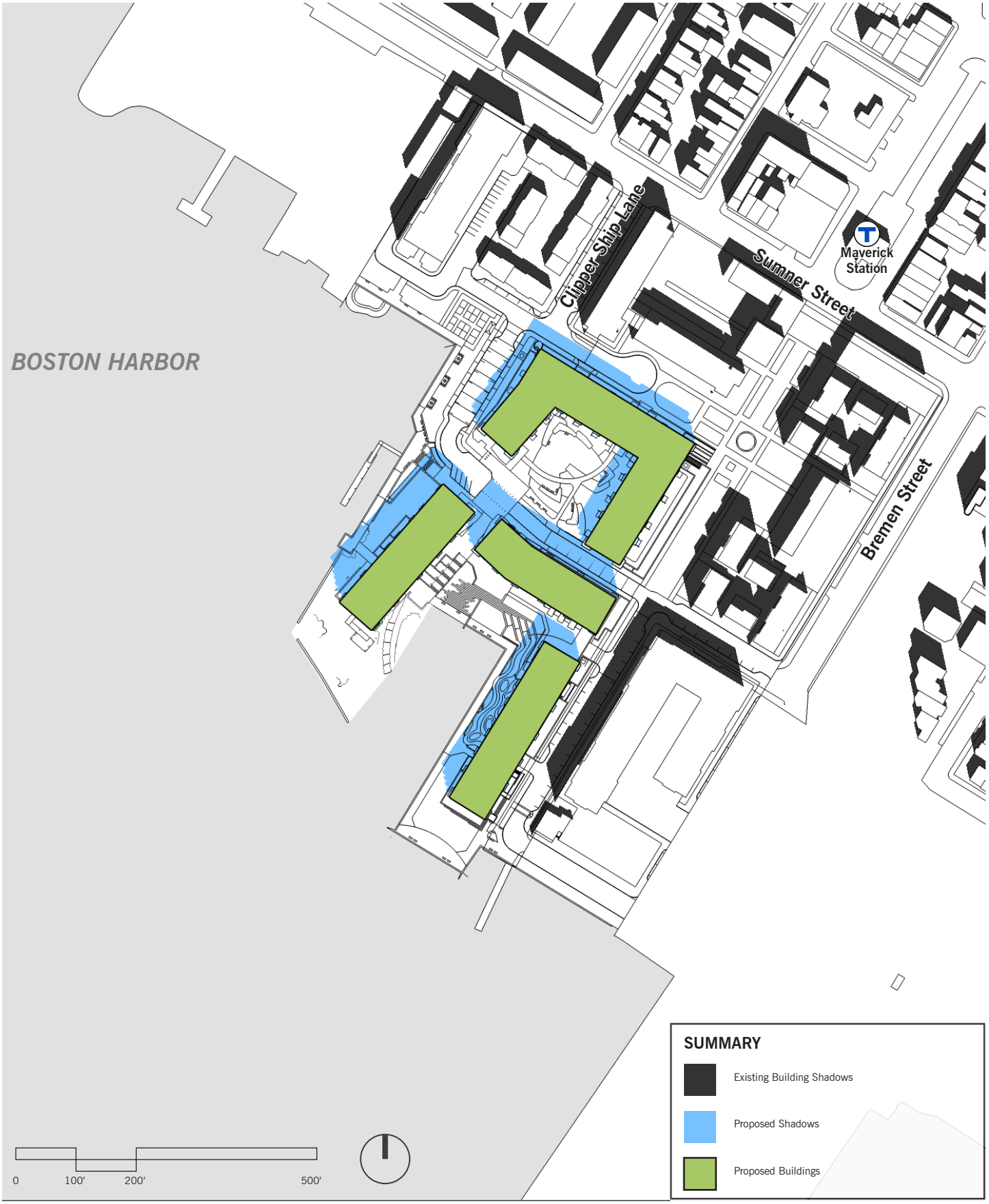


Figure 4-8
Shadow Study - June 21, 5pm
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

Figure 4-9
Shadow Study - September 21, 9am
Source: The Architectural Team Inc., 2015



East Boston, Massachusetts

Figure 4-10
Shadow Study - September 21, 12pm
Source: The Architectural Team Inc., 2015

