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Boston East

East Boston, Massachusetts

DRAFT ENVIRONMENTAL IMPACT REPORT
DRAFT PROJECT IMPACT REPORT
Volume 1 of 2

June 2, 2008

submitted to:

Boston Redevelopment Authority

Executive Office of Energy and Environmental Affairs
MEPA Office

prepared by:

Fort Point Associates, Inc.

in association with:

ICON architecture, inc.
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Childs Engineering Corporation
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submitted by:

Trinity Border Street, LLC
a partnership between Trinity Financial, Inc. and
the East Boston Community Development Corporation

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Chapter 1

Project Description

1.0 PROJECT DESCRIPTION

1.1 PROJECT CONTEXT

Trinity Border Street, LLC ("the proponent") is proposing to redevelop the approximately 14.2-acre property ("the site") located at 102 – 148 Border Street along the East Boston waterfront on Boston Inner Harbor. The project is bound by Border Street to the east, the Atlantic Works, Wigglesworth Machinery, and Boston Towing and Transportation properties to the south, Boston Inner Harbor to the west, and the property at 170 Border Street to the north (see Figure 1-1, Locus Plan). The project is located near Central Square to the north and Maverick Square and the MBTA Maverick Transit Station to the east.

1.1.1 PROJECT SETTING

The project site occupies a prime location on Boston Inner Harbor. It has panoramic views of Charlestown, the Tobin and Zakim bridges, and portions of the Boston skyline. The site has been vacant for over three decades. Recent revitalization efforts in this area of East Boston have focused on specific areas: residential, open space, and infrastructure including such projects and the Maverick Landing residential development, the Massport-owned Piers Park, and the Maverick Station transit improvements. In the neighborhood to the southeast, three sites are currently being proposed for residential development, with some mixed-use components, including Clippership Wharf, Hodge Boiler Works, 6-26 New Street, and Pier One. Maverick Landing to the southeast was recently rebuilt with 426 units of affordable and market-rate housing (see Figure 1-2, Neighborhood Context Plan – Existing Conditions).

The site is comprised of 14.2 acres of land under water and filled tidelands (see Figure 1-3, Existing Conditions Plan and Figure 1-4, Existing Conditions Photos). Although the landside portion of the site, 3.4 acres, is currently vacant of buildings, there remain several structures including footings of former buildings, entrance posts, a silted up outfall pipe, and bulkheads in disrepair. On the waterside, there are two dilapidated marine railways and approximately 25,000 square feet (sf) of dilapidated timber piling areas that extend over 250 feet beyond the high water mark.

Historically, the site was used for industrial activities including shipbuilding, ship and engine repair, dry docks, coal storage, and a carriage factory. It is currently inaccessible to both vehicles and pedestrians as it is surrounded on the landside by a fence.

1.1.2 PLANNING CONTEXT

Over the past decade, the Boston Redevelopment Authority (BRA) has undertaken several planning studies, which recommended the development of housing and other uses to activate and reconnect the East Boston waterfront to adjacent neighborhoods. In response to the planning focus in this area, several residential development proposals for waterfront sites are currently under local and state review. These proposals include various site amenities for residents and the public at large including significant public access to and along the waterfront.

The proposed Boston East Project along this portion of the East Boston waterfront will invigorate the community with a vibrant and inviting place to live and visit. The redevelopment of this project site will add to the exciting transformation of the East Boston waterfront.

The following initiatives and planning exercises provide a basis for the development of projects, in particular, along the East Boston waterfront.

EXECUTIVE ORDER 385 (PLANNING FOR GROWTH)

Massachusetts Executive Order 385, the Growth Management Act, is intended to promote sustainable economic development throughout the Commonwealth. Executive Order 385 notes that proactive and coordinated planning can help minimize potential conflicts between environmental preservation and sustainable economic development activity. Executive Order 385 states that the Commonwealth will promote economic activity and growth that is supported by adequate infrastructure and will not result in or contribute to the avoidable loss of environmental quality and resources.

The project is consistent with the principles outlined in Executive Order 385. The project will have minimal negative environmental impacts, as it is occurring in a previously developed urban area. The project will revitalize a deteriorated and vacant industrial site. The project will minimize impacts on the environment by utilizing adequate water supply, wastewater and utility infrastructure, reducing the amount and improving the quality of stormwater discharges to the Boston Harbor through the implementation of Best Management Practices and I/I mitigation. The project will also incorporate significant public open space and pedestrian access improvements, which include pedestrian pathways, public sidewalks, landscaping, and public waterfront amenities.

The project is a transit-oriented development with access to the MBTA Blue Line only a few blocks away.

EAST BOSTON MUNICIPAL HARBOR PLAN

The East Boston Municipal Harbor Plan (EBMHP) is a land use plan prepared by the City under the Commonwealth's statewide licensing regulations for waterfront projects. This document details a harbor plan tailored to the characteristics of the East Boston waterfront and reflects the planning goals of the community. To assist in preparing the plan, the BRA convened an Advisory Committee that included a broad range of individuals with interest in and knowledge about waterfront issues in East Boston and the City as a whole. The BRA also coordinated the planning process with state agencies, property owners, developers and interested community residents. The BRA submitted the EBMHP for the East Boston waterfront to the Executive Office of Environmental Affairs' (EOEA) Office of Coastal Zone Management on March 12, 2002. On July 15, 2002, the Secretary of EOEA issued a Decision approving the EBMHP.

As part of the Secretary's Decision, an amendment to the EBMHP would be needed for several properties. The amendment would address substitutions, offsets, and amplifications in a site-specific manner that achieves the goals of the EBMHP.

AMENDMENT TO THE EAST BOSTON MUNICIPAL HARBOR PLAN

The EBMHP Amendment planning process began in August 2007 and has involved widespread public support. The BRA recently voted to approve the Amendment and has forwarded it to the Secretary for his review and approval.

The Amendment contains several site-specific substitutions and offsets. These provisions separately and specifically address conditions associated with each of the three subject project sites: 6-26 New Street, Boston East, and 125 Sumner Street. The Amendment provides an approved framework of General Policies that directs the site-specific substitutions and offsets. All of the provisions contained in this MHP Amendment are consistent with the established General Policies, which also help serve to implement related planning policies and actions to enhance the East Boston waterfront.

The Boston East site will comply with the substitutions and offsets contained in the Amendment. The project will provide critical public realm improvements including expansive open space and a Harborwalk that would connect to both the planned Harborwalk on the north side of the site and the planned Waterfront Way on the south side of the site. The open space will provide a direct visual and physical link to the proposed portions of the Harborwalk along the East Boston waterfront. The public will also be able to access the Harborwalk and open space area through sidewalks within the site connecting to Border Street. The proposed maritime interpretive area on the visual axis of Decatur Street, and area under the entrance arch will provide historical and interpretive displays and signage that commemorate the site's extensive maritime history. Additional waterfront amenities, watersheet activation, and programming opportunities will be discussed as part of the Chapter 91 licensing process. Further site-specific zoning modifications may be required to establish conformance with the Amendment and to provide additional zoning relief for the project.

EAST BOSTON MASTER PLAN

In 2000, the Boston Redevelopment Authority (BRA) completed the East Boston Master Plan (EBMP). The EBMP provides a framework for new growth and development in the community's commercial districts and waterfront area, while preserving and enhancing the quality of life in the community's residential neighborhoods. The intensive one-year planning process involved widespread community participation. In addition to citizen involvement, the planning process included extensive coordination among departments (such as the Department of Neighborhood Development, Department of Parks and Recreation, the Boston Transportation Department, and the Boston Housing Authority). The EBMP is organized around four focus areas:

1. Reviving the East Boston Waterfront;
2. Enhancing the Neighborhood’s Commercial Centers;
3. Strengthening the Residential Neighborhoods; and,
4. Shoring up the Airport Edge.

For each focus area, the plan provides recommendations regarding land use, open space, public environment, historic resources, heritage, transportation, and parking. The Boston East site was specifically mentioned in the 2000 EBMP. The EBMP recommended that the Designated Port Area be removed and that housing be developed on the site. The Harborwalk for the Boston East site was also recommended by the EBMP. The Decatur Street view corridor was similarly recommended.

Issued in conjunction with an Implementation Strategy, the plan established a set of goals and objectives that reflect the community's desire to maintain East Boston's identity and culture, while looking into its future development. The project complies with the provisions of the plan by providing much needed housing, critical open space connections, public access, and views through and from the site.

1.2 PROJECT OVERVIEW AND DEVELOPMENT PROGRAM

1.2.1 PROJECT SUMMARY

The project is comprised of two proposed development areas. The first area will be a residential building with 196 housing units, facilities of public accommodation, and open space areas on the west side of the site (see Figure 1-5, Project Site Plan and Figure 1-6, View from the East). The second area will be a marine facility, with a marine travel lift if needed, and a maritime interpretive area on the north side of the site.

The total gross floor area for the project is 235,005 sf with a total floor-area-ratio (FAR) of approximately 1.6 (see Table 1-1, Building Program). The combined building footprint is 50,800 sf, which occupies approximately 34% of the site. There will be 167 parking spaces on the site.

Table 1-1: Building Program

Location	Bldg Footprint (sf)	GSF	Lot Area (sf)	FAR	Building Height	Lot Coverage	Garage Parking Spaces	Parking On-Site
Residential	36,800	215,005	84,218	2.63	85′	44%	141	0
Marine	14,000	20,000	64,011	0.31	36′	22%	0	26
Total	50,800	235,005	148,229	1.63	N/A	34%	141	26

1.2.2 DEVELOPMENT PROGRAM

RESIDENTIAL AREA

The residential building will sit north of Decatur Street allowing a visual corridor from Decatur Street to the waterfront. The massing of the building is split into two wings, placed as long, wharf-like fingers towards the Harbor. Along Border Street, an archway will frame views and encourage access to the Harborwalk. The brick and cast stone stepped building will range from five to seven stories and will consist of five affordable live/work units and 191 one and two-bedroom residential units. At the ground or upper floors, many units will have balconies and decks with waterfront views. Thirteen percent of the units will be affordable and available to households that meet the Boston Redevelopment Authority's (BRA's) affordable housing income limits.

MARINE FACILITY

On the southern side of the site and within the Designated Port Area (DPA) will be a marine facility that will support a marine-related business or activity. The proponent is currently evaluating potential economically viable and programmatically appropriate tenants that would fit within the eligible uses of the DPA and the zoning. As conceptually proposed, the facility will include a two-story building, clad primarily in cementitious clapboard with a masonry brick façade on Border Street. Perpendicular to Border Street will be a long "boatshed" structure. Windows will allow pedestrians on the Harborwalk a view into the facility if the chosen use is spectator worthy. Final building and site program is subject to the needs of the DPA tenant.

A public maritime interpretive area will be created within the DPA. This area will be along the view corridor extending from Decatur Street and will provide public access to the waterfront. It is designed as an interpretive landscape with exhibits that extend into the Harbor including remnants of the historic marine railway.

PARKING AND CIRCULATION

A parking program has been designed in response to long-standing community desires for sufficient parking to be provided in new development projects. The project will provide parking to accommodate project residents and the general public visiting the site, so as to avoid overburdening the surrounding neighborhood streets. There will be a total of 167 parking spaces on the site. Below the residential building, 141 spaces will be designated for the residents, providing 0.7 spaces per residential unit. On the south side of the site in the marine facility parking area, 26 spaces will be designated for visitors and employees of the marine building. The proponent will work with a car-sharing operation such as Zipcar to analyze whether such a service will work at this site. Access to the surface and the subsurface parking areas will be from two separate locations along Border Street. Access to the below grade parking will require a new curb cut while access to the parking area near the marine building will use an existing or relocated curb cut. There will be approximately 26 on-street parking spaces along the project side of Border Street.

WATERSIDE FACILITIES

The proposed marine travel lift will support the marine-related uses at the marine building. If the lift is needed by the tenant, it will be located in the DPA and will be supported by two finger piers.

FACILITIES OF PUBLIC ACCOMMODATION

The project is designed to welcome and encourage public access through the site, both to and along the waterfront and from Border Street. The project includes Facilities of Public Accommodation (FPA) space on the first floor of the residential building to attract the general public to the waterfront (see Figure 1-7, View of Project from the South and Figure 1-8, Border Street Entrance). There are three key FPAs that support public use at the site: Community Gallery, affordable live/work artist studios, and the archway.

COMMUNITY GALLERY

A community gallery, located along and opening onto the Harborwalk and the maritime interpretive area, will create an exciting venue for art exhibitions and community events. This use will help activate the area and encourage the public to take advantage of the site's historic waterfront location and amenities.

AFFORDABLE LIVE/WORK ARTIST STUDIOS

Affordable live/work studios will be located along the maritime interpretive area of the ground floor in the residential building. This location and use are both compatible with the uses within the DPA and with the studios and gallery located across the DPA at 80 Border Street. The affordable live/work units at the project site will allow artists to both live and work in their homes, and to open them to the public during the year to show their work. Income restrictions and BRA certification will be required of residents.

ARCHWAY

An archway at the center of the primary street façade of the residential building will allow the public to pass through to the terrace and the Harborwalk as well as enjoy views of the waterfront from both Border Street and within the archway. It will have historic interpretive features to make it an inviting place for the public and residents.

1.2.3 PUBLIC BENEFITS

Completion of the proposed Boston East project will help revitalize this important part of the East Boston waterfront. The project will restore an area of the City that has been underutilized and inaccessible to the public for three decades, and will eliminate a blighted area. The public benefits of the project will make the area more appealing to both residents and visitors. The project will provide substantial direct benefits for the City of Boston and the region, as noted below.

ENVIRONMENT

- By adhering to the City of Boston's Green Building standards and guidelines, the project will decrease the adverse effects of air pollution and minimize emissions and demand for fossil fuel energy.
- The project will minimize vehicle trips, mileage, and emissions by encouraging use of public transportation, alternative vehicles, and car sharing options, and providing educational and informational signage about transit options.
- The residential development will be certifiable under Article 37 of the City of Boston Zoning Code, which is called the Green Buildings program.
- Stormwater controls will significantly decrease pollution to Boston Harbor as well as improve the Harbor's habitat.
- Cleaning up brownfield site
- Removing piles; cleaning up the water sheet

HOUSING

- The proponent will work with the City to implement the City's affordable housing policies; proposing 13% of the units or 25 units of affordable housing. Of the 25 units of affordable housing, the five live/work units will be affordable and other 20 units will be located throughout the building.
- The project will create 196 new housing units, thereby expanding a constrained housing market and contributing to the City's housing goals.

JOB CREATION

- Contributing to the area's economy, the project will create construction phase employment opportunities and new permanent jobs at the facilities of public accommodation, the residential units, and the marine facility.

PUBLIC ACCESS

- The project will redevelop and revitalize a 3.4-acre parcel along East Boston's waterfront that has never been accessible to the public.
- The project will build an approximately 730-foot long Harborwalk along the entire waterfront side of the site. It will connect to the planned Harborwalk to the north and with the emerging East Boston Harborwalk being developed to the southeast and will ultimately extend 2.4 miles from the Harborside Hyatt Hotel to Border Street.
- The project will provide new public access to and along the water, enhancing the East Boston waterfront public realm.
- The project will create three points of access to the Harborwalk from Border Street.
- Community gallery space, visible and accessible from interpretive area between Border Street and the Harborwalk, will become an integrated community asset for the surrounding neighborhood.
- The artist affordable live/work units will be accessible to the public during the year.

REVENUES

- The project will increase state and local tax revenues through additional commercial and residential uses.
- The project will invest approximately $90 million in development costs.
- The project will generate over $385,000 annually in new property tax revenues.
- Property values in the neighborhood will be improved.

TRANSPORTATION

- The transit-oriented development will be within an eight minute walk of Maverick Station.

- The project will support transportation through the provision of Transportation Demand measures including bicycle racks, and participation in Transportation Demand Management associations.
- The project will address the potential for a car sharing service such as Zipcar.

VIEW CORRIDORS

- The project will enhance the Decatur Street view corridor from Border Street through the middle of the site to the water and allow for expansive views of Boston Inner Harbor.
- The view corridor will be enhanced with landscaping and other public amenities including interpretive exhibits.

1.2.4 PUBLIC REALM IMPROVEMENTS

The site is designed to provide substantial public access to and along Boston Inner Harbor. Public access to the site will be through sidewalks from Border Street and through the large archway opening in the ground floor of the residential building. Refer to Chapter 3 for additional discussion of Open Space and Public Access in relation to the Chapter 91 program.

HARBORWALK

A 12-foot wide Harborwalk will extend along the site's entire waterfront except for small portion of the DPA. The Harborwalk is designed to connect to a planned Harborwalk on the north side of the site and Atlantic Works via a sidewalk to the Waterfront Way, the inland portion of the East Boston Pedestrian Network, on the south side of the site that was recommended in the EBMHP. The Harborwalk, along with the open space areas, will provide excellent viewing, walking, and sitting areas along the waterfront.

OPEN SPACE AND MARITIME INTERPRETIVE AREA

Open space landward of the Harborwalk will provide spectacular viewing areas for pedestrians to view Charlestown, the Zakim and Tobin bridges, and vessel activity on Boston Inner Harbor, which a working harbor with busy and active vessels the ply the channels and nearby waterfronts. To encourage public use and enjoyment of the waterfront, a maritime interpretive area will be created to commemorate the site's extensive maritime history. Near the center of this area, the former marine railway and cradle will remain as historic relics of the shipbuilding industry. Interpretive displays will inform readers about this historic activity and role in development of the East Boston community. There will also be terraced open space on the waterside of the residential building connecting through the archway to Border Street. All of these open space areas will be open and accessible to the public.

1.3 PROJECT ALTERNATIVES

1.3.1 NO ACTION ALTERNATIVE

If the No Action alternative was implemented, the property at 102 - 148 Border Street would continue to be vacant, underutilized, and a hazard to anyone who tries to access the waterfront. It would remain in blighted condition with deteriorated marine structures including pilings and bulkheads as well as a place that would be difficult to be kept clean and free of debris and unsightly vegetation. The site would not be improved, and the site's waterfront would continue to be unavailable to the public. The No Action alternative would preclude activation of the site with 24-hour residential use, marine activity, and enhanced open space and public access. The No Action alternative would also leave the DPA watersheet un-restored to potential industrial uses.

1.3.2 ENF/PNF ALTERNATIVE

Under the ENF/PNF project design (see Figure 1-9, ENF/PNF Alternative), the site was developed in a similar configuration as the current project. The maritime building was in the same location, however, the residential building was located approximately 8 feet north of where it is now. The southern wing of the building, including the community gallery, was closer to the water. Public access to the gallery was more restrictive in the ENF/PNF. The parking and circulation programs were the same as currently proposed. The interpretive area, Harborwalk, and the live/work space on the ground floor are also similar.

1.3.3 PREFERRED ALTERNATIVE

Since the filing of the ENF/PNF, the project design has been revised to address community, interest groups, and agency concerns. While the overall program of uses has remained constant, the public realm has been substantially improved by providing additional public access to and within the project site and the interior portions of the residential building. New public access from the Harborwalk to the community gallery was added along with an outdoor patio. The southern wing of the building was pulled back from the water's edge. Users of the Harborwalk can also access the site from the north side with a new pedestrian connection from Border Street. Affordable live/work artist studios will provide additional public access to the building interior during the year. The archway in the residential building is larger, has improved visual and physical access to the waterfront, and will display interpretive exhibits. The DPA portion of the site also had some changes in its design regarding surface treatments to create a better environment for industrial uses to and along this part of the waterfront.

1.4 PUBLIC REVIEW PROCESS

The project proponents have had several community meetings to review the proposed Boston East project in East Boston. This section identifies the state, local, and community meetings that were held regarding the public review process for this project.

1.4.1 STATE MEPA PROCESS

A joint ENF/PNF was filed with the state MEPA Office in October of 2007. A MEPA scoping session was held at the project site on November 26, 2007. The Secretary of the Executive Office of Environmental Affairs (EOEA) issued a Certificate on the ENF on December 12, 2007, which required the preparation of an Environmental Impact Report.

This Draft Environmental Impact Report/Draft Project Impact Report (DEIR/DPIR) is a joint filing intended to satisfy both the BRA Article 80 Development Review and State MEPA processes. The DEIR/DPIR responds to the issues identified in the Secretary's Certificate on the ENF/PNF, provides further analysis of potential transportation and environmental impacts, and improves upon the overall public realm design and programming.

1.4.2 CITY ARTICLE 80 REVIEW PROCESS

The project has also been reviewed with several departments in the City of Boston including the BRA, the Boston Transportation Department (BTD), the Boston Civic Design Commission (BCDC), the Boston Environmental Department, the Boston Parks and Recreation Department.

A Letter of Intent was submitted to the BRA on June 8, 2007 in accordance with Mayor Thomas M. Menino's Executive Order of October 10, 2000 as amended governing mitigation for development projects. A joint ENF/PNF was filed with the BRA in October of 2007. A scoping session on the PNF was held on October 26, 2007 and a community meeting on the PNF was held in East Boston on October 29, 2007. The BRA issued a Scoping Determination on March 10, 2008 requiring the preparation a Draft Project Impact Report (DPIR).

The BRA appointed an eight-member Impact Advisory Group (IAG). The IAG was invited to the scoping session on October 26, 2007 for their review and comment on the ENF/PNF.

As mentioned above, this DEIR/DPIR is a joint filing intended to satisfy both the City Article 80 and State MEPA processes. The DEIR/DPIR responds to the issues raised and supplies additional analysis required in the BRA's Scoping Determination. The proponent anticipates that the public comment period for State and City processes will run concurrently.

BOSTON TRANSPORTATION DEPARTMENT

Representatives from the Boston Transportation Department attended the BRA Scoping session held with BRA staff in October 2007. The proponent also had conversations with BTD senior staff in November 2007 to clarify the study area, study approach, and analytical assumptions.

BOSTON CIVIC DESIGN COMMISSION

On November 6, 2007, the proponent presented the project to the Boston Civic Design Commission (BCDC). The BCDC generally supported the concept and requested that the project be more fully considered at a sub-committee meeting. The BCDC voted to recommend the project design on January 8, 2008.

1.4.3 MUNCIPAL HARBOR PLAN AMENDMENT PROCESS

The Boston East project is applying for relief as part of the Amendment to the East Boston Municipal Harbor Plan (EBMHP). This process, which is being overseen by the Boston Redevelopment Authority, began in August 2007 with walking tour of the existing and proposed projects in East Boston. There have also been several public meetings held at Maverick Landing and Boston City Hall. At the time of this writing, the BRA had voted and approved the Amendment and submitted it to the Secretary for approval. Approval of the Amendment is expected in September 2008.

1.4.4 ZONING

The site is subject to land use controls contained in the City of Boston zoning code and the state Chapter 91 Waterways licensing program. The project is currently going through the municipal harbor planning amendment process. If necessary, the City will incorporate zoning changes in order to ensure conformity with the approved EBMHP Amendment.

The entire property is zoned Waterfront Commercial. The purposes of the Waterfront Commercial ("WC") Subdistrict are to ensure that the commercial areas located near the waterfront develop in a manner that is sensitive to and compatible with the goals for the waterfront expressed in the East Boston Neighborhood Plan and applicable state policy. Multifamily residential is allowed on upper floors and as a conditional use on the ground floor. Accessory parking is an allowable use when, as proposed, it is located on the first floor or below grade. General retail business space and community uses are allowed under the zoning. The project also includes a marine facility. The proposed uses may include facilities for vessel construction, servicing, and repair, or other similar marine uses that are allowed or conditional uses within the Waterfront Commercial district. Depending on the outcome of the East Boston

Municipal Harbor Plan Amendment planning process and final project configuration, zoning relief in the form of a Planned Development Area will be sought to obtain zoning compliance for use, height, FAR, and Waterfront Yard Area setback.

1.5 ARTICLE 80 LEGAL INFORMATION

Legal Actions Pending

There are no legal judgments or actions pending on or regarding the proposed project.

Tax Arrears

There are no tax arrears on the subject parcels.

Evidence Of Site Control

The City of Boston is the fee owner of the project site. The City has awarded the development rights to Trinity Border Street, LLC.

Public Easements on or surrounding site

According to the "Topographic Plan of Land, Boston East, 102 – 148 Border Street, East Boston, Massachusetts" prepared by Nitsch Engineering, dated May 23, 2007, there is only one easement on site, which is for a combined sewer overflow between Border Street and Boston Harbor.

1.6 FEDERAL, STATE AND LOCAL PERMITS

The project expects to secure many local, state, and federal permits and approvals prior to commencement of construction, and they are detailed in the following list:

Agency	Permit/Approval
Federal	
Environmental Protection Agency	NPDES Notice of Intent for Construction Dewatering
	NPDES Stormwater Management Notice of Intent
United States Army Corps of Engineers	Section 10/Section 404 Permit
Federal Aviation Administration	Notice of Proposed Construction – Crane
	Notice of Proposed Construction – Building
State	
MEPA Office	Environmental Impact Review
Massachusetts Coastal Zone Management	Federal Consistency Review
Massachusetts Historical Commission	Determination of No Adverse Effect
Department of Environmental Protection	Notification of Construction/Demolition
	Water Quality Certification

	Chapter 91 Waterways License
	Massachusetts Contingency Plan (if necessary)
Local	
Boston Redevelopment Authority	Article 80 Large Project Review
	Cooperation Agreement
	Fair Marketing Plan
	Affordable Housing Agreement
Zoning Commission	Planned Development Area
Boston Civic Design Commission	Recommendation Pursuant to Article 80 Review
Boston Transportation Department	Transportation Access Plan Agreement
	Construction Management Plan
Boston Conservation Commission	Order of Conditions
Boston Water & Sewer Commission	Site Plan Approval
	General Service Application
	Sewer Connection Permit
Boston Inspectional Services Department	Building Permit
Public Improvements Commission	Various permits for work in public ways
Boston Public Works Department	Street Opening Permit.

1.7 PROJECT TEAM

The project team is identified below:

Developer:

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Community Partner:

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Contact: Al Caldarelli

Planning Consultant:

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Boston, MA 02108
(617) 357-7044
Contact: Jamie Fay / Richard Jabba

Development Counsel:	**WilmerHale** 60 State Street Boston, MA 02109 (617) 526-6216 Contact: Katharine Bachman
Architects:	**ICON architecture, inc.** 38 Chauncy Street, Suite 1401 Boston, MA 02111 (617) 451-3333 Contact: Nancy Ludwig / Kendra Halliwell
Transportation:	**Woodland Design Group** 5 Dartmouth Drive, Suite 301 Auburn, NH 03032 (603) 641-9500 Contact: Rob Woodland
Civil/Survey:	**Nitsch Engineering** 186 Lincoln Street, Suite 200 Boston, MA 02111 (617) 338-0063 Contact: Paul LeBaron Sr. / John Schmid
Marine:	**Childs Engineering Corporation** 541 Main Street, Box 333 Medfield, MA 02052 (508) 359-8945 Contact: David Porter
Geotechnical:	**McPhail Associates, Inc.** 30 Norfolk Street Cambridge, MA 02139 (617) 868-1420 Contact: Peter DeChaves / Ambrose Donovan
Wind Consultant:	**Frank Durgin PE** 10 Littlefield Road Chebeague Island, ME 04017 (617) 216-4719 Contact: Frank Durgin

Landscape Architect:	**Copley Wolff Design Group** 160 Boylston Street, 3rd Floor Boston, MA 02116 (617) 654-9000 Contact: Lynn Wolff / John Copley
Historical Consultant:	**Public Archaeology Laboratory, Inc.** 210 Lonsdale Avenue Pawtucket, RI 02860 (401) 728-8780 Contact: Suzanne Cherau

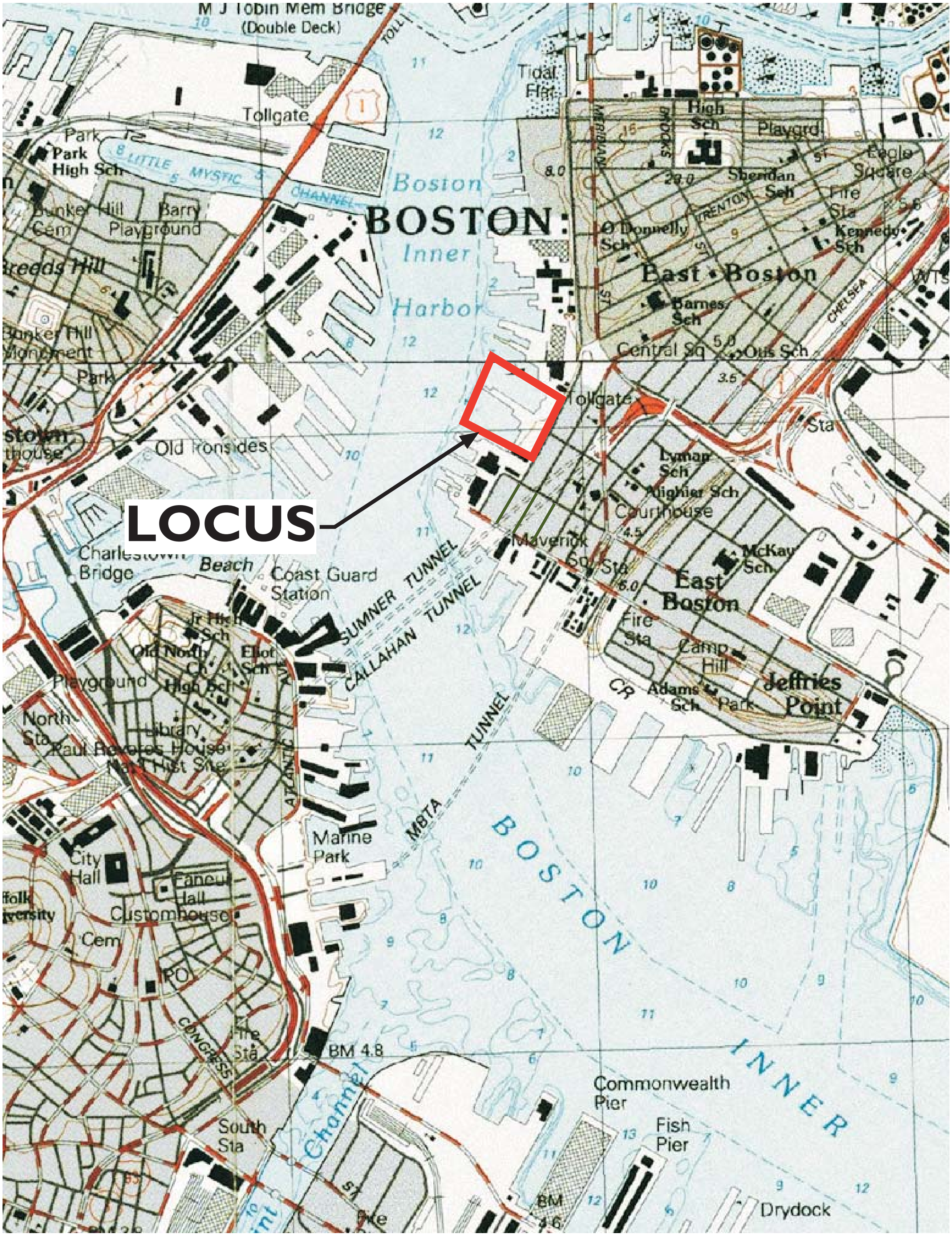


Figure 1-1
Locus Plan
source: USGS

Figure 1-2
Neighborhood Context Plan - Existing Conditions
source: Boston Redevelopment Authority

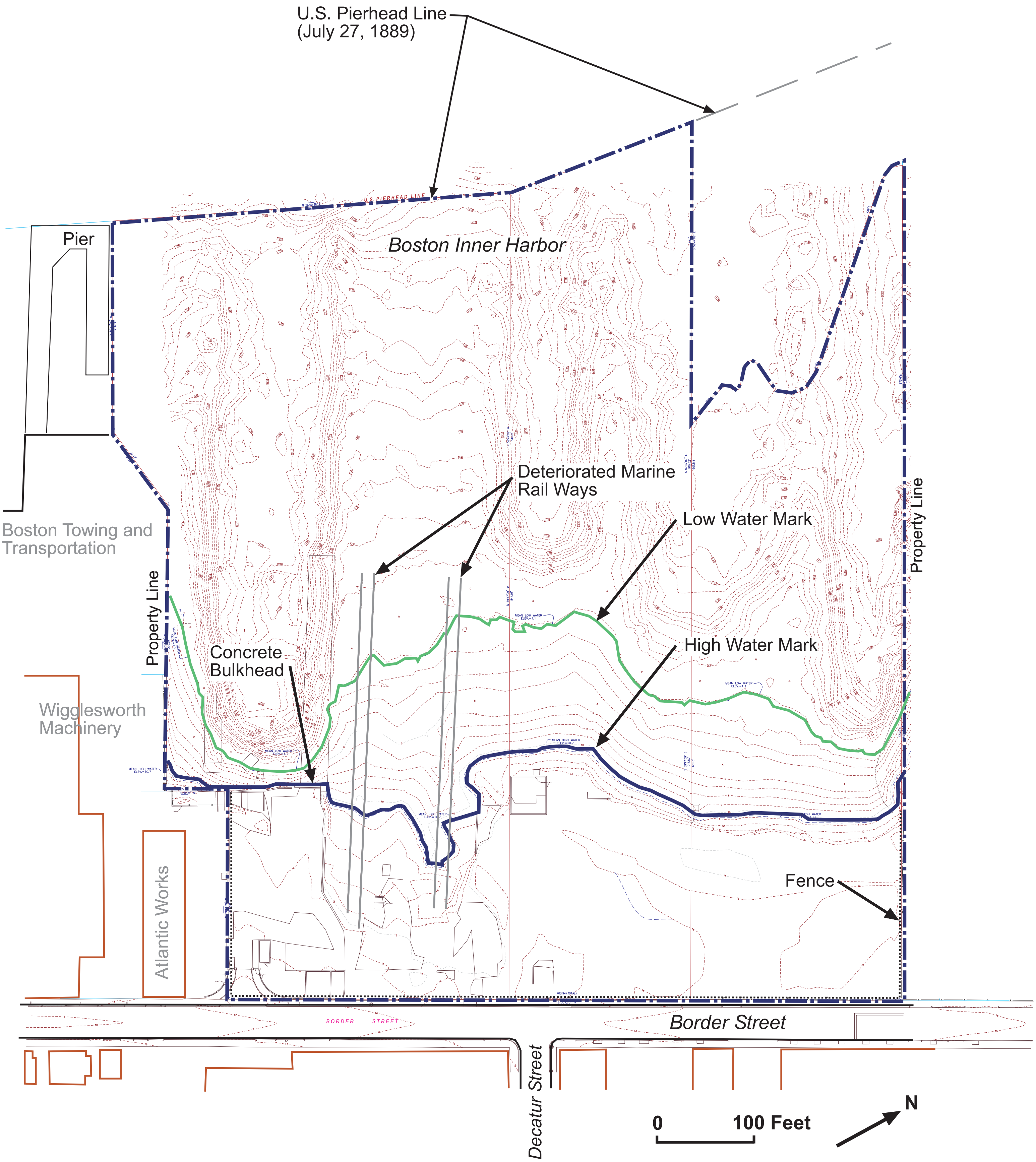


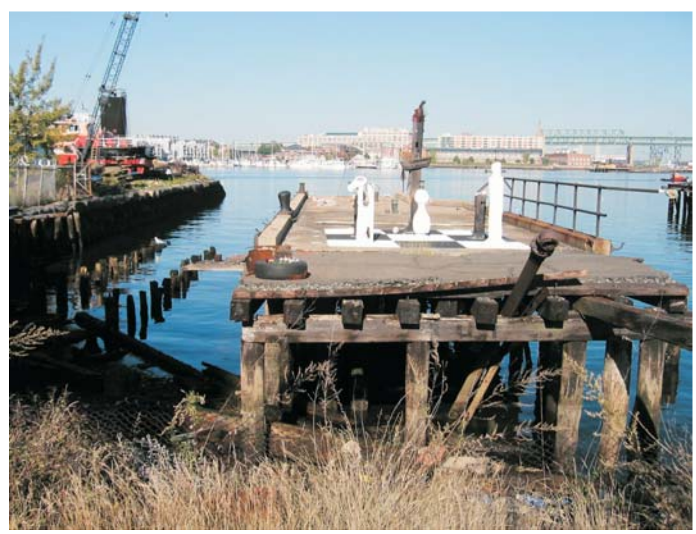
Figure 1-3

Existing Condtions Plan

source: Nitsch Engineering

View of project site looking north

View of project site looking north



View of piers looking west

Figure 1-4
Existing Conditions Photos
source: Fort Point Associates

BOSTON EAST

East Boston, Massachusetts
Trinity Border Street, LLC & East Boston Community Development Corporation
January 22, 2007

ICON architecture

Figure 1-5:

Project Site Plan

BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC

Figure 1-6:

View of the Project from the East

BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC

Figure 1-7:

View of the Project from the South

BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC

Figure 1-8:

Border Street Entrance

COPLEY WOLFF DESIGN GROUP
Landscape Architects & Planners
160 Boylston Street, Boston, MA

BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and East Boston CDC
October 10, 2007

Figure 1-9:

ENF/PNF Alternative

Chapter 2

URBAN DESIGN

2.0 URBAN DESIGN

The design of the Boston East project will create a vibrant public realm in the East Boston community where public access has never been available in the past. The following sections describe the existing urban setting, define the project's design principles, and demonstrate how these principles are met.

2.1 SURROUNDING URBAN FABRIC

The Boston East site is located on the waterside of Border Street on the western edge of East Boston. To the north of the site are Central Square and the Liberty Plaza shopping area, and to the south are the new Maverick Landing mixed-income development and LoPresti Park. The 80 Border Street Cultural Exchange Center/The Atlantic Works Gallery and Shining Star Daycare are in the recently renovated 5-story masonry building to the immediate south. To the immediate north of the site are several industrial buildings. Decatur Street terminates perpendicular to Border Street, with a large industrial building to the southern face, and retail/office along Border Street to the northern side of Decatur Street.

The site is currently a vacant tract of land. While the site was historically and mainly utilized for marine industrial uses, only a few concrete footprints remain in ruin along the water's edge. There are two dilapidated heavy timber marine railways and hundreds of rotting timber piles along the water's edge. Views from the site across the water focus towards Charlestown and downtown Boston.

The neighborhood currently consists of a mix of housing types, retail and storage uses, mixed-use buildings, and industrial uses. There is an excellent range of community service and commercial shops within walking distance from the site including a supermarket, clothing stores, health center, and several schools. The MBTA is renovating Maverick Station, just blocks from the site, to enhance transit services in the neighborhood. Maverick Station is only a five minute ride from downtown Boston and to Logan Airport.

Several parcels in the East Boston waterfront near the project are being redeveloped into new residential and mixed-use projects, including Clippership Wharf (400 units), Portside at Pier One (550 units), and Hodge Boiler Works (119 units). A number of development proposals are currently underway or being evaluated for future use in the vicinity, including the industrial buildings on New Street and a new development on Orleans Street.

2.2 DESIGN RESPONSE TO URBAN FABRIC

The project's design response to the principles outlined in the previous section is described in the following paragraphs.

2.2.1 DESIGN CONCEPT

The fundamental urban design concept is to reconnect the site to the surrounding neighborhood, providing improved physical and visual connections to its magnificent waterfront. The terminus of Decatur Street provides a separation between the residential and maritime uses, as well as an opportunity to highlight the vital link between the city and the Inner Harbor (see Figure 2-1, Urban Design Concept). On the axis of Decatur Street will be a large, open area with interpretive historical displays and landscaping to the water's edge. This public space will maintain the open views of Charlestown and the Tobin Bridge from the street, as well as provide pedestrian access to the waterfront and East Boston Harborwalk. The Harborwalk will extend along most of the length of the parcels, providing an inviting pathway along the water's edge. The new residential building's architectural style is designed to reflect historic wharf building proportions and materials, stepping back from the street and water's edge with a layering of masonry, cast-stone, and paneling.

2.2.2 SITE DESIGN AND PUBLIC REALM

A maritime interpretive area will be created in the center of the site for the community. This area will be between the two new buildings and will be a pedestrian connection from Border Street to the Harbor's edge, maintaining the Decatur Street view corridor, as recommended in the East Boston Municipal Harbor Plan (see Figure 2-2, Project Site Plan). Designed as an interpretive landscape commemorating the site's extensive maritime history, the main entrance to this area will be at the end of Decatur Street, with a gateway framing the view of the water. Interpretive exhibits and displays will extend into the Harbor and integrate remnants of one of the existing marine railways and cradle. Pedestrians on the Harborwalk may view the exposed portions of the marine railway as well as watch tidal interactions along this area. Seating and activity areas will be located along the water's edge. Interpretive elements will be incorporated as focal stopping points to highlight the ship building and maritime history of the site. Utilizing seawall stone and extant rail lines and pylons along a built up seawall edge, the maritime interpretive area will be industrial in character.

The proposed residential building will be incorporated into the site with sensitive grading and landscaping. A wide arching terrace following the curve of the shoreline will be fully accessible and inviting. This terrace will provide an attractive overlook and common area open to the public. Grand steps, ramps, and stairs will provide a variety of paths from the terrace to the Harborwalk. The terrace and landscape will provide privacy for the residents, but will also allow views to the water and provide a common area for gathering and events.

The shoreline in the residential "cove" will be stabilized with rip-rap placed to create a gentle slope to the water.

Sustainable elements of the site include the utilization of existing and recycled materials and native plant species, the reclamation of surface run-off into rain gardens, interpretive elements, public access and seating, and low-level and shielded lighting. The terrace itself will be a "green roof" over a partial parking level below.

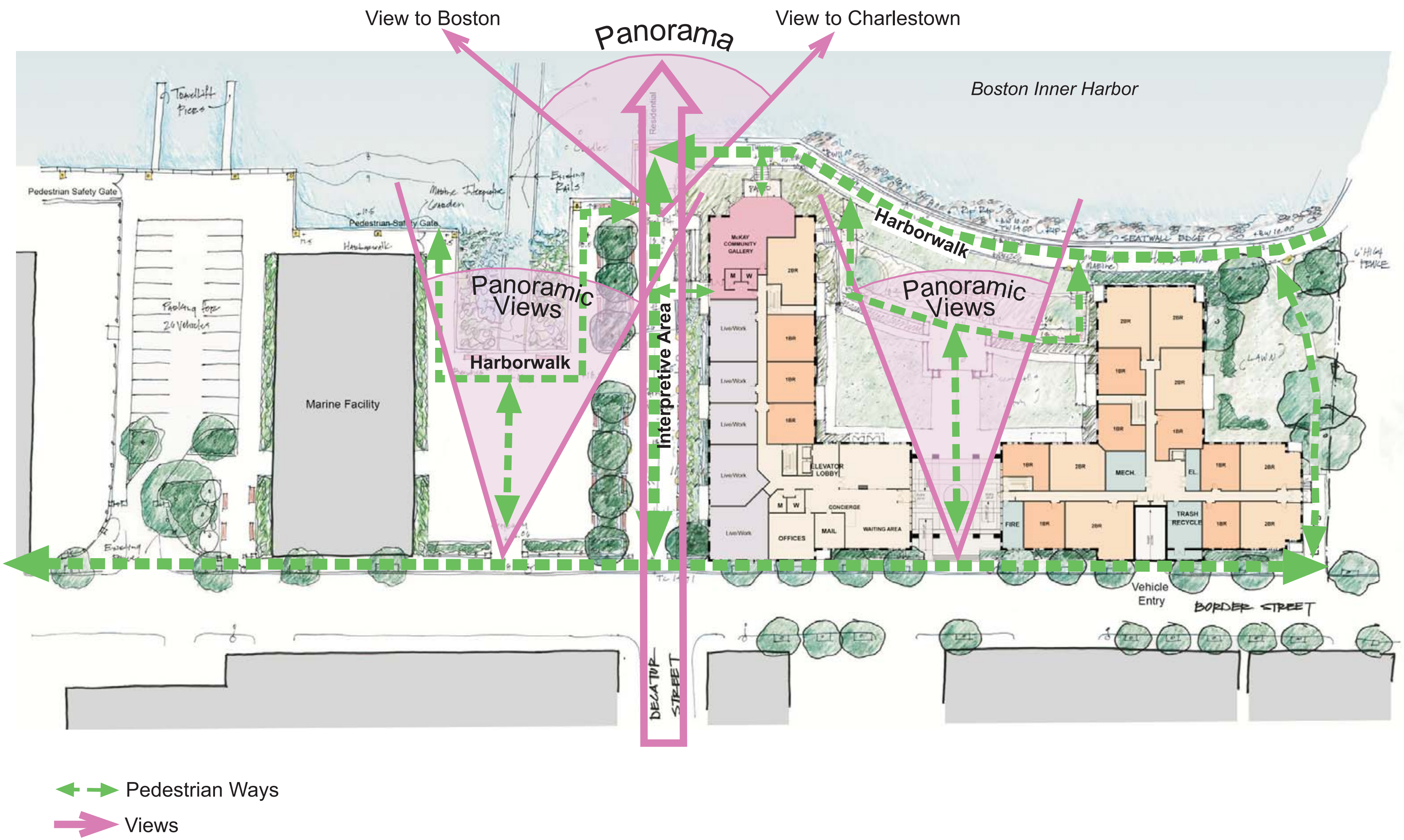
2.3 ARCHITECTURE AND BUILT FORM

The new brick, cast-stone, and paneled residential building has been designed to fit into the scale of the existing and proposed buildings in the neighborhood near the waterfront, which range from 25 to 125 feet high. The architectural style of the proposed residential building has been designed to reflect a traditional waterfront massing of "fingers" reaching out and stepping down in height and materials to the water (see Figure 2-3, Building Elevations). An archway entrance centered on the Border Street facade will provide excellent views of the Boston Inner Harbor and Charlestown, will have interpretive exhibits to invite pedestrians to enter, and will create access to the courtyard terrace and to the waterfront from Border Street (see Figure 2-4, View of Project from the South). The majority of the Border Street façade of the residential building will sit six feet back from the sidewalk with attractive plantings.

The residential building height will range from four to seven stories. At the ground level near the waterfront and opening onto the maritime interpretive area, the new 2,100 square-foot Community Gallery will be an active and vibrant public space with public rest rooms (see Figures 2-5 and 2-6, Residential Building Floor Plans – Lower and Upper). Five Artist Affordable live/Work studios will also open onto the interpretive area and complement the 80 Border Street artist programs. The remaining portion of the ground level and all of the upper levels will consist of one hundred and ninety six (196) one and two-bedroom residential units, with units varying in size from 650 to 1,200 square feet. At the ground or upper floors, residential units may have balconies or decks with waterfront views (see Figure 2-7, Residential Building Detail and Section). All resident parking will be located a half-level underground, accessed by a garage entry off Border Street. One hundred and forty-one (141) parking spaces will be available in the garage, providing 0.7 spaces per residential unit in keeping with transit-oriented development standards and local zoning requirements.

As mentioned above, the residential building facades will be primarily built of traditional building materials: masonry, with cast stone lintels, windowsills, and caps. As the building steps back on the upper levels, the façade materials also change to a panel system, then step back a second time to a curtainwall system at the topmost and waterfront locations. Cast stone bands wrap entirely around the building above the second floor level, grounding the structure. The first and second floor fenestration of the façade will be tied together to read as vertical openings. At regular intervals along each of the "fingers," lightweight balconies will be detailed to emulate ship's masts and the site's maritime history.

Conceptually, the marine facility will sit perpendicular to Border Street, abut the sidewalk, and emulate the conventional urban industrial form of a maritime structure in the shape of a long, two-story "boatshed" structure. This approximately 20,000 square foot building will have a presence on Border Street with a two-story main entrance. This entrance will be highlighted with a masonry façade and a large arched door. Work vehicles, loading, and employee parking for 26 cars will be on the southernmost end of the site, separated from the Atlantic Works property with a generous planted buffer. The existing brick pillar gateway will be removed and a similar pillared gateway will be constructed at the entry to the marine facility parking area (see Figure 2-4, View of Project from the South).



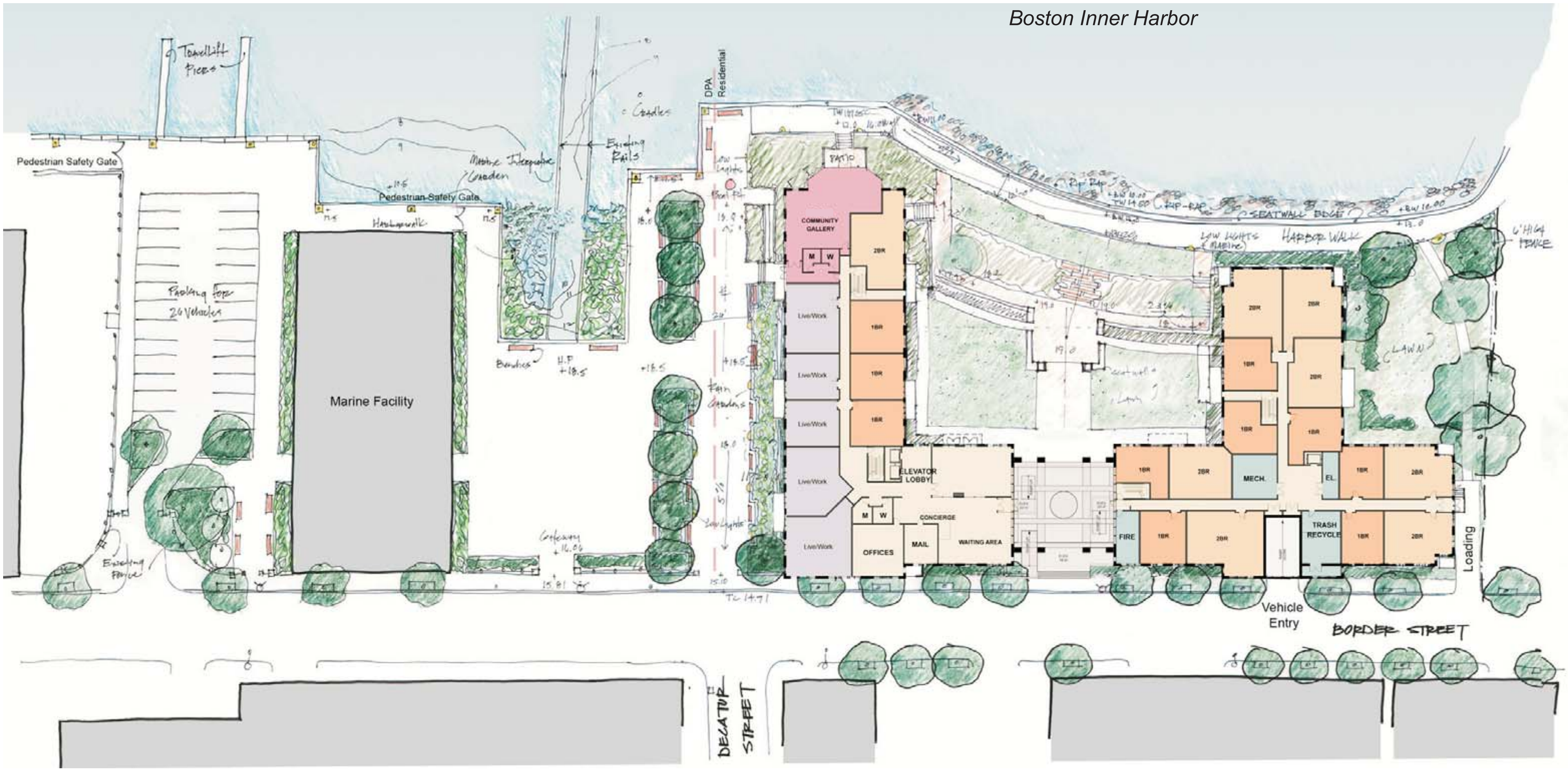
BOSTON EAST

EAST BOSTON, MASSACHUSETTS

Figure 2-1

Urban Design Concept

sources: Copley Wolff Design Group; ICON architecture; Fort Point Associates



BOSTON EAST

EAST BOSTON, MASSACHUSETTS

Figure 2-2

Project Site Plan

sources: Copley Wolff Design Group; ICON architecture

BOSTON EAST

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Figure 2-3:

Building Elevations

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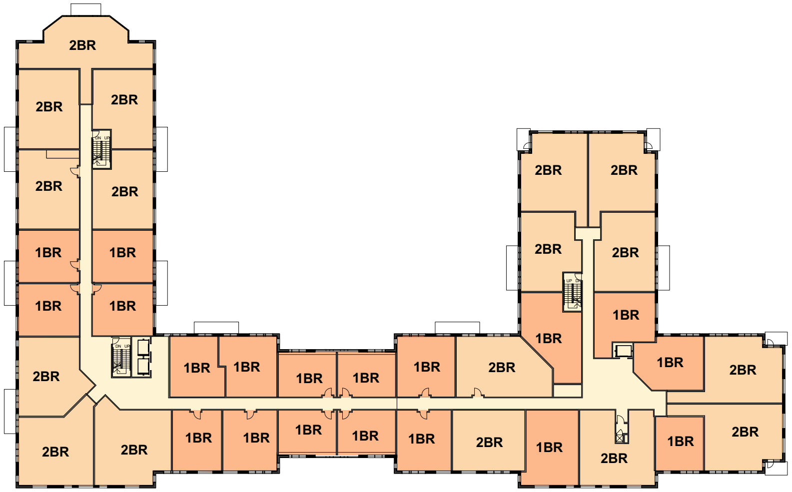
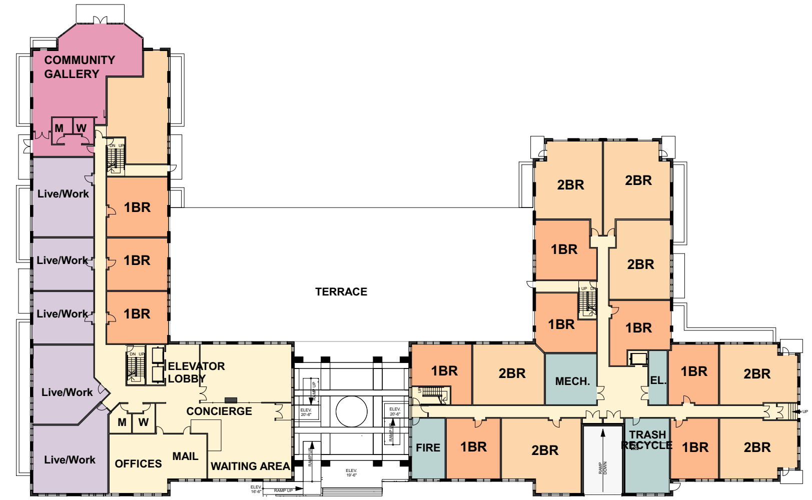
Figure 2-4:

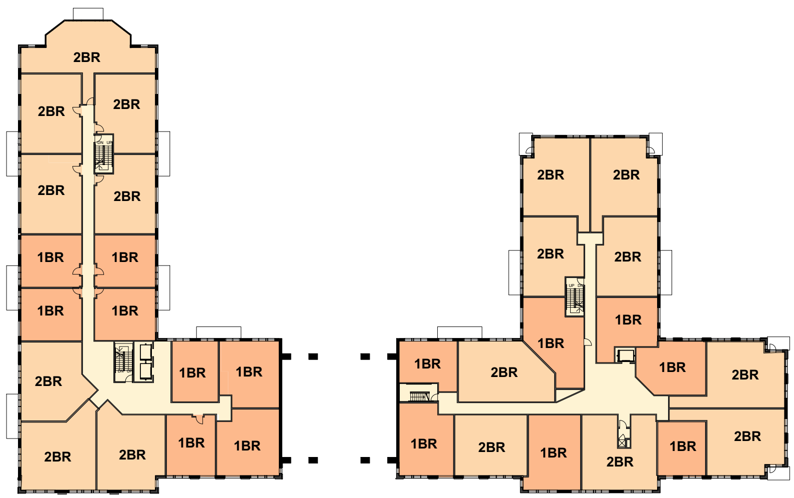
View of the Project from the South



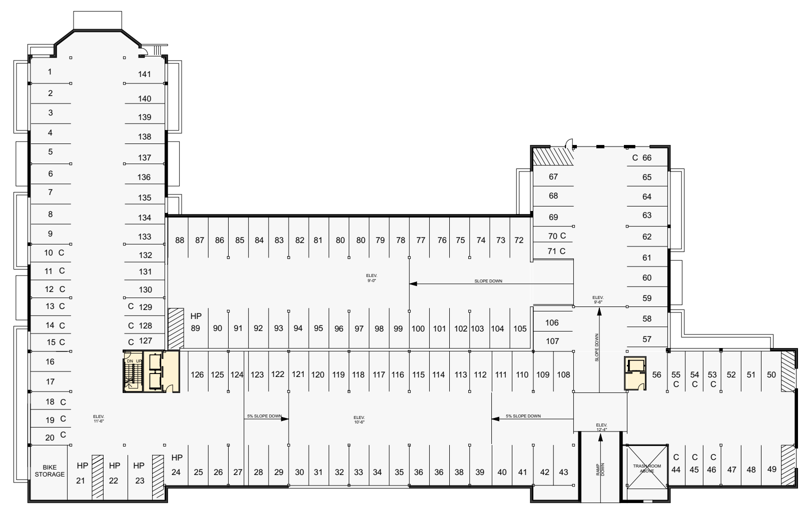
4 Third Floor Plan



2 Ground Floor Plan



3 Second Floor Plan



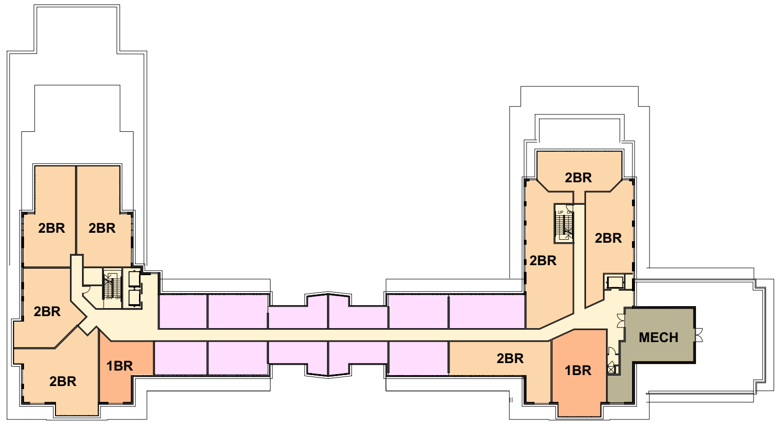
1 Garage Level Plan
SCALE: 1/32" = 1'-0"

BOSTON EAST

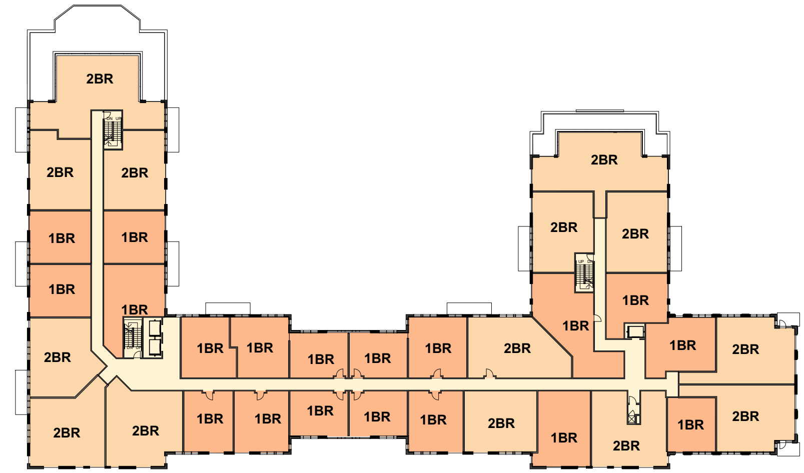
East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
February 27, 2008

Figure 2-5:

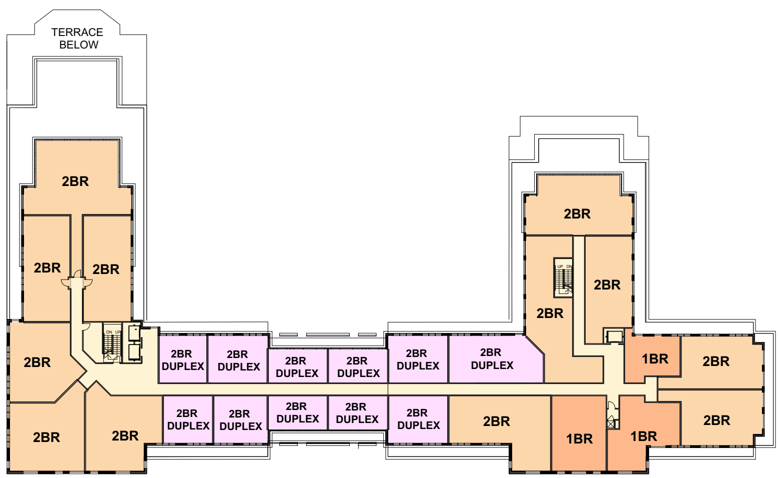
Residential Floor Plans - Lower



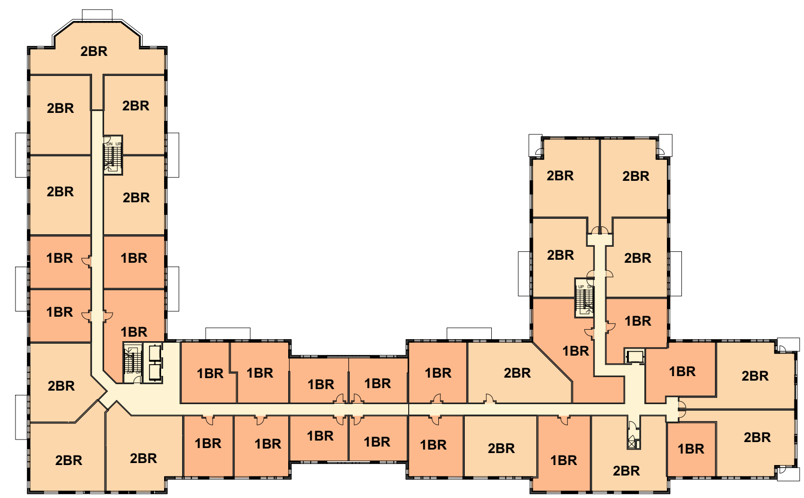
4 Seventh Floor Plan



2 Fifth Floor Plan



3 Sixth Floor Plan



1 Fourth Floor Plan

BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
February 27, 2008

Figure 2-6:

Residential Floor Plans - Upper

BOSTON EAST

Figure 2- 7:

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
February 26, 2008

Residential Building Detail and Section

Chapter 3

TIDELANDS

3.0 TIDELANDS

3.1 INTRODUCTION

The Boston East site is approximately 14.2 acres and is located at 102 – 148 Border Street along Boston Inner Harbor in East Boston. The entire site (10.8 acres of flowed tidelands and 3.4 acres of filled tidelands) is located within Chapter 91 jurisdiction and thus the Chapter 91 regulations, as modified by the East Boston Municipal Harbor Plan (EBMHP), apply to the proposed development. Under the state Waterways Regulations, certain use and dimensional requirements outlined in the Chapter 91 regulations may be altered if a local municipality has developed and received state approval of a municipal harbor plan. The applicable Chapter 91 standards, as modified by the EBMHP are described in Section 3.3 below. The BRA is seeking an amendment to the EBMHP as described in Section 3.5.2, Compliance with the Proposed Amendment to the East Boston Municipal Harbor Plan.

3.2 PROJECT DESCRIPTION

The project includes a new residential building, a marine use building, a water-dependent activity, and substantial public access to and along the Boston Inner Harbor. The proposed residential building varies in height from four to seven stories and contains 196 one and two-bedroom housing units. A one-level subsurface parking structure accommodating 141 cars is provided beneath the building footprint.

On the south side of the residential building is an approximately 20,000 gross square foot (gsf) building that is dedicated for marine related uses and two piers to support a travel lift. An at-grade parking area with 26 spaces will support the proposed marine activities.

The project has been designed to encourage public access through the site, both to and along the waterfront and from Border Street. Public amenities that will be provided include, but are not limited to the following:

- Landscaped public open space of approximately 44,210 square feet (sf);
- Approximately 9,000 sf of Facilities of Public Accommodation (FPA) in the form of interpretive exhibits, artist affordable live/work units accessible to the public at determined times during the year, and the community gallery on the first floor of the residential building;
- A 12-foot wide/10-foot clear Harborwalk that will extend along the entire residential portion of the site's waterfront; and
- An interpretive maritime area that will commemorate the site's extensive maritime history.

The gallery and its restrooms will be available to the general public during normal operating hours and during special events.

3.3 TIDELANDS JURISDICTION

The entire site is in Chapter 91 Jurisdiction. The project site is comprised of flowed tidelands and filled (formerly flowed) tidelands. Based on the Chesbrough map of 1852, the original shoreline is landward of the site. The original low water line varies between approximately 75 to 250 feet seaward of the existing high water mark (see Figure 3-1, Chapter 91 Jurisdiction). Since the site is owned by a public entity, the City of Boston, it is considered Commonwealth tidelands.

All of the existing piers and fill were previously licensed. State authorizations to extend the Harbor Commissioners Line, and for structures and fill were provided between 1885 and 1937 (see Table 3-1, Authorizations at the Boston East Site). These licenses permitted the property owner to maintain, repair, dredge, construct walls, foundations, and piers, and railways, and fill in and over the tidewaters of Boston Harbor.

Table 3-1. Authorizations at the Boston East Site

License No.	Authorization	Date
868	Harbor and Lands Commissioners	May 6, 1885
1399	Harbor and Lands Commissioners	October 16, 1891
1634	Harbor and Lands Commissioners	June 28, 1894
1993	Harbor and Lands Commissioners	March 4, 1897
2028	Harbor and Lands Commissioners	July 8, 1897
2388	Harbor and Lands Commissioners	June 26, 1900
2548	Harbor and Lands Commissioners	October 10, 1901
158	Directors of the Port of Boston	November 10, 1915
162	Directors of the Port of Boston	December 1, 1915
170	Directors of the Port of Boston	February 9, 1916
152	Commission Waterways and Public Lands	December 6, 1917
1246	Department of Public Works	December 31, 1930
1814	Department of Public Works	December 3, 1936
1890	Department of Public Works	September 18, 1937

Source: DEP, Boston, 2007

3.4 COMPLIANCE WITH DESIGNATED PORT AREA

Under Chapter 91, there are a number of restrictions that apply to both the Designated Port Area (DPA) and non-DPA portions of the site. The DPA portions of the site were recently consolidated so that the DPA is now only on the south portion of the site in order to create better development parcels for separate maritime and residential uses (see Figure 3-2, Consolidated DPA Boundary Plan). With the reconfiguration, the marine facility will be located wholly within the DPA boundaries. The reconfigured DPA has direct deep water access, a significant feature that does not create the need for dredging. The proposed uses as a maritime facility and a travel lift are "allowed uses" within a DPA.

3.5 COMPLIANCE WITH CHAPTER 91 STANDARDS

The project is non-water-dependent pursuant to 310 CMR 9.12(4) of the Waterways regulations because it consists of a residential and mixed-use development. As stated in M.G.L. Chapter 91 Section 18, "no structure or fill for a nonwater-dependent use of tidelands may be authorized unless a written determination by the Department [of Environmental Protection] is made following a public hearing that said structures or fill shall serve a proper public purpose and that said purpose shall provide a greater public benefit than detriment to the rights of the public in said tidelands..." Pursuant to 310 CMR 9.31(2)(b) of the Waterways regulations, DEP presumes that the referenced requirement is met if the project complies with the nonwater-dependent use standards of 310 CMR 9.51 - 9.53, and is consistent with the policies of the Massachusetts Office of Coastal Zone Management (CZM).

For the non-DPA portion of the site, the proponent will be seeking relief through a municipal harbor plan (MHP) amendment from certain dimensional constraints including height, the water dependent use zone, and facilities of public accommodation. The East Boston Municipal Harbor Plan Amendment has gone through its public planning process at the municipal level with the Boston Redevelopment Authority (BRA). The BRA recently approved the EBMHP Amendment and forwarded it to the Secretary for approval.

Section 3.5.1 below describes the project compliance with the existing, applicable Chapter 91 standards outlined in 310 CMR 9.00. Section 3.5.2 describes the how the project will comply with the proposed substitutions being requested through an amendment to the EBMHP.

3.5.1 COMPLIANCE WITH CHAPTER 91 REGULATIONS

The project complies with the following standards of the existing Chapter 91 regulations.

310 CMR 9.51(3)(D) - OPEN SPACE

In accordance with 310 CMR 9.51(3)(d), no more than 50% of the project site may be occupied by nonwater-dependent use buildings. The regulations require that, at a minimum, one square foot of open space be provided on the project site for each square foot of tidelands occupied by the footprint of buildings containing nonwater-dependent uses.

The non-DPA portion of the project site consists of 84,218 sf[1] of filled tidelands. The residential building footprint will occupy 36,800 sf or 43.7% of this jurisdiction area, thereby keeping much more than half of the project site free from nonwater-dependent buildings. Furthermore, there is extensive additional open space being provided within the DPA portion of the project.

310 CMR 9.52(1)(a) – Water-Dependent Activity Facilities

The standard 310 CMR 9.52(1)(a) requires that projects with a water dependent use zone (WDUZ) include at least one facility that generates a water-dependent use activity. The proposed Harborwalk enables the project to meet this standard. This Harborwalk will promote active use of the shoreline. It will connect to the future Harborwalk on the north side of the site and to the planned maritime development and activities that are proposed in the south side of the site as well as the inland portion of the Harborwalk. Also, active maritime uses will be on the southern part of the site.

310 CMR 9.53 - Commonwealth Tidelands

The site is publicly owned and contains both filled and flowed tideland. Under the Chapter 91 regulations, the site is classified as Commonwealth tidelands, and therefore, the provisions of 310 CMR 9.53 pertaining to water-dependent activity and exterior open space apply. The proponent will promote public use and enjoyment of such lands to a degree that is fully commensurate with the proprietary rights of the Commonwealth.

Pursuant to 310 CMR 9.53(2)(a), the project is required to promote a water-based public activity that is appropriate for the site, given the nature of the project and the condition of the waterbody on which it is located. The watersheet in front of the site is extremely shallow and not conducive to providing access for vessels such as water taxis, while at the same time being in proximity to a deep draft shipping channel raising concerns over conflicts with small recreational craft. Therefore, the public water based activity which would be appropriate for the site would be shore-based recreational fishing. The Harborwalk will be designed with appropriate areas for recreational fishing and support facilities such as fish cleaning stations.

Pursuant to 310 CMR 9.53(2)(b), at least half of the non-DPA portion of the site will be open space. Furthermore, the project will attract and maintain substantial public activity on a year round basis by creating open space for public use including a Harborwalk that runs along the whole waterfront of the site. These areas will include benches, lighting, trash receptacles, and similar amenities to support and encourage its use.

[1] As measured to the Project Shoreline

3.5.2 COMPLIANCE WITH THE PROPOSED AMENDMENT TO THE EAST BOSTON MUNICIPAL HARBOR PLAN

The project will conform to the following standards, which are included in the BRA's proposed Amendment to the EBMHP:

310 CMR 9.51(3)(C) – WATER-DEPENDENT USE ZONE

In accordance with existing Chapter 91 regulations at 310 CMR 9.51(3)(c), the project must preserve the site's capacity to serve water-dependent uses. This standard is met by ensuring that new or expanded non-water dependent buildings and at or above grade parking facilities are set back from the waterfront. The setback or WDUZ extends landward from the project shoreline 25% of the depth of the lot, with a minimum of 25 feet and a maximum of 100 feet, and along the sides of piers 15% of the lot width, with a minimum of 10 feet and a maximum of 50 feet.

The non-DPA portion of the site has an average lot depth of 212 feet and does not have any piers or wharves on it. As a result of this lot depth, the depth of the WDUZ is 53 feet from the project shoreline and has a total area of 22,791 sf. Two wings of the residential building near the waterfront are within the WDUZ and contain a total of 2,812 sf (see Figure 3-3, Chapter 91 Compliance – WDUZ and FPA).

The BRA is proposing an EBMHP amendment to allow reconfiguration of the WDUZ with a minimum building setback of 25 feet along the locations of the two building wings while proposing a slightly greater area of WDUZ (22,806 sf). The reconfigured WDUZ will be devoted exclusively to water-dependent activity and public access.

The project will comply with the EBMHP Amendment by maintaining a minimum setback of 25 feet for the buildings containing nonwater-dependent uses as shown in Figure 3-3 and allocating wider WDUZ setbacks in different areas of the site, including areas contiguous and adjacent to the proposed DPA and in an amount that offsets the proposed changes. Additional setbacks will be created on other portions of the site to create a broader WDUZ while maintaining at least the same overall area (approximately 22,806 square feet) that would have been provided in lieu of this substitute provision and will be located on the south portion of the site adjacent to the DPA.

310 CMR 9.53(2)(C) - FACILITIES OF PUBLIC ACCOMMODATION AND 310 CMR 9.51(3) – FACILITIES OF PRIVATE TENANCY

Under the Chapter 91 regulations, Facilities of Public Accommodation (FPAs) are required on the ground floor of all buildings containing facilities of private tenancy (FPTs) on Commonwealth tidelands. Allowances are made for upper floor accessory services for up to 25% of the required area. The entire project site is defined as Commonwealth tidelands because of the City of Boston ownership. Additionally, the regulations restrict nonwater-dependent FPTs within 100 feet of the project shoreline. Substitute measures that provide alternative provisions that meet the purposes of avoiding privatization and are tailored to the circumstances of the particular harbor area are permitted.

The BRA is proposing an MHP amendment of the FPT requirement to allow reconfiguration of the FPA space within 100 feet of the project shoreline to locations that provide a more appropriate buffer to the DPA. The Amendment permits:

- FPTs to occupy up to 75% of the ground floor (excluding upper floor accessory uses) in Commonwealth tidelands that are publicly owned; and
- The reconfiguration of FPA space within 100 feet of the project shoreline to locations that provide a more appropriate buffer to the DPA.

Furthermore, the Amendment requires that a minimum of 25% of the ground floor (excluding upper floor accessory uses) shall be devoted to civic and cultural facilities including but not limited to: artist affordable live/work units (certified through the BRA's artist certification process) which is open to the public no less than two times per year, gallery, exhibition space, teaching space, maritime history interpretive exhibit space, community meeting room, and community center. These facilities will be located within the ground floor to effectively promote public use and enjoyment of the project site. The facilities will be managed and programmed to establish the project site as a year-round locus of public activity.

The entire ground floor of the proposed 36,800 sf building is supposed to be programmed for FPAs per the Chapter 91 regulations. The ground floor has approximately 25% (9,360 sf) upper floor accessory services.

The project complies with the FTP requirement of the Amendment, which allows FTPs to occupy up to 75% of the ground floor by providing FPAs on approximately 23% (8,653 sf) on the ground floor of the residential building (see Figure 3-3). These FPAs include 2,040 sf for the Community Gallery, 4,510 sf for the affordable live/work units, and 2,103 sf of open area within the archway of the building between Border Street and the terraced open space on the waterfront.

The project complies with the FPA requirement of the Amendment by providing:

- A community gallery as cost free space reserved for public benefit, including public restrooms;
- Approximately 2,500 square feet of open area within the proposed archway of the building facing Border Street, animated by historic exhibits and interpretive displays that will contribute to attract the public to the waterfront; and

- Five affordable artist live/work units with associated requirements for public access.

310 CMR 9.51(3)(E) - HEIGHT

In accordance with 310 CMR 9.51(3)(e), the building heights are required to be 55 feet or less when located within 100 feet of the high water mark. Landward of the 100-foot line to the Chapter 91 jurisdiction line, buildings can be stepped up on a 1:2 slope.

Under a Chapter 91 compliant scheme, the north and south wings of the building would be 55 feet high within 100 feet from the HWM (see Figure 3-4, Chapter 91 Compliance - Building Massing). The building would be stepped up at a 1:2 slope to a maximum height of 95 to 115 feet high along Border Street.

Through the amendment, the BRA is proposing a uniform height requirement of 85 feet across the site in order to ensure that buildings for non-water dependent uses are modest in size, making more of the ground level environment available to water-dependent activity and public access. This layout allows for more efficient and economical use of the land as well as an increase the total amount of open space on the site to more than 56%. The building wings would step down towards the waters edge.

In the proposed project, the south and north wings of the residential building, which range from five to seven stories, will be 52 feet high (lower than Chapter 91 compliant scheme) at the waterside of the building and then will step up to 63 feet, step again to 74 feet, and again to 85 feet. Along Border Street, the building would reach a maximum height of 85 feet, and step down twice, to 74 feet and 63 feet. The gross square footage of the building would be comparable to the Chapter 91 compliant scheme.

The EBMHP requires projects with a height substitute provisions to demonstrate that they result in comparable wind, shadow, and other conditions at the ground level. A qualitative wind analysis shows that the project meets the BRA wind criteria at key ground level pedestrian areas (see Appendix 2, Wind).

To offset any net new shadow impacts caused by the project, the proponent will provide an additional square foot of exterior public open space for every two square feet of new net shadow from the increased building heights allowed by the EBMHP, as compared to what is allowed under a Chapter 91 compliant design. A shadow analysis was conducted and shows a net increase of shadow impacts in the amount of 4,202 sf of the proposed project over a Chapter 91 compliant design (see Section 5.2, Shadow). As a result, the project will include an offset of 2,101 sf of open space within Chapter 91 jurisdiction of the site (see Figure 3-5, Shadow Impact Open Space Offset).

3.5.3 SUMMARY OF CHAPTER 91 COMPLIANCE

As the foregoing discussion demonstrates, the project complies with the state Chapter 91 regulations as modified by the proposed amendment to the EBMHP. The site design and program will substantially enhance the waterfront environment along this vacant, dilapidated section of the East Boston waterfront. Consistent with goals of Chapter 91 and the EBMHP, the public will benefit from public realm improvements that not only provide views and access to and from the waterfront, but also activate the waterfront with community, interpretive, and water-dependent uses.

3.6 NAVIGATION AND SECURITY

3.6.1 PROPOSED OPERATIONS

The Project proposes to construct two piers in order to support a marine travel lift in the DPA portion of the site, which is adjacent to the property owned by Wigglesworth Machinery. Vessels traveling to and from the lift would also traverse by the Boston Towing and Transportation property. Although no specific tenants have been determined at this time, the proposed use would haul and launch vessels on an as needed basis, which is typical for a marine boat building, servicing, or repair facility in an industrial maritime area as allowed per Waterways Regulations.

3.6.2 SAFETY AND SECURITY

The proponent understands the operational security and operational aspects of the Boston Towing and Transportation site. The vessels at the project site are expected to be substantially smaller than the vessels currently berthed at the Boston Towing site. Although there are no direct impacts from the Project, the proponent will work with the property owners regarding access to and implementation of security measures. Vessel users at the project site will be informed of the types of vessels and uses at the Boston Towing site to minimize conflicts and to ensure safe navigation. No navigational impacts regarding vessels traversing the area are expected as well.

On the landside, the proposed Harborwalk has been redesigned to direct pedestrians away from working portion of the waterfront between the proposed marine travel lift and the maritime facility. People will still have excellent vantage points, most of which are more than 300 feet from the Boston Towing property, to view the working port from the open space areas, Harborwalk, and other parts of the site north of the marine facility.

Construction impacts to vessel traffic at the Boston Towing site are expected to be minimal since only two 50-foot piers in the DPA would be constructed. The construction period would only be a few months.

3.7 PROJECT COMPLIANCE WITH THE MASSACHUSETTS OFFICE OF COASTAL ZONE MANAGEMENT POLICIES

The project is consistent with the Massachusetts Coastal Zone Management (CZM) Program Policies. The Massachusetts CZM Program was established to protect and manage the development and use of the coastal zone under the provisions of the Federal Coastal Zone Management Act of 1972. This is accomplished by reviewing proposed developments in the coastal zone in terms of consistency with the CZM Coastal Policies and Management Principles. The project's consistency with relevant policies/principles is described below.

STORMWATER MANAGEMENT

WATER QUALITY POLICY #2

"Ensure that nonpoint pollution controls promote the attainment of state surface water quality standards in the coastal zone."

The project has developed a stormwater strategy for the construction term and post construction activities. The proponent and the contractor will file for an EPA NPDES Permit and implement the Stormwater Pollution Prevention Plan during construction to mitigate erosion and pollution. All stormwater generated from the surfaces used for vehicular traffic during construction will be treated for the removal of suspended solids and potential contaminants in accordance with the Massachusetts DEP stormwater management policies. Best Management Practices (BMPs) will also be implemented to ensure that erosion and sedimentation are minimized. As deemed necessary, erosion and sedimentation controls, such as hay bales and siltation fences, will be used.

HABITAT PROTECTION

HABITAT POLICY #1

"Protect coastal areas including salt marshes, shellfish beds, dunes, beaches, barrier beaches, salt ponds, eelgrass beds, and fresh water wetlands for their important role as natural habitats."

The project includes a small amount of fill to straighten the shoreline that will affect the coastal beach and land subject to coastal storm flowage resource areas in Boston Inner Harbor. BMPs will be implemented during construction of both the landside and waterside developments to minimize any potential impacts to the resources of the Harbor.

Coastal Hazards

Coastal Hazard Policy #1

"Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flow, salt marshes, and land under the ocean."

Coastal Hazard Policy #2

"Ensure construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Approve permits for flood or erosion control projects only when it has been determined that there will be no significant adverse effects on the project site or adjacent or downcoast areas."

There are no natural coastal landforms such as dunes, beaches, barrier beaches, coastal banks, or salt marshes that provide storm damage prevention and flood control. Although there is coastal beach and land subject to coastal storm flowage resources on the project site, project activities will not create an adverse impact on these resource areas. The water quality will be improved and hazards to vessels navigating the local waters will be reduced by removing the abandoned pilings and loose timber structures that were left as part of the marine railways at the site.

Public Access

Public Access Policy #1

"Ensure that developments proposed near existing public recreation sites minimize their adverse effects. "

Public Access Management Principle #1

Improve public access to coastal recreation facilities and alleviate auto traffic and parking problems through improvements in public transportation. Link existing coastal recreation sites to each other or to nearby coastal inland facilities via trails for bicyclists, hikers, and equestrians, and via rivers for boaters.

Public Access Management Principle #2

Increase capacity of existing recreation areas by facilitating multiple use and by improving management, maintenance and public support facilities. Resolve conflicting uses whenever possible through improved management rather than through exclusion of uses.

The project creates public access to the waterfront at the project site where it is currently prohibited. The project also provides public access along the waterfront and will link a new Harborwalk with other planned Harborwalks and waterfront access ways along the East Boston Inner Harbor. The proposed Community Gallery, a facility of public accommodation, landscaped open space, and interpretive displays will be managed to draw residents and visitors to this waterfront location.

COASTAL HAZARDS

GROWTH MANAGEMENT PRINCIPLE #1
"Encourage, through technical assistance and review of publicly funded development, compatibility of proposed development with local community character and scenic resources."

The project creates excellent affordable housing opportunities at the Boston East site. The project is consistent with the East Boston Master Plan and the East Boston Municipal Harbor Plan. This site was specifically recommended in the EBMP as a location for housing.

GROWTH MANAGEMENT PRINCIPLE #3
"Encourage the revitalization and enhancement of existing development centers in the coastal zone through technical assistance and federal and state financial support for residential, commercial and industrial development."

The site is in proximity to the MBTA Blue Line subway and bus station at Maverick Square, as well as a densely developed residential neighborhood in East Boston. The project involves the redevelopment of a vacant, industrial urban site located on Boston Inner Harbor. It also involves redevelopment of dilapidated shoreline structures in order to support recreational, commercial, and water-dependent industrial uses. The site is also within walking distance of several proposed water taxi docks that would enhance its accessibility and use.

PORTS POLICY #3
"Preserve and enhance the capacity of Designated Port Areas (DPAs) to accommodate water-dependent industrial uses, and prevent the exclusion of such uses from tidelands and any other DPA lands over which a state agency exerts control by virtue of ownership, regulatory authority, or other legal jurisdiction."

This project encourages the location of water-dependent uses within the proposed DPA portion the project site. Landside access for DPA uses will be substantially improved by removing a fence and creating a new parking area. Dilapidated timber pilings and removal of one of two marine railways will clean up the site and create a better shoreline to access the water-dependent uses in the DPA watersheet.

PORTS MANAGEMENT PRINCIPAL #1
"Encourage, through technical and financial assistance, expansion of water dependent uses in designated ports and developed harbors, re-development of urban waterfronts, and expansion of visual access."

This Plan proposes water-dependent uses in the DPA portions of the project site. It also supports redevelopment of this urbanized waterfront as well as expansion of visual access.

Expansion of Water-dependent Uses

Activities that support expansion of water-dependent uses include:

- Removal of all the deteriorated timber pilings within watersheet of the project site.
- Construction of two piers to support a marine travel lift, if required by DPA tenant.
- Proposed maritime facility building and parking area.

Re-development of Urban Waterfronts

The project will substantially redevelop this urban waterfront with new public access and uses including a Harborwalk, maritime interpretive area, and outdoor seating. It will redevelop an existing vacant waterfront parcel into residential and mixed uses that will help activate this part of East Boston as well as create a vibrant place for residents to visit and enjoy.

Expansion of Visual Access

In addition to the Harborwalk that is proposed along the edge of the waterfront, viewing areas from the maritime interpretive area will expand visual access for pedestrians to enjoy the views of Boston, Charlestown, and vessel activities on the Harbor. Viewing areas, benches, and other amenities would also support public use of the Harborwalk. Visual access will be enhanced by the improvement of the view corridor along Decatur Street.

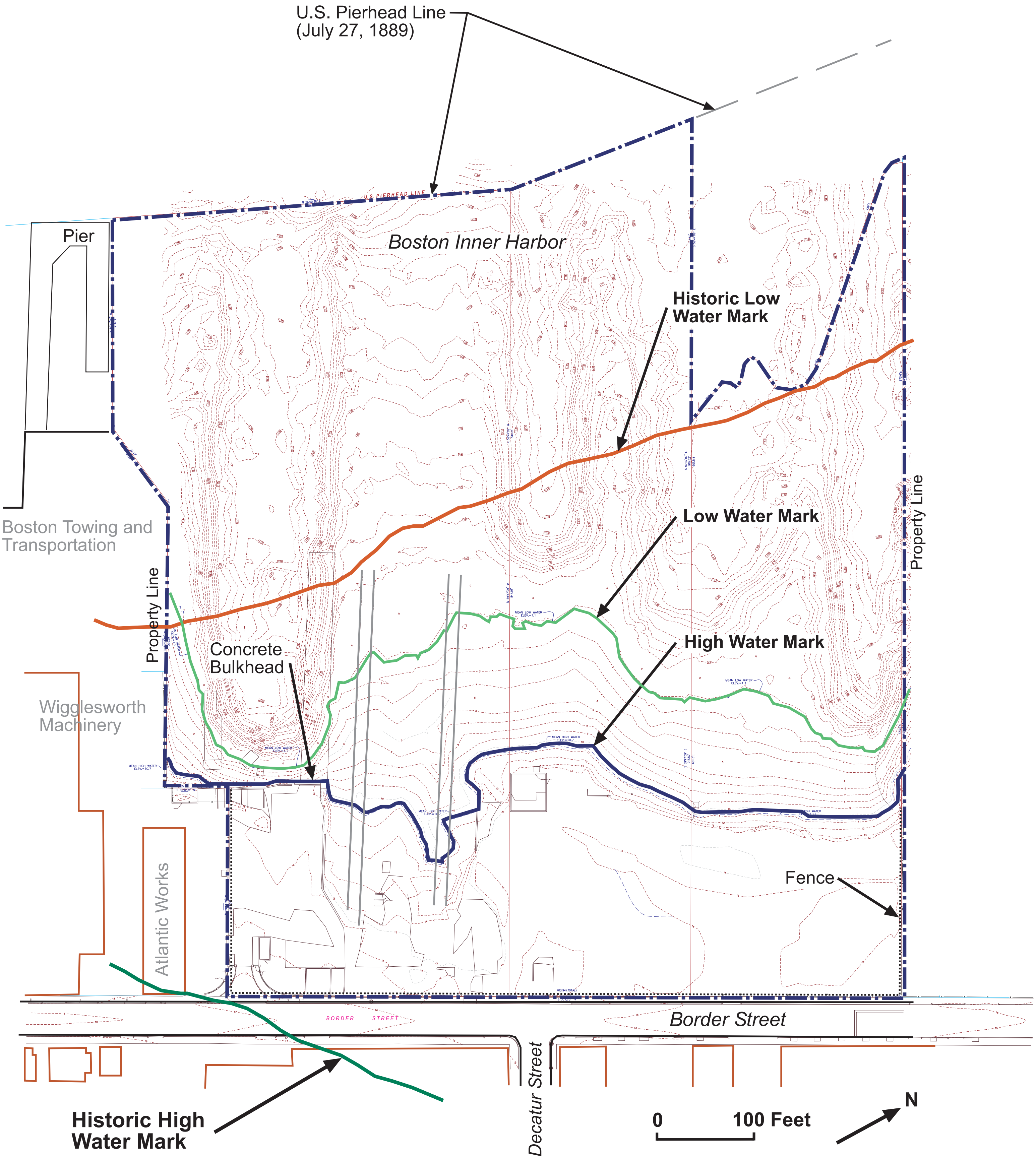
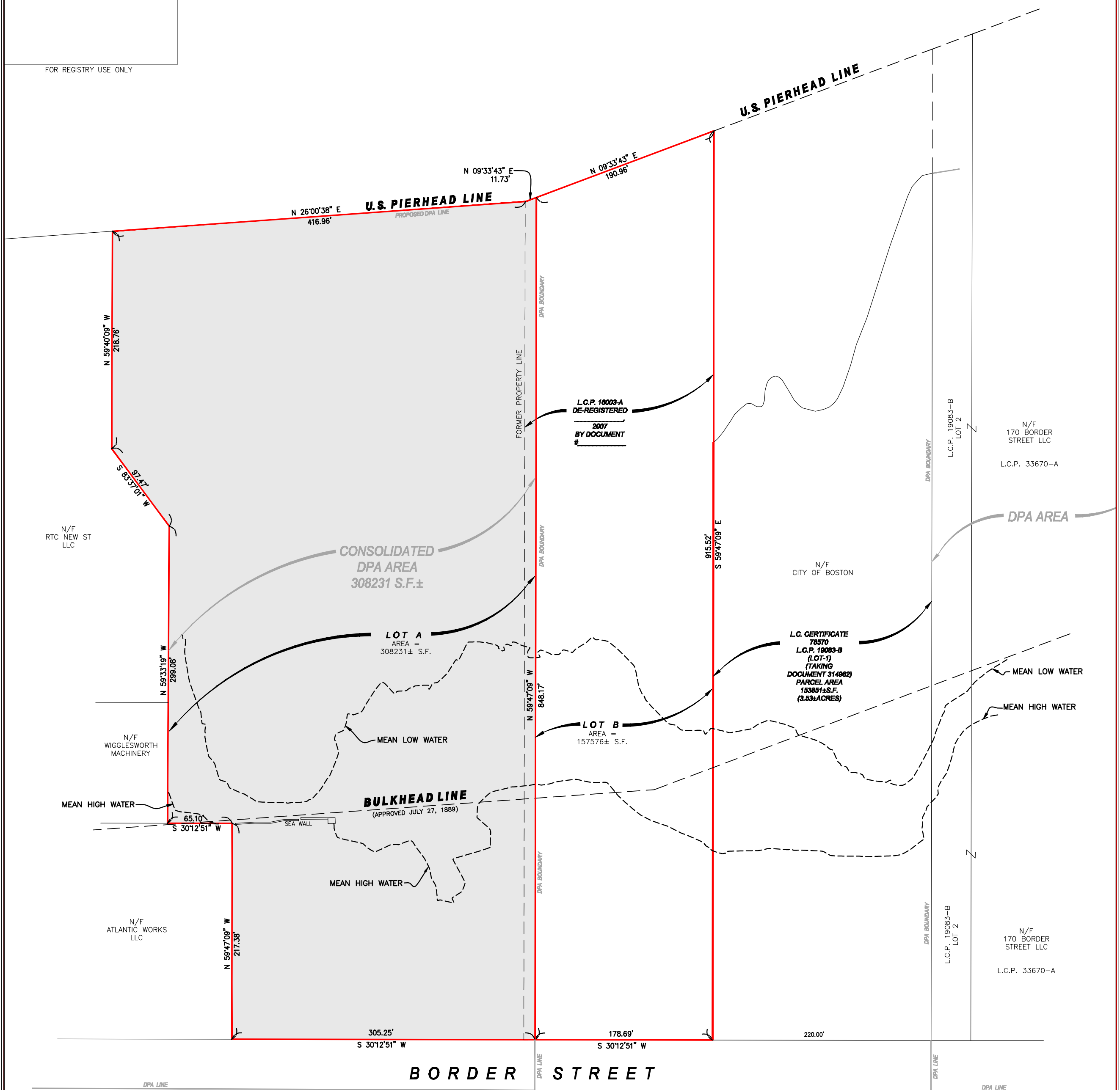


Figure 3-1
Chapter 91 Jurisidiction
sources: Nitsch Engineering; Chesbrough, 1852

FOR REGISTRY USE ONLY



PLAN REFERENCES

LAND COURT PLAN 16003-A
LAND COURT PLAN 19083-B
LAND COURT PLAN 33670-A
BOOK 6833, PAGE 394

DEED REFERENCES

BOOK 8243, PAGE 53
BOOK 8639, PAGE 5
LAND COURT CERTIFICATE 78569
LAND COURT CERTIFICATE 78570

NOTES

1. THE PURPOSE OF THIS PLAN IS TO SUBDIVIDE CITY OF BOSTON PARCELS 5412-3 AND 5413 AND SHOW THE LIMITS OF THE CONSOLIDATED DPA AREA.
2. THE CONSOLIDATED DPA AREA EQUALS 308231 SQUARE FEET, MORE OR LESS.

CERTIFICATION

I HERBY CERTIFY THAT THIS PLAN CONFORMS WITH THE RULES AND REGULATIONS OF THE REGISTRY OF DEEDS.

PAUL S. LEBARON JR., P.L.S.

DATE

GRAPHIC SCALE

50 25 0 50 100 150

SCALE: 1"=50'

SHEET: EX-1 OF 1 REV.