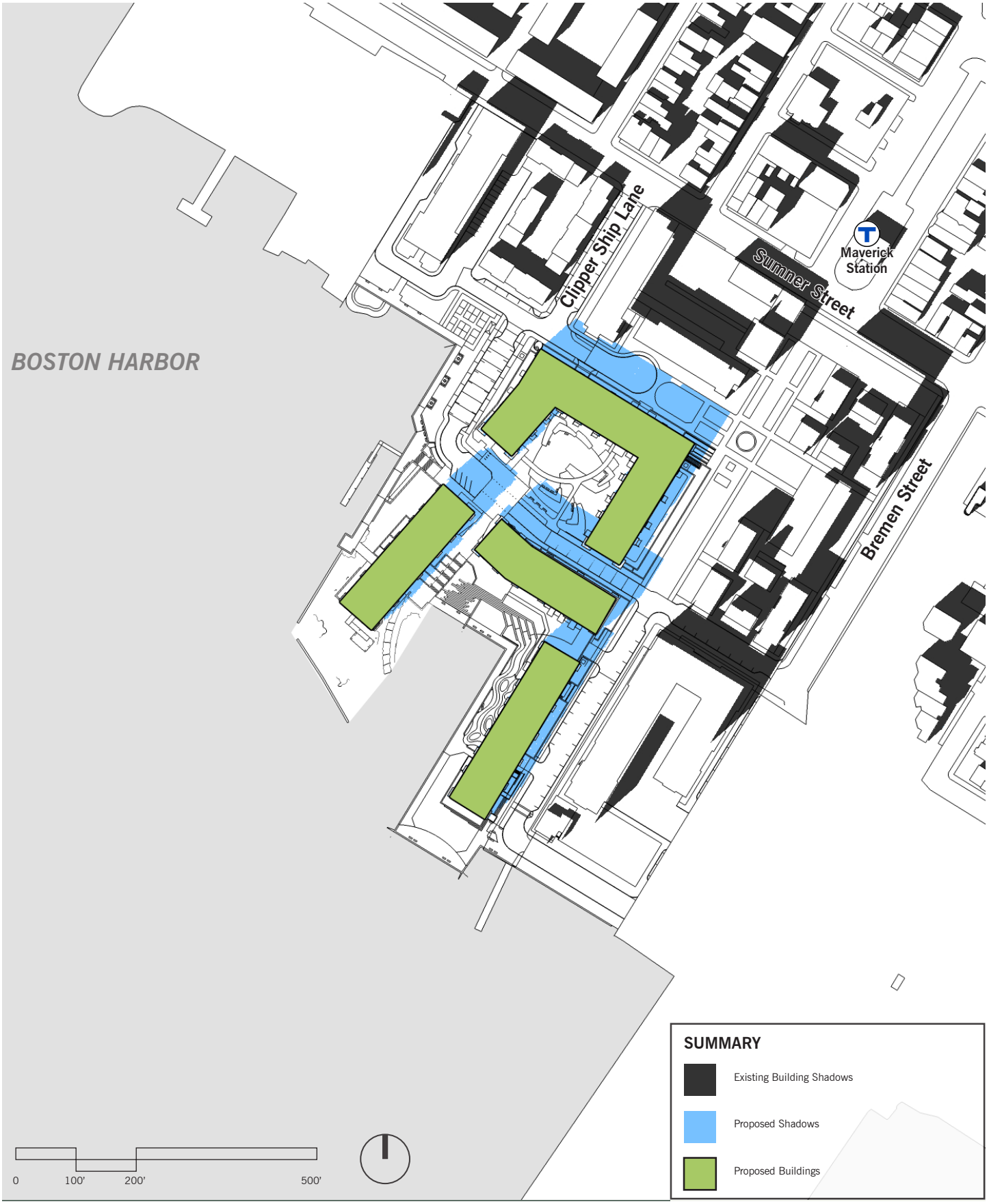


Figure 4-11
Shadow Study - September 21, 3pm
Source: The Architectural Team Inc., 2015

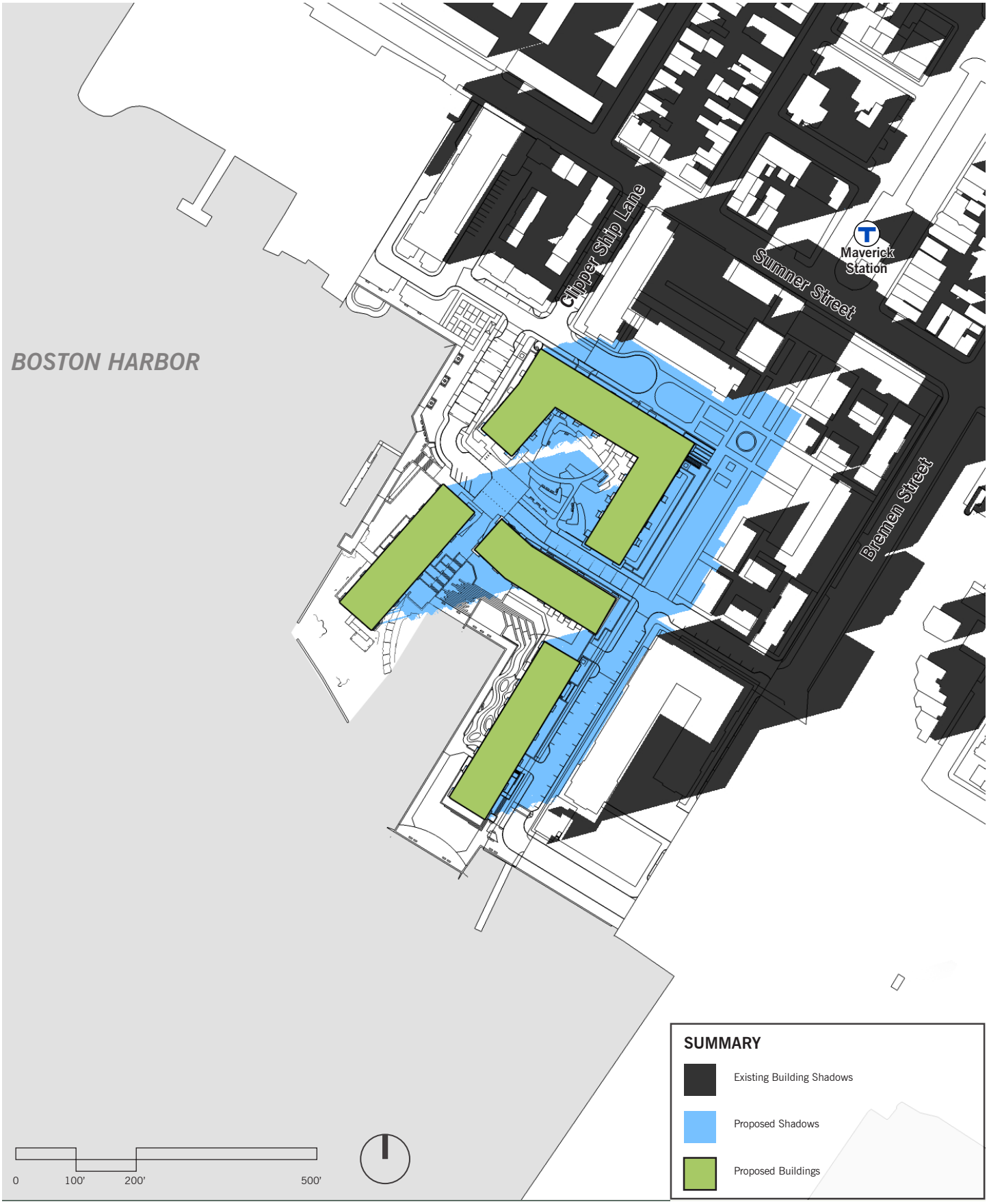
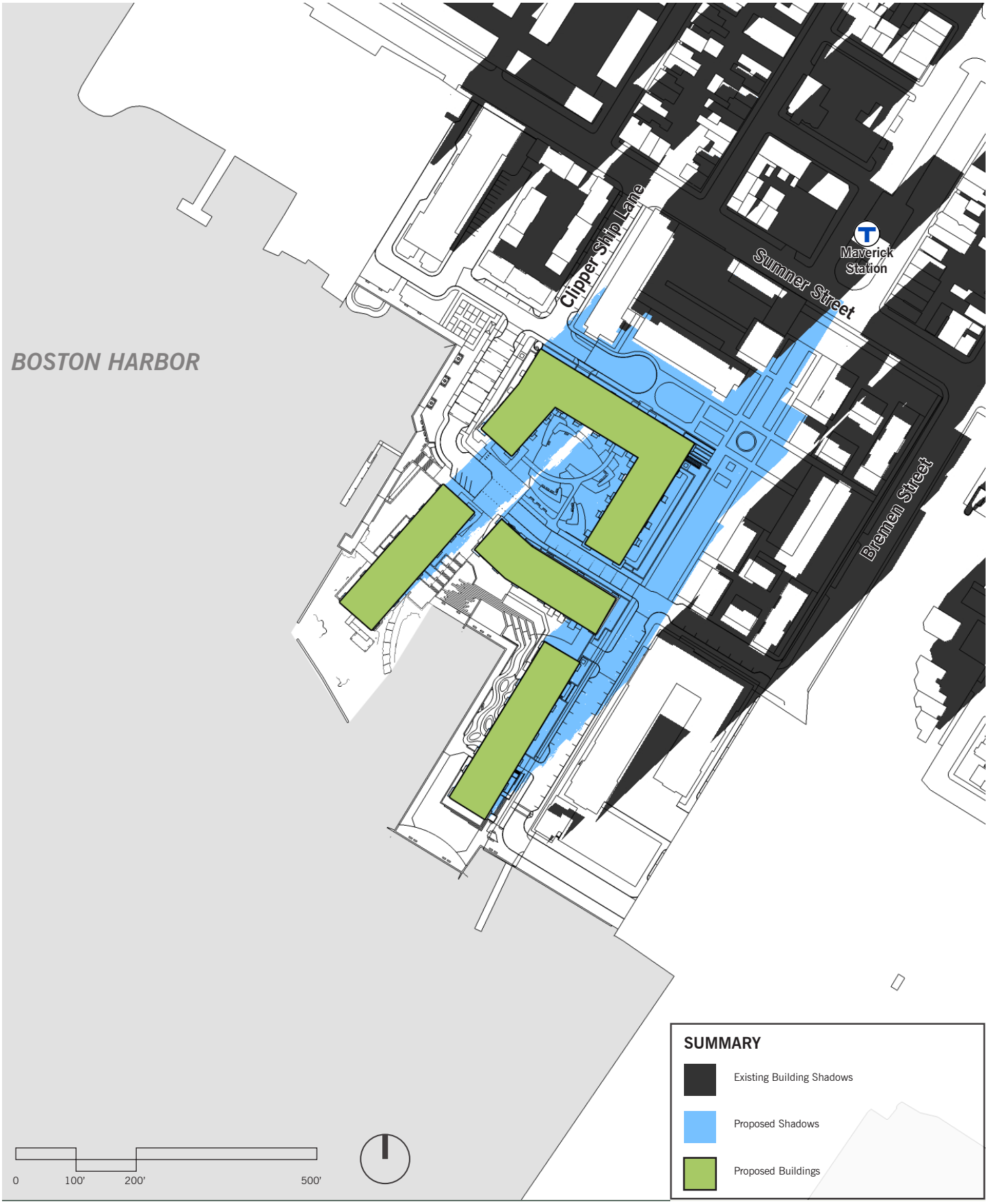