PROJECT # 6374
FILE: 6374_DPA_EXIB_5.dwg
SCALE: 1"=50'
DATE: 10/16/07
DES./COMP: PSL
FIELD BOOK:
DRAFTED BY: DEA
CHECKED BY: PSL

REV.	COMMENTS REVISIONS	DATE

SUBDIVISION & CONSOLIDATED DPA BOUNDARY PLAN

BOSTON EAST

BORDER STREET, BOSTON, MASSACHUSETTS

PREPARED FOR:

TRINITY FINANCIAL

40 COURT STREET, BOSTON MA 02110

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Planning
- GIS Services

Nitsch Engineering
www.nitscheng.com
186 Lincoln Street, Suite 200
Boston, MA 02111-2403
T: (617) 338-0063
F: (617) 338-6472

Figure 3-2. Consolidated DPA Boundary Plan

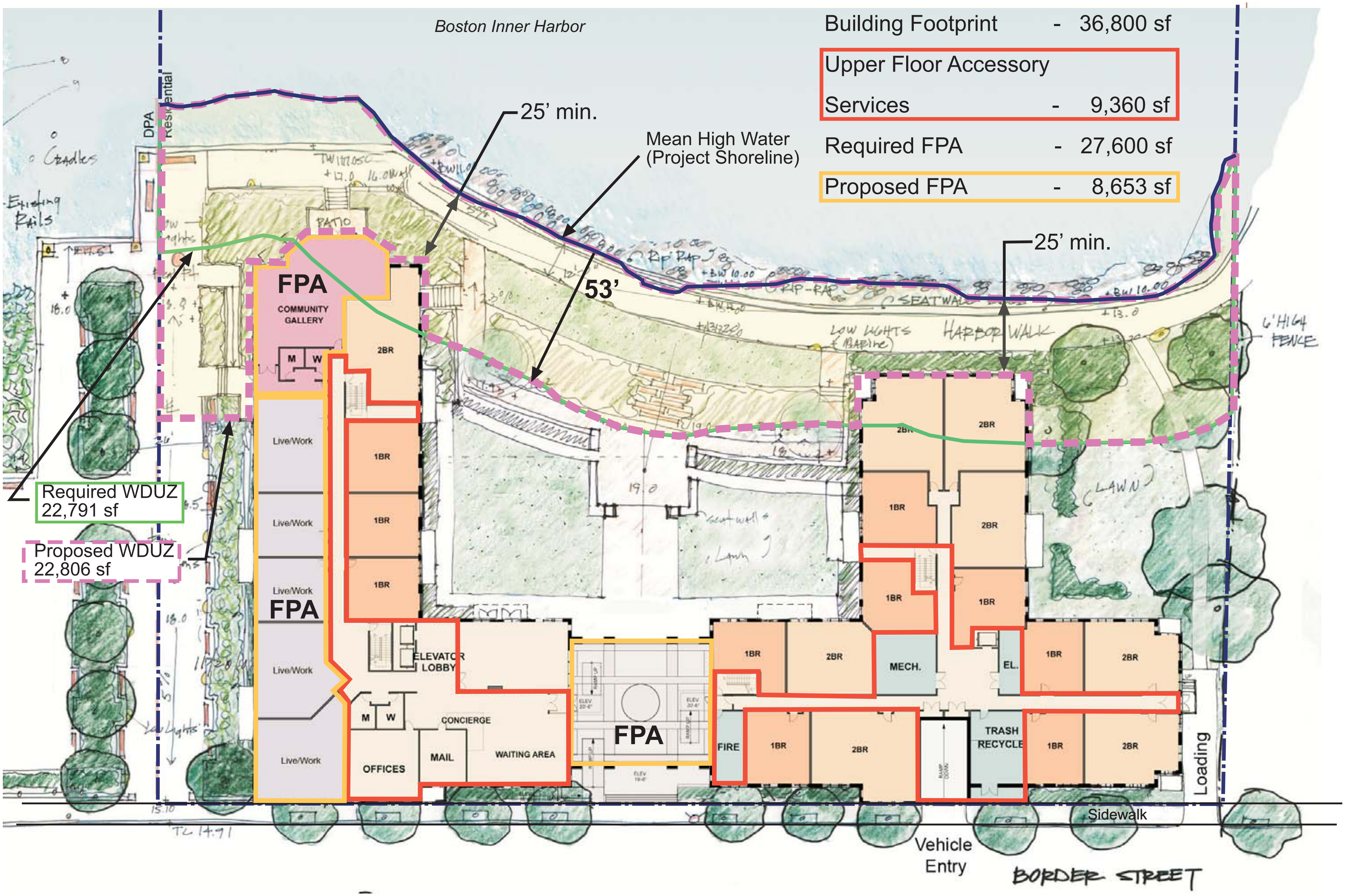
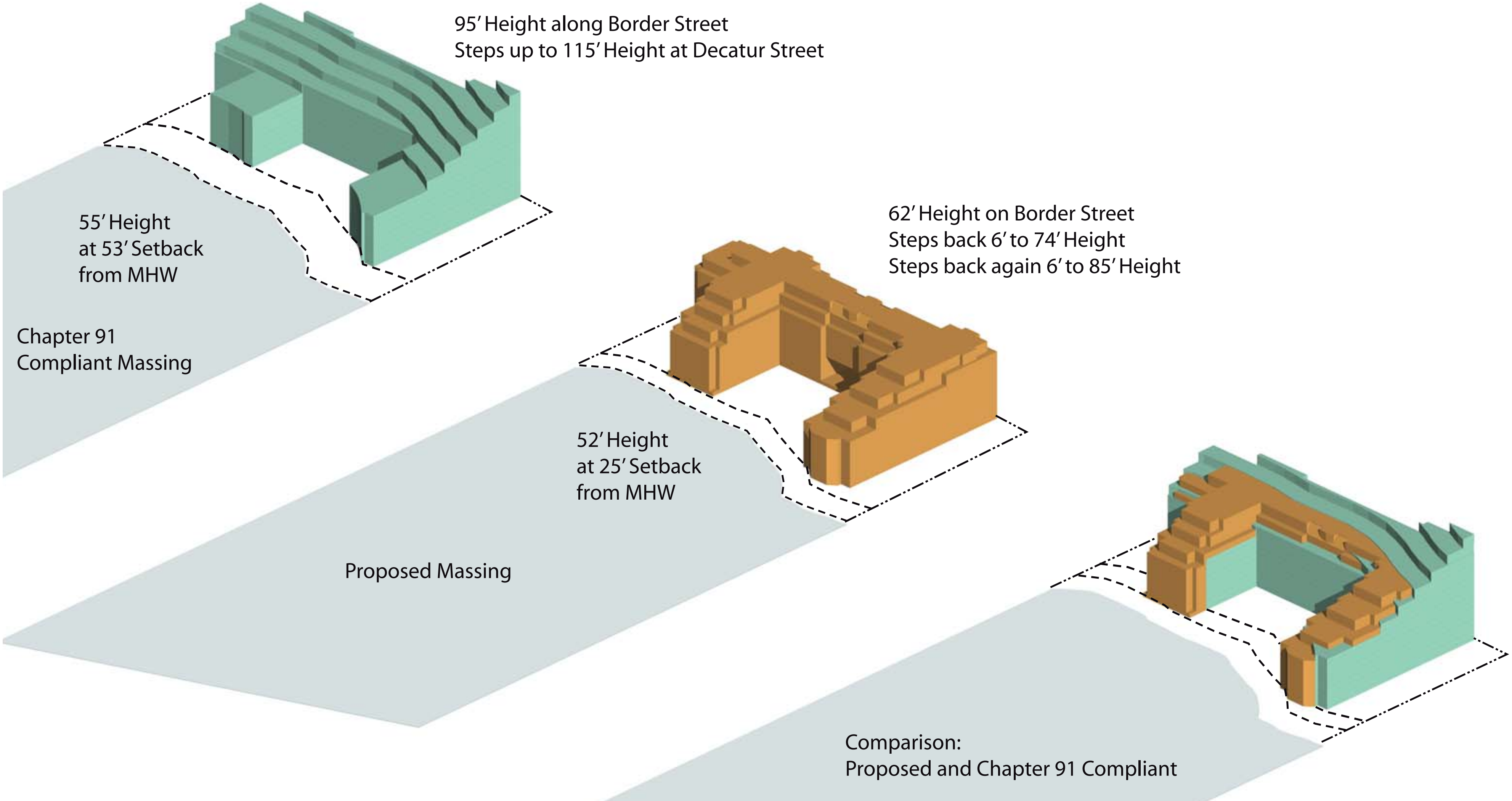


Figure 3-3
Chapter 91 Compliance - WDUZ and FPA
source: Copley Wolff Design Group; Fort Point Assoicates



I.C.O.N

BOSTON EAST

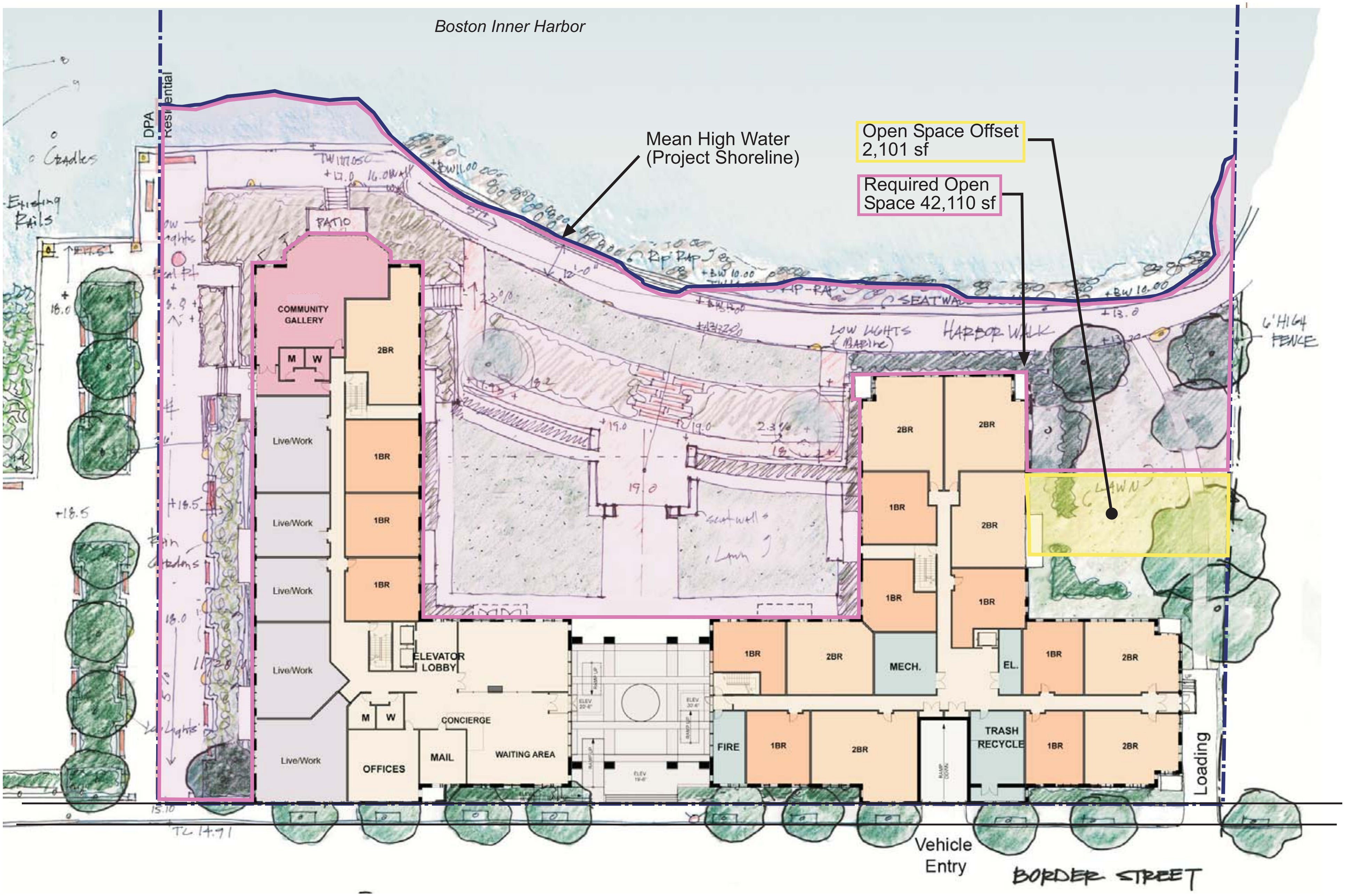
East Boston, Massachusetts

Figure 3-4:

Trinity Border Street LLC and EBCDC

March 17, 2008

Chapter 91 Compliance - Building Massing



BOSTON EAST
EAST BOSTON, MASSACHUSETTS

Figure 3-5
Shadow Impact Open Space Offset
sources: Copley Wolff Design Group; ICON architecture; Fort Point Associates

Chapter 4

Transportation

4.0 TRANSPORTATION

4.1 OVERVIEW

The proposed Boston East project calls for the redevelopment a vacant parcel of land located on Border Street, along East Boston's Inner Harbor waterfront. The project consists of 196 residential units, and approximately 20,000 square feet of marine-related industrial space. The project will include 141 parking spaces in an underground garage for the residential condominiums, and an additional 26 off-street surface parking spaces for the marine-related use.

The transportation access plan for the project describes the existing transportation conditions in the vicinity of the site, evaluates potential short and long-term project-related transportation impacts, and recommends measures to minimize theses impacts. The transportation access plan was developed in consideration of recent area planning efforts including the Boston Transportation Department's (BTDs) January 2007 *East Boston Transportation Action Plan,* BRA's April 2000 *East Boston Master Plan* and January 2000 *Boston Inner Harbor Passenger Water Transportation Plan*, as well as major transportation projects in the area: the Central Artery/Tunnel Project (CA/T), the Logan Airport modernization, and the Blue Line upgrade and improvements to Maverick Station and Maverick Square. The transportation access plan also accounts for other development projects in the area including 6-26 New Street, Hodge Boiler Works, Clippership Wharf, and Portside at Pier One/Boston Harbor Shipyard & Marina.

The project will be a transit-oriented development, due to its location, its land use type, and the support of the proponent. The project site is approximately 2,000 feet (about an eight-minute walk) from Maverick Square, a major transit hub with subway connections to downtown Boston and Logan International Airport, and bus connections to East Boston, Chelsea, and Revere. The proximity to this major transit hub, coupled with the existing pedestrian accommodations on the surrounding area roadways, virtually ensures that the projects residents will travel to these locations on foot, rather than by car.

The proposed project will minimize potential traffic impacts by taking full advantage of the excellent nearby public transit. The project proponent will also implement Travel Demand Management (TDM) measures to encourage residents and future employees of the marine-related industrial space to utilize the nearby transit options. These measures are expected to include providing secure bicycle storage, and distribution of public transit information to future residents and employees.

4.1.1 STUDY METHODOLOGY

This study was conducted in three phases. The first phase involved an inventory of existing traffic conditions in the vicinity of the site. As part of the existing conditions assessment, daily and peak period traffic counts were collected at several key intersections in the vicinity of the site. Field visits were also conducted to inventory existing roadway geometry, parking, and traffic control, and to observe the general operational characteristics for each of the study area intersections.

The second phase of the study builds upon the data collected in the first phase and establishes the framework for evaluating potential traffic impacts associated with the project. In this phase, the projected traffic demands associated with the proposed project were assessed along with future demands of other nearby developments that could influence traffic levels at the study area intersections. The 2008 existing traffic demands were projected to the year of 2013 by which time the proposed project is expected to be built.

In the third phase of the study, measures to minimize project-related traffic impacts and encourage alternative modes of transportation to and from the project site were identified. This report concludes with a list of recommended TDM measures to be implemented as part of the proposed project.

4.2 EXISTING CONDITIONS

The effective evaluation of potential transportation impacts associated with the project requires a thorough understanding of the existing traffic conditions on the roadways and intersections in the vicinity of the project site. The existing conditions assessment consists of an inventory of the roadway and intersection geometries and traffic control devices, collection of daily and peak period traffic volumes, and field observations and analysis of existing traffic operations.

4.2.1 STUDY AREA

The Boston East project site is located on East Boston's Inner Harbor Waterfront, along the western edge of East Boston. The site is currently vacant and free of any buildings. It is also surrounded by a fence, which prohibits any neighborhood access to the harbor waterfront. The project site location in relation to the surrounding area roadways is presented in Figure 4-1.

The site is located on the west side of Border Street, along East Boston Inner Harbor Waterfront. The project site has street frontage on the west side of Border Street across from Decatur Street, and is located between Liberty Plaza Shopping Center to the north and the Atlantic Works Gallery to the south.

Central Square is located just one block northeast of the Boston East project site and is the closest commercial district with shops, restaurants, and other businesses. There are five MBTA bus routes that stop in Central Square, making this the closest available public transportation for residents of Boston East.

Maverick Square, which is located approximately three blocks southeast of the project site, is the site of the MBTA Blue Line subway station and five MBTA bus connections. Maverick Square is likely to be the most-used transportation center for residents of Boston East, as the Blue Line provides direct service to downtown Boston. There is currently no bus service from any part of East Boston to downtown Boston. Maverick Square is connected to Central Square by Meridian Street, which is the major north-south roadway within the vicinity of the project.

4.2.2 STUDY AREA ROADWAYS

The project site lies between Boston Harbor and Border Street, which runs in a north-south orientation along the waterfront. Because of the study area's location adjacent to Boston Harbor, the streets near the project site carry mainly local traffic and very little through-traffic. Since the land uses near the project site are mainly residential and light industrial, and there are no large-scale traffic generators, the traffic volumes on the adjacent streets in the study area are relatively low.

The project site has approximately 700 feet of street frontage on the western side of Border Street. Directly across from the site is the western end of Decatur Street, which intersects with Border Street in a T-intersection. All project-related traffic will access the site from Border Street either north or south of Decatur Street.

Most project-generated vehicular traffic will travel to and from the site via Border Street, Maverick Street, and Decatur Street. These roadways provide access to and from the site via the Route 1A/Sumner Tunnel/Callahan Tunnel ramps, Meridian Street, and other points of East Boston. The recently completed redevelopment of the Maverick Gardens residential block, which has been renamed Maverick Landing, has restored the previously discontinued segments of London Street, Liverpool Street, and Border Street between Maverick Street and Sumner Street, however it is not expected that a large portion of site-related traffic will use these newly completed portions of roadway.

Regional access to and from the site is primarily from the Route 1A /Sumner Tunnel /Callahan Tunnel ramps, located to the northeast of the project site. The Sumner Tunnel and Callahan Tunnel provide access to and from downtown Boston, along with connections to and from Interstate 93 North and Storrow Drive. Route 1A provides access to and from the north, as well as to and from Logan Airport and the

Ted Williams Tunnel, which provides connections to and from the South Boston Waterfront, Interstate 93 South, and the Massachusetts Turnpike West.

Vehicular access from Route 1A and the Callahan Tunnel to the site is currently available via two primary routes: Paris Street, which is a one-way southbound neighborhood collector street running toward Maverick Street via Maverick Square; and Porter Street, which will bring vehicles to the site via Central Square. Vehicular egress from the site to Route 1A and the Sumner Tunnel is also currently available via two primary routes: Havre Street, which is a one-way northbound neighborhood collector street (would be used by motorists traveling northbound on Route 1A), and London Street, which connects Decatur Street with Porter Street (would be used by motorists traveling through the Sumner Tunnel). Other routes to and from Route 1A / Sumner Tunnel / Callahan Tunnel exist within the project study area, including Chelsea Street and Porter Street (via Central Square); however, those routes are not expected to carry a significant portion of site-related traffic.

Some project-generated traffic is also expected to travel through Maverick Square, on Sumner Street and Maverick Street. This route provides access to and from the Ted Williams Tunnel via the Massport Gate near the intersection of Maverick Street /Jeffries Street. Local East Boston traffic traveling via Chelsea Street and Bremen Street would also pass through Maverick Square.

The following is a brief description of the principal study area roadways (see Figure 1).

Border Street is a two-way, north-south neighborhood collector street. It is located along the western edge of East Boston and runs from Maverick Street north via Central Square to its terminus at Condor Street. The project site is located on the western side of Border Street across from Decatur Street and adjacent to Boston Inner Harbor. In the vicinity of the project, Border Street is approximately 32 feet wide, and parking is permitted on both sides of the street. There are approximately 90 unrestricted on-street parking spaces along Border Street between Central Square and Maverick Street.

Maverick Street is an east-west neighborhood collector street. Maverick Street runs from east to west, one-way westbound from Jeffries Street (east) to its terminus with New Street (west), except at two locations, between the north end of Maverick Square and the block between Border Street and New Street, where it's two-way traffic flow. Parking is permitted on both sides of the street. Maverick Street is approximately 30 feet wide in the study area. Between Maverick Square and Paris Street, on-street parking is "2 Hour Parking." Between Paris Street and London Street and between Liverpool Street, on-street parking is "Resident Permit Parking." Between London Street and Liverpool Street and between Border Street and New Street, on-street parking is unrestricted.

Meridian Street is a major neighborhood street that runs from Maverick Square north through Central Square to the McArdle Bridge. Meridian Street has two-way traffic flow north of Maverick Square and runs at an angle to the rest of the street grid network. There are several oblique multi-leg intersections between Maverick Square and Central Square. Meridian Street has on-street parking on both sides of the street in most places; closer to Maverick Square, it is "2 Hour Parking" and "Handicapped Parking Only."

Sumner Street is an east-west neighborhood collector street. Within the study area, Sumner Street is two-way from New Street (west) to Maverick Square. Sumner Street is approximately 48 feet wide, and parking is permitted on both sides of Sumner Street. Between Maverick Square and Havre Street and between London Street and New Street, the on-street parking is unrestricted. Between Havre Street and London Street on street parking is "Resident Permit Parking."

Liverpool Street is a north-south local street that runs from Sumner Street through Maverick Landing to Central Square. Liverpool Street has one-way flow northbound between Sumner Street and Maverick Street and two-way traffic flow between Central Square and Maverick Street. Liverpool Street has unrestricted parking and handicapped parking on both sides of the street.

London Street is a local street that runs from Bennington Street past the Route 1A / Sumner Tunnel Toll Plaza to Sumner Street. London Street has two-way traffic flow between Porter Street and Maverick Street and one-way southbound traffic flow between Bennington Street and Porter Street and between Maverick Street and Sumner Street. London Street has unrestricted parking along both sides of the street with the exception of London Street between Decatur Street and Sumner Street with "Resident Permit Parking."

Havre Street is a local street running one-way northbound street from Sumner Street to Porter Street and the Route 1A northbound on-ramp in the study area. In general, parking is provided on both sides of Havre Street. Along Havre Street, most on-street parking has a "2 Hour Parking 8 am – 6 pm except Resident Permit" regulation and "Resident Permit Parking."

Paris Street is a local street running one-way southbound street from Porter Street to Sumner Street in the study area. Paris Street provides a major connection from the Callahan Tunnel northbound off-ramp (via Porter Street) to Sumner Street. On-street parking is provided on both sides. North of Meridian Street, parking is generally unrestricted with handicapped spaces. South of Meridian Street, on-street parking is "2 Hour Parking 8 am – 6 pm except Resident Permit" and "2 Hour Parking" are available.

Central Square is a large open square with vehicular circulation around a large oval park at its center. The streets surrounding Central Square operate with two-way traffic flow with vehicular circulation in the northeast and southeast corner islands of Central Square operating in a one-way clockwise direction. This island is the location of the MBTA bus stops for routes 114, 116, 117, 120 and 121, with a bus stop on the western side of Central Square along Border Street. Border Street, Meridian Street, Saratoga Street, Liverpool Street, Porter Street, and Bennington Street all lead to Central Square. Most intersections surrounding Central Square are unsignalized. The intersection of Meridian Street/Saratoga Street at the northeast corner of Central Square is signalized.

The City of Boston has proposed several improvements to Central Square to enhance pedestrians' safety and traffic flow. A detailed discussion of the planned roadway improvements are provided in subsequent sections of this report

Maverick Square is the major transportation hub for East Boston, which has retail and residential land uses surrounding the Maverick subway station with vehicular circulation around a large central island. Maverick Square is the location of the MBTA Blue Line station and the MBTA bus stops for routes 114, 116, 117, 120, and 121. Chelsea Street, Meridian Street, Maverick Street, and Sumner Street all lead to Maverick Square. Vehicular circulation is one-way in a clockwise direction with Maverick Square West one-way northbound and Maverick Square East one-way southbound which allows MBTA buses to pick up and discharge passengers at the Maverick Square central island. The short northern and southern ends of Maverick Square operate with two-way traffic flow. At the southern end, a traffic signal controls the Sumner Street and Maverick Square traffic movements. The northern end of Maverick Square is unsignalized, and controlled as an all-way STOP-controlled intersection: at the northern end of Maverick Square, Maverick Street westbound, Chelsea Street southbound, Meridian Street southbound, and Maverick Square northbound are all under STOP-sign control. Vehicles within the large intersection have the right-of-way over vehicles at the approaches, but must yield to pedestrians at the complex intersection's many crosswalks. Along the eastern and western outer edges of Maverick Square, there is on-street parallel parking, most of which is "1 Hour Parking." In the center of Maverick Square, there is metered head-in parking, with a two-hour limit.

4.2.3 STUDY AREA INTERSECTIONS

The study area intersections chosen for detailed analysis were determined based on input from the Boston Transportation Department. In general, these intersections lie on the principal roadways serving the project site. The study area for this project includes all intersections that form Maverick Square and Central Square, all intersections on Meridian Street between Maverick Square and Central Square, and three other intersections on Border Street as required by BTD. Traffic and pedestrian patterns within the boundaries of the study area were also evaluated. The study area intersections are shown in Figure 4-2 and are listed below:

- Meridian Street/Saratoga Street/Central Square North
- Meridian Street/Porter Street/Central Square
- Porter Street/Bennington Street
- Meridian Street/Central Square South
- Liverpool Street/Central Square South
- Border Street/Central Square North
- Border Street/Central Square South/Liberty Plaza South Driveway
- Border Street/Decatur Street
- Maverick Street/Border Street
- Sumner Street/Border Street (formerly Grady Court)
- Meridian Street/London Street
- Meridian Street/Havre Street (North)/Gove Street
- Meridian Street/Havre Street (South)/Decatur Street
- Meridian Street/Paris Street (North)/Emmons Street
- Meridian Street/Paris Street (South)
- Maverick Street/Meridian Street/Maverick Square West
- Maverick Street/Chelsea Street/Maverick Square East
- Sumner Street/Maverick Square East
- Sumner Street/Maverick Square West

A detailed analysis of existing and future traffic operations at each of the study intersections is provided in subsequent sections of this report. A brief description of the study area intersections is presented below.

Meridian Street/Saratoga Street/Central Square is a signalized four-legged intersection that forms in the northeast corner of Central Square. Meridian Street has two-way traffic northbound and southbound and Central Square eastbound is also two-way. Saratoga Street is one-way westbound towards this intersection.

Meridian Street/Porter Street/Bennington Street/Central Square forms an unsignalzed skewed K-intersection with a short roadway segment with raised island between Meridian Street and Bennington Street/Porter Street. Each approach for this intersection has two-way traffic flow. The Meridian Street northbound and southbound approaches form the major street movements with a channelized northbound right island headed for Bennington Street (to the northeast) and Porter Street (to the southeast). The

Bennington Street southwest approach and Porter Street northwest approach are both under STOP-sign control.

Meridian Street/Central Square South is an unsignalized T-intersection that is located in the southeast corner of Central Square. The Meridian Street northbound and southbound are uncontrolled major movements. The Central Square eastbound approach has no signage but is assumed to be under stop and yield control.

Central Square South/Liverpool Street is an unsignalized T-intersection in the southeast quadrant of Central Square with uncontrolled major street movements on Central Square South westbound and eastbound movements. The Liverpool Street northbound approach is under STOP-sign control.

Border Street/Central Square North is an unsignalized T-intersection that is located at the northwest corner of Central Square with uncontrolled major street movements on Border Street northbound and Central Square westbound. The Border Street southbound approach is under STOP-sign control.

Border Street/Central Square South/Liberty Plaza South Driveway is a four-legged intersection located on the southwest corner of Central Square. The Central Square westbound and Border Street southbound approaches both run with uncontrolled major street movements. The Border Street northbound approach is under STOP-sign control. The Liberty Plaza South Driveway eastbound approach, which lacks signage, currently operates under stop control.

Border Street/Decatur Street is an unsignalized T-intersection located directly across from the project site. Both roadways are two-way, with the Border Street northbound and southbound approaches are the uncontrolled major street movements and the Decatur Street westbound approach having STOP sign control.

Maverick Street/Border Street is an unsignalized four legged intersection. Border Street is two-way, north of Maverick Street and the Border Street southbound approach is under STOP-sign control. Border Street, south of Maverick Street is one-way southbound through Maverick Landing to Sumner Street. Maverick Street has one-way westbound traffic flow east of Border Street, while Maverick Street west of Border Street has two-way traffic flow.

Sumner Street/Border Street is an unsignalized T-intersection. Border Street is one-way southbound under STOP-sign control at Sumner Street, which is a two-way street with free flow traffic, eastbound and westbound.

Meridian Street/London Street is an unsignalized skewed four legged intersection. Meridian Street has two-way traffic flow northbound and southbound with uncontrolled major street movements. London Street has two-way traffic flow in the northeast and southwest directions which are under STOP-sign control.

Meridian Street/Havre Street (North)/Gove Street is an unsignalized skewed multi-leg intersection. Meridian Street has two-way traffic flow, which northbound and southbound approaches have uncontrolled major street movements. The southeast leg (Gove Street) provides two-way traffic flow and the Gove Street northwestbound approach is under STOP-sign control. Havre Street intersects Meridian Street at a 45 degree angle with one-way traffic flow in the northeast direction.

Meridian Street/Havre Street (South)/Decatur Street is an unsignalized skewed multi-leg intersection. Meridian Street has two-way traffic flow, which northbound and southbound approaches have uncontrolled major street movements. The northwest leg (Decatur Street) provides two-way traffic flow and the Decatur Street southeastbound approach is under STOP-sign control. The Havre Street southwest leg intersects Meridian Street at a 45 degree angle with one-way traffic flow in the northeast direction. The Havre Street northeastbound approach is under STOP-sign control.

Meridian Street/Paris Street (North)/Emmons Street is an unsignalized skewed multi-leg intersection. Meridian Street has two-way traffic flow, which northbound and southbound approaches have uncontrolled major street movements. The southeast leg (Emmon Street) provides one-way traffic flow in the southeast direction away from the intersection. Paris Street intersects Meridian Street at a 45 degree angle with one-way traffic flow in the southwest direction. The Paris Street northeast leg has one-way traffic flow in the southwest direction towards the intersection is under STOP-sign control.

Meridian Street/Paris Street (South) is an unsignalized skewed multi-leg intersection. Meridian Street has two-way traffic flow, which northbound and southbound approaches have uncontrolled major street movements. Paris Street intersects Meridian Street at a 45 degree angle with one-way traffic flow in the southwest direction. The Paris Street southwest leg has one-way traffic flow in the southwest direction away from the intersection.

Meridian Street/Maverick Street/ Maverick Square is an unsignalized intersection that forms the northwest corner of Maverick Square. Maverick Street is principally one-way westbound, but has a short two-way section at the northern end of Maverick Square. The Maverick Street westbound approach to this intersection is the uncontrolled major street movement, while the Meridian Street southbound approach and the Maverick Square northbound approach are both STOP-controlled.

Chelsea Street / Maverick Street / Maverick Square is an unsignalized intersection that forms the northeast corner of Maverick Square. The Maverick Street one-way westbound approach is STOP-controlled, as is the Chelsea Street southbound approach. Chelsea Street is two-way north of the intersection and is aligned with the one-way southbound segment of Maverick Square. The Maverick Street eastbound approach is uncontrolled, but this intersection has been analyzed as if it were all-way STOP-controlled, which produces a conservative analysis.

Maverick Square / Sumner Street is a signalized intersection at the southern end of Maverick Square. Maverick Square is configured as a one-way pair, separated by the Maverick MBTA Station head-house and surface parking. Maverick Square has its southbound leg on the east, aligned with Chelsea Street, and the northbound leg on the west, aligned with Meridian Street. This intersection has two signalized control points, one at Maverick Square southbound and one at Maverick Square northbound, but it functions as a single intersection.

4.2.4 EXISTING TRAFFIC VOLUMES

Traffic volumes were collected, both mechanically and manually, for key locations throughout the study area to establish existing traffic levels in the vicinity of the project site. Automatic Traffic Recorder (ATR) counts were collected on Border Street and Decatur Street in January 2008. A summary of the ATR data is presented in Table 4-1.

Table 4-1: Daily Traffic Volumes on Area Roadways

Roadway and Location			
	Northbound	**Southbound**	**Total**
Border Street (between Central Sq and Decatur St)	1,216	1,816	3,032
	Eastbound	**Westbound**	**Total**
Decatur Street (east of Border St)	533	503	1,036

As shown in Table 4-1, traffic volumes on the study area roadways adjacent to the project site are moderate. This is consistent with the project site location in a corner of the East Boston neighborhood adjacent to Boston Harbor. The roadways adjacent to the site do not provide convenient access for through-traffic, and as a result, most traffic is local traffic.

To supplemental the ATR data, manual intersection turning movement counts were collected at 16 study area intersections in September 2007 and December 2007 and January 2008. The combined critical peak demand periods of site traffic and adjacent street traffic will occur during the weekday morning and weekday evening commuter peak hours. The intersection turning movement counts were collected during the typical weekday morning and weekday evening commuter "peak periods" (from 7:00

– 9:00 AM and from 4:00 – 6:00 PM). Generally, the peak hours in the study area occur between 8:00 AM to 9:00 AM during the weekday morning and between 4:30 PM to 5:30 PM during the weekday evening.

Seasonal traffic volume data was reviewed to determine if seasonal adjustments were necessary for the traffic counts collected in September, December, and January. Based on the Massachusetts Highway Department (MHD) 2007 Weekday Seasonal Factors for Group 6 - Urban Arterials, Collectors & Rural Arterials (R-2, R-3), the traffic volume data collected in the months of September and December are eight and three percent above average annual daily traffic volumes. Consequently, no seasonal adjustments were made to these counts. However, the traffic counts collected in January are three percent lower than average annual daily traffic volumes. Consequently, the traffic counts collected in January were adjusted upwardly by three percent to reflect the average traffic conditions.

The intersection turning movement counts were collected between September 2007 and January 2008. To establish a uniform baseline design year for analysis of existing traffic operations, the peak hour turning movement counts collected in 2007 were increased by 0.5 percent to reflect the 2008 traffic conditions. The resulting 2008 Existing weekday morning and weekday evening peak hour traffic volumes are presented in Figure 4-3 and 4-4, respectively. The pedestrian activity was also counted at each of the study area intersections. The 2008 Existing weekday morning and weekday evening peak hour pedestrian counts are presented in Figures 4-5 and 4-6, respectively.

4.2.5 EXISTING TRAFFIC OPERATIONS

Previous sections of this report discussed the quantity of traffic flow at the study area intersections. To assess the quality of traffic flow, intersection capacity analysis was conducted for each of the study intersections to establish the existing traffic operating conditions during the weekday morning and weekday evening peak hours based on procedures outlined in the 2000 Highway Capacity Manual, published by the Transportation Research Board.

Level of service (LOS) is a term used to describe the quality of the traffic flow on a roadway facility for a given travel demand. It is an aggregate measure of travel delay, travel speed, congestion, driver discomfort, convenience, and safety based on a comparison of roadway system capacity to roadway system travel demand.

Operating levels of service are reported on a scale of A to F, with LOS A representing the best operating conditions with little or no delay, and LOS F representing the worst operating conditions with long delays. For both signalized and unsignalized intersections, the operating LOS is based on travel delays, which are calculated as a function of traffic volume; peaking characteristic of traffic flow; percentage of heavy vehicles (i.e. trucks and buses); type of traffic control; number of travel lanes and lane use; intersection approach grades; pedestrian activity; and, signal timing, and phasing.

The 2000 Highway Capacity Manual LOS criteria used to evaluate existing traffic operations are summarized in Table 4-2. The LOS designations are reportedly differently for signalized and unsignalized intersections. For signalized intersections, the analysis reports the operations of all traffic entering the intersection. For unsignalized intersections, it is assumed that through movements on the main line are not affected by traffic on the side streets. Consequently, the LOS for unsignalized intersections are reported for the minor street intersection approaches or to left turns from the major street into the minor street, which must yield to oncoming traffic.

Table 4-2: Intersection Level of Service Criteria

	Average Delay per Vehicle (Seconds)	
Level of Service	Signalized Intersections	Unsignalized Intersections
A	≤10.0	≤10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	>80.0	>50.0

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council, Washington, DC, 2000.

The intersection capacity analysis was conducted using the Synchro intersection capacity analysis software. The intersection capacity analysis worksheets are provided in Appendix of this report. A summary of the LOS, stopped time delay, and volume-to-capacity ratio for each study area intersection under Existing Conditions is presented in Table 4-3.

As shown in Table 4-3, the capacity analysis indicates that most of the intersections in the study area currently operate with minimal to moderate delays with corresponding LOS C or better during the weekday morning and weekday evening peak hours. A detailed discussion of the key intersections which currently experience longer delays is presented below.

Meridian Street/Saratoga Street and Central Square North - The capacity analysis indicates that the signalized intersection of Meridian Street/Saratoga Street and Central Square North currently operates at overall LOS B during the weekday morning peak hour but experiences longer delays operating at LOS D during the weekday evening peak hour.

Table 4-3 Existing Traffic Operations Summary

	AM Peak Hour			PM Peak Hour		
Location	**LOS[1]**	**Delay[2]**	**v/c[3]**	**LOS**	**Delay**	**v/c**
Signalized Intersections						
Meridian St/Saratoga St/Central Square North	B	19	0.44	D	36	0.73
Sumner St/Maverick Sq East	B	12	0.21	B	11	0.25
Sumner St/Maverick Sq West	B	16	0.36	C	20	0.55
Unsignalized Intersections						
Meridian St/Porter St/Central Sq						
LT from Meridian St SB	A	8	0.14	A	9	0.15
LT from Porter St WB	E	37	0.61	F	>80	0.89
RT from Porter St WB	B	12	0.31	B	14	0.39
Porter St/Bennington St						
TH/RT from Porter St NB	A	9	0.26	B	10	0.29
LT/TH from Porter St SB	A	9	0.17	B	11	0.26
LT/RT from Bennington St WB	A	9	0.20	B	11	0.31
TH/RT from Bennington St EB	A	10	0.22	B	13	0.42
Meridian St/Central Square South						
LT/TH from Meridian St NB	A	2	0.06	A	4	0.15
LT from Central Square South EB	C	20	0.22	F	>80	0.88
RT from Central Square South EB	B	12	0.14	B	14	0.27

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] v/c = volume-to-capacity ratio
LT = Left, TH = Through, RT = Right, NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

Meridian Street and Porter Street at Central Square - The analysis indicates that the critical westbound left-turn movements from Porter Street onto Meridian Street at the unsignalized intersection of Meridian Street and Porter Street in Central Square currently operates at LOS E and LOS F during the weekday morning and weekday evening peak hours, respectively.

Meridian Street and Central Square South - The critical left-turn movements from Central Square south onto Meridian Street currently operates at LOS C during the weekday morning peak hour but experiences longer delays operating at LOS F during the weekday evening peak hour.

Table 4-3 Existing Traffic Operations Summary (Continued)

	AM Peak Hour			PM Peak Hour		
Location	**LOS[1]**	**Delay[2]**	**v/c[3]**	**LOS**	**Delay**	**v/c**
Unsignalized Intersections						
Liverpool St/Central Square South						
LT/RT from Liverpool St NB	B	11	0.07	B	13	0.14
LT/TH from Central Square South WB	A	2	0.02	A	<1	0.01
Border St/Central Square North						
LT/RT from Border St SB	B	12	0.31	C	22	0.64
LT from Central Square North EB	A	8	0.10	A	8	0.19
Border St/Central Square S/Liberty Plaza S Drwy						
LT/TH/RT from Border St NB	A	9	0.19	A	10	0.24
LT/TH/RT from Border St SB	A	9	0.23	B	12	0.38
LT/TH/RT from Central Square South WB	A	9	0.19	B	11	0.42
LT/TH/RT from Liberty Plaza S Drwy EB	A	8	0.04	A	9	0.15
Border St/Decatur St						
LT/TH from Border St SB	A	1	0.01	A	2	0.02
LT/RT from Decatur St WB	A	9	0.03	A	10	0.05
Maverick St/Border St						
TH/RT from Border St SB	B	10	0.08	B	12	0.19
LT/TH/RT from Maverick St WB	A	1	0.01	A	1	0.01
LT/RT from Maverick St EB	A	7	0.02	A	7	0.04
Sumner St/Grady Ct						
LT/RT from Grady Ct SB	A	9	0.05	A	9	0.12
Meridian St/London St						
LT/TH/RT from Meridian St NB	A	<1	0.00	A	<1	0.01
LT/TH/RT from Meridian St SB	A	<1	0.01	A	<1	0.01
LT/TH/RT from London St WB	F	>80	0.91	F	>80	2.48
LT/TH/RT from London St EB	C	22	0.06	F	>80	0.40
Meridian St/Gove St						
LT/TH from Meridian St SB	A	5	0.17	A	5	0.18
RT from Gove St WB	B	12	0.13	B	13	0.24
Havre St/Gove St						
LT/TH/RT from Gove St WB	B	12	0.23	B	12	0.27
LT/TH from Gove St EB	C	16	0.39	C	17	0.39

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] v/c = volume-to-capacity ratio
LT = Left, TH = Through, RT = Right, NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

Table 4-3 Traffic Operations Summary – Existing Conditions (Continued)

	AM Peak Hour			PM Peak Hour		
Location	**LOS[1]**	**Delay[2]**	**v/c[3]**	**LOS**	**Delay**	**v/c**
Unsignalized Intersections						
Meridian St/Havre St						
LT/TH from Havre St WB	C	16	0.05	C	17	0.06
LT/TH/RT from Havre St EB	C	18	0.32	C	24	0.46
Havre St/Decatur St						
LT/TH/RT from Havre St NB	B	10	0.16	B	11	0.16
RT from Havre St SB	A	9	0.01	A	9	0.02
LT/TH from Decatur St EB	A	5	0.01	A	5	0.03
Meridian St/Decatur St						
LT/TH from Meridian St NB	A	<1	0.01	A	<1	0.01
RT from Decatur St EB	B	10	0.03	B	10	0.03
Meridian St/Emmons St						
LT/TH from Meridian St SB	A	<1	0.01	A	<1	0.01
RT from Emmons St WB	B	11	0.10	B	11	0.11
Paris St/Emmons St						
RT from Paris St NB	A	9	0.01	A	9	0.01
LT/TH/RT from Paris St SB	A	9	0.16	A	9	0.11
Meridian St/Paris St						
LT/TH/RT from Meridian St NB	A	0	0.00	A	<1	0.01
LT/TH from Paris St WB	C	16	0.11	C	18	0.11
Maverick St/Meridian St/Maverick Sq W						
LT from Maverick Sq W NB	B	12	0.02	B	13	0.05
TH/RT from Maverick Sq W NB	B	13	0.29	C	17	0.46
LT/RT from Meridian St SB	C	23	0.42	F	>80	0.95
TH/RT from Maverick St WB	A	0	0.19	A	0	0.18
Maverick St/Chelsea St/Maverick Sq E						
TH/RT from Chelsea St SB	A	9	0.20	A	9	0.21
LT/TH/RT from Maverick St WB	B	11	0.41	B	11	0.47
LT/RT from Maverick St EB	A	8	0.21	A	10	0.31

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] v/c = volume-to-capacity ratio
LT = Left, TH = Through, RT = Right NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

The City of Boston has identified long term improvements at the Central Square intersections as part of the East Boston Transportation Action Plan that significantly enhance future traffic operations within Central Square. A more detailed discussion of the City of Boston's planned roadway improvements at the Central Square intersections is provided in subsequent sections of this report.

Meridian Street and London Street - Continuing southward along Meridian Street, the capacity analysis indicates that the critical side street movements from London Street onto Meridian Street currently operate at LOS F during the weekday morning and weekday evening peak hours.

Meridian Street and Maverick Street at Maverick Square - The unsignalized intersection of Meridian Street and Maverick Square also experiences longer delays during the weekday evening peak hour. The Meridian Street southbound approach at Maverick Street, operates at LOS C during the weekday morning peak hour and LOS F during the weekday evening peak hour.

4.2.6 PARKING

On-street parking is available on most streets within the project study area, as noted above in the street descriptions. The majority of on-street parking within the study area has regulations designed to prevent long-term parking by commuters, while still providing suitable parking supplies for the neighborhood residents and nearby commercial businesses.

The streets surrounding the Maverick Square MBTA Blue Line station have the most restrictive parking regulations. Within Maverick square itself, there is a mix of "2-Hour Parking" and "1-Hour Parking" spaces to accommodate customers of the dense Maverick Square commercial district.

Between Maverick Square and the site, there is a mix of parking regulations designed to accommodate area residents and neighborhood retail customers while still discouraging commuter parking by Blue Line commuters. In general, parking restrictions are reduced with increased distance from Maverick Square, and there are several blocks with no parking restrictions at all. Typical parking regulations in the study area include "2 Hour Parking," "2 Hour Parking 8 am – 6 pm except Resident Permit," and "Resident Permit Parking Only."

Off-street parking in the study area consists principally of accessory parking for restaurants and retail businesses. There are two primary locations for public, off-street parking: the Liberty Plaza shopping center, with 313 parking spaces, and the Walgreen's parking lot adjacent to Meridian Street, with 40 parking spaces. Typically, retail parking lots such as these discourage parking for non-customers and enforce their own parking rules to protect spaces for customers.

A detailed parking survey was conducted for the Boston East project on Thursday January 24, 2008. The survey was performed during the peak weekday parking demand time of 11:00 AM until 1:00 PM. During this time period, 72.4% of on-street parking spaces and free public parking lots were occupied. Private off-street parking lots, including the lots at Walgreen's, Liberty Plaza, and several private residential lots, were 49.3% occupied. There was one public pay lot, adjacent to Maverick Square, that was 72.0% occupied. In the immediate vicinity of the project site, Border Street (between Central Square and Decatur Street) provides a total of 50 on-street parking spaces with 30 occupied spaces (60.0 %) during the survey period from 11:00 AM to 1:00 PM.

These results indicate that there is ample parking supply to meet the demands of the neighborhood, even during the highest periods of demand. It is expected that a significant portion of daytime on-street parking is from non-resident commuters using the Maverick Station, and as such would be parked away from Maverick Square due to resident and short-term parking restrictions. At night, these commuter vehicles would be gone, leaving room for neighborhood residents to find suitable parking near their homes. The tabulated results of the parking survey are included in Appendix 6.

4.2.7 PUBLIC TRANSPORTATION

The project site has excellent access to public transportation including the MBTA Blue Line subway to and from downtown Boston at nearby Maverick Station. This subway service is supplemented by MBTA bus service to other destinations in East Boston and to neighboring Chelsea and Revere. The public transportation system in the vicinity of the project site is shown in Figure 4-7. A more detailed description of the public transportation modes serving the project neighborhood is provided below.

BLUE LINE RAPID TRANSIT

Convenient access to the MBTA Blue Line subway is provided at the nearby Maverick Square, located approximately 2000 feet east of the site. The MBTA Blue Line subway provides direct rapid transit service to downtown Boston's densest employment centers including the Financial District (at Aquarium Station and State Street Station) and the concentration of City, State and Federal government offices (at Government Center Station and Bowdoin Station).

Blue Line service operates with high frequency: weekday peak-hour headways of four minutes, midday headways of nine minutes, weekend headways of 10-11 minutes and late night headways of 13 minutes.

The Blue Line in turn provides connections to the Green Line (at Government Center Station) and Orange Line (at State Street Station), and with it access to the rest of downtown Boston and Back Bay.

Blue Line service to the project area will be significantly enhanced by two recent MBTA initiatives. The ongoing Blue Line Modernization Project will enable six-car train service throughout the Blue Line. A more modern fleet of four-car trains made their debut in February, 2008; these trains are shortened versions of the six-car trains, which are expected to begin service in March 2009, once all Blue Line stations have completed the necessary platform extensions.

The MBTA has started a major reconstruction of Maverick Station. This will improve the aesthetics of the station head-house and have improved traffic circulation and pedestrian access throughout Maverick Square. These improvements to Maverick Station will also greatly enhance transit access and the pedestrian experience in Maverick Square.

MBTA Buses

Maverick Station is served by five MBTA bus routes. A summary of the MBTA Routes and services is provided below.

Route 114: Maverick Square – Bellingham Square, Chelsea

- 10 minute headways during weekday AM and PM rush
- 40 minute headways during weekday off-peak
- No service on Saturday or Sunday

Route 116: Maverick Square – Wonderland Station (via Revere Street)

- 20 minute headways during weekday AM and PM rush
- 20-30 minute headways during weekday off-peak
- 30-40 minute headways on Saturday and Sunday

Route 117: Maverick Square – Wonderland Station (via Beach Street)

- 20 minute headways during weekday AM and PM rush
- 20-30 minute headways during weekday off-peak
- 30-40 minute headways on Saturday and Sunday

Route 120: Maverick Square – Orient Heights

- 16 minute headways during weekday AM and PM peak
- 20 minute headways during weekday off-peak

- 30-60 minute headways on Saturday and Sunday

Route 121: Maverick Square – Wood Island (via Eagle Square)

- 30 minute headways during weekday AM and PM peak
- Weekday PM service operates only between Maverick Station and Eagle Square
- No service during weekday off-peak
- No service on Saturday or Sunday

WATER TRANSPORTATION

The Boston Inner Harbor provides opportunities for water-borne connections between the East Boston waterfront and other points on Boston Harbor. Currently, water transportation services on the East Boston waterfront are limited to water taxis and airport ferries that connect the Logan South water terminal to downtown Boston. Lewis Mall, at the southern end of Lewis Street, was previously the site of water transportation services, although the floating dock that was in use at this location has been lent to the National Park Service for use at Little Brewster Island, one of the Boston Harbor Islands. The developer of the Portside at Pier One/Boston Harbor Shipyard & Marina project has proposed re-instituting water transportation service between the Lewis Mall terminal and downtown Boston. The proponent of the 6-26 New Street development is also proposing a water taxi facility open to the general public for daily trips in and around Boston Harbor.

4.2.8 PEDESTRIAN CONNECTIONS

The public streets in the vicinity of the project site provide good pedestrian access in general. All public streets have continuous sidewalks and good pedestrian crossings, which enable pedestrian access. Central Square, located immediately to the northeast of the project site, is a dense commercial and retail square with park space, and is a primary destination for Boston East residents. Maverick Square is another major destination for project-generated pedestrians, with commercial uses and transportation connections that provide residents and visitors with walking destinations.

Further to the east, the pedestrian system in East Boston is also undergoing major enhancement as a result of open space improvements. The East Boston Greenway provides a pedestrian connection through East Boston to the waterfront, and the Bremen Street Park extends this connection further into East Boston. Further south, Piers Park (Phase I) provides a pleasant pedestrian environment and an attractive destination on the waterfront less than half a mile from the project site. Piers Park (Phase II) will provide another new waterfront open space even closer to the project site. All of these projects, along with the creation of a continuous Harborwalk, which is also planned at the Boston East site, will dramatically improve pedestrian amenities in East Boston.

4.2.9 EXISTING SAFETY

Mass Highway accident data for the three most recent years available (2004 – 2006) was reviewed for key study area intersections along Border Street, Meridian Street, and at Central Square and Maverick Square in the vicinity of the project site. The safety data are summarized in Table 4-4.

As shown in Table 4-4, the intersections of Meridian Street/ Saratoga Street and Meridian Street/Bennington Street/Porter Street had the highest accident rates with nine and eight accidents in the three-year period evaluated respectively. The remaining study area intersections had four or less reported accidents in the three year period evaluated.

The MassHighway Crash Rate Worksheet was then used to determine whether the accident frequencies at the study area intersections were unusually high given the travel demands at each location. The accident rates are expressed in the number of accidents per million entering vehicles at the intersection. The calculated crash rate was then compared to the average accident rate for signalized and unsignalized intersections for MassHighway District 4 and the statewide averages.

As shown in Table 4-4, all study area intersections fall below the MassHighway state-wide and the District 4 district-wide accident rates. This would indicate that none of the study area intersections experienced unusually high accident frequencies, given the travel demands at these intersections. The accident crash rate worksheets are provided the in Appendix 6.

Table 4-4: Study Area Accident Data Summary (2004 – 2006)

	Meridian St/ Saratoga St	Meridian St/ Saratoga St/ Bennington St	Meridian St/ Central Sq/ Liverpool St	Border St/ Central Sq	Border St/ Decatur St	Border St/ Maverick St	Sumner St/ Grady Ct
Year							
2004	0	1	0	0	0	0	0
2005	4	4	1	1	0	1	0
2006	5	3	0	2	0	0	0
Total	**9**	**8**	**1**	**3**	**0**	**1**	**0**
Type							
Angle	4	4	0	1	0	0	0
Rear-end	3	0	1	0	0	0	0
Head-on	0	0	0	0	0	0	0
Unknown-Other	2	4	0	2	0	1	0
Total	**9**	**8**	**1**	**3**	**0**	**1**	**0**
Severity							
Property Damage	5	6	1	1	0	0	0
Personal Injury	0	0	0	1	0	0	0
Fatality	0	0	0	0	0	0	0
Other/Unknown	4	2	1	1	0	1	0
Total	**9**	**8**	**1**	**3**	**0**	**1**	**0**
Weather							
Clear	7	5	1	3	0	1	0
Cloudy	0	1	0	0	0	0	0
Rain	1	1	0	0	0	0	0
Snow/Ice	1	1	0	0	0	0	0
Ice	0	0	0	0	0	0	0
Fog	0	0	0	0	0	0	0
Other/Unknown	0	0	0	0	0	0	0
Total	**9**	**8**	**1**	**3**	**0**	**1**	**0**
Time							
7:00 AM - 9:00 AM	0	1	0	0	0	0	0
9:00 AM - 4:00 PM	5	3	0	2	0	0	0
4:00 PM - 6:00 PM	0	1	0	0	0	1	0
6:00 PM - 7:00 AM	4	3	1	1	0	0	0
Accident Rate	**0.67**	**0.43**	**0.06**	**0.32**	**0.00**	**0.31**	**0.00**
District 4 Average	0.88	0.63	0.63	0.63	0.63	0.63	0.63
Statewide Average	0.87	0.66	0.66	0.66	0.66	0.66	0.66

Source: Mass Highway Accident Records (2004-2006)Accident rates per million entering vehicles (MEV) calculated using Mass Highway worksheet.

Table 4-4: Study Area Accident Data Summary (2004 – 2006) (cont.)

	Meridian St/ London St	Meridian St/ Havre St/ Gove St/ Decatur St	Meridian St/ Paris St/ Emmons St	Maverick St/ Meridian St/ Maverick Sq	Maverick St/ Chelsea St/ Maverick Sq	Sumner St/ Chelsea St/ Maverick Sq
Year						
2004	1	0	0	0	0	1
2005	1	2	1	1	1	0
2006	0	2	1	1	0	1
Total	**2**	**4**	**2**	**2**	**1**	**2**
Type						
Angle	0	2	0	0	0	0
Rear-end	0	2	0	2	0	1
Head-on	0	0	0	0	0	0
Unknown-Other	2	0	2	0	1	1
Total	**2**	**4**	**2**	**2**	**1**	**2**
Severity						
Property Damage	1	0	1	1	0	0
Personal Injury	0	1	1	1	0	0
Fatality	0	0	0	0	0	0
Other/Unknown	1	3	0	0	1	2
Total	**2**	**4**	**2**	**2**	**1**	**2**
Weather						
Clear	1	2	2	0	1	0
Cloudy	1	1	0	1	0	0
Rain	0	1	0	0	0	1
Snow/Ice	0	0	0	0	0	1
Ice	0	0	0	0	0	0
Fog	0	0	0	0	0	0
Other/Unknown	0	0	0	1	0	0
Total	**2**	**4**	**2**	**2**	**1**	**2**
Time						
7:00 AM - 9:00 AM	0	0	1	1	0	0
9:00 AM - 4:00 PM	1	2	0	1	0	2
4:00 PM - 6:00 PM	1	1	0	0	0	0
6:00 PM - 7:00 AM	0	1	1	0	1	0
Accident Rate	**0.14**	**0.27**	**0.21**	**0.24**	**0.12**	**0.34**
District 4 Average	0.63	0.63	0.63	0.63	0.63	0.88
Statewide Average	0.66	0.66	0.66	0.66	0.66	0.87

Source: *Mass Highway Accident Records* (2004-2006)

Accident rates per million entering vehicles (MEV) calculated using Mass Highway worksheet.

4.3 PROJECT IMPACT ASSESSMENT

The Boston East project will generate new travel demands on the surrounding transportation system. However, the project's transportation impacts will be relatively modest for several reasons. The project will be a transit-oriented development, by virtue of its location, its land use type, and the support of the proponent. The project site is approximately 2,000 feet (about an eight-minute walk) from Maverick Square; a major transit hub with subway connections to downtown Boston and Logan International Airport, and bus connections to East Boston, Chelsea, and Revere. The proximity to this major transit hub, coupled with the existing pedestrian accommodations on the surrounding area roadways, makes transit connections to the site via Maverick Square very convenient. The project is also principally a residential development; a land use that has significantly lower peak period traffic impacts than other common urban uses, such as office and retail development. The proponent will also implement travel demand management (TDM) measures in order to minimize automobile reliance among project residents.

The following section describes the anticipated impacts that the proposed project will have on the transportation system in the study area. This section describes the conditions that are anticipated five years into the future, in 2013, the project's future "horizon year." By 2013, the proposed project will be complete and fully occupied.

4.3.1 FUTURE NO-BUILD CONDITIONS

The Future No-Build condition establishes the basis for evaluating the transportation impacts associated with the proposed project. This baseline, or "Future No-Build Condition," describes the transportation conditions in the project study area in the horizon year of 2013 without the effects of the proposed project. The No-Build Condition includes the effects of planned transportation improvements, general area growth and other planned development projects expected to be completed by the 2013 future design year. By establishing a Future No-Build Condition, the effects of the proposed project can be separated from changes in the transportation system and other changes in neighborhood traffic that are unrelated to the proposed project.

To establish the future No Build traffic volumes, the year 2008 Existing travel demands were projected to the design year of 2013, by which time the proposed project is expected to be built and occupied. Independent of the proposed project, a discussion of the development of the future No Build (without project) condition is provided below.

BACKGROUND TRAFFIC GROWTH

Traffic growth is primarily a function of changes in motor vehicle use and expected land development in the region. To predict a rate at which traffic on the roadways in the vicinity of the site can be expected to grow during the five-year forecast period (2008 to 2013), both historic traffic growth and planned area developments were examined.

HISTORIC TRAFFIC GROWTH

The historic traffic growth in the study area was determined based on input from the Boston Transportation Department (BTD). BTD suggests that area traffic growth is approximately 0.5 percent per year. An annualized growth rate of 0.5 percent per year (compounded annually over the five year forecast period from 2008-2013) was applied to the 2008 Existing volumes to account for non-site-specific background traffic growth. This assumption is consistent with other recent transportation planning studies conducted in the East Boston.

SITE-SPECIFIC GROWTH

In addition to the general background traffic growth, planned development projects that could influence traffic volumes on the study area roadways were also considered. The BTD has identified four proposed development projects in the vicinity of the project site to be considered in the development of the future No Build conditions. These include the Clippership Wharf project, the Portside at Pier 1/Boston Harbor Shipyard & Marina project, the 6-26 New Street project, and the Hodge Boiler Works project. These projects are shown in Figure 4-8 and are described below.

Clippership Wharf - The Clippership Wharf project is located along the waterfront to the east of the Carlton Wharf site. This project will add approximately 400 residential units, ground floor Facilities of Public Accommodation (FPA)s, and a total of 685 parking spaces.

Portside at Pier 1 / Boston Harbor Shipyard & Marina - The Portside at Pier 1 project will be located on the Massachusetts Port Authority Pier 1 site to the east of the Clippership Wharf site. The Portside at Pier 1 project will add 585 residential units, ground floor FPAs, and a total of 766 parking spaces. The Pier 1 project is being developed in conjunction with an expansion and rehabilitation of the Boston Harbor Shipyard and Marina, which are located at Pier 6 and Pier 5 respectively, at the eastern end of the East Boston Inner Harbor waterfront.

6-26 New Street - The 6-26 New Street project consists of a redevelopment of a 3.93 acre site on East Boston's Waterfront on the Boston Inner Harbor to provide 148 residential units, and a 106 room hotel or 62 additional residential units, a small marina, a restaurant and 149 parking spaces with a possible additional 76 spaces to be provided using a hydraulic lift system to double stack vehicles.

Hodge Boiler Works - The Hodge Boiler Works project consists of the redevelopment of 2.5 acre site located on East Boston's Waterfront on the southwest corner of Sumner

Street and London Street on the Boston Inner Harbor to provide 119 residential units, a 42-slip marina and supporting 576 square-foot marine service building, a waterside café, an 5-unit bed and breakfast and a 164-space parking garage.

The traffic resulting from these proposed projects is included in the Future No-Build traffic volumes for the Boston East analysis. The vehicle trip generation estimates and anticipated arrival/departure patterns for each of the proposed developments are presented in Appendix 6 of this report. The specific traffic assignments at the study area intersections are documented in the traffic projection model that is also in Appendix 6.

Future Transportation System Improvements

Planned roadway and transportation infrastructure improvements can also affect area travel patterns and future traffic operations. The traffic consultant contacted the Boston Transportation Department and MassHighway to develop a clear understanding of the planned area roadway and transportation infrastructure improvements. Based on these discussions, there are two significant transportation system improvements planned and/or underway.

Blue Line Modernization/Maverick Station The Massachusetts Bay Transportation Authority (MBTA) is also undertaking two initiatives that will significantly enhance Blue Line service to the project area. The ongoing Blue Line Modernization project, which is a CA/T-related public transit commitment, will enable six-car train service throughout the Blue Line. This will enable the MBTA to increase peak hour capacity on the Blue Line by an estimated 35%; the MBTA anticipates that this improvement will be completed in the Fall of 2008.

The MBTA also plans a major reconstruction of Maverick Station and Maverick Square. This will improve the aesthetics of the head-house and of Maverick Square. It will also enable public transit and pedestrian access improvements at Maverick Square. The current plan for Maverick Square will improve bus circulation and enhance pedestrian crossings. The existing vehicular circulation patterns and traffic controls will be preserved in the new plan, but the traffic signal equipment at the intersection of Maverick Square/Sumner Street will be upgraded. The MBTA expects to complete these improvements in 2008.

Maverick Station is one of the remaining stations to be made accessible and refurbished as part of the Blue Line Modernization Program that began in the late 1990s. The project includes station modernization, the lengthening of platforms for the six-car trains, and accessibility for all with the addition of elevators at the Maverick Square head house and the new Lewis Mall head house. Four new escalators will be installed with two at the Lewis Mall head house and two at the Maverick Square head house. Other accessible features include detectable tile warnings along the platform edges, new LED signs, new speaker systems, and new stairs. Upgrades to the finishes, electrical, mechanical, communication and security systems within the station will also be performed. Limited areas of the tunnel exposed during construction will be repaired and waterproofed as part of this new work. Maverick Square will be reconstructed including new parking, crosswalks, lighting, signage, traffic signals, water and drainage piping, and landscaping. A dedicated busway is being installed for the MBTA buses.

Maverick Station construction began in late Fall of 2005. The project reached a milestone on September 22, 2007 when the new Lewis Mall entrance was temporarily opened to the public with two new escalators. The existing entrance in Maverick Square was demolished in November 2007, and now the construction of the new Maverick Square entrance is underway. The overall construction, including two new elevators, is scheduled to be completed in late fall 2008.

Central Square Improvements The City of Boston has identified long term improvements at Central Square as part of the East Boston Transportation Action Plan (dated January 2007) prepared by the Louis Berger Group, Inc. These improvements call for the complete reconstruction of the Square to address existing parking, traffic circulation and pedestrian safety issues associated with the geometric layout and traffic control**.** These improvements include:

- Installation of new traffic signals at Saratoga Street and Meridian Street;
- Installation of new traffic signals at Bennington Street/Porter Street/Central Square;
- Reconfiguration of the parking area along the east side of the square into a more formal lot;
- A right-turn in/right-turn out only driveway on Meridian Street serving the reconfigured parking lot;
- Closure of the right-turn lane onto Porter Street from Meridian Street northbound, creating a pedestrian plaza in front of the Subway sandwich shop and the El Jardin Restaurant;
- Squaring the corners around Bertulli Park by closing the traffic channelization creating more green and open space and shorter pedestrian crossings; and
- Additional trees and landscaping ands streetscape improvements.

In Appendix 6, the proposed long-term improvements at Central Square are shown graphically in Figure 16 – Central Square, Long Term Recommendations of the East Boston Transportation Action, prepared by the Louis Berger Group, Inc.

Based on discussions with the BTD, the City of Boston has already included approximately $3.7 million in the 2008 City budget to implement these improvements. For the purpose of this study, it is assumed that these improvements will be completed by the 2013 design year.

Future No-Build Traffic Volumes

The 2007 Existing peak-hour traffic volumes were grown by 0.5 percent per year over the five-year study horizon (2008 to 2013) to establish the 2013 base future traffic volumes. Traffic increases associated with the other planned area developments were then added to the 2013 base volumes to establish the 2013 No-Build traffic volumes (without the proposed project). The 2013 No-Build weekday morning, and weekday evening peak-hour traffic volume networks are illustrated in Figures 4-9 and 4-10, respectively.

4.3.2 PROJECT TRAVEL DEMAND

To assess the project's transportation impacts the project's overall travel demand was determined in a four-step process including trip generation, travel mode split, trip distribution, and trip assignment. The following sections describe the process of translating the proposed development program into the resulting trips in each mode of travel, including the analytical assumptions and the reference sources used.

Trip Generation

Trip generation estimates for the project were developed based on data presented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 7th Edition (2003). The project will consist of two components including 196 residential units and 20,000 square feet of marine-related light industrial. Trips estimates for the 196 residential units were based on the ITE trip rates for Land Use 232 (High-Rise Residential Condominium/Townhouse), which provide higher and more conservative peak hour trip estimates than the corresponding ITE trip rates for Land Use Code 222 (High Rise Apartment). Trips estimates for the 20,000 square foot marine-related use were based on ITE Land Use 110 (General Light Industrial).

The ITE trip estimates were then converted into person trips based on the anticipated vehicle occupancy rate (VOR) and were based on a variety of sources, depending upon the land use type. The VOR for the residential units is assumed to be 1.18 persons per vehicle based on 2000 U.S. Census Journey-to-Work survey data. The VOR for the marine-related use is assumed to be 1.2 based on data from the Central Transportation Planning Staff (CTPS).

Table 4-4 provides a preliminary projection of the person trips that the project is expected to generate.

Table 4-5: Site Generated Person-Trip Generation

		Daily	AM Peak Hour			PM Peak Hour			
Land Use Type	**Land Use Size**	**Total Person-Trips**	**Person-Trips Entering**	**Person-Trips Exiting**	**Total Person-Trips**	**Person-Trips Entering**	**Person-Trips Exiting**	**Total Person-Trips**	**Vehicle Occupancy Rate**
Condominiums	196 (units)	1,136	19	83	102	60	37	97	1.18 (U.S. Census)
Industrial Building	20,000 (sq ft)	167	19	2	21	2	22	24	1.2 (CTPS)
Total		1,303	38	85	123	62	59	121	

Land Use Assumptions: Condominium -- ITE # 232, High-Rise Residential Condominium/Townhouse
Industrial Building – ITE # 110, General Light Industrial

MODAL CHOICE

The project is well-situated to take advantage of alternative transportation modes and to reduce automobile mode share. Blue Line subway connections to downtown Boston and local bus connections are available at the Maverick Square public transportation hub; approximately 2,000 feet from the project site, equivalent to about an eight-minute walk. As a result, the public transportation mode will be very attractive to residents and visitors of the Boston East development.

East Boston is a dense urban neighborhood, with a mix of residential and commercial land uses and concentrated destinations. These neighborhood conditions make walking and bicycling convenient modes of travel, especially for short errands. Boston East residents and visitors will also travel by automobile, but the auto mode is not expected to dominate travel for the project. Automobile travel will be a less attractive mode than public transit for residents who work downtown. Parking in downtown Boston is expensive and driving through any of the harbor tunnels during commuter peak times will be more time-consuming than taking the train for Boston East residents.

These expectations are derived from the BTD mode split data for East Boston (Travel Zone 7). The trips associated with the industrial component of the project were assumed to follow BTD's mode splits for work related trips. The trips associated with the residential component were assumed to follow BTD's mode splits for home related trips. Table 4-5 summarizes the mode split assumptions for each component.

Table 4-6: Anticipated Travel Mode Characteristic (per BTD mode split data)

Time Period	Auto	Transit	Walk/Bicycle
Industrial Component			
Weekday Daily	74%	21%	5%
Weekday Morning Peak Hour			
Enter	75%	19%	6%
Exit	63%	32%	5%
Weekday Evening Peak Hour			
Enter	63%	32%	5%
Exit	75%	19%	6%
Residential Component			
Weekday Daily	54%	17%	29%
Weekday Morning Peak Hour			
Enter	51%	15%	34%
Exit	45%	25%	30%
Weekday Evening Peak Hour			
Enter	45%	25%	30%
Exit	51%	15%	34%

The BTD travel mode splits presented in Table 4-5 were then applied to the Total Person Trips, presented in Table 4-4, to the number of trips by each mode. The resulting transit, bicycle/walking, and auto trips are presented in Table 4-6 and Table 4-7.

Table 4-7: Non-Auto Site-Generated Trips (per BTD mode split data)

Weekday Daily	Transit Trips			Walk/Bicycle Trips			Total Non-Auto Trips
	Home	Industrial	Total	Home	Industrial	Total	
Enter	96	18	114	165	4	169	283
Exit	97	17	114	165	4	169	283
Total	193	35	228	330	8	338	566
Weekday Morning Peak Hour							
Enter	3	4	7	6	1	7	14
Exit	21	1	22	25	0	25	47
Total	24	5	29	31	1	32	61
Weekday Evening Peak Hour							
Enter	15	1	16	18	0	18	34
Exit	5	4	9	12	1	13	22
Total	20	5	25	30	1	31	56

Table 4-8: Auto Site-Generated Trips (per BTD mode split data)

Weekday Daily	Auto Trips		Total Auto Trips
	Residential	Industrial	
Enter	260	51	311
Exit	260	52	312
Total	520	103	623
Weekday Morning Peak Hour			
Enter	8	12	20
Exit	32	1	33
Total	40	13	53
Weekday Evening Peak Hour			
Enter	23	1	24
Exit	16	14	30
Total	39	15	54

TRIP DISTRIBUTION

The site-generated traffic was distributed to the roadway system based on a review of the BTD Geographical Distribution data and the existing traffic patterns on roadway system serving the site. A summary of this data is provided in Appendix 6. The resulting trip distribution patterns for the residential component and marine-related industrial use are presented Figure 4-11 and Figure 4-12, respectively. The resulting project trip assignments are shown in Figures 4-13 and 4-14 for the weekday morning and weekday evening commuter peak hours, respectively.

4.3.3 2013 BUILD PEAK HOUR TRAFFIC VOLUMES

To establish the 2013 Build peak hour traffic volumes, the project-related traffic was assigned to the surrounding roadway network based on the project distribution patterns presented above. These project trips were then added to the 2013 No-Build peak-hour traffic volumes to reflect the 2013 Build peak-hour traffic volumes. The resulting 2013 Build weekday morning and weekday evening peak-hour traffic volumes are presented in Figures 4-15, and 4-16, respectively.

PROJECT-RELATED TRAFFIC INCREASES AT STUDY AREA INTERSECTIONS

A summary of the project-related peak hour traffic volume increases and percent increase due to the project relative to the 2013 No Build total entering traffic volumes at the study area intersections is presented in Table 4-8.

As shown in Table 4-8, the proposed project will result in only minor traffic increases at the study area intersections. A more detailed discussion of potential traffic impacts associated with the proposed project is presented in the following section of this report.

Table 4-9 Project Related Traffic Increases at Study Area Intersections

Location	AM Peak Hour Volumes			PM Peak Hour Volumes		
	No-Build	Project Trips	% Increase	No-Build	Project Trips	% Increase
Meridian St/Saratoga St/Central Sq North	1,000	5	0.50%	1,284	5	0.39%
Meridian St/Porter St/Bennington St	1,263	2	0.16%	1,602	2	0.12%
Meridian St/Central Sq South/Liverpool St	981	2	0.20%	1,466	2	0.14%
Border St/Central Sq North	562	10	1.78%	877	9	1.03%
Border St/Central Sq South/Liberty Plaza Driveway	511	12	2.35%	812	11	1.35%
Border St/Decatur St	236	38	16.10%	373	45	12.06%
Border St/Maverick St	242	10	4.13%	369	12	3.25%
Sumner St/Grady Ct	124	2	1.61%	205	2	0.98%
Meridian St/London St	1,134	13	1.15%	1,365	15	1.10%
Meridian St/Havre St/Decatur St/Gove St	1,227	18	1.47%	1,405	16	1.14%
Meridian St/Paris St/Emmons St	831	3	0.36%	916	4	0.44%
Maverick St/Meridian St/Maverick Square W	649	5	0.77%	741	6	0.81%
Maverick St/Chelsea St/Maverick Square E	664	5	0.75%	786	6	0.76%
Sumner St/Maverick Square E	465	2	0.43%	589	2	0.34%
Sumner St/Maverick Square W	353	2	0.57%	493	2	0.41%
Border St/Residential Driveway	207	42	20.29%	339	42	12.39%
Border St/Industrial Driveway	205	18	8.78%	304	26	8.55%

4.3.4 TRAFFIC IMPACTS

To quantify potential traffic impacts associated with the proposed project, intersection capacity analyses were conducted for the study area intersections under the 2008 Existing, 2013 No-Build (without project), and 2013 Build (with project) peak-hour traffic conditions, based on procedures contained in the 2000 *Highway Capacity Manual* (HCM) using the Synchro 6.0 intersection capacity analysis software. The intersection capacity analysis worksheets are provided in Appendix 6. A summary of the results of the intersection capacity analyses is presented in Table 4-9.

As shown in Table 4-9, of the 23 existing intersections studied, the HCM capacity analysis indicates that all but five (5) intersections currently operate at LOS C or better during the weekday morning and weekday evening peak hours. The intersections that currently operate with longer delays corresponding to LOS D or worse during one or more of the peak hours analyzed include:

- Meridian Street, Saratoga Street and Central Square;
- Meridian Street, Porter Street and Central Square;
- Meridian Street and Central Square;
- Meridian Street and London Street; and
- Meridian Street, Maverick Street and Maverick Square West.

Table 4-10 Traffic Operations Summary

Location	2008 Existing			2013 No-Build			2013 Build		
	LOS[1]	Delay[2]	v/c[3]	LOS	Delay	v/c	LOS	Delay	v/c
Signalized Intersections									
Meridian St/Saratoga St/Central Square North									
AM Peak Hour	B	19	0.44	B	19	0.41	B	19	0.43
PM Peak Hour	D	36	0.73	B	17	0.56	B	17	0.56
Sumner St/Maverick Sq East									
AM Peak Hour	B	12	0.21	B	12	0.25	B	12	0.25
PM Peak Hour	B	11	0.25	B	11	0.32	B	11	0.33
Sumner St/Maverick Sq West									
AM Peak Hour	B	16	0.30	B	17	0.44	B	17	0.44
PM Peak Hour	C	20	0.55	C	24	0.70	C	24	0.70
Meridian St/Porter St									
AM Peak Hour	-	-	-	C	27	0.54	C	27	0.54
PM Peak Hour	-	-	-	D	38	0.77	D	39	0.77
Porter St/Bennington St									
AM Peak Hour	-	-	-	B	13	0.32	B	13	0.32
PM Peak Hour	-	-	-	B	14	0.44	B	15	0.44
Unsignalized Intersections									
Meridian St/Porter St/Central Sq									
AM Peak Hour									
LT from Meridian St SB	A	8	0.14	-	-	-	-	-	-
LT from Porter St WB	E	37	0.61	-	-	-	-	-	-
RT from Porter St WB	B	12	0.31	-	-	-	-	-	-
PM Peak Hour									
LT from Meridian St SB	A	9	0.15	-	-	-	-	-	-
LT from Porter St WB	F	>80	0.89	-	-	-	-	-	-
RT from Porter St WB	B	14	0.39	-	-	-	-	-	-
Porter St/Bennington St									
AM Peak Hour									
TH/RT from Porter St NB	A	9	0.26	-	-	-	-	-	-
LT/TH from Porter St SB	A	9	0.17	-	-	-	-	-	-
LT/RT from Bennington St WB	A	9	0.20	-	-	-	-	-	-
TH/RT from Bennington St EB	A	10	0.22	-	-	-	-	-	-
PM Peak Hour									
TH/RT from Porter St NB	B	10	0.29	-	-	-	-	-	-
LT/TH from Porter St SB	B	11	0.26	-	-	-	-	-	-
LT/RT from Bennington St WB	B	11	0.31	-	-	-	-	-	-
TH/RT from Bennington St EB	B	13	0.42	-	-	-	-	-	-
Meridian St/Central Square South									
AM Peak Hour									
LT/TH from Meridian St NB	A	2	0.06	A	3	0.08	A	3	0.08
LT/RT from Central Square South EB	-	-	-	D	27	0.50	D	27	0.51
LT from Central Square South EB	C	20	0.22	-	-	-	-	-	-
RT from Central Square South EB	B	12	0.14	-	-	-	-	-	-
PM Peak Hour									
LT/TH from Meridian St NB	A	4	0.15	A	5	0.19	A	5	0.19
LT/RT from Central Square South EB	-	-	-	F	>80	1.84	F	>80	1.86
LT from Central Square South EB	F	>80	0.88	-	-	-	-	-	-
RT from Central Square South EB	B	14	0.27	-	-	-	-	-	-

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] v/c = volume-to-capacity ratio
LT = Left, TH = Through, RT = Right
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

Table 4-10 Traffic Operations Summary (Continued)

Location	2008 Existing			2013 No-Build			2013 Build		
	LOS[1]	Delay[2]	v/c[3]	LOS	Delay	v/c	LOS	Delay	v/c
Unsignalized Intersections									
Liverpool St/Central Square South									
AM Peak Hour									
LT/RT from Liverpool St NB	B	11	0.07	B	11	0.08	B	11	0.08
LT/TH from Central Square South WB	A	2	0.02	A	1	0.02	A	1	0.02
PM Peak Hour									
LT/RT from Liverpool St NB	B	13	0.14	B	14	0.16	B	14	0.16
LT/TH from Central Square South WB	A	<1	0.01	A	<1	0.01	A	<1	0.01
Border St/Central Square North									
AM Peak Hour									
LT/RT from Border St SB	B	12	0.31	B	12	0.34	B	12	0.34
LT from Central Square North EB	A	8	0.10	A	8	0.11	A	8	0.11
PM Peak Hour									
LT/RT from Border St SB	C	22	0.64	D	28	0.73	D	29	0.74
LT from Central Square North EB	A	8	0.19	A	9	0.21	A	9	0.21
Border St/Central Square S/Liberty Plaza S Drwy									
AM Peak Hour									
LT/TH/RT from Border St NB	A	9	0.19	A	9	0.22	A	9	0.23
LT/TH/RT from Border St SB	A	9	0.23	A	9	0.25	A	9	0.26
LT/TH/RT from Central Square South WB	A	9	0.19	A	9	0.19	A	9	0.20
LT/TH/RT from Liberty Plaza S Drwy EB	A	8	0.04	A	8	0.05	A	8	0.05
PM Peak Hour									
LT/TH/RT from Border St NB	A	10	0.24	B	11	0.28	B	11	0.29
LT/TH/RT from Border St SB	B	12	0.38	B	13	0.43	B	13	0.44
LT/TH/RT from Central Square South WB	B	11	0.42	B	12	0.44	B	12	0.45
LT/TH/RT from Liberty Plaza S Drwy EB	A	9	0.15	A	10	0.15	A	10	0.15
Border St/Decatur St									
AM Peak Hour									
LT/TH from Border St SB	A	1	0.01	A	1	0.01	A	2	0.02
LT/RT from Decatur St WB	A	9	0.03	A	9	0.03	A	10	0.04
PM Peak Hour									
LT/TH from Border St SB	A	2	0.02	A	2	0.03	A	2	0.04
LT/RT from Decatur St WB	A	10	0.05	A	10	0.06	B	10	0.08
Maverick St/Border St									
AM Peak Hour									
TH/RT from Border St SB	B	10	0.08	B	11	0.10	B	11	0.11
LT/TH/RT from Maverick St WB	A	1	0.01	A	1	0.01	A	1	0.01
LT/RT from Maverick St EB	A	7	0.02	A	7	0.05	A	8	0.05
PM Peak Hour									
TH/RT from Border St SB	B	12	0.19	B	14	0.28	B	14	0.28
LT/TH/RT from Maverick St WB	A	1	0.01	A	1	0.01	A	1	0.01
LT/RT from Decatur St WB	A	7	0.04	A	8	0.06	A	8	0.06
Sumner St/Grady Ct									
AM Peak Hour									
LT/RT from Grady Ct	A	9	0.05	A	9	0.06	A	9	0.06
PM Peak Hour									
LT/RT from Grady Ct	A	9	0.12	A	10	0.14	A	10	0.15

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] v/c = volume-to-capacity ratio
LT = Left, TH = Through, RT = Right
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

Table 4-10 Traffic Operations Summary (Continued)

Location	2008 Existing			2013 No-Build			2013 Build		
	LOS[1]	Delay[2]	v/c[3]	LOS	Delay	v/c	LOS	Delay	v/c
Unsignalized Intersections									
Meridian St/London St									
AM Peak Hour									
LT/TH/RT from Meridian St NB	A	<1	0.00	A	<1	0.00	A	<1	0.00
LT/TH/RT from Meridian St SB	A	<1	0.01	A	<1	0.01	A	<1	0.01
LT/TH/RT from London St WB	F	>80	0.91	F	>80	1.53	F	>80	1.64
LT/TH/RT from London St EB	C	22	0.06	E	37	0.20	E	40	0.25
PM Peak Hour									
LT/TH/RT from Meridian St NB	A	<1	0.01	A	<1	0.01	A	<1	0.01
LT/TH/RT from Meridian St SB	A	<1	0.01	A	<1	0.01	A	<1	0.01
LT/TH/RT from London St WB	F	>80	2.48	F	*	5.74	F	*	6.66
LT/TH/RT from London St EB	F	>80	0.40	F	*	*	F	*	*
Meridian St/Gove St									
AM Peak Hour									
LT/TH from Meridian St SB	A	5	0.17	A	5	0.18	A	5	0.18
RT from Gove St WB	B	12	0.13	B	12	0.14	B	12	0.14
PM Peak Hour									
LT/TH from Meridian St SB	A	5	0.18	A	5	0.19	A	5	0.19
RT from Gove St WB	B	13	0.24	B	14	0.26	B	14	0.26
Havre St/Gove St									
AM Peak Hour									
LT/TH/RT from Gove St WB	B	12	0.23	B	13	0.28	B	13	0.29
LT/TH from Gove St EB	C	16	0.39	C	19	0.46	C	20	0.47
PM Peak Hour									
LT/TH/RT from Gove St WB	B	12	0.27	B	13	0.33	B	13	0.34
LT/TH from Gove St EB	C	17	0.39	C	20	0.46	C	21	0.48
Meridian St/Havre St									
AM Peak Hour									
LT/TH from Havre St WB	C	16	0.05	C	18	0.06	C	19	0.06
LT/TH/RT from Havre St EB	C	18	0.32	C	23	0.48	D	25	0.53
PM Peak Hour									
LT/TH from Havre St WB	C	17	0.06	C	20	0.07	C	21	0.07
LT/TH/RT from Havre St EB	C	24	0.46	E	39	0.67	E	44	0.73
Havre St/Decatur St									
AM Peak Hour									
LT/TH/RT from Havre St NB	B	10	0.16	B	11	0.22	B	11	0.23
RT from Havre St SB	A	9	0.01	A	9	0.01	A	9	0.01
LT/TH from Decatur St EB	A	5	0.01	A	5	0.01	A	6	0.03
PM Peak Hour									
LT/TH/RT from Havre St NB	B	11	0.16	B	11	0.21	B	12	0.23
RT from Havre St SB	A	9	0.02	A	9	0.02	A	9	0.02
LT/TH from Decatur St EB	A	5	0.03	A	5	0.03	A	6	0.04
Meridian St/Decatur St									
AM Peak Hour									
LT/TH from Meridian St NB	A	<1	0.01	A	<1	0.01	A	<1	0.01
RT from Decatur St EB	B	10	0.03	B	10	0.03	B	10	0.03
PM Peak Hour									
LT/TH from Meridian St NB	A	<1	0.01	A	<1	0.01	A	<1	0.01
RT from Decatur St EB	B	10	0.03	B	11	0.04	B	11	0.04

[1] LOS= Level of Service
[2] Delay = Average delay expressed in seconds per vehicle
[3] v/c = volume-to-capacity ratio
LT = Left, TH = Through, RT = Right
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound *=Delay is incalculable

Table 4-10 Traffic Operations Summary (Continued)

Location	2008 Existing			2013 No-Build			2013 Build		
	LOS[1]	Delay[2]	v/c[3]	LOS	Delay	v/c	LOS	Delay	v/c
Unsignalized Intersections									
Meridian St/Emmons St									
AM Peak Hour									
LT/TH from Meridian St SB	A	<1	0.01	A	<1	0.01	A	<1	0.01
RT from Emmons St WB	B	11	0.10	B	11	0.11	B	11	0.11
PM Peak Hour									
LT/TH from Meridian St SB	A	<1	0.01	A	<1	0.01	A	<1	0.01
RT from Emmons St WB	B	11	0.11	B	12	0.11	B	12	0.11
Paris St/Emmons St									
AM Peak Hour									
RT from Paris St NB	A	9	0.01	A	9	0.01	A	9	0.01
LT/TH/RT from Paris St SB	A	9	0.16	A	10	0.18	A	10	0.18
PM Peak Hour									
RT from Paris St NB	A	9	0.01	A	9	0.01	A	9	0.01
LT/TH/RT from Paris St SB	A	9	0.11	A	9	0.16	A	10	0.17
Meridian St/Paris St									
AM Peak Hour									
LT/TH/RT from Meridian St NB	A	0	0.00	A	0	0.00	A	0	0.00
LT/TH from Paris St WB	C	16	0.11	C	18	0.16	C	18	0.17
PM Peak Hour									
LT/TH/RT from Meridian St NB	A	<1	0.01	A	<1	0.01	A	<1	0.01
LT/TH from Paris St WB	C	18	0.11	C	23	0.27	C	23	0.29
Meridian St/Maverick St/Maverick Sq W									
AM Peak Hour									
LT from Maverick Sq W NB	B	12	0.02	B	12	0.02	B	12	0.02
TH/RT from Maverick Sq W NB	B	13	0.29	B	14	0.32	B	14	0.33
LT/RT from Meridian St SB	C	23	0.42	D	27	0.49	D	27	0.49
PM Peak Hour									
LT from Maverick Sq W NB	B	13	0.05	B	14	0.05	B	14	0.05
TH/RT from Maverick Sq W NB	C	17	0.46	C	19	0.50	C	19	0.50
LT/RT from Meridian St SB	F	>80	0.95	F	>80	1.13	F	>80	1.14
Maverick St/Chelsea St/Maverick Sq E									
AM Peak Hour									
TH/RT from Chelsea St SB	A	9	0.20	A	9	0.22	A	9	0.23
LT/TH/RT from Maverick St WB	B	11	0.41	B	11	0.46	B	11	0.46
LT/RT from Maverick St EB	A	8	0.21	A	9	0.23	A	9	0.23
PM Peak Hour									
TH/RT from Chelsea St SB	A	9	0.21	A	10	0.26	B	10	0.26
LT/TH/RT from Maverick St WB	B	11	0.47	B	13	0.52	B	13	0.53
LT/RT from Maverick St EB	A	10	0.31	B	10	0.34	B	10	0.34
Border St/North Site Drwy									
AM Peak Hour									
LT/TH from Border St NB	-	-	-	-	-	-	A	<1	0.00
LT/RT from North Site Drwy EB	-	-	-	-	-	-	A	9	0.04
PM Peak Hour									
LT/TH from Border St NB	-	-	-	-	-	-	A	<1	0.01
LT/RT from North Site Drwy EB	-	-	-	-	-	-	A	10	0.02
Border St/South Site Drwy									
AM Peak Hour									
LT/TH from Border St NB	-	-	-	-	-	-	A	<1	0.00
LT/RT from South Site Drwy EB	-	-	-	-	-	-	A	10	0.00
PM Peak Hour									
LT/TH from Border St NB	-	-	-	-	-	-	A	0	0.00
LT/RT from South Site Drwy EB	-	-	-	-	-	-	B	11	0.02

[1] LOS= Level of Service [2] Delay = Average delay expressed in seconds per vehicle [3] v/c = volume-to-capacity ratio LT = Left, TH = Through, RT = Right

Independent of the proposed Boston East Project, the HCM capacity analysis indicates that the assumed traffic increases associated with background traffic growth and other planned area developments will result in general increases in delay at all of the intersections and cause two additional intersections operate at LOS D or worse, during one or more of the peak hours analyzed under the 2013 No Build (without Project) conditions. The two intersections include:

- Border Street and Central Square North; and
- Meridian Street and Havre Street.

Traffic increases associated with the proposed Boston East project are minimal and will not result in any additional intersections operating at LOS D or worse under the 2013 Build (with Project weekday morning and weekday evening peak hour conditions). The capacity analysis indicates that the proposed site driveways on Border Street and all movements at the remaining intersections will continue to operate below capacity with LOS C or better during all three peak hour time periods analyzed through the projected (2013 Build with project) conditions. A more detailed discussion of the study area intersections that currently experience longer delays is presented below.

Meridian Street/Saratoga Street and Central Square North - The capacity analysis indicates that the signalized intersection of Meridian Street/Saratoga Street and Central Square North currently operates at overall LOS B during the weekday morning peak hour but experiences longer delays operating at LOS D during the weekday evening peak hour. With the City of Boston's planned Central Square improvements, the intersection is projected to operate at LOS B during both the weekday morning and weekday evening peak hours through the projected 2013 No Build and 2013 Build (with project) conditions.

Meridian Street and Porter Street at Central Square - The analysis indicates that the critical westbound left-turn movements from Porter Street onto Meridian Street at the unsignalized intersection of Meridian Street and Porter Street in Central Square currently operates at LOS E and LOS F during the weekday morning and weekday evening peak hours, respectively. With the City of Boston's planned Central Square improvements, the intersection is projected to operate at LOS C and D during the weekday morning and weekday evening peak hours, respectively under the projected 2013 No Build (without project). The proposed Boston East project will have no noticeable impact on the future traffic operations at this intersections, and these same operating levels will be maintained through the projected 2013 Build (with project) peak hour conditions.

Meridian Street and Central Square South - The critical left-turn movements from Central Square south onto Meridian Street currently operates at LOS C during the weekday morning peak hour but experiences longer delays operating at LOS F during the weekday evening peak hour. The City of Boston has identified long term improvements at the Central Square intersections as part of the East Boston Transportation Action Plan that significantly enhance future traffic operations within Central Square. However, even with these planned improvements the capacity analysis indicates that critical left-turn movements from Central Square south onto Meridian Street currently operates at LOS D and LOS F during the weekday mourning and weekday evening peak hours, respectively, under the future 2013 No Build (without project) conditions. These same operating levels will be maintained through the projected 2013 Build (with project) peak hour conditions. The proposed Boston East project will result in two additional vehicles during the weekday morning and weekday evening peak hours. This minor increase in traffic will have no noticeable impacts on the future traffic operations at this intersection.

Meridian Street and London Street - The capacity analysis indicates that the critical side street movements from London Street onto Meridian Street currently operate at LOS F during the weekday morning and weekday evening peak hours. Independent of the proposed Boston East project, traffic increases associated with general back ground traffic growth and other planned area development projects will result in further delays for the critical side street movements under the project 2013 No Build (without project) peak hour conditions. The proposed Boston East project will result in 13 additional vehicles and 15 additional vehicles during the weekday morning and weekday evening peak hours, respectively. This minor increase in traffic will have no noticeable impacts on the future traffic operations at this intersection.

Meridian Street and Harve Street - The unsignalized intersection of Meridian Street and Harve Street currently operates at LOS C during both the weekday morning and weekday evening peak hours. Independent of the proposed Boston East project, traffic increases associated with general back ground traffic growth and other planned area developments will result in longer delays during the weekday evening peak hour that are projected to operate at LOS C and LOS E during eth weekday morning and weekday evening g peak hours, respectively under the projected 2013 No Build (without project) conditions. These same operating levels will be maintained through the projected 2013 Build (with project) peak hour conditions. The proposed Boston East project will result in 18 additional vehicles during the weekday morning and 16 additional vehicles during the weekday evening peak hours. This represents an increase 1.47 percent and 1.14 percent during the weekday morning and weekday evening peak hours, respectively (relative to the projected 2013 No Build peak hour conditions). This minor increase in traffic will have no noticeable impacts on the future traffic operations at this intersection.

Meridian Street and Maverick Street at Maverick Square - The capacity analysis indicates that the critical southbound movements from Meridian Street experiences longer delays during the weekday evening peak hour. The Meridian Street southbound approach at Maverick Street, operates at LOS C during the weekday morning peak hour and LOS F during the weekday evening peak hour. Independent of the proposed Boston East project, traffic increases associated with general back ground traffic growth and other planned area development projects will result in further delays for the critical side street movements under the project 2013 No Build (without project) peak hour conditions. The proposed Boston East project will result in five additional vehicles and six additional vehicles during the weekday morning and weekday evening peak hours, respectively. This represents an increase 0.77 percent and 0.81 percent during the weekday morning and weekday evening peak hours, respectively (relative to the projected 2013 No Build peak hour conditions). This minor increase in traffic will have no noticeable impacts on the future traffic operations at this intersection.

Table 4-10 shows that the proposed project adds minimal traffic to the study area intersections and the movements that experience LOS D, E, or F.

Table 4-11 summarizes the anticipated vehicle queues at the study area intersections for Existing Conditions, Future No-Build Conditions, and Future Build Conditions. These queuing calculations include 50th percentile queues (the average expected vehicle queue) and the 95th percentile queues (the "worst-case" queue that can be predicted with any accuracy) for the study area intersections during the weekday AM peak hour and PM peak hour. The anticipated queues are expressed in passenger car lengths, with the assumption of 25 feet per queued vehicle.

Table 4-11 shows that the average queues and the worst-case queues at most of the study area intersections are minimal. Because of the project site's location in the southwest corner of East Boston, most of the traffic is for local access. As a result, traffic volumes and vehicle queues are quite low.

4.3.5 PARKING

The proposed project will provide a total of 167 off-street parking spaces with 141 parking spaces in an underground garage for the residential condominiums and an additional 26 off-street surface parking spaces for the marine-related use.

Table 4-11 Project Traffic Increment at Intersections with LOS D, E, or F

		2008 Existing Conditions		2013 No-Build Conditions		2013 Build Conditions		
Location	**Peak Hour**	**LOS**	**Traffic Volume**	**LOS**	**Traffic Volume**	**LOS**	**Traffic Volume**	**% Traffic Increase**
Meridian St/Saratoga St / Central Square North								
Intersection Overall	AM	B	877	B	1,000	B	1,005	0.50 %
	PM	D	1,112	B	1,284	B	1,289	0.39 %
Meridian St / Porter St / Central Square								
Intersection Overall	AM	NA	1,214	C	1,263	C	1,265	0.16 %
	PM	NA	1,524	D	1,602	D	1,604	0.12 %
Porter Street Westbound Approach	AM	E	293	NA	300	NA	300	0.0 %
	PM	F	301	NA	309	NA	309	0.0 %
Meridian St / Central Square South								
Intersection Overall	AM	NA	933	NA	981	NA	983	0.2 %
	PM	NA	1,393	NA	1,466	NA	1,468	0.14 %
Central Square South Eastbound Approach	AM	C	122	D	125	D	127	1.6 %
	PM	F	242	F	247	F	249	0.8 %
Border St / Central Square North								
Intersection Overall	AM	NA	522	NA	562	NA	572	1.78 %
	PM	NA	815	NA	877	NA	886	1.03 %
Border Street Southbound Approach	AM	B	226	B	236	B	238	0.8 %
	PM	C	328	D	350	D	352	0.6 %
Meridian St / London St								
Intersection Overall	AM	NA	1,030	NA	1,134	NA	1,147	1.15 %
	PM	NA	1,202	NA	1,365	NA	1,380	1.10 %
London Street Westbound Approach	AM	F	140	F	172	F	180	4.4 %
	PM	F	143	F	219	F	229	4.4 %
Meridian St / Havre St								
Intersection Overall	AM	NA	1,095	NA	1,227	NA	1,245	1.47 %
	PM	NA	1,239	NA	1,405	NA	1,421	1.14 %
Harve Street Eastbound Approach	AM	C	120	C	162	C	162	0.0 %
	PM	C	108	E	146	E	146	0.0 %
Meridian St / Maverick St/ Maverick Square West								
Intersection Overall	AM	NA	604	NA	649	NA	654	0.77 %
	PM	NA	691	NA	741	NA	747	0.81 %
Meridian Street Southbound Approach	AM	C	133	D	142	D	142	0.0 %
	PM	F	169	F	184	F	184	0.0 %

Table 4-12 Vehicle Queues at Signalized Study Area Intersections

	2008 Existing Conditions		2013 No-Build Conditions		2013 Build Conditions	
Location	**50th %-ile Queue (cars)**	**95th %-ile Queue (cars)**	**50th %-ile Queue (cars)**	**95th %-ile Queue (cars)**	**50th %-ile Queue (cars)**	**95th %-ile Queue (cars)**
Meridian St at Saratoga St						
AM Peak Hour						
Meridian St NB LT/TH	6.2	9.9	-	-	-	-
Meridian St NB LT	-	-	0.8	1.6	0.8	1.6
Meridian St NB TH	-	-	4.1	6.4	4.1	6.3
Meridian St SB TH/RT	6.0	9.3	6.4	9.8	6.4	9.9
Saratoga St WB LT/TH/RT	1.4	3.0	1.4	3.2	1.4	3.2
Saratoga St EB LT	0.6	1.6	-	-	-	-
Saratoga St EB LT/RT	-	-	0.8	2.6	0.8	2.7
PM Peak Hour						
Meridian St NB LT/TH	12.3	21.6	-	-	-	-
Meridian St NB LT	-	-	0.6	1.0	0.5	0.9
Meridian St NB TH	-	-	2.6	3.8	1.9	3.6
Meridian St SB TH/RT	4.9	7.7	5.6	8.8	5.6	8.8
Saratoga St WB LT/TH/RT	2.2	4.5	2.4	4.8	2.4	4.9
Saratoga St EB LT	1.7	3.6	-	-	-	-
Saratoga St EB LT/RT	-	-	3.0	7.2	3.2	7.6
Sumner St at Maverick Sq						
AM Peak Hour						
Sumner St EB LT/TH	0.6	3.2	0.8	3.8	0.8	3.8
Sumner St WB TH/RT	0.6	2.8	0.8	3.2	0.8	3.2
Maverick Sq SB LT	1.1	4.4	1.3	5.0	1.3	5.0
Maverick Sq SB RT	0.0	1.2	0.0	1.3	0.0	1.3
PM Peak Hour						
Sumner St EB LT/TH	0.9	4.7	1.3	6.1	1.3	6.1
Sumner St WB TH/RT	0.7	3.1	0.9	3.4	0.9	3.4
Maverick Sq SB LT	1.1	4.2	1.4	5.1	1.5	5.1
Maverick Sq SB RT	0.0	1.4	0.0	1.5	0.0	1.5
Meridian St at Porter St						
AM Peak Hour						
Meridian St NB TH/RT	-	-	6.4	10.3	6.4	10.3
Meridian St SB LT	-	-	0.8	1.6	0.8	1.6
Meridian St SB TH	-	-	7.6	11.9	7.6	11.8
Porter St WB LT	-	-	3.6	6.4	3.6	6.4
Porter St WB RT	-	-	0.0	0.5	0.0	0.5
PM Peak Hour						
Meridian St NB TH/RT	-	-	13.2	22.3	13.3	22.4
Meridian St SB LT	-	-	2.5	5.1	2.5	5.1
Meridian St SB TH	-	-	4.2	7.3	4.2	7.3
Porter St WB LT	-	-	4.3	8.4	4.6	8.6
Porter St WB RT	-	-	0.4	2.0	0.2	2.0
Porter St at Bennington St						
AM Peak Hour						
Porter St EB TH	-	-	1.3	1.8	1.4	1.8
Porter St EB RT	-	-	0.0	0.0	0.0	0.0
Bennington St WB TH	-	-	1.9	3.5	1.9	3.5
Porter St NB LT	-	-	3.6	5.8	3.6	5.8
Porter St NB RT	-	-	0.0	0.8	0.0	0.8
PM Peak Hour						
Porter St EB TH	-	-	2.2	3.3	2.2	3.3
Porter St EB RT	-	-	0.0	0.0	0.0	0.0
Bennington St WB TH	-	-	2.8	4.8	2.5	4.5
Porter St NB LT	-	-	3.9	7.3	4.1	8.6
Porter St NB RT	-	-	0.0	1.1	0.0	1.1

The 141 garage parking spaces will be principally for the project's residents. This corresponds to a parking ratio of 0.72 spaces per unit for the 196 condominium units. This is well below the proposed parking ratio of 1.5 spaces per condominium unit for Clippership Wharf's 400 condominium units and Portside at Pier 1's 80 condominium units, but higher than the 0.6 parking spaces per unit provided at the nearby Maverick Landing project.

The proposed parking supply is intended to provide adequate parking so that parking demand from the project will not exceed the supply and consume on-street spaces. It is important to preserve on-street parking spaces existing neighborhood residents, new neighborhood residents, customers of neighborhood businesses, and visitors to the waterfront open spaces.

Parking demand for most of the other project components besides the condominiums is expected to be quite low. The small number of on-site employees will not be provided with free parking, and will be encouraged to take public transportation, walk, or bicycle to work. The gallery and Facilities of Public Accommodation are not expected to attract visitors on its own, but instead to be used by people who are already in the area. Therefore, it is not necessary to provide parking for these amenities.

The residential units and the marine-related industrial use complement each other well for a shared-parking arrangement. The proposed marine-related industrial use will provide an additional 26 off-street parking spaces. It is anticipated that the parking demands for the marine related industrial use would be greatest on weekdays during normal business hours and would be largely be available to visitors of the residential development at night and on weekends.

Parking lease fees for project residents will be set at market rates to prevent a parking subsidy from encouraging a higher level of auto ownership among residents. The residential parking spaces will be made available to residents separately from their condominium purchase costs. This will encourage project residents to minimize their automobile ownership, since parking will not be included in the price of their condominium.

4.3.6 PUBLIC TRANSIT

The Project site is expected to add approximately 228 transit trips per day, with 29 trips (7 entering trips and 22 exiting trips) during the weekday morning commuter peak hour and 25 trips (16 entering trips and 9 exiting trips) during the weekday evening commuter peak hour.

The majority of public transit trips to and from the project will be via the Blue Line. This reflects the concentration of employment in downtown Boston, the attractiveness of living at Boston East for people who work downtown, the speed of travel to downtown Boston via the Blue Line and the low cost of subway travel versus parking in downtown Boston. The Blue Line currently has high ridership, especially at its peak loading segment between Maverick Station and Aquarium Station. The MBTA ongoing project to upgrade all the Blue Line stations to accommodate six-car trains will significantly improve capacity. MBTA bus service can supplement Blue Line subway service for destinations in other parts of East Boston and in Chelsea. The developer of the Portside at Pier One project has also proposed reinstituting water transportation service from the Lewis Mall water terminal. This terminal is a short walk from the project site and the water transportation service available there could supplement the Blue Line connection to downtown Boston.

The public transportation trips were also distributed onto the public transportation system based on origin and destination information for public transportation trips in East Boston provided by CTPS. This distribution is summarized below in Table 4-13.

Table 4-13 Public Transportation Trip Distribution

	AM Peak Hour				PM Peak Hour			
	Entering		Exiting		Entering		Exiting	
	% of Trips	# of Trips	% of Trips	# of Trips	% of Trips	# of Trips	% of Trips	# of Trips
Blue Line (to/from Downtown)	42 %	3	79 %	17	78 %	12	52 %	5
Blue Line (to/from North Shore)	30 %	2	11 %	3	12 %	2	25 %	2
Bus Routes 114 / 116 / 117	12 %	1	4 %	1	5 %	1	11 %	1
Bus Routes 120 / 121	16 %	1	6 %	1	5 %	1	13 %	1
Total	**100%**	**7**	**100%**	**22**	**100%**	**16**	**100%**	**9**

The Blue Line Subway will carry the majority of the public transportation trips generated by the proposed project. The Blue Line provides direct rapid transit connections to major downtown Boston employment centers: the Financial District via Aquarium Station, State Street Station, Government Center Station, and Bowdoin Station. The Blue Line also provides convenient transfers to the Orange Line at State Street Station and to the Green Line at Government Center Station.

Under existing conditions, the Blue Line is heavily loaded during commuter peak periods. During peak periods, the Blue Line averages 3.5 minute headway, or 17 trains per hour. The Blue Line currently runs four-car trains, each of which has a capacity of approximately 95 passengers. This produces an overall peak capacity of approximately 6,460 passengers per hour.

Based on 1997 passenger counts, the point on the Blue Line which experiences the maximum loading is the segment beneath Boston Harbor, between Maverick Station and Aquarium Station. The 1997 morning peak hour demand was 5,997 passengers, with a volume-to-capacity ratio of 0.93, while the evening peak hour demand was 4,880, with a volume-to-capacity ratio of 0.76.

As noted above, the MBTA will begin running six-car train service on the Blue Line beginning in 2009. Therefore, in the project analysis horizon year of 2013, the Blue Line will be operating with the six-car trains. The MBTA estimates that this will enable an approximate 35% increase in peak hour capacity on the Blue Line. This will result in a future capacity of approximately 8,720 passengers per hour.

As shown in Table 4-13, the proposed project will add an estimated 22 new passengers to the Blue Line in the peak direction during the AM peak hour and 16 during the PM peak hour. This is equivalent to about 0.3 % of the Blue Line's capacity. As Table 4-14 shows, the Boston East project does not significantly affect Blue Line capacity, and the Blue Line will have adequate capacity to accommodate demand from the Boston East project as well as other proposed projects in the study area.

The project's demand for bus travel is minimal. The total demand is four passengers during the morning peak hour, when there are a total of 18 buses serving Maverick Square, and four passengers during the PM peak hour, when there are a total of 11 buses serving Maverick Square. In addition, the project demand is split approximately in half between entering bus trips and exiting bus trips. As a result, the project generates far less than one passenger per bus during peak periods.

4.3.7 PEDESTRIAN SYSTEM

The Boston East project is designed to maximize pedestrian connectivity through the site and pedestrian access to the waterfront. By redeveloping a vacant parcel on Border Street and providing a large, continuous section of the Harborwalk, the Boston East project will enhance the pedestrian environment on Border Street and improve pedestrian access to the East Boston waterfront. The project's pedestrian facilities will provide residents with excellent walking access to destinations in East Boston and will improve pedestrian access and connectivity for neighborhood residents and visitors.

Table 4-14: Blue Line Capacity and Peak Demand

	Baseline – 1997	Future No-Build – 2007	Future Build – 2007
Cars per train	4	6	6
Capacity (passengers / car)	95	95	95
Headway (minutes)	3.5		
Frequency (trains / hour)	17		
Capacity (passengers / hour)	6,460	8,720 [1]	8,720 [1]
Project-Generated Trips			
AM (to downtown)			
Portside at Pier 1	–	121	–
Clippership Wharf	–	89	–
Hodge Boiler Works	–	26	–
6-26 New Street		18	–
Boston East		--	22
PM (from downtown)			
Portside at Pier 1	–	121	–
Clippership Wharf	–	91	–
Hodge Boiler Works	–	26	–
6-26 New Street		18	–
Boston East		--	16
Peak Hour Demand			
AM (to downtown)	5,997 [2]	8,487 [3]	8,509
PM (from downtown)	4,880 [2]	6,955 [3]	6,971
Peak Hour V/C Ratio			
AM (to downtown)	0.93	0.97	0.97
PM (from downtown)	0.76	0.80	0.80

1 Assumes 35% increment from 4-car train service to 6-car train service

2 Based on *1997 Passenger Counts: MBTA Rapid Transit and Green Line Central Subway*, CTPS for MBTA

3 Assumes 2% annual increment (37% total) from 1997 peak demand to 2013 Build Condition + Portside at Pier 1 + Clippership Wharf+Hodge Boiler Works + 6-26 New Street + Boston East

To ensure that the proposed project does not impact the quality of existing pedestrian accommodations in the vicinity of the project site, BTD has requested that Pedestrian Level-of-Service (PLOS) analysis be conducted for key intersections that are likely access points between the site and the surrounding neighborhood. These intersections include:

- Maverick Square @ Sumner Street;
- Central Square @ Meridian Street and Border Street; and
- Meridian Street @ Harve Street/Decatur Street/Gove Street.

The pedestrian delay and level of service were determined based on procedures outlined in the Highway Capacity Manual, 2000 Edition (HCM2000), published by the Transportation Research Board. A summary of the key criteria for evaluating pedestrian delay and PLOS is provided below.

- Signalized Intersections: At signalized intersections, pedestrian delay is a function of the signal phasing and timing. It is the average time that pedestrians must wait for the pedestrian phase to cross the street.

- Unsignalized Intersections: There are essentially two different conditions for pedestrian crossings at unsignalized intersections.

- Pedestrian Right of Way: At STOP-controlled intersection approaches and at striped pedestrian crossings, it is assumed that pedestrians have the right of way. Therefore, pedestrian delay is assumed to be zero.

- Pedestrian Gaps Required: At unsignalized crossings of a major street (i.e. the street that has the vehicular right of way, with no STOP or Yield control) with no striped crosswalk, it is assumed that pedestrians must wait for a suitable "gap" in the traffic stream. The pedestrian delay until such a gap is available is a function of the roadway volume and the width of the crossing.

The pedestrian delay and the corresponding PLOS for signalized and unsignalized intersections are presented in Table 4-15.

Table 4-15 Pedestrian Delay Level of Service Criteria

	Average Pedestrian Delay (Seconds)	
Level of Service	Signalized Intersections	Unsignalized Intersections
A	≤10.0	≤5.0
B	10.1 to 20.0	5.1 to 10.0
C	20.1 to 30.0	10.1 to 20.0
D	30.1 to 40.0	20.1 to 30.0
E	40.1 to 60.0	30.1 to 45.0
F	>60.0	>45.0

Source: Highway Capacity Manual 2000, Transportation Research Board, National Research Council, Washington, DC, 2000.

The pedestrian delay and levels of service at signalized intersections are functions of the signal timing. The pedestrian delay and levels of service at the signalized intersections of Sumner Street at Maverick Square and Meridian Street at Saratoga Street, requested by BTD, are shown in Table 4-16 below:

Table 4-16 Signalized Intersection Pedestrian Delay and Level of Service

		2008 Existing Conditions		2013 No-Build Conditions		2013 Build Conditions	
Location	Peak Hour	LOS[1]	Delay[2]	LOS	Delay	LOS	Delay
Sumner Street at Maverick Square	AM	C	27.4	C	27.4	C	27.4
	PM	C	27.4	C	27.4	C	27.4
Meridian Street at Saratoga Street	AM	D	31.3	D	31.3	D	31.3
	PM	D	31.3	D	31.3	D	31.3

1 Level of Service
2 Average delay in seconds

BTD has also requested the PLOS for the unsignalized intersections of Maverick Square at Maverick Street, Central Square at Meridian Street, Central Square at Border Street, and Meridian Street at Havre Street/Decatur Street/Gove Street. These unsignalized intersections have striped crosswalks, and per HCM2000 the pedestrian delays are zero.

4.3.8 BICYCLE AMENITIES

The project will provide secure interior storage in the garage for project residents and publicly-accessible outdoor storage for future employees of the marine-related building and visitors the waterfront public space.

4.3.9 SERVICE AND LOADING

The project site is currently vacant and there are no loading or service activities occurring at the project site. Service and loading requirements for the proposed project will be modest. Most service and loading requirements will be limited to trash pickup from the residences and residential deliveries, such as UPS/Federal Express service, as well as infrequent move-in/move-out operations. The proposed residential building will provide an off-street loading area on the north side of the building to accommodate residential deliveries, move-in/move-out operations. Because of the site constraints, a full-sized dumpster cannot be accommodated. Residential trash will be collected in a trash room on the first floor of the building, next to the garage exit ramp. Trash bins will be wheeled outside to Border Street, where it will be picked up by a private hauling company. The building management will contract a hauling company to pick up the trash at regular intervals, based on project needs.

The service and loading requirements of the proposed marine related industrial building can not be identified at this time as a specific tenant has not been identified. However, a suitable off-street loading will be provided for the marine-related use with access provided through the proposed driveway and off-street parking lot.

4.3.10 TRANSPORTATION MITIGATION

The Boston East mixed-use project is principally a transit-oriented residential project with minor impacts on the transportation system. The project will mitigate these minor impacts through improvements to the waterfront public realm and implementation of appropriate Travel Demand Management (TDM) measures.

PUBLIC REALM AND PEDESTRIAN IMPROVEMENTS

The Boston East project will significantly enhance the waterfront public realm by;

- Providing waterfront public access from Border Street to and along the harbor; and
- Providing a large, publicly-accessible, waterfront plaza.

TRAVEL DEMAND MANAGEMENT (TDM)

The project proponent will implement a Travel Demand Management (TDM) program in order to reduce automobile travel, automobile ownership and traffic impacts associated with the proposed project. The TDM measures to be implemented by the Boston East mixed-use project will include:

Transportation Coordinator: The proponent will designate one of the project's full-time, on-site employees as the transportation coordinator. The transportation coordinator should oversee all transportation issues including managing vehicular operations, service and loading, parking, and TDM programs.

Public Transportation Information: The transportation coordinator will maintain a supply of appropriate public transportation information and distribute this information to project residents, visitors, and employees.

Bicycle Storage; There will be secure bicycle storage for project residents. There will be publicly-accessible bicycle storage for visitors to the project and to the waterfront public spaces.

Ridesharing: The transportation coordinator will facilitate ridesharing arrangements for project employees.

Market Rate Parking: Parking lease fees for project residents will be set at market rates to prevent a parking subsidy from encouraging a higher level of auto ownership among residents. The residential parking spaces will be made available to residents separately from their condominium purchase costs. This will encourage project residents to minimize their automobile ownership, since parking will not be included in the price of their condominium.

The proponent will work with BTD to determine an appropriate TDM program and will formalize this program in a Transportation Access Plan Agreement (TAPA).

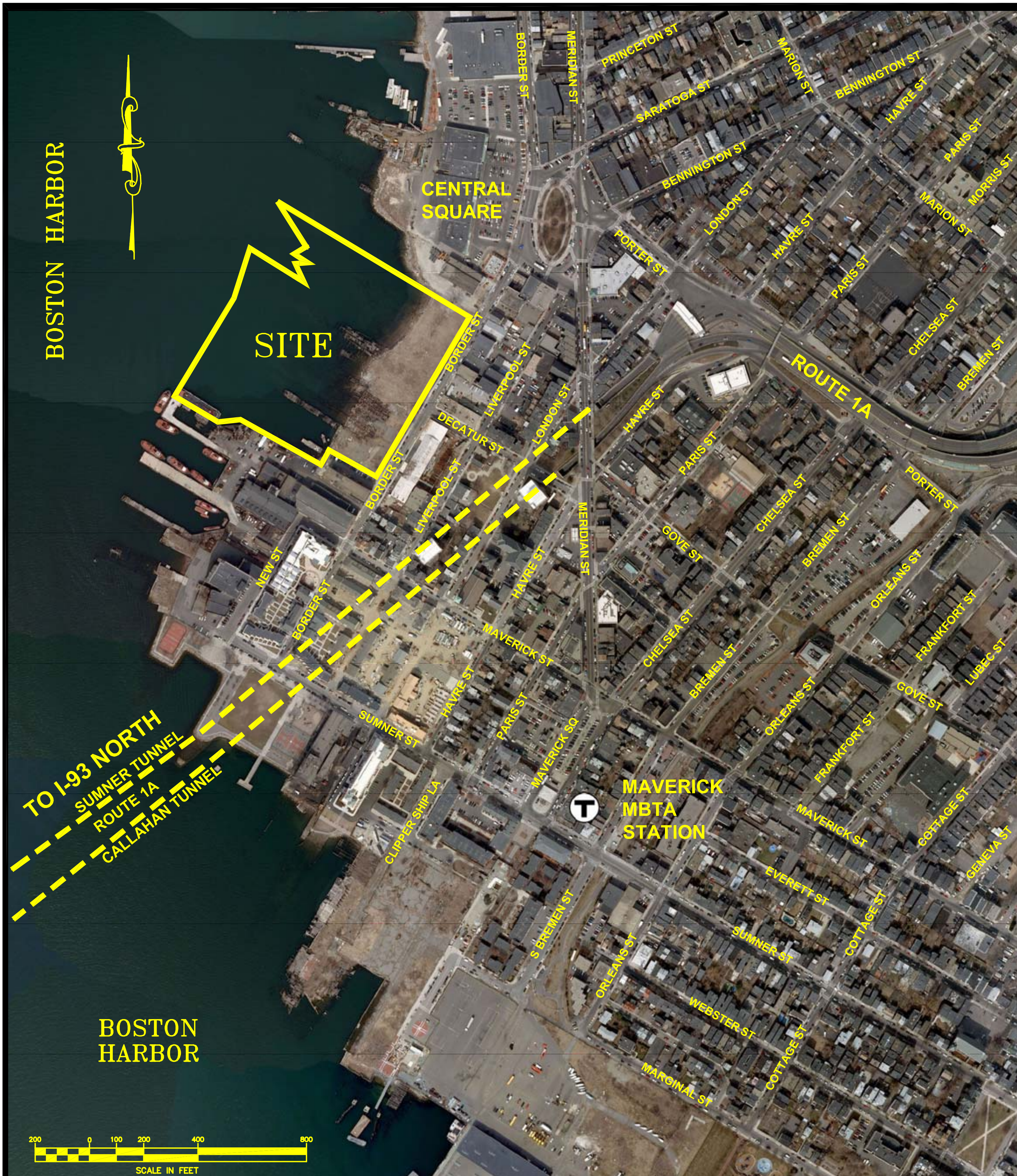


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FIGURE 4–1

PROJECT SITE & EXISTING ROADWAY SYSTEM
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

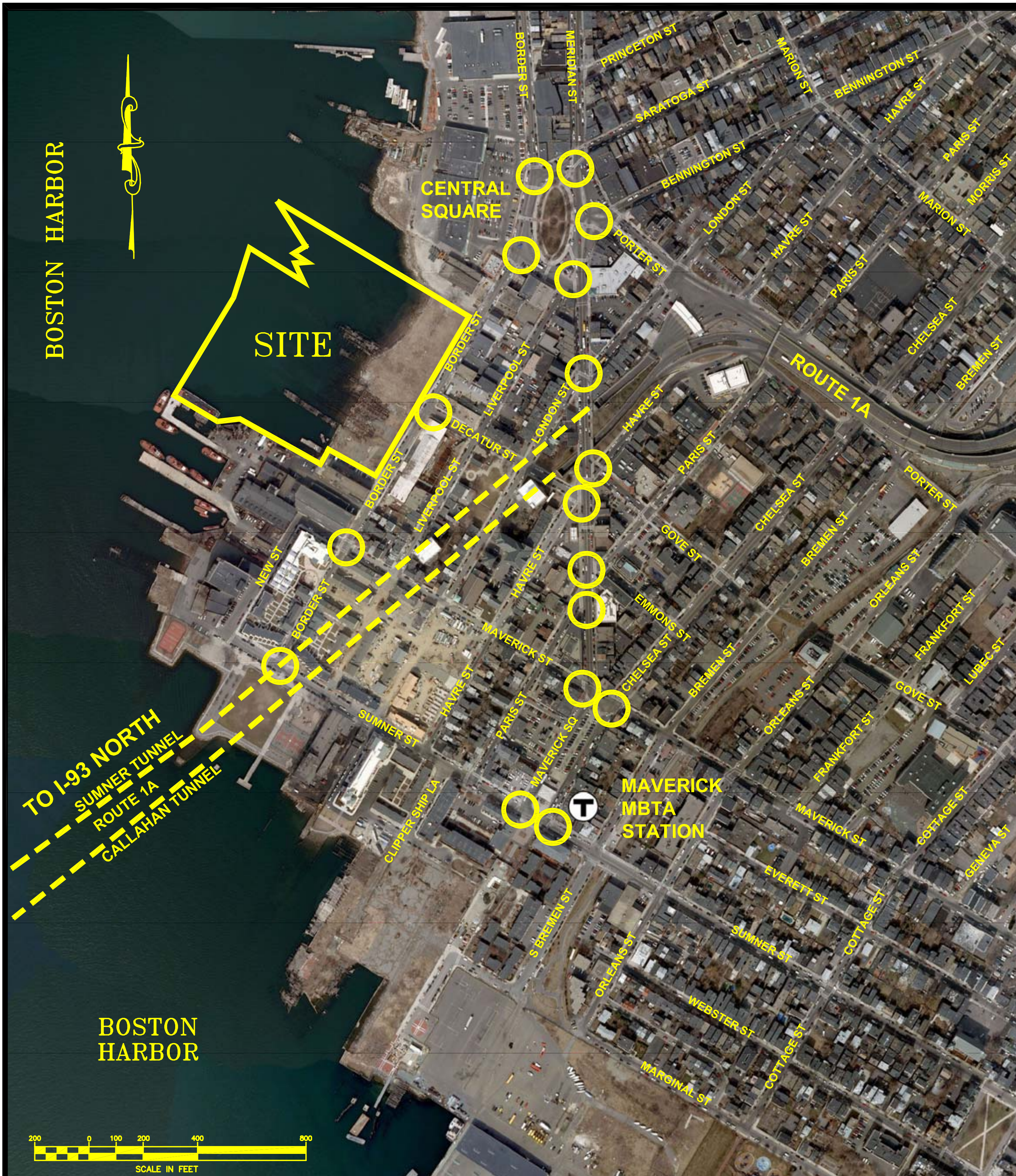

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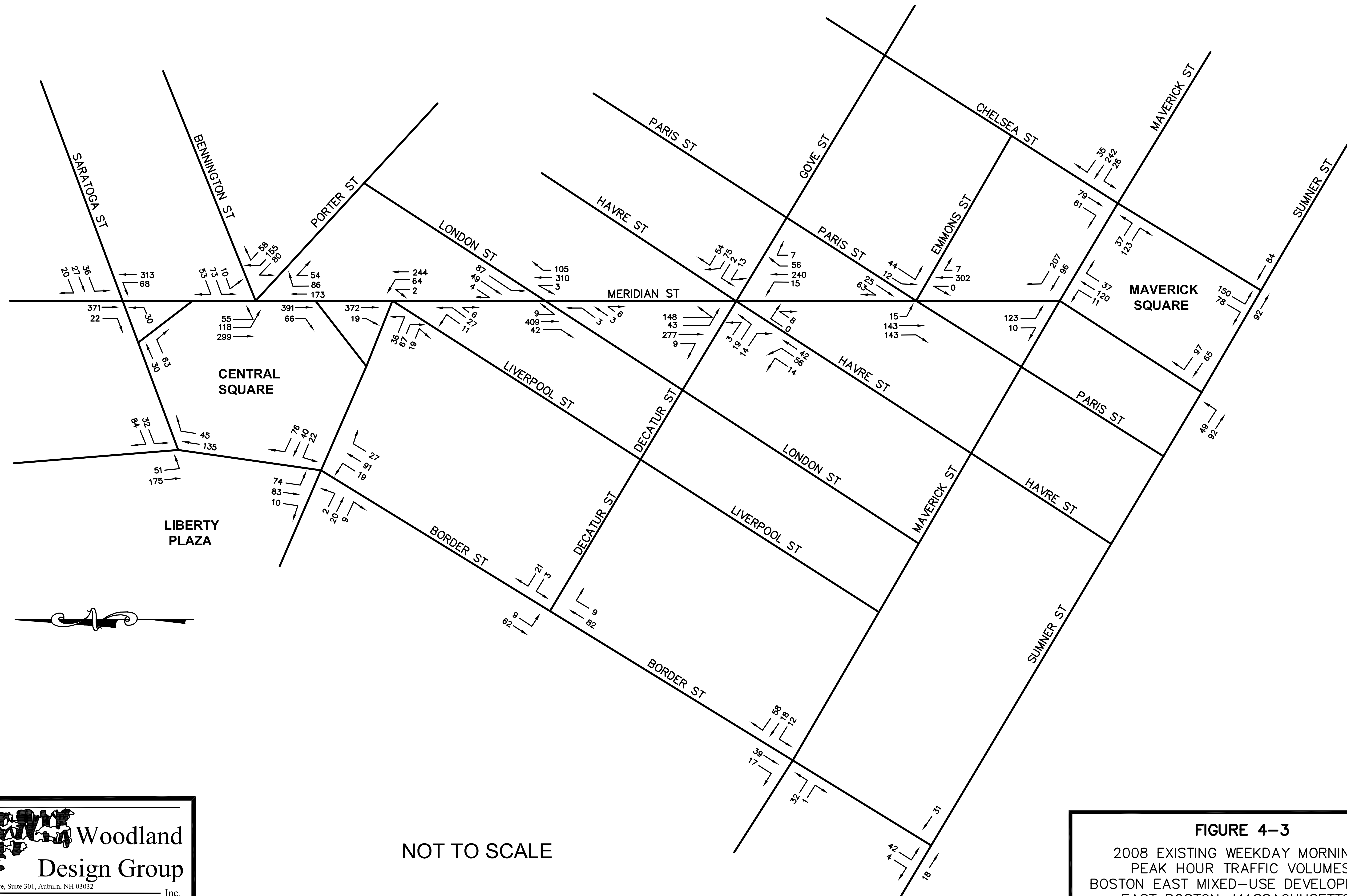
FIGURE 4–2

STUDY AREA INTERSECTIONS
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS



NOT TO SCALE

FIGURE 4–3

2008 EXISTING WEEKDAY MORNING
PEAK HOUR TRAFFIC VOLUMES
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

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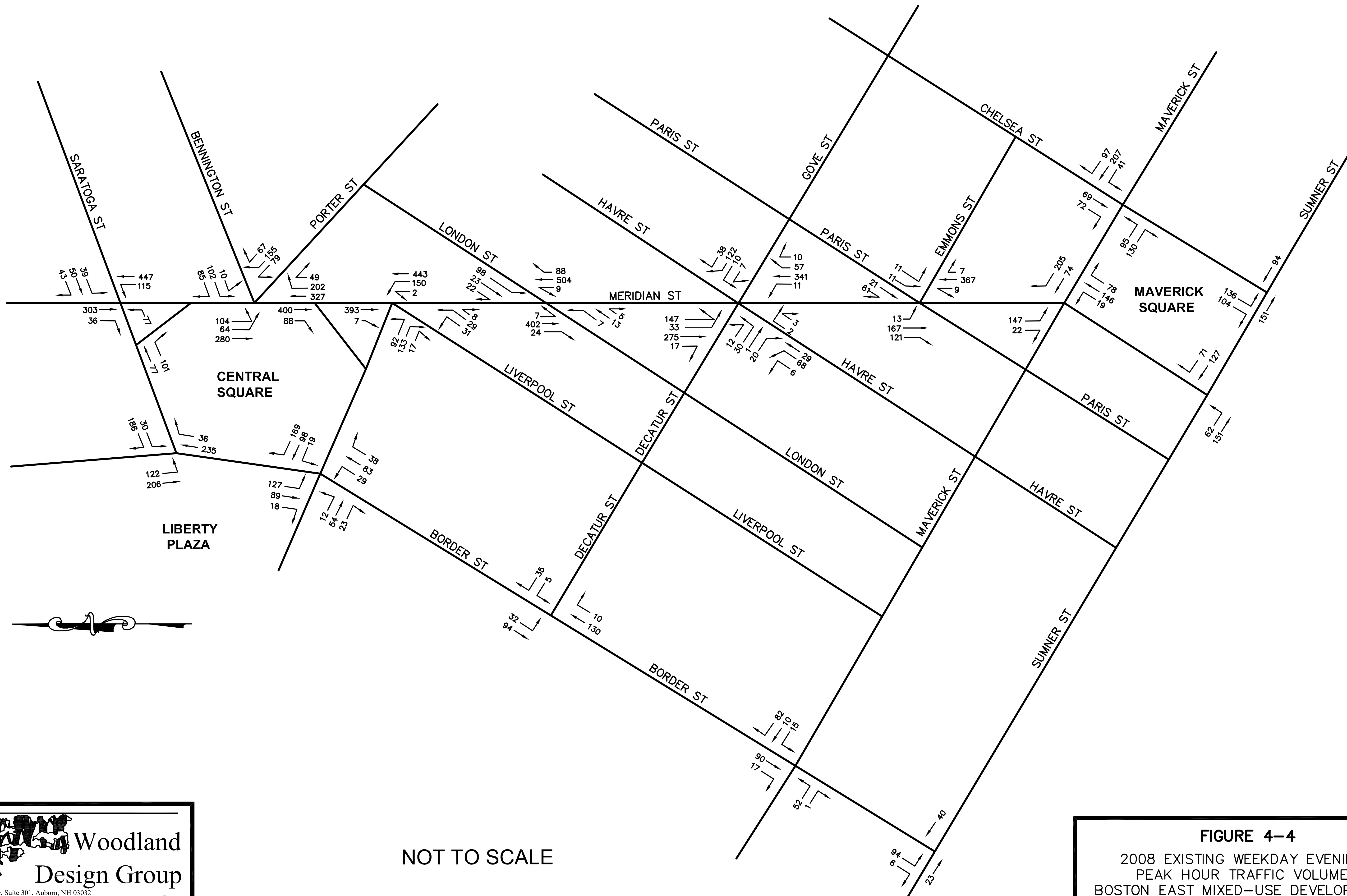

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FIGURE 4–4

2008 EXISTING WEEKDAY EVENING
PEAK HOUR TRAFFIC VOLUMES
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

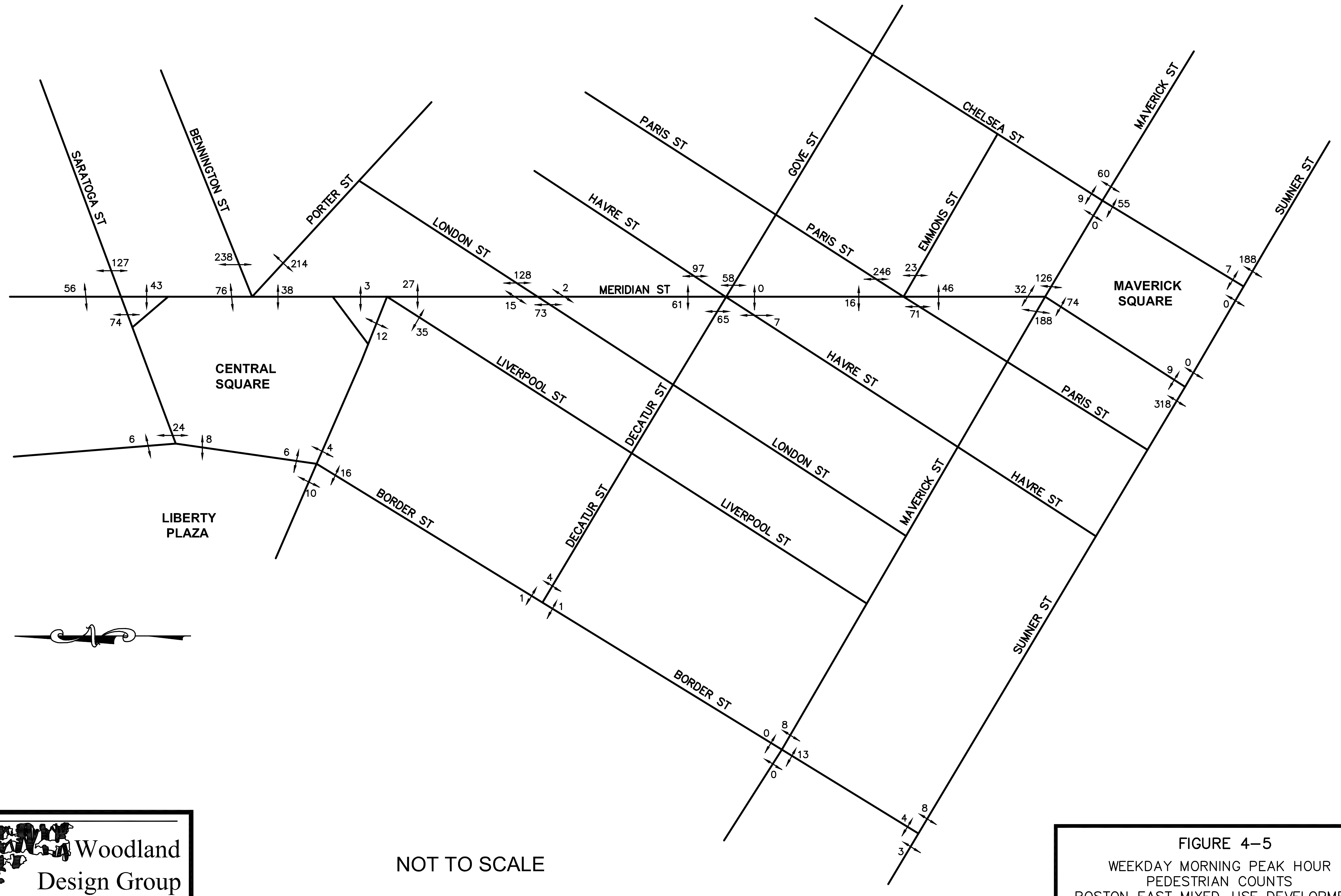

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FIGURE 4–5
WEEKDAY MORNING PEAK HOUR PEDESTRIAN COUNTS
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

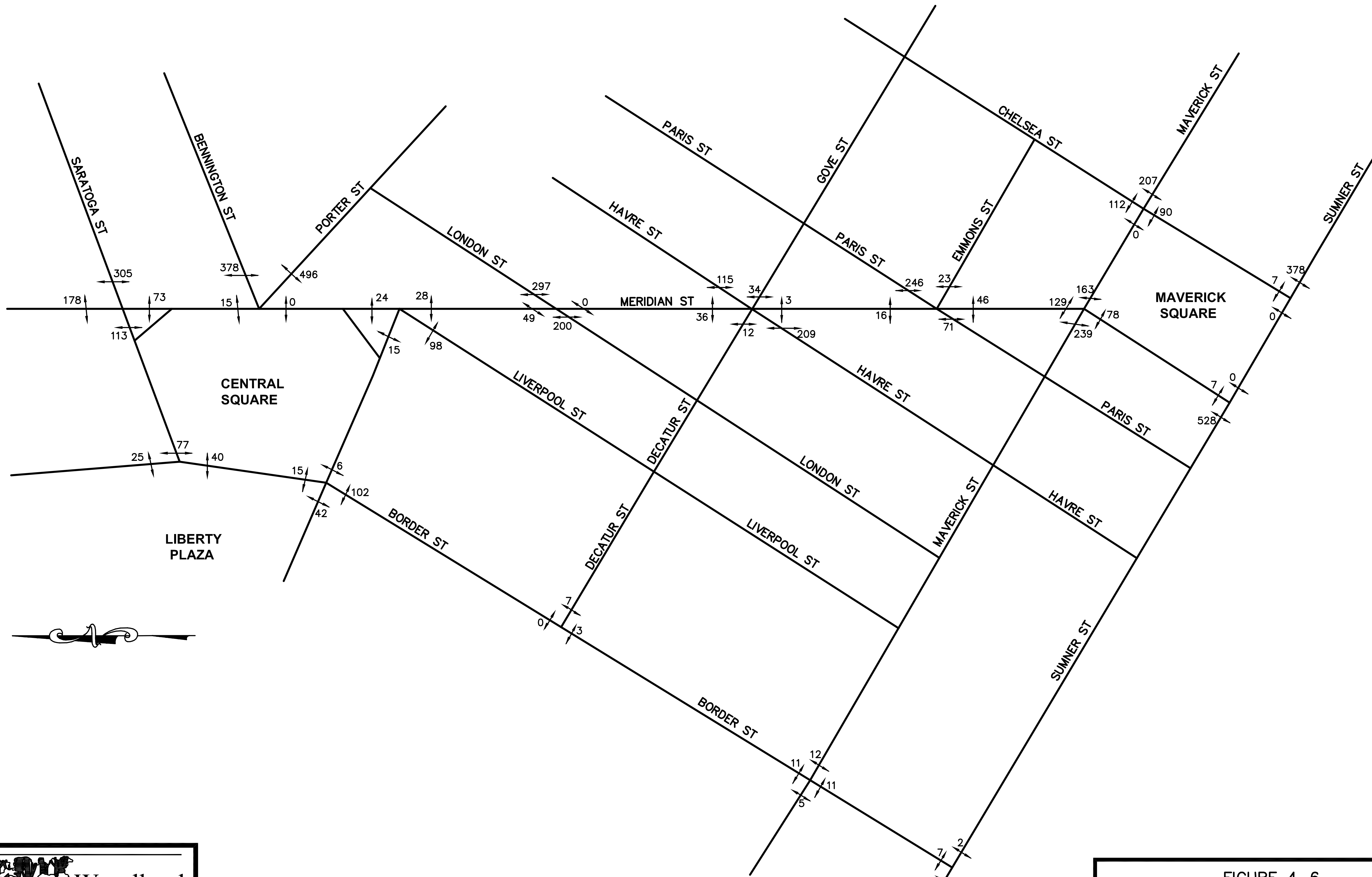

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FIGURE 4–6
WEEKDAY EVENING PEAK HOUR
PEDESTRIAN COUNTS
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

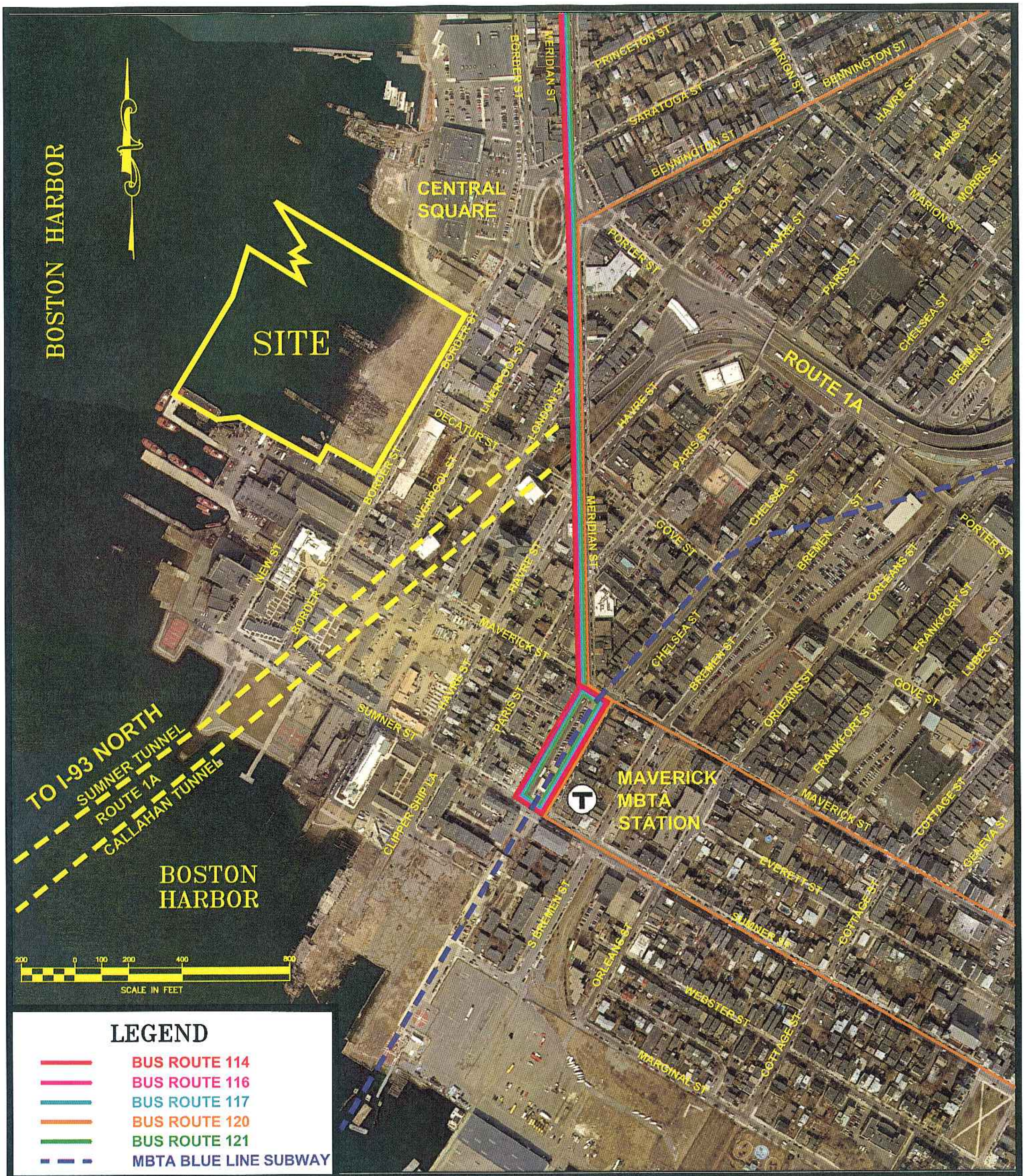

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FIGURE 4-7

PUBLIC TRANSPORTATION
BOSTON EAST MIXED-USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

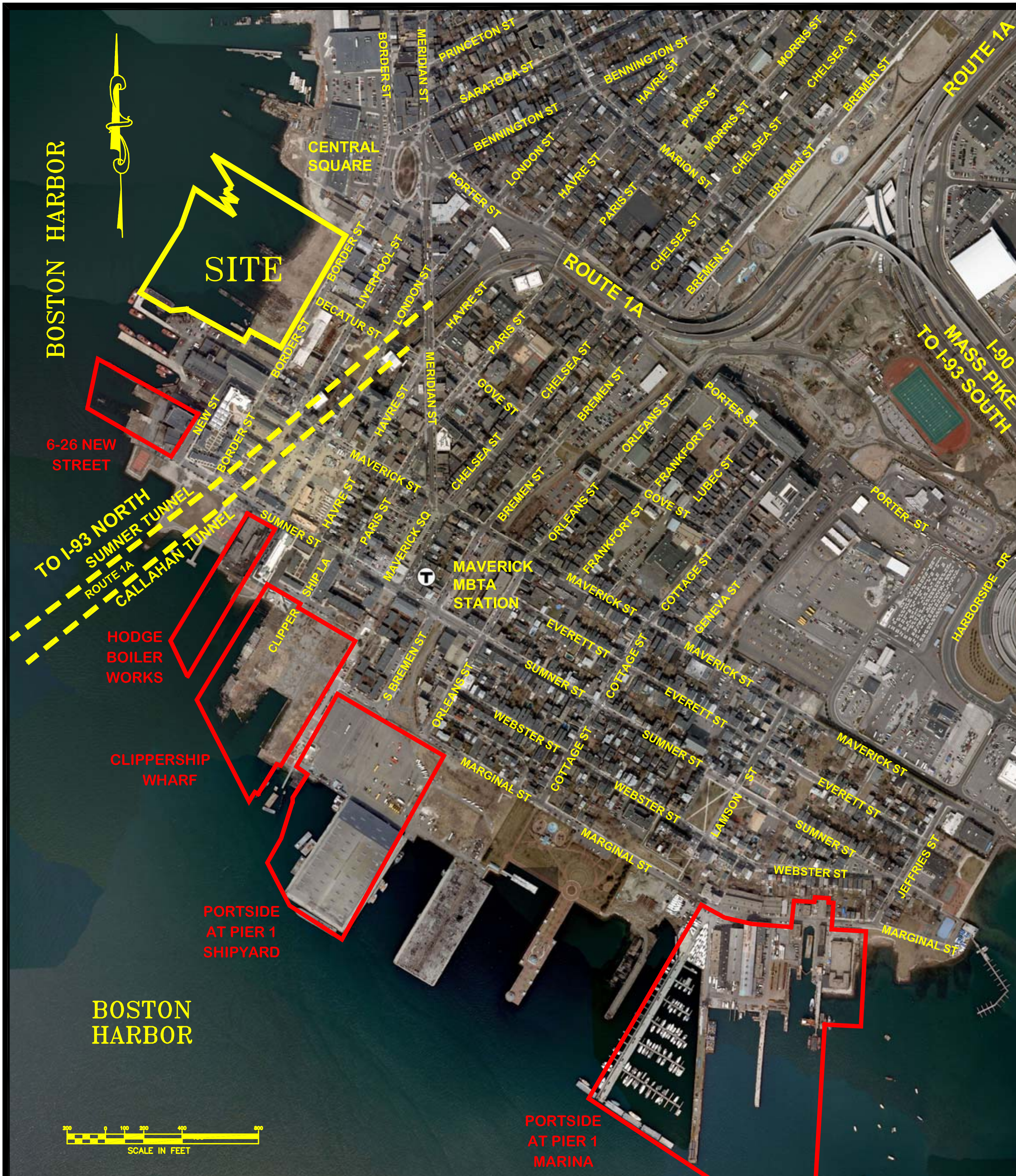

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FIGURE 4-8

EAST BOSTON AREA PROJECTS
BOSTON EAST MIXED-USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

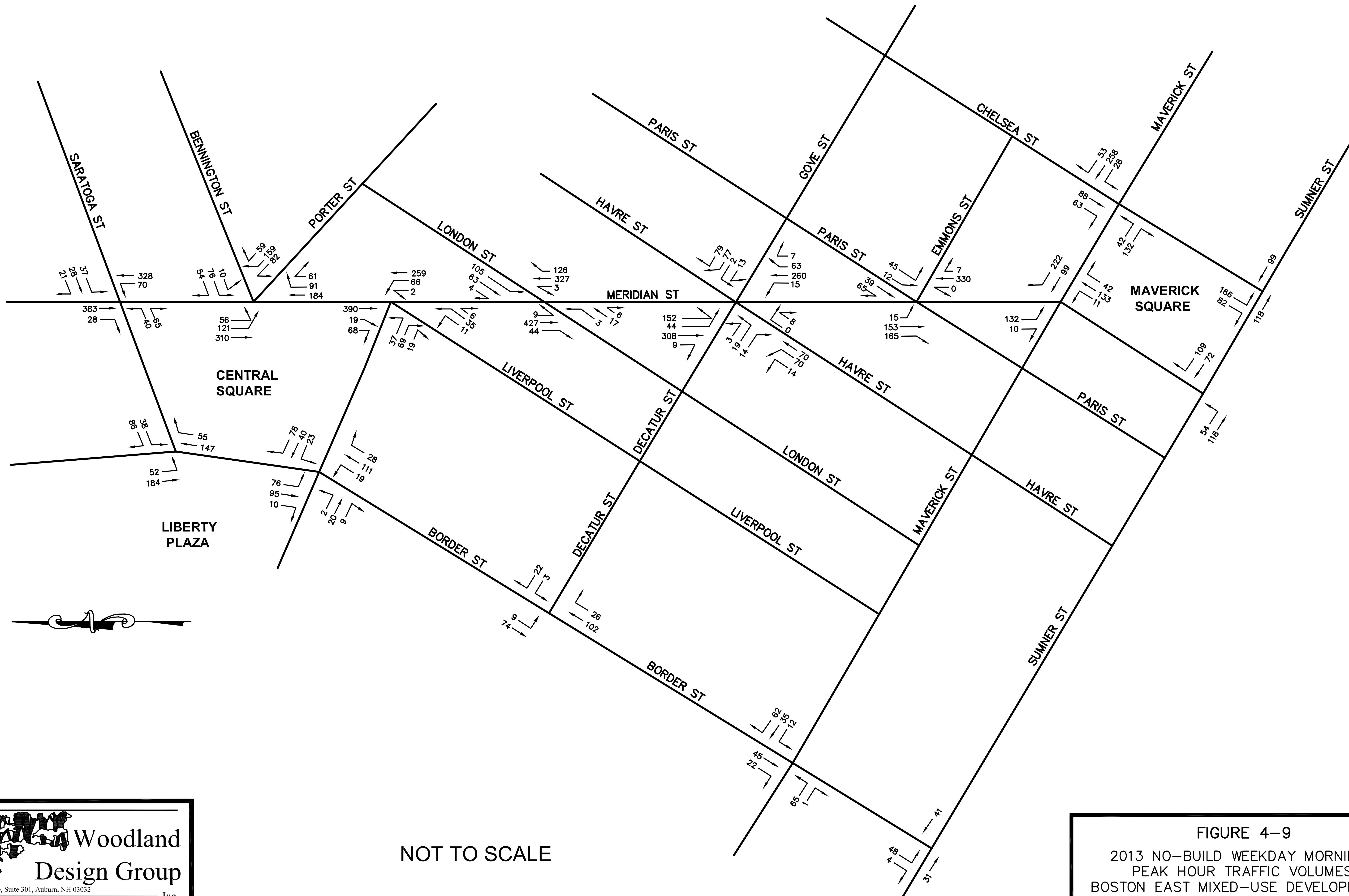

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FIGURE 4–9

2013 NO–BUILD WEEKDAY MORNING PEAK HOUR TRAFFIC VOLUMES
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

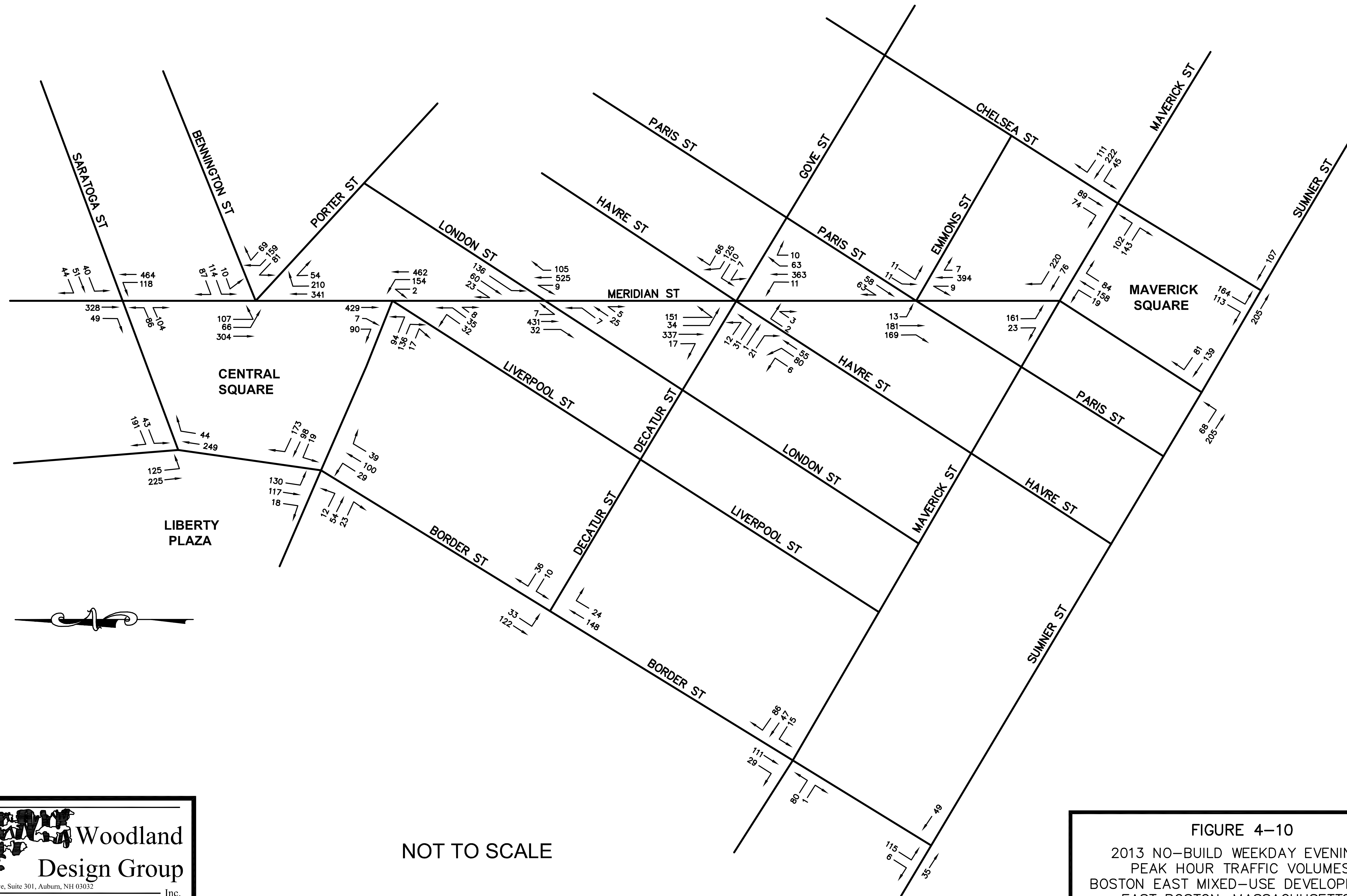

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FIGURE 4–10

2013 NO–BUILD WEEKDAY EVENING PEAK HOUR TRAFFIC VOLUMES
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

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FIGURE 4–11
RESIDENTIAL PROJECT TRIP DISTRIBUTION
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

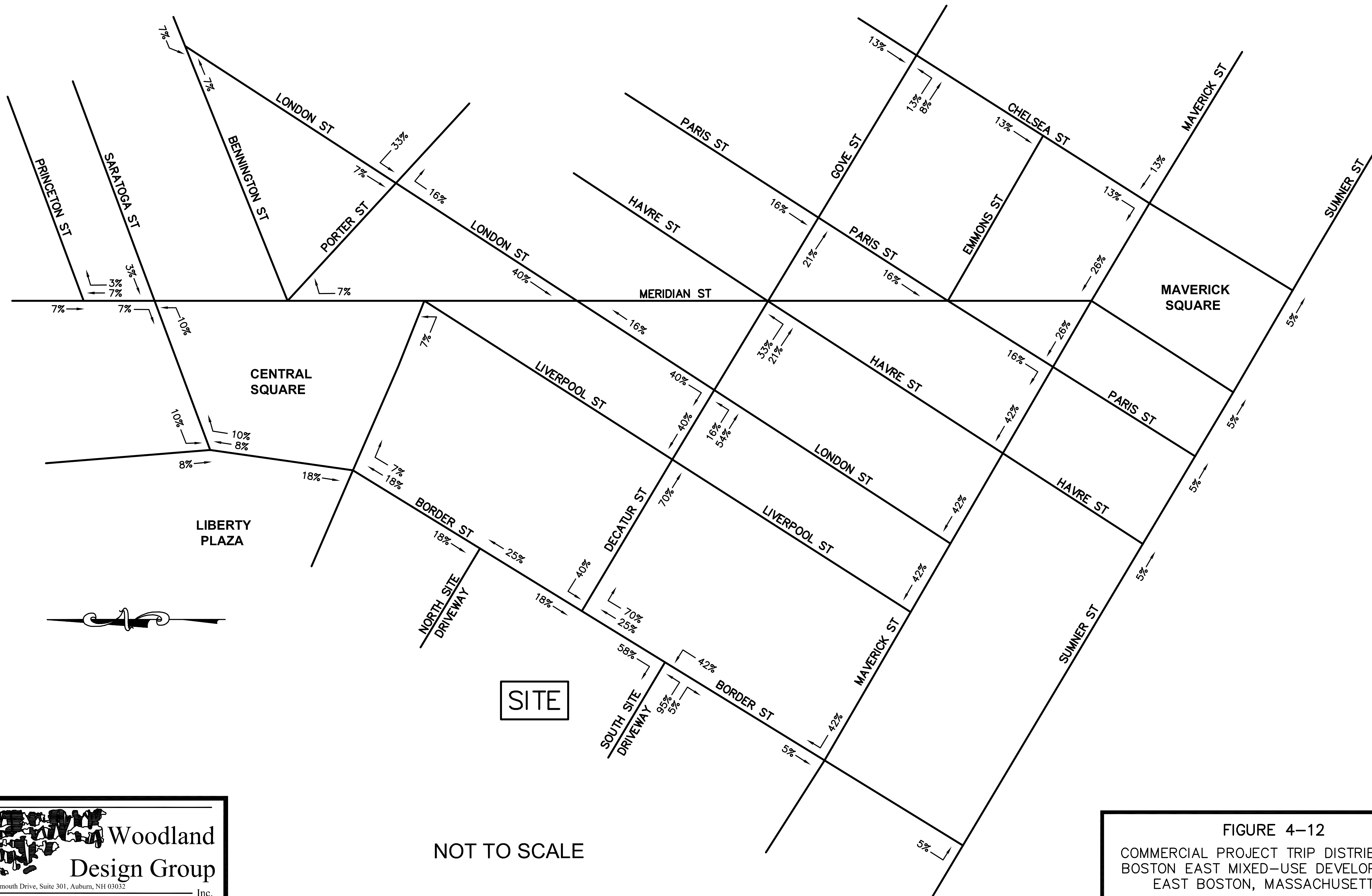

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FIGURE 4–12

COMMERCIAL PROJECT TRIP DISTRIBUTION
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

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FIGURE 4–13
WEEKDAY MORNING PEAK HOUR PROJECT TRIPS
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

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FIGURE 4-14
WEEKDAY EVENING PEAK HOUR
PROJECT TRIPS
BOSTON EAST MIXED-USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

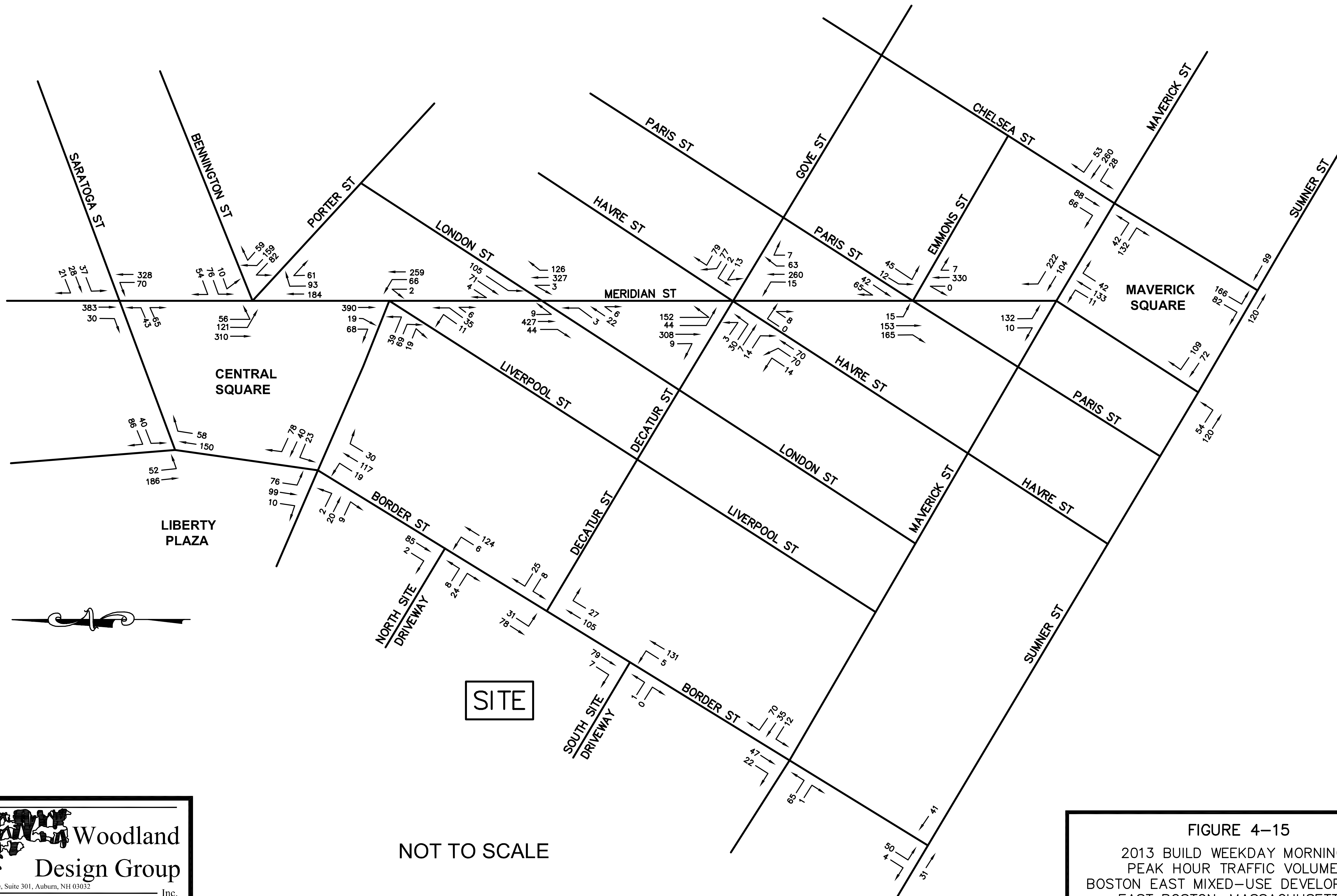

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FIGURE 4–15
2013 BUILD WEEKDAY MORNING
PEAK HOUR TRAFFIC VOLUMES
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

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FIGURE 4–16
2013 BUILD WEEKDAY EVENING
PEAK HOUR TRAFFIC VOLUMES
BOSTON EAST MIXED–USE DEVELOPMENT
EAST BOSTON, MASSACHUSETTS

Chapter 5

ENVIRONMENTAL

5.0 ENVIRONMENTAL

This Chapter evaluates the environmental impacts of the Boston East project. Project impacts on tidelands are discussed separately in Chapter 3.0.

5.1 WIND

A qualitative analysis of the potential wind impacts of the proposed project was undertaken at the pedestrian level using the Pedestrian Level Wind (PLW) comfort criteria developed by the Boston Redevelopment Authority (BRA). The objective of the study was to assess the effect of the proposed development on local wind conditions on public and other areas of pedestrian uses. Areas of concern include building entrances, the proposed Harborwalk, the immediate watersheet, existing and proposed sidewalks and walkways within and adjacent to the proposed project, and Border and Decatur streets. The detailed analysis is presented in Appendix 7.

The study used established wind data to predict wind directions and wind speeds at the project site for each of the four seasons of the year. For this assessment, it has been assumed that there is no landscaping for existing conditions and none associated with the new buildings.

Results for the wind study were obtained for two conditions as follows and as shown on Figure 5-1, No Build Conditions including Building Heights and PLW Location Numbers and Figure 5-2, Build Conditions including Building Heights and PLW Location Numbers.

None of the 46 locations considered for either existing or build conditions, including those adjacent to the project site and along Border Street, is estimated to have PLWs that exceed the Boston Redevelopment Authority (BRA) guideline wind speed of 31 mph one percent of the time. In fact, no location is predicted to have PLWs higher than Category 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered. See Figure 5-3, Annual PLW Categories for No Build Conditions and Figure 5-4, Annual PLW Categories for Build Conditions.

5.2 SHADOW

The objective of the shadow study is to describe the net impact of the shadows cast by the new building as compared to the existing shadow patterns. The areas of greatest interest are the Harborwalk, nearby sidewalks, and open spaces. This report discusses the findings of the shadow analyses for the proposed Boston East project. Since the site is vacant, no studies were conducted for existing conditions.

5.2.1 METHODOLOGY

The shadow patterns illustrated in this report were generated with the aid of a computer graphics program that utilized a 3-dimensional model of the project and existing surroundings. The model was prepared by ICON architecture. The model simulated the geographic characteristics and solar angles for Boston, Massachusetts. Table 5-1 identifies the dates and times for which the shadow conditions were simulated. The dates correspond to the vernal equinox, summer solstice, autumnal equinox, and winter solstice. The times listed are either Eastern Standard Time (EST) or Eastern Daylight Saving Time (EDT), whichever is in effect for the respective dates.

Table 5-1: Dates and Times Studied

DATE	TIME
March 21st (EST)	9:00 a.m., 12:00 noon, 3:00 p.m.
June 21st (EDT)	9:00 a.m., 12:00 noon, 3:00 p.m., 6:00 p.m.
September 21st (EDT)	9:00 a.m., 12:00 noon, 3:00 p.m., 6:00 p.m.
December 21st (EST)	9:00 a.m., 12:00 noon, 3:00 p.m.

The simulations conducted for this study assume bright sunlight from sunrise to sunset, in order to properly identify shadow patterns created by the new structure. Landscaping is not considered on the test configurations; and therefore, the shadow patterns identified are those only created by the various building masses.

The resultant computer generated renderings included as Figures 5-5 through 5-18 exhibit the simulated shadow conditions anticipated to occur on and around the study site. The darker shadows visible in the renderings indicate the shadows cast by the existing buildings. The lighter shadow in blue indicates the additional shadow cast by the proposed residential building on the development site of the proposed Boston East project.

5.2.2 RESULTS

The renderings in Figures 5-5 through 5-18 visually identify the shadows anticipated to occur on the study site for the dates and times indicated. The following discussion references these renderings and provides a detailed description of the existing and proposed shadow patterns.

VERNAL EQUINOX - MARCH 21 (FIGURES 5-5 THROUGH 5-7)

At 9:00 a.m., the morning sun projects shadows in an easterly direction. With the proposed Boston East building in place, a small portion of this shadow extends into the watersheet and waterfront of the project site.

At 12:00 noon, the shadows are cast are in a northerly direction. Shadows from the proposed Boston East building cover some of the Harborwalk and open space area.

At 3:00 p.m., the shadows generated fall towards the northeast and cover a small portion of Border Street. Almost all the shadow is off the Harborwalk at this time.

SUMMER SOLSTICE - JUNE 21 (FIGURES 5-8 THROUGH 5-11)

On June 21 at 9:00 am, shadow from the Boston East development will extend in a easterly direction into the watersheet and cover some of the open space areas.

At 12:00 noon, the shadows cast by the proposed building will be minimal on the open space areas including the Harborwalk.

By 3:00 p.m., the shadow has moved towards the northeast and covers a portion of Border Street.

At 6:00 p.m., there is very little shadow on the site, and it extends across Border Street.

AUTUMNAL EQUINOX - SEPTEMBER 21 (FIGURES 5-12 THROUGH 5-15)

The shadow conditions during the autumnal equinox will be similar to those described for the vernal equinox, except for the difference caused by the use of daylight saving time. At 9:00 a.m., shadows are cast to the east into the watersheet and within the property.

At 12:00 noon, shadows fall to the northwest of the site, partly on the Harborwalk and open space areas.

At 3:00 p.m., the shadows fall to the northeast of the site onto a portion of Border Street and some of the site's open space areas.

By 6:00 p.m., the shadows are cast longer in a north easterly direction and cover Border Street and some of the neighbouring properties across the street.

WINTER SOLSTICE - DECEMBER 21 (FIGURES 5-16 THROUGH 5-18)

The longest shadows of the year will occur during the winter solstice. At 9:00 a.m., the shadow from the proposed building extends farther to the northwest and onto the watersheet. The odd shape to the west of the proposed building is a result of existing shadows from the buildings on the east side of Border Street and from the archway opening within the proposed building.

At 12:00 noon, the shadows are to the northwest and cover the most of the Harborwalk and open space areas.

At 3:00 p.m., the shadows are cast to the northeast. The shadow is cast on the neighbouring property to the north and along a portion of the Harborwalk.

5.2.3 CONCLUSIONS

A shadow study has been conducted on the proposed Boston East development. Using a 3-D computer model and sun position information for Boston, color renderings of the shadow patterns were created to compare the shadow impacts for the proposed building within the site and on the adjacent existing properties.

- The largest shadows occur during the winter solstice (December 21), and the shortest shadows occur during the summer solstice (June 21).
- In general, shadows cast by the proposed development are generally only on the site between 9 am and 3 pm throughout the year.

5.3 DAYLIGHT

This section provides the methodology and results of analyzing the percentage of daylight obstruction from the proposed project. The amount of daylight reaching the streets and the sidewalks after development of the Project will be slightly more than would otherwise be the case compared to the as-of-right conditions.

5.3.1 METHODOLOGY

The daylight analysis was performed utilizing the Boston Redevelopment Authority Daylighting Analysis (BRADA) computer program.[1] Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent city streets centered on the proposed building. The façade of the building facing the viewpoint, including heights, setbacks, corners and other features, is plotted onto a base map using lateral and elevation dimensions. The two-dimensional base graphic generated by BRADA represents a figure of the building in the "sky dome" from the viewpoint chosen. The BRADA program calculates the percentage of daylight that will be obstructed on a scale of 0 percent to 100 percent. BRADA calculates this obstruction value based on the width of view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building. The lower the number, the lower the percentage of obstruction of daylight from any given viewpoint.

1 Method developed by Harvey Bryan and Susan Stuebing, computer program developed by Ronald Fergle, Massachusetts Institute of Technology, Cambridge, MA, September 1985.

The BRA's Scoping Determination on the PNF requested that the daylight analysis study two conditions, the no-build and the build conditions, and also to treat the existing conditions, area context and as-of-right conditions as control for the data comparison. Since the property is currently vacant, the daylight analysis compared the as-of-right condition with the proposed condition.

The potential daylight impacts of the proposed building were analyzed from the main public way, Border Street, for both conditions. This analysis does not analyze the small, 2-story marine facility that is proposed for the south side of project in the Designated Port Area.

5.3.2 RESULTS

The results of the daylight analysis are also presented in Table 5-2 below. The graphic results of the As-of-Right and the Build conditions are shown in Figure 5-19, Daylight Impact Analysis.

Table 5-2: Daylight Analysis Results (percentage obstructed)

Viewpoint	As-of-Right Condition	Build Condition
Border Street	72.4%	75.3%*

The As-of-Right conditions per the Waterfront Commercial sub-district allows for a 55-foot high building along the entire length of the property with no front or side yard setbacks. For the proposed residential building, a simple building design was used due to the limitations of the BRADA program, which could not incorporate the large archway within the building and the stepped building design along Border Street. The proposed building was set at 85 in height, set six feet back from the property line abutting Border Street, and did not include the archway. If the archway and additional stepped design elements were included, more daylight would have been allowed and the percentage obstruction would have been substantially lower.

5.3.3 CONCLUSIONS

From the viewpoint on Border Street, the development of the Project will result in maximum daylight obstruction of 75.3 percent versus 72.4 percent for the As-of-Right condition. Should have the BRADA program incorporated the archway and stepped building elements, the percentage obstruction or the proposed project would have been lower. Furthermore, the daylight obstruction of 75.3 percent is comparable to other recently approved projects in the area including Hodge Boiler Works (66.0%) and Carlton's Wharf (84.9%).

5.4 SOLAR GLARE

A solar glare analysis is intended to measure potential reflective glare from the buildings onto potentially affected streets, and public open spaces and sidewalk areas in order to determine the likelihood of visual impairment or discomfort due to reflective spot glare. As a result of the design and use of generally non-reflective materials, it is not anticipated that the project will have adverse solar glare impacts or create solar heat buildup in nearby buildings. Reflective glass will not be used in order to reduce potential impacts associated with solar glare.

5.5 AIR QUALITY

This section provides a qualitative review of air quality sources and impacts as a result of the proposed Boston East development at 102 - 148 Border Street in East Boston. These impacts are from the parking garage and from traffic sources. Impacts from construction operations are discussed in Section 5.13. Although the heating and mechanical ventilation systems have not yet been designed, they will be designed so there will not be any impacts to the pedestrian level air quality.

5.5.1 EXISTING AIR QUALITY

The site is currently vacant, and there are no site sources that would impact the air quality.

5.5.2 PARKING GARAGE

The design of the garage in the residential building involves one level of underground parking with direct access to Border Street. Since the parking garage is approximately a half-story underground, there will be open air vents located at various points around the building except along the Border Street sidewalk. No mechanical ventilation will be installed as there will be sufficient vents to dilute motor vehicle emissions to the air around the building. Over the long term, air quality impacts from the garage will decline as motor vehicle emission rates decrease due to more stringent emission control requirements for new vehicles.

Mitigation measures to reduce impacts from the garage include several design and program considerations:

- Locate walkways and public use areas away from vented areas,
- Provide plantings around the vents to diffuse emissions,
- Provide a parking space for a shared–use vehicle, and
- Install bicycle racks in the garage.

5.5.3 TRAFFIC

The Massachusetts Department of Environmental Protection (DEP) and the Boston Redevelopment Authority (BRA) typically require a future air quality CO analysis for any intersection where the level-of-service (LOS) is expected to deteriorate to D and the proposed project causes a 10% increase in traffic or where the LOS is E or F and the project contributes to a reduction in LOS. The peak hour traffic generated by the project will be 53 vehicles during the morning peak hour and 54 vehicles during the afternoon peak hour.

The traffic engineers, Woodland Design Group, Inc., performed a transportation study for the project area, which included 27 intersections. Each of these intersections was considered for a microscale CO air quality analysis. Table 5-3 shows a summary of the 2013 Build LOS analysis for each intersection. Based on intersection capacity analysis presented in this report, none of the study area intersections meet the DEP/BRA criteria for a microscale analysis. Consequently, a microscale air quality analysis was not performed for the project.

As shown in Table 5-3, none of the study area intersections warrant a microscale air quality analysis. The project generates only 54 vehicle trips during the busiest hour of the day, and will not have a significant impact on local air quality. See also section 4.3 regarding transportation and LOS related air quality assessment.

Considering that none of the intersections in the project area are congested enough to warrant a microscale air quality analysis and that the project generates only 54 vehicle trips during the peak hour, the project's traffic will not have a significant impact on local air quality. See also Section 4.3 regarding transportation and LOS related air quality assessment.

Table 5-3: Summary of 2013 Build Case LOS for Project Study Area Intersections

Intersection	Build LOS AM/PM	Requires Analysis?
Signalized		
Meridian St/Saratoga St/Central Square N	B/B	NO
Sumner Street/Maverick Square East	B/B	NO
Sumner Street/Maverick Square West	B/C	NO
Meridian Street/Porter Street	C/D	NO
Porter Street/Bennington Street	B/B	NO

Table 5-3: (continued)

Unsignalized		
Meridian St/Central Square South	D/F	NO
Liverpool St/Central Square South	B/B	NO
Border Street/Central Square North	B/D	NO
Border St/Central Square S/Liberty Plaza S Dr	A/B	NO
Border Street/Decatur Street	A/B	NO
Maverick Street/Border Street	B/B	NO
Sumner Street/Grady Court	A/A	NO
Meridian Street/London Street	F/F	NO
Meridian Street/Gove St	B/B	NO
Havre Street/Gove Street	C/C	NO
Meridian Street/Havre Street	D/E	NO
Havre Street/Decatur Street	B/B	NO
Meridian Street/Decatur Street	B/B	NO
Meridian Street/Emmons ST	B/B	NO
Paris Street/Emmons Street	A/A	NO
Meridian Street/Paris Street	C/C	NO
Meridian St/Maverick St/Maverick SQ West	D/F	NO
Meridian St/Chelsea St/Maverick SQ East	B/B	NO
Border St/ Proposed Residential Driveway	A/A	NO
Border S/Proposed Industrial Driveway	A/B	NO

Source: Woodland Design Group, Inc.

5.6 NOISE

The proponent does not anticipate a substantial increase in noise impacts associated with the residential and marine-related uses at the project site based on a qualitative analysis of the existing and potential noise sources.

5.6.1 NOISE REGULATIONS

The Boston Air Pollution Control Commission regulates noise in the City of Boston based on zoning and land use classification. The regulations establish a maximum sound level for a residential / industrial zone, such as the project area, of 65 dBA during the day and 55 dBA at night. These limits do not apply to construction noise or motor vehicle traffic. Noise levels are measured at the lot line. The City of Boston has also established noise limits that apply to nine, octave band center frequencies.

DEP regulations (310 CMR 7.10) require property owners of sound sources to ensure unnecessary noise is not emitted and to take necessary precautions to limit noise emissions. Appropriate measures must be taken to suppress industrial and commercial sources of sound and other man-made sources that cause noise.

The Department of Housing and Urban Development (HUD) has noise regulations for exterior levels, which are generally required for approving HUD-supported or assisted housing projects in high noise areas. Their standard exterior noise level requirement is 65 dBA or less. HUD's regulations do not include interior noise standards; rather a goal of 45 dBA is set forth, and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction, any building will provide sufficient attenuation so that if the exterior level is 65 dBA or less, the interior level will be 45 dBA or less.

5.6.2 EXISTING NOISE SOURCES

Since the site is currently vacant and not used for anything, there are no noise sources that could offer a comparison to future sound levels and impacts. However, there are existing noise sources from the active industrial properties that surround the site including the industrial facility on the north side, the steel fabrication site across Border Street, and the machinery and tugboat facilities on the south side.

5.6.3 POTENTIAL PROJECT NOISE SOURCES

The primary sources of external mechanical noise will include the make-up air units and the compressors in the residential building, which may also include emergency generators that would also contribute to external mechanical noise. It is not anticipated that the rooftop equipment will exceed maximum sound levels.

5.6.4 ANALYSIS OF NOISE

The anticipated noise sources from the project site are expected to be substantially less than the noise from the existing surrounding industrial operations. For example, tugboats operating at the Boston Towing and Transportation site at all hours may contribute to the ambient noise levels. Fabrication of steel components across Border Street may also contribute substantially to the ambient noise levels. However, the proposed mechanical equipment for the project site are not anticipated to significantly increase the noise levels in comparison with the adjacent uses, and therefore are not expected to violate the noise regulations for a residential/industrial area.

5.6.5 MITIGATION MEASURES

At this time, only visual screens are planned for the rooftop equipment, which will provide minimal noise mitigation. Since the rooftop equipment is not expected to exceed maximum sound levels, no noise mitigation is proposed. Furthermore, appropriate low-noise mechanical equipment and noise control measures will be selected as necessary during the design of the project for all sensitive locations to ensure compliance with the City of Boston Zoning District Noise Standards and DEP Noise Policy regulations.

5.7 GEOTECHNICAL AND FOUNDATION

Based upon review of historical boring information from our files and local foundation and construction experience in East Boston, it is anticipated that the existing ground surface is underlain by a thickness of miscellaneous fill material associated with historic site filling. Site ground surface elevations range from approximately El. 14.5 to 18.0 Boston City Base (BCB) datum. The fill material is anticipated to extend to depths ranging from approximately 8 to 16 feet below ground surface. The fill material likely contains ash and cinders, and the below grade remains of former structures, including wood piles. The fill is anticipated to be underlain by an organic deposit consisting of very soft organic silt and peat. The thickness of the organic deposit is estimated to range from 5 to 10 feet. Underlying the fill material and/or organic deposit, a natural sand deposit that extends to depths ranging from approximately 15 feet to 20 feet below ground surface is anticipated. Beneath the sand deposit, a marine clay deposit that may extend to a depth of 100 feet below ground surface overlying a dense glacial till deposit that is plastered on the bedrock surface is anticipated.

Based upon the anticipated subsurface conditions underlying the subject site, foundation support will be provided by a pile foundation system with the lowest level slab being structurally supported. Below-grade space will have waterproofed slabs and foundation walls. The perimeter foundation walls will be designed to resist the design groundwater levels. The lowest level floor will be designed with an underslab drainage system.

Construction of one level of underground parking will require excavation to approximately 15 feet below grade. A temporary excavation support system is likely to be required around the perimeter of the proposed below-grade level of the residential building to retain adjacent soils, control groundwater, and protect adjacent roadways and utilities. The earth support system will be installed into or through the marine clay to reduce seepage of groundwater and harbor water into the excavation and will allow foundation construction to proceed in the dry.

5.8 GROUNDWATER

A ground water analysis was conducted at the site in July 2007. Given that groundwater has been determined to be at a depth of approximately 7 to 17 feet below ground surface, dewatering will be required for foundation construction. It was also determined that groundwater flows to the east or northeast, away from the Harbor.

Potential adverse impacts of temporarily lowering groundwater levels on adjacent buildings and utilities will be mitigated by the use of a relatively watertight excavation support system. Dewatering effluent generated during temporary construction dewatering will be discharged in compliance with applicable regulations and discharge permits. Groundwater levels outside the excavation will be monitored and measures undertaken if impacts exceed contract requirements. Groundwater quality will also be monitored during construction as part of the discharge permit requirements. Construction of the proposed development is not expected to have adverse short or long-term impact on groundwater conditions.

The proponent will work with the Boston Groundwater Trust to identify a groundwater observation well at the site to be used as part of the groundwater monitoring network in East Boston. This will help assure that the project does not have negative impacts on the groundwater levels in this area.

5.9 FLOOD HAZARD DISTRICTS

The Boston East site is relatively flat and located on filled tideland. Its upland portions (above mean high water) range from approximately 5 feet (NGVD) to 12 feet. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the site areas (City of Boston, Community-Panel Number 250286 0005 D, November 2, 1990). According to this FIRM, approximately one-third of the land portion of the site is within Zone C. The remaining portion of the site is in Zone A2 (Elevation 10.0.), within the 100-year floodplain.

The flood zones were determined to be in a similar location using spot elevations from a site plan when compared to the flood zones shown on the FIRM panel. Most of the land within the site is not in the 100-year flood zone (see Figure 5-20, Flood Zones and Wetlands).

In response to agency's concerns about the below-grade parking and the potential hydrostatic forces, the project designers reviewed the flood impacts and the need for flood proofing and preventing water from entering the garage over land. The site will be graded to raise the site out of the flood zone. Fill will be used to raise the elevation of most of the site to approximately 12 feet NGVD and to approximately 8 feet NGVD near the waterfront. To help minimize flooding on the site in addition to the fill, a stone revetment and wall will replace the existing deteriorating shoreline along the residential portion of the site, and sheet pile wall will be installed along the DPA portion. The project will conform to all flood proofing requirements per the State Building Code, sixth edition.

5.10 WETLANDS RESOURCES

5.10.1 RESOURCE AREAS DELINEATION, FUNCTION, AND VALUES

Wetland resource on the Project site include Land Under the Ocean, Coastal Beach, Designated Port Area, Land Subject to Coastal Storm Flowage, Anadromous/Catadromous Fish Runs (see Figure 5-20, Flood Zones and Wetlands). No inland wetland resource areas are present at the project site. The boundaries of the resource areas identified by the wetland consultants have not yet been confirmed by the Boston Conservation Commission and are described below.

Land Under the Ocean (LUO) extends from the mean low water line seaward to the boundary of the municipality's jurisdiction and includes land under estuaries (310 CMR 10.25). Nearshore areas of LUO are likely to be significant to storm damage prevention, flood control, and protection of wildlife habitat and, where they are present, shellfish. Nearshore areas of LUO can help reduce storm damage and flooding by buffering wave energy through the formation of offshore bars or by supplying sediments to adjacent beaches.

LUO occurs at the project site below mean low water. Within LUO at the project site are several dilapidated piers and hundreds of old timber pilings.

To assess the function and value of the LUO resource area, and in particular the presence of submerged aquatic vegetation such as eelgrass, maps available through MassGIS were reviewed and on-site observations made. This analysis revealed no such vegetation in the LUO resource area within or adjacent to the project area. Furthermore, the LUO resource area is not known to contain any significant number of shellfish. Due to the absence of marine grasses, the LUO resource area is not significant to providing food for birds or other wildlife. However, many species of finfish, including winter flounder, are known to occur in Boston Harbor. No offshore bars are associated with the project site.

Anadromous/Catadromous Fish Run (Fish Run) means LUO that underlies an area within estuaries or coastal waters that is a spawning or feeding ground or passageway for anadromous or catadromous fish and is identified by the Division of Marine Fisheries or has been mapped in the Coastal Atlas of the Coastal Zone Management Program (310 CMR 9.35). Fish Runs may play an important role in the protection of marine fisheries.

The main channel of Boston Harbor is a fish run for the following species: rainbow smelt, American shad, river herring, and American eel. At the project site, the Fish Run includes all the land and waters that are in the LUO resource area, which runs seaward from mean low water to the property line. Within this area, there are hundreds of old wood piles, remnants of two marine railways, and portions of former piers.

Coastal Beach (CB) is unconsolidated sediment subject to wave, tidal and coastal storm action that forms the gently sloping shore of a body of salt water and includes tidal flats (310 CMR 10.27). Coastal Beaches extend from the mean low water line landward to the dune line, coastal bankline or the seaward edge of existing man-made structures, when these structures replace one of the above lines, whichever is closest to the ocean. Coastal Beaches may play an important role in storm damage prevention, flood control and the protection of marine fisheries similar to LUO. They may also be significant to the protection of Land Containing Shellfish when shellfish are present. Coastal Beaches may reduce wave energy and natural beaches provide sediment to LUO which serves as a buffer to storm waves.

At the Project site, the Coastal Beach consists primarily of non-native material of various grain sizes and various types of debris, including (but not limited to) bricks, glass, gravel, rocks, steel chain, and wooden docks, piles, and timbers. No intertidal mud or sand flats and vegetated areas exist at the site. Engineered structures, including a dumped-stone revetment and concrete and stone bulkheads, surround portions of the Coastal Beach, greatly reducing the beach's ability to perform natural functions. The coastal engineering structures adjacent to the Coastal Beach provide storm damage prevention and flood control functions. As a result of these factors, the Coastal Beach is not significant to storm damage prevention, flood control, or protection of wildlife habitat.

Land Subject to Coastal Storm Flowage (LSCSF) means land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater. This resource area is significant to flood control and storm damage prevention but has no function for protection of marine fisheries. LSCSF occurs throughout most of the Project area. There are no performance standards associated with this resource area.

Designated Port Areas (DPAs) are developed urban harbors designated by the state, where maritime industrial uses are protected and other uses are restricted (310 CMR 9.24). Landforms within DPAs have usually been greatly altered and coastal engineering structures typically provide protection to upland areas from storm damage and flooding (310 CMR 10.26). Within DPAs, LUO is the only resource area likely to provide significant protection to any interests of the Wetlands Protection Act including marine fisheries, storm damage prevention, and flood control. Work proposed in LUO in DPAs must minimize changes in water circulation and water quality to avoid adverse impacts to marine fisheries. Projects should also be designed to avoid changes in the land's ability to support adjacent coastal engineering structures, or coastal banks, if they exist.

On the Project site, the DPA boundary includes the southern portion of the site, just south of the residential building (see Figure 5-20). Within this area, there are hundreds of old wood piles, remnants of two marine railways, and portions of former docks.

Other Resource Areas and Functions
Because the project area consists solely of coastal wetland resources and is primarily non-vegetated and previously developed, the functions of the resources in terms of maintaining public and private water supplies and prevention of pollution are minimal. Wildlife habitat, other than fisheries and shellfish, is also minimal in the project area. According to the Massachusetts Natural Heritage Atlas, there are no areas of priority habitat or state protected species. There are no inland wetland resource areas found at the project site.

5.10.2 PROJECT IMPACTS

The project related impacts to wetland resource areas are associated with the installation of the DPA facilities, the replacement and extension of the existing revetment, installation of a new bulkhead and rip rap, pier and piling removal, and improvements to the stormwater system and the project design.

The Project has been designed to avoid impacts to resource areas to the greatest extent possible and minimize impacts in areas where impacts are unavoidable. For example, grading to minimize stormwater flows toward the Harbor, and collecting and treating all stormwater using Best Management Practices will reduce impacts.

Designated Port Area
Activities related to the proposed development in the DPA occurring in wetland resources areas include piers to support a new marine travel lift, repairs to an existing

bulkhead, and a new bulkhead. There will be two new 50-foot long piers on pilings that will extend from the bulkhead in front of the marine facility parking area. The piers will be constructed of approximately 24, 16-inch diameter piles. The installation of these piles will impact approximately 100 square feet (sf) of LUO, DPA, and Fish Runs. The pier surfaces will be located above LUO, DPA, and Fish Runs, and will have no direct impact to these resource areas. Although one potential indirect impact would be due to increased shading of approximately 600 sf from the two piers, approximately 2,400 sf of existing pier deck will be removed from the LUO and Fish Run resource areas as part of the project. Furthermore, this area does not contain any eelgrass and is not known to be significant to shellfish. Therefore, any shading impacts would be insignificant. These activities are not expected to create significant adverse impacts to LUO, Fish Run, and CB.

Bulkhead and Rip Rap Construction

The shoreline associated with the project site currently consists of coastal engineering structures, debris, and filled material.

A new steel bulkhead will be installed along the south portion of the site in the DPA. This bulkhead will be approximately 420 linear feet and will run along the waterfront on the waterside of the proposed marine facility building, former marine railways, and the open space area. Most of it will be constructed landward of the mean high water to minimize impacts to the resource areas. Approximately 420 sf of CB will be impacted by this bulkhead.

A new stone rip rap of approximately 350 linear feet is proposed along the northern portion of the shoreline along the proposed Harborwalk to replace the existing shoreline structure at its present location. The rip rap will help stabilize and match the existing grade of the shoreline. It will allow the proposed Harborwalk to be built just landward of the existing mean high water. The structure, however, will provide hard substrate and habitat for intertidal organisms.

Pile Removal and Pier Demolition

The existing dilapidated piers and timber piles will be demolished and removed, and the piles will be cut at the mud line to clean up the site. All demolition material will be taken off-site for disposal in accordance with state regulations. The piers will be dismantled using a barge-mounted crane to the extent possible.

Approximately 4,034 sf of pier and 784 sf of piles will be removed from CB and LUO resources area. The pier removal will significantly reduce shading to the waters below by the same amount of square feet. The removal of piles and piers will help restore the LUO and CB. While temporary impacts to water quality may result from such activities, no permanent significant adverse impacts on resource areas are expected. The removal of the structures will enhance the function and value of the CB resource area.

The Project will also leave in place the remnants of one of the existing historic marine railways located partially in the LUO and in the CB. Approximately 11,200 sf of this CB will be cleaned of debris so that tidal flushing can occur and improve the wetland habitat.

Grading on Site
Approximately 17,500 sf of the CB and 50,900 sf of LSCSF will be impacted by the filling the property to grade for the whole site.

New Stormwater Outlet
A 60-inch Boston Water and Sewer Commission (BWSC) combined sewer overflow pipe that cuts across the middle of the site and outlets into the Harbor will be replaced. The BWSC is in the process of separating the combined sewage system in the area and constructing a separate stormwater system within Border Street. The existing combined sewage overflow will be abandoned and a new 60-inch stormwater outlet to the Harbor will be constructed. On-site stormwater drainage will be connected to this outlet. This CSO separation will also substantially reduce impacts to the Harbor.

Construction Period Impacts
During construction, erosion control/sedimentation measures, such as the placement of hay bales, if necessary, will be undertaken to minimize temporary impacts to water quality. In-water work will be carried out during the time of year that will not interfere with winter flounder spawning, as designated by the Division of Marine Fisheries. This is also typically a time of low biological activity, and will further minimize the potential impacts of turbidity from in-water activities on biological resources.

5.10.3 CONFORMANCE WITH PERMFORMANCE STANDARDS AND MITIGATION MEASURES

The project activities will be undertaken in a manner to ensure compliance with the performance standards for each wetland resource area, as required in 310 CMR 10.00. The proposed project activities comply with the performance standards contained in the state wetland regulations at 310 CMR 10.25, LUO; 310 CMR 10.26, DPA; 310 CMR 10.27, CB; and 310 CMR 10.35, Fish Run. The regulations do not contain performance standards for Land Subject to Coastal Storm Flowage (LSCSF).

Land Under Ocean (310 CMR 10.25)
The proposed activities in the LUO will not result in increased flooding or erosion cause by an increase in the height or velocity of waves impacting the shore. Sediment transport processes that would increase flood or erosion hazards by affecting the natural replenishment of beaches will not be significantly impacted.

The portions of the project creating impacts to resource areas are water-dependent and have been designed to minimize and/or avoid adverse impacts on marine fisheries habitat and wildlife habitat caused by changes in water quality. Only temporary impacts to water quality will occur during the construction period.

Anadromous/Catadromous Fish Run (310 CMR 10.35)
The Fish Run resource area is the same area as LUO. Improvements to this resources area will be through the reduction of impediments and obstructions to spawning or migrating fish. Temporary impacts to the Fish Run will be minimized through the uses of siltation booms and time-of-year restrictions.

Designated Port Area (310 CMR 10.26)
All activities with the DPA will minimize adverse effects on marine fisheries by removing most of the dilapidated piers and piles and improving water circulation and water quality. Any temporary impacts to the water quality will be minimized through the use of siltation booms and time-of-year restrictions where applicable. Also, the land's ability to support existing coastal engineering structures and coastal banks will not be affected.

Coastal Beach (310 CMR 10.27)
At the project site, the CB consists primarily of non-native material of various grain sizes, wood timbers and piles, and debris. No intertidal mud or sand flats exist at the site. This coastal beach is not significant to providing sediment to LUO. Man-made structures surround the created CB, greatly reducing the beach's ability to perform its natural functions. Coastal engineering structures adjacent to the CB provide storm damage prevention and flood control functions. Because of these factors, the CB within the project site is not significant to storm damage prevention, flood control, or protection of wildlife habitat. Furthermore, as part of the site clean up, approximately 1,000 dilapidated timber piles and associated piers will be removed, and this action will improve the water quality and reduce debris falling into the water.

5.10.4 WETLANDS ALTERNATIVES ANALYSIS

In accordance with the Secretary's Certificate, the following paragraphs address the wetlands alternatives analysis.

Project Purposes
The Project purpose for activities in wetlands is to place water-dependent structures (piers on piles) in tidal waters to support a marine travel lift. The placement of revetment and rip rap along the shoreline is also required to stabilize the slope and to create access to the waterfront.

Project Alternatives
The water-based portions of the project were designed to minimize impacts to resource areas while also being economically practicable. The project was also designed to fit in with existing structures, particularly the stone wall along the south side of the site and the sloped revetment along the north side of the site. During the design phase of the project, only one alternative was considered, a no-build alternative.

No-Build Alternative
The no-build alternative would leave the waterside portion of the site in its existing condition. It would leave the existing shoreline in disrepair, in need of stabilization, and allowed for continued erosion and stormwater runoff directly into Boston Harbor. The installation of the proposed marine travel lift piers, which necessitate the reconstruction of the proximate sea wall, would not be considered. The lack of the piers would eliminate a key component of the water-dependent infrastructure in the Designated Port Area. The construction of the proposed revetment and rip rap in the remaining areas of the site would not be considered as well. The dilapidated marine structures including the piers and pilings would continue to degrade and obstruct navigable waters. The dilapidated pilings and piers would not be removed and the watersheet would not be cleaned.

5.11 SOLID AND HAZARDOUS WASTE

5.11.1 SITE HISTORY AND COMPLIANCE WITH MASSACHUSETTS CONTINGENCY PLAN

The site was used starting around 1888 for shipbuilding purposes by the East Boston Dry Dock Company. In 1888 the site was utilized as a boat building shop, locksmith, paint shop, carriage shop, tin shop, and bowling alley. In 1927 portions of the property were utilized by the Burton Furber Coal Co. and Federal Lumber Co. The majority of the subject site was vacant by 1950. Previous environmental assessments indicated records of underground storage tanks (USTs), the storage of up to 100,000 barrels of oil, and the storage of coal on the subject site.

A plan to conduct a program of soil and groundwater quality testing prior to construction to determine the options for reuse, recycling, disposal or treatment of contaminated soil is to be implemented. Groundwater testing will be conducted in support of obtaining temporary construction dewatering permits and to assess the need for on-site treatment to remove contaminants.

Conditions at the site will likely trigger regulatory notification under the Massachusetts Contingency Plan (MCP). Excavated soil will require characterization to assess its disposition for off-site reuse, disposal, treatment or recycling in accordance with DEP policy and the MCP. The construction contractor will be responsible for proper off-site removal of contaminated soil and disposal of solid waste and debris.

5.12 RODENT CONTROL

A rodent control program will be implemented prior to, during, and after construction. The construction contractor will file a rodent extermination certificate, along with the building permit application, with the City of Boston. Rodent inspection, monitoring, and treatment will be conducted before, during, and at the completion of all construction work for the proposed project in compliance with the City's requirements. Rodent extermination prior to the start-up of work may consist of treatment of areas throughout the project site, including the building interior. During the construction process, regular service visits will be made in order to maintain effective rodent control levels. Effective rodent control will also be managed through "build-out," in which a minimal number of potential rodent access points are eliminated as part of the building design.

5.13 CONSTRUCTION IMPACTS

A Construction Management Plan (CMP) will be prepared and submitted to the Boston Transportation Department (BTD) for review once final plans are developed and the construction schedule is fixed and prior to the issuance of a building permit. The proponent intends to follow the guidelines of the City of Boston and the Massachusetts DEP that direct the evaluation and mitigation of construction impacts. The CMP will include detailed information on demolition, removal, construction activities and schedule, specific construction mitigation measures, occupancy of the public right-of-way, and construction materials access and staging area plans to minimize impacts to the local community. Demolition and construction methodologies that ensure public safety and protect nearby residences will be employed.

5.13.1 PUBLIC SAFETY AND PEDESTRIAN ACCESS

Proper pre-planning with the city and neighborhood will be essential to the successful construction of the project. As the design of the Project progresses, the Proponent and its construction team will meet with BTD to discuss the specific locations of barricades, the need for lane closures, pedestrian walkways, and truck queuing areas. Construction methodologies, which ensure public safety and protect nearby residences, will be employed. Techniques such as barricades, walkways, and signage will be used, if necessary.

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

Periodic meetings will also be held with neighborhood groups to describe the ongoing works and to discuss measures that will be taken to minimize impacts on the community. The Project superintendent will email abutters and close neighbors at least once a week during new phases on work.

5.13.2 CONSTRUCTION METHODOLOGY

Construction activities include sheathing, shoring, and excavation for building foundations, below grade garage, utility trenches, building construction, paving, and other site improvements. After additional site and geotechnical studies are completed, the construction methods will be identified.

Although specific construction and staging details have not been generated, the proponent will work with the construction contractor and the City of Boston to ensure that the staging areas will be located to minimize impact to pedestrian and vehicular flow. Secure fencing and barricades will be used to isolate construction areas from pedestrian traffic within the site. In addition, sidewalk areas within and near construction activities will be well marked and lighted to protect pedestrians and ensure their safety. As required by the Boston Police Department, police details will be provided to facilitate traffic flow. All construction procedures will be designed to meet all OSHA safety standards for specific construction activities.

5.13.3 CONSTRUCTION WASTE

Trinity Border Street, LLC will take an active role with regard to the reprocessing and recycling of construction and building demolition waste. All demolition materials from site materials will be removed from the site.

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

5.13.4 CONSTRUCTION PHASING, SCHEDULE, AND HOURS

The project does not anticipate closure of Border Street during construction. Occupancy of portions of Border Street may be required during site preparation and construction of buildings. The project will be sequenced: First, the residential building will be built with staging at the DPA portion of the site. After the residential building is constructed, the DPA portion of the site will be completed. In addition, excavated material from the residential building site will be used for filling and grading other portions of the site.

Construction is expected to commence in the spring of 2009 and will be completed in the spring of 2011. The normal hours for construction activity are planned to be from 7:00 am to 4:00 pm Monday through Friday, although extended hours may be requested. The project office storage trailers, material stockpiles, and project management parking will be located within the site.

5.13.5 CONSTRUCTION STAGING AREAS AND WORKER PARKING

As noted above, the residential building and site work will be constructed in the north side of the site first with its staging area in the DPA portion of the site. Marine facilities and site work in the DPA will then be constructed with the staging area located within the DPA.

It is expected that most construction activities can be accommodated within the current site boundaries. The construction staging areas will be designed to isolate the construction while provide safe access for pedestrians and vehicles during normal day-to-day activities and emergencies. The staging areas will be secured with chain-link fences to protect pedestrians and from entering those areas. Limited on--site parking will be provided for certain key workers.

The number of workers required for the construction of the project will vary depending upon the stage of construction. Construction workers will typically arrive and depart prior to peak traffic conditions and the construction trips are not expected to substantially impact traffic conditions.

The general contractor will be responsible for educating all construction workers about public transit options and encouraging the use of High Occupancy Vehicles (HOVs). All construction workers will be encouraged to utilize mass transit and ridesharing options to access the construction site and to minimize vehicle traffic and parking on the local streets. As part of the program to promote public transportation, the following will be implemented:

- Providing on-site secured space for workers' tool storage,
- Posting transit schedules and maps at the jobsite,
- Distributing informational brochures regarding public transportation, and
- Notifying all subcontractors and suppliers of the worker access/parking limitations and options.

The proponent will submit a Boston Residents Construction Employment Plan in accordance with the Boston Jobs Policy. The Plan will provide that the proponent make good faith efforts to employ local trades people from the City of Boston. In this effort, the proponent will meet with local agencies prior to the start of construction to establish a community outreach program.

5.13.6 CONSTRUCTION TRUCK TRAFFIC AND ACCESS ROUTES

Designated truck routes will be established to govern where construction trucks access and egress the site. The primary construction truck access and egress to and from East Boston will be via Route 1A. Truck traffic to and from the north will use Route 1A South, while truck traffic to and from the west and south will use the Ted Williams Tunnel (I-90) via Logan Airport and Route 1A. Construction trucks will avoid the Sumner and Callahan Tunnels due to congestion and height restrictions. Emergency truck routes will also use these main highways to access and egress the site.

Within East Boston, the suggested primary truck route to the project site is Route 1A southbound to the Porter Street exit, through Central Square, and south on Border Street to the project site. The suggested primary truck egress route is north on Border Street, through Central Square to Meridian Street, south on Meridian Street, and north on Havre Street to Route 1A northbound, and continue on Route 1A north or exit to I-90 west. These truck routes are shown in Figure 5-21, Construction Truck Routes.

Truck traffic will be heaviest during the excavation and concrete foundation work. During this period, it is expected that approximately 10 to 12 trucks, varying in size from small delivery trucks to 18-wheelers, will arrive and leave the site each construction day. Thereafter, truck traffic will vary throughout the construction period, depending upon the activity.

The Proponent will work closely with the BTD in developing the CMP that will include more detail on construction phasing, number of trips, haul routes, and hours of operation.

5.13.7 AIR POLLUTION EMISSIONS AND MITIGATION

Since short-term air quality impacts from fugitive dust may be expected, the CMP will include plans for controlling fugitive dust during demolition and construction. The construction contract will provide for a number of strictly enforced measures to be utilized by contractors to reduce potential emissions and minimize air quality impacts.

The proponent and its construction team will evaluate mitigation methods employed by the Commonwealth's Clean Air Construction Initiative. Mitigation measures will be employed as necessary to minimize the potential impact of air pollution emissions from project construction operations and will include, as necessary:

- Monitoring construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized,
- Wet suppression to minimize the generation of dust from excavation operations and on-site vehicle traffic, with provisions for any runoff control,
- Spraying any piles of excavation materials with soil cement or calcium chloride overnight and on weekends and covering of long-term material stock piles,
- Compacting of the soil or the use of gravel to stabilize the site access points,
- Washing the wheels of vehicles before they leave the site, as necessary, with provisions for runoff control,
- Periodic cleaning of paved streets near the entrances to the site to minimize vehicle mud/dirt carryout,
- Locating aggregate storage piles away from areas having the greatest pedestrian activity, where and when possible,
- Installing fencing around the perimeter of the site to assist in containing wind blown dust, and
- Requiring trucks hauling excavate from the site to install secure covers over their loads.

Given the limited amount of such activities, air emissions are expected to be minimal.

5.13.8 WATER QUALITY AND BEST MANAGEMENT PRACTICES

During construction, best management practices (BMPs) will be used to limit the transportation of sediment off site. Groundwater wells will be established prior to the start of construction and will be monitored throughout the construction process to maintain water levels. Groundwater encountered during excavation will be recharged back into the soil. The Contractor will obtain a NPDES stormwater permit and implement BMPs to minimize pollutant runoff. The Contractor will also use the following water quality related measures:

- Complying with all federal, state and city codes, ordinances and regulations governing the on-site discharge of construction dewatering effluent,
- Using hay bales and silt fencing to prevent silt or soil from entering existing catch basins and the Harbor,
- Using temporary wheel wash areas within the site,
- Using temporary gravel entrance berms at the main exits from the site,
- Isolating and protecting stockpiled materials,
- Monitoring the proper use of tarpaulin covered trucks,
- Preventing/controlling truck spillage, and
- Cleaning the adjacent portions of city streets entering and exiting the project.

5.13.9 NOISE GENERATION AND MITIGATION

Intermittent increases in noise levels will occur in the short-term during construction. The peak noise impacts estimated for the project will only occur for brief periods during the excavation period of the project, when it is conservatively estimated that heavy-duty vehicles will be operating on the site and when pile driving occurs after excavation.