Figure 4-12
Shadow Study - September 21, 5pm
Source: The Architectural Team Inc., 2015

East Boston, Massachusetts

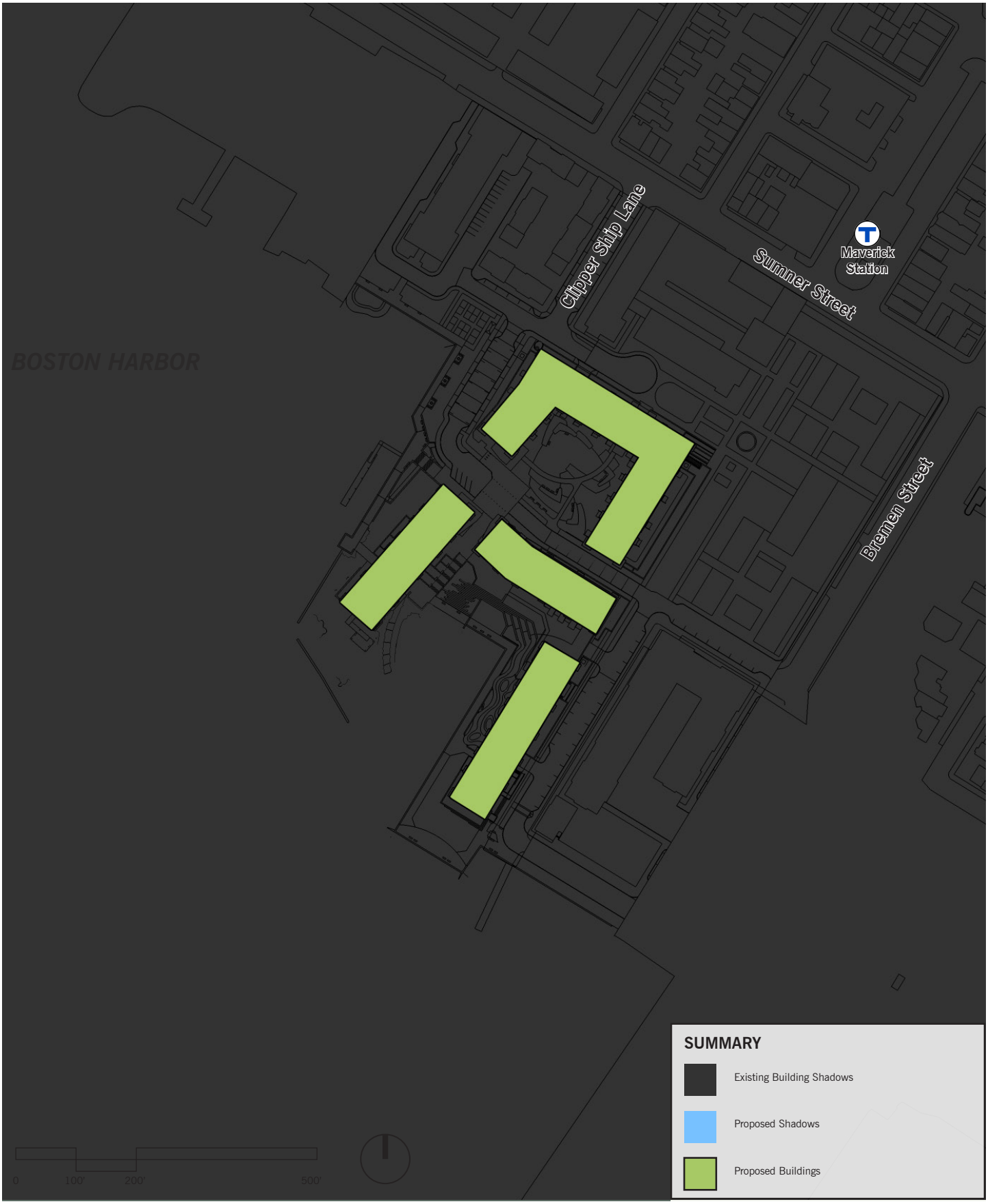
Figure 4-13
Shadow Study - December 21, 9am
Source: The Architectural Team Inc., 2015

Figure 4-14
Shadow Study - December 21, 12pm
Source: The Architectural Team Inc., 2015



East Boston, Massachusetts

Figure 4-15
Shadow Study - December 21, 3pm
Source: The Architectural Team Inc., 2015



East Boston, Massachusetts

Figure 4-16
Shadow Study - December 21, 5pm
Source: The Architectural Team Inc., 2015

APPENDIX 5

MEMORANDUM FROM THE BOSTON REDEVELOPMENT AUTHORITY

Letter 5

MEMORANDUM

TO: David Hanifin

FROM: Richard Mertens

DATE: June 23, 2003

SUBJECT: Clippership Wharf

The proposed Clippership Wharf project, located on abandoned waterfront property in East Boston just south of Maverick Square, consists of a predominantly residential development of approximately 400 residential units in four buildings (including 8 artists live/work units) with a mix of retail, restaurant, arts and educational, community, and water-dependent uses on the ground floors and 670 underground parking spaces to serve residents and the site's commercial and community uses. Four acres of new public open space, including 3.3 acres of landscaped areas, sidewalks, and approximately 1,715 linear feet of Harborwalk wrapping around the site's waterfront edge, together with two new floating docks for water transportation vessels, also are proposed at the site. Approximately 1.8 acres of existing deteriorated pile fields and decking will be removed from Boston Harbor.

The project proponent – Noodle Island Limited Partnership – has filed a very comprehensive joint Draft Project Impact Report/Draft Environmental Impact Report (DPIR/DEIR) detailing the potential environmental, tidelands, transportation, urban design, infrastructure, and historic resources impacts of the proposed development. The document, for the most part, has satisfactorily responded to the BRA's Scoping Determination and has provided sufficient documentation to support a conclusion that this project should result in minimal environmental impact. The major environmental findings can be summarized as follows:

Wind – According to the qualitative pedestrian level wind study, no dangerous or unacceptable winds, or winds exceeding the BRA's guideline criterion, will be created by the proposed project. Except for one location (the southeast corner of the proposed Carlton Wharf building, where uncomfortable conditions are predicted for easterly storm winds and for annual winds – a condition which also exists under No-Build conditions), all winds are predicted to be in one of the three "comfortable" categories. For nearly all locations studied, the proposed project will maintain or improve existing wind conditions. Two locations are predicted to experience increased windiness with the project but still will remain comfortable. Wind conditions along the entire Harborwalk are predicted to be comfortable for walking. The principal areas where existing winds will be reduced to "comfortable for sitting/standing" are within the Central Garden and the plaza area between Buildings 1 and 2, along Marginal Street, and along Lewis Mall/Street (due to the sheltering effects of existing and proposed buildings). No dangerous wind conditions are predicted in the watersheet around the project.

Shadow – Due to the building orientation, shadows cast by the project buildings will primarily affect the project's Central Garden and plaza area at various times throughout the day, the Harborwalk along Clippership Lane in the morning hours, and Lewis Street/Mall in the afternoon hours. Very minimal to no shadows are predicted to fall on the open spaces at the ends of the piers. Shadows from the project buildings also will fall on the façades of existing buildings located north and east of the project site, primarily in mid- to late-afternoon, the greatest impact being during the winter months.

Daylight – The daylight analysis indicates that the skyplane obstruction created by the proposed project will be similar to conditions typical of the surrounding area.

Solar Glare – No solar glare impacts are anticipated due to the use of low-reflective materials.

Air Quality – No violations of air quality standards were predicted from traffic generated by the proposed project or emissions from the project's heating systems and parking garage.

Noise – Noise generated from the buildings' rooftop mechanical equipment and by project-related traffic was predicted to comply with applicable standards. Noise generated by maritime activity and by aircraft flyover was predicted not to adversely affect the proposed residential development.

Hazardous Wastes – Although some contamination previously has been found on the project site, according to an Environmental Risk Characterization the conditions do not pose a significant risk for foreseeable future uses of the property.

Flood Hazards – Although a majority of the site lies within the 100 year floodplain, the ground elevation of the site will be raised out of the 100-year floodplain to allow development to proceed. The majority of the site, including all buildings, also will be outside the velocity zones.

Wetlands – Wetland resources at the site will benefit by the removal of the deteriorated piers, wharves, and pile fields, cleanup of litter and debris, and construction of new rock riprap to strengthen the existing seawalls.

Water Quality – Water quality in the vicinity of the project site will benefit from improved storm water management, including the installation of deep sump catch basins and water quality units on new stormwater outfalls.

Sustainable Design – Several sustainable design features will be incorporated into the proposed project and additional features will be considered as project design development continues.

Navigation – No adverse navigational impacts have been identified. The proposed docking facilities will be designed to minimize potential impacts of wind-induced waves and vessel wakes on vessels docked at Clippership Wharf, and the installation of riprap to reinforce the granite seawalls also will serve to dissipate wave energy.

Specific comments on the DPIR/DEIR, primarily technical in nature, follow:

Pedestrian-Level Wind Impacts

The Wind appendix (Appendix E), which was the qualitative assessment report of Frank Durgan, was missing Figure 2 (Map of Preferred Alternative). 5.1

Shadow Impacts

On page 3-12 (Section 3.4.7). the shadow legend description is reversed; the shadows cast by the proposed project, not by other buildings, is shown as a cross-hatched area. 5.2

On page 3-27, the 3:00 PM shadow description contains an error. According to Figure 3-16, the shadow of Building 3 does reach to Summer Street. 5.3

Noise

The second footnote to Table 3-12 states that Receptors R9 through R13 are far enough from the site that rooftop mechanical systems noise is not a factor. However, according to Figure 3-20, Receptor 9 has the same location as Receptors R1 and R2 (Pier One building at the end of Lewis Street) and therefore mechanical noise would be a factor. 5.4

Construction Impacts

It is recommended that the proposed marine (waterside) construction activities not take place during the spawning season of Harbor fin-fish (generally February through mid-June). 5.5

On page 3-110, it is stated that project construction is not anticipated to have a significant impact on rodent populations. However, the nature of the project site – a vacant, undeveloped waterfront parcel – is such that it would be anticipated that the property could contain a sizeable rodent population and therefore considerable precautions will need to be taken to ensure that displacement of the rodent population to adjacent neighborhoods is prevented. 5.6

Some additional comments regarding the Transportation section.

On page 4-38 and Table 4-16, there is some confusion over the number of existing on-street spaces to be eliminated – 15 or 19 – resulting in a net addition of 19 (or 15) new on-street spaces (a total of 34 on-street spaces are to be provided on the project site). 5.7

On page 4-48, the statement in the last paragraph is an error. According to Table 4-19, the Blue Line operates over capacity in the AM peak hour only. 5.8

APPENDIX 6

GREENHOUSE GAS ANALYSIS

GREENHOUSE GAS ANALYSIS FOR CLIPPERSHIP WHARF

EAST BOSTON, MASSACHUSETTS

March 2015

tech environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

GREENHOUSE GAS ANALYSIS FOR CLIPPERSHIP WHARF

EAST BOSTON, MASSACHUSETTS

Prepared for:

Fort Point Associates, Inc.
33 Union Street
Boston, MA 02108

Prepared by:

Tech Environmental, Inc.
303 Wyman Street, Suite 295
Waltham, Massachusetts 02451

March 5, 2015

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION AND SUMMARY

1.1 Methodology

A greenhouse gas (GHG) emissions analysis was performed for Clippership Wharf (the "Project"), located on Lewis Street in East Boston, consistent with the EOEEA "Greenhouse Gas Emissions Policy and Protocol" (May 5, 2010; the "Policy"). The Project has four multi-family residential buildings, which contain approximately 525,000 gross square feet (sf) of residential space and 30,200 sf of retail or facilities of public accommodation space. The Project will have 492 residential units. The buildings are six-story structures with the first floor used for parking.