Construction work will comply with the requirements of the City of Boston noise ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities. Mitigation measures are expected to include:

- Using appropriate mufflers on all equipment and providing ongoing maintenance of intake and exhaust mufflers,
- Muffling enclosures on continuously operating equipment, such as air compressors, and welding generators with outdoor exposure,
- Replacing specific construction operations and techniques by less noisy ones where feasible,
- Selecting the quietest of alternate equipment items,
- Scheduling equipment operations to keep average levels low, to synchronize noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels, and
- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

The project will be constructed in a manner that complies with the Massachusetts DEP and City of Boston noise regulations.

5.14 SUSTAINABLE DESIGN

The Boston East parcel will achieve compliance with the City of Boston's Article 37 Green Building requirements and the Governor's Executive Order 484 – Leading by Example – Clean Energy and Efficient Buildings. The project will achieve LEED Certifiable status by demonstrating compliance with all of the prerequisites and up to 31 credits of the LEED NC (New Construction) rating system (See Appendix 8, LEED Checklist). The project will strive for the responsible use of resources, including energy, water, and materials, while providing a healthy and comfortable environment for its occupants.

Article 37, the Boston Redevelopment Authority's Green Building requirements, will also be adhered to. Although the proposed project will meet the requirements to be LEED certifiable, using the LEED building rating system, the proponent will not apply for additional Boston Green Building Credits. The checklist is the same as the LEED checklist, with the exception of the last four points, which are not applicable to the site as there are no electricity distribution load constraints, is no historic building, does not have an effect on groundwater, and its size is too small to meet the requirements of transportation demand management.

5.14.1 SUSTAINABLE SITES

The mixed-use project is a redevelopment of a site that was previously utilized as the East Boston Drydock Company and other industrial uses over the past 100 years. A remaining marine rail way will be preserved with interpretive exhibits to highlight the maritime history of the site. With convenient access to Central Square bus lines and the bus and subway connections at the renovated Maverick Station, urban amenities to Boston and points beyond are within easy reach.

To minimize urban heat-gain and to save energy, the project will have a light-colored roofing system. The project includes a half-level of parking underneath the residential use, a portion of which will become a planted outdoor terrace. The following paragraphs describe how the site meets the LEED NC requirements.

5.14.2 WATER EFFICIENCY

The site landscaping will be designed with natural vegetation, with no requirement for irrigation.

5.14.3 ENERGY AND ATMOSPHERE

The mechanical, electrical, plumbing, and fire protection design will exceed the requirements of ASHRAE 90.1-2004 and the Massachusetts Energy Code. The project is targeting a 21% reduction in energy consumption over the minimum ASHRAE standards. To ensure optimal performance, the building systems will be reviewed by a commissioning agent. No CFCs will be used in cooling or refrigeration equipment. Instead, refrigerants with low ozone-depleting / global-warming potential will be a priority. Lighting design will minimize the amount of installed lighting in part by taking into consideration daylighting and will include local controls. High-efficiency lamps and ballasts will be used along with site lighting. Occupancy sensors will be used where applicable to shut off lighting during unoccupied modes. Given the residential use, all units will include Energy Star rated lighting and appliances. Residents will be separately metered for gas and electric usage, promoting energy awareness and responsibility.

5.14.4 MATERIALS AND RESOURCES

Regional materials with high recycled content and renewable characteristics will be targeted for this project. The building will provide space for the collection and storage of future recyclables. In addition, the project team will achieve at least a 50% target for recycling of construction waste.

5.14.5 INDOOR ENVIRONMENTAL QUALITY

The project will create a healthy indoor environment for occupants with particular attention paid to minimizing volatile organic compounds and will optimize the use of daylight and views.

5.14.6 LEED CHECKLIST

A preliminary LEED-NC checklist for both the residential building and the marine facility building is attached in Appendix 8, which is subject to revision as the project moves forward through design. The project will also conform to the requirements of Article 37, Green Buildings of the BRA Zoning Code. At this time, the project has 29 LEED-NC credits and no Boston Green Building Credits.

5.15 HISTORIC RESOURCES

5.15.1 OVERVIEW

The Boston East project area contains about 3.4 acres of upland in three lots that are vacant of buildings and consists of filled tidelands. Approximately 10.8 acres of the parcel are identified as watersheet. The project area was included in a City-Wide Comprehensive Industrial Survey, Boston, Massachusetts conducted by PAL in 1996-1997 for the Boston Landmarks Commission (BLC) and the Massachusetts Historical Commission (MHC) for inclusion in the MHC's Inventory of the Historic Assets of the Commonwealth (Inventory). The "Boston East Site" (no assigned MHC inventory number), as it was called in the East Boston Inner Harbor Industrial Area (BOS.RP), was recommended in the survey as potentially eligible for listing in the National

Register of Historic Places (National Register) for its historical associations and archaeological potential; however, it was noted that the site would need additional research to determine its integrity and therefore its National Register eligibility. Other known historic resources included in the MHC's Inventory and located in the immediate vicinity of the project area include: 129 Border Street (BOS.12876); McLaren's Shop and Sawmill, 135-139 Border Street (BOS.11); Atlantic Works Machine Shop/Wigglesworth Machinery, 60 Border Street (BOS.12874); Atlantic Boiler Works Office, 80 Border Street (BOS.12875); and Atlantic Works Boiler Shop, 36 New Street (BOS.108). The Atlantic Works Complex (60 and 80 Border Street and 36 New Street) was recommended in the 1996-1997 survey as eligible for listing in the National Register.

5.15.2 HISTORIC COMPONENTS OF PROPOSED PROJECT

The project will include the historic remnants of the shipbuilding industry that occurred at the site along with interpretive elements that celebrate this industry and the site's history. To highlight key historic components, the proponent will:

- Complete a historical reconnaissance survey, key results published in this DEIR/DPIR;
- At the time of the proponents geotechnical testing, the proponent will engage a historic consultant to observe and review samples retrieved from test pits;
- Retain at least one of the historic marine railways and cradles;
- Build a Harborwalk and open space area around the marine railway;
- Design and install interpretive elements in the form of signs, narrative, and/or maps related to the history of the site within the open space area;
- Design and install interpretive elements within the archway of the proposed residential building; and
- Build and operate a community gallery in the residential building that has excellent views of the railway and working Boston Harbor. It will host maritime artwork and functions along with other gallery-related events.

These historic features will help create a vibrant and exciting place for visitors and residents as well as provide an understanding of the historic uses of the site and its relationship to the development of the neighborhood and the East Boston community.

5.15.3 PLANNING CONTEXT

The MHC's comments on the Expanded Environmental Notification Form (EENF), Project Notification Form (PNF), and the Secretary's Certificate for the project requested that a historic and archaeological reconnaissance survey be conducted that addresses the land use and development history of the property, the location and identification of historic resources, and the identification of undisturbed portions of the project areas that are sensitive for belowground marine and terrestrial resources.

The MHC also requested the recommendation of a project Area of Potential Effect (APE), an opinion of effect, and recommendations to avoid, minimize, or mitigate adverse effects (MHC letters dated October 3, 2007 and November 16, 2007) (see Appendix 3). The scope and results of the reconnaissance historic and archaeological survey completed by PAL in response to MHC comments are presented in the following sections.

The goal of the reconnaissance archaeological survey was to identify any sensitive areas of the proposed project where potentially significant terrestrial and underwater archaeological resources may be present. The reconnaissance survey included archival research, geotechnical data and underground utilities review, and a walkover survey to collect documentary and existing conditions information needed to determine the archaeological sensitivity of the onshore and marine portions of the Boston East project area.

The goals of the historic reconnaissance survey were: to research and document the land use and development history of the property; to conduct a preliminary field reconnaissance survey of historic resources within the project APE; to make recommendations regarding the potential eligibility of identified historic resources for listing in the National Register of Historic Places or the need for additional survey and evaluation work; and to make recommendations regarding the potential impacts of the proposed project on historic resources identified within the APE.

The site is comprised of three parcels: a southern lot, a central lot, and a northern lot. The results of historic and archaeological reconnaissance survey use the location of these parcels to describe its findings. The parcels are shown on Figure 5-22, Site Parcels and Impacted Areas.

5.15.4 SITE HISTORY

The project site's historical use was for shipbuilding, support industries associated with groundbreaking mid-nineteenth-century clipper ship construction critical to the history of East Boston and Boston Harbor and famous nationally, and other industrial uses. The southern lot in the project area was the site of the East Boston Dry Dock Company beginning in ca. 1839 and included at various times two marine railways and their accompanying headhouse, a sectional dock, a floating dock, and various associated workshops and storage sheds. A floating bath house was also anchored on the site. Research completed for this project indicates that the East Boston Dry Dock Company yard was later leased by the Atlantic Works after 1892 and purchased by the Bethlehem Shipbuilding Corporation in 1928. The Atlantic Works operated the facility until 1950, after which the property was largely vacant.

The central lot was originally the site of the Hall family's coal and lumber business in 1852 that was associated with the East Boston Dry Dock Company's ship building activities. The lot was later used by shipbuilding firms, then an assortment of trades, and a substantial carriage factory complex in ca. 1892. No wood pile piers were located on this lot until after 1900, when it was used for a coal yard. The lot was owned by the United Stevedoring Corporation of New England in the mid-nineteenth century. A small storage and refrigeration building was located on the lot at this time.

The northern lot was originally the site of the Samuel Hall's timber dock and later his shipyard, beginning in 1839. A built-out wharf on the site held a steam saw mill and a coal shed. By 1888, the lot held the George McQuesten & Co. lumber business, which included a log boom, sawmill, and attached planing shop. In the early 1900s, the wharf and piers in this lot were drastically reconfigured by Federal Lumber, which removed these structures to a terminus point corresponding approximately to the filled shoreline of 1852. The site was vacant by 1951.

5.15.5 SURVEY STUDY AREAS

The project APE for aboveground historic resources was defined as the Boston East project area itself, as well as an extended APE to account for potential visual and other indirect impacts from the proposed new construction on the site. The visual APE extends approximately 400 feet south and east and approximately 1,000 feet north on the land side. It also extends approximately 0.5 miles west to encompass the facing Charlestown shoreline across Boston Inner Harbor. The APE for archaeological resources is the location of potential terrestrial and marine ground disturbance. The historic resources identified in the reconnaissance survey are described below, listed in Table 5-4, and shown on Figure 5-23, Historic Resources within the Project Area of Potential Effect. The archaeological sensitivity assessment of both terrestrial and underwater portions of the project parcel is summarized below.

5.15.6 SURVEY FINDINGS AND RECOMMENDATIONS

The survey findings and recommendations are described below. The recommendations address subsurface areas that will be impacted by the location of the proposed work in the central and northern parcels (i.e. the residential building and the drainage outfall). Because the southern parcel will not be developed until a tenant has been identified, the exact location of the marine facility building is unknown. When a tenant is found, the proponent will work with MHC regarding site investigations in the footprint of the designed building in the southern parcel (DPA). No further investigation is proposed for areas that are not to be developed, such as within the southern lot (DPA) or the watersheet of the whole site (see Figure 5-22, Site Parcels and Impacted Areas). Recommendations are in *italics*.

Project Site Historic Findings and Recommendations
The Project site consists of three separate land parcels with different land use and development histories. All three parcels were recommended eligible for listing in the National Register in 1997 as the Boston East Site for historical associations and archaeological potential.

The present survey determined that the two north parcels of the project area on which residential use is proposed contain one wood pier which is not recommended as eligible for the National Register. Therefore, the project will have no direct impact on historic resources within these two parcels.

The south parcel contains a fragmentary maritime industrial landscape dominated by two marine railways, several wood pile piers, and an early twentieth-century concrete sea wall. No visible aboveground granite sea walls were observed at the site. A short portion of seawall at the extreme south end of the parcel could not be viewed because of safety considerations, so it is not known whether this wall is constructed of granite or some other material. All of the visible features on the south parcel are associated with the East Boston Dry Dock Company and the Atlantic Works. The East Boston Dry Dock Company was founded by Samuel Hall, a noted builder of East Boston clipper ships. The Atlantic Works took over the East Boston facility and was the largest private ship repair facility in Boston in the first half of the twentieth century.

The present survey determined that south parcel, including the seawalls, marine railways, and piers, is historically related to the adjacent extant Atlantic Works buildings, which are located off the project site immediately to the south. The Atlantic Works complex is comprised of three building described below, which were recommended as eligible for the National Register in 1997 as a district (aka complex). *Therefore, the south parcel is recommended to be included with this complex as eligible for the National Register as the Atlantic Works Historic District.*

The proposed project involves new marine related construction on the south lot and is within 200 feet of the Atlantic Works Office. The proposed development has the potential to directly impact historic resources, including the two marine railways and associated piers and building foundations in the south parcel (Boston East Site) and may visually impact all three Atlantic Works buildings to the south within the recommended district.

Off-Site Historic Findings and Recommendations
The Atlantic Works complex adjacent to the project area consists of three buildings: the Atlantic Works Boiler Shop (including 30 New Street), Atlantic Works Machine Shop, and Atlantic Works Office Building. These buildings were recommended as eligible for listing in the National Register in 1997 as a district (aka complex). As

stated above, *the present survey finds that the south parcel and the three Atlantic Works buildings are eligible for listing in the National Register as the Atlantic Works Historic District*. The project impacts to the potential district are described above.

Central Square (BOS.C) in East Boston, a mixed use neighborhood and urban green space located approximately 400 feet north of the project area, was surveyed and recommended as eligible for the National Register in 1990 as the Central Square Historic District. Individual resources within the project APE that were previously identified as contributing elements to this potential district and from which the proposed Project may be visible include the Twenty Associates Building (BOS.18) at 35 Central Square, the First Presbyterian Church of East Boston (BOS.64) at 130 London Street, the Stevenson Block (BOS.82) at 232-236 Meridian Street. The Row Houses at 118-124 London Street and the Boston Edison Co. Substation at 175 Border Street have not been previously surveyed but appear eligible for the National Register as contributing elements to the recommended district. Minor visual impacts to Central Square and its potential contributing elements are possible as a result of the proposed project.

The Sumner Tunnel Ventilating Building appears to be eligible for the National Register as part of the greater system of Sumner Tunnel infrastructure. Additional research would be required to determine eligibility for this structure and the overall system but is not recommended at this time. Minor visual impacts to this resource are anticipated as a result of the proposed project.

The Charlestown Naval Yard (BOS.CO) across Boston Inner Harbor is a designated National Historic Landmark and listed in the National Register as a Historic District. The Naval Yard contains two resources, the USS Constitution (BOS.9054) and the USS Cassin Young (BOS.9141), that are also designated National Historic Landmarks and are individually listed in the National Register. However, these two resources are located outside of the project APE. Only minor visual impacts to the Naval Yard are anticipated.

No additional historic resources identified in the Boston East project area APE are recommended as eligible for the National Register.

The recommended project Area of Potential Effect (APE) for aboveground historic resources was defined as the Boston East project area itself, as well as an extended APE to account for potential visual and other indirect impacts from the proposed new construction on the site. The visual APE extends approximately 400 feet south and east and approximately 1,000 feet north on the land side. It also extends approximately 0.5 miles west to encompass the facing Charlestown shoreline across Boston Inner Harbor. The recommended project APE for archaeological resources is the location of potential terrestrial and marine ground disturbance. The historic resources identified in the reconnaissance survey are listed in Table 5-4, and shown on Figure 5-22, Historic Resources within the Project Area of Potential Effect.

Archaeological Findings

A walkover/surface inspection of the project parcel combined with documentary research indicates that the onshore, intertidal, and nearshore submerged portions of the southern lot have a high potential for belowground structural remains and stratigraphic contexts associated with the mid-nineteenth century Samuel Hall shipyard/East Boston Dry Dock Company. These resources include both marine (submerged) features including portions of the sectional dock, floating dock, and marine railway(s) that extend an unknown distance out into the water as well as associated terrestrial components including building foundations (e.g., the railway head houses, office, and work shops) and shipways and cradle features. The soil borings taken in the onshore portion of the lot near the southern property line indicate the presence of wood at 14-15 feet below ground surface (ft bgs). The wood could be associated with vertical sheet pilings or log ramps driven into the glacial subsoils as part of the early nineteenth-century East Boston Timber Company sea wall and/or Hall's shipyard.

Visual investigation of the lot's intertidal and nearshore submerged area combined with an examination of a bathymetric plot and high resolution aerial photographs taken at low tide suggests that the southern portion of the lot has been dredged and its shoreline altered; however, the northern half appears to retain its natural configuration. The southern half of the lot's shoreline is defined by rip rap and sea wall, while the northern half consists of a gently sloping beach composed primarily of coarse to fine sands covered by cobbles and fill materials (e.g., brick, wood, metal, glass, and ceramics). The undisturbed sediments in this northern submerged portion of the lot are considered to have high potential to contain archaeologically sensitive buried paleosols and archaeological deposits or features associated with the area's nineteenth and early twentieth century maritime activities. Low archaeological sensitivity is tentatively assigned to the dredged portion of the lot's submerged area, however, this area will not be impacted by the proposed development.

A walkover/surface inspection of the project parcel combined with documentary research indicates that the onshore, intertidal, and nearshore submerged portions of the central lot have a high potential for belowground structural remains and stratigraphic contexts associated with mid-to-late nineteenth century businesses including a carriage factory, tin shop, blacksmith, pool room, and bowling alley. The Samuel Hall family coal and lumber yard was also present on this parcel in the mid-nineteenth century, and was leased to several notable East Boston shipbuilders for the construction of clipper ships. Based on soil borings evidence, there is also the potential for more deeply buried vertical sheet pilings associated with the early nineteenth-century East Boston Timber Company sea wall and/or Hall's shipyard. The soil borings taken in the onshore portion of the lot indicate the presence of wood remains from 8 to 12 ft bgs parallel to Border Street. These wood remains, like in the southern lot, could be associated with vertical sheet pilings driven into the glacial subsoils as part of the early nineteenth-century East Boston Timber Company sea wall and/or Hall's shipyard. In addition, shell was identified at 16 ft bgs in one of the onshore soil borings near the interface of the historic fill and glacial subsoils. This shell could be associated with buried land surfaces containing evidence of Native American occupation such as shell middens.

Visual investigation of the central lot's intertidal area and examination of high resolution aerial photographs taken at low tide indicate that the remains of the waterfront infrastructure present onshore and described above extend some significant distance out into the submerged portion of the lot. The visual investigation also revealed what appeared to be a naturally, formed gently sloped shoreline spanning the full width of the lot. This shoreline consists primarily of sediments composed of coarse to fine sands covered by deposits of large amounts of cobble, interpreted to be mostly ship ballast (European flint) debris. Fill containing large amounts of brick rubble, household glass and ceramics, as well as a number of scattered shaped wooden timbers possibly associated with on-site wooden shipbuilding or ship repair activities, were also observed in the intertidal zone of the central lot. Examination of a bathymetric plot and aerial photographs suggests that dredging in the submerged portion of the central lot was concentrated in its western half. The eastern half, along with a narrow band of sediment within the footprint of a former pier, appear to be undisturbed by dredging activities. This eastern submerged half of the lot has a high potential to contain undisturbed sediments with archaeologically sensitive buried paleosols and archaeological deposits or features associated with the area's nineteenth and early-twentieth century maritime activities. A small portion of this area will be disturbed for the construction of a new combined sewer outfall and will need to be investigated further prior to construction. Low archaeological sensitivity is tentatively assigned to the dredged portion of the lot's submerged area, however, no work is proposed within the dredged or undredged areas.

A walkover/visual inspection of the project parcel combined with documentary research indicates that the onshore, intertidal, and nearshore submerged portions of the northern lot have a high potential for belowground structural remains and stratigraphic contexts associated with the mid-nineteenth century Samuel Hall shipyard where he established his original timber dock and then built out the wharf area on piers to accommodate a steam saw mill. This saw mill was used throughout the 1800s by subsequent landowners as part of their lumber businesses. The entire pier structure and wharf area that supported the saw mill and adjoining structures along with lumber piles was removed from the site and the useable "land" area was reduced back to its 1852 shoreline first created by Hall for his timber dock. Wood was also identified from 12.5 to 14 ftbs in one of the onshore soil borings taken in the southeast corner of this lot. This wood could be associated with vertical sheet pilings driven into the glacial subsoils as part of the early nineteenth-century East Boston Timber Company sea wall and/or Hall's shipyard. In addition, all three soil borings taken in the onshore portion of the lot contained peat deposits that average about 10 ft bgs between the historic fill and underlying glacial subsoils. Peat deposits are typically associated with Native American sites in marine settings of Boston Harbor. The presence of peat in all three borings is highly suggestive of an intact, buried paleosol along the pre-1830s shoreline. This buried shoreline could contain evidence of Native American resource procurement activities including shell middens and fish weirs.

Visual investigation of the northern lot's intertidal area revealed what appeared to be a gently sloped, naturally formed shoreline consisting primarily of coarse to fine sands intermixed with small gravel with little or no cobble or fill. The northern limit of the area is marked by a deep deposit of rip rap and fill. No archaeological features (e.g., submerged or partially submerged piers or derelict vessels) were visible in the lot's intertidal/nearshore submerged areas. Examination of a bathymetric plot and high-resolution aerial photographs taken at low tide suggests that dredging has occurred in the adjacent harbor waters comprising the western half of the submerged portion of the lot, except for the nearshore third of the area and a narrow strip corresponding with the documented location of Halls' 1852 wharf and steam saw mill that is gone from historic maps after 1912 and before 1927. The undredged portion of the northern lot's offshore area has a high potential to contain undisturbed sediments with archaeologically sensitive buried paleosols and archaeological deposits or features associated with the area's nineteenth and early twentieth-century maritime activities. Although low archaeological sensitivity is tentatively assigned to the dredged portion of the lot's submerged area. However, other than a small amount of riprap to be placed along the existing shoreline, no work is proposed within either the dredged or undredged areas. This area will not impacted by the proposed development.

Archaeological Recommendations for Intensive Survey

A majority of the Boston East parcel comprising these three historic lots and both terrestrial and underwater areas to the Harbor Commission's Line is assessed as having high archaeological sensitivity for potentially significant resources associated with nineteenth-century clipper shipbuilding and post-clipper ship era waterfront activities. There is also a high potential for deeply buried pre-nineteenth century shorelines and submerged paleosols, particularly in the central and northern lots, which could contain intact Native American resources such as shell middens and fish weirs. Low sensitivity onshore areas consist of several documented underground modern utility easements (water, electrical, sewer). Low sensitivity intertidal and nearshore submerged areas consist of the dredged channels.

Intensive (locational) surveys are recommended for the archaeologically sensitive areas of the project parcel where construction is proposed, as follows:

Subsurface testing as part of an intensive (locational) archaeological survey is recommended to locate, identify, and evaluate any onshore archaeological resources related to documented and underdocumented Native American and Euro-American land uses within the Boston East parcel. Because of the nature and depth of the historic/modern fill (as much as 10–15 feet) present in these areas, this testing would need to be in the form of machine-assisted trenches, the precise location and size of which would be determined as part of a proposed research design in consultation with the MHC, BLC, and USACE. These investigations would be limited to the footprint of the proposed residential building and the utility corridor for the new combined sewer overflow pipe and be performed during the time of the project's geotechnical investigations (see Figure 22, Site Parcels and Impacted Areas). No other areas of the project site are proposed to be excavated.

5.15.7 WIND AND SHADOW IMPACTS ON HISTORIC PROPERTIES

This section identifies the impacts to historic properties as a result of the wind and shadow analyses.

Wind Impacts

An assessment was made to determine the effects on pedestrian level winds (PLW) of the proposed buildings at the Boston East Site as described in Section 5.1. The PLW assessment included 46 locations in and near the Project site. Of these locations, five (Location Numbers 9, 12, 23, 29, 30, and 45) are next to or at historic properties identified in this section (see Figures 5-1 through 5-4). According to the study, none of these locations is predicted to have dangerous winds as often as once a year, and no location is predicted to have PLWs higher that Category 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered.

Shadow Impacts

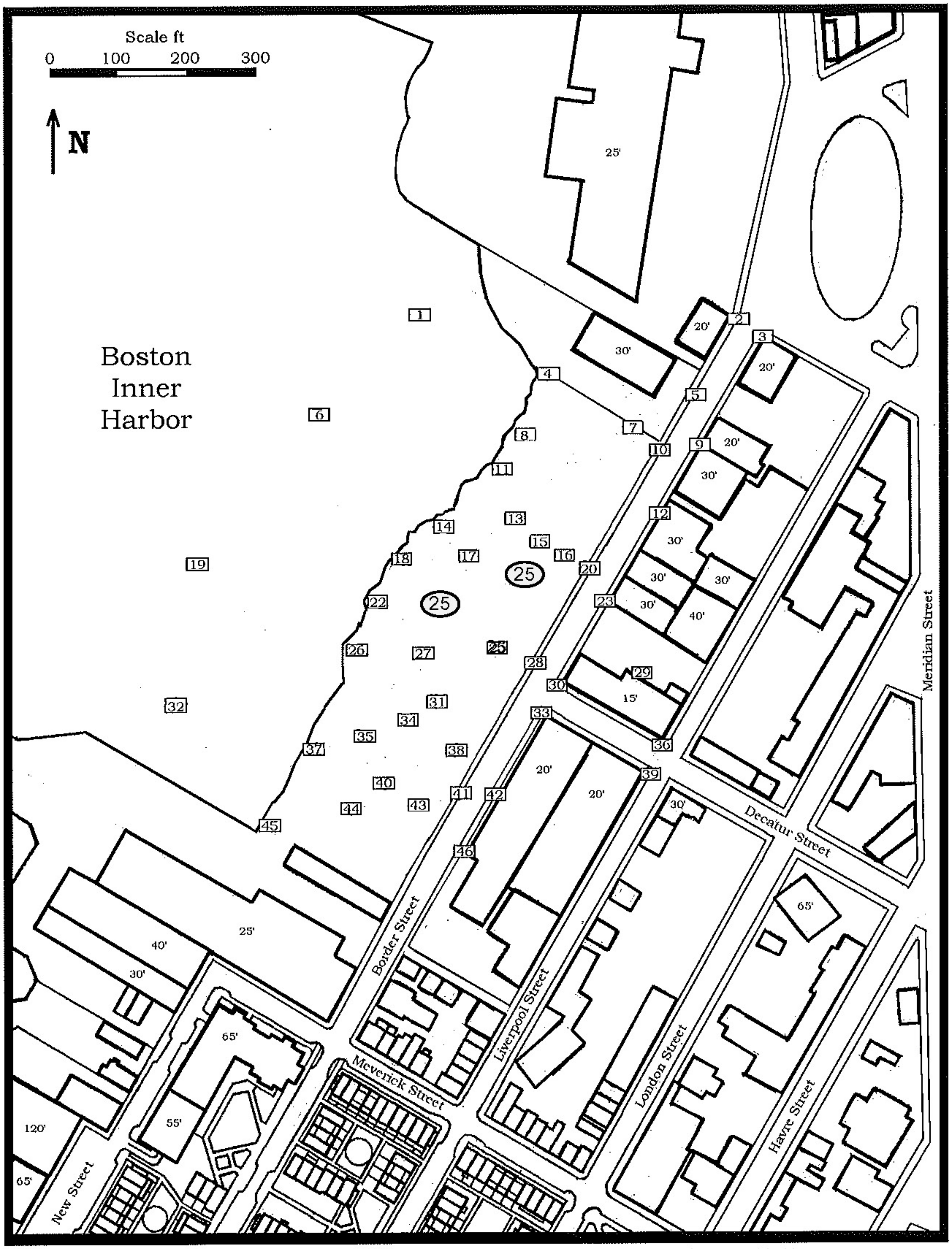
The shadow analysis described in Section 5.2 identified the shadows cast by the proposed seven-story residential building at the Project site using a computer model. Shadows were cast for four days of the year: Spring (March 23), Summer (June 21), Fall (September 21) , and Winter (December 12) and for the hours of 9 am, 12 noon, 3 pm for all days and for 6 pm on the Spring and Summer days (see Figures 5-5 through 5-18). As a result of this study, only shadows at 6 pm on June 21 and September 21 were cast on four historic properties located along the east side of Border Street as shown in Figures 5-11 and 5-15. Since these shadows are cast during the evening when the sun is setting, impacts to the historic properties at 135-139, 149-151, and 161-163 Border Street are minimal and will not adversely affect the setting of these properties.

Table 5-4: Historic Resources in Boston East Project APE

MAP #	MHC #	Historic Name / Function	Other Address	Street #	Street Name	City/Town	Year Built	Designations
1	BOS.CO	Charlestown Navy Yard - Boston Naval Yard (* includes 166 individual MHC listed items)	Charlestown Navy Yard		Chelsea St	Charlestown	1800-1974	NHL, NRDIS
2	BOS.C	Central Square	Central Square		Bennington St, Central Square, Meridian St, Porter St, Saratoga St	East Boston	mid-19th to ca. 1930	RNRE
3	BOS.RP	East Boston Inner Harbor Industrial Area				East Boston	mid 19th to mid-20th ca.	
4	BOS.N	232-323 Meridian Street	Eagle Hill	232-323	Meridian Street	East Boston	R 1830-1915	
5	BOS.12874	Atlantic Works Machine Shop - Wigglesworth Machinery Co.	n/a	60	Border Street	East Boston	1930	RNRE
6	BOS.12875	Atlantic Works Office Building	n/a	80	Border Street	East Boston	1880	RNRE
7	n/a	East Boston Dry Dock Company/Atlantic Works Railway Dry Docks a/k/a "Boston East Site"		103-148	Border Street	East Boston	1734-1950	RNRE, BOS.RP
8	BOS.12876	Industrial Building	n/a	129	Border Street	East Boston	R 1935	BOS.RP
9	BOS.11	McLaren, Alexander and John Shop and Sawmill	n/a	135-139	Border Street	East Boston	ca. 1873	BOS.RP
10	BOS.12	Sturtevant Saw and Planing Mill	143-153 (on form)	149-151	Border Street	East Boston	R 1860	Demolished
11	BOS.13	Chase, Samuel York Carpentry Shop	n/a	161-163	Border Street	East Boston	ca. 1871	BOS.RP
12	BOS.12877	Dagle & MacMillan Machine Shop	n/a	170	Border Street	East Boston	R 1950	BOS.RP
13	BOS.12878	Dagle & MacMillan Office	n/a	170	Border Street	East Boston	R 1950	BOS.RP Demolished
14	n/a	Edison Electrical Illuminating Company Substation	Central Square	175	Border Street	East Boston	1923	
15	BOS.18	Twenty Associates Building	n/a	35	Central Square	East Boston	ca. 1899	C to BOS.C
16	n/a	Flats	n/a	20-28	Decatur Street	East Boston	ca. 1880	
17	n/a	Sumner Tunnel Ventilating Building	n/a	65	Liverpool Street	East Boston	1934	
18	n/a	Flats	n/a	71-73	Liverpool Street	East Boston	ca. 1890	

MAP #	MHC #	Historic Name / Function	Other Address	Street #	Street Name	City/Town	Year Built	Designations
19	n/a	Residence	n/a	75	Liverpool Street	East Boston	ca. 1850	
20	n/a	Commercial Building	n/a	80	Liverpool Street	East Boston	ca. 1950	
21	n/a	Commercial Building	n/a	109	Liverpool Street	East Boston	ca. 1890	
22	n/a	Flats	n/a	102-108 (even)	London Street	East Boston	ca. 1890	
23	n/a	Flats	n/a	110-116 (even)	London Street	East Boston	ca. 1920	
24	n/a	Row Houses	n/a	118-124 (even)	London Street	East Boston	ca. 1880	
25	BOS.64	First Presbyterian Church of East Boston	n/a	130	London Street	East Boston	1871	C to BOS.C
26	BOS.82	Stevenson Block	n/a	232-236	Meridian Street	East Boston	1883	C to BOS.C
27	BOS.83	Commercial Building	n/a	235-239	Meridian Street	East Boston	ca. 1885	BOS.N
28	BOS.84	Commercial Building	n/a	255-265	Meridian Street	East Boston	R 1870	BOS.N
29	BOS.85	Commercial Building	n/a	269	Meridian Street	East Boston	1870	BOS.N
30	BOS.88	Boston Public Library - East Boston Branch	n/a	276-282	Meridian Street	East Boston	1913	BOS.N
31	BOS.108	Atlantic Works Boiler Shop	n/a	36-40	New Street	East Boston	1893	RNRE, BOS.RP
32	n/a	Maverick-Border-Liverpool Streets Residential Block	n/a		Maverick, Border, and Liverpool Streets, Coppersmith Way	East Boston	Mid 19th to mid 20th ca.	

* NHL – National Historic Landmark
C – Contributing to a National Register Listed or Eligible District
NRDIS – National Register Historic District
NRIND – National Register Listed
RNRE – Recommended National Register Eligible



BOSTON EAST
EAST BOSTON, MASSACHUSETTS

Figure 5-1
No Build Conditions including Building Heights and PLW Locations
source: Frank Durgin PE

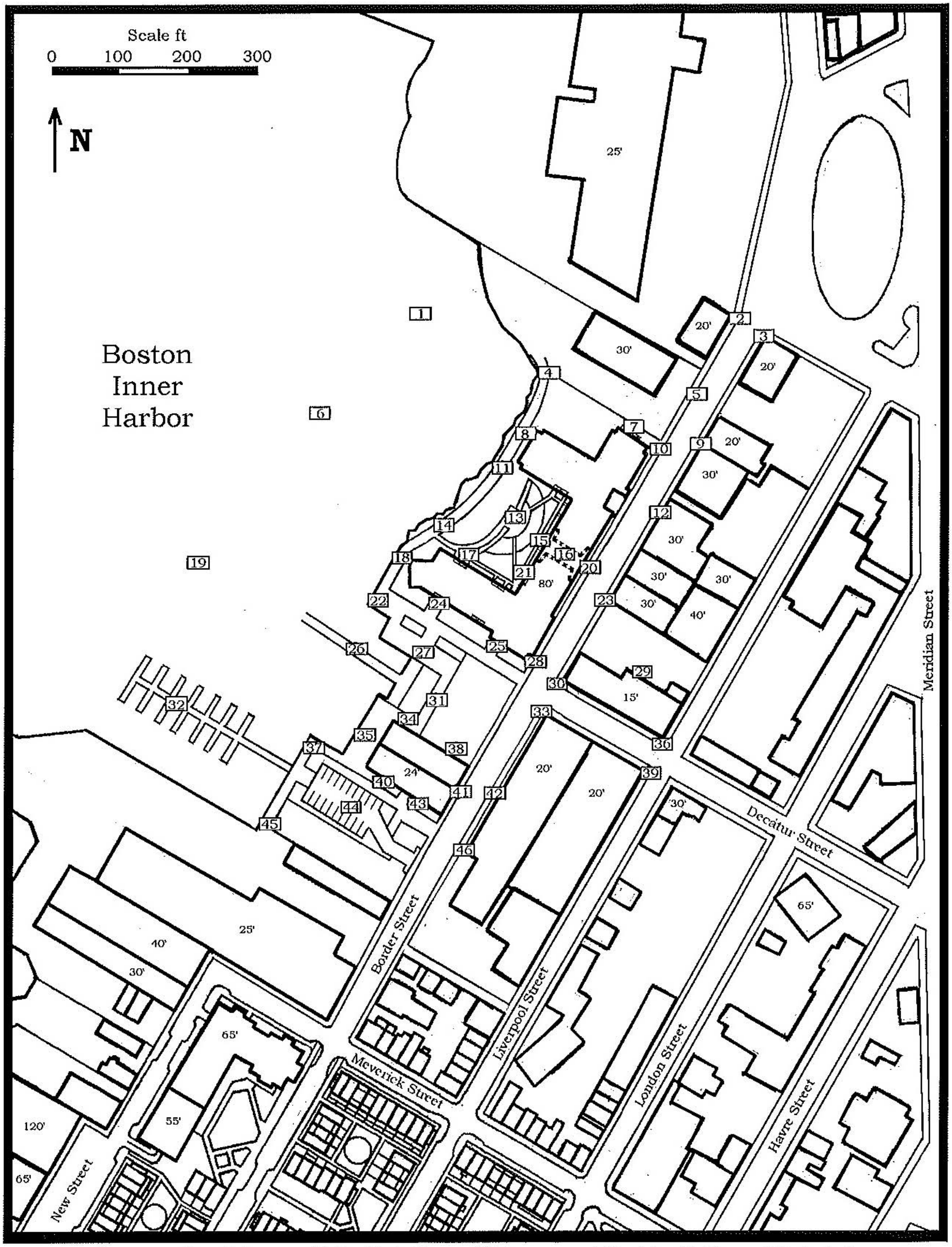
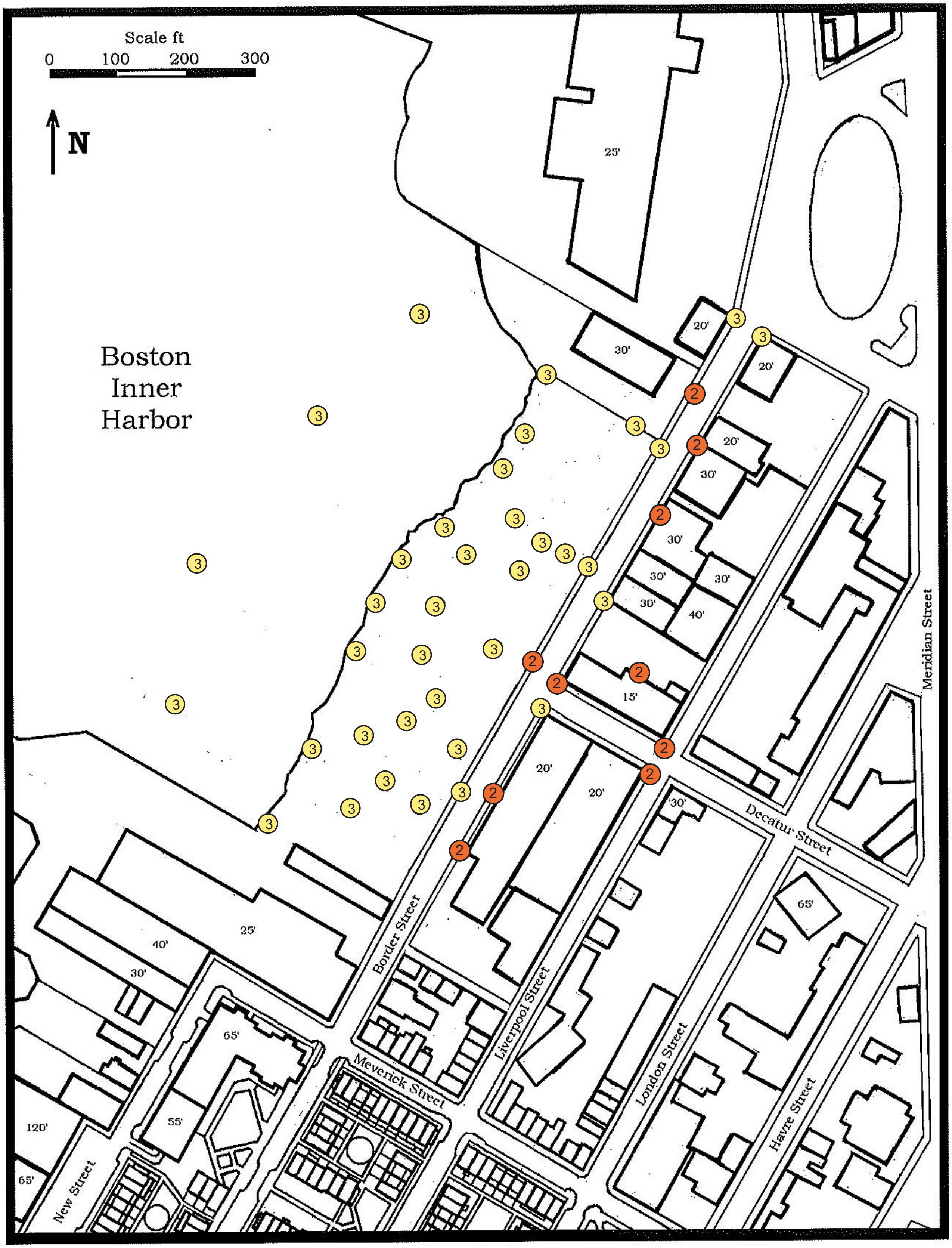


Figure 5-2
Build Conditions including Building Heights and PLW Locations
source: Frank Durgin PE



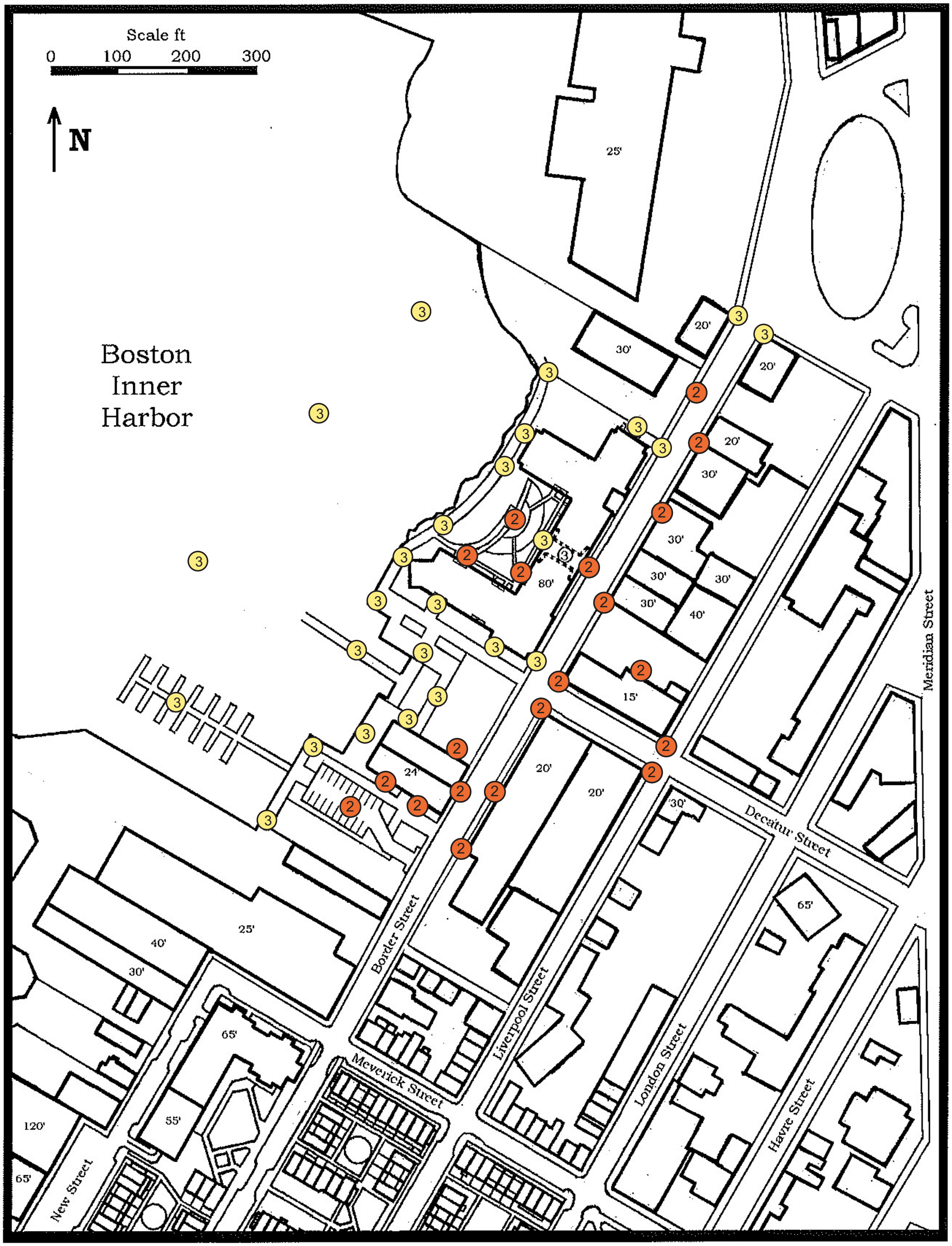
1 Comfortable for long periods of standing or sitting

2 Comfortable for short periods of standing or sitting

3 Comfortable for walking

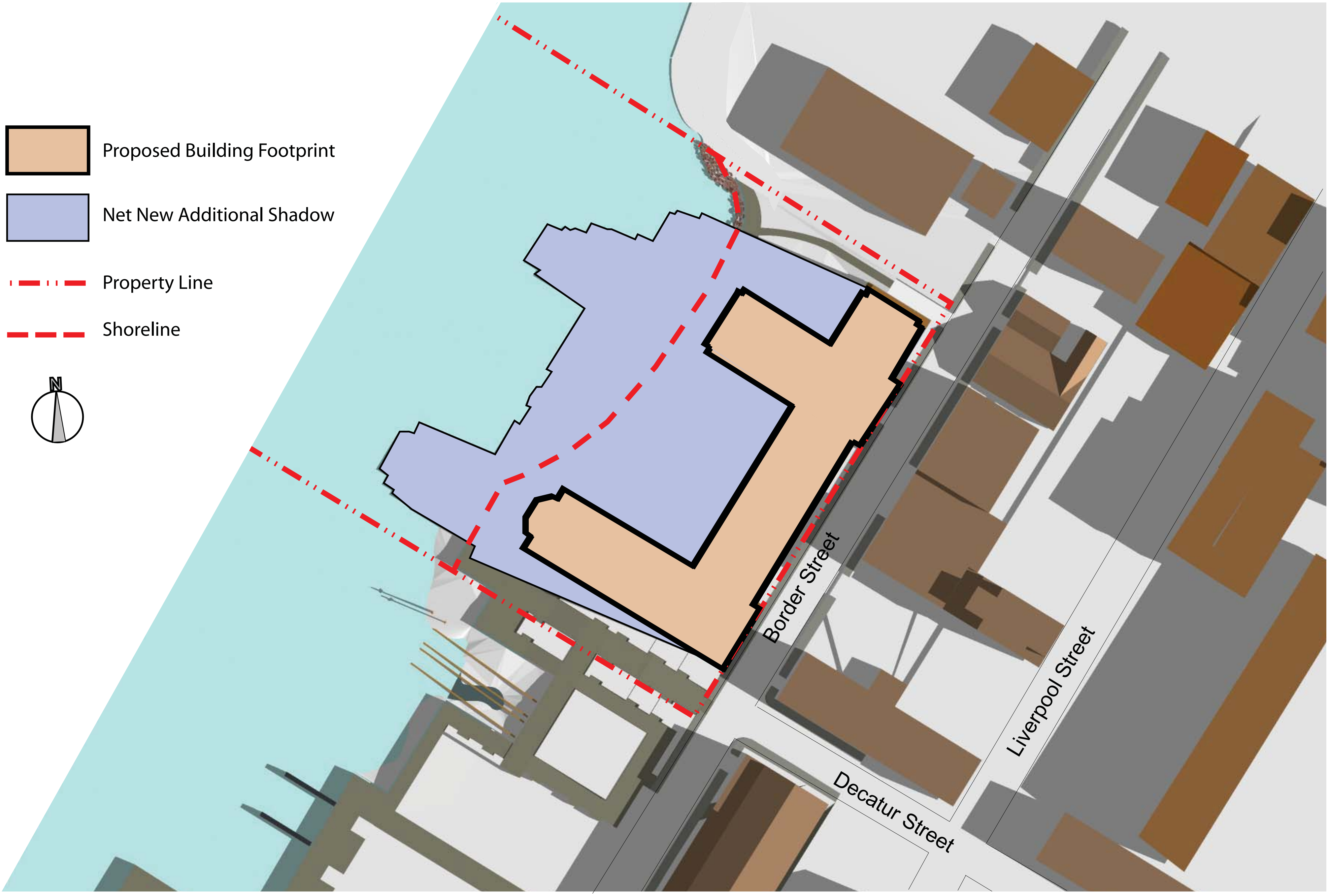
4 Uncomfortable for walking

Figure 5-3
Annual PLW Categories for No Build Conditions
source: Frank Durgin PE



1 Comfortable for long periods of standing or sitting
2 Comfortable for short periods of standing or sitting
3 Comfortable for walking
4 Uncomfortable for walking

Figure 5-4
Annual PLW Categories for Build Conditions
source: Frank Durgin PE

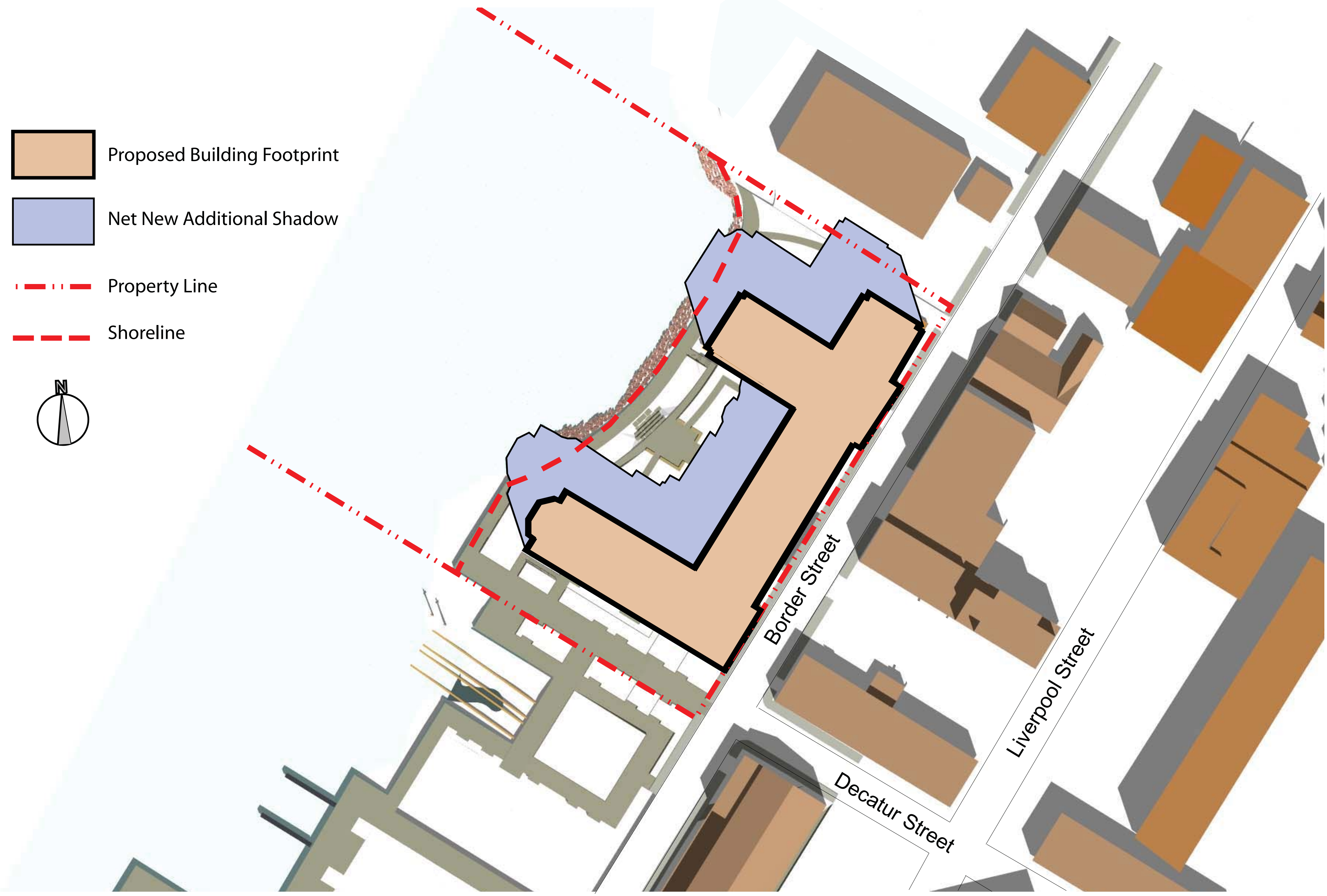


BOSTON EAST

Figure 5-5

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: March 21, 9 am

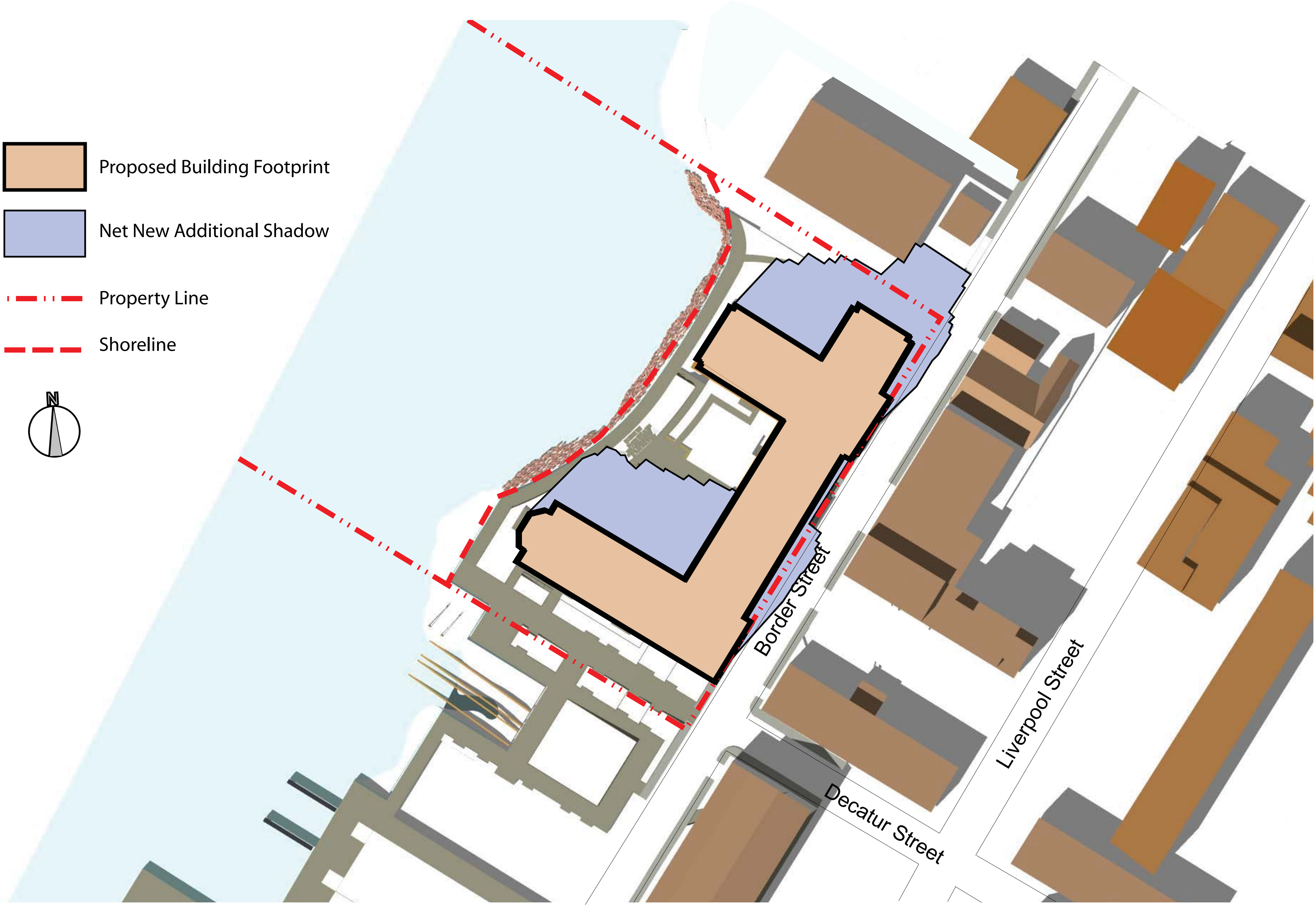


BOSTON EAST

Figure 5-6

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: March 21, 12 pm

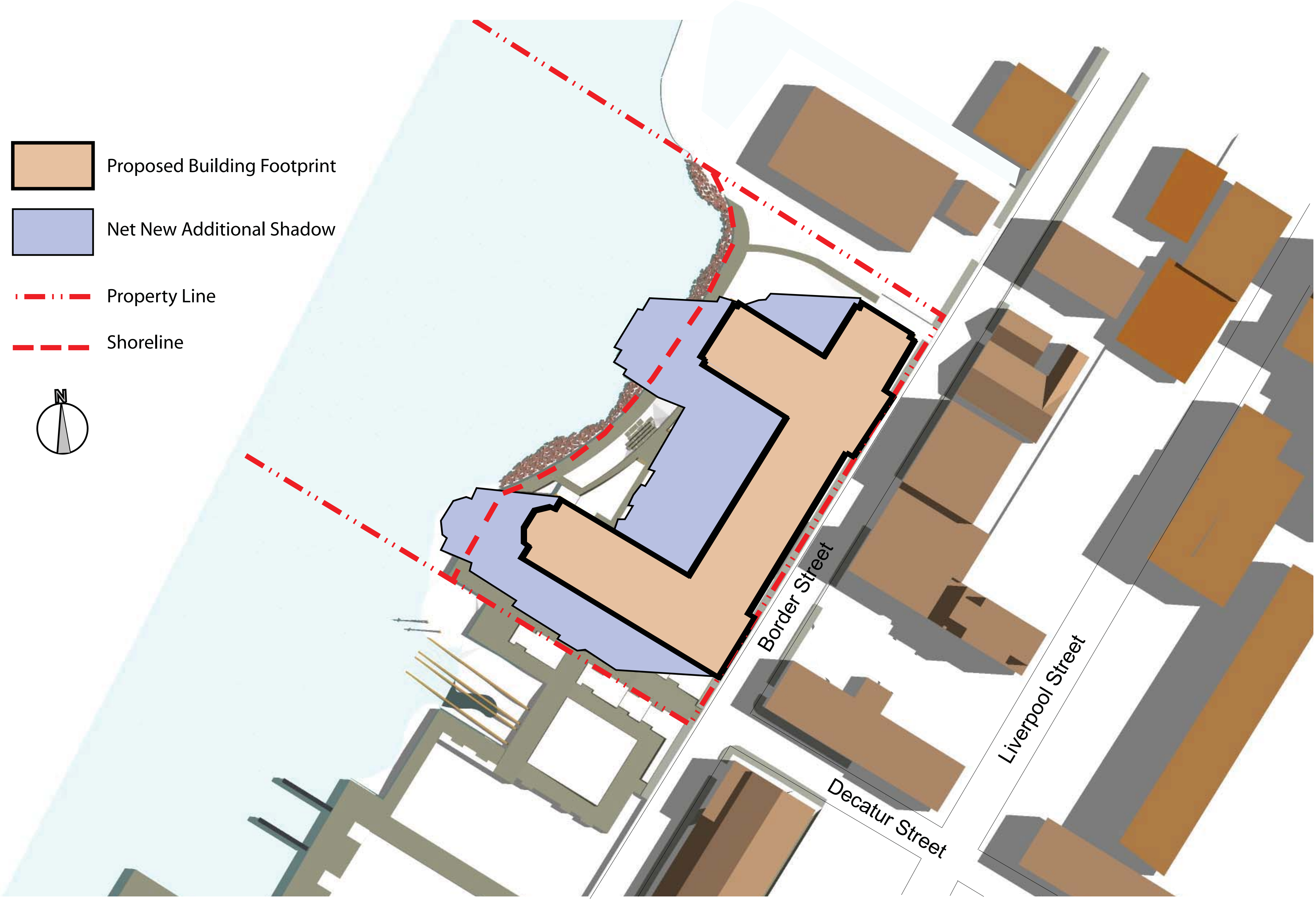


BOSTON EAST

Figure 5-7

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: March 21, 3 pm

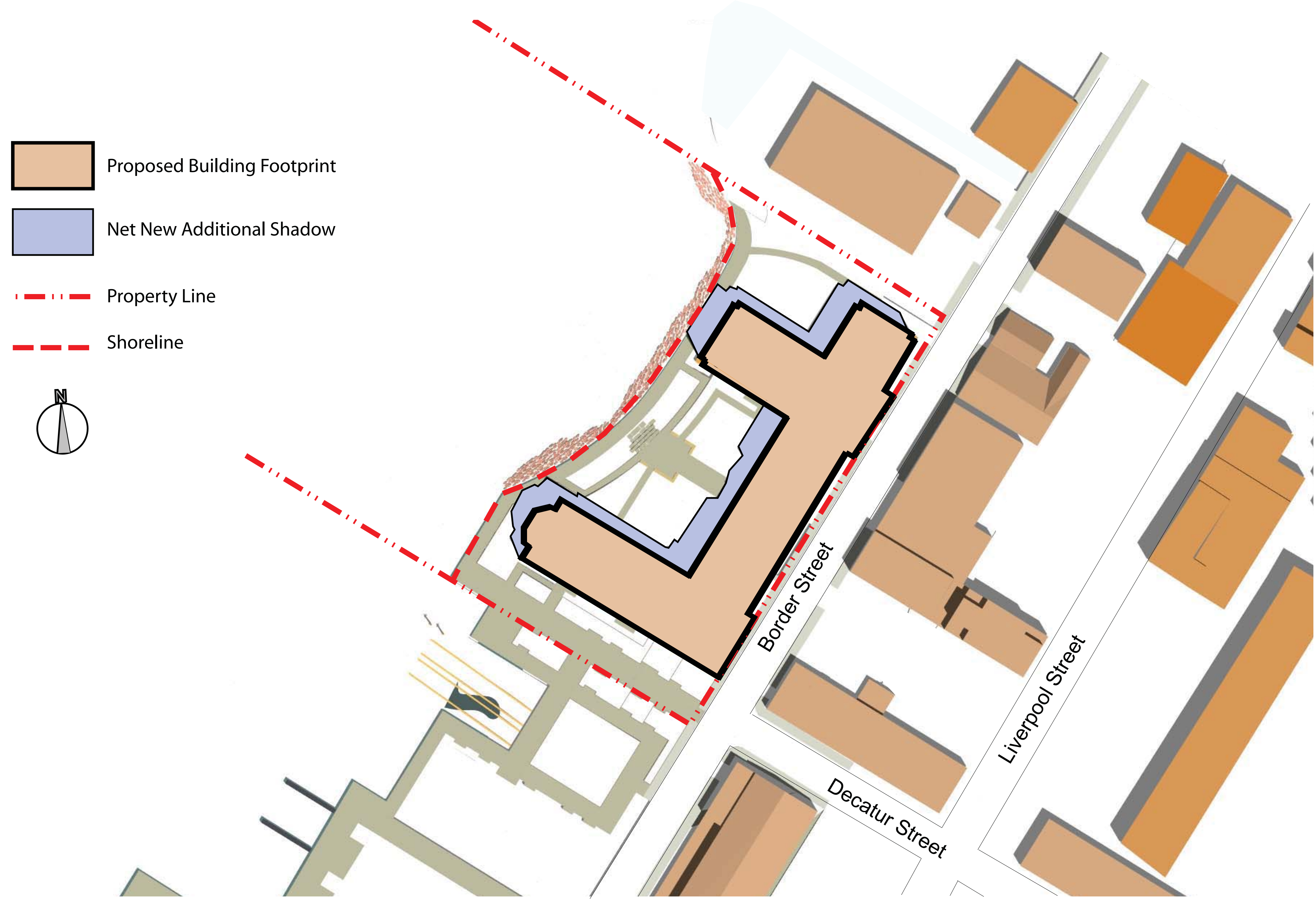


BOSTON EAST

Figure 5-8

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: June 21, 9 am

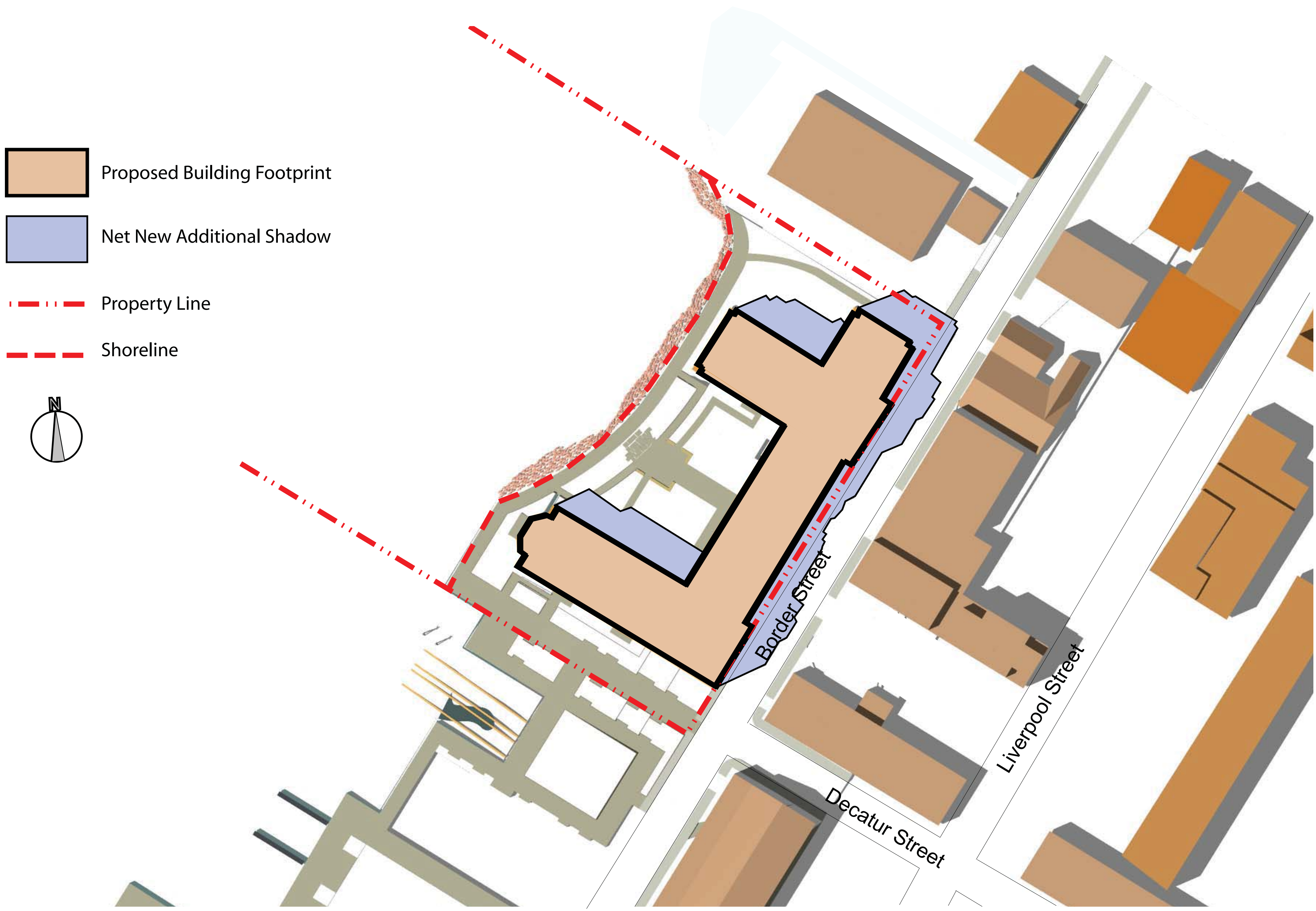


BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Figure 5-9

Shadow Analysis: June 21, 12 pm

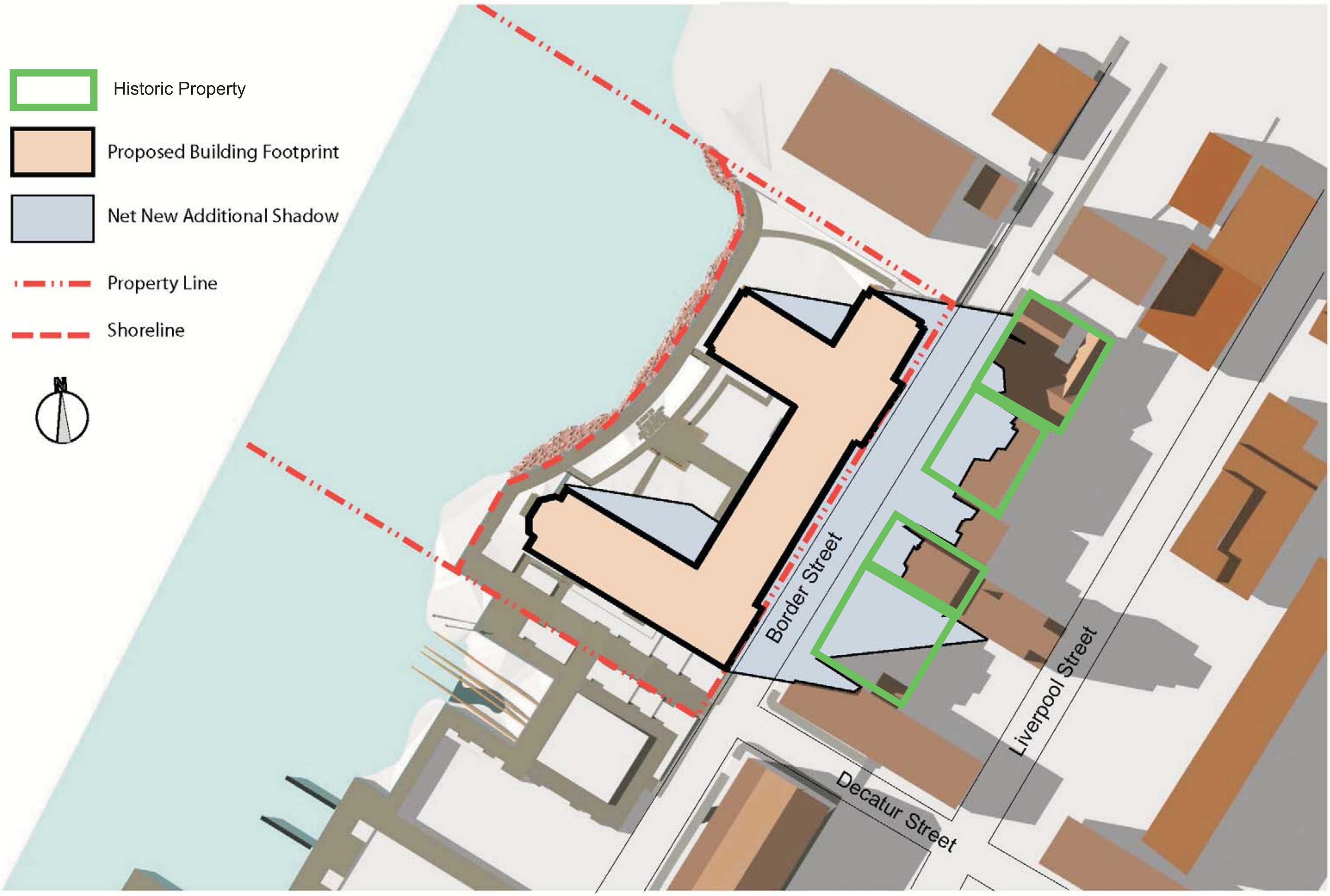


BOSTON EAST

Figure 5-10

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: June 21, 3 pm

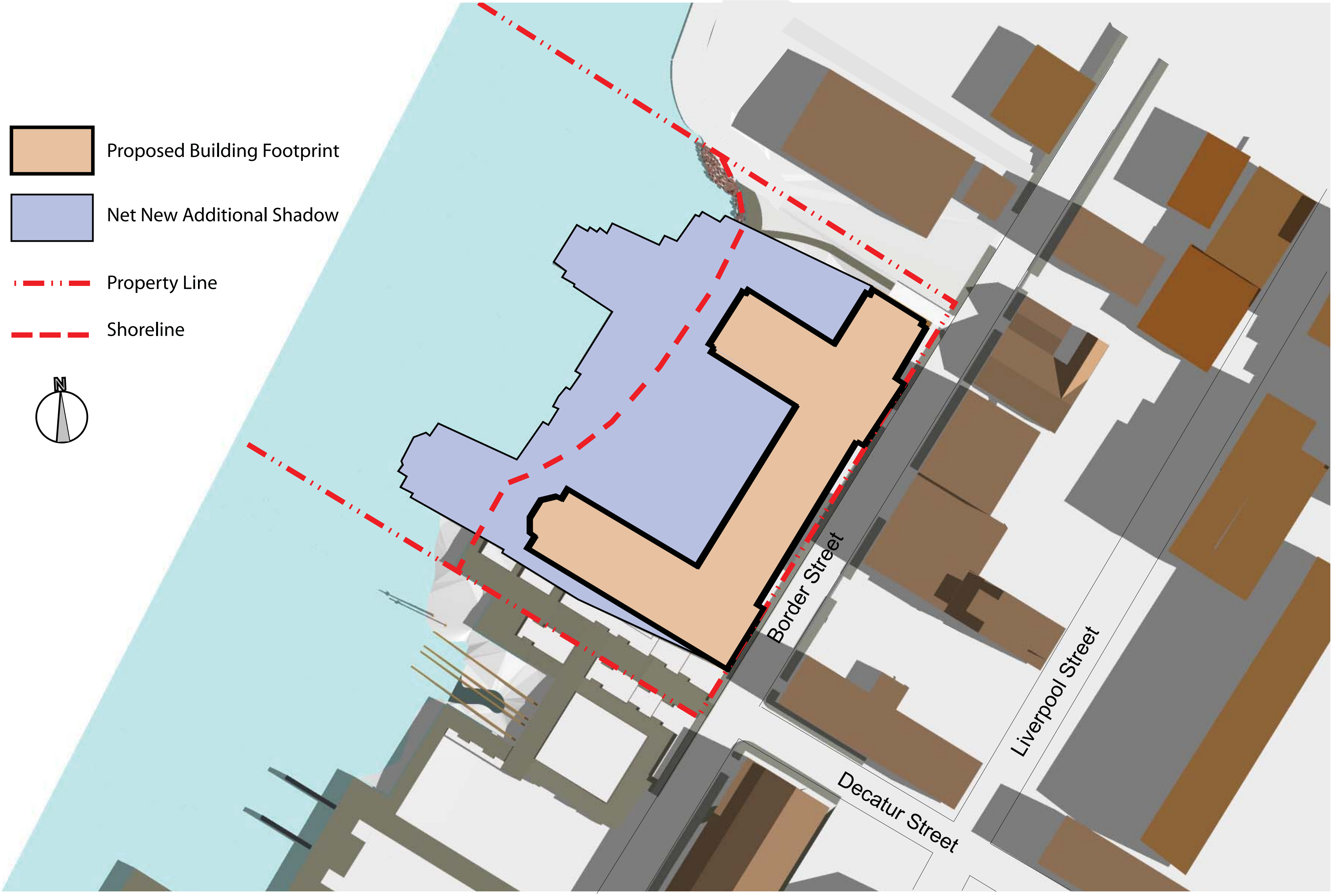


BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Figure 5-11

Shadow Analysis: June 21, 6 pm

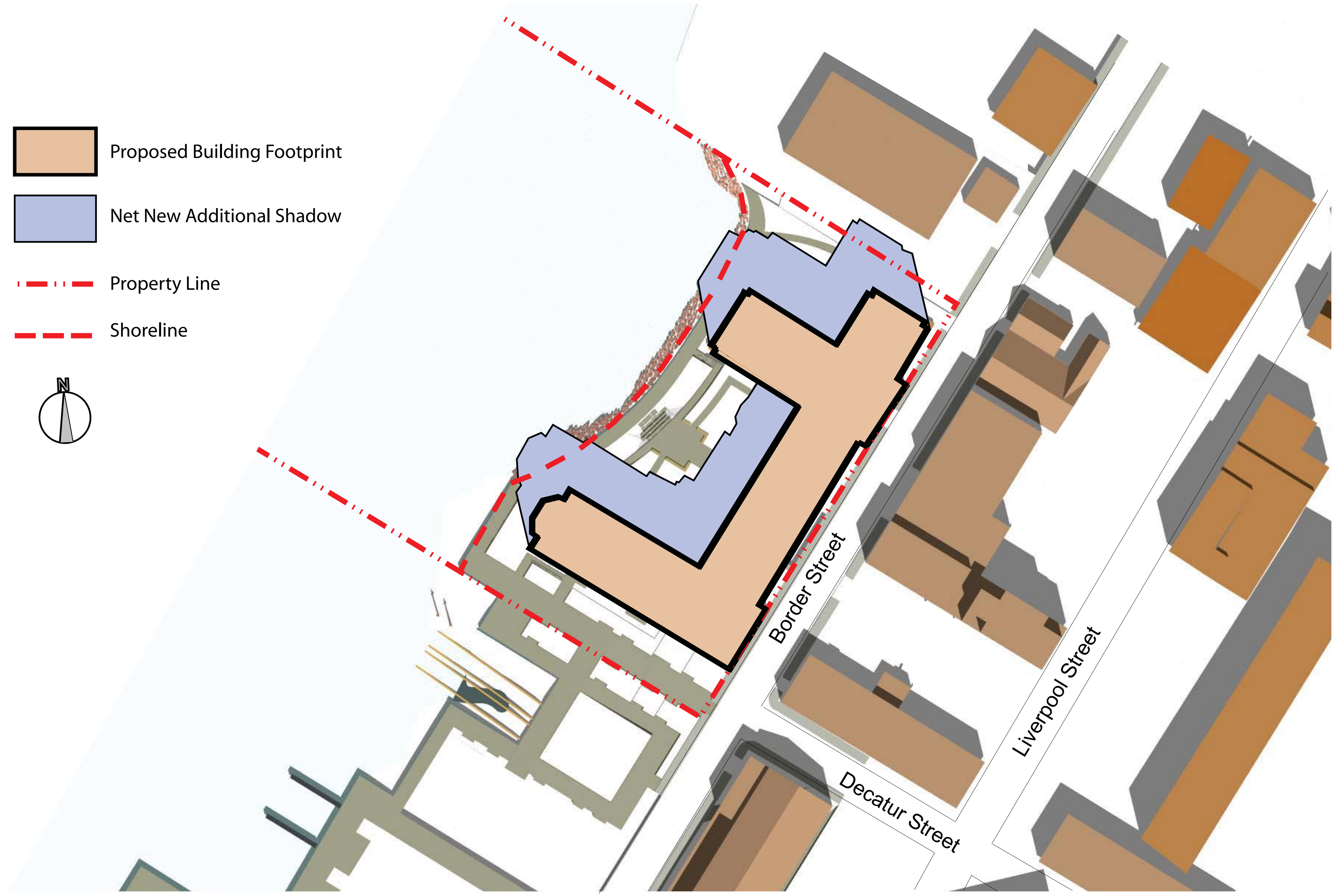


BOSTON EAST

Figure 5-12

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: September 21, 9 am

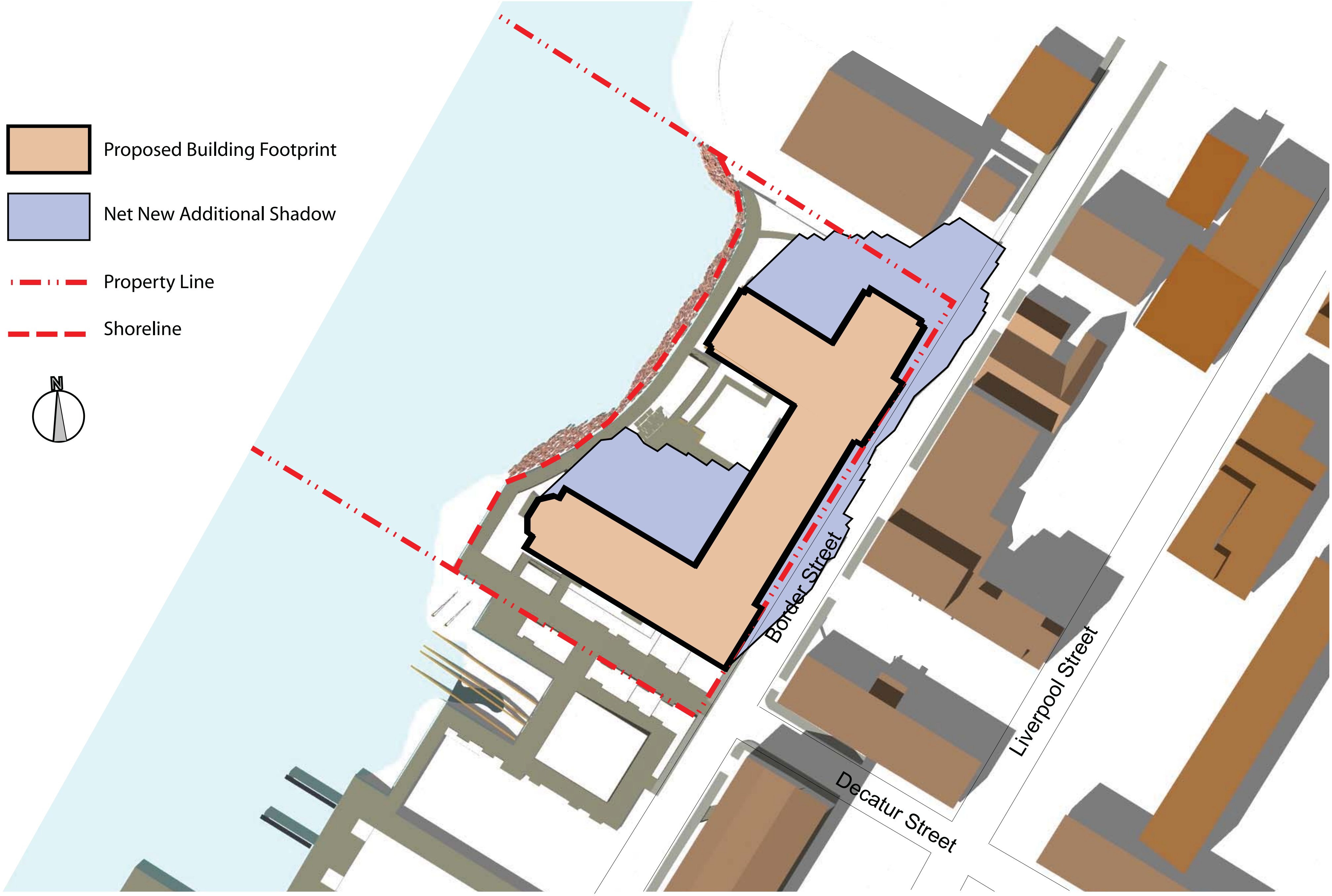


BOSTON EAST

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Figure 5-13

Shadow Analysis: September 21, 12 pm

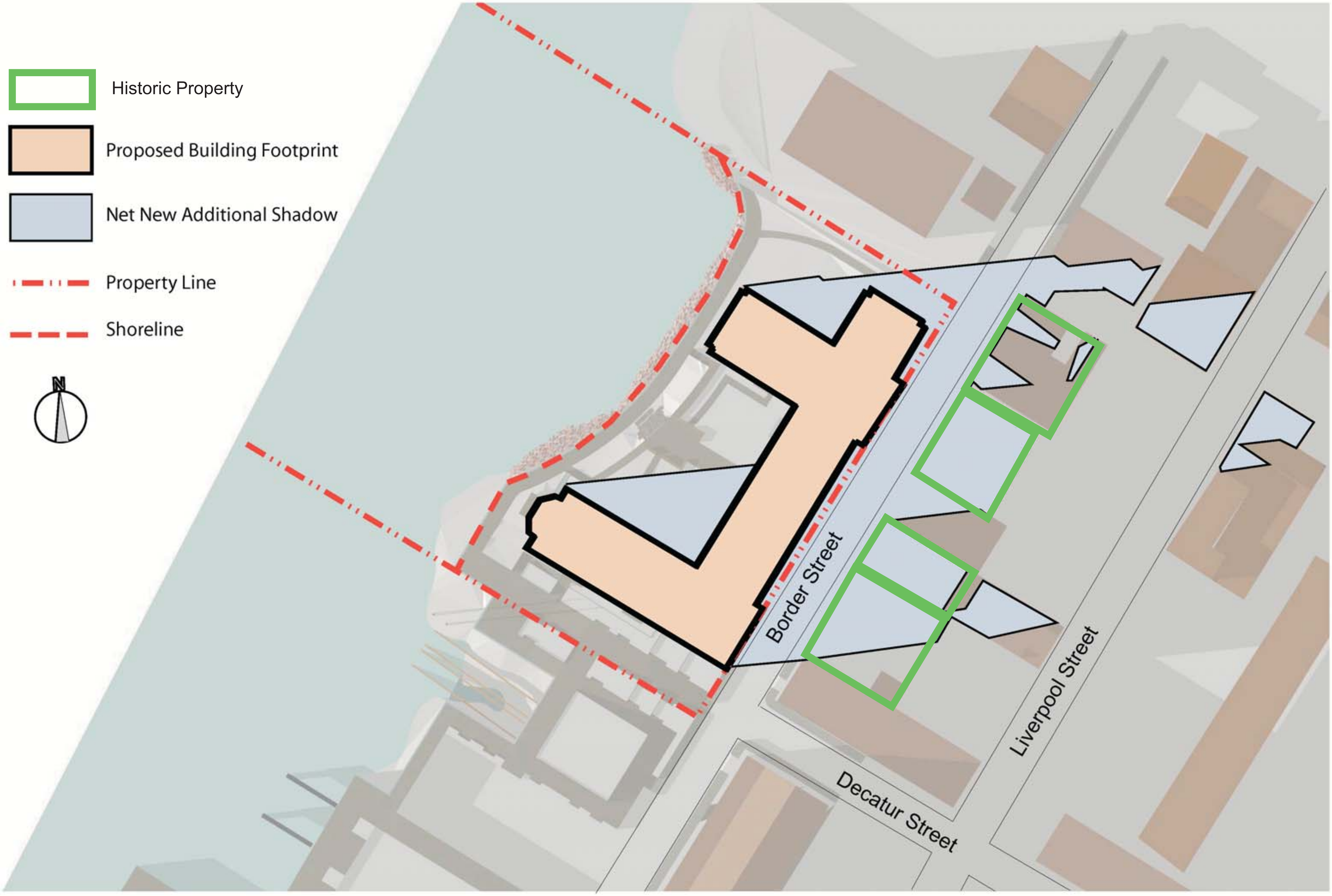


BOSTON EAST

Figure 5-14

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: September 21, 3 pm



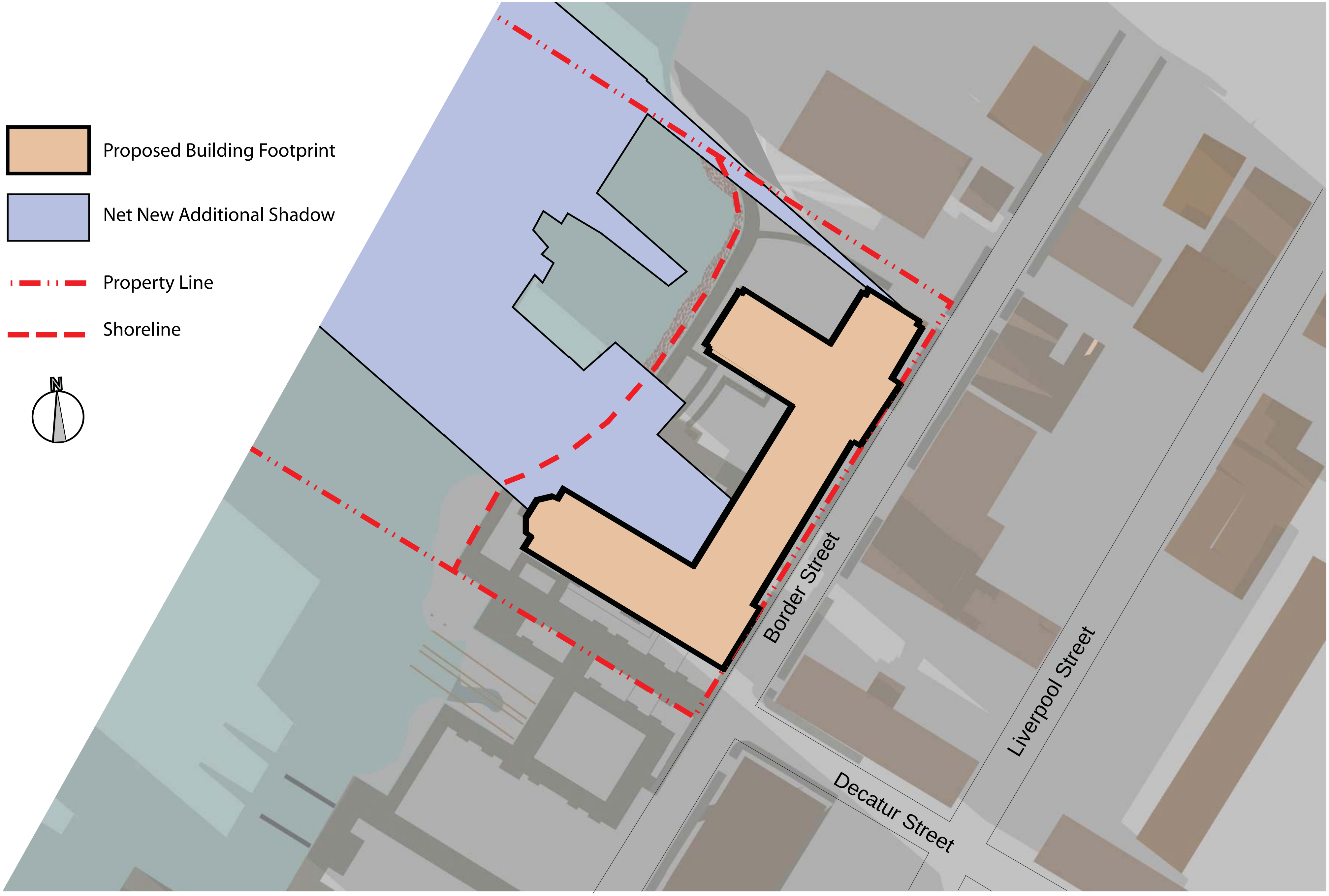
BOSTON EAST

Figure 5-15

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC

March 10, 2008

Shadow Analysis: September 21, 6 pm

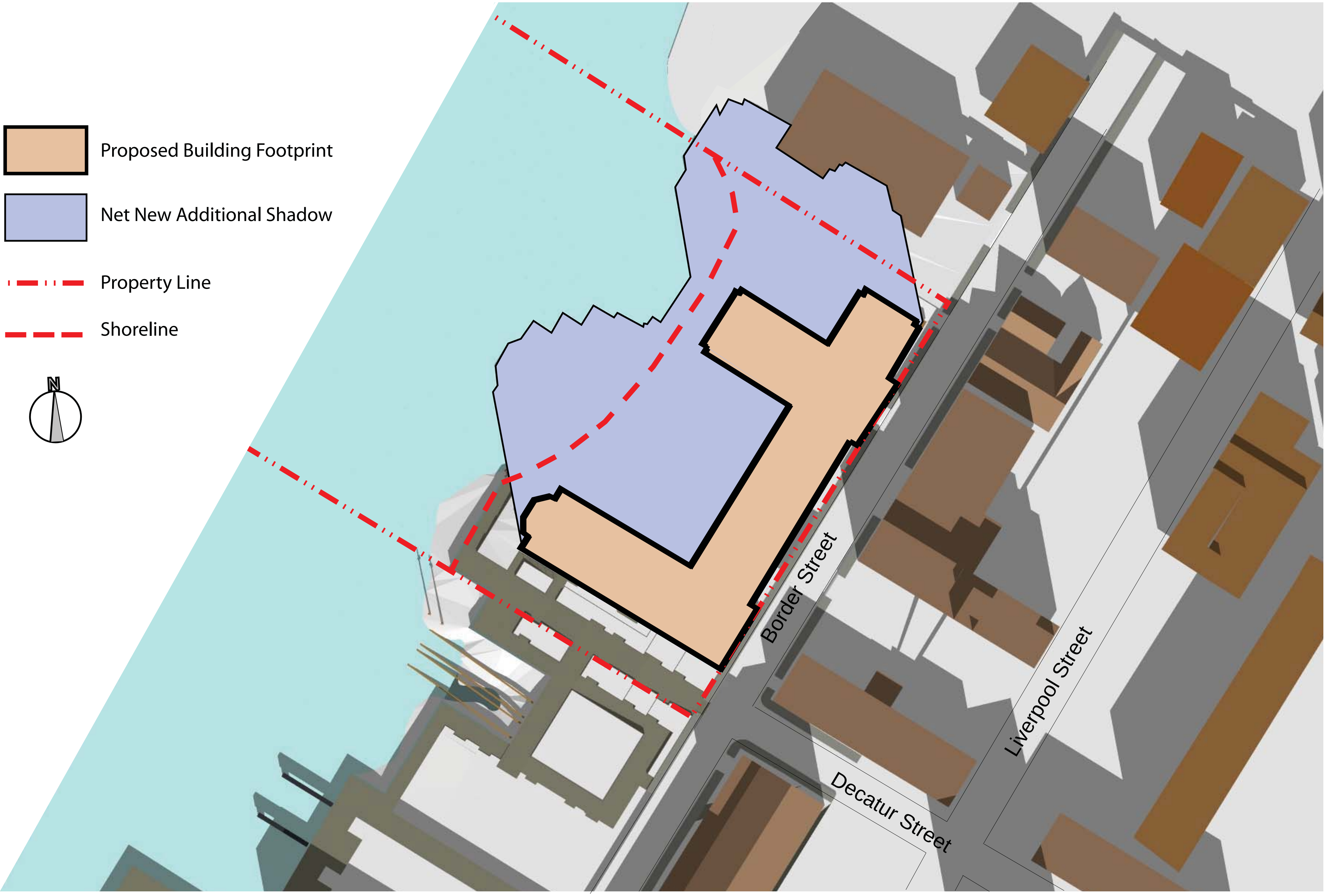


BOSTON EAST

Figure 5-16

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: December 21, 9 am

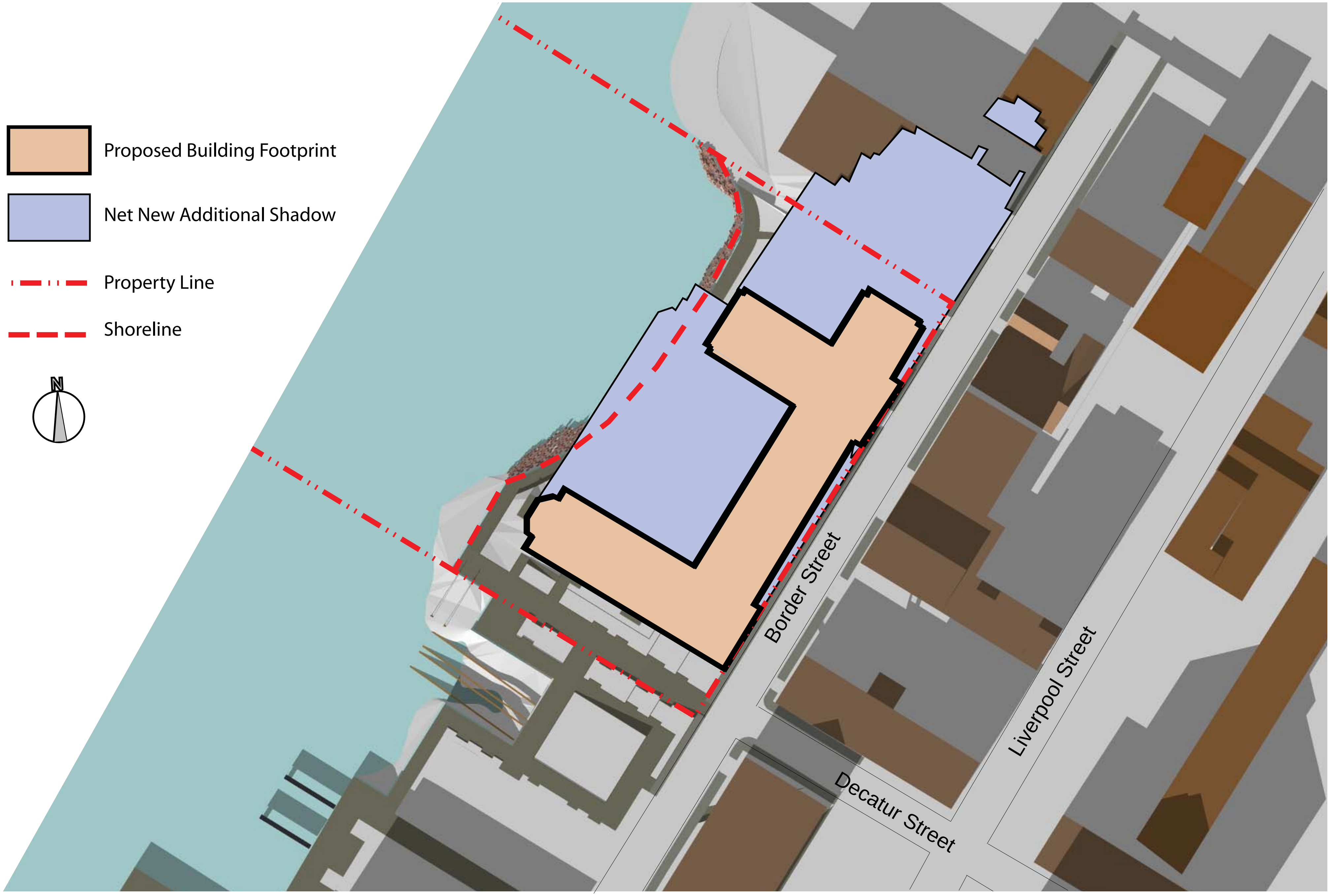


BOSTON EAST

Figure 5-17

East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Shadow Analysis: December 21, 12 pm



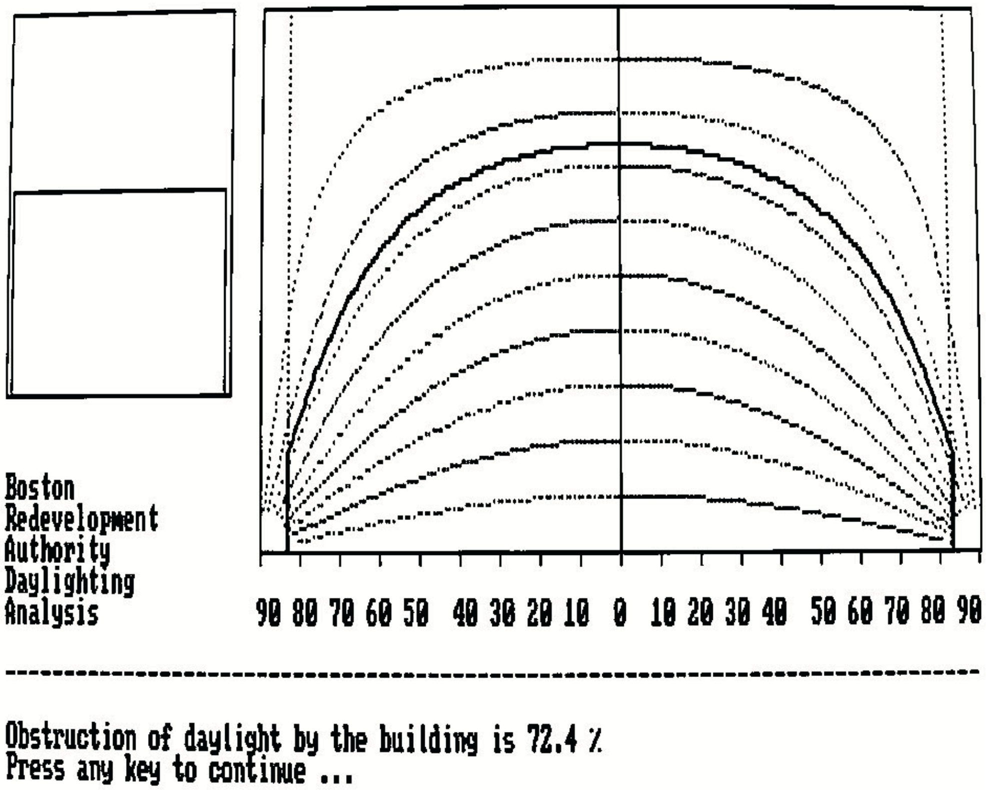
ICON architecture

BOSTON EAST

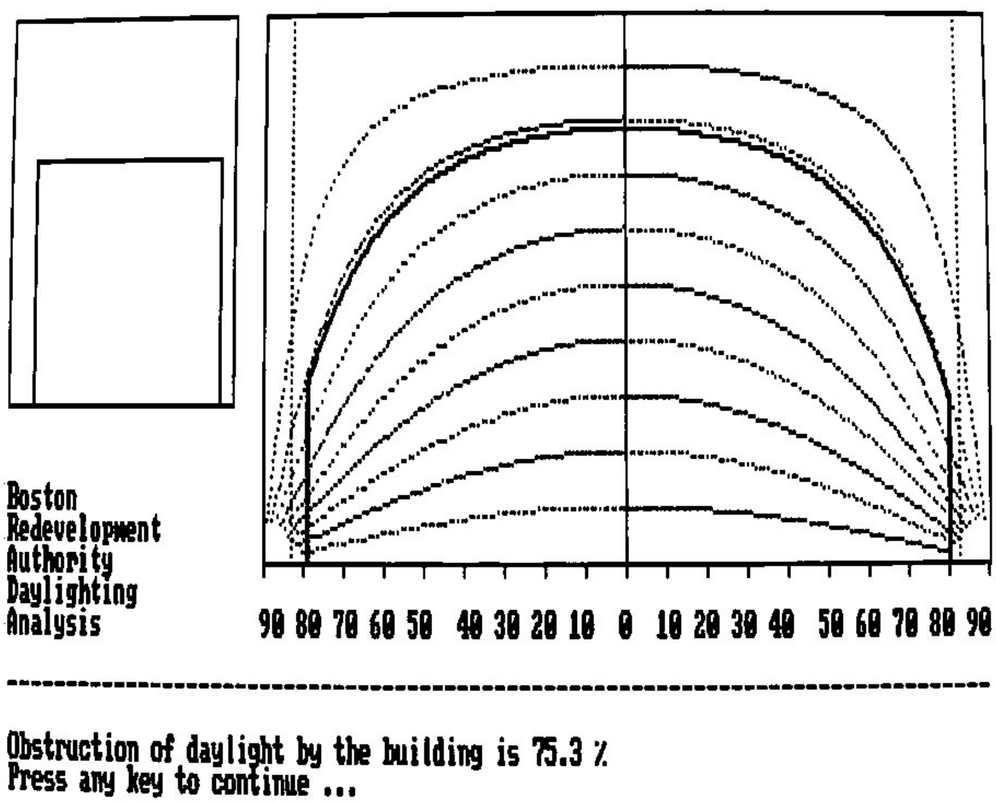
East Boston, Massachusetts
Trinity Border Street LLC and EBCDC
March 10, 2008

Figure 5-18

Shadow Analysis: December 21, 3 pm

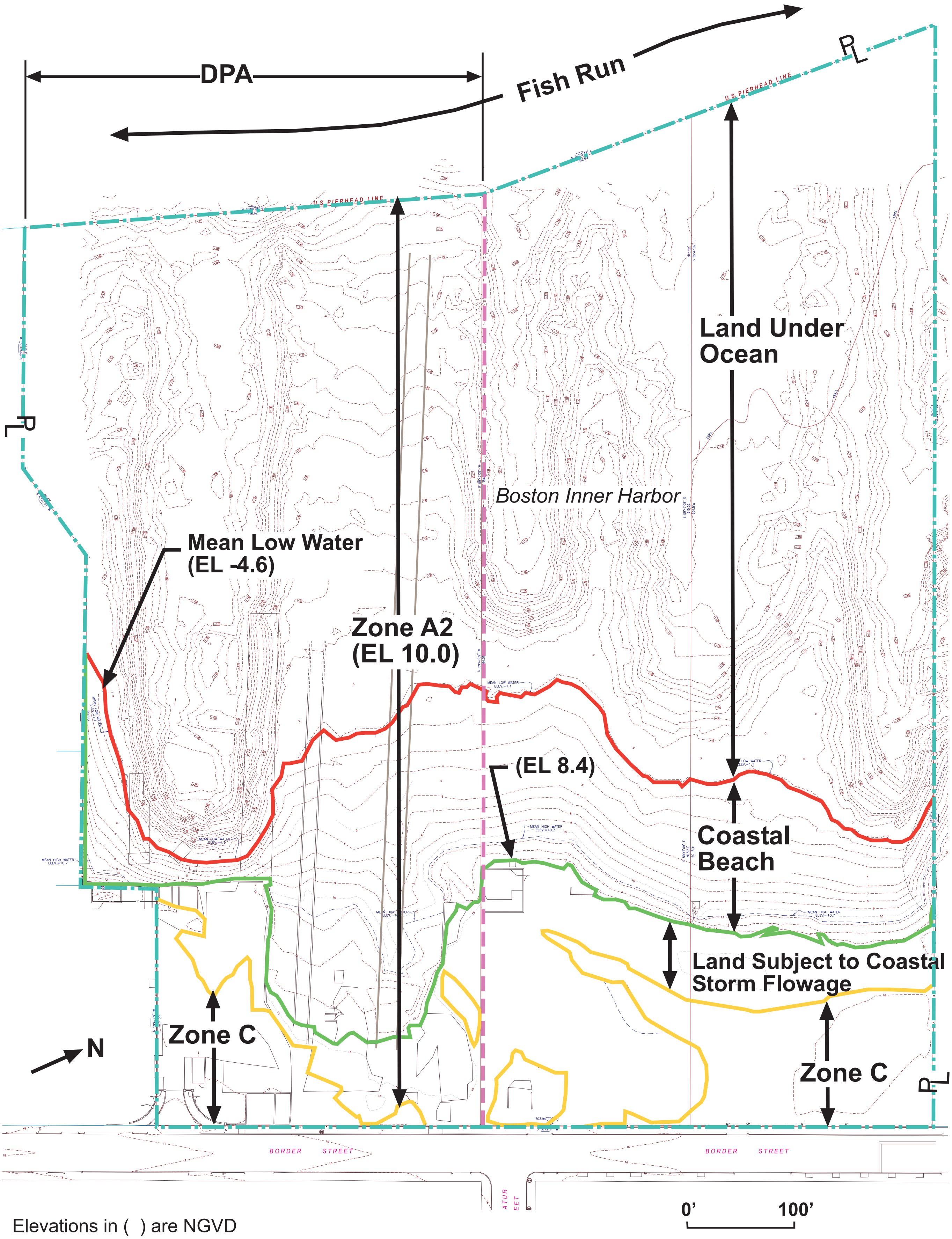


As-of-Right Condition



Proposed Project

Figure 5-19
Daylight Impact Analysis: Border Street
source: BRA,FPA



Elevations in ( ) are NGVD

Figure 5-20
Flood Zones and Wetlands
source: FEMA, FIRM

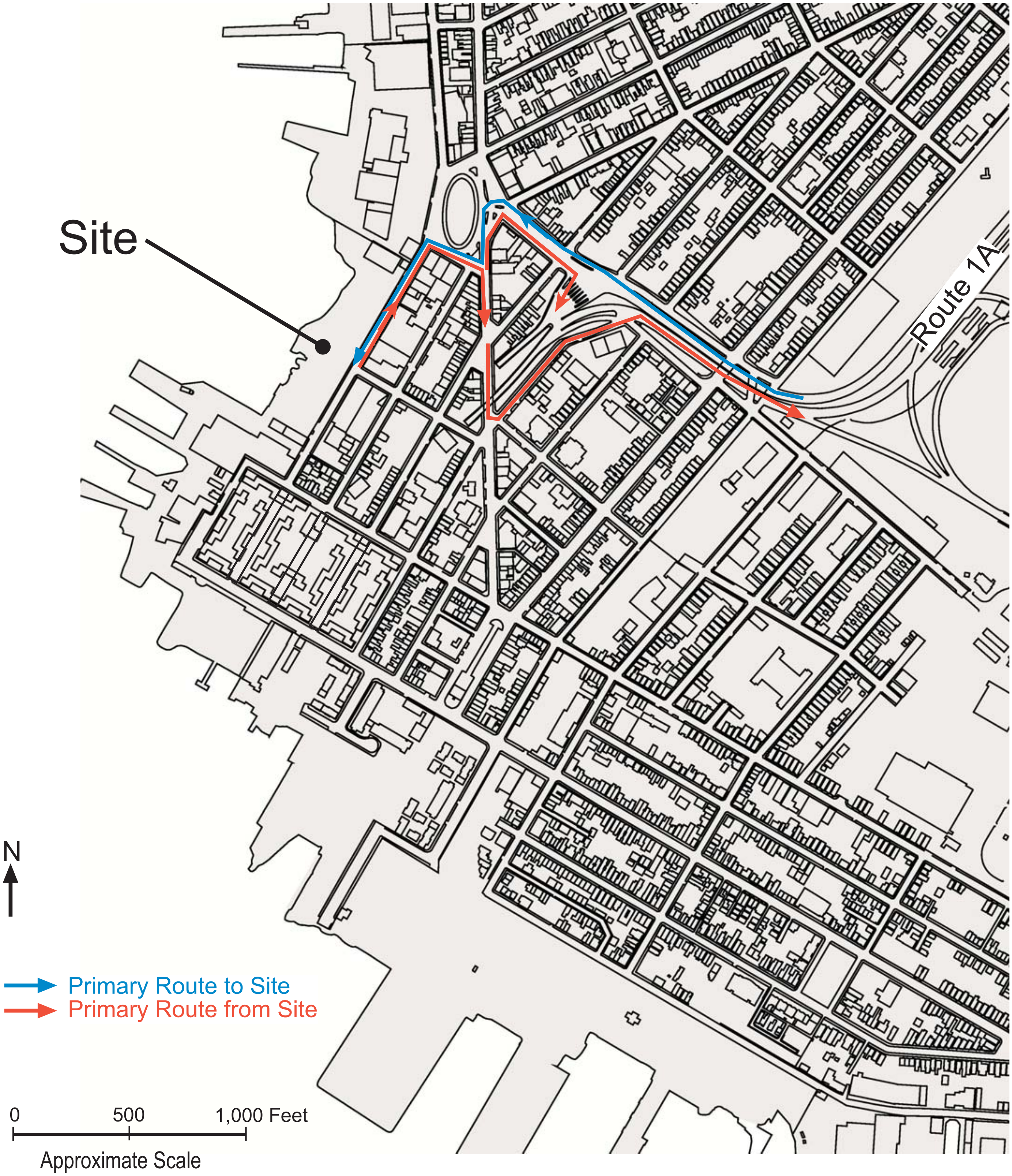


Figure 5-21
Construction Truck Routes
source: BRA

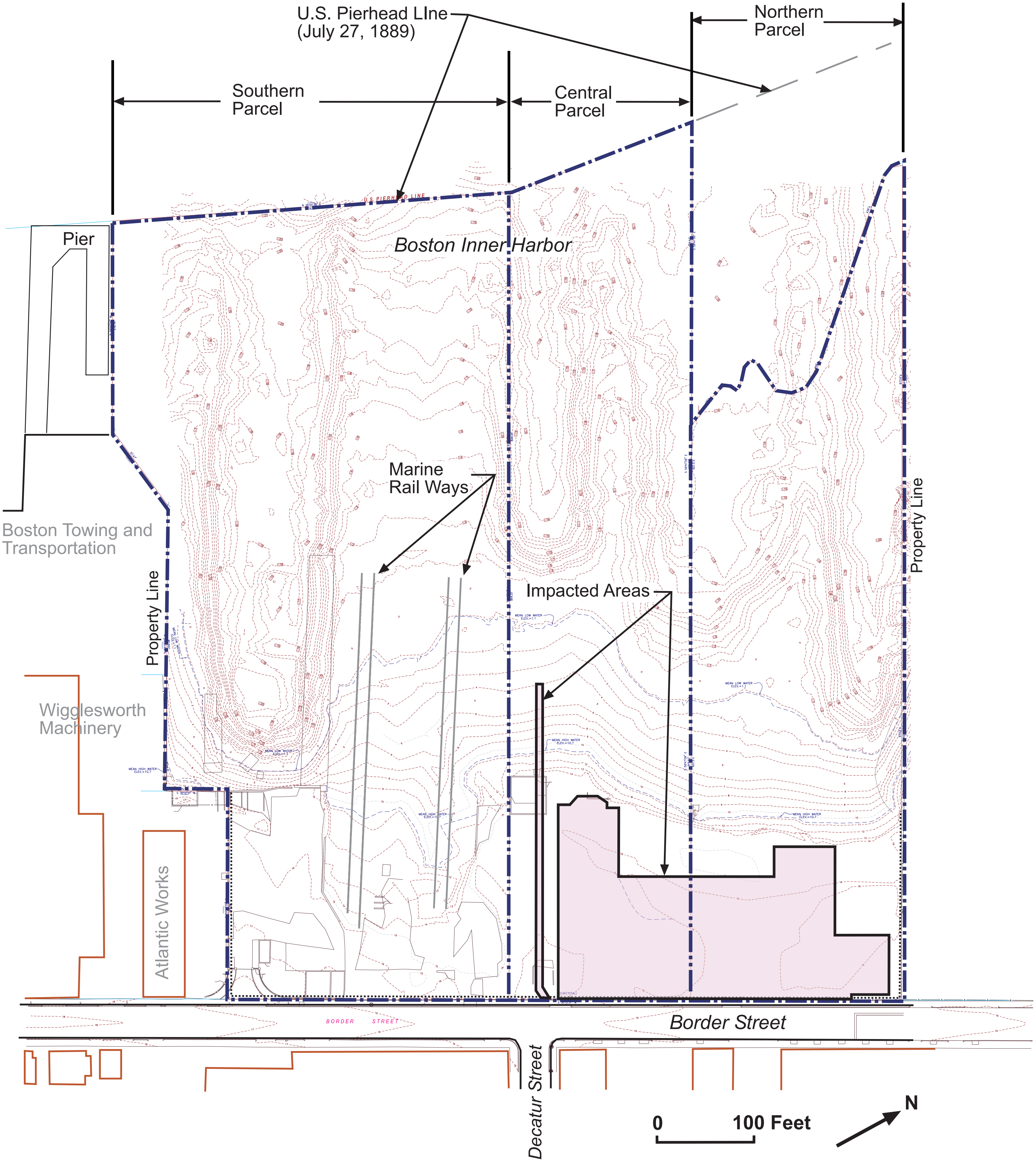


Figure 5-22
Site Parcels and Impacted Areas
sources: Nitsch Engineering

BOSTON EAST
EAST BOSTON, MASSACHUSETTS

Figure 5-23
Historic Resources within the Area of Potential Effect
sources: Massachusetts Historical Commission/PAL Field Survey 2008

Chapter 6

INFRASTRUCTURE

6.0 INFRASTRUCTURE

The following analysis describes the existing utility systems in the Project area and their ability to provide service to the Project. Also discussed are the probable impacts this Project could have on the utility systems and the ways these potential impacts could be mitigated. Best management practices and sustainable design will be incorporated into the Project wherever practical and applicable.