The City of Boston has adopted the Massachusetts Stretch Energy Code, which requires higher levels of energy efficiency. Most of the buildings will be smaller than 100,000 sf and will be subject to Section 501.1.4 of the Stretch Code, the Prescriptive Option. Building 1 is over 100,000 sf and Section 501.1.1 of the Stretch Code will apply[1]. The GHG analysis assumes energy mitigation measures consistent with, and greater than, the Prescriptive Option of the Stretch Code. Consistent with the ASHRAE Appendix G3 methodology recommended by MassDOER for MEPA GHG studies, energy modeling for a multi-family residential building assumes cooling equipment is a Package Terminal Air Conditioner (PTAC) and heating equipment is a hot water fossil fuel boiler. The actual heating and cooling equipment used in the building may be different.

As discussed in Section 3, GHG emissions for the Project are reduced by the following building design and operational energy efficiency measures (EEMs):

- Using higher efficiency windows and building envelopes;
- Using interior lighting systems with a lower light power density, employing LED;
- Using energy efficient split-system heating and cooling systems;
- Sealing, insulating, and testing HVAC supply ducts;
- Employing light-colored membrane roofs (cool roofs);
- LED exterior lighting for parking garages, driveway and walkways;

[1] The requirement in Section 501.1.1 of the Stretch Code that building design shall achieve energy use per square foot at least 20% below the energy requirements of ASHRAE 90.1-2007 applies only to Building 1. This GHG study uses the current Building Code (IECC 2012) as the Base Case, which is more stringent than ASHRAE 90.1-2007, and thus the reductions associated with proposed energy efficiency measures for the conceptual design presented in this report are not comparable to the 20% goal in Section 501.1.1 of the Stretch Code. The actual design for Building 1 will comply with the 20% energy reduction goal in the Stretch Code.

- Installing Energy Star electrical appliances in residential units;
- Installing Energy Star hot water heaters in residential units; and
- Setting aside solar-ready roof space on the larger Building D for a possible third party photo-voltaic (PV) installation.

The GHG Policy requires a project to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of energy savings and emissions reduction. The Project's GHG emissions will include: 1) direct emissions of CO_2 from natural gas combustion for space heating and hot water; and 2) indirect emissions of CO_2 from electricity generated off-site and used on-site for lighting, building cooling and ventilation, and the operation of other equipment. CO_2 emissions were quantified for: (1) the Base Case corresponding to the 9th Edition of the Massachusetts Building Code that includes the IECC 2012 code (the "Code"), and (2) the Mitigation Alternative, which includes all energy saving measures, detailed in Section 3.

Compared to the previously approved project for Clippership Wharf, the revised design in this Notice of Project Change has less building area, 40% fewer parking spaces and less trip generation. Since mobile source emissions will be less than those of the previously approved project, a mobile source analysis has not been done for this GHG study. Clippership Wharf is a transit-oriented project and its TDM measures are outlined in the revised traffic study.

This analysis uses the eQUEST energy design software (version 3.65), which incorporates the U.S. Department of Energy's DOE-2 building energy use model, and CO_2 emission rates of 117.1 lb/million Btu of natural gas[2] and 730 lb/MWhr.[3] The eQUEST model inputs are summarized in Tables 4 and 5.

[2] U.S. Department of Energy, Energy Information Administration.
[3] ISO New England Inc., 2013 New England Electric Generator Air Emissions Report, Annual Average Emission Rate, Table 5.1, December 30, 2014.

Energy use and CO_2 emissions are detailed for the Project buildings in Tables 1A through 1F, and the eQUEST model output is provided in Appendix A. Table 2 summarizes total CO_2 emissions for the Project, for the Base Case (buildings that comply with the Code), and the Mitigation Alternative (includes all energy saving measures). The eQUEST model input files have been provided to the Massachusetts Department of Energy Resources (DOER).

1.2 Summary of Results

The Project's buildings have not progressed past an early conceptual level of design. For this reason, the Proponent commits to the overall carbon dioxide (CO_2) reduction presented below, but retains the flexibility to achieve these goals using energy efficiency measures that may be refined at the stage of detailed design. Table 1F reveals that the Mitigation Alternative will reduce overall Project energy use (stationary sources) by 15.8% and will reduce stationary source CO_2 emissions by 15.9%, compared to the Base Case.

1.3 Section 61 Findings

At the completion of construction, the Proponent will provide a certification to the MEPA Office signed by an appropriate professional identifying either: 1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or 2) an equivalent set of energy efficiency mitigation measures that together are designed to achieve the same percentage reduction in GHG emissions as the Mitigation Alternative, based on the same energy model and modeling assumptions used in this report, have been adopted.

TABLE 1A

ENERGY AND CO_2 MODELING FOR CLIPPERSHIP WHARF - BUILDING 4 - MULTI-FAMILY RESIDENTIAL

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	Building Square Footage	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	95,040	1,062.8		1,948.2		114.1	387.9	502.0	
Cool Roof		1,062.1	-0.1%	1,952.6	0.2%	114.3	387.7	502.0	0.0%
Increased Roof Insulation		1,061.8	-0.1%	1,906.2	-2.2%	111.6	387.6	499.2	-0.6%
Increased Wall Insulation		1,061.9	-0.1%	1,903.3	-2.3%	111.4	387.6	499.0	-0.6%
Lower Window Glass U-Value		1,049.4	-1.3%	1,787.0	-8.3%	104.6	383.0	487.7	-2.9%
Lower Interior Light Power Density		1,008.8	-5.1%	1,965.8	0.9%	115.1	368.2	483.3	-3.7%
Energy STAR Electric Appliances		994.4	-6.4%	2,034.4	4.4%	119.1	363.0	482.1	-4.0%
Energy STAR Hot Water Heater		1,062.8	0.0%	1,823.7	-6.4%	106.8	387.9	494.7	-1.5%
Higher Heating Efficiency		1,062.8	0.0%	1,898.0	-2.6%	111.1	387.9	499.0	-0.6%
Higher Cooling Efficiency		1,048.2	-1.4%	1,948.2	0.0%	114.1	382.6	496.7	-1.1%
Mitigation Alternative - All Measures Listed Above		913.2	-14.1%	1,642.8	-15.7%	96.2	333.3	429.5	-14.4%

TABLE 1B

ENERGY AND CO_2 MODELING FOR CLIPPERSHIP WHARF - BUILDING 2 - MULTI-FAMILY RESIDENTIAL

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	Building Square Footage	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	89,280	968.4		1,831.3		107.2	353.5	460.7	
Cool Roof		967.8	-0.1%	1,835.4	0.2%	107.5	353.2	460.7	0.0%
Increased Roof Insulation		969.0	0.1%	1,793.2	-2.1%	105.0	353.7	458.7	-0.4%
Increased Wall Insulation		968.0	0.0%	1,789.2	-2.3%	104.8	353.3	458.1	-0.6%
Lower Window Glass U-Value		960.9	-0.8%	1,680.2	-8.3%	98.4	350.7	449.1	-2.5%
Lower Interior Light Power Density		921.5	-4.8%	1,842.4	0.6%	107.9	336.3	444.2	-3.6%
Energy STAR Electric Appliances		904.5	-6.6%	1,910.0	4.3%	111.8	330.1	442.0	-4.1%
Energy STAR Hot Water Heater		968.4	0.0%	1,714.3	-6.4%	100.4	353.5	453.8	-1.5%
Higher Heating Efficiency		968.4	0.0%	1,784.1	-2.6%	104.5	353.5	457.9	-0.6%
Higher Cooling Efficiency		956.0	-1.3%	1,831.3	0.0%	107.2	348.9	456.2	-1.0%
Mitigation Alternative - All Measures Listed Above		838.8	-13.4%	1,539.8	-15.9%	90.2	306.2	396.3	-14.0%

TABLE 1C

ENERGY AND CO_2 MODELING FOR CLIPPERSHIP WHARF - BUILDING 3 - MULTI-FAMILY RESIDENTIAL

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	Building Square Footage	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	92,160	1,031.1		1,892.3		110.8	376.4	487.1	
Cool Roof		1,030.4	-0.1%	1,896.5	0.2%	111.0	376.1	487.1	0.0%
Increased Roof Insulation		1,030.1	-0.1%	1,851.5	-2.2%	108.4	376.0	484.4	-0.6%
Increased Wall Insulation		1,030.2	-0.1%	1,848.4	-2.3%	108.2	376.0	484.2	-0.6%
Lower Window Glass U-Value		1,018.1	-1.3%	1,735.0	-8.3%	101.6	371.6	473.2	-2.9%
Lower Interior Light Power Density		978.7	-5.1%	1,908.1	0.8%	111.7	357.2	468.9	-3.7%
Energy STAR Electric Appliances		964.8	-6.4%	1,976.0	4.4%	115.7	352.2	467.9	-4.0%
Energy STAR Hot Water Heater		1,031.1	0.0%	1,771.6	-6.4%	103.7	376.4	480.1	-1.5%
Higher Heating Efficiency		1,031.1	0.0%	1,843.5	-2.6%	107.9	376.4	484.3	-0.6%
Higher Cooling Efficiency		1,017.0	-1.4%	1,892.3	0.0%	110.8	371.2	482.0	-1.1%
Mitigation Alternative - All Measures Listed Above		885.9	-14.1%	1,594.6	-15.7%	93.4	323.4	416.7	-14.5%

TABLE 1D

ENERGY AND CO_2 MODELING FOR CLIPPERSHIP WHARF - BUILDING 1 - MULTI-FAMILY RESIDENTIAL

Effects of Individual Mitigation Measures

Mitigation Measures - eQUEST Model Run	Building Square Footage	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case	276,520	2,986.3		5,379.7		315.0	1,090.0	1,405.0	
Cool Roof		2,984.3	-0.1%	5,391.2	0.2%	315.7	1,089.3	1,404.9	0.0%
Increased Roof Insulation		2,988.1	0.1%	5,263.7	-2.2%	308.2	1,090.7	1,398.8	-0.4%
Increased Wall Insulation		2,984.8	-0.1%	5,279.2	-1.9%	309.1	1,089.5	1,398.5	-0.5%
Lower Window Glass U-Value		2,963.8	-0.8%	5,014.1	-6.8%	293.6	1,081.8	1,375.4	-2.1%
Lower Interior Light Power Density		2,844.7	-4.7%	5,438.3	1.1%	318.4	1,038.3	1,356.7	-3.4%
Energy STAR Electric Appliances		2,787.7	-6.7%	5,615.2	4.4%	328.8	1,017.5	1,346.3	-4.2%
Energy STAR Hot Water Heater		2,986.3	0.0%	5,017.3	-6.7%	293.8	1,090.0	1,383.8	-1.5%
Higher Heating Efficiency		2,986.3	0.0%	5,254.3	-2.3%	307.6	1,090.0	1,397.6	-0.5%
Higher Cooling Efficiency		2,948.7	-1.3%	5,379.7	0.0%	315.0	1,076.3	1,391.3	-1.0%
Mitigation Alternative - All Measures Listed Above		2,584.2	-13.5%	4,626.6	-14.0%	270.9	943.2	1,214.1	-13.6%

TABLE 1E

ENERGY AND CO_2 MODELING FOR CLIPPERSHIP WHARF

Outdoor Lighting for Parking Garages and Internal Roadways

Mitigation Measures		Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)
Base Case - Code		268.5		0.0		0.0	98.0	98.0	
Mitigation Alternative - LED Lights		72.3	-73.1%	0.0	0.0%	0.0	26.4	26.4	-73.1%

TABLE 1F

ENERGY AND CO_2 MODELING FOR CLIPPERSHIP WHARF

Totals for All Buildings and Parking Garages

All Buildings - Combined Mitigation	Electrical Usage (MWh/yr)	Electrical Change (%)	Gas Usage (MMBtu/yr)	Gas Change (%)	Heating CO_2 Emissions (tons/yr)	Electrical CO_2 Emissions (tons/yr)	Total CO_2 Emissions (tons/yr)	CO_2 Emissions Change (%)	Energy Use Change (%)
Base Case	6,317.1		11,051.5		647.1	2,305.7	2,952.8		
Mitigation Case	5,294.4	-16.2%	9,403.8	-14.9%	550.6	1,932.4	2,483.0	-15.9%	-15.8%

TABLE 2

GREENHOUSE GAS (CO_2) EMISSIONS SUMMARY
CLIPPERSHIP WHARF

Source	Base Case	Mitigation Alternative	Change in GHG Emissions
Direct Emissions	647.1	550.6	-14.9%
Indirect Emissions	2,305.7	1,032.4	-16.2%
Total CO_2 Emissions	2,952.8	2,483.0	-15.9%

2.0 GREENHOUSE GAS (GHG) MITIGATION ANALYSIS

The GHG Policy requires the Project to identify measures to avoid, minimize, or mitigate GHG emissions. The following sections discuss the measures the Project will implement.

2.1 Site Design Mitigation Measures

- ***Sustainable Development Principles*** – The Project conserves land by redeveloping an existing developed site. Open space will include waterfront access along the entire perimeter of the site.
- ***Design Project to Support Alternative Transportation to the Site –*** The project is located near the Maverick Square MBTA Station and a water taxi dock is also nearby.
- ***Minimize Energy Use Through Building Orientation*** – Large portions of Buildings 1 and 2 will face south and large portions of Buildings 1, 3 and 4 will face west, capturing natural light throughout the year.

2.2 Building Design and Operation Mitigation Measures

The eQUEST energy model inputs are summarized in Tables 3 and 4. A comparison of the Project's Base Case Energy Use Intensity (EUI) to the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS) and Residential Energy Consumption Survey (RECS) data is provided in Table 5 and reveals the modeled Base Case buildings are within +/- 10% of the average CBECS and RECS EUI values. The Project will adopt all reasonable and feasible energy efficiency measures (EEMs), listed below.

- ***Energy Efficient Windows and Building Envelope –*** Building envelope insulation will exceed Code. Roof insulation will be R-30, wall insulation will be R-26, and slab insulation will be R10. Window glass type will be better than Code: double-pane, low-e glass, U value = 0.36.