The Project's Civil and MEP Engineers will coordinate with the City agencies responsible for the area's utility systems as the design progresses. Utility connections will be designed to minimize impacts to the surrounding area and all appropriate permits and approvals will be acquired prior to construction. The following sections describe the existing and proposed conditions of the domestic water, fire protection, sanitary sewer, and storm drain systems.

6.1 OVERVIEW OF EXISTING UTILITY SERVICES

The Project Site is bounded by Border Street to the east, abutting properties to the north and south, and Boston Harbor to the west. Border Street contains a 12-inch low-pressure cast iron (CI) water main that was installed in 1857, a 20-inch low-pressure CI water main that was installed in 1897, a Boston Water and Sewer Commission (BWSC) combined sewer line that varies in size (24″x24″, 30″x48″, 32″x48″, and 20″x34″), and a Massachusetts Water Resources Authority (MWRA) sewer line that varies in size (12″ and 15″). Both of the low-pressure water mains are owned and operated by the BWSC. Multiple catch basins are located in Border Street, all of which drain into the BWSC combined sewer system. A 60-inch combined sewer overflow pipe runs through the Project site and discharges into the Boston Harbor. BWSC's combined sewer system connects to the MWRA's sewer system in the portion of Border Street adjacent to the proposed residential building. The existing water distribution and sanitary sewer systems are shown on Figures 6-1, Water System Map and 6-2, Sewer System Map.

The BWSC is in the process of constructing a separated storm drain system in Border Street. This system will collect runoff from the existing catch basins and discharge to the Boston Harbor via a new 60-inch stormwater outfall pipe. See Section 6.4.2 for more information.

A BWSC approved Site Plan and General Service Application is required for the construction of proposed water and sanitary sewer connections to the main lines in Border Street as well as the construction of the site storm drainage system. In addition, a Stormwater Pollution Prevention Plan (SWPPP) will be submitted to BWSC specifying best management practices for protecting the site from erosion and preventing sediment from entering the storm drainage system and Boston Harbor during construction.

Proposed connections to the BWSC's water and sanitary sewer systems as well as the site's storm drainage system will be designed in conformance with the BWSC's design standards, Sewer Use and Water Distribution System Regulations, and Requirements for Site Plans. The Proponent will submit the General Service Application and Site Plans to BWSC for review and approval prior to construction. The Site Plans will indicate the existing and proposed water mains, sanitary sewer lines, and storm drainage system within the site and in Border Street. The Site Plans will show any existing utilities to be abandoned, the locations of proposed connections, and the limit of work to be performed in Border Street. Abandoned services will be cut and capped at the main line according to BWSC standards.

6.2 WATER SYSTEM

6.2.1 EXISTING WATER SERVICE

The BWSC owns, operates, and maintains the water distribution system in the vicinity of the Project site. Border Street contains a 12-inch low pressure cast iron (CI) water main that was installed in 1857 and a 20-inch low pressure CI water main that was installed in 1897. A 6-inch water line enters the site from the 12-inch CI water main. The 6-inch water line reduces to a 4-inch water line and continues into the site. The service is capped near the shoreline. The existing water distribution system is illustrated on Figure 6-1.

Multiple fire hydrants are located in the sidewalk along Border Street. One hydrant is located near the southeast corner of the proposed marine facility building. A second hydrant is located between the proposed marine facility building and the proposed residential building. A third hydrant is located northeast of the proposed residential building. If work is proposed in the sidewalk on Border Street, the plans will indicate that these hydrants must remain in operation during construction.

There are no expected water capacity problems in the vicinity of the Project site. The results of a pending flow test by BWSC will confirm the ability of the water distribution system to service the proposed development.

6.2.2 ESTIMATED PROPOSED WATER DEMAND

The Project's estimated proposed water demand for domestic sources is based on the estimated sanitary flow. A conservative factor of 1.10 is applied to the estimated sanitary flow to account for consumption and other miscellaneous losses. The Project's estimated peak water demand for domestic sources is 26,740 gallons per day (gpd). This water will be supplied by the BWSC.

6.2.3 PROPOSED WATER SERVICE

Proposed domestic water service will connect to one of the low-pressure water mains in Border Street. The size and locations of proposed domestic water services will be coordinated with the Plumbing Engineer. Domestic water service to the proposed buildings will be metered in accordance with BWSC standards, which includes a meter transmission unit (MTU) as part of BWSC's automatic meter reading system. A gate valve will be installed on these new domestic water lines to minimize public hazard or inconvenience in the event of a water main break. A valve box and cover will be installed over the gate valve to provide shut-off access. If required, internal booster pumps will be included in the design by the Plumbing Engineer to provide adequate domestic water pressure to the upper floor spaces.

Proposed fire protection service will connect to one of the low-pressure water mains in Border Street. The size and locations of proposed fire protection service will be coordinated with the Fire Protection Engineer. As with the domestic water service, a gate valve will be installed on these new fire protection lines to minimize public hazard or inconvenience in the event of a water main break. A valve box and cover will be installed over the gate valve to provide shut-off access. If required, internal booster pumps will be included in the design by the Fire Protection Engineer to provide adequate water pressure to all standpipes and sprinkler systems. A double check valve assembly or reduced pressure backflow preventer will be provided on all fire protection services as they enter the building to protect the municipal water supply.

All proposed domestic water and fire protection services will be shown on the Site Plans that get submitted to BWSC. Any existing services to be abandoned shall be cut and capped at the main per BWSC standards.

6.2.4 WATER SUPPLY CONSERVATION AND MITIGATION

The Project will be LEED[1] certifiable through City's Article 37 Green Building Program, which requires the use of water conserving fixtures. As a result, water conservation measures, including low-flow toilets and urinals, restricted flow faucets, and sensor operated sinks, toilets, and urinals, will be incorporated into the design where possible and applicable.

[1] LEED – United States Green Building Council

6.3 SANITARY SEWAGE SERVICE

6.3.1 EXISTING SANITARY SEWER SYSTEM

The BWSC owns, operates, and maintains the combined sewer line on the west side of Border Street as well as the catch basins that drain into this line. The MWRA owns, operates, and maintains the sewer line on the east side of Border Street. The existing sanitary sewer system is illustrated on Figure 6-2.

The BWSC combined sewer line drains into the MWRA sewer line in the area of Border Street adjacent to the proposed residential building. The BWSC system also has a 60-inch combined sewer overflow pipe that travels through the Project site and discharges into Boston Harbor.

Regional sewer service and treatment are provided by the MWRA system, which ultimately connects to the Deer Island Wastewater Treatment Plant. From this treatment plant, sanitary sewer flow is treated and discharged to Massachusetts Bay.

6.3.2 ESTIMATED PROPOSED SANITARY FLOW

The Massachusetts Department of Environmental Projection (DEP) sets forth estimated sewage generation rates for specific establishments and building uses. These values can be related to the number of bedrooms, square footage of a building, number of seats, or various other factors. DEP's estimated sewage generation rates can be found in 310 CMR 15.203 and 314 CMR 7.15.

The proposed construction and building program will increase the effluent discharged to the existing sanitary sewer system. The proposed development includes a seven-story building with public common space and 196 residential units as well as a 20,000 square foot marine facility building. For the Project, the total estimated proposed sanitary flow is 24,310 gpd based upon actual sewage generation at a similar "green building" project. Table 6-1 includes a detailed breakdown of the proposed building program, the respective sewage generation rate for each building use, the total flow for each building use, and the total proposed sanitary flow for the Project.

Per the regulations of 314 CMR 7.00, any proposed development with a new sewer connection that results in a discharge greater than 15,000 gpd but less than 50,000 gpd is required to file a one-time Compliance Certificate with DEP. The Project's building program results in an estimated sewage discharge of 24,310 gpd and therefore the Project will need to file this Compliance Certificate with DEP.

Table 6-1: Estimated Proposed Sewer Discharge

Building Use	Number	Sewage Generation Rate	Total Flow (gpd)
Studio/One Bedroom Unit (90 units)	90 Bedrooms	75 gpd/bedroom[1]	6,750
Two Bedroom Units (106 units)	212 Bedrooms	75 gpd/bedroom[1]	15,900
Common Area	2,100 sf	75 gpd/1,000 sf[2]	160
Marine Facility	20,000 sf	75 gpd/1,000 sf[2]	1,500
Total			24,310

Notes:

1. The sewage generation rate used for residential dwelling units is based on a study of the actual sewage generation rates at the nearby Maverick Landing residential complex.
2. Sewage generation rates taken from the Massachusetts Department of Environmental Protection, 310 CMR 15.00, The State Environmental Code, Title V, Section 15.203: Sewage System Design Flow Criteria; and 314 CMR 7.00, Sewer System Extension and Connection Permit Program, Section 7.15: Calculation of Flows.

6.3.3 PROPOSED SANITARY SEWER CONNECTIONS

Proposed sanitary sewer lines from the new buildings will connect to BWSC's combined sewer line in Border Street. The underground parking garage will have a separate drainage system that collects runoff into an oil/grease separator. The runoff collected by the oil/grease separator will be discharged to BWSC's combined sewer system in Border Street. Oil/grease separators will conform to BWSC standards.

The construction of all connections will be performed so as to minimize any effects on adjacent streets, sidewalks, and any areas within the public right-of-way. All proposed sanitary sewer connections for the new buildings will be kept separate from proposed storm drain connections. Any existing sanitary sewer connections to be abandoned will be cut and capped at the main in accordance with BWSC standards. Also, all required approvals and permits for new sewer connections will be obtained prior to construction.

A flow capacity analysis has been performed on the existing combined sewer system that the Project will be connecting into as well as the MWRA sewer system that accepts all flows from the BWSC system. Information on the existing sewer pipes was obtained from BWSC sewer maps and surveyed information. Flow capacity of the existing sewer pipes was calculated using Manning's Equation. The results of these calculations are presented in Table 6-2.

Table 6-2: Analysis of the Existing BWSC and MWRA Sewer Systems

Manhole	Slope of Pipe	Size of Pipe	Flow Capacity	
BWSC Number	%	Inches	cfs	MGD
9 to 8	0.10	24″x24″	6.21	4.01
8 to 7	0.45	30″x48″	43.50	28.11
7 to RE 010-2	0.07	32″x48″	18.85	12.18
31 to RE 010-2	0.60	20″x34″	18.36	11.87
010-4P27 to 1	0.15	15″	2.33	1.51

Notes:

1. Pipe information from BWSC Sewer Map 27L and 27M and a survey performed by Nitsch Engineering dated January 28, 2008.
2. Sewer manhole numbers for reference only.
3. Flow capacity derived from Manning's Equation.
4. Roughness coefficient (n value) assumed to be 0.015 for all pipes.

It is anticipated that most if not all of the sewer pipes listed in Table 6-2 will receive the estimated proposed sanitary flow from the new development. Based on the Project's estimated proposed sanitary flow of 24,125 gpd and with a peaking factor of five, no capacity problems are expected within the BWSC or MWRA sewer systems. Table 6-3 outlines the Project's estimated daily sanitary flow and its comparison to the most restrictive BWSC combined sewer pipe as well as the MWRA sewer pipe.

Table 6-3: Comparison of Sanitary Flow and System Capacity

Estimated Flow (gpd)	Estimated Flow (cfs)	Peaking Factor	Revised Estimated Flow (cfs)	Capacity of Existing Sewer Pipes (cfs)	
				BWSC	MWRA
24,310	0.038	5	0.188	6.21	2.33

6.3.4 SEWER SYSTEM MITIGATION

To help conserve water and reduce the amount of wastewater generated by the Project, water conservation devices, including low-flow toilets and urinals as well as flow-restricting faucets, will be incorporated into the Project design wherever possible.

As mitigation for the I/I program, the proponent will be designing, permitting, and constructing a new storm drain outlet that will run from Border Street to Boston

Harbor. The proponent will work with the BWSC to coordinate the timing and location of the proposed work.

6.4 STORM DRAINAGE SYSTEM

6.4.1 EXISTING STORM DRAINAGE SYSTEM

The existing site soils consist of Udorthents as classified by the National Resource Conservation Service (NRCS) soil survey. This soil is described as an area previously excavated and filled with a sandy/gravelly material. All stormwater runoff from the site sheet flows into the Harbor. Surface runoff from Border Street is collected by catch basins and drains into the existing combined sewer system. A 60-inch combined sewer overflow pipe runs through the Project site and discharges into the Boston Harbor. Table 6-4 below lists the pre-development peak discharge rates for the site.

Table 6-4: Pre-Development Peak Discharge Rates

Storm Event	Runoff Rate (cfs)
2-year	6.00
10-year	10.47
25-year	13.41
100-year	17.03

6.4.2 PROPOSED STORM DRAINAGE SYSTEM

BWSC is currently in the process of constructing a separated storm drain system in Border Street. This system will collect runoff from the existing catch basins and discharge to Boston Harbor via a new 60-inch stormwater outfall pipe. The design and construction of the separated storm drain system in Border Street is being handled by BWSC. The design and construction of the 60-inch stormwater outfall pipe will be handled by the proponent.

The Project's site drainage system will include deep-sump catch basins with hoods, area drains with sumps, and water quality structures to collect, treat, and discharge stormwater from the site. Underground recharge systems will be implemented where applicable. The drainage system will ultimately connect to the 60-inch stormwater outfall pipe that discharges to the Boston Harbor. Permanent plaques bearing the warning "Don't Dump – Drains to Boston Harbor" will be installed at all new catch basins and area drains and at any existing catch basins that are adjacent to a reconstructed area.

Runoff from the proposed Harborwalk and some walkways and lawn areas will sheet flow into the Boston Harbor. Runoff from the surface parking lot will be collected with deep-sump catch basins with hoods and treated using a water quality structure. Treated runoff from the surface parking lot and all other onsite runoff from roof areas, landscaped planters, and the remaining walkways will be collected and routed to the 60-inch stormwater outfall pipe.

Stormwater will discharge to the Boston Harbor by means of the 60-inch outfall pipe or via overland flow. The Harbor is identified as land subject to coastal storm flowage, and therefore, per DEP Stormwater Management Standard #2, pre-development peak discharge rates do not need to be maintained. Table 6-5 below lists the post-development peak discharge rates for the site as well as the increase from the pre-development peak discharge rates.

Table 6-5: Post-Development Peak Discharge Rates

Storm Event	Runoff Rate (cfs)	Increase (cfs)
2-year	9.15	3.15
10-year	13.89	3.42
25-year	16.91	3.50
100-year	20.57	3.54

During construction, existing and proposed catch basins and area drains will be protected with filter fabric, silt sacks, and/or hay bales to prevent sediment from entering the structures. These controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

In addition, the proponent will obtain a NPDES General Permit for Construction from the U.S. Environmental Protection Agency and DEP, as required. A copy of the SWPPP submitted with the NPDES permit will also be provided to BWSC.

6.4.3 DEP STORMWATER MANAGEMENT POLICY

The DEP Stormwater Management Policy requires projects that fall under the jurisdiction of the Massachusetts Wetlands Protection Act (WPA) to meet performance standards with regard to stormwater discharges to wetland resource areas. Due to its location in proximity to Boston Harbor, the project is subject to the WPA, and stormwater BMPs have been designed in conformance with the DEP performance standards. BMPs and mitigation measures may include deep sump hooded catch basins, mechanical separators, and recharge systems. The following paragraphs present how the project conforms to the DEP Stormwater Management Standards:

Standard #1: No new untreated stormwater will discharge into, or cause erosion to, wetlands or waters.

Compliance: The proposed development shall collect stormwater via a closed drainage system, treat the stormwater utilizing BMPs, and discharge via a 60-inch outfall pipe into the Boston Harbor.

Standard #2: Post-development peak discharge rates do not exceed pre-development rates on the site either at the point of discharge or down-gradient of the property boundary for the 2- and 10-year 24-hour design storms. The project's stormwater design will not increase flooding impacts offsite for the 100-year design storm.

Compliance: Stormwater from the site will discharge to land subject to coastal storm flowage (Boston Harbor) and therefore the Project will request that the Boston Conservation Commission waive Standard #2.

Standard #3: The annual groundwater recharge for the post-development site must approximate the annual recharge from existing site conditions, based on soil type.

Compliance: This standard is not applicable given that the site's proximity to the harbor precludes providing onsite groundwater recharge

Standard #4: For new development, the proposed stormwater management system must achieve an 80% removal rate for the site's average annual load of TSS.

Compliance: The stormwater management system for the project will incorporate several BMPs so as to achieve at least 80% total suspended solid removal (TSS).

Standard #5: If the site contains an area with Higher Potential Pollutant Loads (as prescribed by the Policy), BMPs must be used to prevent the recharge of untreated stormwater.

Compliance: Activities at the site are limited to residential, marine, and accessory uses. The project does not include marine service or dispensing of fuels. The project will not be considered a land use with higher pollutant load.

Standard #6: If the site contains areas of Sensitive Resources (as prescribed by the Policy), such as rare/endangered wildlife habitats, ACECs, etc., a larger volume of runoff from the "first flush" must be treated (1 inch of runoff from impervious area vs. the standard ½ inch).

Compliance: The project will not discharge to or affect any critical areas

Standard #7: Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable.

Compliance: Although the site is vacant with vegetated cover, the pier remains and soil type are evidence of its former use as a shipyard and should be considered a redevelopment project. The proposed development will comply with all applicable Stormwater Management Standards.

Standard #8: Erosion and sediment controls must be designed into the project to minimize adverse environmental effects.

Compliance: The erosion control measures incorporated into the project include the placement of haybale/siltation barriers and the installation of silt sacks in catch basins. Erosion control measures will be placed around stockpiles of loose materials. The measures will be inspected and maintained until the disturbed areas are stabilized.

Standard #9: A long-term BMP operation and maintenance plan is required to ensure proper maintenance and functioning of the stormwater management system.

Compliance: An Operations and Maintenance Plan including long-term BMP operation requirements will be prepared to ensure proper maintenance and functioning of the system. The Operations and Maintenance Plan will ensure that the facility provides adequate preventative maintenance to minimize discharge of contaminants to Boston Harbor. Facility personnel will inspect the stormwater management system on a routine basis not less than once per month for the first six months of operation and annually thereafter. A typical maintenance schedule is provided below:

1. Catch Basins and Manholes shall be inspected for accumulation of silt, sediment, or debris on a monthly basis. Cleaning will be performed whenever the sediment level rises to within one foot of invert elevation of the outlet pipe. Removed sediment will be disposed off site by a qualified waste disposal contractor in accordance with state and federal regulations.

2. Mechanical Separators shall be inspected and maintained in accordance with the manufacturer's recommendations. During the first year of operation, the units shall be inspected monthly to determine an appropriate maintenance schedule based on

actual site conditions. Mechanical Separators shall be inspected annually at the end of the winter season and cleaned as necessary. Accumulated sediment will be removed by means of a vacuum truck and disposed off site by a qualified waste disposal contractor in accordance with state and federal regulations.

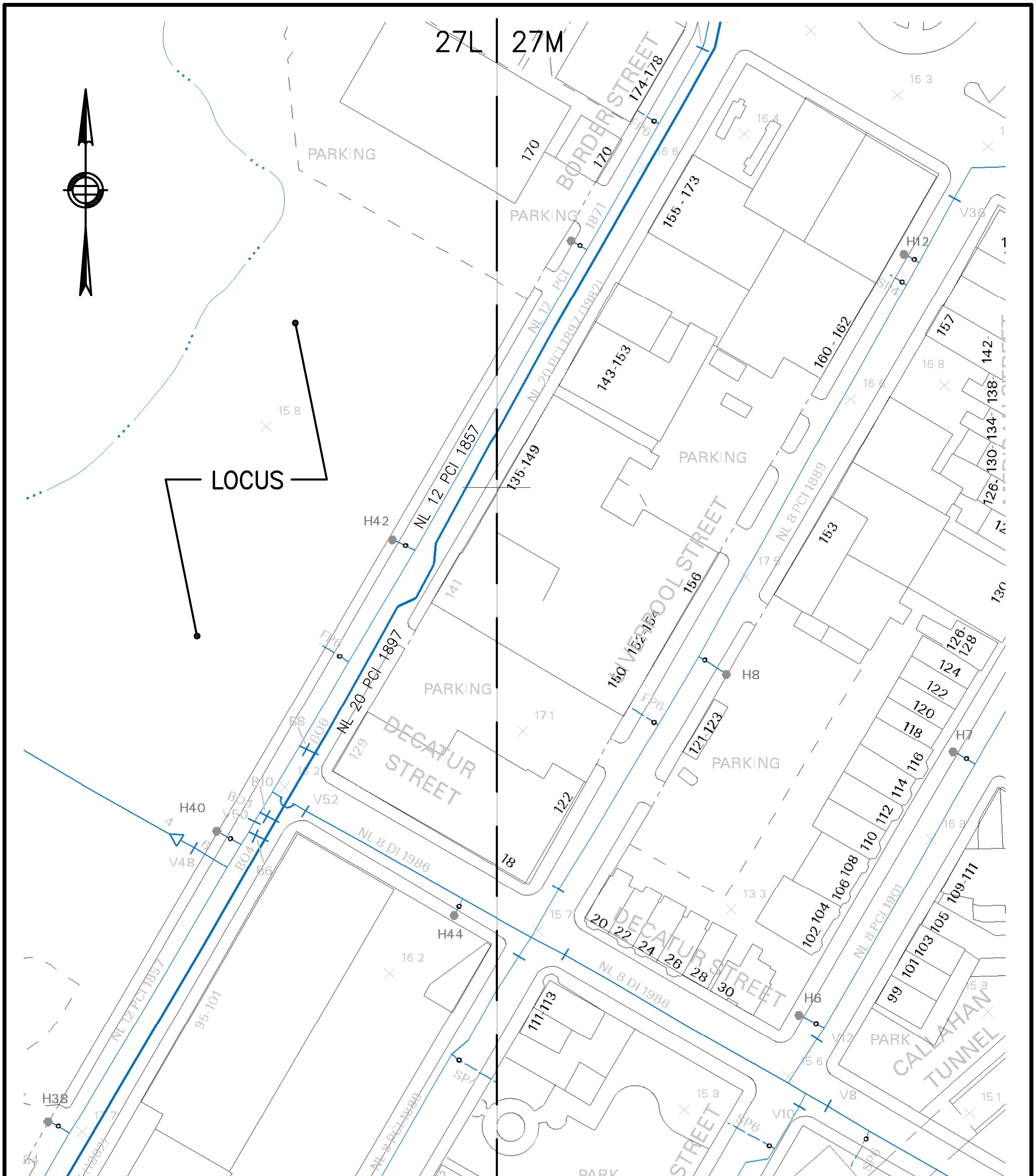
3. Street sweeping of the project site shall be performed on an as-needed basis. At a minimum, street sweeping will be performed once per year during the spring to remove salt and sand from snow removal and de-icing operations.

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

Compliance: No illicit discharges, including wastewater, process wastes, toxic pollutants, and hazardous substances will be introduced into the stormwater management system. An Illicit Discharge Compliance Statement will be filed with the Boston Conservation Commission prior to receiving a Certificate of Compliance for the Project.

6.5 ENERGY AND TELECOMMUNICATIONS

The survey plan prepared by Nitsch Engineering indicates that there are electric, telephone, cable, and gas services in Border Street that are accessible to the proposed development. The MEP Engineer will coordinate the design of these services with the respective utility companies.

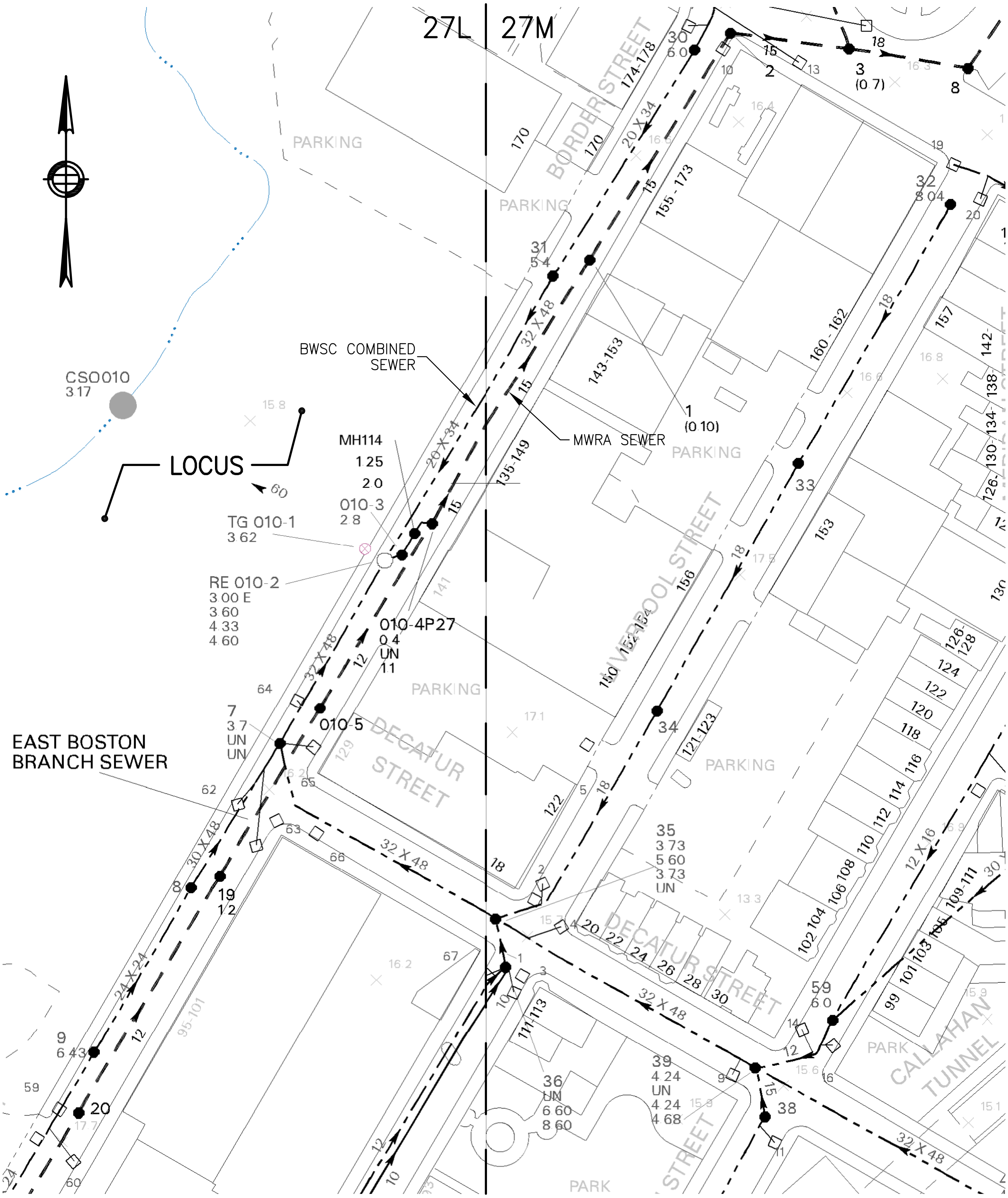


BOSTON WATER AND SEWER COMMISISON
WATER SYSTEM MAP

TRINITY BOSTON EAST
EAST BOSTON, MA

SCALE 1"=100'

FIGURE 6-1



BOSTON WATER AND SEWER COMMISSION
SEWER SYSTEM MAP

TRINITY BOSTON EAST
EAST BOSTON, MA

SCALE 1"=100'

FIGURE 6-2

Appendix 1

MEPA CERTIFICATE

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

DEVAL L. PATRICK
GOVERNOR
TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR
IAN A. BOWLES
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

December 12, 2007

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Boston East
PROJECT LOCATION	: 103-148 Border Street - East Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14123
PROJECT PROPONENT	: Trinity Border Street, LLC
DATE NOTICED IN MONITOR	: November 12, 2007

Pursuant to the Massachusetts Environmental Policy Act (G. L., c. 30, s. 61-62H) and Sections 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that the above project requires the preparation of a mandatory Environmental Impact Report (EIR).

According to the Environmental Notification Form (ENF), the proposed project consists of the construction of 241,859 square foot (sf) 196-unit residential development. The project will include a 1,840 sf community gallery within the residential building, a 20,000 sf marine industrial building, 560 sf finger piers (2) supporting a marine travel lift, 50,318 sf of open space, and 750 linear feet of Harborwalk (12 feet wide) along the entire waterfront side of the site. The project is comprised of two development areas: one on the Non-Designated Port Area with a residential building, and a second area located within a Designated Port Area (DPA) on the south side of the site that includes a two-story marine industrial facility with finger piers and a marine travel lift. Thirteen percent (26) of the residential units will be affordable. The site contains about 3.4 acres of land that is vacant of structures, and consists of filled and flowed Commonwealth tidelands. The project site also contains approximately 10.8 acres of watersheet.

The project is subject to a mandatory EIR pursuant to Section 11.03(3)(a)(5) of the MEPA regulations because it requires a Chapter 91 License for more than one acre of new non-water dependent use of tidelands. It may require a 401 Water Quality Certificate, a Construction

Dewatering Permit, a Notification of Construction and Demolition, Compliance with the Massachusetts Contingency Plan, and a Chapter 91 Waterways License from the Department of Environmental Protection (MassDEP). The project will require approval of an amendment to the Municipal Harbor Plan (MHP) by the Executive Office of Energy and Environmental Affairs (EEA). The Massachusetts Historical Commission (MHC) will evaluate the project impacts to potential historical resources. The project must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site. The project may require a Notice of Construction and a Section 10/Section 404 Programmatic General Permit? from the U.S. Army Corps of Engineers. It may need to undergo Federal Consistency Review by the Massachusetts Coastal Zone Management (MCZM) Office. The project will require an Order of Conditions from the Boston Conservation Commission. Because the project site requires a Chapter 91 Waterways License, MEPA jurisdiction extends to any aspects of the project that may have significant environmental impacts.

Access to the proposed parking garage will be from Border Street. Another driveway for residential off-street loading is on the north side of the site, and a third driveway to the surface parking lot will also be provided onto Border Street. Using the Institute of Traffic Engineers Trip Generation land use codes 232 for High Rise Residential Condominium/ Townhouse and 110 for General Light Industrial use, the proponent has estimated that the project will generate approximately 1,303 unadjusted new average daily vehicle trips. The proponent will provide 165 parking spaces (about 0.7 parking spaces per unit). There will be 26 surface parking spaces reserved for the marine industrial use and 139 spaces within the parking garage reserved for the residences.

The proposed project will be connected to existing municipal water and sewer service. It will consume approximately 37,224 gallons per day (gpd) of water and will generate 33,840 gpd of wastewater flow.

The project is subject to review by the BRA under the Article 80 Large Project Review process of the Boston Zoning Code. Accordingly, the proponent will prepare a Project Impact Report (PIR). It is my view that the planning for this project would be best served by a coordinated review and the submission of a single set of documents to satisfy the requirements of both MEPA (Section 11.09(4)(c)) and the BRA (Section 80-6). The proponent should coordinate this joint review process with both agencies to establish the necessary review periods.

The proposed project would require an amendment to the MHP and the proponent has indicated that it will work with the City to amend the MHP. In accordance with the MHP regulations at 301 CMR 23.04, such an amendment requires a public review process, prior to a decision on the amendment by the Secretary of Energy and Environmental Affairs. The public process should be coordinated by the City of Boston under the guidance of the MCZM Office.

The proponent has the ability to coordinate the MEPA and MHP amendment processes to provide a timely and efficient mechanism to review project design, programming, and decision-making. The DEIR should be used as the vehicle for publishing a public hearing draft of the City's proposed amendment(s). The FEIR should not be submitted until the MHP process has been completed to ensure that all relevant terms and conditions of this approval are resolved prior to the FEIR Certificate.

SCOPE

This EIR should follow the MEPA Regulations at 301 CMR 11.07 for outline and content, as modified by this scope and the Article 80 requirements. It should address the comments listed at the end of this Certificate, to the extent that they are within the required scope, and should include a copy of this Certificate.

Project Description

The EIR should provide a detailed project description. It should identify and explain any project phasing. The EIR should discuss the consistency of the project with local and regional growth management and open space plans, Executive Order (EO) 385 (Planning for Growth), the East Boston Municipal Harbor Plan (MHP), and the Master Plan for East Boston.

Alternatives Analysis

In addition to the No-Build Alternative and the Preferred Alternative, the EIR should discuss alternative building configurations on the site that might result in fewer impacts, e.g. a Chapter 91 Compliant Alternative. The EIR should also evaluate the proposed site layout and describe alternative site layouts for the site that were considered in the Chapter 91 and Section 106 historical review process. This analysis should provide a comparison of the differences between the environmental impacts associated with each of the alternative building designs and site layouts. The building designs and site layouts should analyze alternative locations, landscape layouts, and designs that will be inviting to the public. The proponent should respond to the suggestion from The Boston Harbor Association that the EIR analyze the option of pulling the buildings back to create a horizontal view corridor in line with existing adjacent buildings. The EIR should identify how the site can be improved to maximize visual enjoyment and to minimize wind and shadow impacts.

Waterways Licensing

The EIR must describe how the proposed project will comply with the Waterways Regulations, 310 CMR 9.00. The waterways licensing concerns are building massing, wind and shadow impacts, public views, facilities of public accommodation (FPA), water-based public facilities, open space, parking, and site specific information as outlined in the MassDEP comment letter.

The project is subject to the East Boston Municipal Harbor Plan (MHP). The proponent is seeking an amendment to the MHP to provide flexibility on building height, waterfront setback, and ground floor use. The EIR should identify the portion of the project site within the Designated Port Area (DPA). It should describe all the development controls on the property and include any supporting documentation. The EIR should contain site and floor plans for the project showing cross-sectional views and elevations of the floor levels. Both the MEPA Office and the permitting agencies need to evaluate site design and layout. The EIR should inventory all existing and proposed site lines. The various design alternatives for the Border and Decatur Street view corridors should be included in the EIR. These design alternatives should use pedestrian level perspectives to assess impacts to water views. The specific ground floor FPAs should be identified in the EIR. The site contains approximately 3.4 acres of filled Commonwealth tidelands.

The EIR should provide sufficient information to document the project's compliance with all applicable provisions of M.G.L. c. 91 and its implementing regulations (310 CMR 9.00) and the East Boston Municipal Harbor Plan. It should present a clear technical analysis of how the project complies with the various dimensional requirements set forth in the regulations as they pertain to new buildings for non-water dependent use. The EIR should show how the project will comply with the limitations on facilities of private tenancy and the requirements for FPAs found in the referenced regulations at 9.51(3)(b)and 9.53(2)(c). It should identify the measures undertaken by the proponent to address the safety and security issues associated with the adjacent Boston Towing operations and the potential marine industrial operations that are proposed for this site.

I ask the proponent to consult with MassDEP and MCZM to determine the issues to be included in the EIR analyzing alternative design and project layouts. The EIR will need to address how the project will meet the open space standards of the Waterways Regulations.

Traffic

The EIR should be prepared in conformance with the EOEA/EOTC Guidelines for EIR/EIS Traffic Impact Assessment. It should identify appropriate mitigation measures for areas where the project may impact traffic operations. It should analyze traffic impacts by determining the level-of-service (LOS) at the following affected intersections:

Central Square;
Border/Decatur Street;
Border/Maverick Street;
Border/Summer Street; and
Border Street/Project Garage Driveway.

The EIR's LOS analysis should include both a.m. and p.m. weekday peak hours, volume to capacity ratios, a traffic distribution map, and background growth from other proposed projects in the area. Future conditions should cover a five-year time horizon (2012). The EIR should also include any additional intersections included in the scope issued by the BRA and the Boston Transportation Department (BTD).

The EIR should examine present (2007) and future (2012) build and no-build traffic volumes for all impacted roadways and intersections. It should utilize trip generation estimates based on Land Use Code (LUC) 232 (High Rise Residential Condominium/Townhouse), 110 (General Light Industrial), and estimate trips from the gallery space. Trip generation rates should be quantified and explained in the EIR. The EIR should include a breakdown by transportation mode and the reasoning behind these estimated trip generation numbers. It should fully describe all of the proposed components at the project site to provide accurate trip generation estimations. The EIR should identify the trucking and servicing needs of the proponent's maritime industrial user. It should identify the access needs for the maritime industrial user. The EIR should discuss the suitability of proposed signalization changes. Any Massachusetts Highway Department (MassHighway) or Boston plans for the reconstruction of roadways in the vicinity of the project should be discussed in the EIR. Traffic accident history for the three most recent years for which data are available should be reviewed and presented for the study area.

Parking

Parking at the site will include approximately 139 parking spaces in an underground parking garage and 26 surface parking spaces. The EIR should identify the parking supply in the area, both off- and on-street parking, proposed parking fees, and parking demand from the project. It should describe how the number of parking spaces needed was determined. The EIR should identify the number of parking spaces required by zoning, and recommended by the Boston Transportation Department (BTD) in its citywide standards.

Pedestrian and Bicycle Facilities

The EIR should provide a map showing existing and proposed pedestrian/sidewalk facilities, which are proposed for the project. It should identify the proposed bicycle facility improvements included with this project. The EIR should identify pedestrian demand and how the project will accommodate and improve the Harbor Walk.

Transportation Demand Management (TDM) and Public Transportation

The EIR should identify the potential TDM measures that the proponent will commit to implementing. The proponent should consider the following TDM measures:

- Subsidize MBTA transit passes for employees and residents of the project.
- Provide a parking space to a car-sharing service, such as Zipcar.
- Provide transit information to all residents.
- Consider forming a Transportation Management Agency (TMA) with other nearby residential buildings in order to provide a shuttle bus with connections to Maverick

Station on the Blue Line.

- Provide ridesharing information to building residents and employees.
- Encourage the use of bicycles by providing bicycle racks and bicycle storage for residents as well as shower and locker facilities to employees.

The EIR should identify MBTA bus routes and stops in the neighborhood. Any private shuttle buses operating in the neighborhood should be identified and included.

Wind and Shadow

The EIR should consider specific building design alternatives as a means of reducing adverse wind and shadow impacts on the ground level pedestrian environment. The development of this project site will in and of itself lead to a greater public enjoyment of that area of the East Boston waterfront. The proponent should strive to accomplish this development in a way that is truly inviting. The completion of the Harbor Walk along the East Boston waterfront will be of little utility if it is so windy and shadowed that no one will choose to walk there.

The EIR's mitigation measures should be guided by the wind tunnel testing of the East Boston harborfront massing. This wind tunnel testing is essential to determine the potential impacts of wind at the pedestrian level. For purposes of the EIR, a wind analysis that evaluates pedestrian level impacts will be sufficient.

Mitigation for wind impacts is essential. This proposed portion of the Harbor Walk along the project site may be impacted by unacceptable winds for walking.

The Harbor Walk north of the project site could be in shadow for significant periods of the day and year. I encourage the proponent to explore mitigation measures that could be implemented to lessen the shadow impacts of the proposed project and improve the quality of the pedestrian experience in that location.

Wetlands:

The Wetland Section of the EIR should contain an alternatives analysis to ensure that all wetland impacts are avoided, and where unavoidable impacts occur, impacts are minimized and mitigated. The EIR should illustrate that the impacts have been minimized and that the project will be accomplished in a manner that is consistent with the Performance Standards of the Wetlands Regulations (310 CMR 10.00).

The EIR should address the significance of the wetland resources on site, including public and private water supply; riverfront areas; flood control; storm damage prevention; fisheries; shellfish; and wildlife habitat. The ENF has indicated that the project would impact the following wetland resource areas: 100 sf of Land under the Ocean; 100 sf of a Designated Port Area; 19,670 sf of Coastal Beach; and 69,650 sf of Land Subject to Coastal Storm Flowage.

All resource area boundaries, riverfront areas, applicable buffer zones, and 100-year flood elevations should be clearly delineated on a plan. Filled and flowed tidelands should be surveyed, mapped, and located on the plans. Each wetland resource area and riverfront area should be characterized according to 310 CMR 10.00. The text should explain whether the Boston Conservation Commission has accepted the resource area boundaries, and any disputed boundary should be identified. The EIR should provide an accurate measurement of the wetland resource areas that will be affected by the project.

For any amount of required wetlands replication, a detailed wetlands replication plan should be provided in the EIR that, at a minimum, includes: replication location(s) delineated on plans, elevations, typical cross sections, test pits or soil boring logs, groundwater elevations, the hydrology of areas to be altered and replicated, list of wetlands plant species of areas to be altered and the proposed wetland replication species, planned construction sequence, and a discussion of the required performance standards and monitoring.

Comments from the Department of Conservation and Recreation (DCR) identify concern with the below grade parking and note that the structure is likely to be subject to hydrostatic forces. The structure must be constructed consistent with the State Building Code (Sixth Edition, Section 3107.0) requirements. In addition, the proponent should consider the FEMA Technical Bulletin on Non-Residential Floodproofing – Requirements and Certification. The EIR should respond to the concerns identified by DCR and demonstrate that the project will conform to the regulatory standards and requirements.

Drainage

The EIR should evaluate potential drainage impacts on water resources from the project. It should include a detailed description of the existing site's drainage system design in the construction area and identify any proposed changes, including a discussion of the alternatives considered along with their impacts. The EIR should present drainage calculations such as the rates for stormwater runoff for the 10, 25, and 100-year storm events. It should identify the quantity and quality of flows. The proponent should consider recharge rather than discharge to the Harbor.

Proposed activities, including construction mitigation, erosion and sedimentation control, phased construction, and drainage discharges or overland flow into wetland resources, should be evaluated. The location of detention/infiltration basins and their distances from wetland resource areas, and the expected water quality of the effluent from said basins should be identified. This analysis should address current and expected post-construction water quality of the predicted final receiving water bodies. The drainage analysis should insure that on- and off-site wetland resource areas are not impacted by changes in stormwater runoff patterns.

The EIR should address the performance standards of MassDEP's Stormwater Management Policy. It should demonstrate that the project is consistent with this policy. The proponent should use the MassDEP Stormwater Management Handbook when addressing this issue.

The EIR should discuss the consistency of the project with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit from the U.S. Environmental Protection Agency for stormwater discharges from a construction site. It should include a discussion of best management practices employed to meet the NPDES requirements, and should include a draft Pollution Prevention Plan in the DEIR

A maintenance program for the drainage system will be needed to ensure its effectiveness. This maintenance program should outline the actual maintenance operations, sweeping schedule, responsible parties, and back-up systems.

Groundwater/Contaminated Soils

The EIR should describe the dewatering of the construction site. It should identify monitoring measures to avoid significant impacts to the groundwater levels. The EIR should summarize pre-construction groundwater conditions and outline how it will monitor groundwater levels (on- and off-site). It should identify that the design and construction methods for the underslab drainage system have the ability to remove groundwater from the upper aquifer that is critical to keeping wood pilings wet as recommended by the Boston Groundwater Trust (BGT). The BGT recommends that the proponent install another groundwater well before and during construction to ensure that the project is not contributing to a reduction in the groundwater levels. The EIR should address how contamination encountered during construction will be addressed and compliance with the Massachusetts Contingency Plan (MCP) will be achieved. The EIR should present a summary of the results of hazardous waste studies and remediation efforts undertaken at the project site by the proponent to comply with the MCP.

Drinking Water

The EIR should explain any impacts from the project on the drinking water supply and distribution system. It should propose mitigation as appropriate.

Wastewater

The wastewater system in the project area is a combined system for stormwater and sewer. The proponent should propose separation of stormwater/wastewater around the site. The EIR should outline the proponent's efforts to reduce water consumption and thereby reduce wastewater generation. It should identify any capacity deficiencies within the municipal wastewater system to handle the project's additional wastewater flows. In its comment letter, the

MassDEP is requesting this proponent to consider Infiltration/Inflow (I/I) reduction at a minimum of a 4:1 ratio for the sewershed to which the flow is added. The EIR should address this I/I issue and work closely with the Boston Water and Sewer Commission (BWSC), the Massachusetts Water Resources Authority (MWRA), and MassDEP.

Construction Issues

The EIR should include a construction management plan that describes the project's phasing, erosion and sedimentation controls, monitoring, and contingencies. It should present a discussion on potential construction period impacts (including but not limited to noise, vibration, dust, and traffic maintenance) and analyze feasible measures that can avoid or eliminate these impacts. The proponent is proposing minor filling at the site. Truck routes to the proposed construction site should be identified in the EIR. The EIR should identify construction hours and any impacts expected during peak travel hours on local roadways.

The proponent should consider participation in MassDEP's Clean Air Construction Initiative to mitigate diesel emissions associated with the construction period. The EIR should discuss the measures proposed to implement construction-period diesel emission mitigation, including the retrofit of construction equipment and the use of on-road low-sulfur diesel (LSD) fuel.

Visual/Aesthetics

The EIR should include a visual resource assessment . The visual resource assessment should include a conceptual-level landscaping plan and building elevations from all sides.

Historical Resources/Cultural Issues

The project site is located within the "City-Wide Comprehensive Industrial Survey, Boston, Massachusetts, 1996-1997" conducted on behalf of the Boston Landmarks Commission and MHC and may be eligible for listing in the National Register of Historic Places. The EIR should report on the results of the reconnaissance historic and archaeological survey to be conducted at the project site by the proponent. The scope of the investigation should include comprehensive documentary research to trace the land use and development history of the property, and to locate and identify historic properties with a recommendation for a project Area of Potential Effect, an opinion of effect, and recommendations to avoid, minimize, or mitigate adverse effects.

The survey scope should include a review of the data from the geotechnical coring for information about subsurface conditions. Additional subsurface investigations may be recommended to locate and identify important archaeological features and deposits. Available recent high resolution aerial photographs taken at low tide, and accurate maps of the property should be reviewed and included with the report of the investigation to assist in documenting the location and condition of the pier pilings, marine railway, and other potentially important site features, including any submerged cultural resources. The report should include any recommendations for any additional investigations and to preserve important site characteristics that can be incorporated into the project design. The results should be taken into account in developing the public interpretation initiative as part of the public benefit and access plan. The impacts of wind and shadow on adjacent and proximate historic properties should also be considered in the EIR. The potential shadow impacts should be superimposed on maps with the historic properties identified.

Sustainable Design

To the maximum feasible extent, the proponent should incorporate sustainable design elements into the project design. The EIR should summarize the proponents' efforts to obtain a Leadership in Energy and Environmental Design (LEED) Certification for each proposed building. The basic elements of a sustainable design program may include, but not be limited to, the following measures:

- optimization of natural day lighting, passive solar gain, and natural cooling;
- use of energy efficient HVAC and lighting systems, appliances and other equipment, and use of solar preheating of makeup air;
- favoring building supplies and materials that are non-toxic, made from recycled materials, and made with low embodied energy;
- provision of easily accessible and user-friendly recycling system infrastructure into building design;
- development of a solid waste reduction plan;
- development of an annual audit program for energy consumption, waste streams, and use of renewable resources;
- LEED green building standards; and
- water conservation and reuse of wastewater and stormwater.

Mitigation

The EIR should include a separate chapter on mitigation measures. This chapter on mitigation should include a proposed Section 61 Findings for all state permits. The proposed Section 61 Findings should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation should also be included.

In the ENF, the proponent has committed to provide the following mitigation measures:

- Extend the Harbor Walk along the seaward edge of the site.
- Create approximately 50,318 sf of open space

- Remove all the deteriorated timber pilings within the watersheet of the project site.
- Provide public access ways from Border Street to the water's edge on a site that has no public access.
- Provide FPAs (community gallery with restrooms with programs for community residents) to a site that has none.
- Provide two finger piers supporting a marine travel lift and a marine industrial building.
- Construct a new stormwater overflow for the BWSC stormwater system on the project site.

The EIR should describe the proponent's efforts to establish the Harbor Walk and public open space as well as FPAs on the ground floor of the building as part of its Chapter 91 Licensing process. It should describe the proponent's efforts to work with the community regarding the types of public facilities to be provided at this location. The proponent should consider working with The Boston Harbor Association and other East Boston advocacy groups to improve Boston's harbor.

Response to Comments

The EIR should respond to the comments received to the extent that the comments are within the subject matter of this scope. Each comment letter should be reprinted in the EIR. I defer to the proponent as it develops the format for this section, but the Response to Comments section should provide clear answers to the questions raised.

Circulation

The EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should also be sent to the list of "comments received" below and to Boston officials. A copy of the EIR should be made available for public review at the Boston Public Library (East Boston Branch).

December 12, 2007
DATE

Ian A. Bowles

Comments received :

Boston Groundwater Trust, 11/12/07
MassDEP/Boston, 11/13/07
MHC, 11/16/07
Senator Anthony Petruccelli, 11/19/07
Fort Point Assoc., 11/28/07
MA Board of Underwater Archaeological Resources, 11/26/07

City Councilor Salvatore LaMattina, 11/28/07
New Street Realty Trust, 11/28/07
Pepe & Hazard, 11/28/07
MCZM, 11/28/07
MWRA, 12/3/07
MassDEP/NERO, 12/3/07
BWSC, 12/3/07
DCR, 12/3/07
BED, 12/4/07
The Boston Harbor Assoc., 12/5/07

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IAB/WTG/wg

Appendix 2

BRA Scoping Determination

BOSTON REDEVELOPMENT AUTHORITY

SCOPING DETERMINATION
BOSTON EAST

SUBMISSION REQUIREMENTS
FOR DRAFT PROJECT IMPACT REPORT (DPIR)

PROPOSED PROJECT:	BOSTON EAST
PROJECT SITE:	102-148 BORDER STREET, EAST BOSTON BOUNDED BY BORDER STREET TO THE EAST, ATLANTIC WORKS, WIGGLESWORTH MACHINERY, AND BOSTON TOWING AND TRANSPORTATION PROPERTIES TO THE SOUTH, BOSTON INNER HARBOR TO THE WEST, AND THE PROPERTY LOCATED AT 170 BORDER STREET TO THE NORTH
PROPONENT:	TRINITY BORDER STREET, LLC c/o TRINITY FINANCIAL 40 COURT STREET, 8th FLOOR BOSTON, MA 02108
DATE:	MARCH 10, 2008

The Boston Redevelopment Authority ("BRA") is issuing this Scoping Determination pursuant to Section 80B-5 of the Boston Zoning Code ("Code") in response to a Project Notification Form ("PNF"), which Trinity Border Street, LLC (the "Proponent"), filed for the Boston East project on October 19, 2007. Notice of the receipt by the BRA of the PNF was published in the *Boston Herald* on October 19, 2007, which initiated a 30-day public comment period with a closing date of November 19, 2007.

In accordance with the BRA's policy on mitigation as outlined in Mayor Thomas M. Menino's Executive Order Relative to the Provision of Mitigation by Development Projects in Boston, the Proponent submitted a Letter of Intent, dated June 8, 2007, received on June 12, 2007, for the redevelopment of a 14.2 acre property, which includes land and watersheet, located at 102-148 Border Street in East Boston (the "Proposed Project").

On June 22, 2007, letters soliciting Impact Advisory Group ("IAG") nominations for the Proposed Project were delivered to City Councilor Salvatore LaMattina, and the former State Representative Anthony Petruccelli, who is now the State Senator for the District. Additional letters seeking recommendations were delivered to the Office of Neighborhood Services and to the City Councilors At-Large.

The letters sought nominations or recommendations to the IAG by June 29, 2007. State Senator Anthony Petruccelli, and City Councilor Salvatore LaMattina each responded with two (2) nominations. The Office of Neighborhood Services responded with a total of two (2) nominations. The BRA nominated four (4) people. On September 7, 2007, the four City Councilors At-Large declined the opportunity to make nominations.

Two (2) of the people who had been nominated to serve on the IAG declined the nomination. Eight (8) individuals were appointed to the IAG and have been invited to participate in advising BRA staff on the determination and consideration of impacts and appropriate mitigation regarding the Proposed Project. The following list includes the names of the IAG members:

Kay Brayden-Strelitz
Karen Buttiglieri
Ruth Capone
Lorraine Curry
Kristin Langone
Diane Modica
Robert Pyles
Ernie Torgesen

The Notice of the receipt by the BRA of the PNF and the PNF were sent to the City's public agencies pursuant to Section 80A-2 of the Code, as well as to the IAG members. Pursuant to Section 80B-5.3 of the Boston Zoning Code (the "Code"), a scoping session was held on October 26, 2007 with the City of Boston's public agencies at which time the Proposed Project was reviewed and discussed. Members of the IAG were also invited to attend the scoping session.

The Proponent conducted a publicly advertised public meeting, which was held on October 29, 2007 at the Maverick Landing Community Center, located at 31 Liverpool Street in East Boston. The community will continue to have an opportunity to give input regarding the Proposed Project during the Article 80-review process.

Comments received by the BRA during the comment period are included in **Appendices A, B, and C**. The DPIR should include complete responses to all comments included in **Appendices A, B and C** within the framework of the criteria outlined in the Scoping Determination.

Written comments in response to the PNF received by the BRA from elected officials and the City's public agencies are included in **Appendix A** and must be answered in their entirety.

Specifically, they are from:

- City Councilor Salvatore LaMattina, District One
- State Senator Anthony Petruccelli, First Suffolk and Middlesex District
- David Carlson, Senior Architect, BRA, and Executive Director, Boston Civic Design Commission
- Robert D'Amico, Senior Planner, City of Boston Transportation Department
- Sandra R. Duran, Deputy Director, Real Estate Management and Sales, Department of Neighborhood Development
- Valerie Gingrich, Waterfront Planner, BRA, and Carlos Montanez, Senior Planner, BRA
- Bryan Glascock, Director, City of Boston Environment Department
- Dennis L. Keeley, Acting Fire Marshall, City of Boston Fire Department
- Elliott Laffer, Executive Director, Boston Groundwater Trust
- Katie Pedersen, Senior Project Manager/Environmental Review Specialist, BRA
- John Sullivan, P.E., Chief Engineer, Boston Water and Sewer Commission

Written comments in response to the PNF received by the BRA from the IAG are included in **Appendix B** and must be answered in their entirety. Listed in chronological order of date received, specifically they are from:

- Kay Brayden-Strelitz, Diane Modica and Rob Pyles – November 19, 2007
- Ernie Torgersen – November 19, 2007
- Kristin Langone – December 10, 2007

Written comments in response to the PNF received by the BRA from the public are included in **Appendix C** and must be answered in their entirety. Listed in chronological order of date received specifically they are from:

- FastForwards Realty Trust, Benjamin P. Goodman - November 13, 2007
- Joe D'Amelio - November 15, 2007
- Neenah Estrella-Luna - November 19, 2007
- Ejay Khan - November 19, 2007
- Bob Strelitz - November 19, 2007
- Captain John Tyler - November 20, 2007
- Melissa Tyler - November 20, 2007
- Greg Yankosky - November 20, 2007
- Maverick Tenants Organization, Inc. ("MTO"), Ruth Capone, MTO Interim Director/Chairperson & the Board of Directors - November 28, 2007
- New Street Realty Trust, M. Bruce Ohanian, Co-Trustee and Varney Hintlian, Co-Trustee - November 28, 2007
- The Boston Harbor Association - December 5, 2007

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

I. PROJECT DESCRIPTION

The Boston East project is located at 102-148 Border Street along the East Boston waterfront and consists of approximately 14.2 acres, of which approximately 10.8 acres are watersheet, and is bound by Border Street to the east, Atlantic Works, Wigglesworth Machinery, and Boston Towing and Transportation properties to the south, the Boston Inner Harbor to the west, and the property at 170 Border Street to the north (the "Project Site"). The Project Site is located near Central Square to the north and Maverick Square and the Massachusetts Bay Transportation Authority Transit Station to the east.

The Project Site includes land under water, and filled tidelands. Currently, the landside portion of the Project Site is vacant. There are several structures on the Project Site including footings of former buildings, entrance posts, an outfall pipe, and bulkheads that are in disrepair. On the waterside, there are two dilapidated marine railways and approximately 25,000 square feet of dilapidated timber piling areas that extend over 250 feet beyond the high water mark. Although the Project Site currently is inaccessible to both vehicles and pedestrians and is surrounded by a fence, historically the Project Site was used for commercial and industrial activities including ship building, ship and engine repair, dry docks, coal storage, and a carriage factory.

Previously, there was a Designated Port Area ("DPA") designation on both the north and south side of the Project Site. Through a separate regulatory process from the Article 80 process, the DPA area was reconfigured and consolidated to the southern portion of the Project Site. The reconfiguration will afford better development parcels for maritime and residential uses. The Proposed Project and the information contained in the PNF were predicated on the reconfiguration of the DPA.

The Proposed Project includes two development areas, a non-DPA area and a DPA area. The non-DPA area, which is located on the northern portion of the Project Site includes a residential building that will range from five to seven stories and will contain approximately 196 units, an approximately 1,840 square foot community gallery as the facility of public accommodation, located along the Harborwalk, which will help activate the area, 139 underground parking spaces, and open space. The residential units will be a mix of one and two-bedroom units. The residential building has two wings, placed as long, wharf-like fingers that extend towards Boston Harbor, as well as an archway. The open space on the waterside of the Project Site will be terraced and will lead up to the archway, through to Border Street.

The DPA area, which is located on the southern portion of the Project Site, includes a two-story, approximately 20,000 square foot marine industrial facility, a marine travel lift, twenty-six parking spaces, and a maritime interpretive area. The Proponent is currently evaluating potential economically viable and programmatically appropriate tenants that would fit within the eligible uses of the DPA. The interpretive area will be designed as an interpretive landscape with exhibits that extend into Boston Harbor.

The total gross floor area for the Proposed Project is 241,859 square feet with a total floor-area-ratio ("FAR") of approximately 1.63. The combined building footprint is 50,800 square feet, which occupies 34% of the Project Site.

The Proposed Project also includes approximately 750 feet of Harborwalk, which will include three points of access from Border Street, and will connect to the planned Harborwalk to the north with the emerging East Boston Harborwalk being developed to the southeast. Ultimately, the Harborwalk will extend from the Harborside Hyatt Hotel to Border Street.

II. PREAMBLE

The Proposed Project is being reviewed pursuant to Article 80, Development Review and Approval, which sets forth a comprehensive procedure for project review of the following components: transportation, environmental protection, urban design, historic resources, infrastructure systems, site plan, tidelands, and Development Impact Project, if any. The Proponent is required to prepare and submit to the BRA a Draft Project Impact Report ("DPIR") that meets the requirements of the Scoping Determination by detailing the Proposed Project's impacts and proposed measures to mitigate, limit or minimize such impacts. The DPIR shall contain the information necessary to meet the specifications of Section 80B-3 (Scope of Large Project Review; Content of Reports) and Section 80B-4 (Standards for Large Project Review Approval), as required by the Scoping Determination. After submitting the DPIR, the Proponent shall publish notice of such submittal as required by Section 80A-2. Pursuant to Section 80B-4(c)(i)(3), the BRA shall issue a written Preliminary Adequacy Determination ("PAD") within ninety (90) days. Public comments, including the comments of public agencies, shall be transmitted in writing to the BRA no later than fifteen (15) days prior to the date by which the BRA must issue its PAD. The PAD shall indicate the additional steps, if any, necessary for the Proponent to satisfy the requirements of the Scoping Determination. If the BRA determines that the DPIR adequately describes the Proposed Project's impacts and, if appropriate, proposed measures to mitigate, limit or minimize such impacts, the PAD will announce such a determination and that the requirements of further review are waived pursuant to Section 80B-5.4(c)(iv). Section 80B-6 requires the Director of the BRA to issue a Certification of Compliance indicating the successful completion of the Article 80 development review requirements before the Commissioner of Inspectional Services can issue any building permit for the Proposed Project.

III. REVIEW/SUBMISSION REQUIREMENTS

In addition to full-size scale drawings, 55 copies of a bound booklet containing all submission materials reduced to size 8-1/2" x 11", except where otherwise specified, are required. The booklet should be printed on both sides of the page. In addition, an adequate number of copies must be available for community review. A copy of this scoping determination should be included in the booklet for review.

A. GENERAL INFORMATION

1. Applicant/Proponent Information

    a. Development team

        (1) Names

            (a) Proponent (including description of development entity and type of corporation, and the principals thereof)

(b) Attorney
(c) Project consultants and architects

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

(3) Designated contact for each

b. Legal Information

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

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

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

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

B. REGULATORY CONTROL AND PERMITS

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

C. PROJECT ALTERNATIVES

The DPIR must include the following alternatives. The analyses as provided for in the Environmental Protection Component, Urban Design Component, and Transportation Component sections of this Scoping Determination shall be required for both alternatives.

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

Alternative 2 – Full build of Proposed Project as modified during the Boston Civic Design Commission, BRA, and public review process and in response to comments contained in this Scoping Determination.

D. PROJECT DESCRIPTION

The DPIR shall contain a full description of the Proposed Project and its elements, including size, physical characteristics, and proposed uses. This section of the DPIR also shall present the development context of the Proposed Project (description of the surrounding environment), existing site conditions, project purpose and objectives, and approximate project cost and development schedule.

The Proponent shall provide plans indicating the locations and layouts of the affordable units, all of which shall be presumed to be created on-site, consistent with BRA policy. The number of units to be created, the incomes of the households to be reached, and the unit size mix shall be consistent with the Inclusionary Development Policy, effective May 16, 2006.

E. TRANSPORTATION COMPONENT

The analysis included in the DPIR must utilize the Boston Transportation Department's ("BTD") Transportation Access Plan Guidelines and Scope and BTD's comment letter, dated November 15, 2007. Both BTD documents are included in **Appendix A** and are incorporated herein by reference and made a part hereof. The Proponent is required to address all comments included in BTD's comment letters in addition to the following comments.

The residential component of the Proposed Project will generate significant new pedestrian traffic at the location and in the general Central Square area. Considering the current environment in Central Square, BTD will closely monitor the Proponent's plan to mitigate potential impacts in relationship to vehicular movements and how the increase in pedestrian traffic will affect the overall flow of traffic in Central Square.

By virtue of its location, the Proposed Project will have convenient connections to Maverick Station, Logan Airport and the surrounding roadway system leading north, south and westbound. The Proponent will be required to implement travel demand management ("TDM") measures in order to minimize automobile reliance among residents of the Proposed Project. These measures include:

distribution of public transit information, pedestrian and streetscape improvements and secure bicycle storage.

Due to the design of the building, which will be constructed up to the sidewalk, BTD will require an audio/video alarm located at the access/egress point to the underground parking garage to warn pedestrians of vehicles exiting the property. An alarm will also be necessary at the access/egress point of the residential off-street loading area if similar in design to the residential garage.

Construction Management Plan
The Proponent must execute a Construction Management Plan ("CMP") with BTD. The CMP should detail the schedule, staging, parking, delivery, and other associated construction impacts of the Proposed Project.

Transportation Access Plan Agreement
The Proponent will have to execute a Transportation Access Plan Agreement ("TAPA") with BTD, which will codify the specific measures, mitigation and agreements between the Proponent and BTD. The Proponent shall be responsible for all costs associated with mitigation efforts including, but not limited to design and engineering, construction, and inspection. As part of this document, BTD will require that the Proponent include traffic and parking information regarding all other projects planned for the general area, which includes all waterfront development projects.

F. ENVIRONMENTAL PROTECTION COMPONENT

The DPIR shall address the comments of the City of Boston Environment Department, dated December 4, 2007, included in **Appendix A,** and incorporated herein by reference and made a part hereof.

Additional comments related to environmental impacts are described in a memorandum from Katie Pedersen, Senior Project Manager/Environmental Review Specialist, BRA, dated November 28, 2007. This memorandum is included in **Appendix A,** and incorporated herein by reference and made a part hereof and will be addressed in its entirety.

Air Quality
The Proponent shall provide a description of the existing and projected future air quality in the Proposed Project vicinity and shall evaluate ambient levels to determine conformance with the National Ambient Air Quality Standards ("NAAQS"). Careful consideration shall be given to mitigation measures to ensure compliance with air quality standards.

A future air quality (carbon monoxide) analysis shall be required for any intersection (including garage entrance/exits) where the level of service (LOS) is expected to deteriorate to D and the Proposed Project causes a 10 percent increase in traffic or where the level of service is E or F and the Proposed Project contributes to a reduction in LOS.

The study shall analyze the existing conditions, future No-Build and future Build conditions only. The methodology and parameters of the air quality analysis shall be approved in advance by the BRA and the Massachusetts Department of Environmental Protection ("DEP"). Mitigation measures to eliminate or avoid any violation of air quality standards shall be described.

A description of the Proposed Project's heating and mechanical systems including location of buildings/garage intake and exhaust vents and specifications, and an analysis of the impact on pedestrian level air quality and on any sensitive receptors from operation of the heating, mechanical and exhaust systems, including the building's emergency generator as well as the parking garage, shall be required. Measures to avoid any violation of air quality standards shall be described.

Noise

The Proponent shall establish the existing noise levels at the Proposed Project Site and vicinity and shall calculate future noise levels after project completion, thus demonstrating compliance with the Interior Design Noise Levels (not to exceed day-night average sound level of 45 decibels) established by U.S. Department of Housing and Urban Development, as well as applicable City, State and Federal noise criteria.

The Proponent has stated that the primary source will emanate from the external mechanical equipment, containing the make-up air units and the compressors. The Proposed Project may also include emergency generators, which would also contribute to external mechanical noise. Despite the fact that the rooftop equipment is not anticipated to exceed maximum sound levels, due to the Proposed Project's proximity to an adjacent residential neighborhood, appropriate low-noise mechanical equipment and noise control measures will be required in accord with the Regulations for Control of Noise in the City of Boston and the Commonwealth of Massachusetts. The Proponent shall also describe any other measures necessary to minimize and/or eliminate adverse noise impacts from the Proposed Project.

Solar Glare

The Proponent has stated that the Proposed Project does not incorporate the reflective building material. Consequently, the Proponent does not anticipate the creation of either an adverse solar glare impact or a solar heat buildup in nearby buildings. The Proponent shall demonstrate that the glass selected will avoid the creation of a visual nuisance and/or a hazard, as it interferes with vision and concentration. However, should the design change and incorporate substantial glass-facades, a solar glare analysis shall be required. The analysis shall measure potential reflective glare from the buildings onto potentially affected streets and public open spaces and sidewalk areas in order to determine the likelihood of visual impairment or discomfort due to reflective spot glare. Mitigation measures to eliminate any adverse reflective glare shall be identified.

Daylight

The Proponent shall conduct a daylight analysis for both build and no-build conditions. The analysis shall measure the percentage of skydome obstructed by the Proposed Project and evaluate the net change in obstruction. If alternative massing studies are requested as part of the Article 80 Development Review Process, daylight analysis of such alternatives shall also be conducted for comparison. The study shall treat the following elements as controls for data comparison: existing conditions, the context of the area, and the as-of right conditions. Daylight analyses should be taken for each major building façade within the limits of the BRA Daylight Analysis (BRADA) program, fronting these public and quasi-public ways. The midpoint of each roadway should be taken as a study point.

Geotechnical Impacts

A description and analysis of the existing sub-soil conditions, including the potential for ground movement and settlement during excavation and potential impact on adjacent buildings and utility lines shall be required. This analysis shall also include a description of the foundation construction methodology, the amount and method of excavation, and the need for any blasting and/or pile driving and the impact on adjacent buildings and infrastructure. A Vibration Monitoring Plan shall be developed prior to commencing construction activities to ensure that impacts from the project construction on adjacent buildings and infrastructure are avoided. Mitigation measures to minimize and avoid damage to adjacent buildings and infrastructure must be described.

Groundwater

The Proponent anticipates groundwater to be present within a depth of 10 feet below-ground surface and thus dewatering is likely to be required for foundation construction. A relatively watertight excavation support system will be employed in order to mitigate the potential adverse impacts of temporarily lowering groundwater levels on adjacent buildings and utilities. The Proponent has stated that groundwater levels outside the excavation will be monitored. However, the Proponent has not offered a description of the manner in which groundwater levels will be monitored and hence encouraged to install observation monitoring wells. Upon completion of construction, the Proponent would be encouraged to assign monitoring wells to the Boston Groundwater Trust (the "Trust") and if on private property, a permanent easement for access by the Trust or designated representative provided.

If on-going pumping or dewatering is required, the metering of discharge should be conducted with oversight by the Boston Water and Sewer Commission.

The BRA requests that the Proponent consult with the Trust regarding potential groundwater issues. Contact information for the Trust:

Boston Groundwater Trust
234 Clarendon Street
Boston, MA 02116

Attention: Elliott Laffer, Executive Director
617-859-8439

Shadow

The Proponent shall be required to provide a detailed shadow analysis, describing and depicting the existing shadow conditions and the anticipated shadow impacts from the Proposed Project. The analysis shall examine existing and build condition shadow impacts for the 9:00 a.m., 12:00 Noon, and 3:00 p.m. hours during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 23), and the winter solstice (December 22). Impacts at 6:00 p.m., during the summer and autumn must be examined as well. It should be noted that due to the time differences (daylight savings v. standard), the autumnal equinox shadows would not be the same as the vernal equinox shadows and therefore separate shadow studies are required for the vernal and autumnal equinoxes.

The shadow impact analysis must include net shadow from the Proposed Project as well as existing shadow and clearly illustrate the incremental impact of the Proposed Project. For purposes of clarity, new shadow should be shown in a dark, contrasting tone, distinguishable from existing shadow. The shadow impact study area shall include, at a minimum, the entire area to be encompassed by the maximum shadow expected to be produced by the Proposed Project. The build condition(s) shall include all buildings under construction and any proposed buildings anticipated to be completed prior to the completion of the Proposed Project. Shadows from all existing buildings within the shadow impact study area shall be shown. A North Arrow shall be provided on all figures. Shadows shall be determined by using the applicable Boston Azimuth and Altitude data.

Particular attention shall be given to existing or proposed public open spaces and pedestrian areas, including, but not limited to, the existing sidewalks and pedestrian walkways within, adjacent to, and in the vicinity of the Proposed Project and the existing and proposed plazas, historic resources, LoPresti Park, and other open space areas within the vicinity of the Proposed Project.

Wind

The Proponent has conducted a qualitative analysis to determine the Proposed Project's one-story Marina building and a seven-story residence building effect on pedestrian level winds (PLWs). Results we obtained for both existing (no-build) and build conditions for NW (winter), SW (summer), easterly storm, and annual winds. The Proponent has stated that none of the forty-six locations considered for either existing or build conditions is estimated to have PLWs that exceed the BRA guideline of an effective gust velocity of 31 miles per hour (mph) not be exceeded more than 1% of the time. The Proponent has further asserted that the addition of the Proposed Project buildings tend to reduce PLWs in the vicinity of the two buildings due to their sheltering affects, although winds are increased somewhat near the corners of the 80-foot building. No location is estimated to have dangerous winds as often as once a year, nor is any location estimated to have PLWs higher than Catergory 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered.

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

Stormwater Management

The Proponent has provided a description of the exiting drainage conditions as well as a description of proposed plan to construct a new 60-inch stormwater outlet from the Border Street separated stormwater system to the Harbor.

The Proponent has demonstrated compliance the DEP Stormwater Management Policy as the Proposed Project falls under the jurisdiction of the Massachusetts Wetlands Protection Act (WPA), thus requiring the Proposed Project to meet performance standards with regard to stormwater discharges to wetland resource areas. Due to its proximity to the Boston Harbor, the project is subject to the WPA, and stormwater Best Management Practices (BMPs) have been designed in conformance with the DEP performance standards. The Proponent has provided an illustration of how the Proposed Project will conform to the DEP Stormwater Management Standards.

Tidelands/Chapter 91

The Proponent shall provide documentation from the Massachusetts Department of Environmental Protection regarding Chapter 91 licensing determination of applicability.

East Boston Municipal Harbor Plan

The Proponent is seeking, through a process to amend the East Boston Municipal Harbor Plan, relief from height restrictions and a reduction in required Facilities of Public Accommodation space.

The development of residential uses in industrial areas presents particular challenges. The amended East Boston Municipal Harbor Plan should identify and then outline how these challenges can be met in ways that preserve and support our important marine industrial uses while allowing for development.

We look forward to learning more in the DEIR/DPIR about the basis for reducing the Facilities of Public Accommodation and about the issue of residential/industrial compatibility.

Solid and Hazardous Wastes/Materials

The Proponent shall provide a list of any known or potential contaminants on the Site, and if applicable, a description of remediation measures to ensure their safe removal and disposal, pursuant to the M.G.L., Chapter 21E and the Massachusetts Contingency Plan.

Any potential hazardous wastes to be generated by the proposed site must be identified. In addition, potential waste generation must be estimated and plans for disposal indicated and measures to promote reduction of waste generation and to promote recycling in compliance with the City's recycling program described.

Historic Landmarks

The Proponent has identified, mapped and described historic resources and any other historic properties in the vicinity of the Proposed Project's site and evaluated the anticipated effects of the Proposed Project on these resources. The Proponent has stated that the Proposed Project will not have any adverse impacts to the historic structures in the surrounding area.

The City Archaeologist concurs with the recommendations of the Massachusetts Historical Commission ("MHC") to conduct a reconnaissance historic and archaeological survey (950 CMR 70) to locate and identify important terrestrial and submerged cultural deposits. Please contact Ms. Ellen Berkland at 617-635-3850.

The Boston Landmarks Commission (the "BLC") commends the Proponent's efforts to retain on site historic artifacts and incorporate them into the historic maritime interpretive area. This element will allow visitors to understand the industrial maritime history of the site and serve as an educational element along the Harborwalk. The BLC encourages the proponent to also integrate interpretive signage elements throughout the project site.

The BLC requests that dated cornerstones be incorporated into all new construction. This element will allow those who are attentive to and value the architecture of the City to appreciate the historical context in which structures were conceived.

Sustainable Design/Green Buildings

The purpose of Article 37 of the Boston Zoning Code is to ensure that major buildings projects are planned, designed, constructed and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston. Any project subject to the provisions of Article 37 shall be LEED Certifiable (U.S. Green Buildings Council) under an appropriate LEED rating system.

The Proponent has provided a completed LEED-NC checklist indicating 31 points for which the Proposed Project is expected to qualify (including any Boston Green Credits, found in Appendix A to Article 37). The applicant shall demonstrate that the Proposed Project will meet the requirements of Article 37 with appropriate supporting documentation and by certification from a LEED Accredited Professional.

A LEED Checklist is provided for the residential building but not for the marine building. As this is one 241,859 gross square foot project, a checklist should be completed for each building. This checklist and any update to the checklist for the residential building should be included in the DEIR/DPIR.

G. URBAN DESIGN COMPONENT

A complete discussion of the Proposed Project as it relates to the Urban Design Component and other Article 80 review topics are described in a memorandum from David Carlson, Senior Architect, BRA, dated February 12, 2008 included in **Appendix A.** These comments are incorporated herein by reference and made a part hereof and must be addressed in their entirety in the DPIR.

Boston Civic Design Commission

Boston Civic Design Commission ("BCDC") Review is established by Article 28 of the Code and is a part of the Article 80 Project and Plan review processes. BCDC review is advisory to the BRA and should occur before the BRA Board takes action pursuant to the Article 80 process. In special cases, where this threshold is not applicable, BCDC review should occur during the schematic phase of project design or plan evolution so as to maximize the potential benefit of BCDC comments.

BCDC voted to review and saw a presentation of the Proposed Project at its November 6, 2007 meeting; the Proponent made a presentation to the BCDC's Design Sub-Committee on November 27, 2007. At the request of the BCDC Design Sub-Committee, the Proponent returned to the Design Sub-Committee to make a follow up presentation on December 18, 2007, at which time the Design Sub-Committee recommended that the Proposed Project should appear before the full BCDC on January 8, 2008 to seek a vote of approval. On January 8, 2008, the Proposed Project was approved by BCDC.

The following (standard list of) urban design materials should be submitted for the DPIR for the Proposed Project or, if no DPIR is requested, should be submitted as a record 'schematic design' submission pursuant to the BRA's Development Review Procedures:

1. Written description of program elements and space allocation for each element

2. Plan for the surrounding area and district and sections at an appropriate scale (1" = 40' or larger) showing relationships of the Proposed Project to the surrounding area and district:
    a. massing
    b. building height
    c. scaling elements
    d. open space
    e. major topographical features
    f. pedestrian and vehicular circulation
    g. land use

3. Black and white or color 8"x10" photographs of the site and neighborhood

4. Eye-level perspective (reproducible line drawings) showing the proposal (including main entries and public passages/areas) both in the context of the surrounding area and experientially; i.e., how the public might experience the public realm created by the building and site designs.

Additional views from the area streets (Border and Decatur, i.e.) are required, with particular emphasis on important viewing areas such as key approaches (Harbor, Central Square). Long-ranged (distanced) views of the proposed project should also be studied to assess the impact on the skyline or other view lines. Context and the massing of other approved Projects should be included. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) both the build and no-build conditions. The view locations should be approved by the BRA before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.

5. Site sections at 1" = 20' or larger showing relationships to adjacent buildings and spaces.

6. Site plan at an appropriate scale (1" = 20' or larger) showing:
   a. General relationships of proposed and existing adjacent buildings and open space
   b. Open spaces defined by buildings on adjacent parcels and across streets
   c. General location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
   d. Pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
   e. Survey information, such as extending elevations, benchmarks, and utilities
   f. Construction limits

7. Study building/site model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration (window treatment), facade composition, etc.

8. Massing model at 1" = 40' in basswood suitable for placement in the area model at the BRA (if applicable).

9. Drawings at an appropriate scales (e.g., 1" =8', 1"-16', or 1"-20') to describe the facade design and proposed materials including:
   a. Building and site improvement plans
   b. Elevations in the context of the surrounding area
   c. Sections showing organization of functions and spaces
   d. Preliminary building plans showing ground floor and typical upper floors
   e. Phasing of the proposed project

10. A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.

11. Proposed schedule for submittal of all design or development related materials.

12. Proposed LEED certification plans and point rating goal assessment.

13. Electronic model of the Proposed Project in format suitable for use in the BRA's digital 3-D model of Boston. Format should be approved by Urban Design's Technology manager.

H. INFRASTRUCTURE SYSTEMS COMPONENT

The DPIR must address the comments of the Boston Water and Sewer Commission ("BWSC"), dated December 3, 2007, and the comments of the Boston Groundwater Trust, dated November 2, 2007, included in **Appendix A.**

I. FIRE PREVENTION/CONTROL

The DPIR must address the following fire prevention/control issues for all phases of construction as well as for the final design stage. The written comments of Dennis L. Keeley, Acting Fire Marshall, City of Boston Fire Department, dated October 25, 2007, are included in **Appendix A,** and are incorporated herein by reference and made a part hereof.

The following issues must be addressed:

- emergency vehicle access to all new buildings as well as any existing buildings that might be affected;
- impact on availability and accessibility of hydrant locations for new buildings as well as any existing buildings that might be impacted;
- impact on availability and accessibility to siamese connection locations for new buildings as well as for any existing buildings that might be impacted;
- impact that a transformer vault fire or explosion will have on the fire safety of the building(s), particularly as it relates to the location of the vault;

- need for Boston Fire Department permit requirements as outlined in the Boston Fire Prevention Code, the Massachusetts Fire Prevention Regulations 527 CMR, and the Massachusetts fire Prevention Laws (M.G.L. c. 148); and

- if the Proposed Project will include air-supported structures, the impact of the design on fire safety relative to the interaction of the area underneath the structure to the structure as well as to the interaction of the structure to the area underneath the structure.

J. PUBLIC WORKS COMPONENT

Although the Boston Public Works Department ("PWD") did not submit comments regarding the Proposed Project, below is what PWD traditionally requests of a proponent. The Proponent should coordinate with PWD to ensure that the necessary review and approvals occur, and that the appropriate analyses are completed regarding the Proposed Project.

<u>Site Plan</u>
The Proponent must provide an engineer's site plan at an appropriate engineering scale that shows curb functionality on both sides of all streets that abuts the property.

<u>Sidewalks</u>
The Proponent is responsible for the reconstruction of the sidewalks abutting the project, and where appropriate, extend the limits to the nearest intersection. This effort may constitute a License, Maintenance and Indemnification ("LM&I") agreement with the Public Improvement Commission ("PIC"). The reconstruction effort must meet current ADA guidelines, including the re-construction or installation of necessary ADA compatible ramps where needed.

<u>Discontinuances</u>
Any and all discontinuances (sub-surface, surface or above surface) within the Public Right-of-Way ("ROW") must be processed through the PIC.

<u>Landscaping</u>
The Proponent must seek approval from Mr. Ken Crasco, Chief Landscape Architect, Boston Parks and Recreation Department, for all landscape elements. Program must accompany a LM&I with the PIC.

Street Lighting
Street lighting needs must be consulted with Mr. Joe Banks of the Street Lighting Division, PWD, and where needed, be installed by the Proponent, and must be consistent with the area lighting, to provide a consistent urban design.

Roadway
Based on the extent of construction activity, including utility connections and taps, the Proponent will be responsible for the reconstruction of the roadway sections that immediately abuts the property, and where appropriate, extend the limits on re-construction to the nearest intersection.

Public Trash Receptacles
The Proponent should consult with Mr. Tim McCarthy of PWD, and is responsible for purchasing solar powered trash compactors to be used in public space consistent with the City of Boston's Plans.

Public Art
Proponent is encouraged to contact Ms. Sarah Hutt, Boston Arts Commission, to participate with the City's public arts program, creating notable art pieces in public spaces.

Groundwater
Proponent should install groundwater-monitoring wells in accordance to Inspectional Services Department standards, to monitor groundwater levels during construction, and convey the wells to the Boston Groundwater Trust through the PIC after the completion of the project.

K. MUNICIPAL HARBOR PLAN

The entire Project Site is located within Chapter 91 jurisdiction and will be included in the scope of a Municipal Harbor Plan amendment for the 2002 Municipal Harbor Plan for East Boston. Through the Municipal Harbor Plan amendment process, the Proposed Project will seek relief from certain dimensional constraints, including height, the water dependent use zone, and reducing the amount of Facilities of Public Accommodation and allowing Facilities of Private Tenancy within 100 feet of the project shoreline.

Tidelands
The Project Site is comprised of flowed tidelands, and filled (formerly flowed) tidelands. Since the Project Site is currently owned by the City of Boston, the Project Site is considered Commonwealth tidelands.

Building Height
The proposed building height of 85 feet and does not conform to the height allowed under Chapter 91 regulations, per 310 CMR 9.51(3)(e). The Proponent will be seeking a substitution for the height through the East Boston Municipal Harbor Plan amendment process to allow an 85 foot tall building within 100 feet of the high water mark.

Water-Dependent Use Zone
Per 310 CMR 9.51(3)(c), the Proposed Project should have a setback or Water-Dependent Use Zone that extends landward from the Project shoreline 25% of the depth of the lot, with a minimum of 25 feet and a maximum of 100 feet, and along the sides of piers, 15% of the lot width, with a minimum of 10 feet and a maximum of 50 feet.

The Proponent is seeking relief through the East Boston Municipal Harbor Plan amendment process to reconfigure the Water-Dependent Use Zone, which would reduce the residential building's required setback from the Project Shoreline.

Ground Floor Uses
Per 310 CMR 9.53(2)(c), 75% of the ground floor is required to be Facilities of Public Accommodation. Since the Proposed Project currently includes only 14% Facilities of Public Accommodation on the ground floor of the residential building and because the ground floor uses are primarily residential, the Proponent will be seeking relief through the East Boston Municipal Harbor Plan amendment process for the reduction of the required Facilities of Public Accommodation space.

Zoning
The Proposed Project is located within a Waterfront Commercial Subdistrict of the East Boston Neighborhood District (Article 53 of the Code). Accordingly, the minimum open space is 50%, the maximum allowed Floor Area Ratio is 1.0 and the maximum allowed building height is fifty-five (55) feet. In this zoning subdistrict, the proposed multifamily use is an allowed use on upper floors and conditional on the ground floor.

L. DEVELOPMENT IMPACT PROJECT

Based on the information provided in the PNF, the Proposed Project's uses will not require the Proponent to enter into a Development Impact Project ("DIP") agreement.

M. PUBLIC NOTICE

The Proponent will be responsible for preparing and publishing in one or more newspaper of general circulation in the city of Boston a Public Notice of the submission the DPIR to the BRA as required by Article 80A-2. This notice shall be published within five (5) days after the receipt of the DPIR by the BRA. Public comments shall be transmitted to the BRA within seventy five (75) days of the publication of the Public Notice.

Following publication of the Notice, the Proponent shall submit a copy of the Public Notice to the BRA as well as the date of publication.