- ***Higher-Efficiency Cooling and Heating Systems*** – For this analysis, the multi-family residential units have a gas-fired heating appliance AFUE 90% efficiency and a PTAC with an SEER 15.0 rating. If the buildings are instead equipped with heat pumps and condensing boilers, equivalent or better efficiencies will be achieved.

- ***Seal, Test and Insulate HVAC Supply Ducts*** – HVAC supply ducts will be sealed, leak tested, and insulated to reduce energy losses.

- ***Cool Roofs*** – The residential buildings will have light-colored shingled roofs.

- ***Energy STAR Appliances and Hot Water Heaters*** – Residential units will use electric appliances and hot water heaters that are Energy STAR rated for high efficiency. Consistent with DOER policy, the plug load values used in the eQUEST model are COMNET average values for all buildings. The plug loads with Energy STAR appliances are assumed to be 10% lower.

- ***Energy Efficient Interior Lighting*** – Interior Light Power Density (LPD) will be at least 10% below Code for all buildings. The residential buildings will use a combination of fluorescent and LED fixtures to reduce LPD and meet the requirements for high-efficiency fixtures in the Code.

- ***Energy Efficient External Lighting –*** LED fixtures will be used to light the parking garages, driveway and walkways.

- ***Parking Garage Naturally Ventilated –*** The parking garages will be on the level below the first floor of residential units, and this parking level will be either at grade or slightly below ground depending on the final land contours. All garage levels will be naturally ventilated.

- ***Recycle Materials*** – The Project will provide adequate space for tenants to recycle materials, such as recycle cans, bottles, cardboard and paper in the recycling building.

Other building design and operation mitigation measures were considered for the Project, but were rejected because they are either technically/financially infeasible or inappropriate for the Project:

- ***Reduce Energy Demand by Using Peak Shaving or Load Shifting Strategies*** – These measures are not appropriate for residential buildings that must use power during peak periods.

- ***Combined Heat and Power (CHP) Technologies into Project*** – To be cost effective, CHP requires a 24/7 stable electrical output requirement and heat demand host. The project's thermal loads are seasonal only, making CHP economically infeasible.

- ***Virtual Net Metering*** – Virtual net metering allows multiple homeowners to participate in the same metering system and share the output from a single facility that is not physically connected

to their property (or their meter). This process allows individuals to sell excess energy produced by their on-site solar system to back to the utility grid and receive credits on their electric bill. A Massachusetts DOER report released in March claims that community shared solar models that rely on virtual net metering services "may only be viable for a few years or less, in some utility service territories." [4]A second problem with VNM is that it would require a group of unrelated persons to agree to buy and sell electricity together, the logistics of which are likely impractical. As stated in Section 2.3, the Proponent is only committing to set aside space on the southern side of Building 5 for a possible third-party photo-voltaic (PV) installation and to make the roof solar-ready since it is not economically feasible as this time. Since virtual net metering may only be viable for a short period of time and the third-party PV is not economically feasible, virtual net metering is not economically feasible or practical for this project.

- ***Construct Green Roof*** – The proponent does not consider it economically feasible to construct and maintain a green roof. Green roofs, which consist of layers of gravel, soil and vegetation atop a rubberized water-proof membrane, are expensive to install and maintain. They typically require a steel-reinforced concrete roof that can support a dead weight of 35 lb/sf and the installation cost exclusive of roof redesign is $30/sf.[5] While green roof technology has the potential to improve stormwater management on the Project and reduce overall energy costs, the significant additional costs (over $3.3 million for the Project) related to the required engineering, construction and installation of the green roof is not economically feasible.

2.3 Building Energy Efficiency Measures Requiring Further Study

This section identifies other efficiency measures that will be studied at the stage of detailed design.

On-Site Renewable Energy – The Proponent affirms its commitment to set aside space on the southern side of Building 1 for a possible third-party photo-voltaic (PV) installation and to make the roof solar-ready. The revised PV cost feasibility analysis presented below estimates the cost of a 200-kW system installed on the apartment building roof. To obtain the most accurate installed-cost for a commercial-size PV system, data were obtained from the most recent installed-cost report on the EOEEA website for Qualified Generation Units in the 100-kW to 200-kW size range.[6] The average installed cost for installations starting commercial operation in 2013/14 is $3.50; this figure includes data posted through August 8, 2014.

For this PV cost analysis, a 200-kW system was assumed with an installed cost of $3.50/W; this is generally considered the minimum size for a financially feasible third-party vendor PPA. The following facts were assumed: (1) SRECs are market-based incentives, and while the expectation has been that they should sell between $300 and $550 per MWh, less broker fees, the recent market price has been lower in the $175 to $206 range[7]; (2) An owner can place excess SRECs into an

[4] MDOER, Community Shared Solar Review and Recommendations for Massachusetts Models, March 2013.
[5] Oberndorfer, Erica, et al., "Green Roofs as Urban Ecosystems: Ecological Structures, Functions and Services," BioScience, Vol. 57, No. 10, November 2007.
[6] Massachusetts EOEEA, "RPS Solar Carve-Out Qualified Renewable Generation Units – updated August 8 and March 26, 2014," http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/rps-aps/qualified-generation-units.html.

[7] "Solar success costing owners, Price of state bonds dips with popularity of panel systems," Boston Globe, January 17, 2013.

auction account and receive $285 per MWh ($300 minus 5% fee). Since there are no firm estimates of the future value of SRECs, this analysis assumed the guaranteed floor price of $285, the most realistic assumption.

A 200-kW PV system, flat-mounted, is projected to generate 206,528 kWh per year,[8] which equates to 75.4 tons per year[9] in GHG emissions reductions. A 200 kW PV system would reduce the annual Mitigation Case CO_2 emissions (Table 2 in the EENF GHG report) by 7% = 100% * 75.4 / 1,042.1. The economics of a PV installation were calculated using the DOER Commercial Solar Financial Model updated to reflect the above assumptions. Model output is attached.

The cost calculator inputs are as follows:

- PV system size of 200 kW
- System cost of $3.50/Watt
- Annual capacity factor of 11.8% (flush mounted on roof)
- SREC value of $285 / MWh and revenue term 10 years
- An inverter replacement frequency of once every 10 years

The customer discount rate is defined as the interest rate of return that could be earned in an investment in the financial markets with similar risk. At present, a 20-year U.S. Treasury bond pays slightly above 3%; that is the lowest risk investment possible and is not comparable to the risk of investing in a PV system. Corporate bond rates are 4% to 8%, depending on their investment grade. This analysis assumed a reasonable customer discount rate of 8%. The calculations assume federal tax credits, State tax deductions and SREC values.

For the 200-kW system, the calculated Net Present Value of the PV system is $26,989. The Simple Payback Period is 6 years. Based on market research, almost 90 percent of strong prospects would consider a payback of four years, but acceptance begins to drop rapidly once paybacks reach five years.[10] Net Present Value (NPV) is the standard financial method for using the time value of money to appraise long-term projects. Used for capital budgeting, and widely throughout economics, NPV measures the excess or shortfall of cash flows, in present value terms, once financing charges are met. If the NPV is positive, an investment may be accepted since it would add value to a project over the long-term.