Appendix 3

Response to Comments

DRAFT Response to Comments on the Expanded Environmental/Project Notification Forms

MEPA Certificate and BRA Scoping Determination

Letter	Scope
MEPA (M)	Massachusetts Executive Office of Energy and Environmental Affairs, MEPA, Ian A. Bowles, Certificate #14123
BRA (B)	Boston Redevelopment Authority (BRA)

State Comment Letters

Letter #	Commenter
Letter 1	Massachusetts Coastal Zone Management, Leslie-Ann McGee
Letter 2	Massachusetts Coastal Zone Management/Bureau of Underwater Archeology, Victor T. Mastone
Letter 3	Massachusetts Department of Conservation and Recreation, Eric Carlson
Letter 4	Massachusetts Department of Environmental Protection, Andrea Langhauser
Letter 5	Massachusetts Department of Environmental Protection/NERO, John D. Viola
Letter 6	Massachusetts Historical Commission, Brona Simon
Letter 7	Massachusetts Water Resources Authority, Marianne Connolly
Letter 8	Senator Anthony Petruccelli

City Comment Letters

Letter 9	Boston Environment Department, Bryan Glascock
Letter 10	Boston Fire Department, Dennis L, Keeley
Letter 11	Boston Redevelopment Authority, Valerie Gingrich and Carlos Montana
Letter 12	Boston Redevelopment Authority, Katie Pedersen
Letter 12A	Boston Redevelopment Authority – David Carlson
Letter 13	Boston Transportation Department, Robert D'Amico
Letter 14	Boston Water Sewer Commission, John P. Sullivan
Letter 15	Department of Neighborhood Development, Sandra R. Duran
Letter 16	Impact Advisory Group, Kay Brayden-Strelitz
Letter 17	Impact Advisory Group, Kristin Langone
Letter 18	City Councilor Salvatore LaMattina

Private/Local Agency Comment Letters

Letter 19	Boston Ground Water Trust, Elliot Laffer
Letter 20	Boston Ground Water Trust, Elliot Laffer
Letter 21	Fastforwards Realty, Benjamin P. Goodman
Letter 22	Fort Point Associates, Jamie Fay

Letter 23	Ejay Khan
Letter 24	Maverick Tenants Organization, Ruth Capone
Letter 25	Neenah Estrella-Luna
Letter 26	New Street Realty Trust, Bruce Ohanian and Varney Ohanian
Letter 27	Pepe & Hazard, Harlan M. Doliner
Letter 28	The Boston Harbor Association, Vivien Li
Letter 29	Ernie Torgersen
Letter 30	Captain John Tyler
Letter 31	Melissa Tyler
Letter 32	Greg Yankosky

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

DEVAL L. PATRICK
GOVERNOR
TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR
IAN A. BOWLES
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

December 12, 2007

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Boston East
PROJECT LOCATION	: 103-148 Border Street - East Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14123
PROJECT PROPONENT	: Trinity Border Street, LLC
DATE NOTICED IN MONITOR	: November 12, 2007

Pursuant to the Massachusetts Environmental Policy Act (G. L., c. 30, s. 61-62H) and Sections 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that the above project requires the preparation of a mandatory Environmental Impact Report (EIR).

According to the Environmental Notification Form (ENF), the proposed project consists of the construction of 241,859 square foot (sf) 196-unit residential development. The project will include a 1,840 sf community gallery within the residential building, a 20,000 sf marine industrial building, 560 sf finger piers (2) supporting a marine travel lift, 50,318 sf of open space, and 750 linear feet of Harborwalk (12 feet wide) along the entire waterfront side of the site. The project is comprised of two development areas: one on the Non-Designated Port Area with a residential building, and a second area located within a Designated Port Area (DPA) on the south side of the site that includes a two-story marine industrial facility with finger piers and a marine travel lift. Thirteen percent (26) of the residential units will be affordable. The site contains about 3.4 acres of land that is vacant of structures, and consists of filled and flowed Commonwealth tidelands. The project site also contains approximately 10.8 acres of watersheet.

The project is subject to a mandatory EIR pursuant to Section 11.03(3)(a)(5) of the MEPA regulations because it requires a Chapter 91 License for more than one acre of new non-water dependent use of tidelands. It may require a 401 Water Quality Certificate, a Construction

Dewatering Permit, a Notification of Construction and Demolition, Compliance with the Massachusetts Contingency Plan, and a Chapter 91 Waterways License from the Department of Environmental Protection (MassDEP). The project will require approval of an amendment to the Municipal Harbor Plan (MHP) by the Executive Office of Energy and Environmental Affairs (EEA). The Massachusetts Historical Commission (MHC) will evaluate the project impacts to potential historical resources. The project must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site. The project may require a Notice of Construction and a Section 10/Section 404 Programmatic General Permit? from the U.S. Army Corps of Engineers. It may need to undergo Federal Consistency Review by the Massachusetts Coastal Zone Management (MCZM) Office. The project will require an Order of Conditions from the Boston Conservation Commission. Because the project site requires a Chapter 91 Waterways License, MEPA jurisdiction extends to any aspects of the project that may have significant environmental impacts.

Access to the proposed parking garage will be from Border Street. Another driveway for residential off-street loading is on the north side of the site, and a third driveway to the surface parking lot will also be provided onto Border Street. Using the Institute of Traffic Engineers Trip Generation land use codes 232 for High Rise Residential Condominium/ Townhouse and 110 for General Light Industrial use, the proponent has estimated that the project will generate approximately 1,303 unadjusted new average daily vehicle trips. The proponent will provide 165 parking spaces (about 0.7 parking spaces per unit). There will be 26 surface parking spaces reserved for the marine industrial use and 139 spaces within the parking garage reserved for the residences.

The proposed project will be connected to existing municipal water and sewer service. It will consume approximately 37,224 gallons per day (gpd) of water and will generate 33,840 gpd of wastewater flow.

The project is subject to review by the BRA under the Article 80 Large Project Review process of the Boston Zoning Code. Accordingly, the proponent will prepare a Project Impact Report (PIR). It is my view that the planning for this project would be best served by a coordinated review and the submission of a single set of documents to satisfy the requirements of both MEPA (Section 11.09(4)(c)) and the BRA (Section 80-6). The proponent should coordinate this joint review process with both agencies to establish the necessary review periods. M.1

The proposed project would require an amendment to the MHP and the proponent has indicated that it will work with the City to amend the MHP. In accordance with the MHP regulations at 301 CMR 23.04, such an amendment requires a public review process, prior to a decision on the amendment by the Secretary of Energy and Environmental Affairs. The public process should be coordinated by the City of Boston under the guidance of the MCZM Office. M.2

The proponent has the ability to coordinate the MEPA and MHP amendment processes to provide a timely and efficient mechanism to review project design, programming, and decision-making. The DEIR should be used as the vehicle for publishing a public hearing draft of the City's proposed amendment(s). The FEIR should not be submitted until the MHP process has been completed to ensure that all relevant terms and conditions of this approval are resolved prior to the FEIR Certificate. M.3

SCOPE

This EIR should follow the MEPA Regulations at 301 CMR 11.07 for outline and content, as modified by this scope and the Article 80 requirements. It should address the comments listed at the end of this Certificate, to the extent that they are within the required scope, and should include a copy of this Certificate.

Project Description

The EIR should provide a detailed project description. It should identify and explain any project phasing. The EIR should discuss the consistency of the project with local and regional growth management and open space plans, Executive Order (EO) 385 (Planning for Growth), the East Boston Municipal Harbor Plan (MHP), and the Master Plan for East Boston. M.4

Alternatives Analysis

In addition to the No-Build Alternative and the Preferred Alternative, the EIR should discuss alternative building configurations on the site that might result in fewer impacts, e.g. a Chapter 91 Compliant Alternative. The EIR should also evaluate the proposed site layout and describe alternative site layouts for the site that were considered in the Chapter 91 and Section 106 historical review process. This analysis should provide a comparison of the differences between the environmental impacts associated with each of the alternative building designs and site layouts. The building designs and site layouts should analyze alternative locations, landscape layouts, and designs that will be inviting to the public. The proponent should respond to the suggestion from The Boston Harbor Association that the EIR analyze the option of pulling the buildings back to create a horizontal view corridor in line with existing adjacent buildings. The EIR should identify how the site can be improved to maximize visual enjoyment and to minimize wind and shadow impacts. M.5

Waterways Licensing

The EIR must describe how the proposed project will comply with the Waterways Regulations, 310 CMR 9.00. The waterways licensing concerns are building massing, wind and shadow impacts, public views, facilities of public accommodation (FPA), water-based public facilities, open space, parking, and site specific information as outlined in the MassDEP comment letter. M.6

The project is subject to the East Boston Municipal Harbor Plan (MHP). The proponent

is seeking an amendment to the MHP to provide flexibility on building height, waterfront M.7
setback, and ground floor use. The EIR should identify the portion of the project site within the Designated Port Area (DPA). It should describe all the development controls on the property and include any supporting documentation. The EIR should contain site and floor plans for the project showing cross-sectional views and elevations of the floor levels. Both the MEPA Office and the permitting agencies need to evaluate site design and layout. The EIR should inventory all existing and proposed site lines. The various design alternatives for the Border and Decatur Street view corridors should be included in the EIR. These design alternatives should use pedestrian level perspectives to assess impacts to water views. The specific ground floor FPAs should be identified in the EIR. The site contains approximately 3.4 acres of filled Commonwealth tidelands.

The EIR should provide sufficient information to document the project's compliance with all applicable provisions of M.G.L. c. 91 and its implementing regulations (310 CMR 9.00) and the East Boston Municipal Harbor Plan. It should present a clear technical analysis of how the project complies with the various dimensional requirements set forth in the regulations as they pertain to new buildings for non-water dependent use. The EIR should show how the project will comply with the limitations on facilities of private tenancy and the requirements for FPAs found in the referenced regulations at 9.51(3)(b)and 9.53(2)(c). It should identify the measures undertaken by the proponent to address the safety and security issues associated with the
adjacent Boston Towing operations and the potential marine industrial operations that are M.8
proposed for this site.

I ask the proponent to consult with MassDEP and MCZM to determine the issues to be
included in the EIR analyzing alternative design and project layouts. The EIR will need to M.9
address how the project will meet the open space standards of the Waterways Regulations.

Traffic

The EIR should be prepared in conformance with the EOEA/EOTC Guidelines for M.10
EIR/EIS Traffic Impact Assessment. It should identify appropriate mitigation measures for areas where the project may impact traffic operations. It should analyze traffic impacts by determining the level-of-service (LOS) at the following affected intersections:

Central Square;
Border/Decatur Street;
Border/Maverick Street;
Border/Summer Street; and
Border Street/Project Garage Driveway.

The EIR's LOS analysis should include both a.m. and p.m. weekday peak hours, volume to capacity ratios, a traffic distribution map, and background growth from other proposed projects in the area. Future conditions should cover a five-year time horizon (2012). The EIR should also include any additional intersections included in the scope issued by the BRA and the Boston Transportation Department (BTD).

The EIR should examine present (2007) and future (2012) build and no-build traffic volumes for all impacted roadways and intersections. It should utilize trip generation estimates based on Land Use Code (LUC) 232 (High Rise Residential Condominium/Townhouse), 110 (General Light Industrial), and estimate trips from the gallery space. Trip generation rates should be quantified and explained in the EIR. The EIR should include a breakdown by transportation mode and the reasoning behind these estimated trip generation numbers. It should fully describe all of the proposed components at the project site to provide accurate trip generation estimations. The EIR should identify the trucking and servicing needs of the proponent's maritime industrial user. It should identify the access needs for the maritime industrial user. The EIR should discuss the suitability of proposed signalization changes. Any Massachusetts Highway Department (MassHighway) or Boston plans for the reconstruction of roadways in the vicinity of the project should be discussed in the EIR. Traffic accident history for the three most recent years for which data are available should be reviewed and presented for the study area. M.11

Parking

Parking at the site will include approximately 139 parking spaces in an underground parking garage and 26 surface parking spaces. The EIR should identify the parking supply in the area, both off- and on-street parking, proposed parking fees, and parking demand from the project. It should describe how the number of parking spaces needed was determined. The EIR should identify the number of parking spaces required by zoning, and recommended by the Boston Transportation Department (BTD) in its citywide standards. M.12

Pedestrian and Bicycle Facilities

The EIR should provide a map showing existing and proposed pedestrian/sidewalk facilities, which are proposed for the project. It should identify the proposed bicycle facility improvements included with this project. The EIR should identify pedestrian demand and how the project will accommodate and improve the Harbor Walk. M.13

Transportation Demand Management (TDM) and Public Transportation

The EIR should identify the potential TDM measures that the proponent will commit to implementing. The proponent should consider the following TDM measures: M.14

- Subsidize MBTA transit passes for employees and residents of the project.
- Provide a parking space to a car-sharing service, such as Zipcar.
- Provide transit information to all residents.
- Consider forming a Transportation Management Agency (TMA) with other nearby residential buildings in order to provide a shuttle bus with connections to Maverick

Station on the Blue Line.

- Provide ridesharing information to building residents and employees.
- Encourage the use of bicycles by providing bicycle racks and bicycle storage for residents as well as shower and locker facilities to employees.

The EIR should identify MBTA bus routes and stops in the neighborhood. Any private shuttle buses operating in the neighborhood should be identified and included.

Wind and Shadow

The EIR should consider specific building design alternatives as a means of reducing adverse wind and shadow impacts on the ground level pedestrian environment. The development of this project site will in and of itself lead to a greater public enjoyment of that area of the East Boston waterfront. The proponent should strive to accomplish this development in a way that is truly inviting. The completion of the Harbor Walk along the East Boston waterfront will be of little utility if it is so windy and shadowed that no one will choose to walk there. M.15

The EIR's mitigation measures should be guided by the wind tunnel testing of the East Boston harborfront massing. This wind tunnel testing is essential to determine the potential impacts of wind at the pedestrian level. For purposes of the EIR, a wind analysis that evaluates pedestrian level impacts will be sufficient.

Mitigation for wind impacts is essential. This proposed portion of the Harbor Walk along the project site may be impacted by unacceptable winds for walking.

The Harbor Walk north of the project site could be in shadow for significant periods of the day and year. I encourage the proponent to explore mitigation measures that could be implemented to lessen the shadow impacts of the proposed project and improve the quality of the pedestrian experience in that location.

Wetlands:

The Wetland Section of the EIR should contain an alternatives analysis to ensure that all wetland impacts are avoided, and where unavoidable impacts occur, impacts are minimized and mitigated. The EIR should illustrate that the impacts have been minimized and that the project will be accomplished in a manner that is consistent with the Performance Standards of the Wetlands Regulations (310 CMR 10.00). M.16

The EIR should address the significance of the wetland resources on site, including public and private water supply; riverfront areas; flood control; storm damage prevention; fisheries; shellfish; and wildlife habitat. The ENF has indicated that the project would impact the following wetland resource areas: 100 sf of Land under the Ocean; 100 sf of a Designated Port Area; 19,670 sf of Coastal Beach; and 69,650 sf of Land Subject to Coastal Storm Flowage.

All resource area boundaries, riverfront areas, applicable buffer zones, and 100-year flood elevations should be clearly delineated on a plan. Filled and flowed tidelands should be surveyed, mapped, and located on the plans. Each wetland resource area and riverfront area should be characterized according to 310 CMR 10.00. The text should explain whether the Boston Conservation Commission has accepted the resource area boundaries, and any disputed boundary should be identified. The EIR should provide an accurate measurement of the wetland resource areas that will be affected by the project.

For any amount of required wetlands replication, a detailed wetlands replication plan should be provided in the EIR that, at a minimum, includes: replication location(s) delineated on plans, elevations, typical cross sections, test pits or soil boring logs, groundwater elevations, the hydrology of areas to be altered and replicated, list of wetlands plant species of areas to be altered and the proposed wetland replication species, planned construction sequence, and a discussion of the required performance standards and monitoring.

Comments from the Department of Conservation and Recreation (DCR) identify concern M.17
with the below grade parking and note that the structure is likely to be subject to hydrostatic forces. The structure must be constructed consistent with the State Building Code (Sixth Edition, Section 3107.0) requirements. In addition, the proponent should consider the FEMA Technical Bulletin on Non-Residential Floodproofing – Requirements and Certification. The EIR should respond to the concerns identified by DCR and demonstrate that the project will conform to the regulatory standards and requirements.

Drainage

The EIR should evaluate potential drainage impacts on water resources from the project. It should include a detailed description of the existing site's drainage system design in the construction area and identify any proposed changes, including a discussion of the alternatives M.18
considered along with their impacts. The EIR should present drainage calculations such as the rates for stormwater runoff for the 10, 25, and 100-year storm events. It should identify the quantity and quality of flows. The proponent should consider recharge rather than discharge to the Harbor.

Proposed activities, including construction mitigation, erosion and sedimentation control, phased construction, and drainage discharges or overland flow into wetland resources, should be evaluated. The location of detention/infiltration basins and their distances from wetland resource areas, and the expected water quality of the effluent from said basins should be identified. This analysis should address current and expected post-construction water quality of the predicted final receiving water bodies. The drainage analysis should insure that on- and off-site wetland resource areas are not impacted by changes in stormwater runoff patterns.

The EIR should address the performance standards of MassDEP's Stormwater Management Policy. It should demonstrate that the project is consistent with this policy. The proponent should use the MassDEP Stormwater Management Handbook when addressing this issue.

The EIR should discuss the consistency of the project with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit from the U.S. Environmental Protection Agency for stormwater discharges from a construction site. It should include a discussion of best management practices employed to meet the NPDES requirements, and should include a draft Pollution Prevention Plan in the DEIR M.19

A maintenance program for the drainage system will be needed to ensure its effectiveness. This maintenance program should outline the actual maintenance operations, sweeping schedule, responsible parties, and back-up systems. M.20

Groundwater/Contaminated Soils

The EIR should describe the dewatering of the construction site. It should identify monitoring measures to avoid significant impacts to the groundwater levels. The EIR should summarize pre-construction groundwater conditions and outline how it will monitor groundwater levels (on- and off-site). It should identify that the design and construction methods for the underslab drainage system have the ability to remove groundwater from the upper aquifer that is critical to keeping wood pilings wet as recommended by the Boston Groundwater Trust (BGT). The BGT recommends that the proponent install another groundwater well before and during construction to ensure that the project is not contributing to a reduction in the groundwater levels. The EIR should address how contamination encountered during construction will be addressed and compliance with the Massachusetts Contingency Plan (MCP) will be achieved. The EIR should present a summary of the results of hazardous waste studies and remediation efforts undertaken at the project site by the proponent to comply with the MCP. M.21 M.22

Drinking Water

The EIR should explain any impacts from the project on the drinking water supply and distribution system. It should propose mitigation as appropriate. M.23

Wastewater

The wastewater system in the project area is a combined system for stormwater and sewer. The proponent should propose separation of stormwater/wastewater around the site. The EIR should outline the proponent's efforts to reduce water consumption and thereby reduce wastewater generation. It should identify any capacity deficiencies within the municipal wastewater system to handle the project's additional wastewater flows. In its comment letter, the M.24

MassDEP is requesting this proponent to consider Infiltration/Inflow (I/I) reduction at a minimum of a 4:1 ratio for the sewershed to which the flow is added. The EIR should address this I/I issue and work closely with the Boston Water and Sewer Commission (BWSC), the Massachusetts Water Resources Authority (MWRA), and MassDEP.

Construction Issues

The EIR should include a construction management plan that describes the project's phasing, erosion and sedimentation controls, monitoring, and contingencies. It should present a discussion on potential construction period impacts (including but not limited to noise, vibration, M.25
dust, and traffic maintenance) and analyze feasible measures that can avoid or eliminate these impacts. The proponent is proposing minor filling at the site. Truck routes to the proposed construction site should be identified in the EIR. The EIR should identify construction hours and any impacts expected during peak travel hours on local roadways.

The proponent should consider participation in MassDEP's Clean Air Construction M.26
Initiative to mitigate diesel emissions associated with the construction period. The EIR should discuss the measures proposed to implement construction-period diesel emission mitigation, including the retrofit of construction equipment and the use of on-road low-sulfur diesel (LSD) fuel.

Visual/Aesthetics

The EIR should include a visual resource assessment . The visual resource assessment M.27
should include a conceptual-level landscaping plan and building elevations from all sides.

Historical Resources/Cultural Issues

The project site is located within the "City-Wide Comprehensive Industrial Survey, Boston, Massachusetts, 1996-1997" conducted on behalf of the Boston Landmarks Commission and MHC and may be eligible for listing in the National Register of Historic Places. The EIR should report on the results of the reconnaissance historic and archaeological survey to be conducted at the project site by the proponent. The scope of the investigation should include comprehensive documentary research to trace the land use and development history of the property, and to locate and identify historic properties with a recommendation for a project Area of Potential Effect, an opinion of effect, and recommendations to avoid, minimize, or mitigate adverse effects.

M.28

The survey scope should include a review of the data from the geotechnical coring for information about subsurface conditions. Additional subsurface investigations may be recommended to locate and identify important archaeological features and deposits. Available recent high resolution aerial photographs taken at low tide, and accurate maps of the property should be reviewed and included with the report of the investigation to assist in documenting the location and condition of the pier pilings, marine railway, and other potentially important site features, including any submerged cultural resources. The report should include any recommendations for any additional investigations and to preserve important site characteristics that can be incorporated into the project design. The results should be taken into account in developing the public interpretation initiative as part of the public benefit and access plan. The impacts of wind and shadow on adjacent and proximate historic properties should also be considered in the EIR. The potential shadow impacts should be superimposed on maps with the historic properties identified. M.29

Sustainable Design

To the maximum feasible extent, the proponent should incorporate sustainable design elements into the project design. The EIR should summarize the proponents' efforts to obtain a Leadership in Energy and Environmental Design (LEED) Certification for each proposed building. The basic elements of a sustainable design program may include, but not be limited to, the following measures: M.30

- optimization of natural day lighting, passive solar gain, and natural cooling;
- use of energy efficient HVAC and lighting systems, appliances and other equipment, and use of solar preheating of makeup air;
- favoring building supplies and materials that are non-toxic, made from recycled materials, and made with low embodied energy;
- provision of easily accessible and user-friendly recycling system infrastructure into building design;
- development of a solid waste reduction plan;
- development of an annual audit program for energy consumption, waste streams, and use of renewable resources;
- LEED green building standards; and
- water conservation and reuse of wastewater and stormwater.

Mitigation

The EIR should include a separate chapter on mitigation measures. This chapter on mitigation should include a proposed Section 61 Findings for all state permits. The proposed Section 61 Findings should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation should also be included. M.31

In the ENF, the proponent has committed to provide the following mitigation measures:

- Extend the Harbor Walk along the seaward edge of the site.
- Create approximately 50,318 sf of open space

- Remove all the deteriorated timber pilings within the watersheet of the project site.
- Provide public access ways from Border Street to the water's edge on a site that has no public access.
- Provide FPAs (community gallery with restrooms with programs for community residents) to a site that has none.
- Provide two finger piers supporting a marine travel lift and a marine industrial building.
- Construct a new stormwater overflow for the BWSC stormwater system on the project site.

The EIR should describe the proponent's efforts to establish the Harbor Walk and public open space as well as FPAs on the ground floor of the building as part of its Chapter 91 Licensing process. It should describe the proponent's efforts to work with the community regarding the types of public facilities to be provided at this location. The proponent should consider working with The Boston Harbor Association and other East Boston advocacy groups to improve Boston's harbor. M.32

Response to Comments

The EIR should respond to the comments received to the extent that the comments are within the subject matter of this scope. Each comment letter should be reprinted in the EIR. I defer to the proponent as it develops the format for this section, but the Response to Comments section should provide clear answers to the questions raised. M.33

Circulation

The EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should also be sent to the list of "comments received" below and to Boston officials. M.34 A copy of the EIR should be made available for public review at the Boston Public Library (East Boston Branch).

December 12, 2007
DATE

Ian A. Bowles

Comments received :

Boston Groundwater Trust, 11/12/07
MassDEP/Boston, 11/13/07
MHC, 11/16/07
Senator Anthony Petruccelli, 11/19/07
Fort Point Assoc., 11/28/07
MA Board of Underwater Archaeological Resources, 11/26/07

City Councilor Salvatore LaMattina, 11/28/07
New Street Realty Trust, 11/28/07
Pepe & Hazard, 11/28/07
MCZM, 11/28/07
MWRA, 12/3/07
MassDEP/NERO, 12/3/07
BWSC, 12/3/07
DCR, 12/3/07
BED, 12/4/07
The Boston Harbor Assoc., 12/5/07

14123enf
IAB/WTG/wg

MEPA Certificate	Executive Office of Environmental Affairs, Secretary Ian A. Bowles
M.1	The project will submit a Draft Environmental Impact Report/Draft Project Impact Report (DEIR/DPIR) to both the MEPA office and the BRA and will coordinate the review process with both agencies.
M.2	The Municipal Harbor Plan (MHP) Amendment public review process is being coordinated by the City of Boston under the guidance of Massachusetts Coastal Zone Management. If a Final EIR is submitted, it will not be until the MHP Amendment process has been completed.
M.3	The proponent understands that the MHP amendment process is ongoing simultaneously with the MEPA process. The filing of this DEIR includes the proposed amendments to the East Boston Municipal Harbor Plan (EBMHP). The FEIR will not be submitted until the MHP process has been completed.
M.4	The detailed project description is found in Section 1.2. Although there is no phasing planned for this project, the larger residential portion will be built first by utilizing the DPA area as a staging site and then the smaller marine building and DPA site will be constructed. The project's consistency with the EO 385, the EBMHP, and the EBMP are described in Section 1.1.2.
M.5	Project alternatives are described in Section 1.3.
M.6	Section 3.0 provides a detailed discussion of tidelands issues including the project's compliance with Waterways regulations.
M.7	The Designated Port Area (DPA) location is described in Section 3.4. Site plans, cross-sections, elevations, and floor plans are in Section 2.0.
M.8	Safety and security issues within the site and the adjacent Boston Towing property are described in Section 3.0. See also response to comment # 27.1 regarding the safety and security issues with the Boston Towing property.
M.9	The proponent has had discussions with MCZM and DEP concerning alternative design and project layout issues.
M.10	Section 4.0 of the DEIR/DPIR provides a traffic assessment in conformance with EOEA Guidelines for EIR/EIS Traffic Impact Assessment. Mitigation measures in the form of TDMs are identified for areas where the project impacts traffic operations. A LOS analysis was determined for all requested intersections as well as those requested by the BRA and BTD.
M.11	Section 4.0 includes a detailed assessment of present and future traffic volumes and trip generation estimates. There are no proposed signalization changes. Traffic accident history is discussed in this section.
M.12	See Section 4.0 for a description of parking demand and supply for the project and the adjacent street.

M.13	A multitude of pedestrian ways and connections to and through the site and building will provide sufficient means to support pedestrian demand, especially along the Harborwalk. See Section 2 for a description of pedestrian ways and a map. Bicycle storage will be in the garage. Section 4.0 identifies pedestrian and bicycle improvements.
M.14	TDM measures that the proponent will commit to implementation are identified in Section 4.0.
M.15	The proposed development, which is in the final stages of the design process, will create an inviting and enjoyable place for users of the Harborwalk. As part of the design process, the development team considered design options and improvements to minimize wind and shadow impacts, in particular along the waterfront portion of the site. A key design change resulted in moving the south wing of the residential building away from the Harborwalk, thereby reducing wind and shadow impacts to users of this public amenity. A pedestrian level wind analysis was conducted for this site. None of the 46 locations considered for either existing or build conditions were estimated to exceed the BRA guideline wind speed of 31 mph one percent of the time (see Section 5.1 of the DEIR/DPIR). Shadow impacts to the Harborwalk were reduced by stepping down the building height as it moves closer to the Harborwalk. An open space offset was also proposed as part of the EBMHP Amendment process (see Section 3.5 of the DEIR/DPIR).
M.16	Resource areas and an analysis of wetland impacts are in Section 5.10 of the DEIR/DPIR.
M.17	The structure will be constructed in conformance with State Building Code (Sixth Edition, Section 3107.) See responses to comments # 1.3, 3.1, and 3.3.
M.18	The DEIR evaluates potential impacts on water resources caused by the project and include a detailed description of the existing and proposed stormwater conditions. Pre and post-development drainage calculations (rates and volumes of run-off) for the 10, 25, and 100-year storm event will be provided. Groundwater recharge will also be considered. The project will also comply with the latest MassDEP Stormwater Management Policy and current wetlands and 401 Water Quality Certification regulations.
M.19	The project will comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit. Best management practices will be implemented in the project design to meet the NPDES requirements and will be discussed in the DEIR.
M.20	A maintenance program will be implemented by the proponent to ensure the stormwater management plans effectiveness in treating and mitigating stormwater runoff.

M.21	Section 5.13 describes the construction methods, including dewatering, at the site. The groundwater will be monitored before, during, and post construction as described in this section. See also response to comment # 19. 2.
M.22	The site is currently undergoing a soil and boring testing. Detailed contamination levels and construction methods that comply with the Massachusetts Contingency Plan are discussed in Section 5.11.
M.23	The project will have no impact on the drinking water supply. All potable water in the area is provided by the MWRA and BWSC.
M.24	Sanitary sewage and stormwater discharge will be separate. Sanitary sewage will be discharge to the combined sanitary sewer in Border Street, which is now under construction. Stormwater will be treated and discharged into the Harbor in compliance with the latest local and state regulations. As mitigation for the I/I program, the proponent will design, permit, and construction a new storm drain outlet that will run from Border Street to Boston Harbor, and will work closely with the BWSC, MWRA, and MassDEP.
M.25	A construction management plan is being developed as part of the Article 80 Review process. Construction hours, impacts, and truck routes are in Section 5.13.
M.26	All construction equipment will have the required emission control equipment. Construction period diesel emission mitigation is described in Section 5.13.
M.27	Section 2 contains the conceptual-level landscaping plan and building elevations from the east, south, and west sides.
M.28	The results of the reconnaissance historic and archaeological survey are in Section 5.16.
M.29	Impacts to of wind and shadow on adjacent and proximate historic properties are in Section 5.15.
M.30	Section 5.14 discusses the projects sustainable design features and its efforts to make the project LEED certifiable. See also responses to comments # 5.10, # 9.5, and # 12A.5.
M.31	Mitigation measures identified in the ENF/PNF are in Appendix 4 of the DEIR/DPIR.
M.32	Municipal Harbor Plan and Chapter 91 elements are described in Section 3.0 of the DEIR/DPIR. .
M.33	Comments and responses are in Appendix 3 of the DEIR/DPIR.
M.34	The DEIR/DPIR will be circulated in compliance with Section 11.16 of the MEPA regulations. Copies will be sent to appropriate state and local agencies as well as all people that commented on and/or requested the ENF/PNF.

BOSTON REDEVELOPMENT AUTHORITY

SCOPING DETERMINATION
BOSTON EAST

SUBMISSION REQUIREMENTS
FOR DRAFT PROJECT IMPACT REPORT (DPIR)

PROPOSED PROJECT:	BOSTON EAST
PROJECT SITE:	102-148 BORDER STREET, EAST BOSTON BOUNDED BY BORDER STREET TO THE EAST, ATLANTIC WORKS, WIGGLESWORTH MACHINERY, AND BOSTON TOWING AND TRANSPORTATION PROPERTIES TO THE SOUTH, BOSTON INNER HARBOR TO THE WEST, AND THE PROPERTY LOCATED AT 170 BORDER STREET TO THE NORTH
PROPONENT:	TRINITY BORDER STREET, LLC c/o TRINITY FINANCIAL 40 COURT STREET, 8th FLOOR BOSTON, MA 02108
DATE:	MARCH 10, 2008

The Boston Redevelopment Authority ("BRA") is issuing this Scoping Determination pursuant to Section 80B-5 of the Boston Zoning Code ("Code") in response to a Project Notification Form ("PNF"), which Trinity Border Street, LLC (the "Proponent"), filed for the Boston East project on October 19, 2007. Notice of the receipt by the BRA of the PNF was published in the *Boston Herald* on October 19, 2007, which initiated a 30-day public comment period with a closing date of November 19, 2007.

In accordance with the BRA's policy on mitigation as outlined in Mayor Thomas M. Menino's Executive Order Relative to the Provision of Mitigation by Development Projects in Boston, the Proponent submitted a Letter of Intent, dated June 8, 2007, received on June 12, 2007, for the redevelopment of a 14.2 acre property, which includes land and watersheet, located at 102-148 Border Street in East Boston (the "Proposed Project").

On June 22, 2007, letters soliciting Impact Advisory Group ("IAG") nominations for the Proposed Project were delivered to City Councilor Salvatore LaMattina, and the former State Representative Anthony Petruccelli, who is now the State Senator for the District. Additional letters seeking recommendations were delivered to the Office of Neighborhood Services and to the City Councilors At-Large.

The letters sought nominations or recommendations to the IAG by June 29, 2007. State Senator Anthony Petruccelli, and City Councilor Salvatore LaMattina each responded with two (2) nominations. The Office of Neighborhood Services responded with a total of two (2) nominations. The BRA nominated four (4) people. On September 7, 2007, the four City Councilors At-Large declined the opportunity to make nominations.

Two (2) of the people who had been nominated to serve on the IAG declined the nomination. Eight (8) individuals were appointed to the IAG and have been invited to participate in advising BRA staff on the determination and consideration of impacts and appropriate mitigation regarding the Proposed Project. The following list includes the names of the IAG members:

Kay Brayden-Strelitz
Karen Buttiglieri
Ruth Capone
Lorraine Curry
Kristin Langone
Diane Modica
Robert Pyles
Ernie Torgesen

The Notice of the receipt by the BRA of the PNF and the PNF were sent to the City's public agencies pursuant to Section 80A-2 of the Code, as well as to the IAG members. Pursuant to Section 80B-5.3 of the Boston Zoning Code (the "Code"), a scoping session was held on October 26, 2007 with the City of Boston's public agencies at which time the Proposed Project was reviewed and discussed. Members of the IAG were also invited to attend the scoping session.

The Proponent conducted a publicly advertised public meeting, which was held on October 29, 2007 at the Maverick Landing Community Center, located at 31 Liverpool Street in East Boston. The community will continue to have an opportunity to give input regarding the Proposed Project during the Article 80-review process.

Comments received by the BRA during the comment period are included in **Appendices A, B, and C**. The DPIR should include complete responses to all comments included in **Appendices A, B and C** within the framework of the criteria outlined in the Scoping Determination. B.1

Written comments in response to the PNF received by the BRA from elected officials and the City's public agencies are included in **Appendix A** and must be answered in their entirety.

Specifically, they are from:

- City Councilor Salvatore LaMattina, District One
- State Senator Anthony Petruccelli, First Suffolk and Middlesex District
- David Carlson, Senior Architect, BRA, and Executive Director, Boston Civic Design Commission
- Robert D'Amico, Senior Planner, City of Boston Transportation Department
- Sandra R. Duran, Deputy Director, Real Estate Management and Sales, Department of Neighborhood Development
- Valerie Gingrich, Waterfront Planner, BRA, and Carlos Montanez, Senior Planner, BRA
- Bryan Glascock, Director, City of Boston Environment Department
- Dennis L. Keeley, Acting Fire Marshall, City of Boston Fire Department
- Elliott Laffer, Executive Director, Boston Groundwater Trust
- Katie Pedersen, Senior Project Manager/Environmental Review Specialist, BRA
- John Sullivan, P.E., Chief Engineer, Boston Water and Sewer Commission

Written comments in response to the PNF received by the BRA from the IAG are included in **Appendix B** and must be answered in their entirety. Listed in chronological order of date received, specifically they are from:

- Kay Brayden-Strelitz, Diane Modica and Rob Pyles – November 19, 2007
- Ernie Torgersen – November 19, 2007
- Kristin Langone – December 10, 2007

Written comments in response to the PNF received by the BRA from the public are included in **Appendix C** and must be answered in their entirety. Listed in chronological order of date received specifically they are from:

- FastForwards Realty Trust, Benjamin P. Goodman - November 13, 2007
- Joe D'Amelio - November 15, 2007
- Neenah Estrella-Luna - November 19, 2007
- Ejay Khan - November 19, 2007
- Bob Strelitz - November 19, 2007
- Captain John Tyler - November 20, 2007
- Melissa Tyler - November 20, 2007
- Greg Yankosky - November 20, 2007
- Maverick Tenants Organization, Inc. ("MTO"), Ruth Capone, MTO Interim Director/Chairperson & the Board of Directors - November 28, 2007
- New Street Realty Trust, M. Bruce Ohanian, Co-Trustee and Varney Hintlian, Co-Trustee - November 28, 2007
- The Boston Harbor Association - December 5, 2007

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

I. PROJECT DESCRIPTION

The Boston East project is located at 102-148 Border Street along the East Boston waterfront and consists of approximately 14.2 acres, of which approximately 10.8 acres are watersheet, and is bound by Border Street to the east, Atlantic Works, Wigglesworth Machinery, and Boston Towing and Transportation properties to the south, the Boston Inner Harbor to the west, and the property at 170 Border Street to the north (the "Project Site"). The Project Site is located near Central Square to the north and Maverick Square and the Massachusetts Bay Transportation Authority Transit Station to the east.

The Project Site includes land under water, and filled tidelands. Currently, the landside portion of the Project Site is vacant. There are several structures on the Project Site including footings of former buildings, entrance posts, an outfall pipe, and bulkheads that are in disrepair. On the waterside, there are two dilapidated marine railways and approximately 25,000 square feet of dilapidated timber piling areas that extend over 250 feet beyond the high water mark. Although the Project Site currently is inaccessible to both vehicles and pedestrians and is surrounded by a fence, historically the Project Site was used for commercial and industrial activities including ship building, ship and engine repair, dry docks, coal storage, and a carriage factory.

Previously, there was a Designated Port Area ("DPA") designation on both the north and south side of the Project Site. Through a separate regulatory process from the Article 80 process, the DPA area was reconfigured and consolidated to the southern portion of the Project Site. The reconfiguration will afford better development parcels for maritime and residential uses. The Proposed Project and the information contained in the PNF were predicated on the reconfiguration of the DPA.

The Proposed Project includes two development areas, a non-DPA area and a DPA area. The non-DPA area, which is located on the northern portion of the Project Site includes a residential building that will range from five to seven stories and will contain approximately 196 units, an approximately 1,840 square foot community gallery as the facility of public accommodation, located along the Harborwalk, which will help activate the area, 139 underground parking spaces, and open space. The residential units will be a mix of one and two-bedroom units. The residential building has two wings, placed as long, wharf-like fingers that extend towards Boston Harbor, as well as an archway. The open space on the waterside of the Project Site will be terraced and will lead up to the archway, through to Border Street.

The DPA area, which is located on the southern portion of the Project Site, includes a two-story, approximately 20,000 square foot marine industrial facility, a marine travel lift, twenty-six parking spaces, and a maritime interpretive area. The Proponent is currently evaluating potential economically viable and programmatically appropriate tenants that would fit within the eligible uses of the DPA. The interpretive area will be designed as an interpretive landscape with exhibits that extend into Boston Harbor.

The total gross floor area for the Proposed Project is 241,859 square feet with a total floor-area-ratio ("FAR") of approximately 1.63. The combined building footprint is 50,800 square feet, which occupies 34% of the Project Site.

The Proposed Project also includes approximately 750 feet of Harborwalk, which will include three points of access from Border Street, and will connect to the planned Harborwalk to the north with the emerging East Boston Harborwalk being developed to the southeast. Ultimately, the Harborwalk will extend from the Harborside Hyatt Hotel to Border Street.

II. PREAMBLE

The Proposed Project is being reviewed pursuant to Article 80, Development Review and Approval, which sets forth a comprehensive procedure for project review of the following components: transportation, environmental protection, urban design, historic resources, infrastructure systems, site plan, tidelands, and B-2
Development Impact Project, if any. The Proponent is required to prepare and

submit to the BRA a Draft Project Impact Report ("DPIR") that meets the requirements of the Scoping Determination by detailing the Proposed Project's impacts and proposed measures to mitigate, limit or minimize such impacts. The DPIR shall contain the information necessary to meet the specifications of Section 80B-3 (Scope of Large Project Review; Content of Reports) and Section 80B-4 (Standards for Large Project Review Approval), as required by the Scoping Determination. After submitting the DPIR, the Proponent shall publish notice of such submittal as required by Section 80A-2. Pursuant to Section 80B-4(c)(i)(3), the BRA shall issue a written Preliminary Adequacy Determination ("PAD") within ninety (90) days. Public comments, including the comments of public agencies, shall be transmitted in writing to the BRA no later than fifteen (15) days prior to the date by which the BRA must issue its PAD. The PAD shall indicate the additional steps, if any, necessary for the Proponent to satisfy the requirements of the Scoping Determination. If the BRA determines that the DPIR adequately describes the Proposed Project's impacts and, if appropriate, proposed measures to mitigate, limit or minimize such impacts, the PAD will announce such a determination and that the requirements of further review are waived pursuant to Section 80B-5.4(c)(iv). Section 80B-6 requires the Director of the BRA to issue a Certification of Compliance indicating the successful completion of the Article 80 development review requirements before the Commissioner of Inspectional Services can issue any building permit for the Proposed Project. B-3

III. <u>REVIEW/SUBMISSION REQUIREMENTS</u>

In addition to full-size scale drawings, 55 copies of a bound booklet containing all submission materials reduced to size 8-1/2" x 11", except where otherwise specified, are required. The booklet should be printed on both sides of the page. In addition, an adequate number of copies must be available for community review. A copy of this scoping determination should be included in the booklet for review. B.4

A. GENERAL INFORMATION

1. Applicant/Proponent Information

   a. Development team

      (1) Names

         (a) Proponent (including description of development entity and type of corporation, and the principals thereof)

(b) Attorney
(c) Project consultants and architects

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

(3) Designated contact for each

b. Legal Information

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

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

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

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

B. REGULATORY CONTROL AND PERMITS

An updated list of all anticipated permits or approvals required from other municipal, state or federal agencies, including a proposed application schedule shall be included in the DPIR. B.5

C. PROJECT ALTERNATIVES

The DPIR must include the following alternatives. The analyses as provided for in the Environmental Protection Component, Urban Design Component, and Transportation Component sections of this Scoping Determination shall be required for both alternatives. B.6

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

Alternative 2 – Full build of Proposed Project as modified during the Boston Civic Design Commission, BRA, and public review process and in response to comments contained in this Scoping Determination.

D. PROJECT DESCRIPTION

The DPIR shall contain a full description of the Proposed Project and its elements, including size, physical characteristics, and proposed uses. This section of the DPIR also shall present the development context of the Proposed Project (description of the surrounding environment), existing site conditions, project purpose and objectives, and approximate project cost and development schedule. B.7

The Proponent shall provide plans indicating the locations and layouts of the affordable units, all of which shall be presumed to be created on-site, consistent with BRA policy. The number of units to be created, the incomes of the households to be reached, and the unit size mix shall be consistent with the Inclusionary Development Policy, effective May 16, 2006. B.8

E. TRANSPORTATION COMPONENT

The analysis included in the DPIR must utilize the Boston Transportation Department's ("BTD") Transportation Access Plan Guidelines and Scope and BTD's comment letter, dated November 15, 2007. Both BTD documents are included in **Appendix A** and are incorporated herein by reference and made a part hereof. The Proponent is required to address all comments included in BTD's comment letters in addition to the following comments. B.9

The residential component of the Proposed Project will generate significant new pedestrian traffic at the location and in the general Central Square area. Considering the current environment in Central Square, BTD will closely monitor the Proponent's plan to mitigate potential impacts in relationship to vehicular movements and how the increase in pedestrian traffic will affect the overall flow of traffic in Central Square. B.10

By virtue of its location, the Proposed Project will have convenient connections to Maverick Station, Logan Airport and the surrounding roadway system leading north, south and westbound. The Proponent will be required to implement travel demand management ("TDM") measures in order to minimize automobile reliance among residents of the Proposed Project. These measures include: B.11

distribution of public transit information, pedestrian and streetscape improvements and secure bicycle storage.

Due to the design of the building, which will be constructed up to the sidewalk, BTD will require an audio/video alarm located at the access/egress point to the underground parking garage to warn pedestrians of vehicles exiting the property. An alarm will also be necessary at the access/egress point of the residential off-street loading area if similar in design to the residential garage. B.12

Construction Management Plan

The Proponent must execute a Construction Management Plan ("CMP") with BTD. The CMP should detail the schedule, staging, parking, delivery, and other associated construction impacts of the Proposed Project. B.13

Transportation Access Plan Agreement

The Proponent will have to execute a Transportation Access Plan Agreement ("TAPA") with BTD, which will codify the specific measures, mitigation and agreements between the Proponent and BTD. The Proponent shall be responsible for all costs associated with mitigation efforts including, but not limited to design and engineering, construction, and inspection. As part of this document, BTD will require that the Proponent include traffic and parking information regarding all other projects planned for the general area, which includes all waterfront development projects. B.14

F. ENVIRONMENTAL PROTECTION COMPONENT

The DPIR shall address the comments of the City of Boston Environment Department, dated December 4, 2007, included in **Appendix A**, and incorporated herein by reference and made a part hereof. B.15

Additional comments related to environmental impacts are described in a memorandum from Katie Pedersen, Senior Project Manager/Environmental Review Specialist, BRA, dated November 28, 2007. This memorandum is included in **Appendix A,** and incorporated herein by reference and made a part hereof and will be addressed in its entirety.

Air Quality

The Proponent shall provide a description of the existing and projected future air quality in the Proposed Project vicinity and shall evaluate ambient levels to determine conformance with the National Ambient Air Quality Standards ("NAAQS"). Careful consideration shall be given to mitigation measures to ensure compliance with air quality standards. B.16

A future air quality (carbon monoxide) analysis shall be required for any intersection (including garage entrance/exits) where the level of service (LOS) is expected to deteriorate to D and the Proposed Project causes a 10 percent increase in traffic or where the level of service is E or F and the Proposed Project contributes to a reduction in LOS. B.17

The study shall analyze the existing conditions, future No-Build and future Build conditions only. The methodology and parameters of the air quality analysis shall be approved in advance by the BRA and the Massachusetts Department of Environmental Protection ("DEP"). Mitigation measures to eliminate or avoid any violation of air quality standards shall be described.

A description of the Proposed Project's heating and mechanical systems including location of buildings/garage intake and exhaust vents and specifications, and an analysis of the impact on pedestrian level air quality and on any sensitive receptors from operation of the heating, mechanical and exhaust systems, including the building's emergency generator as well as the parking garage, shall be required. Measures to avoid any violation of air quality standards shall be described. B.18

Noise

The Proponent shall establish the existing noise levels at the Proposed Project Site and vicinity and shall calculate future noise levels after project completion, thus demonstrating compliance with the Interior Design Noise Levels (not to exceed day-night average sound level of 45 decibels) established by U.S. Department of Housing and Urban Development, as well as applicable City, State and Federal noise criteria. B.19

The Proponent has stated that the primary source will emanate from the external mechanical equipment, containing the make-up air units and the compressors. The Proposed Project may also include emergency generators, which would also contribute to external mechanical noise. Despite the fact that the rooftop equipment is not anticipated to exceed maximum sound levels, due to the Proposed Project's proximity to an adjacent residential neighborhood, appropriate low-noise mechanical equipment and noise control measures will be required in accord with the Regulations for Control of Noise in the City of Boston and the Commonwealth of Massachusetts. The Proponent shall also describe any other measures necessary to minimize and/or eliminate adverse noise impacts from the Proposed Project.

Solar Glare

The Proponent has stated that the Proposed Project does not incorporate the reflective building material. Consequently, the Proponent does not anticipate the B.20

creation of either an adverse solar glare impact or a solar heat buildup in nearby buildings. The Proponent shall demonstrate that the glass selected will avoid the creation of a visual nuisance and/or a hazard, as it interferes with vision and concentration. However, should the design change and incorporate substantial glass-facades, a solar glare analysis shall be required. The analysis shall measure potential reflective glare from the buildings onto potentially affected streets and public open spaces and sidewalk areas in order to determine the likelihood of visual impairment or discomfort due to reflective spot glare. Mitigation measures to eliminate any adverse reflective glare shall be identified.

Daylight

The Proponent shall conduct a daylight analysis for both build and no-build conditions. The analysis shall measure the percentage of skydome obstructed by the Proposed Project and evaluate the net change in obstruction. If alternative massing studies are requested as part of the Article 80 Development Review Process, daylight analysis of such alternatives shall also be conducted for comparison. The study shall treat the following elements as controls for data comparison: existing conditions, the context of the area, and the as-of right conditions. Daylight analyses should be taken for each major building façade within the limits of the BRA Daylight Analysis (BRADA) program, fronting these public and quasi-public ways. The midpoint of each roadway should be taken as a study point. B.21

Geotechnical Impacts

A description and analysis of the existing sub-soil conditions, including the potential for ground movement and settlement during excavation and potential impact on adjacent buildings and utility lines shall be required. This analysis shall also include a description of the foundation construction methodology, the amount and method of excavation, and the need for any blasting and/or pile driving and the impact on adjacent buildings and infrastructure. A Vibration Monitoring Plan shall be developed prior to commencing construction activities to ensure that impacts from the project construction on adjacent buildings and infrastructure are avoided. Mitigation measures to minimize and avoid damage to adjacent buildings and infrastructure must be described. B.22

Groundwater

The Proponent anticipates groundwater to be present within a depth of 10 feet below-ground surface and thus dewatering is likely to be required for foundation construction. A relatively watertight excavation support system will be employed in order to mitigate the potential adverse impacts of temporarily lowering groundwater levels on adjacent buildings and utilities. The Proponent has stated that groundwater levels outside the excavation will be monitored. However, the Proponent has not offered a description of the manner in which B.23

groundwater levels will be monitored and hence encouraged to install observation monitoring wells. Upon completion of construction, the Proponent would be encouraged to assign monitoring wells to the Boston Groundwater Trust (the "Trust") and if on private property, a permanent easement for access by the Trust or designated representative provided.

If on-going pumping or dewatering is required, the metering of discharge should be conducted with oversight by the Boston Water and Sewer Commission.

The BRA requests that the Proponent consult with the Trust regarding potential groundwater issues. Contact information for the Trust:

Boston Groundwater Trust
234 Clarendon Street
Boston, MA 02116

Attention: Elliott Laffer, Executive Director
617-859-8439

Shadow

The Proponent shall be required to provide a detailed shadow analysis, describing and depicting the existing shadow conditions and the anticipated shadow impacts from the Proposed Project. The analysis shall examine existing and build condition shadow impacts for the 9:00 a.m., 12:00 Noon, and 3:00 p.m. hours during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 23), and the winter solstice (December 22). Impacts at 6:00 p.m., during the summer and autumn must be examined as well. It should be noted that due to the time differences (daylight savings v. standard), the autumnal equinox shadows would not be the same as the vernal equinox shadows and therefore separate shadow studies are required for the vernal and autumnal equinoxes. B.24

The shadow impact analysis must include net shadow from the Proposed Project as well as existing shadow and clearly illustrate the incremental impact of the Proposed Project. For purposes of clarity, new shadow should be shown in a dark, contrasting tone, distinguishable from existing shadow. The shadow impact study area shall include, at a minimum, the entire area to be encompassed by the maximum shadow expected to be produced by the Proposed Project. The build condition(s) shall include all buildings under construction and any proposed buildings anticipated to be completed prior to the completion of the Proposed Project. Shadows from all existing buildings within the shadow impact study area shall be shown. A North Arrow shall be provided on all figures. Shadows shall be determined by using the applicable Boston Azimuth and Altitude data.

Particular attention shall be given to existing or proposed public open spaces and pedestrian areas, including, but not limited to, the existing sidewalks and pedestrian walkways within, adjacent to, and in the vicinity of the Proposed Project and the existing and proposed plazas, historic resources, LoPresti Park, and other open space areas within the vicinity of the Proposed Project.

Wind

The Proponent has conducted a qualitative analysis to determine the Proposed Project's one-story Marina building and a seven-story residence building effect on pedestrian level winds (PLWs). Results we obtained for both existing (no-build) and build conditions for NW (winter), SW (summer), easterly storm, and annual winds. The Proponent has stated that none of the forty-six locations considered for either existing or build conditions is estimated to have PLWs that exceed the BRA guideline of an effective gust velocity of 31 miles per hour (mph) not be exceeded more than 1% of the time. The Proponent has further asserted that the addition of the Proposed Project buildings tend to reduce PLWs in the vicinity of the two buildings due to their sheltering affects, although winds are increased somewhat near the corners of the 80-foot building. No location is estimated to have dangerous winds as often as once a year, nor is any location estimated to have PLWs higher than Catergory 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered.

For the areas where wind speeds are projected to be dangerous or to exceed acceptable levels, measures to reduce wind speeds and to mitigate potential adverse impact shall be identified. B.25

Stormwater Management

The Proponent has provided a description of the exiting drainage conditions as well as a description of proposed plan to construct a new 60-inch stormwater outlet from the Border Street separated stormwater system to the Harbor.

The Proponent has demonstrated compliance the DEP Stormwater Management Policy as the Proposed Project falls under the jurisdiction of the Massachusetts Wetlands Protection Act (WPA), thus requiring the Proposed Project to meet performance standards with regard to stormwater discharges to wetland resource areas. Due to its proximity to the Boston Harbor, the project is subject to the WPA, and stormwater Best Management Practices (BMPs) have been designed in conformance with the DEP performance standards. The Proponent has provided an illustration of how the Proposed Project will conform to the DEP Stormwater Management Standards.

Tidelands/Chapter 91
The Proponent shall provide documentation from the Massachusetts Department of Environmental Protection regarding Chapter 91 licensing determination of applicability. B.26

East Boston Municipal Harbor Plan
The Proponent is seeking, through a process to amend the East Boston Municipal Harbor Plan, relief from height restrictions and a reduction in required Facilities of Public Accommodation space.

The development of residential uses in industrial areas presents particular challenges. The amended East Boston Municipal Harbor Plan should identify and then outline how these challenges can be met in ways that preserve and support our important marine industrial uses while allowing for development.

We look forward to learning more in the DEIR/DPIR about the basis for reducing the Facilities of Public Accommodation and about the issue of residential/industrial compatibility. B.27

Solid and Hazardous Wastes/Materials
The Proponent shall provide a list of any known or potential contaminants on the Site, and if applicable, a description of remediation measures to ensure their safe removal and disposal, pursuant to the M.G.L., Chapter 21E and the Massachusetts Contingency Plan. B.28

Any potential hazardous wastes to be generated by the proposed site must be identified. In addition, potential waste generation must be estimated and plans for disposal indicated and measures to promote reduction of waste generation and to promote recycling in compliance with the City's recycling program described.

Historic Landmarks
The Proponent has identified, mapped and described historic resources and any other historic properties in the vicinity of the Proposed Project's site and evaluated the anticipated effects of the Proposed Project on these resources. The Proponent has stated that the Proposed Project will not have any adverse impacts to the historic structures in the surrounding area.

The City Archaeologist concurs with the recommendations of the Massachusetts Historical Commission ("MHC") to conduct a reconnaissance historic and archaeological survey (950 CMR 70) to locate and identify important terrestrial B.29

and submerged cultural deposits. Please contact Ms. Ellen Berkland at 617-635-3850.

The Boston Landmarks Commission (the "BLC") commends the Proponent's efforts to retain on site historic artifacts and incorporate them into the historic maritime interpretive area. This element will allow visitors to understand the industrial maritime history of the site and serve as an educational element along the Harborwalk. The BLC encourages the proponent to also integrate interpretive signage elements throughout the project site. B.30

The BLC requests that dated cornerstones be incorporated into all new construction. This element will allow those who are attentive to and value the architecture of the City to appreciate the historical context in which structures were conceived. B.31

Sustainable Design/Green Buildings

The purpose of Article 37 of the Boston Zoning Code is to ensure that major buildings projects are planned, designed, constructed and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston. Any project subject to the provisions of Article 37 shall be LEED Certifiable (U.S. Green Buildings Council) under an appropriate LEED rating system.

The Proponent has provided a completed LEED-NC checklist indicating 31 points for which the Proposed Project is expected to qualify (including any Boston Green Credits, found in Appendix A to Article 37). The applicant shall demonstrate that the Proposed Project will meet the requirements of Article 37 with appropriate supporting documentation and by certification from a LEED Accredited Professional. B.32

A LEED Checklist is provided for the residential building but not for the marine building. As this is one 241,859 gross square foot project, a checklist should be completed for each building. This checklist and any update to the checklist for the residential building should be included in the DEIR/DPIR.

G. URBAN DESIGN COMPONENT

A complete discussion of the Proposed Project as it relates to the Urban Design Component and other Article 80 review topics are described in a memorandum from David Carlson, Senior Architect, BRA, dated February 12, 2008 included in **Appendix A.** These comments are incorporated herein by reference and made a part hereof and must be addressed in their entirety in the DPIR. B.33

Boston Civic Design Commission

Boston Civic Design Commission ("BCDC") Review is established by Article 28 of the Code and is a part of the Article 80 Project and Plan review processes. BCDC review is advisory to the BRA and should occur before the BRA Board takes action pursuant to the Article 80 process. In special cases, where this threshold is not applicable, BCDC review should occur during the schematic phase of project design or plan evolution so as to maximize the potential benefit of BCDC comments.

BCDC voted to review and saw a presentation of the Proposed Project at its November 6, 2007 meeting; the Proponent made a presentation to the BCDC's Design Sub-Committee on November 27, 2007. At the request of the BCDC Design Sub-Committee, the Proponent returned to the Design Sub-Committee to make a follow up presentation on December 18, 2007, at which time the Design Sub-Committee recommended that the Proposed Project should appear before the full BCDC on January 8, 2008 to seek a vote of approval. On January 8, 2008, the Proposed Project was approved by BCDC.

The following (standard list of) urban design materials should be submitted for the DPIR for the Proposed Project or, if no DPIR is requested, should be submitted as a record 'schematic design' submission pursuant to the BRA's Development Review Procedures: B.34

1. Written description of program elements and space allocation for each element

2. Plan for the surrounding area and district and sections at an appropriate scale (1" = 40' or larger) showing relationships of the Proposed Project to the surrounding area and district:
    a. massing
    b. building height
    c. scaling elements
    d. open space
    e. major topographical features
    f. pedestrian and vehicular circulation
    g. land use

3. Black and white or color 8"x10" photographs of the site and neighborhood

4. Eye-level perspective (reproducible line drawings) showing the proposal (including main entries and public passages/areas) both in the context of the surrounding area and experientially; i.e., how the public might experience the public realm created by the building and site designs.

Additional views from the area streets (Border and Decatur, i.e.) are required, with particular emphasis on important viewing areas such as key approaches (Harbor, Central Square). Long-ranged (distanced) views of the proposed project should also be studied to assess the impact on the skyline or other view lines. Context and the massing of other approved Projects should be included. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) both the build and no-build conditions. The view locations should be approved by the BRA before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.

5. Site sections at 1" = 20' or larger showing relationships to adjacent buildings and spaces.

6. Site plan at an appropriate scale (1" = 20' or larger) showing:
   - a. General relationships of proposed and existing adjacent buildings and open space
   - b. Open spaces defined by buildings on adjacent parcels and across streets
   - c. General location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
   - d. Pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
   - e. Survey information, such as extending elevations, benchmarks, and utilities
   - f. Construction limits

7. Study building/site model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration (window treatment), facade composition, etc.

8. Massing model at 1" = 40' in basswood suitable for placement in the area model at the BRA (if applicable).

9. Drawings at an appropriate scales (<u>e.g.,</u> 1" =8', 1"-16', or 1"-20') to describe the facade design and proposed materials including:
   - a. Building and site improvement plans
   - b. Elevations in the context of the surrounding area
   - c. Sections showing organization of functions and spaces
   - d. Preliminary building plans showing ground floor and typical upper floors
   - e. Phasing of the proposed project

10. A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.

11. Proposed schedule for submittal of all design or development related materials.

12. Proposed LEED certification plans and point rating goal assessment.

13. Electronic model of the Proposed Project in format suitable for use in the BRA's digital 3-D model of Boston. Format should be approved by Urban Design's Technology manager.

H. INFRASTRUCTURE SYSTEMS COMPONENT

The DPIR must address the comments of the Boston Water and Sewer Commission ("BWSC"), dated December 3, 2007, and the comments of the Boston Groundwater Trust, dated November 2, 2007, included in **Appendix A.** B.35

I. FIRE PREVENTION/CONTROL

The DPIR must address the following fire prevention/control issues for all phases of construction as well as for the final design stage. The written comments of Dennis L. Keeley, Acting Fire Marshall, City of Boston Fire Department, dated October 25, 2007, are included in **Appendix A,** and are incorporated herein by reference and made a part hereof. B.36

The following issues must be addressed:

- emergency vehicle access to all new buildings as well as any existing buildings that might be affected;
- impact on availability and accessibility of hydrant locations for new buildings as well as any existing buildings that might be impacted;
- impact on availability and accessibility to siamese connection locations for new buildings as well as for any existing buildings that might be impacted;
- impact that a transformer vault fire or explosion will have on the fire safety of the building(s), particularly as it relates to the location of the vault;

- need for Boston Fire Department permit requirements as outlined in the Boston Fire Prevention Code, the Massachusetts Fire Prevention Regulations 527 CMR, and the Massachusetts fire Prevention Laws (M.G.L. c. 148); and

- if the Proposed Project will include air-supported structures, the impact of the design on fire safety relative to the interaction of the area underneath the structure to the structure as well as to the interaction of the structure to the area underneath the structure.

J. PUBLIC WORKS COMPONENT

Although the Boston Public Works Department ("PWD") did not submit comments regarding the Proposed Project, below is what PWD traditionally requests of a proponent. The Proponent should coordinate with PWD to ensure that the necessary review and approvals occur, and that the appropriate analyses are completed regarding the Proposed Project. B.37

Site Plan
The Proponent must provide an engineer's site plan at an appropriate engineering scale that shows curb functionality on both sides of all streets that abuts the property.

Sidewalks
The Proponent is responsible for the reconstruction of the sidewalks abutting the project, and where appropriate, extend the limits to the nearest intersection. This effort may constitute a License, Maintenance and Indemnification ("LM&I") agreement with the Public Improvement Commission ("PIC"). The reconstruction effort must meet current ADA guidelines, including the re-construction or installation of necessary ADA compatible ramps where needed.

Discontinuances
Any and all discontinuances (sub-surface, surface or above surface) within the Public Right-of-Way ("ROW") must be processed through the PIC.

Landscaping
The Proponent must seek approval from Mr. Ken Crasco, Chief Landscape Architect, Boston Parks and Recreation Department, for all landscape elements. Program must accompany a LM&I with the PIC. B.38

Street Lighting
Street lighting needs must be consulted with Mr. Joe Banks of the Street Lighting Division, PWD, and where needed, be installed by the Proponent, and must be consistent with the area lighting, to provide a consistent urban design.

Roadway
Based on the extent of construction activity, including utility connections and taps, the Proponent will be responsible for the reconstruction of the roadway sections that immediately abuts the property, and where appropriate, extend the limits on re-construction to the nearest intersection.

Public Trash Receptacles
The Proponent should consult with Mr. Tim McCarthy of PWD, and is responsible for purchasing solar powered trash compactors to be used in public space consistent with the City of Boston's Plans.

Public Art
Proponent is encouraged to contact Ms. Sarah Hutt, Boston Arts Commission, to participate with the City's public arts program, creating notable art pieces in public spaces.

Groundwater
Proponent should install groundwater-monitoring wells in accordance to Inspectional Services Department standards, to monitor groundwater levels during construction, and convey the wells to the Boston Groundwater Trust through the PIC after the completion of the project. B.39

K. MUNICIPAL HARBOR PLAN

The entire Project Site is located within Chapter 91 jurisdiction and will be included in the scope of a Municipal Harbor Plan amendment for the 2002 Municipal Harbor Plan for East Boston. Through the Municipal Harbor Plan amendment process, the Proposed Project will seek relief from certain dimensional constraints, including height, the water dependent use zone, and reducing the amount of Facilities of Public Accommodation and allowing Facilities of Private Tenancy within 100 feet of the project shoreline. B.40

Tidelands
The Project Site is comprised of flowed tidelands, and filled (formerly flowed) tidelands. Since the Project Site is currently owned by the City of Boston, the Project Site is considered Commonwealth tidelands.

Building Height
The proposed building height of 85 feet and does not conform to the height allowed under Chapter 91 regulations, per 310 CMR 9.51(3)(e). The Proponent will be seeking a substitution for the height through the East Boston Municipal Harbor Plan amendment process to allow an 85 foot tall building within 100 feet of the high water mark.

Water-Dependent Use Zone
Per 310 CMR 9.51(3)(c), the Proposed Project should have a setback or Water-Dependent Use Zone that extends landward from the Project shoreline 25% of the depth of the lot, with a minimum of 25 feet and a maximum of 100 feet, and along the sides of piers, 15% of the lot width, with a minimum of 10 feet and a maximum of 50 feet.

The Proponent is seeking relief through the East Boston Municipal Harbor Plan amendment process to reconfigure the Water-Dependent Use Zone, which would reduce the residential building's required setback from the Project Shoreline.

Ground Floor Uses
Per 310 CMR 9.53(2)(c), 75% of the ground floor is required to be Facilities of Public Accommodation. Since the Proposed Project currently includes only 14% Facilities of Public Accommodation on the ground floor of the residential building and because the ground floor uses are primarily residential, the Proponent will be seeking relief through the East Boston Municipal Harbor Plan amendment process for the reduction of the required Facilities of Public Accommodation space.

Zoning
The Proposed Project is located within a Waterfront Commercial Subdistrict of the East Boston Neighborhood District (Article 53 of the Code). Accordingly, the minimum open space is 50%, the maximum allowed Floor Area Ratio is 1.0 and the maximum allowed building height is fifty-five (55) feet. In this zoning subdistrict, the proposed multifamily use is an allowed use on upper floors and conditional on the ground floor.

L. DEVELOPMENT IMPACT PROJECT

Based on the information provided in the PNF, the Proposed Project's uses will not require the Proponent to enter into a Development Impact Project ("DIP") agreement.

M. PUBLIC NOTICE

The Proponent will be responsible for preparing and publishing in one or more newspaper of general circulation in the city of Boston a Public Notice of the submission the DPIR to the BRA as required by Article 80A-2. This notice shall be published within five (5) days after the receipt of the DPIR by the BRA. Public comments shall be transmitted to the BRA within seventy five (75) days of the publication of the Public Notice. B.41

Following publication of the Notice, the Proponent shall submit a copy of the Public Notice to the BRA as well as the date of publication.

BRA Scope	Boston Redevelopment Authority
B.1	Responses to the Scoping Determination and the comments that were in Appendices A, B, and C are in this section of the DEIR/DPIR.
B.2	The DEIR/DPIR meets the submission requirements by detailing the projects impacts and providing measures to mitigate, limit, or minimize those impacts.
B.3	The proponent will publish a notice of the DPIR submittal as required by Section 80A-2.
B.4	Fifty-five copies of the completed DEIR/DPIR will be submitted to the BRA for their review and distribution. Full-size scale drawings will be submitted to the appropriate agencies during the Article 80 Review process.
B.5	An updated list of all permits and approvals is contained in Section 1.0 of the DEIR/DPIR.
B.6	The alternatives required in the Environment, Urban Design, and Transportation sections reflect the no-build and preferred alternatives.
B.7	See Sections 1.0 and 2.0 for descriptions of the project.
B.8	Section 1.2 of the DEIR/DPIR provides counts of affordable units.
B.9	See responses to comment # 13 regarding BTDs letter.
B.10	The traffic analysis in Section 5.0 addresses pedestrian traffic near Central Square.
B.11	Travel demand management measures are detailed in the Section 5.0 of the DEIR/DPIR.
B.12	Both the loading area and the parking garage have been designed with sufficient sight lines so that pedestrians will be well aware of any vehicles that egress from these two locations. The proponent will consult with BTD to ensure that these designs meet their requirements.
B.13	A construction management plan will be submitted separately to the BRA as part of the Article 80 review process.
B.14	A TAPA with BTD will be executed as part of the Article 80 review process.
B.15	Responses to all comments from the City of Boston Environment Department can be found in numbers 9.1 through 9.19.
B.16	An air quality analysis is in Section 5.5 of the DEIR/DPIR.
B.17	See response to comment # 12.2.
B.18	See response to comment # 12.3.
B.19	See response to comment # 12.4.
B.20	See response to comment # 12.5.
B.21	See response to comment # 12.6.
B.22	See response to comment # 12.7.

B.23	See response to comment # 12.8.
B.24	See response to comment # 12.9.
B.25	See response to comment # 12.10.
B.26	See response to comment # 12.11.
B.27	See Section 3.5 of the DEIR/DPIR regarding facilities of public accommodation. The proponent fully understands the challenges and issues regarding the compatibility and coexistence of residential and industrial land uses. East Boston has many areas along the waterfront and within the its dense neighborhoods with these two land uses that have existed side by side for decades along Border, New, Liverpool, and Decatur streets. Furthermore, the proposed development will have a large buffer area including open space and a parking lot next to the existing waterfront industrial use to help attenuate impacts between the residential and industrial uses.
B.28	See response to comment # 12.12.
B.29	The results of the historic and archeological survey are in Section 5.16 of the DEIR/DPIR.
B.30	See response to comment # 9.14.
B.31	See response to comment # 9.17.
B.32	Section 5.14 provides documentation of how the project meets Article 37 requirements.
B.33	Responses to comments from David Carlson are addressed in the response section and within the DPIR.
B.34	See response to comment # 12A.5.
B.35	See responses to comments # 14.1 through 14.17.
B.36	See responses to comments # 10.1 through 10.5.
B.37	The proponent will coordinate with the Boston Public Works Department to ensure necessary reviews and approvals occur regarding site plans, sidewalks, discontinuances, landscaping, street lighting, roadway, public trash receptacles, public art, and ground water.
B.38	The proponent will not have to seek approval from the Boston Parks and Recreation Department for landscape elements since there is no public park within 100 feet of the project site.
B.39	See responses to comments 12.8 and 19.2 regarding groundwater monitoring wells.
B.40	See Section 3.5 regarding the substitutions that the proponent will be seeking through the Amendment to the East Boston Municipal Harbor Plan.
B.41	The proponent will publish a public notice in one newspaper of general circulation in the City of Boston within five days of the DPIR submittal to the BRA.

Letter 1

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
OFFICE OF COASTAL ZONE MANAGEMENT
251 Causeway Street, Suite 800, Boston, MA 02114-2136
(617) 626-1200 FAX: (617) 626-1240

MEMORANDUM

TO: Ian Bowles, Secretary, EOEEA
ATTN: William Gage, MEPA Unit
FROM: Leslie-Ann McGee, Director, CZM LAMcGee
DATE: November 28, 2007
RE: EEA 14123 – Boston East Development, East Boston

The Massachusetts Office of Coastal Zone Management (CZM) has completed its review of the above-referenced Environmental Notification Form (ENF), noticed in the Environmental Monitor dated November 12, 2007, and recommends the preparation of an Environmental Impact Report.

Project Description

The project site is located at 102-148 Border Street in East Boston on a 14.2 acre site, of which approximately 10.8 acres is watersheet. The project site is bound by Border Street to the east, Atlantic Works, Wigglesworth Machinery, and Boston Towing and Transportation properties to the south, Boston Inner Harbor to the west, and the property at 170 Border Street to the north. The site is comprised of land under water and filled Commonwealth Tidelands. The ENF states that there are several remaining structures including footings of former buildings, entrance posts, an outfall pipe, and bulkheads in various states of disrepair. On the waterside, there are two dilapidated marine railways and approximately 25,000 square feet of dilapidated timber piling areas that extend over 250 feet beyond the high water mark.

The proposed project consists of two development areas. The first area will include a residential building with facilities of public accommodation and open space areas on the west side of the site. The residential building will have 196 units and will range from five to seven stories. The second development area will include a maritime facility, with a marine travel lift if needed, and a maritime interpretive area on the south side of the site. The project will provide 165 total parking spaces to accommodate the residential building and the maritime facility.

Project Comments

Municipal Harbor Plan

The ENF indicates that the City of Boston has begun the process of preparing an amendment to the East Boston Municipal Harbor Plan (MHP) and will be requesting substitute provisions to the minimum use limitations and numerical standards of the Waterways Regulations governing nonwater-dependent projects on tidelands for the Boston East site.

As it is proposed currently, the project appears to require three (3) substitute provisions: 1) reducing the required amount of facilities of public accommodation on Commonwealth Tidelands and allowing Facilities of Private Tenancy within 100 feet of the project shoreline;

2) allowing building heights, in excess of those allowed under the Waterways Regulations, closer to the water's edge; and 3) reconfiguring the Water-Dependent Use Zone, which would reduce the residential building's setback from the project shoreline. Pursuant to 310 CMR 9.34(2)(b), DEP may apply alternative use limitations or numerical standards provided substitute provisions and associated offsets, supported by appropriate analysis, are specified and approved in an MHP. While it is possible for this project to begin the MEPA review process, a Chapter 91 license 1.1
cannot be issued until the city has completed the MHP amendment and obtained approval from the Secretary of the Executive Office of Energy and Environmental Affairs. CZM recommends, therefore, that a final Certificate for the project not be issued until the city's MHP Amendment has been approved by the Secretary.

Designated Port Area

The Project Site Plan (Figure 3.1), included in the ENF, shows proposed open space, pedestrian networks, and an interpretive maritime area located in the Designated Port Area (DPA). CZM recommends that the proponent re-configure portions of the project site in consideration of the needs of the future maritime-industrial tenant. The proposed open space adjacent to the maritime facility and the perimeter public access that runs along the shoreline between the maritime facility and the proposed marine travel lift should be eliminated and 1.2
appropriate buffering elements should be incorporated between the residential building and the maritime facility. These physical buffering elements should not be located solely on the DPA portion of the site. In addition to providing physical buffering elements, the proponent should include language in all applicable lease forms and condominium deeds as a notice to buyers and tenants of the residential building regarding the presence of adjoining and abutting DPA maritime-industrial uses. The proponent should coordinate with the Boston Redevelopment Authority's ongoing MHP Amendment process in order to incorporate the recommendations noted above, to identify an appropriate maritime-industrial tenant, and to ensure consistency with all applicable CZM program policies.

Coastal Hazards

According to the ENF, the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates that approximately two-thirds of the project site is located in the A-2 Zone which is subject to 100-year flood events. CZM recommends that the proponent 1.3
coordinate with the City of Boston Conservation Commission and the City of Boston Inspectional Services Department, who review flood zone issues for the City of Boston, to ensure that the proposed project meets all applicable City requirements and CZM program policies.

Federal Consistency Review

The proposed project may be subject to CZM federal consistency review, in which case the project must be found to be consistent with CZM's enforceable program policies. For further 1.4
information on this process, please contact Robert Boeri, Project Review Coordinator, at 617-626-1050, or visit the CZM web site at www.mass.gov/czm.

LAM/bw

cc: Brad Washburn,
CZM Boston Harbor Regional Coordinator
Ben Lynch,
Program Chief, MassDEP Waterways Regulation Program
Richard McGuinness,
Deputy Director of Waterfront Planning, Boston Redevelopment Authority
Kristin Kara,
Project Manager, Boston Redevelopment Authority

Letter 1	Massachusetts Coastal Zone Management, Leslie-Ann McGee
1.1	The proponent understands the requirement to have an approved East Boston Municipal Harbor Plan (EBMHP) Amendment prior to the issuance of a Chapter 91 license and that a final Certificate will not be issued until the EBMHP Amendment has been approved.
1.2	The Designated Port Area (DPA) portion of the site has been reconfigured based on input from the community and city agencies and is considered a significant improvement and public asset over the existing property. However, portions of the Harborwalk along the DPA will be designed to direct pedestrians away from the waterfront and buffer this portion of the DPA between the proposed marine travel lift and the maritime facility instead of passing directly through the DPA area. The proponent is actively involved with the Boston Redevelopment Authority's (BRAs) ongoing EBMHP Amendment process to help identify an appropriate maritime-industrial tenant and to ensure consistency with all applicable CZM program policies. As part of the Chapter 91 licensing process, the proponent will respond to the request in the East Boston Municipal Harbor Plan Amendment regarding the inclusion of language in condominium documents that describe the existence of nearby water-dependent industrial uses in the DPA.
1.3	The proponent will be coordinating its design and site plans with the Boston Conservation Commission and the Boston Inspectional Services Departments in order to address flood zone issues and meet applicable city requirements and CZM program policies. Site grades will be raised to remove area from the flood zone.
1.4	The project is subject to CZM federal consistency review. Therefore, the project has included responses to CZMs enforceable program policies in Section 3.7.

Letter 2 BG

The COMMONWEALTH OF MASSACHUSETTS
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES
OFFICE OF COASTAL ZONE MANAGEMENT
251 Causeway Street, Suite 800, Boston, MA 02114-2136
Tel. (617) 626-1200 Fax (617) 626-1240 Web Site: www.mass.gov/czm/buar/index.htm

November 26, 2007

RECEIVED
NOV 27 2007
MEPA

Secretary Ian A. Bowles
Executive Office of Environmental Affairs
Attention: Bill Gage, MEPA Unit
100 Cambridge St., Suite 900
Boston, MA 02114

RE: Boston East, 102-148 Border Street, East Boston (EOEA No. 14123)

Dear Secretary Bowles:

The staff of the Massachusetts Board of Underwater Archaeological Resources has completed its review of the above referenced project as described in the *Environmental Monitor* of 12 November 2007.

The Board has conducted a preliminary review of its files and secondary literature sources to identify known and potential submerged cultural resources in the proposed project area. No record of any underwater archaeological resources was found within the proposed project boundaries. However, due to the high number of remnant historic wharves and related structures associated with intensive historic period shipbuilding, commerce, transportation and other waterfront activities in this area, the Board cannot conclude that there are no submerged cultural resources in the proposed project area. Additionally, the historical record suggests more than thirty (30) shipwrecking incidents in proposed project vicinity during the period of 1799-1893 for which locations are vague. Furthermore, the loss of earlier and smaller coastal vessels and the purposeful abandonment of obsolete or damaged vessels are generally not found in the documentary record. The level and diversity of maritime commercial, military, and recreational activities throughout the Boston Inner Harbor region may have resulted in the creation of a number of undocumented and anonymous underwater archaeological sites such as small craft, derelict vessels, or dumpsites. These possible site types represent classes of vessels of which our knowledge is severely limited and, thus, are potentially historically and archaeologically significant.

Due to the high archaeological potential of the proposed project vicinity, the Board recommends an archaeological assessment of the submerged portion of the project area (and inter-tidal zone) including, but not limited to historic research of the property use, a visual survey at low tide by a qualified marine archaeologist and documentation of the extant marine railway remains. This assessment should be completed and submitted for review by both the staff of the Board and the Massachusetts Historical Commission prior to any demolition/construction activity. 2:1

The Board appreciates the opportunity to provide the comments. Should you have any questions regarding this letter, please do hot hesitate to contact me at the address above, by telephone at (617) 626-1141, or by email at victor.mastone@state.ma.us.

Sincerely,

Victor T. Mastone
Director

Cc: Brona Simon, MHC
Marc Paiva, USACE
Brad Washburn, MCZM
Bob Boeri, MCZM
Richard Jabba, Fort Point Associates, Inc.

Letter 2	Massachusetts Coastal Zone Management/Bureau of Underwater Archaeological Resources, Victor T. Mastone
2.1	An archaeological assessment of the submerged portion of the project area has been conducted as requested (see Section 5.15).

Letter 3

Gage, Bill (EEA)

From: Carlson, Eric (DCR)
Sent: Monday, December 03, 2007 1:21 PM
To: Gage, Bill (EEA)
Subject: EOEEA 14123 - Boston East

Bill,

My concern about this project relates to the below grade parking. The project is located partly within the 100-year floodplain (zone A2, with a base flood elevation of 10 NGVD). Even without flooding conditions the below garde parking structure is likely to be subject to hydrostatic forces. They address this in the ENF in their description of construction conditions, so they are aware of the issue. They must meet the conditions of the State Building 3.1
Code, Sixth Edition, Section 3107.0. Additionally, FEMA has a Technical Bulletin on the subject, Non-Residential Floodproofing - Requirements and Certification, that the applicant may want to consider.

In addition to considering the forces the structure will encounter, the design must also prevent water from entering overland. This type of situation is extremely dangerous and can happen rapidly. Entrances to the lower levels 3.2
should be higher than elevation 10; one foot higher might be a good place to start.

Projects within the 100-year floodplain involving any federal action (e.g., permit, funding, etc.) must also comply 3.3
with federal Executive Order 11988, Floodplain Management. This executive order requires an eight-step decision-making process which includes analysis of alternatives, avoiding impacts when possible, and minimizing impacts when avoidance is not possible. Because the proposed project requires an Army Corps of Engineers 404 permit and a NPDES permit, this Executive Order applies.

Thanks.

Eric Carlson, Environmental Engineer
Flood Hazard Management Program
(617) 626-1362

Letter 3	Massachusetts Department of Conservation and Recreation, Eric Carlson
3.1	The project designers understand the need for flood proofing the below-grade parking and for preventing water from entering the garage over land or through subsurface pressure. The project will conform to all flood proofing requirements per the State Building Code, sixth edition.
3.2	Entrances to the lower levels of the project will be higher than elevation 10 (NGVD). Primary access to the building will be through the main entry archway at elevation 19.5 feet.
3.3	The project will comply with federal Executive Order 11988, Floodplain Management since it is within the 100-year floodplain and involves getting a federal permit.

Gage, Bill (EEA)

From: Langhauser, Andrea (DEP) [Andrea.Langhauser@state.ma.us]
Sent: Tuesday, November 13, 2007 10:12 AM
To: Gage, Bill (ENV); Buckley, Deirdre (EEA)
Cc: Strysky, Alexander (DEP); Baker, Nancy (DEP); Lynch, Ben (DEP)
Subject: Environmental Monitor 11-12-07

Bill and Deirdre,
The following 2 ENFs have been assigned to me for Waterways review.
14124 - Parcel E (South) Boston
14123 - Boston East (East) Boston

Thanks in advance for sending me info on scoping meeting.

Regards, Andrea Langhauser
617-348-4084

-----Original Message-----
From: bounce-172719-125157@listserv.state.ma.us
[mailto:bounce-172719-125157@listserv.state.ma.us] On Behalf Of Richard Bourre
Sent: Monday, November 12, 2007 11:02 AM
To: Langhauser, Andrea (DEP)
Subject: Environmental Monitor 11-12-07

FYI - the November 12, 2007 edition of the Environmental Monitor is now available at:

http://www.mass.gov/envir/mepa/secondlevelpages/currentissue.htm

Letter 4	Massachusetts Department of Environmental Protection, Andrea Langhauser
	No comment required.

Letter 5

BG

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
205B Lowell Street, Wilmington, MA 01887 • (978) 694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

December 3, 2007

RECEIVED
DEC 4 - 2007
MEPA

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: East Boston
Boston East
102-148 Border Street
EEA # 14123

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) submitted by Trinity Border Street LLC to construct 196 units of residential housing in one building on a portion of the site that is not in a designated port area (DPA), a two-story marine industrial facility with a travel lift and maritime interpretative area within the DPA, and parking for 165 vehicles on a 14.2 acre site in East Boston (EEA #14123). The Department provides the following comments.

Waterways Program

The entire project site is located on filled tidelands and is therefore wholly within the jurisdiction of M.G.L. c. 91 and the Waterways regulations at 310 CMR 9.00. Since the site is owned by a public agency, the site is considered to consist of filled Commonwealth tidelands, and the nonwater-dependent components of the project are additionally subject to the regulations, 310 CMR 9.51-9.53, governing all nonwater-dependent projects and particularly those sited on Commonwealth tidelands.

As noted in the ENF, the design of the nonwater-dependent residential component of the project does not conform to several requirements of the Waterways regulations, and accordingly, 5.1
the project will require that substitutions be granted through an amendment to the East Boston Municipal Harbor Plan (MHP). The ENF states that the project will require three substitute provisions:

1) a reconfiguration of the water-dependent use zone [310 CMR 9.51(3)(c)];
2) building heights in excess of the allowable limits [310 CMR 9.51(3)(e)]; and

3) relief from the standard that requires interior Facilities of Public Accommodation (FPA) on the ground floor of nonwater-dependent buildings located within 100 feet of the project shoreline and on Commonwealth tidelands [310 CMR 9.51(3)(b) and 9.53(2)(c)].

The Waterways Program expects that the Municipal Harbor Planning and Approval process may significantly alter aspects of the proposed project and add greater detail to public access and other associated benefits of the project; therefore, we recommend that the final MEPA Certificate not be issued for this project until the Secretary approves the MHP amendment.

The ENF also describes preliminary plans for the adjacent portion of the site located 5.2
within the East Boston Designated Port Area (DPA). The ENF proposes to develop this portion of the site with a building and other infrastructure, such as a travel lift, intended for water-dependent industrial use. While the Waterways Program supports the development of the DPA parcel, the design of this parcel also may benefit from the MHP process and from a more concrete plan of possible uses of the site. For example, the design presented in the ENF devotes a significant portion of the DPA land to public access and to form a buffer between the industrial use and the adjacent planned residential use; the buffer and public access elements may be better suited to the residential site.

Wastewater

As of January 12, 2007, a certification statement with MassDEP for a sewer connection has been required when wastewater discharges are greater than 15,000 gallons per day (gpd) and less than 50,000 gallons per day (gpd). Because the wastewater flow from the project is estimated to be less than 50,000 gpd, the proponent does not require a sewer extension/connection permit. Additional information on the changes in the sewer extension and connection regulations is available on the MassDEP website: http://www.mass.gov/dep/service/regulations/314cmr07.pdf.

The ENF states that there is sufficient capacity in the existing collection system to accommodate the estimated 33,840 gallons per day (gpd) of new wastewater flow, from the Boston East project. Wastewater generated by the project will discharge into the Boston Water and Sewer Commission (BWSC) sewer system, which flows into the MWRA system and ultimately to the Deer Island Wastewater Treatment Facility.

MassDEP, in cooperation with MWRA and its member communities (including Boston), are implementing a flow control program in the MWRA regional wastewater system, to remove extraneous clean water (e.g., infiltration/ inflow (I/I)) from the system. Should an environmental impact report be required, MassDEP requests that the report evaluate the system within the 5.3
service area for opportunities to participate in the I/I reduction effort, in order to ensure that the additional wastewater flows are offset by the removal of I/I. Currently, MassDEP is using a minimum 4:1 ratio for I/I removal to new wastewater flow added. This ratio may be increased if specific flow constrictions/overflows already exist in the sewershed to which the new flow is added. The proponent should work with the city, and consult with MassDEP on this issue.

Assuming that a 4:1 ratio is utilized, the proponent would need to remove, or cause to be removed, 135,360 gpd of I/I.

Stormwater

As a redevelopment project, the ENF indicates that the stormwater management system would comply with the Massachusetts Stormwater Management Policy. However, the very limited information on the design of that drainage system is insufficient to demonstrate that the 5.4
project would control water quality impacts from the runoff discharged from the project site. The proponent should be aware that the MassDEP Stormwater Management Policy (SMP), is being revised and will be incorporated into the wetlands and 401 Water Quality Certification regulations on January 2, 2008. The revisions to the stormwater management standards may be applicable to this project.

Low Impact Development

The Department recommends, and the revisions in the revised stormwater management regulations require, consideration of low impact development (LID) and the use of integrated management practices (IMP) for control of stormwater, either alone or in combination with conventional drainage control measures. LID is an approach to stormwater management that 5.5
minimizes runoff impacts by maintaining and mimicking existing hydrologic functions through site design techniques such as disconnecting runoff flow pathways and dispersing stormwater control across the site, reducing imperviousness, and minimizing clearing and grading while preserving natural resources and drainage patterns. When combined with pollution prevention measures, LID can be less costly than conventional gutter and pipe drainage system and can provide redundancy for stormwater control.

Construction Period Air Quality

Participation in the MassDEP Diesel Retrofit Program is a way to mitigate adverse construction period impacts from diesel emissions. MassDEP believes it is appropriate and necessary to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible. Diesel emissions contain fine particulates that have been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. Fine particulate matter also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP recommends that the project proponent work with its staff to implement 5.6
construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as oxidation catalysts or diesel particulate filters. Additional information is available on the MassDEP website: http://www.mass.gov/dep/water/wastewater/diesel.htm. In addition, MassDEP recommends that the project proponent require its contractor(s) to use on-road low-sulfur diesel (LSD) fuel in their off-road construction equipment. On-road LSD fuel has a sulfur content of approximately 500 parts per million (ppm) in contrast to lower grade off-road diesel fuel which has a sulfur content of 3,000 ppm. The use of LSD fuel, in conjunction with after-engine emission controls, can reduce particulate matter by an additional 25 percent beyond that obtainable with after-engine controls only.

Recycling Issues

The project includes demolition and reconstruction, which will generate a significant amount of construction and demolition (C&D) waste. Although the ENF has not made a 5.7
commitment to recycling construction debris, MassDEP encourages the project proponent to incorporate C&D recycling activities as a sustainable measure for the project.

The project proponent is advised that demolition activities must comply with both Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. Chapter 40, Section 54, which provides:

> "Every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by Section one hundred and fifty A of Chapter one hundred and eleven. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate."

For purposes of implementing the requirements of M.G.L. Chapter 40, Section 54, MassDEP considers an asphalt, brick, and concrete (ABC) rubble processing or recycling facility, pursuant to the provisions of section (3) of 310 CMR 16.05 Site Assignment Regulations for Solid Waste Management Facilities, to be conditionally exempt from the site assignment requirements if the ABC rubble at such facilities is separated at the point of generation from other solid waste materials. Under 310 CMR 16.05(3), ABC can be crushed on-site with just a 30-day notification 5.8
to MassDEP. However, the asphalt is limited to weathered bituminous concrete (no roofing asphalt) and the brick and concrete must be uncoated or not impregnated with materials such as roofing epoxy. If the brick and concrete are not clean, e.g., coated and/or impregnated, the material is defined as construction and demolition (C&D) waste and requires either a Beneficial Use Determination (BUD) or a Site Assignment and permit before it can be crushed.

Pursuant to the requirements of 310 CMR 7.02 of the Air Pollution Control Regulations, if the ABC crushing activities are projected to result in the emission of one ton or more of particulate matter to the ambient air per year and/or if the crushing equipment employs a diesel oil fired engine with an energy input capacity of three million or more British thermal units per 5.9
hour for either mechanical or electrical power which will remain on-site for twelve or more months, then a plan application must be submitted to MassDEP for written Approval prior to installation and operation of the crushing equipment.

In addition, since it appears that significant portions of the demolition project contain asbestos, the project proponent is advised that asbestos and asbestos-containing waste material are a special waste as defined in the Solid Waste Management regulations (310 CMR 19.061). Asbestos removal notification on permit form ANF 001 and building demolition notification on permit form AQ06 must be submitted to MassDEP at least 10 working days prior to initiating work. Except for vinyl asbestos tile (VAT) and asphaltic-asbestos felt and shingles, the disposal of asbestos containing materials within the Commonwealth must be at a facility specifically approved by MassDEP (310 CMR 19.061). No asbestos containing material including VAT, and/or asphaltic-asbestos felts or shingles may be disposed at a facility operating as a recycling facility, (310 CMR 16.05). The disposal of the asbestos containing materials outside the jurisdictional boundaries of the Commonwealth must comply with all the applicable laws and regulations of the state receiving the material.

The demolition activity also must conform to current Massachusetts Air Pollution Control Regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10. As such, the proponent should propose measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. MassDEP must be notified in writing, at least 10 days in advance of removing any asbestos. MassDEP also must be notified in writing, at least 10 days prior to any demolition work. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Pollution Control Regulations (310 CMR 7.15 (2)).

Facilitating future waste reduction and recycling and integrating recycled materials into the project are necessary to minimize or mitigate the long-term solid waste impacts of this type of development. The Commonwealth's waste diversion strategy is part of an integrated solid waste management plan, contained in The Solid Waste Master Plan that places a priority on source reduction and recycling. Efforts to reduce waste generation and promote recycling have yielded significant environmental and economic benefits to Massachusetts' residents, businesses and municipal governments over the last ten years. Waste diversion will become even more important in the future as the key means to conserve the state's declining supply of disposal capacity and stabilize waste disposal costs.

As the lead state agencies responsible for helping the Commonwealth achieve its waste diversion goals, MassDEP and EEA have strongly supported voluntary initiatives by the private sector to institutionalize source reduction and recycling into their operations. Adapting the design, infrastructure, and contractual requirements necessary to incorporate reduction, recycling and recycled products into existing large-scale developments has presented significant challenges to recycling proponents. Integrating those components into developments such as the Boston East at the planning and design stage enable the project's management and occupants to establish and maintain effective waste diversion programs. For example, facilities with minimal obstructions to trash receptacles and easy access to main recycling areas and trash chutes allow for implementation of recycling programs and have been proven to reduce cleaning costs by 20 percent to 50 percent. Other designs that provide sufficient space and electrical services will support consolidating and compacting recyclable material and truck access for recycling material collection.

By incorporating recycling and source reduction into the design, the proponents would have the opportunity to join a national movement toward sustainable design. Sustainable design was endorsed in 1993 by the American Institute of Architects with the signing of its *Declaration* *of Interdependence for a Sustainable Future.* The project proponent should be aware there are several organizations that provide additional information and technical assistance, including WasteCap, the Chelsea Center for Recycling and Economic Development, and MassRecycle. 5.10

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Alex Strysky at (617) 292-5616 for further information on the Chapter 91 Waterways issues. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Alex Strysky, MassDEP-Boston
Jill Provencal, MassDEP-NERO
Marianne Connolly, MWRA
John E. Sullivan, BWSC
Brad Washburn, MCZM

Letter 5	**Massachusetts Department of Environmental Protection, Northeast Regional Office, John D. Viola**
5.1	The proponent is working with the BRA to develop the EBMHP Amendment, which will include three substitutions for the Boston East project. See also response to comment # M.2.
5.2	The current design of the DPA portion of the site is conceptual at this time and will be advanced upon selection of a tenant that will actually use the site. Until the site is developed, however, the interim design will include landscaping and other treatments, including the Harborwalk.
5.3	The proponent will be coordinating with the BWSC regarding the I/I measures for the project and will participate in the I/I program to help ensure that the benefits of the CSO control plan will be realized.
5.4	The proponent understands the need to comply with the latest MassDEP Stormwater Management Policy and current wetlands and 401 Water Quality Certification regulations. Applicable drainage system plans will be provided to the appropriate agency for their review and approval.
5.5	The project will consider low impact development and the use of integrated management practices for control of stormwater.
5.6	The project will participate in the MassDEP Diesel Retrofit Program in order to mitigate construction period impacts of diesel emissions to the maximum extent feasible. The project will also conform to U.S. EPA requirements regarding use of low sulfur diesel for off-road equipment engines.
5.7	The project has committed to recycling a minimum of 75% of its demolition and reconstruction waste. It will comply with both solid waste and air pollution regulations pursuant to the provisions of 310 CMR 16.00 and will work with the selected contractor to develop a recycling plan for demolition and reconstruction-generated waste.
5.8	If demolition activities are anticipated to exceed emission thresholds, a plan application will be submitted to MassDEP for written approval prior to installation and operation of crushing equipment as required per air quality regulations (310 CMR 7.00). Although there are no buildings on the site, demolition and site preparation will require removal of site debris and some of the existing foundations. The demolition contractor will attempt to recycle as much of the building materials, including asphalt pavement, as possible. Any materials that cannot be recycled will be disposed of at an approved solid waste disposal facility. All demolition material will be transported from the site in covered trucks. The demolition phase of the project will be intermittent and is expected to have a duration of less than 30 days to complete and will have a brief and insignificant air quality impact. The demolition activities will comply with regulations 310 CMR 7.01, 7.09, and 7.10. As per 310 CMR 7.09(2), the DEP will be notified ten working days prior to the initiation of the building demolition. The DEIR/DPIR describes measures to reduce the potential air quality and noise impacts of the necessary site demolition.

5.9	The project will comply with air quality regulations pursuant to 310 CMR 7.00. (From Frank E.: Not sure on this. We want to say that the Emergency Generator will NOT exceed 300Kw – I can provide a manufacturer's spec for such – with sound pressure levels etc.
5.10	To date, the project has incorporated sustainable design measures into its design and operation, and will be LEED certifiable. As the design process continues, sustainable design features will be included. The project will be using several informational and technical resources to aid in its development including a LEED certified professional.

Letter 6 BG

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

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NOV 19 2007
MEPA

November 16, 2007

Secretary Ian A. Bowles
Executive Office of Energy & Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn.: William Gage

RE: Boston East Site, 102-148 Border Street, East Boston. MHC #RC.43029. EEA #14123.

Dear Secretary Bowles:

Staff of the Massachusetts Historical Commission have reviewed the Environmental Notification Form (ENF) and Project Notification Form submitted for the project referenced above.

The project area was included in the "City-Wide Comprehensive Industrial Survey, Boston, Massachusetts, 1996-1997" conducted by the PAL on behalf of the Boston Landmarks Commission and the MHC. This general area of East Boston "share[s] waterfront orientation with emphasis on shipbuilding and support industries, with a potential archaeological site associated with mid-nineteenth-century clipper ship construction critical to the history" of East Boston and Boston Harbor (page 7). A date of "1734-mid-20th c." is assigned to this general area. The project area was the location of the East Boston Dry Dock Company, and included "a boat building shop, locksmith, paint shop, wagon shop, tin shop, and bowling alley." A coal company and lumber company were present in 1927, and that pilings from associated piers, and portions of marine railways and cradles are visible at the property. There is also likely to be portions of an historic seawall along the harbor. Some historic properties included in MHC's Inventory of Historic Assets of the Commonwealth in the project area vicinity and that may be in the project Area of Potential Effect (APE) include the Atlantic Boiler Works/Wigglesworth Machinery (BOS.12874) at 60 Border Street; the Atlantic Boiler Works (BOS.12875) at 80 Border Street; 129 Border Street (BOS.12876); and, McLaren's Shop and Sawmill (BOS.11) at 135-139 Border Street. The Atlantic Boiler Works (BOS.12875) has not been formally evaluated by the MHC, but may be eligible for listing in the National Register of Historic Places. The Atlantic Boiler Works provides critical studio and exhibition space for local artists and is a vital neighborhood cultural institution overseen by the East Boston Artists Group that assists to preserve and maintain the historic asset.

MHC requests that a reconnaissance historic and archaeological survey (950 CMR 70) be conducted for the property. The scope of the investigation should include comprehensive documentary research to trace the land use and development history of the property, and to locate and identify historic properties with a recommendation for a project APE, an opinion of effect, and recommendations to avoid, minimize, or mitigate adverse effects. The survey scope should include a review of the data from the geotechnical coring for information about subsurface 6.1

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www.sec.state.ma.us/mhc

conditions. Additional subsurface investigations (such as hand- and machine-assisted archaeological units) may be recommended to locate and identify important archaeological features and deposits.

Available recent high resolution aerial photographs taken at low tide, and accurate maps of the property should be reviewed and included with the report of the investigation to assist in documenting the location and conditions of the pier pilings, marine railway, and other potentially important site features, including any submerged cultural resources. The report of the investigation should include recommendations for any additional investigations that may be required to locate and evaluate significant resources, and that might also require a health and safety plan for the investigators. The report should include recommendations to retain and preserve important site characteristics (such historic granite seawalls) that can be incorporated into the project design. The results of the report should also be taken into account in developing 6.2
the public interpretation initiative as part of the public benefit and access plan.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800), MGL c. 9, ss. 26-27C (950 CMR 70-71), and MEPA (301 CMR 11). Please contact Edward L. Bell of my staff if you have any questions at this time.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc:
James G. Keefe, Trinity Border LLC
Richard Jabba, Fort Point Associates
Karen Kirk Adams, USACOE-NED-Regulatory
Kate Atwood, USACOE-NED
Coastal Zone Management
Victor Mastone, Board of Underwater Archaeological Resources
MassDevelopment
Boston Redevelopment Authority
Ellen Lipsey, Boston Landmarks Commission
Ellen P. Berkland, Boston City Archaeologist

Letter 6	Massachusetts Historical Commission, Brona Simon
6.1	A reconnaissance historic and archaeological survey has been conducted for this property and the results are included in Section 5.15.
6.2	The findings of the reconnaissance surveys will be utilized to prepare the interpretive exhibits for the project.

Letter 7

3G

MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Telephone: (617) 242-6000
Facsimile: (617) 788-4899

December 3, 2007

Mr. Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St, Suite 900
Attn: MEPA Office, William Gage
Boston, MA 02114

RECEIVED
DEC 4 - 2007
MEPA

Subject: Boston East
Environmental Notification Form - EOEEA #14123

Dear Secretary Bowles:

The Massachusetts Water Resources Authority (MWRA) appreciates the opportunity to comment on the Environmental Notification Form (ENF) for the Boston East Project. The project is to be located at 102-148 Border Street along the East Boston waterfront on the Boston Inner Harbor. This project comprises of two development areas: one on the non-Designated Port Area (DPA) with a proposed residential building, a facility of public accommodation, and open space areas on the north side of the site, and the second area is located within a DPA on the south side of the site that includes a two-story marine industrial facility and marine travel lift with a maritime interpretive area. The project will provide 139 parking spaces below the residential building to accommodate the residents. Other parking spaces will be provided for the public. MWRA comments focus on issues related to Construction Coordination, Wastewater Flows and MWRA Toxic Reduction and Control Permitting.

MWRA Construction Coordination

MWRA is currently completing final design of the federally court ordered East Boston Branch Sewer Relief project intended to bring CSO discharges along the East Boston shoreline into compliance with the federal Clean Water Act and state water quality standards. The East Boston Branch Sewer Relief project is one of 35 projects in MWRA's $811 million long-term CSO control plan for Boston Harbor. As part of the East Boston CSO project, MWRA plans to replace and upgrade its existing sewer on Border Street. Between Decatur and Condor Streets, the existing sewer will be replaced with a new sewer installed by microtunneling. Between Decatur and Maverick Streets the existing sewer will be replaced in its current location using the pipebursting method.

In addition, MWRA will be modifying an existing BWSC structure on Border Street, east of the intersection with Decatur Street. MWRA's construction on Border Street between Decatur and Condor Streets will be performed between June 2008 and June 2010. MWRA's construction on Border Street between Decatur and Maverick Streets will be performed between December 2008 and March 2010. The construction schedule is mandated by the Federal Court Order in the Boston Harbor Case.

MWRA urges the project proponent to coordinate design and construction of any proposed utility installations and/or connections within Border Street with MWRA and BWSC to ensure no conflicts exist with MWRA's court-ordered construction. Access to the 102 – 148 Border Street site could at times be affected by MWRA's construction. Also, any new sewers constructed on the redevelopment site should be connected to the Boston Water & Sewer Commission's (BWSC) system, not to the MWRA interceptor. 7.1

Wastewater Flows

MWRA's CSO control project in East Boston is intended to reduce CSO discharges to Boston Harbor in accordance with discharge goals that will become permit discharge limits. Any increase in flow to the East Boston system may contribute to greater surcharging and overflows during wet weather. The proponent should offset new flows to the system with I/I removal or sewer separation to help ensure that the benefits of the CSO control plan will be realized and will provide and maintain the necessary water quality improvements in the long-term. The proponent should develop and implement a flow offset plan in accordance with DEP and BWSC policies and in coordination with them. 7.2

Toxic Reduction and Control (TRAC) Permitting

The MWRA prohibits the discharge of groundwater to the sanitary sewer system, pursuant to 360 C.M.R. 10.023(1) except in a combined sewer area when permitted by the Authority and the municipality. The proposed construction of the Boston East project has access to a storm drain and it is not located in a combine sewer area; therefore, the discharge of groundwater to the sanitary sewer system associated with the construction and redevelopment of the Boston East project location at 102 -148 Border Street is prohibited. The Boston East project must secure a US EPA – NPDES General Permit for Storm water Discharges from its construction activities. 7.3

The Boston East project must also comply with 360 C.M.R. 10.016, if it intends to install gas/oil separator(s) in its parking garage. In addition to complying with 360 C.M.R. 10.000, the Boston East project shall conform to the regulations of the Board of State Examiners of Plumbers and Gas Fitters, 248 C.M.R. 2.00 (State Plumbing Code), and all other applicable laws. The installation of the proposed gas/oil separator(s) will require MWRA approval and may not be back filled until inspected and approved by the MWRA and the Local Plumbing Inspector. To obtain an inspection the Boston East project must contact Paul Pisano, MWRA, Source Coordinator, (617) 305-5661. 7.4

Once the structures are completed and if the Proponent intends to operate laboratories, energy facilities or other processes that generate industrial wastewater on the premises, a Sewer Use Discharge Permit is required from the MWRA for the discharge of effluent into the sanitary sewer system. To obtain such a permit, the Proponent shall contact Lori LaPointe, MWRA, Industrial Coordinator, (617) 305-5645, TRAC, to obtain a MWRA Sewer Use Discharge Permit Application. The Owner must have a MWRA Sewer Use Discharge Permit prior to discharging wastewater from its operations into the MWRA sanitary sewer system. 7.5

Should you have any questions or require further information on these comments, you may contact David Kubiak, Sr. Program Manager, Wastewater Engineering, at (617) 570-5460, or me at (617) 788-1165.

Sincerely,

Marianne Connolly

Marianne Connolly
Program Manager, Regulatory Compliance

cc: David Kubiak, Engineering & Construction
David Pottle, Engineering & Construction
Kevin Brander, DEP Northeast Region

C:MEPA:14123BostonEast.doc

Letter 7	Massachusetts Water Resources Authority, Marianne Connolly
7.1	The proponent will coordinate the design and construction of any proposed utility installations and/or connection in Border Street with MWRA and BWSC to ensure there are no conflicts with MWRAs court ordered construction. The project will connect its sewer system to the BWSC system in Border Street.
7.2	The proponent will design, permit, and construct the storm drain outlet from Border Street to the Harbor to offset the project's sewer generation regarding mitigation for the I/I program. The proponent will be coordinating with the BWSC regarding the I/I measures for the project to help ensure that the benefits of the CSO control plan will be realized.
7.3	The project will not discharge groundwater to the sanitary sewer system. Furthermore, the proponent will secure a NPDES General Permit for stormwater discharges from its construction activities.
7.4	The project will comply with 360 CMR 10.00 regarding sewers and 248 CMR 2.00 regarding plumbing and gas work. The proponent will also contact Paul Pisano at the MWRA to obtain an inspection at the project site.
7.5	If a tenant at the maritime facility will be generating industrial waste, the owner/operator of the site will obtain a Sewer Use Discharge Permit.

Letter 8

BG

COMMONWEALTH OF MASSACHUSETTS

MASSACHUSETTS SENATE

STATE HOUSE, BOSTON 02133-1053

ANTHONY PETRUCCELLI
STATE SENATOR
FIRST SUFFOLK AND MIDDLESEX DISTRICT

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RECEIVED
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MEPA

November 19, 2007

Ian A. Bowles Jr., Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

#-14123

Dear Secretary Bowles:

I am writing in support of the Boston East Project Notification Form/Environmental Notification Form submitted by Trinity Border Street LLC, a partnership between Trinity Financial and the East Boston CDC, on October 19, 2007. Trinity Financial and the EBCDC have built a solid reputation in the East Boston community for completing large, complicated projects and transforming the neighborhood as evidenced by the new Maverick Landing development.

The Trinity/EBCDC proposal for new residential units on the East Boston waterfront will strengthen the growing East Boston community. The design by ICON architecture respects the maritime history of the site and the open space plan will benefit the entire community.

I trust that Trinity and EBCDC will produce a new development for which we can all be proud. I encourage your agency to expedite the permitting process of this new development so that East Boston can benefit from a revitalized waterfront.

Sincerely,

Anthony Petruccelli

ANTHONY PETRUCCELLI
State Senator

Letter 8	State Senator Anthony Petruccelli
	No response is required.

December 4, 2007

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114
Attention: William Gage, MEPA Office

John Palmieri, Director
Boston Redevelopment Authority
Boston City Hall, Room 925
Boston, MA 02201
Attention: Kristin Kara, Economic Development

Re: 102-148 Border Street, Boston East - Environmental Notification Form/Project Notification Form, EEA #14123

Dear Secretary Bowles and Director Palmieri:

The City of Boston Environment Department has reviewed the Environmental Notification Form/Project Notification Form (ENF/PNF) and offers the following comments.

The 14.2-acre East Boston project site, 10.8 acres of which are watersheet, is bounded by Border Street, the Atlantic Works, Wigglesworth Machinery, Boston Towing and Transportation and Boston Inner Harbor. There are structures on the landside of the site including the footings of former buildings, entrance posts and bulkheads; the waterside has 25,000 square feet (SF) of timber pilings and two marine railways.

The project proposed by Trinity Border, LLC is to include new nonwater-dependent dependent use of filled tidelands and new water-dependent use of flowed tidelands. It will result in the new alteration of 200 SF of wetlands and use 1.5 acres of tidelands or waterways for nonwater-dependent uses Land Subject to Coastal Storm Flowage (69,650 SF), Land Under the Ocean (100 SF), DPA (100 SF) and Coastal Beach (19,670 SF) will be permanently impacted. Two-thirds of the upland portion of the site is in a 100-year flood plane. A Waterways License (Chapter 91) from DEP and an Order of Conditions from the Boston Conservation Commission will be required.

The proposal for the portion of the site that is not in the DPA is a 196-unit residential building with five and seven-story (85-foot zoning height) elements, open space and a 1,840 square foot (SF) community gallery as a facility of public accommodation (FPA). The building will be split into two wings on wharf-like fingers. An archway will connect the wings. The wings as currently planned would extend into the Water-Dependent Use Zone (WDUZ). This project element will be constructed first.

We ask that public restrooms be provided as an FPA and located so that they can be accessed directly from the project open space. Signage in a location highly visible to the public should indicate that they are available to the general public. 9.1

Parking spaces are to number 165; 139 for residents in a structure below the residential building and 26 surface spaces on the south side of the site for the use of visitors and employees of the maritime building. The project will generate 1,102 new vehicle trips per day.

The other area of the site is in a Designated Port Area (DPA). The proposal for this area is a two-story marine industrial facility, a maritime interpretive area and the construction of two piers for a marine travel lift if it is required by DPA permit. A program of uses has yet to be established. This project element will be constructed after the residential segment is completed.

The ENF/PNF notes that a 2000 East Boston Master Plan recommended that the DPA be removed from the project site and that housing be developed. There is no reference to whether or how this recommendation may fit in to long-term plans for the site. 9.2

The proponent is seeking, through a process to amend the East Boston Municipal Harbor Plan (EBMHP), to reconfigure and consolidate the DPA into the southern portion of the site. The rationale is that better development parcels will be created for the maritime industrial and residential uses. The proponent is also seeking through the same process a relief from height restrictions and a reduction in required FPA space.

The development of residential uses in industrial areas presents particular challenges. The amended EBMHP should identify and then outline how these challenges can be met in ways that preserve and support our important marine industrial uses while allowing for development. 9.3

We look forward to learning more in the DEIR/DPIR about the basis for reducing FPAs and about the issue of residential/industrial compatibility.

The ENF/PNF indicates that the project will include the reclamation of surface run-off into rain gardens and that native plant species will be utilized. We support these measures and believe that a comprehensive stormwater retention and re-use program may well eliminate that need for irrigation. 9.4

A LEED Checklist is provided for the residential building but not for the marine building. As this is one 241,859 gross square foot (GSF) project, a checklist should be completed for each building. This checklist and any update to the checklist for the residential building should be included in the DEIR/DPIR. We look forward to reviewing the checklists with the proponent. 9.5

Boat builders, a coal company, paint shop, tin shop and lumber company were some of the prior industrial occupants of the site. Soil and groundwater testing are planned.

Please provide this department with testing results so that the City's Licensed Site Professional (LSP) will have complete information. 9.6

It is important that a noise study be conducted for the project. Ambient sound levels must be measured and noise levels predicted for the project at full build for residences at the site and for off-site sensitive receptors. The use of a marine travel lift should be assumed. The City's residential limits will apply. For the comfort of project residents, envelope and window design should take into account both industrial use-related sound and aircraft noise. 9.7

Cumulative shadow with the proposed project is expected to be 4,513 SF greater than with Chapter 91-compliant height and massing (33,226/28,713). The net increase in shadow area is projected to be 60,415 SF for the proposed projected versus 52,614 SF for a Chapter 91-compliant project (+7,801 SF).

The shadow diagrams in the ENF/PNF are not useful in demonstrating existing and expected shadow and they are provided only using October 23 as a study date. While the October 23 date is used for MHP analyses, the appropriate dates for Article 80 review are March 21, June 21, October 21 and December 21 at 9:00 a.m., 12:00 noon, 3:00 p.m. and, for June and October, 6:00 p.m. The DEIR/DPIR should provide study diagrams that include: 9.8

- a north arrow;
- street names;
- the identification of doorways, bus stops, open space and areas where pedestrians are likely to congregate (in front of historic resources or other tourist destinations, for example);
- clear delineation of shadow on both rooftops and facades; and
- clear distinctions between existing shadow and new shadow.

They should oriented for use ale consistent with that used for diagrams depicting wind monitoring locations, no build and build.

The disposal of snow and the storage of salt, sand and other deicing chemicals should be considered in the project's design. Snow removed from the site cannot be discharged into Boston Harbor. Salt, sand and deicing chemicals should be stored so that they do not drift from the site and do not seep into surrounding water. 9.9

We request the permanent installation at all catch basins plaques that bear the warning "Don't Dump - Drains to Boston Harbor." Information on the casting can be obtained from the Operations Division of the BWSC (617-989-7000). 9.10

This department suggests that the proponent evaluate BigBelly®, solar receptacles that automatically compact trash at the point of disposal. This equipment increases holding capacity 4 to 8 times over standard trash receptacles, reducing collection trips and proportionally cutting related fuel use and greenhouse gas emissions. Mr. Timothy McCarthy of the Public Works Department would welcome the opportunity to discuss the City of Boston's experience with this technology. He can be reached at 617-635-4968. 9.11

We recommend the installation of "Mutt Mitt" stations along the Harborwalk and within the Cove Terrace area. 9.12

The staff of the Boston Landmarks Commission (BLC) has reviewed the ENF/PNF.

The site was formerly used since at least 1888 by the East Boston Dry Dock Company, and later by a coal company and lumber yard. It has historically been used for industrial purposes. The site is identified in the *Inventory of Historic and Archaeological Assets of the Commonwealth*

(Inventory), but the only remaining historic structures on the site are remnants of pier pilings and portions of marine railways and cradles. The site is in close proximity to several historic resources identified in the Inventory, but the proposed project will not have any negative impact on these nearby historic resources.

The City Archaeologist concurs with the recommendations of the Massachusetts Historical Commission (MHC) to conduct a reconnaissance historic and archaeological survey (950 CMR 70) 9.13
to locate and identify important terrestrial and submerged cultural deposits. Please contact Ellen Berkland at 617-635-3850 if there are questions.

The BLC commends the proponent's efforts to retain on site historic artifacts and incorporate them into the historic maritime interpretive area. This element will allow visitors to understand the industrial maritime history of the site and serve as an educational element along the Harborwalk. 9.14
The BLC encourages the proponent to also integrate interpretive signage elements throughout the project site.

The proposed site plan, massing, and architectural details appear to be appropriate to the site and surrounding neighborhood. Missing, however, from the ENF/PNF are sections showing the heights of stories, bays, the archway and rooftop mechanical enclosures. There are also no renderings showing the expected views to the water through the archway. These sections and 9.15
renderings should be provided in a DEIR/DPIR.

The retention of harbor views from other areas in the neighborhood and the proposed public space connecting to the Harborwalk will be a positive amenity for the community.

BLC staff agrees with BRA Urban Design staff that new construction projects in the City should be constructed with traditional building materials and techniques rather than synthetic composite materials. Simulated materials such as exterior insulated finish systems (EIFS), and glass fiber 9.16
reinforced concrete (GFRC) are inconsistent with Boston architecture and are unlikely to withstand decades of the City's freeze-and-thaw climate.

The BLC requests that dated cornerstones be incorporated into all new construction. This element will allow those who are attentive to and value the architecture of the City to appreciate the 9.17
historical context in which structures were conceived.

The expected 17 percent weekday residential transit mode share is quite low. The DEIR/DPIR should provide detailed information about how transit use will be made attractive. 9.18

We appreciate that the proponent will talk with Zipcar once project is completed and note that there are no Zipcar locations in East Boston. Given the projected high vehicle mode share and ratio of residential units to parking spaces, Zipcar accessibility may be an important amenity.

An increasingly common residential TDM measure for condominiums is offering one Massachusetts Bay Transportation Authority (MBTA) monthly LinkPass for each unit during the year after the initial sale of each unit. Such subsidies encourage residents to try the transit system and, in combination with car sharing, can emphasize that city living at the project can be comfortable without a vehicle.

We ask that bicycles rentals be provided as part of the project's FPAs. 9.19

Thank you for the opportunity to offer comment. We look forward to the DEIR/DPIR.

Sincerely,

Bryan Glascock
Director

102-148 Border Street, Boston East.doc.DBG:MTZ.mtz

Letter 9	Boston Environment Department, Bryan Glascock
9.1	Public restrooms have been added to the FPA, the Community Gallery. The location of signage for this FPA has not been determined yet.
9.2	In response to the East Boston Master Plan (EBMP) recommendations to put housing at the Boston East site, the city-owned parcel had two DPAs on it which made in difficult to develop. Since the DPAs have been consolidated on the south side of the site, the EBMP recommendation to increase the quality of residential use on the waterfront by building new housing will be fulfilled with the proposed Boston East development. Furthermore, the development will balance the community's desire for increased open space and cultural activities with the demand for waterfront residential use.
9.3	The proponent has worked extensively with the BRA to develop the EBMHP Amendment. The proponent is seeking relief for height, facilities of public accommodation, and the water-dependent use zone as a means to improve the development at the site. See also response to comment # 9.2.
9.4	Best management practices and stormwater control measures will be employed to minimize runoff from the site. Native species will also be used.
9.5	A LEED check list for both buildings is included in Appendix 8 of the DEIR/DPIR.
9.6	Soil and groundwater test results are not completed at this time.
9.7	A qualitative noise analysis that meets the City's requirements is included in Section 5.6.
9.8	A shadow study that meets Article 80 requirements is included in Section 5.2.
9.9	The project will employ best management practices as part of its maintenance and operations. The storage of snow, salt, and other deicing chemical will be considered in the design of the site. A snow removal plan will not allow disposal of snow into Boston Harbor.
9.10	Catch basin plaques will be installed next to any drain that empties into Boston Harbor.
9.11	The proponent has discussed the feasibility of Big Belly dumpsters with Mr. McCarthy of Public Works Department. The proponent would be happy to install this type of trash handling equipment once the volume of trash makes it a reasonable requirement. It is expected that this may occur at the Harborwalk and FPA areas once they start generating significant traffic. In the interim, trash at these areas would be disposed in covered architectural trash containers and handled by the development's professional management company.
9.12	Mitt mutt stations will be considered as part of the programming and use of the open space and Harborwalk during the Chapter 91 licensing process.
9.13	See response to comment # 6.1.
9.14	Although the final landscape elements have not been determined, interpretive signage that incorporates the maritime history of the site is being considered.
9.15	Additional renderings of the building and site are included in Section 2 of the DEIR/DPIR.

9.16	The new residential building will be primarily clad in brick and cast stone, with metal panel and curtain-wall systems on the upper floors. The proponent is working with the BRA and the Boston Civic Design Commission throughout the design process. The marine facility will have a brick façade on Border Street, and will be constructed of suitable materials for the waterfront location.
9.17	A dated cornerstone located on the Border Street façade will be included as part of the final project design.
9.18	The transportation analysis in Section 4.0 of the DEIR/DPIR identifies measures to make transit options more attractive.
9.19	The proponent has revisited the potential of incorporating commercial uses on the ground floor of the residential building but has consistently determined that they are not economically justified. Should a future use such as bicycle rentals become feasible, the proponent would consider its use.

Letter 10

Boston

Kristin Kara
Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

October 25, 2007

Dear Ms. Kara:

Regarding the Project Notification Form for Boston East – East Boston project submitted to the BRA on October 19, 2007 the Boston Fire Department requires the following issues addressed by a qualified individual.

1. Emergency vehicle site access to the new buildings as well as existing buildings that might be affected. 2-4:
2. Impact on availability and accessibility of hydrant locations for new buildings as well as for any existing buildings that might be impacted. M.1
3. Impact on availability and accessibility to siamese connection locations for new buildings as well as for any existing buildings that might be impacted.
4. Impact that a transformer vault fire or explosion will have on the fire safety of the building. Particularly as it relates to the location of the vault. M.2
5. Need for Boston Fire Department permit requirements as outlined in the Boston Fire Prevention Code, the Massachusetts Fire Prevention Regulations (527 CMR), and the Massachusetts Fire Prevention Laws (MGL CH148). 7:
6. For projects involving air-supported structures, it is critical that the impact of the design has on fire safety relative to the interaction of the area underneath the structure to the structure as well as to the interaction of the structure to the area underneath the structure.
7. Due to the increasing popularity of private wireless communication services, it has become increasingly difficult and costly for the Fire Department to locate our emergency communications equipment at appropriate sites. At the same time, the need for antenna sites has grown as development continues in downtown/Back Bay. We would appreciate it if the BRA, as part of its development review process for high-rise towers, could assist the Fire Department in obtaining rooftop access for our communications equipment as a public benefit too meet this critical public safety need. M.3

These items should be analyzed for all phases of the construction as well as the final design stage. This project will need permits from the Boston Fire Department as well as the Inspectional Services Department.

Respectfully,

Dennis L. Keeley
Acting Fire Marshal

Pjm
Cc: Paul Donga, FPE, Plans Unit, BFD

Letter 10	Boston Fire Department, Dennis L. Keeley
10.1	For the proposed residential building, the site plan provides for emergency vehicle access on the front (west) side along Border Street and from the south side along the open space area. The proposed marine facility will have vehicle access from the open space area on the north side, from Sumner Street along the west side, and from the parking lot along the south side.
10.2	Several fire hydrants are present on Border and Decatur streets. These hydrants will service all proposed buildings. Siamese connections will be included in final building plans in accordance with local code and specific requirements from the Boston Fire Department.
10.3	The transformer for the residential building will be located at the north end of the site. The proponent is coordinating fire safety with the Boston Fire Department.
10.4	Boston Fire Department permits will be applied for as required by the by Massachusetts Fire Prevention Laws (MGL 148), Massachusetts Fire Prevention regulations (527 CMR), and the Boston Fire Prevention Code, (Ordinances of 1979, Chapter 28).
10.5	The proponent will work with the Boston Fire Department and the BRA to support placement of rooftop access for communications equipment as a public benefit to the extent allowed by local and state regulations.

MEMORANDUM

Date: November 30, 2007

To: Kristin Kara, Project Manager

From: Valerie Gingrich, Waterfront Planner

Carlos Montañez, Senior Planner

Re: **Comments on the Project Notification Form (PNF) for Boston East**

The following are my comments and questions in response to the PNF submitted for Boston East by Trinity Border Street, LLC.

Harborwalk

- The most recent site plan shows a proposed connection from the Harborwalk back to Border Street on the Northern side of the site. This connection is shown as a natural path between the building and the property line. This path should be clearly delineated and designed as a Harborwalk connection from the water to Border Street. M.4

Facilities of Public Accommodation / Facilities of Private Tenancy

- The proponent should consider artist live/work space as a potential use/FPA on the ground floor of the building. M.5

- The proponent should provide details on how the plaza/archway, which is proposed as an FPA, will be activated and programmed to be inviting to the public. Things to consider include inviting signage, creative lighting, and interpretative plaques.

- The proposed Gallery should have access from the Harborwalk. A hardscaped plaza should link the Harborwalk and the Gallery entrance.

- Considering the ongoing discussion regarding the viability of commercial uses in the ground floor of the building, the ground floor should be designed in a way that would not preclude conversion of uses in the future. This may require higher ceiling heights and other design considerations, such as access and storefront transparency.

Designated Port Area (DPA)

- Site improvements are encouraged in the DPA area to address the current state of the site. A less formal design is recommended as an interim use which will allow for flexibility for future tenants. (e.g. Massport's Navy Field Pier)

- Harborwalk should continue in the DPA area, but be designed to function in the DPA use zone.

Water Dependent Use Zone

- The most recent site plan shows the southern wing of the building pulled back from the water's edge to create more space and visual access along the water. This redesign is an improvement to the design and alleviates the pinch point that had been created in this location.

Letter 11	Boston Redevelopment Authority, Valerie Gingrich and Carlos Montana
11.1	The path that connects the Harborwalk to Border Street along the northern side of the site will be clearly delineated and designated as a Harborwalk connection.
11.2	The proponent has considered several options for FPA space on the ground floor of the proposed residential building. The proposed Community Gallery has been identified as the best use for providing the community at large with the most public space and a much needed place for residents and visitors to enjoy. Affordable live/work units have also been added to the ground floor. The plaza and archway will be clearly visible and accessible from Border Street for pedestrians as a place that is open to the public. It will be identified with appropriate signage. Although the details of the design have advanced, the types of lighting and location of interpretive signs have not been determined at this time. The design of the Community Gallery has advanced substantially from its original layout and location. Although the Gallery now has a patio and an access stairway from the Harborwalk, the primary means of access will be along the south side of the residential building, allowing activity to flow into the interpretive area. The proponent has revisited the potential of incorporating commercial uses on the ground floor of the residential building but has consistently determined that they are not economically justified. Should a future use become feasible, the proponent would consider its use. Inclusion of design features such as high ceiling heights and doorways that may never be used is not a feasible economic option as well.
11.3	The current design of the DPA portion of the site is conceptual at this time and will be advanced upon selection of a tenant to actually use the site. Until the site is developed, however, the interim design will include landscaping and other treatments, including the Harborwalk. Although a Harborwalk is proposed in the DPA portion of the site, there will be some landscape treatments such as bollards and signage to steer people away from the working portion of the DPA between the proposed maritime facility and the marine travel lift.

BRA MEMORANDUM

TO: Kristin Kara

FROM: Katie Pedersen

DATE: November 28, 2007

RE: Boston East
102-148 Border Street
East Boston, Massachusetts
Comments on Project Notification Form/ Environmental Notification Form

I have reviewed the Project Notification Form/Environmental Notification Form (PNF/ENF) dated October 19, 2007 and submit the following Scoping Determination comments for the Environmental Protection Component. Trinity Border Street, LLC (the Proponent) proposes to redevelop the approximately 14.2-acre property (the Site) located at 102 -148 Border Street along the East Boston waterfront on Boston Inner Harbor. The Proposed Project is bound by Border Street to the east, the Atlantic Works, Wigglesworth Machinery, and Boston Towing and Transportation properties to the south, Boston Harbor to the west, and the property at 170 Border Street to the north. The Proposed Project is located near Central Square to the north and Maverick Square and the MBTA Maverick Transit Station to the east.

The landside of the Proposed Project is currently vacant. There are several structures including footings of former buildings, entrance posts, and bulkheads in disrepair on the site. On the waterside, there are tow dilapidated marine railways and approximately 25,000 square feet of dilapidated timber pilings areas.

The Proposed Project is comprised of two development areas: one on the non-Designated Port Area (DPA) with a residential building (196 units), a facility of public accommodation, and open space areas on the north side of the Site, and a second area located within a DPA on the south side of the Site that includes a two-story marine industrial facility and a marine travel lift with a maritime interpretive area. The Proposed Project will provide 165 parking spaces to accommodate Proposed Project residents and the general public visiting the Site.

<u>Air Quality</u>

The Proponent shall provide a description of the existing and projected future air quality in the Proposed Project vicinity and shall evaluate ambient levels to determine 12.1
conformance with the National Ambient Air Quality Standards (NAAQS). Careful consideration shall be given to mitigation measures to ensure compliance with air quality standards.

A future air quality (carbon monoxide) analysis shall be required for any intersection
(including garage entrance/exits) where the level of service (LOS) is expected to
deteriorate to D and the Proposed Project causes a 10 percent increase in traffic or where 12.2
the level of service is E or F and the Proposed Project contributes to a reduction in LOS.

The study shall analyze the existing conditions, future No-Build and future Build conditions only. The methodology and parameters of the air quality analysis shall be approved in advance by the Boston Redevelopment Authority (BRA) and the Massachusetts Department of Environmental Protection (DEP). Mitigation measures to eliminate or avoid any violation of air quality standards shall be described.

A description of the Proposed Project's heating and mechanical systems including
location of buildings/garage intake and exhaust vents and specifications, and an analysis
of the impact on pedestrian level air quality and on any sensitive receptors from operation 12.3
of the heating, mechanical and exhaust systems, including the building's emergency
generator as well as the parking garage, shall be required. Measures to avoid any
violation of air quality standards shall be described.

<u>Noise</u>

The Proponent shall establish the existing noise levels at the Proposed Project Site and 12.4
vicinity and shall calculate future noise levels after project completion, thus
demonstrating compliance with the Interior Design Noise Levels (not to exceed day-night
average sound level of 45 decibels) established by U.S. Department of Housing and
Urban Development, as well as applicable City, State and Federal noise criteria.

The Proponent has stated that the primary source will emanate from the external mechanical equipment, containing the make-up air units and the compressors. The Proposed Project may also include emergency generators, which would also contribute to external mechanical noise. Despite the fact that the rooftop equipment is not anticipated to exceed maximum sound levels, due to the Proposed Project's proximity to an adjacent residential neighborhood, appropriate low-noise mechanical equipment and noise control measures will be required in accord with the Regulations for Control of Noise in the City of Boston and the Commonwealth of Massachusetts. The Proponent shall also describe any other measures necessary to minimize and/or eliminate adverse noise impacts from the Proposed Project.

<u>Solar Glare</u>

The Proponent has stated that the Proposed Project does not incorporate the reflective
building material. Consequently, the Proponent does not anticipate the creation of either
an adverse solar glare impact or a solar heat buildup in nearby buildings. The Proponent 12.5
shall demonstrate that the glass selected will avoid the creation of a visual nuisance
and/or a hazard, as it interferes with vision and concentration. However, should the
design change and incorporate substantial glass-facades, a solar glare analysis shall be
required. The analysis shall measure potential reflective glare from the buildings onto

potentially affected streets and public open spaces and sidewalk areas in order to determine the likelihood of visual impairment or discomfort due to reflective spot glare. Mitigation measures to eliminate any adverse reflective glare shall be identified.

Daylight

The Proponent shall conduct a daylight analysis for both build and no-build conditions. The analysis shall measure the percentage of skydome obstructed by the Proposed Project and evaluate the net change in obstruction. If alternative massing studies are requested as part of the Article 80 Development Review Process, daylight analysis of such alternatives shall also be conducted for comparison. The study shall treat the following elements as controls for data comparison: existing conditions, the context of the area, and the as-of right conditions. Daylight analyses should be taken for each major building façade within the limits of the BRA Daylight Analysis (BRADA) program, fronting these public and quasi-public ways. The midpoint of each roadway should be taken as a study point. 12.6

Geotechnical Impacts

A description and analysis of the existing sub-soil conditions, including the potential for ground movement and settlement during excavation and potential impact on adjacent buildings and utility lines shall be required. This analysis shall also include a description of the foundation construction methodology, the amount and method of excavation, and the need for any blasting and/or pile driving and the impact on adjacent buildings and infrastructure. A Vibration Monitoring Plan shall be developed prior to commencing construction activities to ensure that impacts from the project construction on adjacent buildings and infrastructure are avoided. Mitigation measures to minimize and avoid damage to adjacent buildings and infrastructure must be described. 12.7

Groundwater

The Proponent anticipates groundwater to be present within a depth of 10 feet below-ground surface and thus dewatering is likely to be required for foundation construction. A relatively watertight excavation support system will be employed in order to mitigate the potential adverse impacts of temporarily lowering groundwater levels on adjacent buildings and utilities. The Proponent has stated that groundwater levels outside the excavation will monitored. However, the Proponent has not offered a description of the manner in which groundwater levels will be monitored and hence encouraged to install observation monitoring wells. Upon completion of construction, the Proponent would be encouraged to assign monitoring wells to the Boston Groundwater Trust (Trust) and if on private property, a permanent easement for access by the Trust or designated representative provided. 12.8

If on-going pumping or dewatering is required, the metering of discharge should be conducted with oversight by the Boston Water and Sewer Commission.

Shadow

The Proponent shall be required to provide a detailed shadow analysis, describing and depicting the existing shadow conditions and the anticipated shadow impacts from the Proposed Project. The analysis shall examine existing and build condition shadow impacts for the 9:00 a.m., 12:00 Noon, and 3:00 p.m. hours during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 23), and the winter solstice (December 22). Impacts at 6:00 p.m., during the summer and autumn must be examined as well. It should be noted that due to the time differences (daylight savings v. standard), the autumnal equinox shadows would not be the same as the vernal equinox shadows and therefore separate shadow studies are required for the vernal and autumnal equinoxes. 12.9

The shadow impact analysis must include net shadow from the Proposed Project as well as existing shadow and clearly illustrate the incremental impact of the Proposed Project. For purposes of clarity, new shadow should be shown in a dark, contrasting tone, distinguishable from existing shadow. The shadow impact study area shall include, at a minimum, the entire area to be encompassed by the maximum shadow expected to be produced by the Proposed Project. The build condition(s) shall include all buildings under construction and any proposed buildings anticipated to be completed prior to the completion of the Proposed Project. Shadows from all existing buildings within the shadow impact study area shall be shown. A North Arrow shall be provided on all figures. Shadows shall be determined by using the applicable Boston Azimuth and Altitude data.

Particular attention shall be given to existing or proposed public open spaces and pedestrian areas, including, but not limited to, the existing sidewalks and pedestrian walkways within, adjacent to, and in the vicinity of the Proposed Project and the existing and proposed plazas, historic resources, LoPresti Park, and other open space areas within the vicinity of the Proposed Project

Wind

The Proponent has conducted a qualitative analysis to determine the Proposed Project's one-story Marina building and a seven-story residence building effect on pedestrian level winds (PLWs). Results we obtained for both existing (no-build) and build conditions for NW (winter), SW (summer), easterly storm, and annual winds. The Proponent has stated that none of the forty-six locations considered for either existing or build conditions is estimated to have PLWs that exceed the BRA guideline of an effective gust velocity of 31 miles per hour (mph) not be exceeded more than 1% of the time. The Proponent has further asserted that the addition of the Proposed Project buildings tend to reduce PLWs in the vicinity of the two buildings due to their sheltering affects, although winds are increased somewhat near the corners of the 80-foot building. No location is estimated to have dangerous winds as often as once a year, nor is any location estimated to have PLWs higher than Catergory 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered.

For the areas where wind speeds are projected to be dangerous or to exceed acceptable levels, measures to reduce wind speeds and to mitigate potential adverse impact shall be identified. 12.10

Stormwater Management

The Proponent has provided a description of the exiting drainage conditions as well the a description of proposed plan to construct a new 60-inch stormwater outlet from the Border Street separated stormwater system to the Harbor.

The Proponent has demonstrated compliance the DEP Stormwater Management Policy as the Proposed Project falls under the jurisdiction of the Massachusetts Wetlands Protection Act (WPA), thus requiring the Proposed Project to meet performance standards with regard to stormwater discharges to wetland resource areas. Due to its proximity to the Boston Harbor, the project is subject to the WPA, and stormwater Best Management Practices (BMPs) have been designed in conformance with the DEP performance standards. The Proponent has provided an illustration of how the Proposed Project will conform to the DEP Stormwater Management Standards.

Tidelands/Chapter 91

The Proponent shall provide documentation from the Massachusetts Department of Environmental Protection regarding Chapter 91 licensing determination of applicability. 12.11

Solid and Hazardous Wastes/Materials

The Proponent shall provide a list of any known or potential contaminants on the Site, and if applicable, a description of remediation measures to ensure their safe removal and disposal, pursuant to the M.G.L., Chapter 21E and the Massachusetts Contingency Plan. 12.12

Any potential hazardous wastes to be generated by the proposed site must be identified. In addition, potential waste generation must be estimated and plans for disposal indicated and measures to promote reduction of waste generation and to promote recycling in compliance with the City's recycling program described.

Historic Landmarks

The Proponent has identified, mapped and described historic resources and any other historic properties in the vicinity of the Proposed Project's site and evaluated the anticipated effects of the Proposed Project on these resources. The Proponent has stated that the Proposed Project will not have an adverse impacts to the historic structures in the surrounding area.

Sustainable Design/Green Buildings

The purpose of Article 37 of the Boston Zoning Code is to ensure that major buildings
projects are planned, designed, constructed and managed to minimize adverse
environmental impacts; to conserve natural resources; to promote sustainable
development; and to enhance the quality of life in Boston. Any project subject to the
provisions of Article 37 shall be LEED Certifiable (U.S. Green Buildings Council) under 12.13
an appropriate LEED rating system.

The Proponent has provided a completed LEED-NC checklist indicating 31 points for which the Proposed Project is expected to qualify (including any Boston Green Credits, found in Appendix A to Article 37). The applicant shall demonstrate that the Proposed Project will meet the requirements of Article37 with appropriate supporting documentation and by certification from a LEED Accredited Professional.

Letter 12	Boston Redevelopment Authority, Katie Pedersen
12.1	A qualitative air quality analysis in Section 5.5 of the DEIR/DPIR.
12.2	A future air quality analysis of intersections was not conducted because there were no intersections that triggered the specified thresholds regarding changes in LOS or traffic volume.
12.3	See Section 5.5 for a description of the project's ventilation system and an analysis of its impact on pedestrian level air quality.
12.4	A qualitative assessment of existing and future noise levels and mitigation measures are described in Section 5.6 of the DEIR/DPIR.
12.5	Since the project does not incorporate reflective building material, a solar glare analysis will not be conducted. See Section 5.4 for a description of how the project will not create a visual nuisance and/or hazard.
12.6	A daylight analysis is in Section 5.3 of the DEIR/DPIR.
12.7	See Section 5.4 for a description and analysis of the subsoil conditions. In the vibration analysis plan that will be submitted prior to construction activities, there will be mitigation measures to minimize and avoid damage to adjacent buildings and infrastructure. Based on the distance of the proposed structure from adjacent buildings and the types of soils there does not appear to be significant exposure. The geotechnical engineer will develop a Vibration (and Lateral Movement) Monitoring Plan which will be included in the project's construction specifications. The geotechnical engineer will be on site during this phase of construction and will review and monitor the plan.
12.8	The proponent will work with the Boston Groundwater Trust to identify another groundwater observation well at the site to be used as part of the groundwater monitoring network in East Boston.
12.9	A detailed shadow analysis is in Section 5.2 of the DEIR/DPIR.
12.10	No wind speeds are projected to be dangerous or exceed acceptable levels according to the results of the pedestrian level wind study.
12.11	See Section 3.0 for a full description of the Chapter 91/Tidelands documentation.
12.12	Any contaminants at the project site and remediation measures to remove them safely from the site and dispose them properly will be identified when the site analysis is completed. See also responses to comments # 5.7 and # 5.8.
12.13	See Section 5.14 for a description of how the project meets Article 37 requirements.

Letter 12A

MEMORANDUM

TO: Kristin Kara
FROM: David Carlson
DATE: February 12, 2008
SUBJECT: Boston East
Scoping Comments

The Proposed Project consists of approximately 196 residential units (and a speculative industrial use) in a massing and height configuration that is in the process of being modified in response to comments from staff, community, and the Boston Civic Design Commission. Therefore the comments made below should be applied or understood in their general, and not necessarily specific, sense. The intent is to bring the building and site design represented in the PNF at least to the current state of design, and beyond, for submission in the DPIR stage.

URBAN DESIGN COMPONENT

The Boston Civic Design Commission has reviewed this Project and recommended its approval to the BRA ; the following excerpt from the minutes of January 8, 2008 is the final discussion of progress and issues before their vote:

> *Nancy Ludwig (NL) of ICON Architecture set up perspectives, and talked through the design changes made during Committee sessions, including a modification of the entry expression and its arch, evolution of the facade composition and materials, a massing change on the 'long arm' of the building, and an overall simplification of the design, with an attendant increase in its coherence. ET: There were positive things about the layout at the beginning; many of the comments were more detailed in nature, such as the 'pinch point' issue along Harborwalk, or the nature of the slip and the bridge leading across it....WR asked about the garage height, the treatment of the edge. NL: You won't see the openings; essentially, the garage is below grade. There are window wells with berms and landscaped buffer areas surrounding them. Kendra Halliwell noted that a few would be visible from limited vantages. WR: That's the reason I asked the question. NL: Generally, they will not be seen.*

The basic strategy of the design and massing as they have evolved through the staff and BCDC 12A.1
review process are not questioned, but require documentation. The design of the building and
its use of materials should continue to evolve using the simplified hierarchy of materials and 12A.2
tripartite expression without losing the inventive expressions that give the project its character.
A more detailed site/landscape plan with grading indicated may be helpful to understand more 12A.3
fully the relationship of the building massing to Harborwalk and public passages around its perimeter. This should resolve the issue raised about the visibility of the garage ventilation openings; the plan should also better resolve the pedestrian pathway that leads back to Border Street through the loading area. The site plan and landscaping design in general are a good starting point but need further development. Also, please show the interactions with program elements that have changed. The recent introduction of artists' live/work space along the south perimeter leading to the gallery/community space, and the multiple direct entries into the latter, are welcome improvements which should be shown. The somewhat more public program uses should be reflected in subtle ways on the facade.

The resolution of the ‘pinch point’ referenced in the BCDC excerpt (as well as the programming modifications) assisted coincidentally in the resolution of Chapter 91 issues. The slight widening of the space between the building wings gives a more generous sense of scale to this amenity. Along these lines, and as suggested during the discourse with the BCDC, we recommend that the Proponent consider ways of increasing the sense of connection from north to south along the full Harborwalk edge, including connections to the Central Square area, and possibly the introduction of an additional gallery or artist work or work/live space on the ground floor at the end of the shorter wing, accessible from the pathways. (Any square footage or remunerative footage lost, as discussed during the course of review, might reasonably be added atop the southeast sector of the building. This is where height would be most favorably received in the Chapter 91 diagram; it is closest to the high ventilation structure nearby, and adds some asymmetry to the design that may add comfortably to the strategies used to modulate the scale of the Proposed Project.) 12A.4

The following (standard list of) urban design materials should be submitted for the DPIR for the Proposed Project or, if no DPIR is requested, should be submitted as a record ‘schematic design’ submission pursuant to the BRA’s Development Review Procedures: 12A.5

1. Written description of program elements and space allocation for each element

2. Plan for the surrounding area and district and sections at an appropriate scale (1" = 40' or larger) showing relationships of the Proposed Project to the surrounding area and district:

   a. massing
   b. building height
   c. scaling elements
   d. open space
   e. major topographical features
   f. pedestrian and vehicular circulation
   g. land use

3. Black and white or color 8"x10" photographs of the site and neighborhood

4. Eye-level perspective (reproducible line drawings) showing the proposal (including main entries and public passages/areas) both in the context of the surrounding area and experientially; i.e., how the public might experience the public realm created by the building and site designs. Additional views from the area streets (Border and Decatur, i.e.) are required, with particular emphasis on important viewing areas such as key approaches (Harbor, Central Square). Long-ranged (distanced) views of the proposed project should also be studied to assess the impact on the skyline or other view lines. Context and the massing of other approved Projects should be included. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) both the build and no-build conditions. The view locations should be approved by the BRA before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.

5. Site sections at 1" = 20' or larger showing relationships to adjacent buildings and spaces.

6. Site plan at an appropriate scale (1" = 20' or larger) showing:
    a. General relationships of proposed and existing adjacent buildings and open space
    b. Open spaces defined by buildings on adjacent parcels and across streets
    c. General location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
    d. Pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
    e. Survey information, such as extending elevations, benchmarks, and utilities
    f. Construction limits

7. Study building/site model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration (window treatment), facade composition, etc.

8. Massing model at 1" = 40' in basswood suitable for placement in the area model at the BRA (if applicable).

9. Drawings at an appropriate scales (e.g., 1" =8', 1"-16', or 1"-20') to describe the facade design and proposed materials including:
    a. Building and site improvement plans
    b. Elevations in the context of the surrounding area
    c. Sections showing organization of functions and spaces
    d. Preliminary building plans showing ground floor and typical upper floors
    e. Phasing of the proposed project

10. A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.

11. Proposed schedule for submittal of all design or development related materials.

12. Proposed LEED certification plans and point rating goal assessment.

13. Electronic model of the Proposed Project in format suitable for use in the BRA's digital 3-D model of Boston. Format should be approved by Urban Design's Technology manager

Letter 12A	Boston Redevelopment Authority, David Carlson
12A.1	The development of the design and massing of this project is an ongoing process that is being described as part of this DEIR/DPIR and will be documented further during the BRA Design Review process.
12A.2	The design of the building and it materials will continue to be refined through the design process in consultation with the BRA and all relevant parties.
12A.3	The site and landscape plan is at a conceptual level. As the design progresses, particular attention will be paid to proposed improvements regarding the relationship between the building and the public places including the Harborwalk and its connections. Program changes from the ENF/PNF include the addition of affordable live/work units, a new path between Border Street and the north side of the Harborwalk, public access to the community gallery from the Harborwalk, and movement of the south wing of the building away from the Harborwalk. There have been substantial improvements in the design of the public passages within the site including a new path that connects the terminus of the Harborwalk on the north side of the site with Border Street, an archway that has interpretive displays, and a new connection to the Community Gallery from the Harborwalk.
12A.4	Additional connections to and from the Harborwalk in relationship to the building design and ground floor uses will be considered during the next phases of development and in consultation with the BRA.
12A.5	The required urban design materials will be submitted in part with this DEIR/DPIR and at appropriate times during the Article 80 Design review process. A written description of program elements and space allocation is in Section 1.2 of the DEIR/DPIR. A design review schedule will be included in the Schematic Design submission. LEED certification plans and point rating goal assessment is in Section 5.14 of the DEIR/DPIR.

BOSTON
TRANSPORTATION
DEPARTMENT

ONE CITY HALL PLAZA/ROOM 721
BOSTON, MASSACHUSETTS 02201
(617) 635-4680/FAX (617) 635-4295

November 15, 2007

Kristen Kara, Project Manager
Boston Redevelopment Authority
One City Hall Square 9th Floor
Boston, Massachusetts 02201

Re: Boston East Project Notification Form / Environmental Notification Form

Dear Ms. Kara:

The Boston Transportation Department (BTD) has reviewed the above listed document and is pleased to provide you with our comments and related scope of work.

The proposed Boston East project consists of 196 residential units and approximately 20,000 square feet of marine related space, with waterfront public accommodations. The project will include 139 parking spaces in an underground garage for residential use and an additional 26 off-street surface parking spaces for the marine related use.

The residential component of the project will generate significant new pedestrian traffic at the location and in the general Central Square area. Considering the current environment in Central Square, BTD will closely monitor the proponents plan to mitigate 13.1
potential impacts in relationship to vehicular movements and how the increase in pedestrian traffic will affect the overall traffic flow in Central Square.

By virtue of its location, the project will have convenient connections to Maverick Station, Logan Airport and the surrounding roadway system leading north, south and westbound. The proponent will be required to implement a travel demand management 13.2
(TDM) measures in order to minimize automobile reliance among project residents. These measures should include: distribution of public transit information, pedestrian and streetscape improvements and secure bicycle storage.

Due to the design of the building, which will be constructed up to the sidewalk, BTD will require an audio/video alarm located at the access/egress point to the underground parking garage to warn pedestrians of vehicles exiting the property. An alarm will also be 13.3
necessary at the access/ egress point of the residential off-street loading area if similar in design to the residential garage.

BTD will require the proponent to include in their Transportation Access Plan Agreement (TAPA) process, traffic and parking information pertaining to all other projects planned for the general area, including all waterfront development projects. 13.4

Due to the number of developments either underway or planned for the immediate area, BTD cannot allow any project to provide stand-alone data.

Finally, as required by the TAPA, BTD will require a Construction Management Plan (CMP) to be filed by the proponent. 13.5

If you have any questions on this matter, please feel free to call at 617-635-3076.

Sincerely,

Robert D'Amico
Senior Planner

BOSTON TRANSPORTATION DEPARTMENT

TRANSPORTATION ACCESS PLAN GUIDELINES

And

SCOPE OF WORK

Boston is a dense city, with high levels of vehicular congestion, pedestrian traffic, and parking demand. New development of all types increases travel demand, and will have transportation impacts that require analysis, review, and mitigation. Through the City of Boston's Article 80 development review process, the Boston Transportation Department (BTD) works with development team (the "project proponent") to ensure that they thoroughly evaluate the transportation impacts associated with the proposed project, propose and analyze ways to mitigate these transportation impacts, and implement appropriate mitigation measures.

The project proponent is responsible for assessing and mitigating the short-term and long-term impacts of the proposed project. Submitting the following documentation to BTD:

1. Transportation Access Plan. The Transportation Access Plan shall fully describe all transportation-related issues surrounding the proposed project. It should include the following principal components:
   - Description of Existing Transportation Conditions. A summary of existing traffic, public transit, pedestrian, bicycle, and parking conditions in the study area.
   - Evaluation of the Proposed Project's Long-Term Transportation Impacts. A detailed description of the proposed project and a detailed analysis of the project's long-term impacts on traffic, public transit, pedestrian, bicycle, and parking conditions.
   - Mitigation of the Project's Long-Term Transportation Impacts. Identification of appropriate measures to mitigate project impacts, including physical and operational improvements, travel demand management (TDM), and long-term project impact monitoring.
   - Description of the Project's Short-Term Construction Impacts and Proposed Mitigation. General overview of the project's construction impacts, construction schedule and phasing, and measures to mitigate the short-term impacts. This is a summary of the more detailed Construction Management Plan (CMP) to be submitted to BTD under separate cover.

   The Access Plan typically comprises the transportation component(s) of the proposed project's various environment filings, such as the Draft Project Impact Report (DPIR) or the Final Project Impact Report (FPIR); in special cases, the Access Plan may be a separate document. In any case, the Access Plan should adhere to the guidelines and scope of work set forth below. The analysis and reporting guidelines below are designed to be general enough that they will apply to most or all major development projects; they are also designed to be specific enough to ensure adequate information and equitable review of all development projects. These guidelines shall be followed as closely as possible. If the project proponent believes that certain provisions are not applicable to the development in question, the proponent shall obtain BTD's explicit approval to forego those provisions.

2. Construction Management Plan. The Construction Management Plan (CMP) shall include a detailed proposal for the proposed project's construction: schedule, phasing, and occupancy of the public right-of-way, access and delivery requirements, transportation impacts, and mitigation. The proponent shall submit the CMP to BTD, under separate cover from the Access Plan. The project's general contractor typically prepares the CMP. Guidelines for preparation of the CMP are available from BTD. The CMP shall be completed prior to the issuance of a Building Permit from the City of Boston's Inspectional Services Department (ISD).

3. Transportation Access Plan Agreement. The Transportation Access Plan Agreement (TAPA) is a formal legal agreement between the project developer and BTD. The TAPA formalizes the findings of the Access Plan, the mitigation commitments, elements of access and physical design, and any other responsibilities of the developer and BTD. Since the TAPA must incorporate the results of the technical analysis, physical design, and assessment of mitigation requirements, it must be executed after these processes have been completed. However, the TAPA must be executed prior to approval of the project's design through the City of Boston's Public Improvements Commissioner (PIC). An electronic copy of the basic TAPA form is available from BTD. It is the proponent's responsibility to complete the TAPA so that it reflects the specific findings and commitments for the project, and to get BTD review and approval of the document.

STUDY AREA

The Access Plan shall consist of a thorough analysis of the proposed project's transportation impacts throughout the relevant study area. The study area shall comprise the public right-of-way and important transportation elements of the area described by the following list of intersections:

a. Border Street and Meridian Street @ Central Square
b. Border Street / Decatur Street
c. Border Street / Maverick Street
d. Meridian Street / London Street
e. Meridian Street / Havre Street / Gove Street / Decatur Street
f. Meridian Street / Paris Street / Emmons Street
g. Meridian Street / Maverick Street / Sumner Street @ Maverick Square

The proponent shall review all relevant project proposals and planning studies that would affect the study area, and incorporate these into the transportation analysis, as appropriate.

DEFINITION OF TASKS

Task 1. Description of Existing Transportation Conditions

The Existing Conditions component shall summarize the current status of the transportation system within the study area. It shall focus on the issues listed below, and shall identify any existing problems or deficiencies in the transportation system. The Existing Conditions analysis will form the basis for projecting future conditions, and enable comprehensive assessment of the proposed project's transportation impacts.

1.1 Project Site Conditions. Describe general conditions in the vicinity of the project site, including:

- Existing land use, including existing site square footage, building square footage, number of employees or residents, zoning provisions, and other applicable information
- Physical condition of the site, existing access and egress
- Major streets and intersections in the vicinity of the site
- On-street regulations

Include a survey of existing conditions.

1.2 Traffic. The Access Plan shall include traffic volume counts at the study area intersections for weekday morning and evening peak periods under existing conditions. These shall be classification counts in areas with high volumes of heavy vehicles. The morning and evening peak volumes represent a minimum for traffic impact analysis. Depending upon the nature of the proposed project or local conditions, BTD may require traffic analysis for additional conditions, such as the Saturday afternoon peak.

Existing capacity analyses shall be performed to determine level of service at all study area intersections. Analyses shall reflect realistic peak period characteristics, including pedestrian volumes, requirements for pedestrian phases, curb operations (bus stops, pick-up / drop-off), usable lanes, grade, and percentage of heavy vehicles. Appropriate traffic models will be discussed below.

1.3 Parking. The Access Plan shall summarize the parking supply within ¼ mile of the project site. The parking inventory shall focus on publicly available spaces, but shall also include private resident or employee spaces as well, if the information is available. The parking inventory shall include:

a. Location (block face for on-street spaces, facility for off-street spaces). Include a graphic representation of the parking supply locations with respect to the project.
b. Type of Space
    - On street (metered, resident parking, unregulated, etc.)
    - Off-street (surface lot or garage, user type: resident, employee, commercially-available, customer, etc.)
c. Parking Fees, by Type of Space
d. Percentage Utilization During Parking Peak (assume 12 noon)

This inventory can be supplemented with data from published sources such as the BTD's 1987 Downtown Parking Inventory Study, updated as necessary with survey data.

If there is currently parking associated with the project site, the Access Plan shall summarize the parking use and management. The description of existing on-site parking use shall include: number of spaces, occupation of spaces by user type, hour of peak occupancy, turnover rate, parking fees, and any high-occupancy vehicle spaces.

1.4 Transit. The Access Plan shall describe the study area's mass transit system:

a. Transit Supply
    - Massachusetts Bay Transportation Authority (MBTA) services, proximity to site
        - Service (mode of transit, line, closest station stop)
        - Service characteristics (frequency during peak periods, geographic connections)
        - Physical characteristics (station conditions, rolling stock)
    - Private transit services (summarize characteristics above)
    - Other transit and high-occupancy vehicle (HOV) services

b. System Utilization
    - Capacity by line during peak periods
    - Current ridership and percentage capacity utilization by line during peak periods

1.5 Pedestrians. The Access Plan shall include a description of pedestrian conditions on sidewalks and intersections adjacent to the site, including major pedestrian routes and desire lines in and around the site, volumes of pedestrians on these routes, and the conditions of these corridors, including any deficiencies or barriers.

Pedestrian volumes shall be counted and pedestrian level of service shall be calculated at the following intersection crossings and sidewalk locations:

a. Maverick Square @ Sumner Street and Maverick Street
b. Central Square @ Meridian Street and Border Street
c. Meridian Street @ Havre Street / Decatur Street / Gove Street

Describe pedestrian accommodation at signalized intersections in the study area (i.e. exclusive vs. concurrent, crossing time provided).

1.6 Bicycles. The Access Plan shall describe existing bicycle usage, primary bicycle routes, accommodation of bicycles in the public right-of-way, and the current supply and location of any existing bicycle racks on or adjacent to the project site. On a day with good weather (record date and weather conditions), survey bicycle rack utilization by location. Document storage of bicycles in locations without bicycle racks. Include bicycle volume counts at the following intersections and bike routes:

a. Maverick Square @ Sumner Street and Maverick Street
b. Central Square @ Border Street and Meridian Street
c. Meridian Street @ Havre Street / Decatur Street / Gove Street

1.7 Loading and Service. The Access Plan shall describe any existing loading and service uses on the site, as well as any special conditions relative to loading and service in the surrounding area.

- Vehicle-occupancy rate (VOR) assumption, by land use type (for translation of vehicle-trip rates to person-trip rates)
- Daily person-trip generation (by land use and overall)
  - Daily person-trip generation rate (per 1,000 square feet, or per unit)
  - Resulting daily person-trip ends
- AM peak hour person-trip generation (by land use and overall)
  - AM peak hour person-trip generation rate
  - AM peak hour person-trips, entering
  - AM peak hour person-trips, exiting
- PM Peak Hour person-trip generation (by land use and overall)
  - PM peak hour person-trip generation rate
  - PM peak hour person-trips, entering
  - PM peak hour person-trips, exiting
- Source for trip generation rates

b. Mode Split and Vehicle Occupancy Rate. Person-trips shall be apportioned among the various principal modes (automobile, public transit, walking, bicycling) using an appropriate mode split. The mode split shall be presented as percentages of automobile, public transit, and walk / bicycle travel. Working with BTD, the Central Transportation Planning Staff (CTPS) has compiled appropriate mode split assumptions for various sections of Boston, according to trip type. These mode splits, along with VOR for automobile trips, are included in Appendix xx. The mode split calculation shall be based upon these assumptions. If the proponent wishes to adjust these mode splits based upon specific project characteristics, the adjustment must be supported by accepted evidence and by appropriate mitigation commitments (e.g. enhanced travel demand management to justify a higher public transit mode share). BTD must approve any adjustments to the mode split and VOR assumptions in Appendix xx. The Access Plan shall include a clear, easily understood table that summarizes the assumptions and the resulting trips by land use type, by trip purpose, and by mode.

c. Trip Distribution. The trip distribution shall identify the directional split (i.e. north, south, west) of person-trips and vehicle-trips for the specific location and trip types of the proposed project. Detailed trip distribution information for trips to and from all areas of Boston is included in Appendix xx. The trip distribution is allocated by individual mode, and should be applied to the resulting trip totals by mode. The Access Plan shall use this information for trip distribution assumptions, unless BTD recommends or approves other trip distribution assumptions.

d. Trip Assignment. The distributed trips shall be assigned to the appropriate means of accessing the project: highway routes, surface streets, surface intersections, sidewalks, crosswalks, site access / egress points, and public transit lines. If the project expects to rely upon an off-site parking supply, trips shall be assigned appropriately to these locations. Drop-off, pick-up, and valet trips shall also be assigned appropriately, i.e. both entering and exiting the site access, and entering or exiting an off-site parking area.

Attached appendices include the base assumptions that the project proponent shall use for trip generation rates, mode splits, trip distribution, and vehicle occupancy rate for specified areas of Boston. The proponent may believe that other assumptions should be used due to specific circumstances, such as proximity to public transit (not relevant for downtown zones) or exceptional travel demand management commitments. Where such special circumstances warrant, the proponent may propose alternative assumptions, which are subject to explicit BTD approval.

2.3 Future No-Build Condition. The analysis of the proposed project's transportation impacts must be based on a comparison with an appropriate baseline condition. The proposed project's impacts would be felt fully during some future "horizon year" when the project is expected to be complete, occupied, and operating. The effects of the proposed project (under the "Future Build Condition") are most appropriately demonstrated in comparison to projected transportation conditions during the horizon year without the effects of the proposed project.

- The horizon year shall be five years in the future, unless specific circumstances require that a different time frame be used.
- The Future No-Build Condition shall be based on the Existing Conditions assessment, with the addition of development and infrastructure projects that have been proposed and are expected to be complete and operational by the horizon year (per BTD and BRA instructions).
- The Future No-Build Condition traffic, transit, and pedestrian volumes shall also include a background growth rate of 1 – 1 ½ % per year (depending upon local conditions) added to existing traffic volume counts, transit ridership, and pedestrian counts, unless otherwise specified by BTD.

2.4 Future Build Condition. The central component of the Access Plan is the assessment of the proposed project's long-term impacts. This shall include evaluations of the project's effects on all transportation modes and aspects, throughout the study area.

a. Traffic Impacts.

I) Traffic Volumes. The traffic analysis shall include diagrams of turning movement volumes generated by the proposed project at all study area intersections, and total turning movement volumes for the Future Build Condition. Therefore, the Access Plan shall include turning movement volume diagrams for AM peak volumes, PM peak volumes, and any other required period, of each of the following:

a) Existing Conditions (based on current traffic counts)
b) Future No-Build Conditions (Existing Conditions, plus appropriate future changes and growth factor)
c) Project-Generated Traffic Volumes (based on trip generation)
d) Future Build Conditions (Future No-Build Conditions, plus Project-Generated Traffic Volumes)
e) Future Build Conditions with Mitigation (if the proponent plans to undertake any roadway or signalization changes in order to mitigate traffic impacts of the proposed project)

ii) Traffic Capacity Analysis Software. The Access Plan shall include traffic capacity analyses for Existing Conditions, Future No-Build Conditions, and Future Build Conditions. The capacity analysis shall be performed using an approved and appropriate capacity analysis software program.

- For intersections that are widely spaced and will operate in isolation, the proponent shall use software based upon the *Highway Capacity Manual* (HCS), 1997 edition.
- For closely spaced intersections with long queues that create interaction between intersections, the proponent shall use a computer model, such as Transyt-7F (version 8) or Synchro that can accurately model these effects. In such cases, the proponent shall model all of the intersections that would interact.

The computer model output shall be attached to the Access Plan as an appendix.

iii) Traffic Capacity Analysis Results Summary. The Access Plan shall include a tabular summary of the traffic capacity analysis, for all conditions (Existing, No-Build, Build) for each intersection as a whole and for each approach of every intersection. The summary shall include the volume-to-capacity ratio (v/c), level of service (LOS), delay, and estimated queue lengths for each study intersection, and for each approach of every intersection. The summary table shall also highlight changes to intersection and individual approach LOS that result from site-generated traffic.

iv) Traffic Counts. The proponent shall submit, under separate cover, turning movement count summary sheets for each intersection in the study area.

b. Parking Impacts. The Access Plan shall include an analysis of projected parking demand and proposed parking supply.

I) Parking Demand Analysis. The Access Plan shall include an analysis of total parking demand in the horizon year, broken down by land use and user type (e.g. office employee vs. visitor, hotel employee vs. guest, retail employee vs. patron). The parking demand analysis shall include

- Daily vehicle-trip generation by land use and user type (consistent with mode split and VOR)
- Parking turnover by land use and user type (cite source)
- Parking demand peaks by land use and user type
- Overall parking demand and peak parking demand, based on shared parking among all land uses and user types included in the proposed projected

ii) Proposed Parking Supply. The Access Plan shall include a summary of the project's proposed off-street parking supply. Parking supply, and parking costs, plays a central role in determining mode split and vehicular traffic impact. In general, parking shall be limited to minimum supply that is appropriate to the neighborhood, the project's transit access, and the project's mode split. Appendix xx includes a map of parking ratio guidelines by land use and area of the city. The project's parking ratio shall remain within these guidelines. If the parking supply exceeds these guidelines, the proponent must justify the excess parking based on circumstances specific to the project. Higher parking ratios may increase transportation impacts, and necessitate enhanced mitigation measures. The information below shall be summarized in a clear table.

- Total Spaces
    - Existing

    - Future No-Build (if applicable)
    - Future Build Parking Conditions
- Parking Allocation
    - Space allocation among various land uses
    - Parking ratios: spaces per thousand square feet or per unit, by land use
    - Specially-designated parking spaces, e.g. vanpools, livery vehicles, rental cars, car-sharing
    - Treatment of existing parking spaces, including displacement of existing parking spaces and how the parking demand for these spaces would be met in the Future Build Condition
- Comparison of Parking Supply and Demand
    - Projected shortfall or surplus of parking spaces, by land use
    - Proposed management of shortfall or surplus
- Provide a plan of all parking facilities, including layout, access, and size of spaces.

iii) Off-Site Parking Supply. Describe any anticipated utilization of off-site parking supply (as described in the Existing Conditions section, amended to reflect Future No-Build Conditions) required to satisfy project-generated parking demand.

- On-Street Parking Supply
- Off-Street Parking Supply
    - Number and type of spaces required (i.e. publicly-available, employee, residential)
    - Resulting parking utilization at 12 noon on a weekday (additional parking survey times may be required, depending upon the nature of the project)

iv) Proposed Parking Management Plan

- Description of Proposed Parking Operations
    - Access control
    - Valet operations
    - Pass or payment medium
    - Management of operations to prevent illegal parking, violation of 5-minute idling law
- Parking fees
- Management of Specially-Designated Parking Spaces (e.g. vanpool, carpools, rental cars, car-sharing)
    - Location
    - Parking fees
    - Accommodation of increased supply if demand warrants

c. Transit Impacts. Describe the anticipated impacts of the project on the mass transit system, based on the information about Existing Conditions and the projected transit person-trips (based on trip generation – trip distribution – mode split calculations). Future transit conditions shall be based on transit supply and capacity that is expected to be available in the horizon year; if there is some doubt, the proponent shall consult with BTD and/or the MBTA. The proponent may use generally available MBTA ridership data as a basis for this analysis. The Access Plan shall include the following information:

Task 2. Evaluation of Proposed Project's Long-Term Transportation Impacts

The central component of the Access Plan is the evaluation of the proposed project's long-term transportation impacts. The Access Plan must evaluate these impacts in detail, for all the transportation modes and aspects that will be affected, including traffic, parking, public transit, pedestrians, bicycles, and service and loading. These impacts must be compared to the appropriate baseline condition, the Future No-Build Condition. The following are the principal issues, modes, and conditions that must be analyzed.

2.1 Project Description. The Access Plan shall include a summary of the key project characteristics that are relevant to the project's transportation impacts. These include:

- Project name and street address
- Study area, including critical intersections
- Anticipated construction start and completion dates
- Relevant zoning regulations with respect to use, parking and other characteristics
- Required permits, variances, and licenses
- Site area
- Project's gross square footage and floor-area ratio (FAR)
- Gross square footage by use
- Other relevant variables (e.g. number of dwelling units, number of hotel rooms, number of employees)
- Number of parking spaces, specified by use type
- Number of loading bays, dimensions of bays, design loading vehicle

2.2 Trip Generation Analysis. The Access Plan shall include a clear and detailed trip generation analysis for the proposed uses of the site. This analysis shall include:

a. Person-Trip Generation. The Access Plan shall summarize the proposed project's person-trip generation, for daily, AM peak, and PM peak trips. For certain uses, person-trips shall also be calculated for other time periods, such as Saturday afternoon peak hour (e.g. cultural or entertainment use in an area with significant weekend congestion).

The person-trip calculations shall be based on appropriate trip generation rates, typically the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 6th Edition*. The ITE manual includes comprehensive vehicle-trip generation rates based on surveys in suburban locations throughout the United States. Because Boston benefits from an excellent public transit system and pedestrian access, ITE vehicle-trip generation rates are not directly applicable to resulting vehicle trips. ITE rates shall be used to generate total person-trips by correcting for vehicle occupancy rate (VOR). Appendix xx includes a compilation of the most common ITE trip generation rates and corresponding VOR. The proponent shall use these trip generation rates whenever possible. Where necessary, these trip generation rates may be supplemented by survey data or information from other sources (subject to BTD requirement and/or approval). The person-trip generation analysis shall be summarized in a clear table, in the body of the Access Plan, including all of the following information:

- Land use type
- Square footage, by land use type

i) Transit Trip Distribution
   - Distribution of project-generated transit trips by zone
   - Distribution of project-generated transit trips by transit line / route

ii) System Utilization
   - Existing Conditions: Capacity and utilization by line
   - No-Build Conditions: Capacity and utilization by line
   - Build Conditions: Capacity and utilization by line

d. Pedestrian Impacts. Describe future pedestrian conditions in the study area:
   - Pedestrian access to and from the project, pedestrian circulation routes
   - Pedestrian accommodation in the project's public spaces (e.g. sidewalk, adjacent intersections, plaza spaces, benches, etc.)
   - Pedestrian level of service (LOS) at all surveyed crosswalks, sidewalks and other locations
     - Existing Conditions
     - Future No-Build Conditions
     - Future Build Conditions

   NOTE: The traffic capacity analyses must also assume appropriate accommodation of pedestrians in all signalization assumptions. The pedestrian impacts analysis shall describe the assumptions regarding accommodation of pedestrians in the traffic analysis, i.e. pedestrian walk rate and percentage of cycles in which pedestrian phase is called (verify with BTD).

e. Bicycles. Describe bicycle access to, from, and within the project site. Describe bicycle storage and other amenities (e.g. shower and changing facilities) to be provided. BTD will provide guidelines on bicycle storage requirements based on project type and size.

f. Loading and Service. The project must accommodate loading and service facilities in an off-street location. The loading and service plan shall not rely upon loading facilities and truck back-up maneuvers in the public right-of-way. Describe service and loading requirements:
   - Number of loading bays
   - Services to be provided (e.g. garbage compactor, garbage collection, restaurant service, move-in / move-out, etc.)
   - Level of loading and service activity (number of trucks per day or per week)
   - Loading and service schedule, schedule restrictions (proponent shall prohibit or strictly limit loading and service activities during peak periods)
   - Design vehicle(s)
   - Required truck turning movements (show design vehicle turning movements on site plan)
   - Major loading and service vehicle routes for site access and egress
   - Access for emergency vehicles

2.5 Site Plan. Provide an engineered site plan showing Build Conditions (contrast with existing conditions):
- Public right-of-way layout

  - Roadways
  - Sidewalks
- Vehicular access and circulation
- Service and loading
- Parking
- Bicycle storage
- Proposed on-street regulations

Task 3. Mitigation of the Project's Long-Term Transportation Impacts

Major development projects offer benefits, but they also consume public services and create impacts on public resources. Chief among these impacts is a development's effect on the transportation system. The project proponent is required to quantify and analyze these impacts through the Access Plan. It is then the responsibility of the project proponent, working with BTD, to develop strategies for reducing and mitigating these impacts. These strategies will typically include travel demand management (TDM) measures and improvements to Boston's transportation system.

These transportation system improvements and mitigation measures have associated costs. The proponent should view these costs as an integral component of the overall project cost, necessary to enable the transportation system to accommodate the project's impacts. The mitigation measures benefit the users of the transportation system, in particular the new users associated with the proposed project. Project proponents shall allocate appropriate funding for the mitigation. The mitigation measures associated with a development project will be specified in the project's Transportation Access Plan Agreement (TAPA) between the proponent and BTD.

3.1 Travel Demand Management (TDM). Travel demand management comprises a variety of strategies designed to reduce single-occupancy vehicle (SOV) travel and encourage "alternate modes" of transportation (public transit, walking, bicycling). TDM programs are critical due to the disproportionate impacts of SOV travel on congestion, parking demand, air quality, and quality of life. TDM programs are especially important for projects that generate higher trip volumes, create concentrated peaks of demand, and create more impacts related to roadway congestion, parking demand, and vehicle emissions. TDM programs are required even when proponent uses the default analysis assumptions for mode split and VOR; since these default assumptions reflect long-standing TDM efforts and Transportation Management Association programs.

Appropriate TDM measures and requirements will vary depending upon the type of development, the neighborhood, the impact analysis assumptions, and other circumstances. For example, many of the measures below would not apply to a residential development. In the case of commercial office development, some (but not all) of the measures below would be the responsibility of the tenants, rather than the proponent. The proponent will be required to implement those TDM measures that are within its control, and should at least encourage and facilitate such measures. However, if the proponent seeks to base its impact analysis on aggressive assumptions (e.g. a high transit mode share), the proponent must require appropriate TDM measures in its lease agreements with tenants.

In the TAPA, the proponent will be required to implement the following TDM measures (as appropriate to the specific project):

a. Transportation Coordinator. Designate a full-time, on-site employee as the development's transportation coordinator. The transportation coordinator shall oversee all transportation issues. This includes managing vehicular operations, service and loading, parking, and TDM programs. In addition, the transportation coordinator will be responsible for the monitoring program and will serve as the contact and liaison for BTD and the Transportation Management Association (TMA).

b. Ridesharing / Carpooling. Facilitate ridesharing through geographic matching, parking fee discounts, and preferential parking for carpools / vanpools. This may be accomplished through membership in a TMA, participation in CARAVAN for Commuters, and/or use of computerized ridesharing software.
c. Guaranteed Ride Home Program. Offer a "guaranteed ride home" in order to remove an obstacle to transit use and ridesharing
d. Transit Pass Programs. Encourage employees to use transit through the following measures:
   - Offer on-site transit pass sales or participate in the MBTA Corporate T-Pass Program
   - Offer federal "Commuter Choice" programs, including pre-tax deductions for transit passes and subsidized transit passes
e. Information and Promotion of Travel Alternatives
   - Provide employees and visitors with public transit system maps and other system information
   - Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options
   - Sponsor an annual (or more frequent) "Transportation Day" at which employees may obtain information on travel alternatives and register to participate in ridesharing programs
   - Provide information on travel alternatives for employees and visitors via the Internet
   - Provide information on travel alternatives to new employees
f. Transportation Management Association (TMA) Membership. Investigate joining a Transportation Management Association. Encourage tenants to join the TMA as well. If no TMA is established in the project area, investigate starting a new TMA or becoming affiliated with an existing TMA. A TMA can provide many of these TDM measures, including ride matching, guaranteed ride home, and transit information and promotional materials.
g. Bicycle Facilities and Promotion
   - Provide secure bicycle storage (number of spaces will be specified depending upon size of development and type of land use)
   - Provide additional publicly-accessible bicycle storage (number of spaces will be specified)
   - Provide shower and changing facilities for bicycle commuters
   - Promote bicycles as an alternative to SOV travel, provide promotional material on bicycle commuting and bicycle safety, and provide incentives for bicycle use
h. Parking Management
   - Charge market-rate parking fees
   - Offer preferential parking to carpools and vanpools
   - Offer reduced parking rates to carpools and vanpools
   - Offer parking "cash-out" option
   - Offer garage space for car rentals
   - Offer parking space for car-sharing
   - Offer parking space, charging facilities for electric vehicles
   - Offer parking / layover space for livery vehicles (hotel development)
   - Enforce a 5-minute limit on vehicle idling for all users of the Development, in accordance with Massachusetts state law

i. Trip Reduction Strategies. To the degree possible, the Developer shall implement the following strategies for its own on-site employees. The Developer shall also encourage tenants to implement these strategies as well.
   - Telecommuting. Reduce overall trip demand by enabling employees to telecommute.
   - Flexible Work Schedules. Reduce peak hour and overall trip demand by enabling employees to telecommute, work a compressed workweek, or work hours that enable off-peak commuting.
   - Local Hiring. Recruit and hire employees from the local area. Such local employees can more easily use alternatives to SOV travel, including walking, bicycling, and transit.

j. Transportation Monitoring and Annual Reporting. Monitor transportation conditions, conduct employee transportation surveys, and provide BTD with an annual report on findings. This information will be useful to BTD in identifying and addressing issues with travel and access, including transit service, pedestrian and bicycle access, parking, and traffic. This information will enable BTD to pursue improved access for the project, and provide benefits to the proponent. BTD will provide employee survey forms and transportation monitoring forms to ensure uniformity of data.

3.2 Transportation System Improvements. In order to meet Boston's mobility needs as its population, density, and land development increase, Boston's transportation system requires improvements. These improvements offset the transportation impacts of new development. In addition, these improvements can make the traveling experience easier in the vicinity of the project, which accrues to the benefit of the proponent and the development's users.

a. Geometric Changes and Improvements to the Public Right-of-Way. The proponent may be required to make geometric changes and improvements to roadways, sidewalks, and other elements in the vicinity of the proposed project. These changes and improvements may be necessary in order to enable new circulation patterns resulting from the project and mitigate impacts of new vehicle or pedestrian trips. The proponent's consultant in consultation with BTD shall design changes and improvements. The project proponent will be required to directly fund and implement all changes and improvements to the public right-of-way, and to obtain any required permits. The proponent shall obtain the approval of the City of Boston's Public Improvements Commission (PIC) for any changes to the public right-of-way. A contractor approved by BTD, and subject to final BTD inspection and approval shall make these improvements with input from BTD, per specifications provided by BTD.

b. Traffic Signal Improvements. BTD operates most of the traffic signals in Boston. Improvements to traffic signals in the vicinity of the proposed project may be necessary to manage the increased travel demands placed on the intersection. Improving the operations of these signals can reduce congestion and improve conditions for pedestrians, bicycles, transit vehicles, and general traffic. Typical traffic signal improvements that BTD may require include:

   i) Traffic signal equipment
      - Signal controller
      - Signal heads and pedestrian heads
      - Signal poles and mast arms

   ii) Traffic monitoring equipment

- System detectors
- Video monitoring cameras

iii) Traffic signal communications equipment
- Communications conduit (4" PVC)
- Signal interconnect cable

The project proponent will be required to directly fund and implement all traffic signal improvements, and to obtain any required permits. A contractor approved by BTD, and subject to final BTD inspection and approval shall make these improvements with input from BTD, per specifications provided by BTD.

c. Public Transit System Improvements. New development can add significantly to public transit demand and have other impacts on the transit system. In order to manage this demand and mitigate the impacts, the proponent may be required to make or contribute to transit system improvements. These improvements shall be determined in consultation with BTD and the MBTA. Improvements may include:
- Physical improvements to MBTA system stations and stops
- Water transportation
  - Dock and/or landside infrastructure improvements
  - Operating subsidy for water transportation services
- Supplemental transit services. Public transit is the most desirable means of achieving transit access, and the proponent shall make every effort to facilitate transit access to the proposed project via public services. However, there may be some situations in which private supplemental transit services, such as shuttle buses, are necessary.
  - Overall transit demand in the area is too low to justify public transit service, but the proposed project requires transit access
  - The proposed project generates a concentration of trips to and from certain locations, such that a shuttle is feasible and useful in reducing auto trips (e.g. a hotel with airport and/or convention shuttles)

Task 4. Description of the Project's Short-Term Construction Impacts and Proposed Mitigation

The Access Plan shall include an overview of construction period transportation impacts and proposed short-term mitigation. This shall be a summary of the more detailed Construction Management Plan (CMP) that must be submitted to BTD under separate cover. The construction management summary in the Access Plan shall provide an appropriate level of information regarding the analysis and proposed management of the impacts of the project during the construction period, including:

- The need for full or partial street closures, street occupancy, sidewalk closures, and/or sidewalk occupancy during construction
- Frequency and schedule for truck movements and construction materials deliveries, including designated and prohibited delivery times
- Designated truck routes
- Plans for maintaining pedestrian and vehicle access during each phase of construction
- Parking provisions for construction workers
- Mode of transportation for construction workers, initiatives for reducing driving and parking demands
- Coordination with other construction projects in the area
- Distribution of information regarding construction conditions and impact mitigation to abutters

Letter 13	Boston Transportation Department, Robert D'Amico
13.1	The DEIR/DPIR includes a transportation analysis of the proposed Central Square improvements identified by BTD as part of the East Boston Action Plan (see Section 4.0).
13.2	Travel demand management measures will be implemented as part of the Transportation Access Plan. The intent of these measures is to minimize automobile reliance among residents of the project and to increase the use of other forms of transportation including bicycles and transit through education, information, streetscape improvements, and similar measures.
13.3	The designers of the vehicular access/egress points at the project site are reviewing the sight lines and angles that are needed to ensure the safe passage of pedestrians and other users of the sidewalks. Appropriate alarms and/or warning signals will be utilized at these locations as warranted.
13.4	The proponent understands the cumulative impacts of all the planned projects in East Boston, including the waterfront development projects. The TAPA process includes traffic and parking information pertaining to all major projects planned for the general area.
13.5	The proponent will file a Construction Management Plan as part of the Article 80 Review process.

Boston Water and Sewer Commission

980 Harrison Avenue
Boston, MA 02119-2540
617-989-7000

December 3, 2007

Secretary Ian A. Bowles, Jr., Secretary
Executive Office of Environmental Affairs
Attn: William Gage, MEPA Reviewer
100 Cambridge Street, Suite 900
Boston, MA 02114

and

Ms. Kirsten Kara
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

RECEIVED
DEC 5 - 2007
MEPA

Re: Boston East, ENF/PNF, EOEA No. 14123

Dear Secretary Bowles and Ms. Kara:

The Boston Water and Sewer Commission (Commission) has reviewed the Environmental Notification Form /Project Notification Form (ENF/PNF) for Boston East located at 102-148 Border Street in East Boston. The project is bound by Border Street to the east, the Atlantic Works, Wigglesworth Machinery and Boston Towing and Transportation properties to the south, the Boston Inner Harbor to the west, and the property at 170 Border Street to the north and Maverick Square and the MBTA Maverick Transit Station to the east.

The proposed project is comprised of two development areas; (1) a 196 unit residential building with an open area on the west side of the building and (2) a marine facility with a travel lift and interpretive area. The seven-story residential building will total about 221,859 gross square foot in area with a 139-space, below grade parking garage. The size of the two story marine facility will be about 20,000 square feet. This building, to be located to the south of the residential building, will have about 26 street level parking spaces.

According to the ENF/PNF, all of the stormwater runoff from the site will be directed into a new 60-inch pipe that will traverse the site and will be built by the Commission. The Commission will review the proponent's design plans but the proponent will be responsible for designing, permitting and funding the installation of this pipe. The proponent can coordinate the review of the design plans with Mr. Stephan Shea, Director of Design (617-989-7425). 14.1

The ENF/PNF also states that the project will generate about 33,840 gallons per day of sewage and will consume approximately 37,224 gallons per day of water.

The proponent is advised that the Massachusetts Department of Environmental Protection (DEP) routinely requires proponents to assist the agency in its program for reducing infiltration and inflow (I/I). In cooperation with this effort, the Massachusetts Water Resources Authority (MWRA) and its member communities are implementing a coordinated approach to control extraneous flows such as I/I into the wastewater system. In this regard, the DEP has routinely required projects that add a significant amount of new wastewater flows to offset the increase with a reduction in I/I. Typically, the DEP uses a minimum ratio 14.2
of 4 to 1; 4 gallons of I/I removed for each gallon of proposed wastewater. As a member community, the Commission supports the DEP and the MWRA, and will require the proponent to develop an I/I reduction plan that is consistent with their policy.

The Commission has the following general comments regarding the proposed Boston East project:

General Comments

1. Prior to demolishing any structures, above or below grade, all water, sewer and storm drain connections must be cut and capped at the main pipe in accordance with the Commission's requirements. The proponent must complete a Termination Verification 14.3
Approval Form for the Demolition Permit, available from the Commission, and submit a completed form to the City of Boston's Inspectional Services Department before the Demolition Permit will be issued.

2. The proponent is advised that the discharge of any dewatering drainage to the Commission's drainage system, whether it is temporary or on a permanent basis, requires 14.4
a Drainage Discharge Permit issued by the Commission. *An NPDES Permit issued by the EPA and/or DEP does not relieve the proponent of the responsibility to obtain authorization from the Commission.* Failure to obtain a Drainage Discharge Permit from the Commission for any dewatering discharge may result in a fine of up to $ 1,000 per day per violation.

3. Boston East should be aware that the US Environmental Protection Agency issued a draft Remediation General Permit (RGP) for Groundwater Remediation, Contaminated Construction Dewatering, and Miscellaneous Surface Water Discharges. If groundwater 14.5
contaminated with petroleum products, for example, is encountered, Boston East will be required to apply for a RGP to cover these discharges.

4. Boston East must submit a General Service Application and site plan to the Commission 14.6
for review and approval. The site plan should show the location of all existing and proposed water lines, sewers and storm drains that serve the site. Separate service connections for sanitary flow and storm water will be required.

5. To assure compliance with the Commission's requirements, site plans and General

Service Applications should be submitted to the Commission for review when project design is 50 percent complete.

6. With the site plan, the proponent must provide detailed and updated estimates for water demand, sanitary sewer flows and stormwater runoff generation for the proposed project. The amount of potable water required for landscape irrigation must be quantified. The proponent must also provide an analysis of the impacts of the proposed project on the Commission's water, sewer and storm drainage systems. 14.7

<u>Water</u>

7. The proponent should explore opportunities for implementing water conservation measures in addition to those required by the State Plumbing Code. In particular the proponent should consider outdoor landscaping which requires minimal water. If the proponent plans to install in-ground sprinkler systems, the Commission recommends that timers, soil moisture indicators and rainfall sensors be installed. The use of sensor-operated faucets and toilets in common areas of buildings should also be considered. 14.8

8. The Commission utilizes a Fixed Radio Meter Reading System to obtain water meter readings. If a new water meter is needed for the proposed project, the Commission will provide a Meter Transmitter Unit (MTU) and connect the device to the meter. For information regarding the installation of MTUs, the proponent should contact the Commission's Meter Installation Department. 14.9

9. If Boston East plans to provide water service and pump out facilities at the proposed docks, New England Development will be required to install cross connection control devises on the water service. New England Development is advised to consult with Mr. Dennis Pateras, Manager of Cross Connection Control, with regards to backflow prevention. 14.10

<u>Sewer and Drains</u>

10. The site plan must show in detail how drainage from building roofs and from other impervious areas will be managed. Roof runoff and other stormwater runoff must be conveyed separately from sanitary waste at all times. 14.11

11. In conjunction with the site plan and General Service Application, the proponent will be required to submit a Stormwater Pollution Prevention Plan. The plan must: 14.12

    - Identify specific best management measures for controlling erosion and preventing the discharge of sediment, contaminated stormwater or construction debris to the Commission's drainage system when construction is underway.

    - Include a site map which shows, at a minimum, existing drainage patterns and areas used for storage or treatment of contaminated soils, groundwater or stormwater, and the location of major control or treatment structures to be utilized during construction.

- Specifically identify how the project will comply with the Department of Environmental Protection's Performance Standards for Stormwater Management both during construction and after construction is complete.

12. The Commission requires oil traps on drains within an enclosed parking garage. Discharges from oil traps must be directed to the sanitary sewer and not to a storm drain. The requirements for oil traps are provided in the Commission's Requirements for Site Plans. 14.13

13. In accordance with the Commission's Sewer Use Regulations, grease traps will be required in any restaurant or commercial kitchen. The proponent is advised to consult with Mr. Richard Fowler, Supervisor for the Commission's Grease Trap Program, prior to preparing plans for a restaurant or commercial kitchen. 14.14

14. The project proponent will be required to obtain coverage under the EPA's NPDES General Permit for Construction. A copy of the Notice of Intent and the pollution prevention plan prepared pursuant to the Permit should be provided to the Commission, prior to the commencement of construction. 14.15

15. The Commission requests that the proponent install a permanent "Don't Dump, Drains to Boston Harbor" castings next to any new catch basin installed as part of the projects. 14.16

16. The proponent should be aware that the US Environmental Protection Agency issued a draft Remediation General Permit (RGP) for Groundwater Remediation, Contaminated Construction Dewatering, and Miscellaneous Surface Water Discharges. If groundwater contaminated with petroleum products, for example, is encountered, the proponent will be required to apply for a RGP to cover these discharges. 14.17

Thank you for the opportunity to comment on this project.

Yours truly,

John P. Sullivan, P.E.
Chief Engineer

JPS/pwk

c.

James G. Keefe, Trinity Border Street LLC
M. Zlody, Boston Environment Department
John Walser, BRA
P. Laroque, BWSC

Letter 14	Boston Water and Sewer Commission, John P. Sullivan
14.1	The proponent will be responsible for designing, permitting, and funding the installation of the new 60-inch stormwater pipe across the site as an offset to the project's sewer generation and as mitigation for the I/I program.
14.2	See responses to comments #7.1 and # 7.2.
14.3	The proponent will complete a Termination Verification Approval Form with the Inspectional Services Department in order to obtain a Demolition Permit.
14.4	The proponent will obtain a Drainage Discharge Permit from the BWSC if dewatering drainage is to be discharged to the BWSC system. See also response to comment # 7.3.
14.5	If the groundwater is found to be contaminated, the proponent will apply for a Remediation General Permit from the U.S. EPA.
14.6	A General Service Application and a site plan with all existing and proposed water, sewer, and storm drains will be prepared and submitted to the BWSC for review at the Design Development (50%) stage.
14.7	Detailed estimates for water demand, sanitary sewer flows, stormwater runoff generation, and potable water required for landscaping will be provided with the site plan. An analysis of impacts of the proposed project on the BWSC's water, sewer, and stormwater systems will also be provided.
14.8	The proponent will identify measures to reduce water consumption through both physical and operational measures.
14.9	The proponent will contact the Meter Installation Department of the BWSC regarding the need for a MTU.
14.10	There are no plans to provide water service or pump out facilities at this time.
14.11	Detailed site plans showing the utility and drainage systems will be submitted to the BWSC.
14.12	A complete Stormwater Pollution Prevention Plan will be submitted under separate cover to the BWSC.
14.13	An oil/water separator will be installed in the enclosed parking garage. The discharge will be to the BWSC sewer system.
14.14	No commercial kitchen or restaurants are planned for this project.
14.15	See response to comment # 7.3.
14.16	See response to comment # 9.10.
14.17	See response to comment # 14.5.

DEPARTMENT OF NEIGHBORHOOD DEVELOPMENT
THOMAS M. MENINO, MAYOR

November 15, 2007

Kristen Kara
Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Dear Ms. Kara:

I am writing to express the Department of Neighborhood Development's (DND) enthusiastic support for the Boston East project located at 102 - 148 Border Street, East Boston, proposed by Trinity Border Street LLC.

After a lengthy community process and the issuance of both a Request for Qualifications (RFQ) and a Request for Proposals (RFP), DND asked the Public Facilities Commission to tentatively designate this developer to revitalize this key waterfront site. We are very excited about transforming a long neglected location into a mixed-use development that will feature 189 units of housing, an interpretive waterfront park and community gallery paying homage to the ship building history of the site, and a build-to-suit marine facility likely including a marina. We applaud the evolving design that will be instrumental in reconnecting the neighborhood with its waterfront, as well as the extension of the harbor walk that will be facilitated by this project.

In all, we wish to convey our support of Trinity Border Street LLC's work thus far in moving the project forward through its various processes. We look forward to our continued work with you at the BRA as we bring this project from the drawing board to making it a vibrant reality for the East Boston neighborhood and the City of Boston.

Sincerely,

Sandra R Duran

Sandra R. Duran
Deputy Director
Real Estate Management and Sales

Cc: file

Letter 15	Department of Neighborhood Development
	No responses are needed.

Letter 16

Sarah Barnat

From: Kara, Kristin [Kristin.Kara.bra@cityofboston.gov]
Sent: Monday, November 19, 2007 1:36 PM
To: Sarah Barnat
Subject: FW: Border Street Design

IAG comment letter

From: Brayden, Catherine (EEC) [mailto:Catherine.Brayden@state.ma.us]
Sent: Monday, November 19, 2007 1:28 PM
To: Kara, Kristin
Cc: dmodiac@aol.com; rob@audisseyguides.com; kabob14@verizon.net
Subject: Border Street Design

Dear Kristin

Please accept this letter on behalf of Dianne Modica, Rob Piles, and me; members of the Impact Advisory Group (IAG) and Bob Strelitz, community resident, as comments for the Trinity Development of Border Street, East Boston.

After careful consideration of the project's written and descriptive design, attendance at the BRA informational meetings, and design review meeting, we wish to submit our conclusions on the design of the BORDER STREET, EAST BOSTON proposal.

- We **agree** with the design committee that the archway seemed arbitrary and not in the correct location. 16.1
    - It is our opinion that the archway was not an arch but an uninviting, unappealing rectangular opening not "A Statement Archway."
- We **agree** with the design committee's review of the façade. 16.2
    - The façade was not in keeping with the maritime history of the area.
    - The longer of the two wings/projections on the waterside of the building divided the residential and maritime areas.
- We **disagree** with the design committee about that mass and scale of the building. 16.3
    - The mass and scale of the building was not appropriate with the neighborhood.
- We recommend:
    - An increase set back of the building on BORDER STREET. 16.4
    - An increase in the amount of commercial/retail space or facilities of public accommodation. 16.5

Submitted on behalf of the above community and IAG participants,

Kay Brayden-Strelitz

Kay Brayden, Investigator
Department of Early Education and Care
1250 Hancock Street, Suite 120S
Quincy, Ma 02169
(O) 617-472-2881 x 631
(F) 617-472-2722
catherine.brayden@state.ma.us.
http://www.eec.state.ma.us/

Letter 16	Impact Advisory Group, Kay Brayden-Strelitz
16.1	The archway has been substantially improved in response to the community concerns about seeing the plaza and water from Border Street and about access to the open space under the archway. It will also include interpretive displays to encourage public access.
16.2	The design of the building has undergone several revisions in response to the community input and requests by city agencies. Furthermore, the intent of the Community Gallery is to celebrate and inform both residents and visitors about the site's maritime history. The longer of the two wings of the residential building facing the waterside has been pulled back in order to provide more open space along the Harborwalk, create a better alignment of the buildings along the water, and open the view corridor along the water's edge.
16.3	The design of the building has undergone several revisions in response to the community input and requests by city agencies.
16.4	The design of the building and its internal functions does not allow for it to be setback further from Border Street.
16.5	The proponent has determined that it is not economically feasible to increase the amount of commercial/retail space at the project site.

Kristin Kara
Boston Redevelopment Authority
Boston City Hall
Boston, MA 02201

Dear Ms. Kara:

As a member of the Boston East IAG, I would like to express my support for the Boston East project proposed by Trinity Border Street LLC. The site plan they have presented allows for both residential and marine use in a mutually compatible way. I understand that the design is evolving based on input from the BCDC. I am happy with the direction the design is headed and am comfortable with the scale and massing of the proposed building.

Having purchased my first home this year in the Carlton Wharf Condominiums, I can attest to the quality design and craftsmanship of Trinity's work. I am also pleased by the responsiveness and quality of their management company, WinnResidential. More residential units on the waterfront will surely help in the continued improvement of the East Boston neighborhood.

I believe that East Boston is a great neighborhood and look forward to more people having the opportunity to live in new housing where there is now only vacant, blighted land. I look forward to reviewing the Trinity plans as they progress, and believe that they are a team that can make new development happen in East Boston.

Sincerely,

Kristin Langone

Letter 17	Impact Advisory Group, Kristin Langone
	No responses are needed.

#T41123 Letter 18 BG

The Office of
SALVATORE LAMATTINA
Boston City Councilor - District One

RECEIVED
NOV 28 2007
MEPA

Kristin Kara
Boston Redevelopment Authority
Boston City Hall
Boston, MA 02201

Ian A. Bowles Jr., Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Ms. Kara and Mr. Bowles:

I am pleased to provide this letter in support of the Boston East Project Notification Form and Environmental Notification Form submitted by Trinity Border Street LLC, a partnership between Trinity Financial and East Boston CDC. East Boston residents will benefit from the restoration of the Border Street waterfront from a vacant lot to a vibrant mixed-use site. Trinity and the EBCDC's plan to build 196 residential units and an integrated open space plan including a significant portion of harborwalk will greatly enhance the neighborhood.

Trinity Financial and EBCDC are the only developers to have completed a project on the East Boston waterfront. They have an experienced development team of architects and engineers who understand the complications involved in developing waterfront property. I am confident they will work closely with the neighborhood to produce another fantastic development on the harbor.

I encourage your agency to work with the developer to permit this site as quickly as possible. The residents of East Boston deserve to have access to their waterfront and new investment in the community.

Thank you,

Sal LaMattina

Councilor Salvatore LaMattina
617-635-3200

Boston City Hall - 5th Floor, Boston, MA 02201 • (617) 635-3200 • FAX: (617) 635-4203 • salvatore.lamattina@cityofboston.gov

Letter 18	City Councilor Salvatore LaMattina
	No responses are needed.

Boston Groundwater Trust

234 Clarendon St., Third Floor, Boston, MA 02116
617.859.8439 voice • 617.266.8750 fax
bostongroundwater.org

November 2, 2007

Ms. Kristen Kara, Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

Subject: Boston East

Dear Ms. Kara:

Thank you for the opportunity to comment on the Project Notification Form for the Boston East project. The Boston Groundwater Trust was established by the Boston City Council to monitor groundwater levels in sections of the City where the integrity of building foundations is threatened by lowered groundwater levels and to make recommendations for solving the problem. As such, my comments are limited to groundwater related issues.

While the Groundwater Conservation Overlay District does not include East Boston, there are areas in that part of the City where groundwater levels are extremely low and many buildings are supported on wooden pilings that are subject to deterioration when exposed to such conditions. The Trust has extended its network of observation wells in East Boston; two of those wells are located close to the project site. The well at the corner of Border and Decatur Streets, adjacent to the site, has been measured at around Elevation 5 feet relative to Boston City Base. This level is of concern, especially in East Boston where many buildings have had their pilings cut off at higher levels than are common elsewhere in Boston. The groundwater level is also of concern because it is so low while being less than a block from the harbor. Of even more concern is the groundwater level two blocks away at the corner of Border Street and Central Square, which is 4-5 feet lower.

Because of these low groundwater levels, the project should take all possible steps to assure that it cannot cause reductions at either current elevations or if repair of infrastructure causes those levels to increase. The project includes an underground garage. I was pleased to read that the below grade space will have waterproofed slabs and foundation walls. It is important to make sure by design and construction methods that the underslab drainage system not have the ability to remove groundwater from the upper aquifer that is critical to keeping wood pilings wet. It 19.1

would be helpful to install another groundwater observation well between the two mentioned above and to monitor these wells before and during construction to make sure that the project is not contributing to a reduction in level. After construction, the new well, which should be installed in accordance with our standard specifications, should be turned over to the Trust for incorporation into our monitoring network. 19.2

I look forward to working with the proponent and the Authority on measures that assure that the project cannot have negative impacts on groundwater levels in this sensitive area.

Very truly yours,

Elliott Laffer
Executive Director

Cc: Kathleen Pedersen, BRA
Maura Zlody, BED

Letter 19	Boston Ground Water Trust, Elliot Laffer
19.1	The proponent understands the impacts that construction of the project has on the groundwater elevations and the buildings in the neighborhood that are on wood pilings. With this in mind, the proponent will take all possible steps to ensure that groundwater levels do not change by incorporating measures such as waterproofing slabs and foundation walls.
19.2	The proponent will work with the Boston Groundwater Trust to identify another groundwater observation well at the site to be used as part of the groundwater monitoring network in East Boston.

Letter 20 BG

Boston Groundwater Trust

234 Clarendon St., Third Floor, Boston, MA 02116
617.859.8439 voice • 617.266.8750 fax
bostongroundwater.org

November 12, 2007

Secretary Ian A. Bowles
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office – William Gage
EOEA #14123
100 Cambridge St, Suite 900
Boston, MA 02114

Subject: Boston East

Dear Secretary Bowles:

Thank you for the opportunity to comment on the Environmental Notification Form for the Boston East project. The Boston Groundwater Trust was established by the Boston City Council to monitor groundwater levels in sections of the City where the integrity of building foundations is threatened by lowered groundwater levels and to make recommendations for solving the problem. As such, my comments are limited to groundwater related issues.

While the Groundwater Conservation Overlay District does not include East Boston, there are areas in that part of the City where groundwater levels are extremely low and many buildings are supported on wooden pilings that are subject to deterioration when exposed to such conditions. The Trust has extended its network of observation wells in East Boston; two of those wells are located close to the project site. The well at the corner of Border and Decatur Streets, adjacent to the site, has been measured at around Elevation 5 feet relative to Boston City Base. This level is of concern, especially in East Boston where many buildings have had their pilings cut off at higher levels than are common elsewhere in Boston. The groundwater level is also of concern because it is so low while being less than a block from the harbor. Of even more concern is the groundwater level two blocks away at the corner of Border Street and Central Square, which is 4-5 feet lower.

Because of these low groundwater levels, the project should take all possible steps to assure that it cannot cause reductions at either current elevations or if repair of infrastructure causes those levels to increase. The project includes an underground garage. I was pleased to read that the below grade space will have waterproofed slabs and foundation walls. It is important to make sure by design and construction methods that the 20.1

underslab drainage system not have the ability to remove groundwater from the upper aquifer that is critical to keeping wood pilings wet. It would be helpful to install another groundwater observation well between the two mentioned above and to monitor these wells before and during construction to make sure that the project is not contributing to a reduction in level. After construction, the new well, which should be installed in accordance with our standard specifications, should be turned over to the Trust for incorporation into our monitoring network. 20.2

I look forward to working with the proponent on measures that assure that the project cannot have negative impacts on groundwater levels in this sensitive area.

Very truly yours,

Elliott Laffer
Executive Director

Letter 20	Boston Ground Water Trust, Elliot Laffer (facsimile)
20.1	See responses to Letter 19.1.
20.2	See responses to Letter 19.2.