While the NPV is slightly positive, the payback period is longer than what is normally acceptable, suggesting a PV system is not be feasible for the Project at this time. The Proponent will set aside space on the roof of Building 1 as "solar ready" to accommodate flat-mounted PV systems for a possible third-party provider PV installation in the future.

[8] Personal communication, Natalie Howlett, Renewable Energy Project Coordinator, Massachusetts DOER. This figure is four times 51,632 kWh/year for a 50 kW system.

[9] Annual PV system electrical generation is 206.5 MWh. Multiplying by the ISO New England emission factor of 730 lb CO_2 per MWh and dividing by 2,000 lb/ton yields an annual CO_2 emission reduction of 75.4 tons/year.

[10] *Assessment of California CHP Market and Policy Options for Increased Penetration*, Final Report, Co-sponsors Public Interest Energy Research Program (PIER) and California Energy Commission, July 2005.

Solar Hot Water Systems – A solar hot water feasibility analysis is presented for the Building 4, containing approximately 95,000 square feet of multi-family residential space. Similar results apply to the other three buildings.

The eQUEST energy modeling for Building 4 predicts daily residential demand for hot water of approximately 2,200 gallons per day requiring the burning of 3.4 million Btu/day of natural gas in hot water heater. The installed cost of a solar panel hot-water heater designed to provide this quantity of hot water each day is $210,100,[11] and the system would have a roof collector area of 2,000 sf. Offsetting the system cost is a 30% federal tax credit, for a net capital cost of $147,070. The cost of electricity to run the water pump and for system maintenance is estimated at 1% to 1.5% of installed cost per year, or $1,471 to $2,207 per year. A typical system has an expected life of 15 years.

MassCEC, through the Commonwealth Solar Hot Water Commercial Scale Program, provides subsidies for solar thermal feasibility studies and construction grants, but these are not available to projects that displace natural gas fired water heating[12], as would be the case at the Crown Colony Project. The avoided burning of natural gas to heat water for the Project, on a day when the solar panels are producing hot water at capacity, is calculated as 2.89 million Btu of heat (the heat required to produce approximately 2,200 gallons of hot water from cold water feed) divided by an 85% efficiency factor for the hot water heater, yielding 3.4 million Btu per day.

The annual capacity factor for a solar thermal system in Massachusetts is 15%[13], and thus the avoided natural gas combustion for a full year is 186.2 million Btu. This equates to 10.9 tons/year of CO_2 emissions (117.1 lb/million Btu x 186.2 million Btu/year x 0.0005 ton/lb). A Solar Hot Water system would reduce the annual Mitigation Case CO_2 emissions (Table 2 in the EIR GHG report) by 0.4% = 100% * 10.9 /2,483.0

At the annual average commercial gas price in Massachusetts for the past year of $12 per million Btu[14], the avoided cost of fuel is $2,234 per year. Including maintenance and electricity costs, cash flow to offset the amortized installed cost ranges from +$27 to +$763 per year and the simple payback period (ignoring the cost of money) exceeds the useful life of the equipment. The analysis reveals that a commercial solar thermal system for this Project is not financially feasible due to the low annual capacity factor in Boston (infrequency of strong sunshine) and the high system cost.

[11] SunMaxx Solar, Commercial Thermal Solar Installed Costs, www.sunmaxxsolar.com/commercial-solar-hot-water-heating.php. A MassCEC solar spreadsheet gives a similar installed cost of $200,000.
[12] www.masscec.com/solicitations/commonwealth-solar-hot-water-commercial-scale#construction.
[13] Energy Information Administration, U.S. Department of Energy, "Monthly capacity factors for select renewable fuels and technologies, January 2011-October 2013, for Massachusetts."
[14] Energy Information Agency, Commercial Gas Prices in Massachusetts, 2013-2014.

2.4 Draft Outline for Tenant Manual

The Proponent will provide each tenant with a Tenant Manual, which will educate tenants on the energy efficient measures incorporated into each apartment. The Tenant Manual will include the following information:

- The Proponent will provide to tenants on the Energy Star appliances installed in each housing unit.

- The Proponent will provide to tenants on the water-conserving bathroom fixtures that exceed Code.

- The Proponent will install programmable thermostats to reduce energy usage.

- The Proponent will provide to tenants a list of amenities (such as ATMs, food services, bicycle racks and Maverick Square MBTA Station) within walking distance for tenants.

- The Proponent will encourage tenants to collect and recycle cans, bottles, and paper, and provide information on where to bring recycling materials to the recycling building.

TABLE 3
SUMMARY OF ENERGY MODELING ASSUMPTIONS
CROWN COLONY

Energy Efficiency Measure (EEM)	Base Case (Code)[1]	Mitigation Case
Building Envelope	Roof R25 Walls R17 Slab R10	Roof R30 Walls R26 Slab R10
Window Glass (operable windows)	U=0.45, DOE Type 2002	U=0.36 DOE Type 2614
Cool Roof	No	Yes
Cooling Efficiency Residential PTAC	SEER 13.0	SEER 15.0
Heating Efficiency Gas-Fired (AFUE)	78%	90%
Light Power Density (Whole Building Method)	MF Residential 0.7 W/SF Retail/FPA 1.4 W/SF	MF Residential 0.55 W/SF Retail/FPA 1.2 W/SF
Electric Plug Load – Energy STAR (Residential - COMNET) (Retail – App G)	MF Residential 1.44 W/SF Retail/FPA 0.25 W/SF	MF Residential 1.30 W/SF Retail/FPA 0.,23 W/SF
Exterior Lighting Light Power Density	130 W/kSF	35 W/kSF (LED)

[1] IECC 2012.

TABLE 4
SUMMARY OF ACTIVITY AREAS FOR CLIPPERSHIP WHARF BUILDINGS

Building Name	eQUEST Activity Type	% Floor Area	External Electrical Load
Buildings 1-4 MF Residential	MF Residential Corridor Retail/FPA Lobby Storage Laundry	85 6 5 1 2 1	Exterior/Garage Lighting Base Case 268.5 MWh/yr Mitigation Case 72.3 MWhr/yr

TABLE 5
COMPARISON OF eQUEST BASE CASE ENERGY USE INTENSITY
TO U.S. DEPARTMENT OF ENERGY CBECS AND RECS DATA

Buildings	Base Case EUI (kBtu/SF)	CBECS and RECS EUI (kBtu/SF)
Buildings 1 through 4 (MF Residential)	56.3, 57.5, 58.7, 58.7	$(0.95*54.5^{1})+(0.05*65.0^{2})$ $= 55.0^{3}$

[1] RECS (2009) Table CE1.1 MF Apartments in 5 or More Unit Buildings.
[2]CBECS (2003) Table C5A Retail Other Than Mall, Northeast.
[3]Building use is 95% multi-family residential and 5% retail/facilities of public accommodation.