Letter 21

FASTFORWARDS REALTY

258 WEST BROADWAY
BOSTON, MA 02127-1913
O) 617.721.4696
F) 617.639.5743

Kristin Kara, Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007
Via Fax to: 617.367.5916

Dear Ms. Kara,

I am writing to express my strong support for the development of the Boston East Project as presented at the public meeting held on October 29, 2007. I was impressed by both your presentation and the presentation of the representatives from Trinity Border St. LLC.

I represent the FastForwards Realty Trust which owns several properties all in close proximity to Boston East including 44 Maverick St., 53 Liverpool St., 58 Liverpool St. The trust will also be acquiring 77 & 85 Liverpool St. in the next 30 days.

The existing site both an eyesore and a tempting hazard for youths. I believe the development of the site is in the best interests of the 20 tenants at my properties and the neighborhood. My one concern with the project is the relatively limited parking that is being proposed. I believe this situation could be somewhat ameliorated with the dedication of several parking spots for use by Zipcar. 21.1

Given the daunting regulatory requirements, uncertain real estate market, technical difficulties of building near the water, and rising construction costs, I applaud Trinity Border's vision. While several members of the community expressed some design concerns, I suggest that it is strongly in the public's best interest to give the developer the flexibility to create a project that is economically viable and will actually get built rather than all the other waterfront developments that seem to have stalled.

Sincerely,

Benjamin P. Goodman, Trustee
FastForwards Realty Trust

Letter 21	Fastforwards Realty, Benjamin P. Goodman
21.1	The project is considering the use of alternative modes of transportation, including a car sharing service, as part of its transportation component and measures to reduce dependence on automobiles and need for parking spaces. Bicycle parking in the garage will be provided for the residents.

Letter 22

Gage, Bill (EEA)

From: Jamie Fay [jfay@fpa-inc.com]
Sent: Wednesday, November 28, 2007 9:42 AM
To: William Gage
Subject: Finger Piers

Bill:

Per our discussion, the size of the finger piers are 4' by 70', for a total sf of the two finger piers of 560 sf.

This design as you know is a conceptual placeholder. The actual pier/dock design would depend on the future tenant needs.

J.

Jamie Fay
President
Fort Point Associates, Inc.
33 Union Street, 3rd Floor
Boston, MA 02108-2414
(617) 357-7044 x204
(617) 357-9135 fax

www.fpa-inc.com

Letter 22	Fort Point Associates, Jamie Fay
	No response is required.

November 19. 2007

Kristin Kara, Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

Re: Boston East Project

Dear Kristin,

I attended the public meeting on October 29th concerning the proposed Boston East project. I had also attended the prior RFQ and RFP public meetings on this project. While I wholly support Trinity Financial and EBCDC in their bid to develop this project, I would like to comment on some of the changes in the most recent proposal.

First, I much preferred the 2005 Bondy Studio rendering of the project presented at the RFQ public meeting. It was mostly brick and had a charming old Boston look, which I think would be a much more attractive addition to our neighborhood than the current sterile "New Boston" looking structures. 23.1

Second, I do not like the "arch" depicted in the current design, which is not an arch at all but an uninteresting square opening. There is a wonderful example of an often painted and photographed arch at the Boston Fuel Trans building on New Street, which would be a much more attractive model for this project, especially if they returned to something closer to the earlier design. 23.2

Third, and very important to me and other tenants at the Atlantic Works Artist Building at 80 Border Street, is the loss of a large open green space with wildlife (I regularly see hawks, great blue herons, kingfishers, colonies of nesting terns and various other water birds), cool old piers and docks, beautiful mature trees which we get to watch change with the seasons, and a mostly unobstructed view of the bustle of marine activity on the Mystic River – a truly inspirational spot for artists and naturalists. Now we are looking at that being replaced by a parking lot and a purely functional looking, possibly two-story, marine industrial building, which will block our connection to the planned green space. There was even mention of the possibility of a high security marine facility which would require fencing, thereby cutting us off from the proposed harbor walk as well. While the main development proposal includes a community meeting and exhibit space, this most recent proposal essentially cuts us off from it completely. I don't know if it would qualify as a DPA use, but with the amount of heavy wind that blows over that parcel on a regular basis, instead of a marine industrial building, a few small sculptural design wind turbines (for example shaped like the bow of a ship) could provide power for the development and possibly even enough to sell back to Nstar, and if done artistically, could create a unique attraction that would draw people to the area. 23.3

Finally, instead of being embraced for the great creative resource we provide for the community, and highlighted as the economic generator Governor Patrick, Treasurer Cahill, Chairman Turkington, Chairman Bosley and others in the State House and City Government talk about arts and culture being for our City and State, it feels like we (the artist community at 80 Border Street) are being pushed into the background. 23.4

I understand that economics and regulations dictate to a large extent what can realistically be done with this parcel; but as a working artist and immediate abutter to it, I would like to see a little more creative problem solving go into it so it that it can become something that we all will enjoy and be proud to have in East Boston. Thank you for the opportunity to comment.

Sincerely,

Ejay Khan
Khan Studio
80 Border Street
East Boston, MA 02128

Cc: Sen. Anthony Petrucelli - Anthony.Petrucelli@state.ma.us
Rep. Carlo Basile - Rep.CarloBasile@Hou.State.MA.US

Letter 23	Ejay Khan
23.1	The project has undergone substantial design revisions and improvements due to community and city agency input since the Bondy Studio rendering of the project was presented approximately 3 years ago as a conceptual design. See also responses to comments # 16.1 and # 16.2.
23.2	Since its original conceptual plans, the design of the archway has undergone several revisions due to opinions and recommendations from residents, advocacy groups, and city agencies. The current design is reflection of these concerns, which mainly focused on the need for a wider archway and improved visual and pedestrian access to the waterfront.
23.3	The area between 80 Border Street and the proposed residential building is in a Designated Port Area (DPA), which is restricted to water-dependent industrial uses. The proposed marine facility and parking area is conceptual at this time since no tenant or specific use has been identified.
23.4	The proponent understands and supports the extent and types of cultural uses offered at 80 Border Street that have substantially improved the quality of life within the East Boston community. This project will also help transform a blighted waterfront lot into a mixed-use facility with open space, a community gallery, and a Harborwalk.

Letter 24

Maverick Tenants Organization, Inc.
31 Liverpool Street
East Boston, MA 02128
(617) 569-5100, Fax# (617) 567-2420

Kristin Kara
Boston Redevelopment Authority
Boston City Hall
Boston, MA 02201

Dear Ms. Kara;

The Maverick Tenants Organization is in full support of the Boston East Project Notification form submitted by Trinity Financial and the East Boston CDC to the Boston Redevelopment Authority. As you know, the MTO has worked very closely with Trinity Financial for the past four years, on the redevelopment of Maverick Landing, and the EBCDC since the 90's. We are extremely thankful and proud of their commitment and excellent services they have provided for our residents In Maverick Landing and our community at large.

Trinity and the EBCDC have been true partners to us, they have listened to our concerns, addressed the residents with quick answers, and reasonably given us the utmost input, in compromising with any of our issues.

The residents of Maverick Landing are excited that further development along the Border Street property will improve our surroundings, create opportunities for people to enjoy new businesses, residences, and outdoor space that has been obscure for so many years, and bring a safe feeling to all.

I trust and believe that Trinity and EBCDC will work hard to complete this project in a timely manner and continue to make a positive impact by enhancing the neighborhood we consider our home.

Sincerely,

Ruth Capone

Ruth Capone
MTO Interim Director/Chairperson
& the Board of Directors

Letter 24	Maverick Tenants Organization, Ruth Capone
	No responses are needed

Neenah Estrella-Luna
116 London Street #2 • East Boston, MA 02128 • (617) 271-9056 • neenah@starluna.net

19 November 2007

Kara Kristen
Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

Dear Kristen,

I'm writing in regards to the Boston East project located at 102-148 Border East Boston. I have read most of the Project Notification Form and am not opposed to this project in concept. There are a few questions and concerns that I would like to see the proponent address. My concerns surround the amount of parking in the development, meeting LEED certification standards, meeting healthy home standards, and the incorporation of facilities of public accommodation. In addition, I would like to see a more thorough analysis of the potential changes in property values of surrounding residential properties that includes a viewshed analysis. I am also concerned about the potential climate change impacts on the water line and flood hazard might have on this development.

Parking

I am happy to see that the project includes less than 1 parking space per unit. I would like the proponent to 25.1
consider reducing the number of parking spaces even further. East Boston already carries an enormous health and environmental burden from the airport, the tanker traffic in the harbor and on Chelsea Creek, as well as vehicular traffic from the tunnels, the Tobin Bridge and Route 1A. The asthma rates among children in East Boston are significantly higher than surrounding communities. Our streets are already clogged with alot of traffic. Given that the size of the units proposed are not likely to attract very many, if any, families with children, it is possible to market this development to buyers or renters who are seeking to maintain an environmentally friendly lifestyle. Incorporating a car sharing service within the project, as well as emphasizing the proximity to the Maverick and Airport MBTA stations in marketing, makes reducing the number of parking spaces a potentially feasible option. As a public health professional, I would encourage the BRA and the project proponent to seriously look into ways to reduce the number of new traffic that this project might generate. The proponent may want to take a look at the Forbes Lofts development in Chelsea, MA as a model for how to keep traffic impacts to a minimum.

LEED and Energy Star

I am happy to see that the proponent seeks to comply with minimum LEED certification standards. I would like the BRA and the proponent to seriously consider actually going through the LEED process. It would better 25.2
demonstrate a commitment to environmental sustainability and friendliness by having the project and the development process reviewed by LEED.

I realize that the EPA's Energy Star guidelines do not apply to this development, however I would encourage the proponent to follow the guidelines as closely as possible. I think that the energy efficient measures 25.3
described in the PNF are the minimum that the proponent should do. I also encourage the proponent to commit to putting solar panels on the roof of this facility. I recommend that the BRA require this as a condition of any the permits or approvals it provides to the developer in this project.

Healthy Homes
I am happy to see that the proponent is committed to incorporating many of HUD's Healthy Homes Initiative guidelines. I would encourage the proponent to not include any carpeting in the residential units. Carpeting is a primary contributor to asthma. The proponents would be doing future residents living with asthma a favor by not installing any potential asthma triggers. I am not sure what mechanisms might be in place to allow for this, but prohibiting residents from smoking in the residential units would go far in preventing exposure to a pernicious cause of disease and disability. This is currently being done on a voluntary basis in other New England states and has been found to be very successful. Early reports on these efforts have found that smoke-free residential units have lower maintenance costs and higher resale values than those without smoking prohibitions.

Facilities of Public Accommodation
The current project proposal includes gallery space, which I believe is a wonderful addition to the community. It will provide additional space to our budding art community.

During the public meeting on October 29, the proponents alluded to a report that indicated that additional retail space is not needed in this area and therefore would attempt to "trade" the construction of the required facilities of public accommodation with improvements in the adjacent marine facility. I have not had a chance to read this report, however, to the extent that the findings of this report are based on existing retail establishments in Liberty Plaza, I would encourage the BRA and the proponent to revisit this conclusion. The owner of the 25.5
Liberty Plaza is discussing making significant changes to Liberty Plaza, potentially reducing the number or quality of access to retail services. I do find it difficult to believe that, given the changes in the type of population living in the Maverick and Central Square areas that additional retail would not be fully utilized. I would like to see a little more support for not including some space for some sorely needed services, like a bookstore, coffee shop (not a Dunkin Donuts style shop), flower shop, or bakery. If the owner of Liberty Plaza moves forward in making the changes that have been discussed recently in community meetings, I imagine there might be plenty of opportunity to find tenants who do not want to move to temporary spaces.

Property values and viewshed analysis
On page 1-3 of the Project Notification Form, the project proponents assert that this project will increase surrounding property values however they do not provide any data or analysis to support this assertion. I would like to see a thorough analysis of the impact on property values in the immediately surrounding community. Increasing property values is a double edged sword. Property ownership is the primary form of wealth for many residents in this traditionally working class neighborhood and an increase in property values also 25.6
increases the potential wealth of these owners. At the same time, it can also result in higher property tax assessments and encourage neighborhood-destabilizing speculation. So it is important for residents to understand what impact this development may or may not have on their property values.

This analysis should also include a viewshed analysis. I am concerned about what impact the proposed height of this development may have on our second and third floor views of the Zakim and Tobin Bridges. My 25.7
specific question is whether this development would block our views and in what way it would block our views.

Climate change impacts
One of the important benefits this project proposes to provide neighborhood residents is additional open space and specifically access to the harbor. I am excited about the possibility of living two blocks from this new open space. I find the proposal to include access to the water intriguing. I am, however, concerned that the proponents have not considered potential changes to the shoreline as a result of climate change. I realize they are using FEMA's current flood hazard designation, however those designations have not incorporated new 25.8
information around potential impacts from sea level changes. I encourage the BRA and the proponent to

consult with the scientists at Woods Hole Oceanographic Institute to perform an analysis of the long term viability of building this development so close to the shoreline.

There are many aspects of this proposed development that are very good. I like the commitment to providing mixed income housing as well as providing additional open space to the community. I am a little concerned 25.9
that the design might be a little too imposing on the surrounding community in terms of height and traffic. I am also concerned that the archway may not be wide enough to provide the visual cue to residents that the open space behind the Border Street face is open to the public. I am also concerned that the proponent is too willing to forgo potentially needed retail space. But I believe that there are ways to address these concerns and build a profitable residential development that will also be a benefit to the community. I look forward to seeing the concerns outlined here addressed in future reports and public meetings.

Please feel free to contact me with any questions or concerns.

Neenah Estrella-Luna, MPH

CC: Sal LaMattina, Boston City Councilor
Carlo Basile, State Representative
Anthony Petrucelli, State Senator

Letter 25	Neenah Estrella-Luna
25.1	The proponent has reduced the parking to a minimum based on the project design, proximity to both the Central Square and Maverick Station transit stops, and with sustainable design measures such as bicycle racks for residents and excellent pedestrian connections in and out of the site.
25.2	The proponent has considered the option of becoming LEED certified. Due to budget constraints and project schedule deadline, however, it is not a feasible option.
25.3	The project will be LEED certifiable. The proponent is addressing all options to conserve energy from both capital and operational standpoints. Other considerations regarding the types of choice of energy efficient measures include the types of uses and whether or not tenants and/or owners will occupy the building.
25.4	Although the proponent has had discussions about the health and quality of the interiors, the interior building design and components have not been determined at this stage in the design process.
25.5	See response to comment # 9.19.
25.6	Generally, when an unimproved lot is improved, property values increase on neighboring properties. Any change in property values is not expected to encourage neighborhood-destabilization speculation due to the small size of the proposed development relative to the existing, built-out neighborhood.
25.7	The development team has identified viewshed areas within the project site and along Decatur Street. Some views from buildings beyond Border Street, however, may have views obstructed.
25.8	The project design meets all current flood and building design regulations.
25.9	See response to comments # 25.2 through # 25.8.

Letter 26 B6

New Street Realty Trust
45 Dunham Road
Billerica, MA 01821

RECEIVED
NOV 30 2007
MEPA

November 28, 2007

Ms. Kristin Kara
Boston Redevelopment Authority
Boston City Hall
Boston, MA 02201

Mr. Ian A. Bowles
Secretary
Massachusetts Environmental Policy Act Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: EOEEA # 14123

Dear Ms. Kara and Mr. Bowles:

As the developer of the New Street Mixed-Use Project, we are pleased to express our support for Boston East, a project being developed by Trinity Financial, in partnership with the East Boston Community Development Corporation. The project as presented in the PNF/ENF dated October 19, 2007 will greatly improve the blighted site and will add to the entire neighborhood's transformation.

We appreciate your efforts and look forward to the project moving through the process.

We urge you to look favorably upon this request.

Sincerely,

M Bruce Ohanian (CAR)
M. Bruce Ohanian
Co-Trustee, New Street Realty Trust

Varney Hintlian (CAR)
Varney Hintlian
Co-Trustee, New Street Realty Trust

Letter 26	New Street Realty Trust, Bruce Ohanian and Varney Ohanian
	No responses are needed.

Letter 27 BG

PEPE & HAZARD LLP

A BUSINESS LAW FIRM

225 FRANKLIN STREET, 16TH FLOOR
BOSTON, MASSACHUSETTS 02110-2804
617.748.5500 FACSIMILE: 617.748.5555

HARLAN M. DOLINER
Attorney At Law
Direct: 617.748.5522
hdoliner@pepehazard.com

November 28, 2007

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DEC 3 - 2007
MEPA

By Electronic and First Class Mail
Secretary Ian A. Bowles
EOEA, Attn: MEPA Office
Mr. William Gage, **EOEA File #14123**
100 Cambridge Street, Suite 900
Boston MA 02114

Re: **EOEA File #14123** Comments on Environmental Notification Form – *Boston East,* East Boston

Dear Secretary Bowles and Mr. Gage:

Introduction

This letter, commenting on the *Environmental Notification Form* ("ENF") for "Boston East", located at 102-148 Border Street, East Boston (EOEA File #14123), is respectfully submitted on behalf of my client Boston Towing & Transportation Companies, ("Boston Towing"), which abuts the project site on the south. As discussed below, Boston Towing has serious concerns about making sure that the EIR for this project adequately discloses and evaluates the potential safety and security issues presented by the development proposed in the ENF. These concerns go to the vital issue of whether Boston Towing could safely and securely continue its operations during the construction and operation of the Boston East project. Consequently, we respectfully request that the Secretary include the issues set forth below, and an analysis of their impacts and their resolutions, in his scope for the required DEIR.

Boston Towing and Its Operations

Boston Towing is the oldest continually operating general maritime towing company in New England, dating back to 1857. It is also the largest New England-based marine transportation company providing regularly scheduled general and specialized towing services including petroleum transport, ship docking, LNG vessel escort, RO/RO, lightering, marine construction, salvage support, petroleum transportation and specialized towing.[1] Boston Towing's tugboat, towboat and barge operators regularly escort large vessels carrying cargoes such as LNG, home heating oil and jet fuel in and out of the Port of Boston.[2] The services are provided 24 hours a day, 365 days a year, regardless of weather or sea conditions. Barge operations are expected to markedly increase in the very near future as home heating oil and other energy sources are increasingly transported by short sea shipping to reduce the expense and carbon footprint of highway truck transport.

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[1] Lightering is the off-shore transfer of a liquid bulk cargo to or from a barge to a ship. Boston Towing provides these services to vessels anchored in or near Boston Harbor, bringing fuel and fresh water, *e.g.*, and off-loading sewage. The transport of ships' sewage is projected to profoundly increase if Boston Harbor is declared a "no discharge" zone.
[2] Boston Towing employs about 130 management, operations, maintenance, construction and sea-going personnel.

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As a company operating commercial vessels and involved in the escort of LNG ships, Boston Towing must comply with a hierarchy of international and federal laws and regulations governing maritime security in the post-9/11 world. These include the International Ship & Port Security Code, (ISPS), the Maritime Transportation Security Act of 2002, (MTSA) and the Safety of Life at Sea Convention, (SOLAS). Of major concern are the security of its operations and the control of access to its Border Street facility. Operational security and access control are required to be addressed in the various vessel and facility security assessments and plans Boston Towing is required to perform, develop and implement. Development and operation of the Boston East project may necessitate amendments to these assessments and plans, as well as physical modifications to Boston Towing's northerly border. 27.1

The DEIR must take into account Boston Towing's operations and safety/security issues

Boston Towing tugboats ranging from 85 to 128 feet, barges and other marine construction equipment are constantly plying the water directly in front of the proposed project site. While the precise location and operational details of the project's proposed public access, finger piers, travel lift and "marine-related business or activity" are not specified in the ENF, it appears they would all be located adjacent to many of Boston Towing's on-going operations, including LNG vessel transit support, sewage barge off-loads and fuel transfer operations. Locations and operational details of the proposed public access areas and routes, finger piers, travel lift and "marine-related business or activity" *and* their alternatives should be set forth and evaluated in the DEIR. That these project features would be located next to Boston Towing's pre-existing maritime industrial activities poses potentially severe public safety and environmental risks. *E.g.*, a user of the public access space carelessly tosses a cigarette while a fuel transfer is on-going; a recreational boater leaving the travel lift or finger piers zooms out just as a tug with a barge in tow leaves the Boston Towing facility and (of necessity) crosses in front of the project site; a tourist attempts to enter onto the Boston Towing site to get a better photo of the "nifty" tugboats. 27.2

The EIR for the Boston East project must include an analysis of how the project's construction and operations would be coordinated with Boston Towing's pre-existing, on-going vessel traffic, maritime industrial uses and their concomitant safety and security concerns. Such an analysis should be required to extend to how permitting processes to occur before the Department of Environmental Protection, Coastal Zone Management, (and for that matter the involved federal and city agencies) can successfully integrate and address these issues into their deliberations and permit conditions. 27.3

Sincerely,

Harlan M. Doliner

CC: Boston Towing & Transportation Companies
Mr. Richard Jabba, Fort Point Associates
Boston Redevelopment Authority

HMD/33577/3/588204v1
11/29/07-BOS/

Letter 27	Pepe & Hazard, Harlan M. Doliner
27.1	The proponent fully understands the issues regarding the security of the Boston Towing and Transportation operations and the control of access to its property. Only the water portion of the Boston East site borders the Boston Towing property. East of this area, the proposed use is for a marine travel lift, which is allowed under the state Designated Port Area regulations and includes marine-industrial uses such as boat yards, commercial passenger operations, and associated water-dependent industrial uses. Its uses should have minimal impact on the operations and access of the Boston Towing operations and security. On the landside, the proposed Harborwalk has been redesigned to direct pedestrians to the street away from working portion of the waterfront between the proposed marine travel lift and the maritime facility.
27.2	See response to comment above.
27.3	Section 3.6 of the DEIR/DPIR includes a review and analysis of the project's proposed operations, and the impacts and resolutions concerning the safety and security issues at the Boston Towing property. The permitting agencies will review this analysis and propose permit conditions as necessary.

The Boston Harbor Association
for a clean, alive and accessible Boston Harbor

5 December 2007

Secretary Ian A. Bowles, Jr.
Executive Office of Energy and Environmental
Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
ATT: MEPA Office

RECEIVED
DEC - 6 2007
MEPA

RE: EOEA #14123- Boston East
East Boston, MA

Dear Secretary Bowles:

The Boston Harbor Association (TBHA), a non-profit, public interest organization founded in 1973 by the League of Women Voters and the Boston Shipping Association, has been a member of the City of Boston's Municipal Harbor Planning Committee since its inception earlier this decade. We have been active participants of the East Boston Municipal Harbor Planning Committee, attending site visits, boat tours, and numerous meetings regarding the East Boston waterfront.

The Boston Harbor Association supports the redevelopment of the East Boston waterfront, recognizing that it will be a mix of Designated Port Area, commercial, residential, and open space uses. The infrastructure and open space improvements have been extremely encouraging, much of it occurring in advance of waterfront development.

374 Congress Street, Suite 307 ■ Boston, Massachusetts ■ 02210-1807 ■ Telephone (617) 482-1722 ■ Fax (617) 482-9750 ■ www.tbha.org

For example, the MBTA improvements at Airport Station and the pending completion of improvements at Maverick Station will help foster and complement the new developments in East Boston. Thanks to the advocacy efforts of East Boston residents and groups such as the Boston Natural Areas Network, the renovated Airport Station allows for a seamless transition to Bremen Street Park, built as part of the Central Artery/Tunnel Project's mitigation efforts and now maintained by the Massachusetts Port Authority. The park, with its play areas, community gardens, passive and active spaces, is a significant new addition to the East Boston Greenway.

As part of the Back to the Beaches Program, the Department of Recreation and Conservation's improvements at Constitution Beach, particularly the new bathhouse and the new playground, are much used by East Boston residents who wish to enjoy a cleaner Boston Harbor.

This summer, the Massachusetts Port Authority completed Navy Fuel Pier Airport Buffer Area, a very attractive new segment for the public to enjoy along Boston Harbor.

In addition, the expected completion of improvements at Maverick Station on the MBTA Blue Line in 2008 will do much to support waterfront revitalization efforts on the East Boston waterfront. Not only will there be interior platform and exterior station improvements (latter includes better traffic circulation, landscaping, and a friendly exterior), but the new headhouse will make the station more convenient for new waterfront residents as well as allow for longer MBTA trains serving residents, workers, and visitors.

As part of the revitalization of the Boston East site, a 14.2 acre site located at 102- 148 Border Street, Trinity Border Street, LLC, on behalf of Trinity Financial, Inc., and the East Boston Community Development Corporation, has submitted an Environmental Notification Form. A Municipal Harbor Plan Amendment will need to be submitted by the Boston Redevelopment Authority before an Environmental Impact Report can be filed.

The project includes two aspects. One area will consist of a residential building with 196 housing units, underground parking, a facility of public accommodation, and open spaces on the west side of the site. The second portion of the site, within the Designated Port Area, will be used for a marine facility, with a marine travel lift if necessary, and with a maritime interpretive area on the south side of the site.

Last week, Trinity Border Street, LLC, met with TBHA's Harbor Use Committee to discuss the project. TBHA voiced strong support for the mix of residential and DPA uses on the property, as well as for the HarborWalk access along the non-DPA portion of the land.

Our comments on the project follow:

Development Consistent with the Designated Port Area (DPA):

I. Truck Access to DPA

At present, the Boston East site includes Designated Port Area (DPA) portions on both the north and south sides. As part of a separate regulatory process, the project proponent is proposing to consolidate the DPA area into the southern portion of the site to allow for better development of the maritime industrial and the residential uses on the site.

Assuming that the consolidation of the DPA area is approved by the Commonwealth, the project proponent is proposing a two-story, 14,000 sq. ft. marine facility for a marine-related business or activity, and an adjacent marine travel lift. The proponent also proposes a public maritime interpretive area at the center of the site within the Designated Port Area as well as full perimeter HarborWalk access, including within the Designated Port Area.

Figure 3-2, Maritime Facility Elevations, may or may not be a realistic depiction of the DPA use which will occur at this site. No depiction is provided of the potential truck access onto the site, in the event that the marine facility requires heavy machinery or construction equipment (not unlikely, for many maritime industrial users). For permitting purposes, we ask that the green open space shown on Figure 3-1 within the DPA be removed, and that that space be depicted as vehicle access for the DPA use. 28.1

We ask that the Secretary's Certificate require a more robust transportation analysis of the trucking and servicing needs of a maritime industrial user in the DPA portion of the site. Chapter 5.0 of the Environmental Notification Form only analyzes the employee vehicle trips on the DPA portion of the site, and does not discuss nor acknowledge the truck and other access needs of a maritime industrial user in a Designated Port Area.

II. HarborWalk and Public Access

Depending upon the type of maritime industrial user in the DPA, current and proposed regulations of the U.S. Department of Homeland Security, under which the U.S. Coast Guard operates, may or may not permit public access to the DPA portion of the site. In addition, because of potential safety factors, such as truck access to and from a maritime industrial site, only point access, not full perimeter access, is required in the DPA.

In the interest of public safety, and to ensure that the greatest number and mix of maritime industrial tenants will consider this site, we ask 28.2
that only HarborWalk point access be permitted within the DPA portion of the site. Full perimeter access is not needed at this time, given the nature of DPA activities which may occur at this site and given point access at other DPA locations within Boston Harbor.

Likewise, any maritime industrial education program which attracts the public (a use which The Boston Harbor Association strongly supports) should be moved to the non-DPA portion of the site, for public safety reasons as outlined above.

III. Public Notification of DPA

In instances where new residential uses are proposed next to an existing Designated Port Area, The Boston Harbor Association has strongly recommended that notice be given to the new tenants and/or owners. When necessary, both the Massachusetts Port Authority and the Boston Redevelopment Authority have required that notice be given to residents about adjacent uses. 28.3

TBHA recommends that language such as the following be included in all deeds recorded with the Registry of Deeds as well as in all rental leases:

"The operation of water-dependent and/or maritime industrial uses in the adjacent Designated Port Area (DPA) of this site will generate noise, including but not limited to noise from trucking activities, operation of a travel lift and other material handling equipment, vessel and equipment repairs and maintenance, and all other activities which support the Working Port.

"Such operations will also generate odors from the products handled and/or processed, as well as emissions from machinery, equipment, and trucks.

The residential unit has been designed in anticipation of these adjacent conditions, but no representation is made that truck traffic, odors, emissions, heavy equipment noise, and other environmental conditions related to maritime industrial and/or water-dependent industrial activities will not be experienced by unit residents and/or owners.

"Unit residents and/or owners shall not engage in prohibiting the above stated and/or future maritime industrial and/or water-dependent industrial activities or conditions in the East Boston Designated Port Area.

"The management entity, or if relevant, condominium association, shall not use any management entity funds, or if relevant, condominium association funds, to restrict the above stated and/or future maritime industrial and/or water-dependent industrial activities in the East Boston Designated Port Area."

IV. Seaport Bond Funds

The City of Boston's Department of Neighborhood Development will continue to own the Boston East site. Because the site is owned by a public entity, it is potentially eligible for the Commonwealth's Seaport Bond funds. 28.4

We urge the City of Boston to explore funding opportunities for infrastructure improvements which can further enhance DPA activities on this site.

Chapter 91 Issues:

The project proponent is requesting relief from three of the dimensional requirements under the Chapter 91 regulations governing height, water dependent use zone, and facilities of public accommodation.

I. Height

Under Chapter 91 regulations, building heights of 55 feet or less within 100 feet of the high water mark and 105 feet or less within 200 feet of the high water mark are allowed. The proponent is seeking a substitution provision which will allow for a uniform height of 85 feet across the non-DPA portion of the site. According to the proponent, "This layout allows for more efficient and economical use of the land as well as an increase (sic) the total amount of open space on the site to more than 57%" (page 4-6 of filing).

More detailed wind and shadow analysis is needed in
the Environmental Impact Report to determine the 28.5
ground level impacts of such a substitution measure
on pedestrian and water dependent users.

If only point access is provided in the DPA portion
of the site and the remainder of the DPA area is
used for DPA activities, the project proponent 28.6
should re-calculate the amount of open space on
site (it will be less than the 57% presently
calculated).

II. Water Dependent Use Zone

Under Chapter 91 regulations, new or expanded non-water dependent uses are set back from the waterfront. The setback extends landward from the project shoreline 25% of the depth of the lot, with a minimum of 25 feet and a maximum of 100 feet.

Under the proposed project, the buildings are 53 feet from the project shoreline and two parts of the residential buildings are within the Water Dependent Use Zone covering 3,292 sq. ft. The proponent proposes a substitution to reconfigure the Water Dependent Use Zone to allow a minimum setback of 25 feet while maintaining the Water Dependent Use Zone in a different area of the site.

At TBHA's Harbor Use Committee meeting, it was
suggested that the project proponent look not only
at the view corridors towards Boston Harbor, but
also parallel to the shoreline. Rather than
extending the two buildings outward towards the
Harbor away from Border Street, it was suggested 28.7
that the EIR analyze the option of pulling the
buildings back to create a horizontal view corridor
in line with existing adjacent buildings.

Regarding activities in the Water Dependent Use
Zone, we anticipate that during the Chapter 91 28.8
licensing process, the proponent will develop a
fuller discussion of activities in the WDUZ, such
as a fish cleaning station, interpretive signage,
and other measures.

III. Facilities of Public Accommodation

Under Chapter 91 regulations governing this project, 75% of the ground floor shall be for facilities of public accommodation (27,640 sq. ft.), and 25% (9,160 sq. ft.) for upper floor accessory services.

The project proponent proposes 14% of the ground floor for facilities of public accommodation (5,290 sq. ft.), of which 1,840 sq. ft. is for the Donald McKay Community Gallery and of which 3,450 sq. ft. is open area within the archway of the building between Border Street and the terraced open space on the waterfront.

It is not clear whether the open space within the
archway of the building would satisfy the Chapter
91 requirements for ground floor facilities of
public accommodation. The project proponent will 28.9
no doubt provide additional information during the
Municipal Harbor Planning process about options for
a bait and tackle shop to support recreational
fishing at this site, as well as information about
public rest rooms for the general public using the
HarborWalk along the non-DPA portion of the site.

The Boston Redevelopment Authority's 2000 East Boston Master Plan called for the creation of a permanent museum in East Boston that "could include exhibits that interpret East Boston's history and development summarized in four basic themes" of American Revolution, Maritime, Immigration, and

Transportation (page 29 of Master Plan), and the Plan indicates Boston East as an optional location for the historic and interpretive museum. At one time, the Boston East site was also proposed as a possible location for the Shining Sea Shipyard Museum. We urge the project proponent to work with 28.10
community leaders, cultural institutions, and others in the development of a maritime interpretive museum or facility within the FPA spaces, given the prominence of this site in the maritime history of Border Street and East Boston.

At last week's East Boston Municipal Harbor Planning Committee meeting, TBHA asked that the City of Boston's Public Facilities Department provide information on needed public facilities to support the extensive new development projects and new residents anticipated along the East Boston waterfront. Community centers, library branch, 28.11
senior citizen centers, day care facilities, intergenerational facilities, public safety (police and/or fire) facilities, schools, religious facilities, health facilities, and similar facilities are no doubt needed along the East Boston waterfront, and may be appropriate for ground floor FPA usage at this site. We anticipate a fuller, more detailed analysis as part of the Municipal Harbor Planning process.

Also, more up-to-date information beyond 2004 and 2005 market data may be provided during the Municipal Harbor Planning process to ascertain current and future retail uses along the East Boston waterfront, taking into account that subsequent to 2005, the enhanced MBTA station improvements at Maverick and Airport stations, the new segments of the East Boston Greenway, Massport's newly-opened Navy Fuel Pier Airport Buffer area, and the anticipated Piers Park II (hopefully completed when the Boston East project opens) will bring more workers, residents, and visitors to the area.

Navigational Clearance:

In the event that future floats, piers, or other structures are built on the watersheet, there needs to be sufficient clearance to avoid tankers and ships using the navigational channel. At present, 28.12
the U.S. Army Corps of Engineers requires 30% of navigational draft. For Boston Harbor, any structure on the watersheet needs to be configured to have a clearance of 120 feet from the edge of the navigational channel.

Sustainable Development:

The project proponent proposes to provide 165 parking spaces on site, with 139 spaces below the residential building for residents (0.7 parking spaces per residential unit).

Given the proximity of MBTA service available to residents at this site and the proximity to planned water transportation at Lewis Mall (to be supported by development at Pier One and at Clippership 28.13
Wharf), we urge the project proponent to work to further encourage public transportation and water

transportation usage at this site, and to decrease the amount of on-site parking.

We highly commend the project proponent for seeking Platinum LEED certification for this project.

Water Quality:

Following construction of the project, we urge best management practices in the on-going maintenance of 28.14
the site. We assume that the project proponent will file with the City of Boston and relevant state agencies a snow removal plan to ensure that snow is not disposed into Boston Harbor.

According to the project proponent, an existing Boston Water and Sewer Commission combined sewer system is located directly in front of the site on Border Street which connects to a 15-inch MWRA sewer also located on Border Street.

A new 60-inch stormwater outlet from the Border Street separated stormwater system is to be constructed by Boston Water and Sewer Commission.
We urge the project proponent to work closely with 28.15
the Commission and with the MWRA regarding the timing of construction activities to minimize construction disruptions to the community, and anticipate that the City of Boston will provide a permanent easement to the Boston Water and Sewer Commission to allow for maintenance and repair of the outlet.

Any new sewers constructed as part of this project should connect to the Boston Water and Sewer Commission system, not to the MWRA interceptor.

Regarding wastewater flows, the project proponent should offset any new flows to the system with I/I removal or sewer separation to ensure that the benefits of the MWRA's combined sewer overflows (CSO) control plan will be realized. 28.16

Thank you for your consideration.

Sincerely,

Vivien Li
Executive Director
The Boston Harbor Association

Letter 28	The Boston Harbor Association, Vivien Li
28.1	The DPA portion of the site has been designed at the conceptual level since no tenant has been identified at this time. The placement of green open space between the proposed maritime facility and Border Street does not preclude a change of use for vehicular truck access in the future. When a tenant is identified, appropriate vehicular access will be put in place whether it is in front of or along side the maritime facility.
28.2	See response to comments # 1.2 and # 11.2.
28.3	As part of the Chapter 91 licensing process, the proponent will respond to the request in the East Boston Municipal Harbor Plan Amendment regarding the inclusion of language in condominium documents that describe the existence of nearby water-dependent industrial uses in the DPA.
28.4	The proponent will seek available and eligible funding opportunities in order to enhance DPA activities at the site.
28.5	The wind study presented in the DEIR/DPIR is based on the substitution provision that would allow the proposed building to be at a uniform height of 85 feet across the non-DPA portion of the site. See Section 5.1 for additional information on the wind study.
28.6	The calculations for open space were for the non-DPA portion of the site, which is currently over 50%. There is no open space requirement for DPAs.
28.7	The longer of the two wings of the building facing the waterside has been pulled back from the water and Harborwalk in order to provide more open space along the Harborwalk, to create a better alignment of the buildings along the water, and to open the view corridor along the water.
28.8	During the Chapter 91 permitting process, the proponent anticipates a discussion of the activities and design elements that will be part of the WDUZ.
28.9	The archway of the building is considered FPA space under chapter 91 regulations. Affordable live/work units, which are also considered FPA space under the EBMHP Amendment, have also been added to the ground floor of the residential building. Additional FPA uses, such as a bait and tackle shop, will only be considered if they are economically feasible.
28.10	See response to comment # 11.2.
28.11	The project is providing an excellent community resources and public benefits including the Community Gallery, the open space area, and the Harborwalk to the East Boston community. Affordable live/work units have also been added as part of the FPA mix of uses. Should the community prioritize different or other FPAs over those that have been carefully designed into the site, they will be considered during the Municipal Harbor Planning process. See also response to comment # 11.2.

28.12	There is more than 120 feet of clearance from the channel to any proposed structure.
28.13	As part of the transportation component for this project, the proponent will be providing measures to reduce automobile use and increase the use of alternative modes of transportation such as bicycle and transit options as part of the Transportation Access Plan (see response to comment # 13.2).
28.14	The project will employ best management practices as part of its maintenance and operations. The snow will not be disposed of in Boston Harbor.
28.15	See response to comment # 11.1 and #14.1.
28.16	See response to comment # 7.2, # 11.1 and #14.1.

Kristin Kara
Project Manager
BRA
1 City Hall Square
Boston, MA 02201-1007

Dear Kristin,

November 19, 2007

I am a member if the IAG team for the project proposed on Border Street in East Boston called Boston East. The last plans for this project do net meet the standards that it need to. I personally feel that the development of East Boston's waterfront is long due, yet it needs to be much better than this proposal.

I have issues with the design for starters, the last plans that I saw did not meet the standards that East Boston residents need. There is a need for signature elements that 29.1
will make this building different and an attraction to draw the communities in and around Boston as of course East Boston residents.

What I'd like to see added is better use of the mariner theme that I an important part of East Boston's history.

Suggestions:
Adding better lighting on all parts of the building itself, A replica of just the lighting from Boston Light (lighthouse) would make this visable from various parts of Boston. A well light Widows Walk would also be appropriate for the time when the tall ships were necessary use for transportation and trade. I personally feel that the replica light is the best added use of lighting because of the use they served, they kept the ships on course and for not running aground. 29.2

The building needs to be set further away from the sidewalk, that alone will draw the public to the building, and be safer, added landscaping in both the from and back is necessary.

A signature dome will make the design better also.

Retail:

The long term study done by the BRA needs to be reconsidered. I am the former Executive Director of East Boston Main Streets, at that time, just two years ago, I received many complaints that there is no businesses in East Boston to get decent meat, a 29.3
nice box of chocolates, a better selection of wines and beer, a decent greeting card, a consignment shop, nice flowers, more cafes, an art gallery and many other businesses that would serve all income levels. The new developments planned for East Boston's waterfront is in general for middle and higher income people, they call themselves the new "Business Professionals". In most cases the developments that are not on the waterfront have made their condos and apartments, gated communities, this does not help

the economy in East Boston, they shop elsewhere and do not use the existing businesses, the current businesses do not fit their needs or wants. An ATM branch and a dry cleaning service also needs to be added.

Some of my additional suggestions:

What's left of the existing original dock do need to be cut and capped off. The docks that are cut need to be incorporated into this project, just as a part of our mariner history.

A replica of a tall ship mast used for a flagpole for the American Flag is necessary. 29.4

The mariner use does need to be in place before this project goes further.

The sides of the building look very much like any modern cruise ship.

The safety of for residents and visitors need to be better.

I'll end this letter with I feel strongly that our waterfront does need to be developed, it long overdue, it just need to be done right. This proposal is not, in my opinion, does not meet any of the necessary standards. Please feel free to contact me at any time. Thank you.

Sincerely,

Ernie Torgersen
196 Bremen St.
East Boston, MA 02128

617-561-1202 (home)
617-599-0383 (mobile)

Letter 29	Ernie Torgersen
29.1	The design of the residential buildings and site has gone through many revisions due to community and city agency input. All of its features, including the open space elements, the Harborwalk, the Community Gallery, and the archway will substantially benefit the residents of the neighborhood and visitors to East Boston. See also response to comments # 11.2 and # 16.2.
29.2	The design team has considered different types of public art and interpretive features that could be used to enliven the open space and make it more inviting to the public. These features and other landscaping elements such as plantings and lighting types will be considered as the design features are advanced. See also response to comment # 16.4
29.3	See response to comment # 11.2.
29.4	As part of the site remediation, the pilings will have to be removed. However, portions of the existing railways will be secured to preserve the maritime history of the site. If a flag pole is put at the site, a replica of a tall ship mast will be considered. A marine tenant has not be yet been identified for the maritime facility. It would not make economic sense to stop the remaining portion of the project until a tenant is found for the DPA portion of the site.

CAPTAIN JOHN TYLER

v 100Marginal Street
v East Boston, MA
v 02128
v captjohntyler@mac.com

November 20, 2007

Kristin Kara
Boston Redevelopment Authority
Boston City Hall
Boston, MA 02201

Dear Kristin,

This is a letter in support of the proposed development by Trinity Financial Inc. At the city owned property on Border Street, East Boston. Now known as Boston East.

As a East Boston resident, I believe that we are long overdue for the waterfront of East Boston to have high quality housing in prime locations such as this that can also keep the Maritime industrial zoning intact. I believe the two uses are compatible and Trinity is prepared to show the way forward to the city and local community.

Quality housing development such as this will increase the tax base in the area and bring in higher income families who will be able to spend more in the community of East Boston locally and the city of Boston in General. Boston needs to attract higher income earners back to live in all communities in the City.

Sincerely,

Capt. John Tyler

Letter 30	Captain John Tyler
	No responses are needed.

Sarah Barnat

From: Kara, Kristin [Kristin.Kara.bra@cityofboston.gov]
Sent: Tuesday, November 20, 2007 11:02 AM
To: Sarah Barnat
Subject: FW: Support of Boston East

fyi

From: Melissa Tyler [mailto:melissa@tummytoys.com]
Sent: Tuesday, November 20, 2007 9:56 AM
To: Kara, Kristin
Subject: Support of Boston East

Dear Kristin,

I am a long time resident of East Boston and have been to many meetings in regards to waterfront developments.

I believe that Trinity is putting together a plan that will benefit the residents of East Boston and keep the precious maritime history and use alive and thriving in
East Boston.

The designs I have seen thus far look to be a beautiful development and knowing that they are going to be market rate dwellings is appealing. East Boston has enough low income housing and as a community we need to develop the waterfront to the people who will bring the money into our neighborhood restaurants, shops and schools.

Please feel free to contact me if you need any other feed back.

Sincerely,

Melissa Tyler
Chief Navel Officer
www.TummyToys.com
Fine Jewelry for your navel.

100 Marginal St
East Boston, MA 02128

617-997-4427 office
617-571-9031 mobile
617-249-0767 Fax

Letter 31	Melissa Tyler
	No responses are needed.

Sarah Barnat

From: smlvoice@aol.com
Sent: Tuesday, November 20, 2007 10:49 AM
To: kristin.kara.bra@cityofboton.gov
Cc: Sarah Barnat
Subject: Letter of support for Boston East.

Fr: Greg Yankosky
205 Webster St.
East Boston 02128
wk: Studio 209
80 Border St.
East Boston 02128

I am writing in support of the Boston East project as presented by Trinity Financial, EBCDC & other team members to East Boston citizens last month.

The combination of new housing being built next to a vibrant arts building with studios, a gallery, & cultural exchange center with nearby deli, cafe, & other support business is a win-win situation.

I feel the case for the project was well presented at the informational meeting at Maverick Landing. Environmental, aesthetic & traffic impacts seemed to have been carefully thought out & addressed.

I have a photo studio at the Atlantic Works Building at 80 Border St., and am an officer of the 80 Border St. Cultural Exchange Center. I am confident that the Boston East project, by means of injecting new potential customers & clients into our neighborhood, will help both of these establishments, as well as to fuel an Arts & Cultural based economic engine here in East Boston.

Thank you for your consideration, Greg

Greg Yankosky
smlvoice@aol.com
518-895-2243

Letter 32	Greg Yankosky
	No responses are needed.

Appendix 4

DRAFT SECTION 61 FINDING

Draft Section 61 Findings

Project Name: **Boston East**
Project Location: **102-148 Border Street**
Project Proponent: **Trinity Border Street LLC**
EOEA File No.: **#14123**

Massachusetts General Laws Chapter 30, Section 61 requires State agencies and authorities to review, evaluate and determine impacts on the natural environment of all projects or activities conducted by them, and to undertake all practicable means and measures to minimize and prevent damage to the environment. The finding required by Section 61 "shall be limited to those matters which are within the scope of the environmental impact report, if any, required [on a project]." M.G.L. c. 30, §. 62A.

Draft Section 61 Findings prepared for the Project are found on the following pages.

FINDING BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF RESOURCE PROTECTION
FOR A CHAPTER 91 LICENSE UNDER M.G.L. C. 30, S. 61

Introduction

Massachusetts General Laws, Chapter 30, section 61 ("Section 61") requires that "[a]ll agencies, departments, boards, commission and authorities of the Commonwealth shall review, evaluate, and determine the impact on the natural environment of all works, projects, or activities conducted by them and shall use all practical means and measures to minimize damage to the environment. Any determination made by an agency of the Commonwealth shall include a finding describing that all feasible measures have been taken to avoid or minimize said impact." The finding required by Section 61 "shall be limited to those matters which are within the scope of the environmental impact report, if any, required [on a project]." M.G.L. c. 30. S. 62A.

The development of the Boston East Project site will require a Chapter 91 License from DEP Waterways Program for work on approximately 14.2 acres of flowed and filled (formerly flowed) tidelands. The entire project is within Chapter 91 jurisdiction. The project will also require an amendment to the East Boston Municipal Harbor Plan. Therefore the DEP-Waterways Program must issue a Section 61 finding.

MEPA Review

An Environmental Notification Form (ENF) for the Project was prepared and filed on October 19, 2007, the Secretary of the Executive Office of Environmental Affairs (the Secretary) issued a Certificate on the ENF specifying the scope for a Draft Environmental Impact Report (DEIR) on December 12, 2007. The DEIR was filed with the Secretary on May 15, 2008. The Secretary issued the Certificate on the DEIR on __________.

Project Description

The project includes a new seven-story residential building, a marine use building, a water-dependent activity, and substantial public access to and along the Boston Inner Harbor. The proposed residential building varies in height from five to seven stories and contains 195 housing units consisting of one and two-bedroom units. A one-level subsurface parking structure accommodating 141 cars is provided beneath the building footprint. The project includes a 2,100 square-foot (sf) space on the ground floor of the residential building that is programmed as a facility of public accommodation to be known as the Community Gallery. On the south side of the residential building is an approximately 20,000 gross square foot (gsf) building that is dedicated for marine related uses and two piers to support a travel lift. An at-grade parking area with 26 spaces will support the proposed marine activities. The project will provide substantial public access to and along the Harbor with the addition of a Harborwalk along the entire waterfront of the site as well as additional connections to the existing and proposed sections of the Harborwalk in East Boston. The Project meets the performance standards of the Chapter 91 regulations as modified by the East Boston Municipal Harbor Plan.

Mitigation Measures

- The project will redevelop and revitalize a 3.4-acre parcel along East Boston's waterfront that has never been accessible to the public.
- The project will build an approximately 730-foot long Harborwalk along the waterfront side of the site. It will connect the planned Harborwalk to the north with the emerging East Boston Harborwalk being developed to the southeast and will ultimately extend 2.4 miles from the Harborside Hyatt Hotel to Border Street.
- The project will provide new public access to and along the water, enhancing the East Boston waterfront.
- The project will create three points of public access to the Harborwalk from Border Street.
- Community gallery space, visible and accessible from the interpretive area between Border Street and the Harborwalk, will become an integrated community asset for the surrounding neighborhood.
- The project will enhance the Decatur Street view corridor from Border Street through the middle of the site and allow for expansive views of the Boston Inner Harbor.
- The view corridor will be enhanced with landscaping and other public amenities.

Conclusion

Now, therefore, the DEP-BRP, having reviewed the MEPA filings for the Boston East Project and the mitigation measures proposed, finds pursuant to M.G.L. c. 30, section 61 that with the implementation of the aforesaid measures, all practical and feasible means and measures will have been taken to avoid or minimize potential damage to the environment from the Project.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION – BUREAU OF RESOURCE PROTECTION

_________________________ ____________________________

Date By

FINDING BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF RESOURCE PROTECTION (FOR A WATER QUALITY CERTIFICATION) UNDER M.G.L. C. 30, S. 61

Introduction

Massachusetts General Laws, Chapter 30, section 61 ("Section 61") requires that "[a]ll agencies, departments, boards, commission and authorities of the Commonwealth shall review, evaluate, and determine the impact on the natural environment of all works, projects, or activities conducted by them and shall use all practical means and measures to minimize damage to the environment. Any determination made by an agency of the Commonwealth shall include a finding describing that all feasible measures have been taken to avoid or minimize said impact." The finding required by Section 61 "shall be limited to those matters which are within the scope of the environmental impact report, if any, required [on a project]." M.G.L. c. 30. S. 62A.

The development of the Boston East Project site may require a Water Quality Certification from DEP for the discharge of fill in state waters. Therefore, the DEP-BRP must issue a Section 61 Finding.

MEPA Review

An Environmental Notification Form (ENF) for the Project was prepared and filed on October 19, 2007, the Secretary of the Executive Office of Environmental Affairs (the Secretary) issued a Certificate on the ENF specifying the scope for a Draft Environmental Impact Report (DEIR) on December 12, 2007. The DEIR was filed with the Secretary on May 15, 2008. The Secretary issued the Certificate on the DEIR on __________.

Project Description

The project includes a new seven-story residential building, a marine use building, a water-dependent activity, and substantial public access to and along the Boston Inner Harbor. The proposed residential building varies in height from five to seven stories and contains 195 housing units consisting of one and two-bedroom units. A one-level subsurface parking structure accommodating 141 cars is provided beneath the building footprint. The project includes a 2,100 square-foot (sf) space on the ground floor of the residential building that is programmed as a facility of public accommodation to be known as the Community Gallery. On the south side of the residential building is an approximately 20,000 gross square foot (gsf) building that is dedicated for marine related uses and two piers to support a travel lift. An at-grade parking area with 26 spaces will support the proposed marine activities. The project will provide substantial public access to and along the Harbor with the addition of a Harborwalk along the entire waterfront of the site as well as additional connections to the existing and proposed sections of the Harborwalk in East Boston. The Project meets the performance standards of the Chapter 91 regulations as modified by the East Boston Municipal Harbor Plan.

Mitigation Measures

- Implementation of Best Management Practices (BMP) during construction. All stormwater run-off from the proposed building, marina, walkways, etc, will be collected via a closed drainage system, treated for sediment removal utilizing BMPs and discharged into the Harbor.
- Participation in an I/I removal program in consultation with the Boston Water and Sewer Commission by permitting, designing, and constructing a new 60-inch stormwater outlet from the Border Street separated stormwater system into the Harbor as an offset for the project's sewer generation.
- Implementation of a stormwater management plan prepared in accordance with the DEP Stormwater Policy.
- Removal of dilapidated timber piles within the watersheet of the project site.

Conclusion

Now, therefore, the DEP-BRP, having reviewed the MEPA filings for the Boston East Project and the mitigation measures proposed, finds pursuant to M.G.L. c. 30, section 61 that with the implementation of the aforesaid measures, all practical and feasible means and measures will have been taken to avoid or minimize potential damage to the environment from the Project.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION – BUREAU OF RESOURCE PROTECTION

________________________ __________________________

Date By

Appendix 5

DISTRIBUTION LIST

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Executive Office of Energy and Environmental Affairs
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MEPA Office

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Executive Office of Energy and Environmental Affairs
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Chris Busch, Executive Secretary
Boston Conservation Commission
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Richard McGuinness, Waterfront Planner
One City Hall Square, 9th Floor
Boston, MA 02201

Boston Water and Sewer Commission

John Sullivan, Chief Engineer
980 Harrison Avenue
Boston, MA 02119

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Army Corps of Engineers

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Permits and Enforcement Section
Regulatory Division
696 Virginian Road
Concord, MA 01742

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Boston Groundwater Trust

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234 Clarendon Street, Third Floor
Boston, MA 02116

The Boston Harbor Association

Vivien Li, Executive Director
374 Congress Street, Suite 307
Boston, MA 02210

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Bruce Ohanian and Varney Hintlian, Co-Trustees
45 Dunham Road
Billerica, MA 01821

Pepe & Hazard LLP

Harlan M. Doliner, Esquire
225 Franklin Street, 16th Floor
Boston, MA 02110

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Appendix 6

Transportation

Appendix 7

WIND

See Volume 2, Appendix 6 for Transportation

A QUALITATIVE ASSESSMENT OF PEDESTRIAN LEVEL WINDS FOR THE PROPOSED SEVEN-STORY BUILDING AND A MARINA AT 108-148 BORDER STREET IN EAST BOSTON, MASSACHUSETTS

BY FRANK H. DURGIN, P.E.

1.0 SUMMARY

A qualitative assessment has been made to determine the effect on pedestrian level winds (PLWs) of a proposed one-story Marina building and a seven-story residence building along the harbor side of Border Street in East Boston, Massachusetts. Results are obtained for both existing and build conditions for NW (winter), SW (summer), easterly storm, and annual winds.

None of the forty-six locations considered for either existing or build conditions is estimated to have PLWs that exceed the Boston Redevelopment Authority (BRA) guideline wind speed. No location is predicted to have dangerous winds as often as once a year. In fact, no location is predicted to have PLWs higher than Category 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered.

Overall, the addition of the proposed buildings tends to reduce PLWs in the vicinity of the two buildings due to their sheltering affects, although winds are increased somewhat near the corners of the 80-foot building.

Detailed results are presented in Figures 12-19 and Table 1 and are summarized in Table 2. For this assessment, it has been assumed that there is no landscaping for existing conditions and none associated with the new building.

2.0 INTRODUCTION

This is an assessment of the effect of a proposed one-story Marina building and a seven-story residence building along the harbor side of Border Street in East Boston, Massachusetts, on PLWs in its vicinity. The assessment is based on:

1 A set of elevations and a site plan of the proposed buildings dated June 4 and 15 received June 20, 2007, from Fort Point Associates, Inc. (FPA);

2 A second updated site plan (no date) received from FPA July 24, 2007;

3 Heights of several tall buildings obtained from other studies done by the author for sites S of this site;

4 Twenty photographs taken during a site visit;

5 An evaluation of the urban context of the proposed project site;

6 A review of the Boston wind climate; and

7 The author's 36 years of experience dealing with PLWs.

The interaction of the wind with buildings and structures is very complicated and, at times, difficult to predict, especially for an urban area with a mixture of low-rise, and mid-rise buildings. Thus this evaluation provides a qualitative assessment of PLWs.

3.0 LOCATION AND DESCRIPTION OF THE PROJECT AND SURROUNDING AREA

3.1 DESCRIPTION OF EXISTING CONDITIONS (Figure 1)

The site is at 102-148 along the west side of Border Street in East Boston. Currently the site is empty except for shrubs and a few trees. .

The locations at which PLWs will be estimated are at the rectangles with numbers shown in Figure 1. These locations were chosen to be in areas of expected pedestrian activity.

3.2 DESCRIPTION OF BUILD CONDITIONS (Figure 2)

For build conditions, there will be an 80-foot, seven-story building near the NE end of the site, and a 24-foot one-story marina building near the SW end of the site (Figure 2). Again, the locations at which the PLW Categories will be estimated are at the numbered rectangles. Location 16 is in a pedestrian walkway under the seven-story building. It provides access to a terrace and the Harbor Walk from Border Street.

3.3 THE SURROUNDING AREA (Figures 1 and 2)

The area near this site has mostly one- to three-story buildings, although there are a few four-story buildings. The exceptions are the 65 foot Sumner Tunnel vent tower at the corner of London and Decatur Streets; the 65-foot building at the corner of Maverick and New Streets, and the 120-foot building on New Street. There is the permitted 95-foot Hodge Boiler Building on Sumner Street next to Lo Presti Park, but that is too far away to have a significant effect on PLWs at the site.

4.0 THE WIND CLIMATE

4.1 THE VARIATION OF WIND SPEED WITH HEIGHT

In general, the natural wind is unsteady (*i.e.,* it is gusty) and its average speed increases with height above the ground [1]. Figure 3 depicts how the average wind speed varies with height for different types of terrain. While generally it does not happen, when one puts up any building, the possibility exists that the building will bring the higher speed winds at the top of the building down to ground level.

Figure 4 shows schematically how an isolated building interacts with the wind. Because the wind speed increases with height, as the wind is forced to a stop at the upwind façade, the pressure recovered on that façade is higher near the top than at the bottom of the façade. As a result, the wind flows down the windward façade and forms the vortex upwind of the building shown in the figure. This vortex is stretched and accelerated as it goes around the two upwind lower corners, causing the accelerated flow in areas (A) shown on the left hand side of Figure 4. Similar accelerated areas also occur for winds blowing at the corners of the building (B in Figure 4). The proposed seven-story building is not strictly rectangular, but the wind near the exposed corners of the three wings will be accelerated in ways similar to that shown in figure 4.

Monolithic buildings (*i.e.,* those that do not change shape with height), if they are significantly taller than most of the surrounding buildings, almost invariably will be windy at their bases.

4.2 STATISTICAL DESCRIPTION OF THE BOSTON WIND CLIMATE

The project site is located about one mile W of Logan Airfield. Thus, the wind data from Logan Airfield usually used to define the winds for the Boston area is applicable. Figure 5 depicts a wind rose for Boston. The wind speeds are estimated at pedestrian level at the airport. The length of each line radiating from the center of the figure to the outermost crossing line is proportional to the total time the wind comes from that direction. The other lines crossing the radial lines indicate the frequency of winds less than 7, 10, and 15 mph. As noted in the figure, the wind rose is based on surface wind data from Logan Airfield taken from 1945 to 1965. Data from 1965 to 2005 is also available, but it is not believed to be as representative of the true winds in Boston. Many 25- to 40-story buildings have been built in the financial district of Boston since 1965. The financial district is just one mile SSW of Logan Airfield.

Figure 5 shows that the winds in Boston come primarily from the NW, W, and SW. Figures 6 through 9 show pedestrian level wind roses for Boston for winter (Dec., Jan., and Feb.), spring (Mar., Apr., and May), summer (Jun., Jul., and Aug.), and fall (Sept., Oct., and Nov.). These figures show that NW winds tend to occur during the colder months and SW winds during the warmer months. Spring and fall are transitional, but winds are stronger in the spring than in the fall. Strong easterly winds usually occur during storms when there is precipitation.

The average wind speed at Logan Airfield at 58 feet (the average height at which the data was taken) is 12.9 mph. At pedestrian height (*i.e.,* at chest height, 4.5 feet) it is about 8.6 mph. The average wind speeds at 58 and 4.5 feet at Logan Airfield for each month are shown in Figure 10. Seasonally, the average wind speed at pedestrian level is 9.4 mph in the winter, 9.2 mph in the spring, 7.4 mph in the summer, and 8.2 mph in the fall.

5.0 CRITERIA

Since the early 1980s, the BRA has used a guideline criterion for acceptable winds of not exceeding a 31 mph effective gust more often than once in one hundred hours. The effective gust is defined as the average wind speed plus 1.5 times the root mean square variation about the average. The effective gust can be shown to be about the fastest one-minute gust in an hour. When many locations are considered, the effective gust averages about 1.4 times the average hourly wind speed [3]. However, that ratio can vary widely from 1.4 for individual locations.

In 1978, Melbourne [2] developed probabilistic criteria for average and peak PLWs, which accounted for different types of pedestrian activity as well as the safety aspects of such winds. Durgin [3] suggested the use of an Equivalent Average which combines the effects of average, gusting, and peak winds and later [4 and 5] reinterpreted Melbourne's criteria to apply to Equivalent Average winds (Figure 11). The Equivalent Average used in this figure is similar to an hourly average, but combines the effects of steady and gusting winds. Five categories of PLWs are defined:

1) Comfortable for Long Periods of Standing or Sitting;[1]
2) Comfortable for Short Periods of Standing and Sitting;
3) Comfortable for Walking;
4) Uncomfortable for Walking;
5) Dangerous and Unacceptable.

It is now generally agreed that while unacceptable can be defined at a higher probability, (in this case 1% of the time), dangerous winds should be defined as a once a year event, that is, at the 0.01% level of probability. That criteria was investigated in this study and no location was estimated to have dangerous winds.

These criteria are not absolute (any location can have dangerous winds in a major storm or hurricane). Rather, they imply that the location would have wind speeds such that the activity suggested could be undertaken comfortably most of the time, and would be perceived[2] as such, by most people who frequent the location. For example, the PLWs at Logan Airfield are in Category 4 (uncomfortable for walking) but near the dividing line between Category 4 and Category 3 (comfortable for walking) (see Figure 11). But they are well under the BRA 31 mph effective gust wind speed guideline (converted to an equivalent average wind), which is high in Category 4. Therefore, most people would probably perceive conditions in the open at Logan Airfield as marginally comfortable for walking.

6.0 PEDESTRIAN LEVEL WINDS AT THE SITE

[1] The numbering system for the Categories was reversed in December, 1999. Before December, 1999, the slowest winds were in Category 5 and the fastest in Category 1. Since the December, 1999, the slowest are in Category 1 and the fastest in Category 5.

[2] On a somewhat windy day, a person familiar with the location would choose not to go there for the specified activity.

6.1 INTRODUCTION

The objective of this study was to examine the effect of a proposed one-story Marina building and a seven-story residence building along the harbor side of Border Street on PLWs about the site and at nearby buildings.

In the following sections, the effects of NW winter winds, SW summer winds, and easterly storm winds will be discussed for existing and build conditions. The results from NW, SW, and storm directions will be summarized by an estimated prediction of the annual PLW category at each location considered. When a PLW Category does not change, it does not mean the PLWs did not increase or decrease, but only that they did not change sufficiently for the PLW Category to change. Typically a Category covers 4 or 5 mph at the 1% probability level. Thus, when a PLW Category does change, it may be caused by just a small (1 mph or less) change in predicted PLW speed.

The estimated categories for all locations, wind directions, and annual winds for both existing and build conditions are shown in Figures 12 to 19. The results for all locations, wind directions, and annual winds are tabulated in Table 1 and summarized in Table 2. Table 2 indicates both the number of locations that will not change category and those that will change up or down one or two categories.

For the most part, the weather in New England is dominated by either large coastal storms (fall, winter, and spring) or the Bermuda High (summer). Typically, when a coastal storm occurs, it rains or snows for 4 to 12 hours, then it clears, and, as the storm moves to the NE, the winds blow from the NW for three or four days until the next weather system arrives. These storms and the NW winds following them occur mostly in the fall, winter, and spring. NW winds are particularly uncomfortable in the winter, when typically they occur on cold days. The Bermuda High is generally responsible for the SW winds that occur in the summer.

6.2.1 Northwest (Winter) Winds (Figures 12 & 13)

NW winds blow directly off the Inner Harbor at the Harbor Walk along the shoreline of the site Figure 13). The results for NW winds include the effects of all winds blowing from W to N. The estimated categories for all locations for existing and build conditions for NW winds are shown in Figures 12 and 13 (also see Tables 1 & 2).

For NW winds, the PLW Category at thirty-two of the forty-six locations considered does not change. The PLW Category did not increase at any location. The PLW Category decreased by one Category at 10 locations (12, 15, 17, 20, 23-25, 33, 36, and 40) due to these locations being sheltered by one or the other of the proposed buildings. At locations 21, 28, 41 and 43 the PLW

Category decreased by two because for N and W winds these locations are completely sheltered by the new buildings.

6.2.2 Southwest (Summer) Winds (Figures 14 & 15)

The prevailing winds in the summer are from the SW. SW winds blow nearly parallel to Border Street from Maverick to Decatur Street. The results for SW winds include effects of all winds blowing from S to W. The estimated categories for all locations for existing and build conditions are shown in Figures 14 and 15 (also see Tables 1 & 2).

For SW winds, the PLW Category does not change at twenty-nine of the forty-six locations considered. The PLW Category does not increase at any location considered. It decreases by one at fourteen locations (7, 9-13, 15, 20, 23, 31, 33, 40, 41, and 43), and by two at four locations (17, 21, 34, and 38). In every case the decrease is due to sheltering by one of the two proposed buildings.

6.2.3 Easterly Storm Winds (Figures 16 & 17)

Easterly winds occur about one third of the time. Light easterly winds occur as a storm starts or in the summer as a sea breeze. During the first four to twelve hours of a typical coastal storm, it rains or snows depending on the temperature. The wind is from the NE or SE depending on whether the center of the storm passes to the east or west of the city. The results for easterly storm winds includes the effects of all winds blowing from N to E to S (i.e., from the eastern side of the compass).

Since for strong easterly winds, it will generally be raining or snowing, and people expect it to be windy, the emphasis in evaluating the effect of the proposed added stories should be on entering or exiting buildings. The Categories for all easterly wind directions from N-E-S were estimated and have been combined to obtain a single result for easterly winds. Bear in mind that the total time the winds come from all of these easterly directions is about the same as the time the wind comes from either the NW or SW quadrants.

The estimated Categories for all locations for existing and build conditions are shown in Figures 16 and 17 (See Tables 1 & 2).

For easterly winds, PLW Categories at all twenty of the forty-six locations considered are estimated to remain unchanged. At five (10, 12, 23, 30, and 41), the PLW Category increases by one. Except for location 10 at the NE corner of the 80-foot building, these increases are due to the PLWs being accelerated along Border Street by the 80-foot building. For these easterly winds the PLW Category at 15 locations (11, 14, 16, 17, 22, 26, 27, 31, 34, 35, 37, 38, and 43-45) decreases by one and at six locations (13, 15, 21, 24, 25, and 40) the PLW

Category decreases by two. In every case, these decreases are due to sheltering of one of the two new buildings.

6.2.4 Annual Winds

In the above discussion, only winds from three general wind directions are discussed. While those are important directions related to seasons and storms, one cannot infer the overall annual windiness at any location from those results. PLW Categories were estimated at each location for the eight major wind directions (i.e., from the NE, E, SE, S, SW, W, NW, and N directions). Those estimated categories were then used with an eight compass point statistical description of the Boston wind climate to estimate the overall annual category for each of the forty locations considered. The resulting estimated categories for each location for existing and build conditions are listed in the last two columns in Table 1. In comparing these annual estimates with those for the five specific directions, one must remember that the total occurrence of winds from the easterly directions is roughly equal to that for either the NW or SW direction. These annual estimates are qualitative and must be treated as such.

For annual winds, thirty-two of the forty-six locations considered are estimated not to change PLW Category. The PLW Category is estimated to increase by one at location 28 at the S corner of the 80-foot building. At 13 locations (13, 15, 17, 20, 21, 23, 30, 33, 38, 40, 41, 43, and 44), the estimated PLW Category decreased by one.

7.0 SUMMARY AND CONCLUSIONS

A qualitative assessment has been made to determine the effect on PLWs of a proposed one-story Marina building and a seven-story residence building along the harbor side of Border Street in East Boston, Massachusetts. Results are obtained for both existing and build conditions for NW (winter), SW (summer), easterly storm, and annual winds.

None of the forty-six locations considered for either existing or build conditions is estimated to have PLWs that exceed the BRA guideline wind speed. No location is predicted to have dangerous winds as often as once a year. In fact, no location is predicted to have PLWs higher than Category 3 (comfortable for walking) for either existing or build conditions for any of the wind conditions considered.

Overall, the addition of the proposed buildings tends to reduce PLWs in the vicinity of the two buildings due to their sheltering affects, although winds are increased somewhat near the corners of the 80-foot building.

Detailed results are presented in Figures 12-19 and Table 1 and are summarized in Table 2. For this assessment, it has been assumed that there is no landscaping for existing conditions and none associated with the new building.

8.0 REFERENCES

1) Davenport, A.G., and Isyumov, N., "The Application of the Boundary Layer Wind Tunnel to the Prediction of Wind Loading", Proceedings of Intl. Seminar on Wind Effects on Buildings and Structures, Ottawa, Canada, September, 1967.

2) Melbourne, W.H., "Criteria for Environmental Wind Conditions", *Journal of Industrial Aerodynamics*, Vol.3, 1978, pp. 241-249.

3) Durgin, F.H., "Use of the Equivalent Average for Evaluating Pedestrian Level Winds", Presented at the Sixth U.S National Conf. On Wind Engineering, University of Houston, Houston, Texas, March 7-10, 1989, *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 36, pp. 817-828, 1990.

4) Durgin, F.H., "Pedestrian Level Wind Studies at the Wright Brothers Facility", Progress in Wind Engineering (Proc. of the 8th International Conference on Wind Engineering), New York, Elsevier, Part 4, 1992, pp. 2253-2264.

5) Durgin, F.H., "Pedestrian Level Wind Criteria Using the Equivalent Average", *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 66 (1997), pp. 215-226.

TABLE 1

ESTIMATED CATEGORIES FOR NW, SW, EASTERLY STORM, AND ANNUAL WINDS FOR EXISTING (Ex) AND BUILD (Bld) CONDITIONS

Loc	NW		SW		STORM		ANNUAL		Loc
No.	Ex	Bld	Ex	Bld	Ex	Bld	Ex	Bld	No.
1	3	3	3	3	3	3	3	3	1
2	3	3	2	2	3	3	3	3	2
3	3	3	2	2	3	3	3	3	3
4	3	3	3	3	2	2	3	3	4
5	2	2	2	2	2	2	2	2	5
6	3	3	3	3	3	3	3	3	6
7	3	3	3	2	2	2	3	3	7
8	3	3	3	3	3	3	3	3	8
9	2	2	3	2	1	1	2	2	9
10	3	3	3	2	2	3	3	3	10
11	3	3	3	2	3	2	3	3	11
12	2	1	3	2	1	2	2	2	12
13	3	3	3	2	3	1	3	2	13
14	3	3	3	3	3	2	3	3	14
15	3	2	3	2	3	1	3	2	15
16	3	3	3	3	3	2	3	3	16
17	3	2	3	1	3	2	3	2	17
18	3	3	3	3	3	3	3	3	18
19	3	3	3	3	3	3	3	3	19
20	3	2	3	2	2	2	3	2	20
21	3	1	3	1	3	1	3	2	21
22	3	3	3	3	3	2	3	3	22
23	3	2	3	2	1	2	3	2	23
24	3	2	3	3	3	1	3	3	24
25	3	2	3	3	3	1	3	3	25
26	3	3	3	3	3	2	3	3	26
27	3	3	3	3	3	2	3	3	27
28	3	1	3	3	2	2	2	3	28
29	2	2	1	1	2	2	2	2	29
30	3	2	3	3	1	2	3	2	30

TABLE 1 (Contd)

ESTIMATED CATEGORIES FOR NW, SW, EASTERLY STORM, AND ANNUAL WINDS FOR EXISTING (Ex) AND BUILD (Bld) CONDITIONS

Loc	NW		SW		STORM		ANNUAL		Loc
No.	Ex	Bld	Ex	Bld	Ex	Bld	Ex	Bld	No.
31	3	3	3	2	3	2	3	3	31
32	3	3	3	3	3	3	3	3	32
33	3	2	3	2	2	2	3	2	33
34	3	3	3	1	3	2	3	3	34
35	3	3	3	3	3	2	3	3	35
36	2	1	2	2	2	2	2	2	36
37	3	3	3	3	3	2	3	3	37
38	3	3	3	1	3	2	3	2	38
39	2	2	2	2	2	2	2	2	39
40	3	2	3	2	3	1	3	2	40
41	3	1	3	2	2	3	3	2	41
42	2	2	2	2	1	1	2	2	42
43	3	1	3	2	2	1	3	2	43
44	3	3	2	2	3	2	3	2	44
45	3	3	2	2	3	2	3	3	45
46	2	2	2	2	1	1	2	2	46

TABLE 2

SUMMARY OF LOCATIONS THAT CHANGED CATEGORY BETWEEN EXISTING AND BUILD CONDITIONS

Direction	NW	SW	Storm	Annual
Up 2 Cat.	0	0	0	0
Up 1 Cat	0	0	5	1
No Change.	32	28	20	32
Down 1 Cat.	10	14	15	13
Down 2 Cat.	4	4	6	0

Frank H. Durgin, P.E. 8/4/07

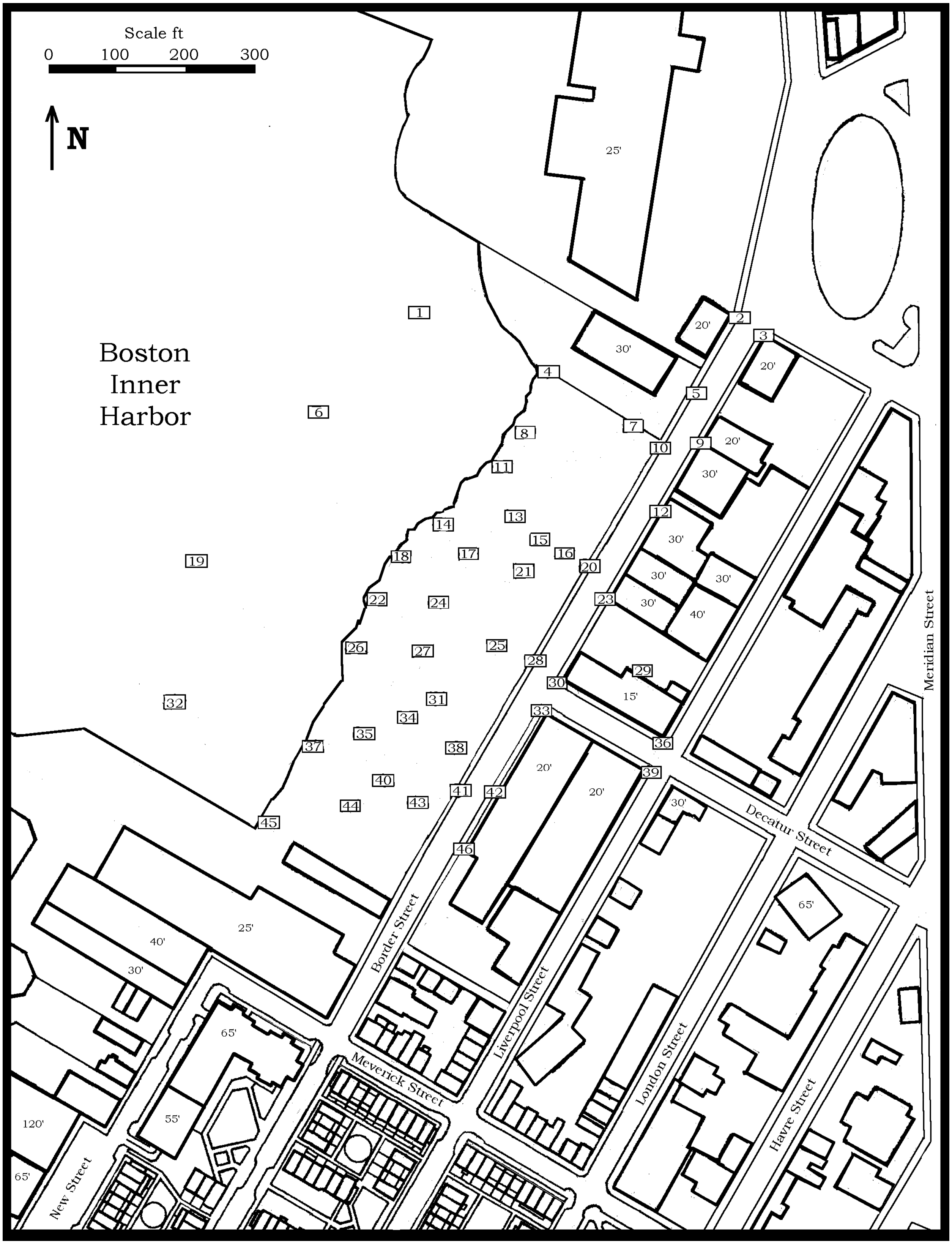


Figure 1. Map of Existing Conditions with Building Heights and Location Numbers

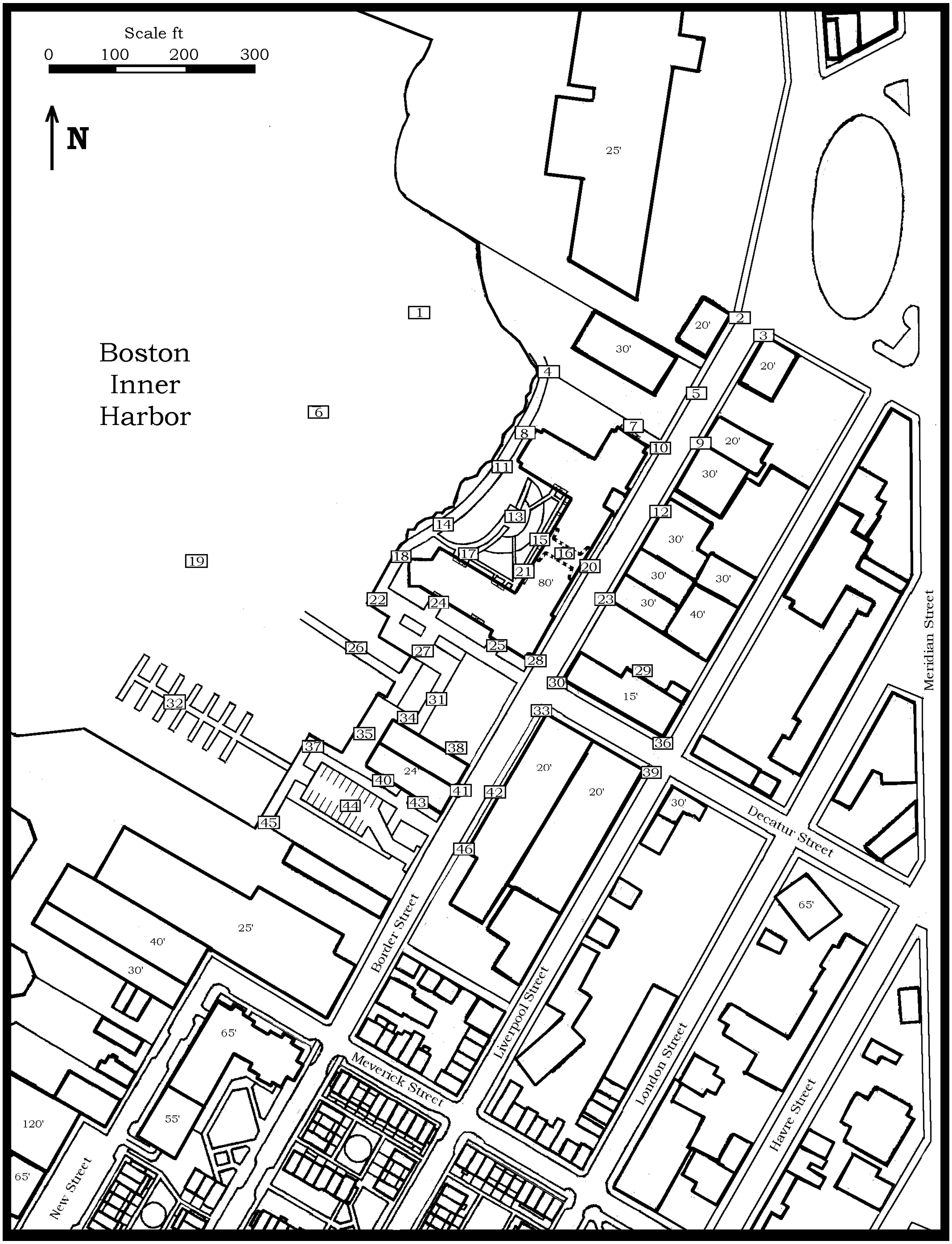


Figure 2. Map of Build Conditions with Building Heights and PLW Location Numbers

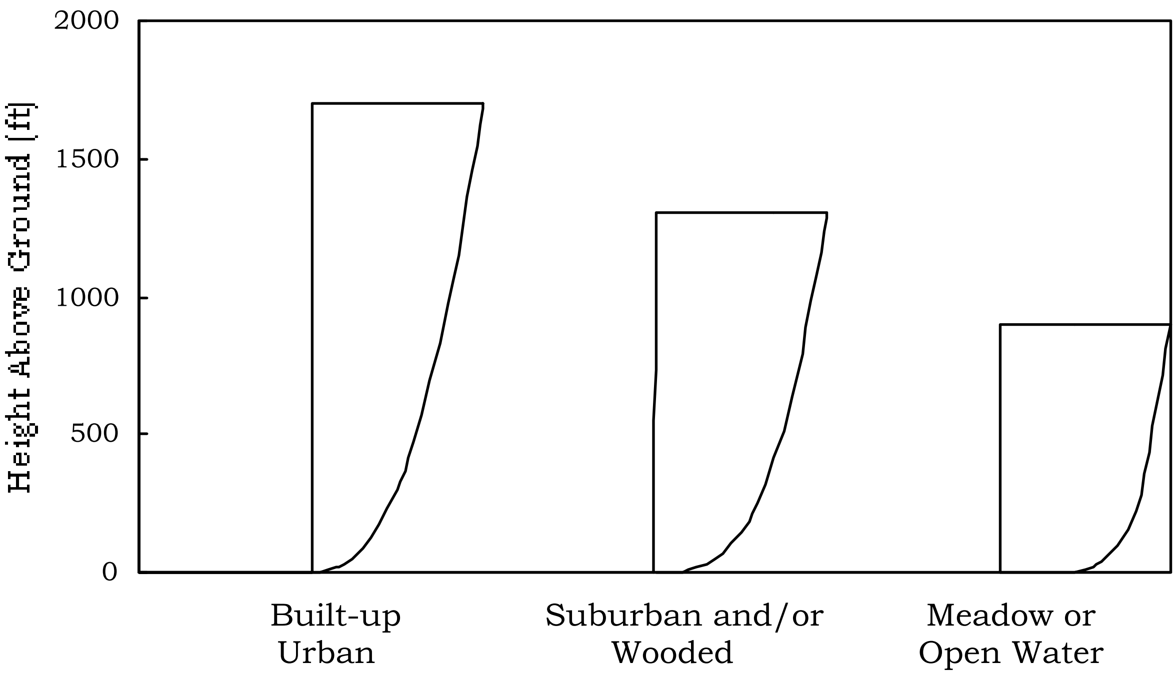


Figure 3 Types of Earth's Boundary Layers After Davenport

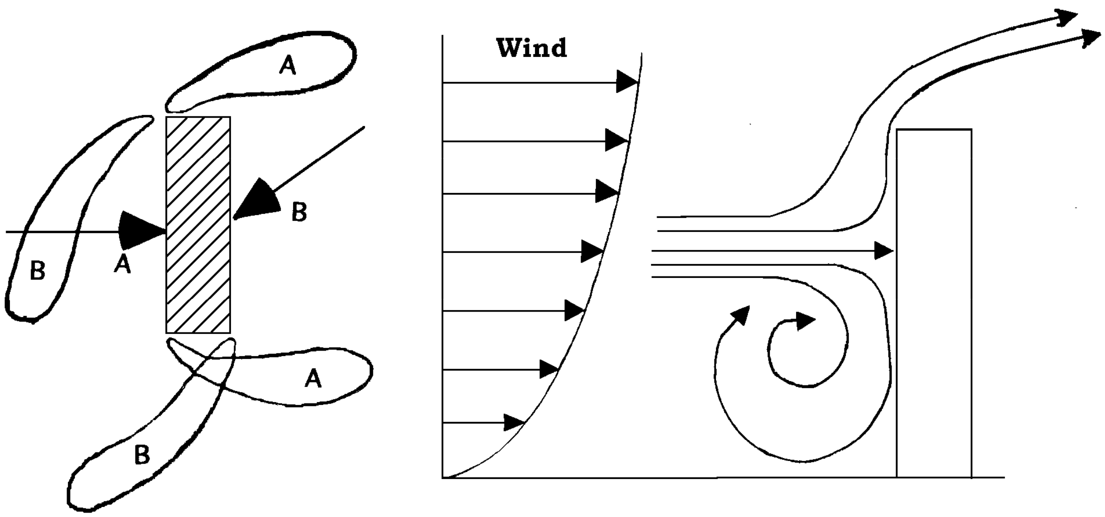


Figure 4 Schematic of How the Wind Interacts With an Isolated Building

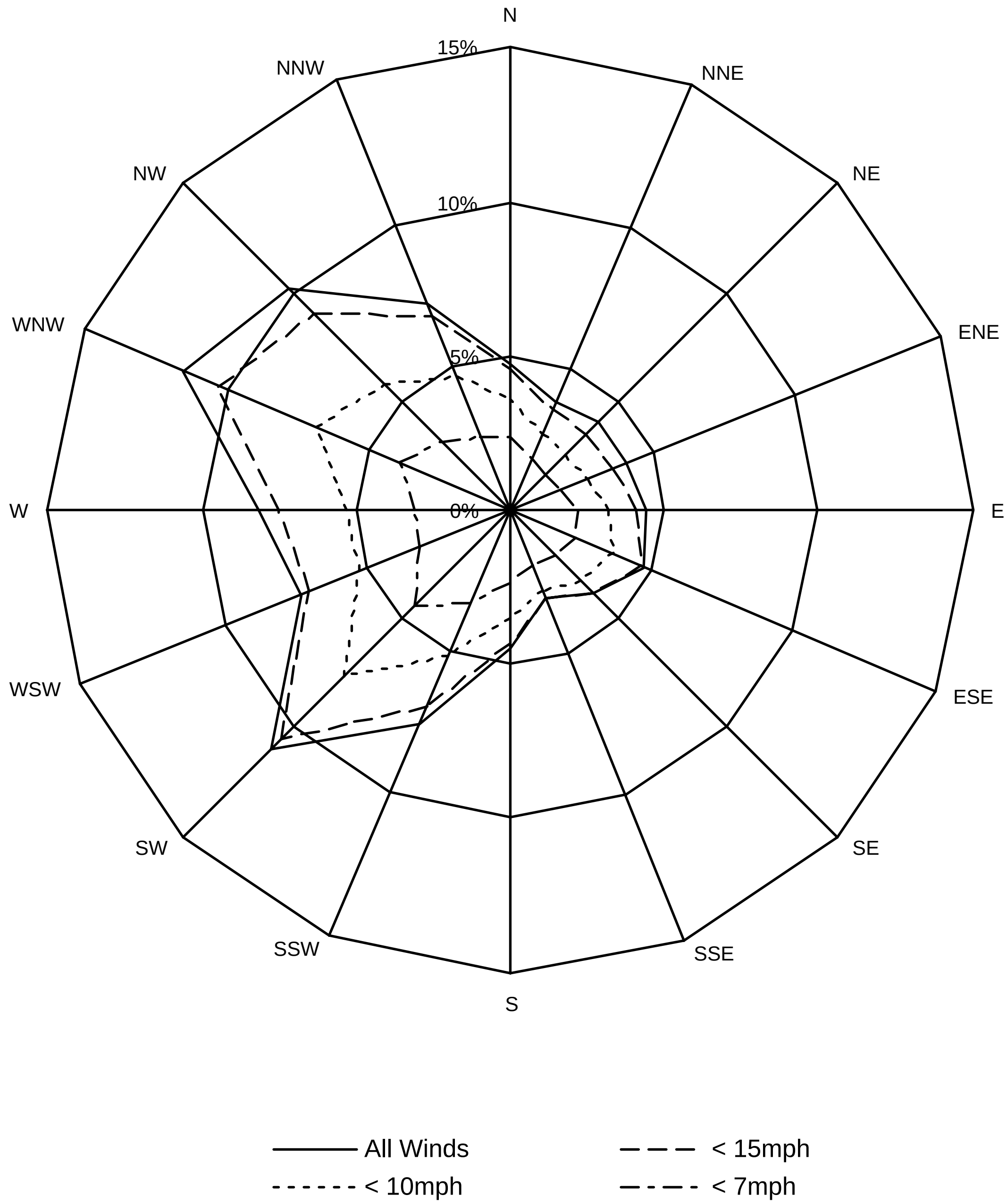


Figure 5 Annual Pedestrian Level Wind Rose for Boston Based on Surface Data from Logan Airfield 1945-1965

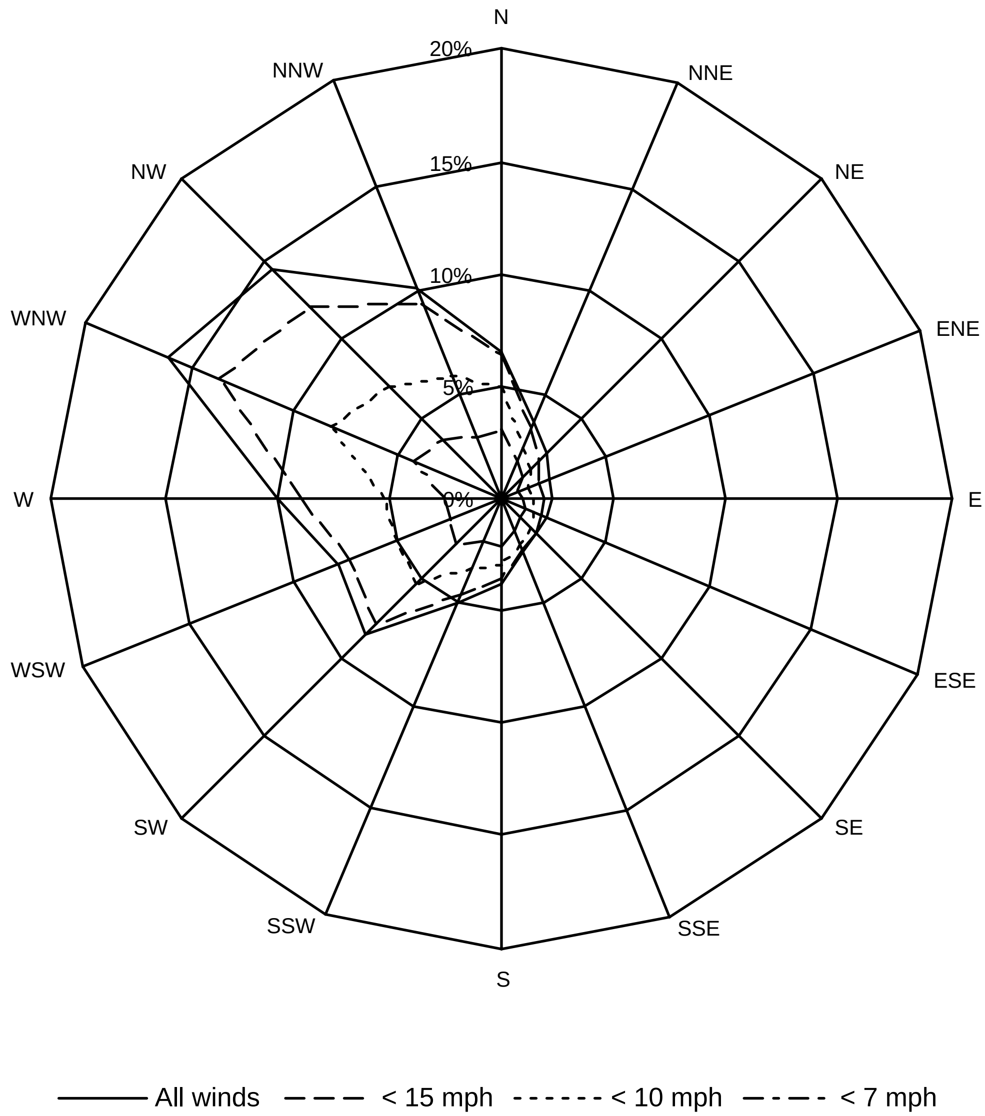


Figure 6 Winter (December, January, February) Pedestrian Level Wind Rose for Boston Based on Surface Data from Logan Air Field 1945-1965

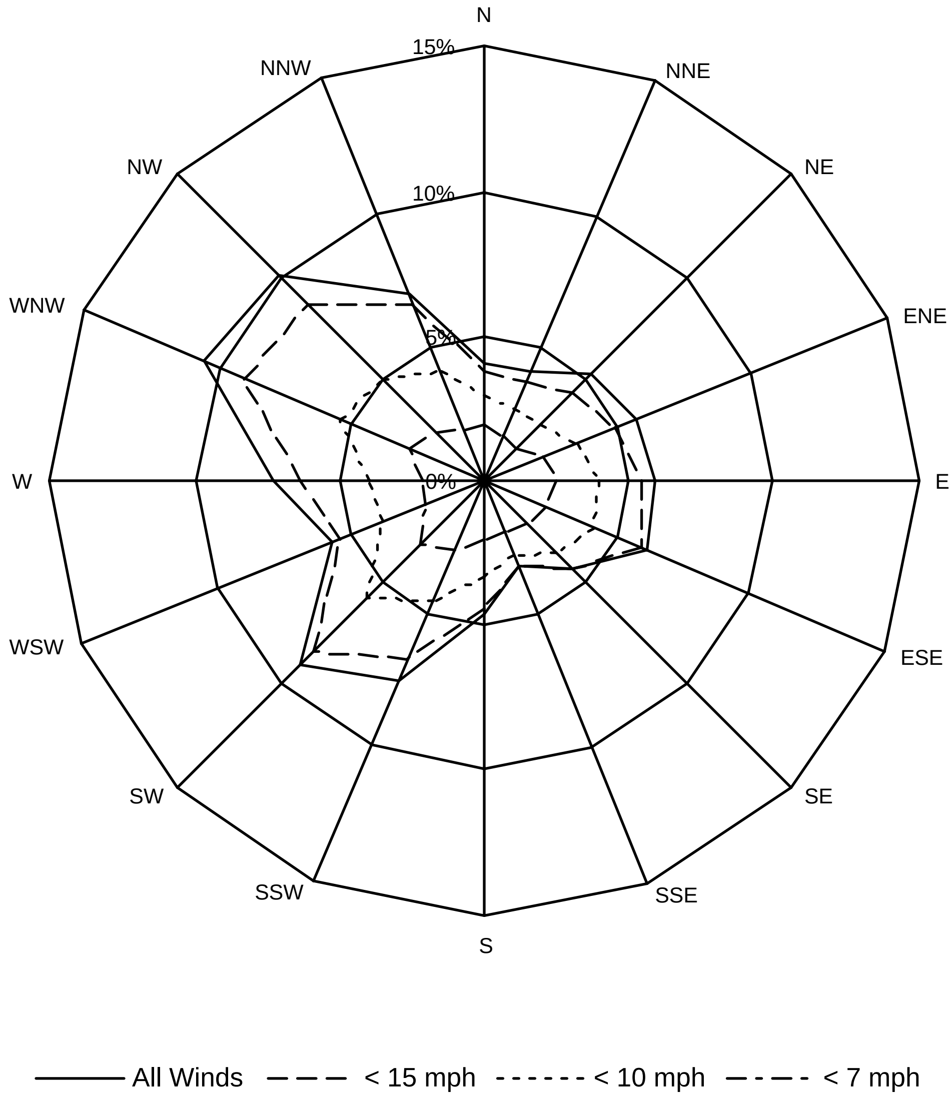


Figure 7 Spring (March, April, May) Pedestrian Level Wind Rose for Boston based on Surface Data from Logan Air Field 1945-1965

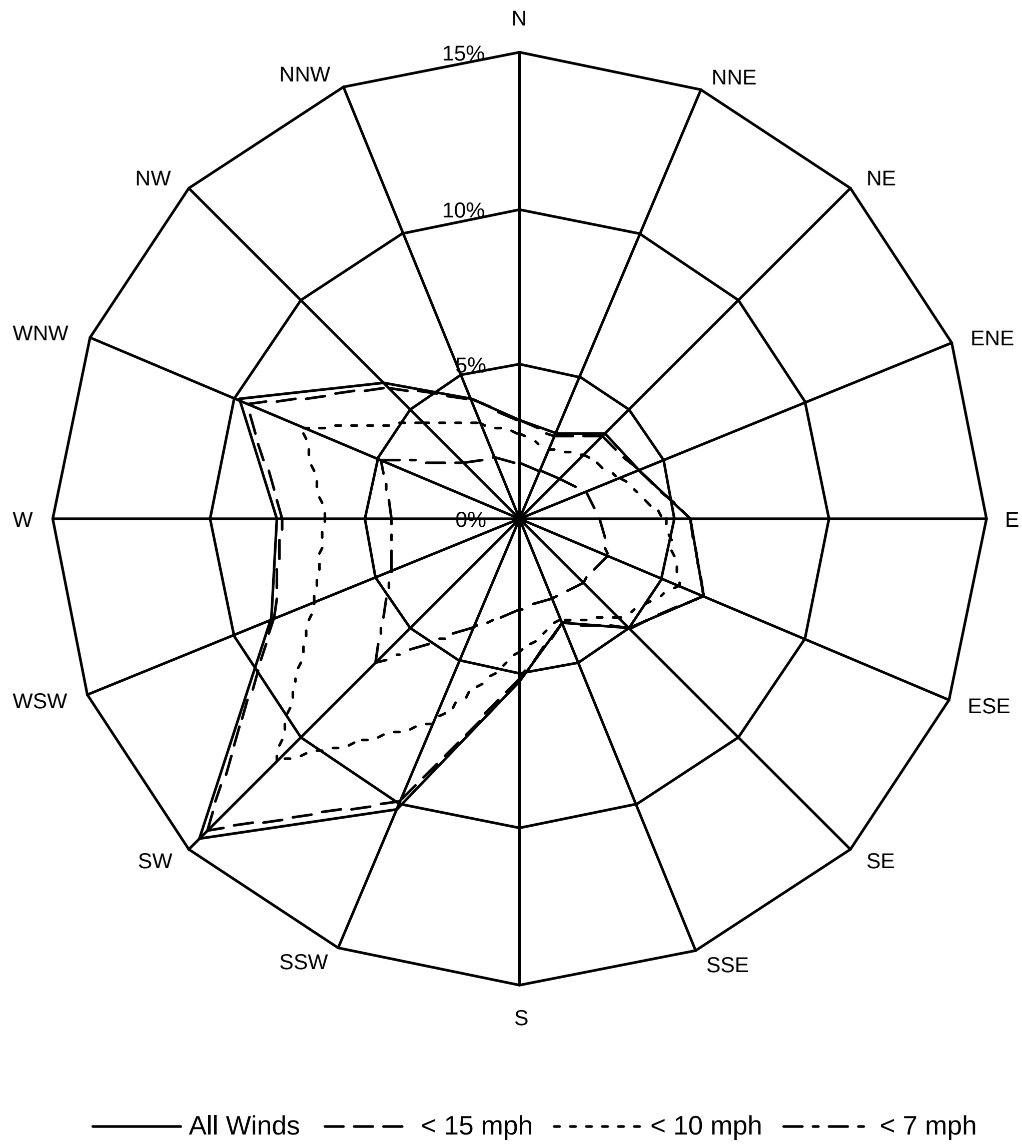


Figure 8 Summer (June, July, August) Pedestrian Level Wind Rose for Boston based on Surface Data from Logan Air Field 1945-1965

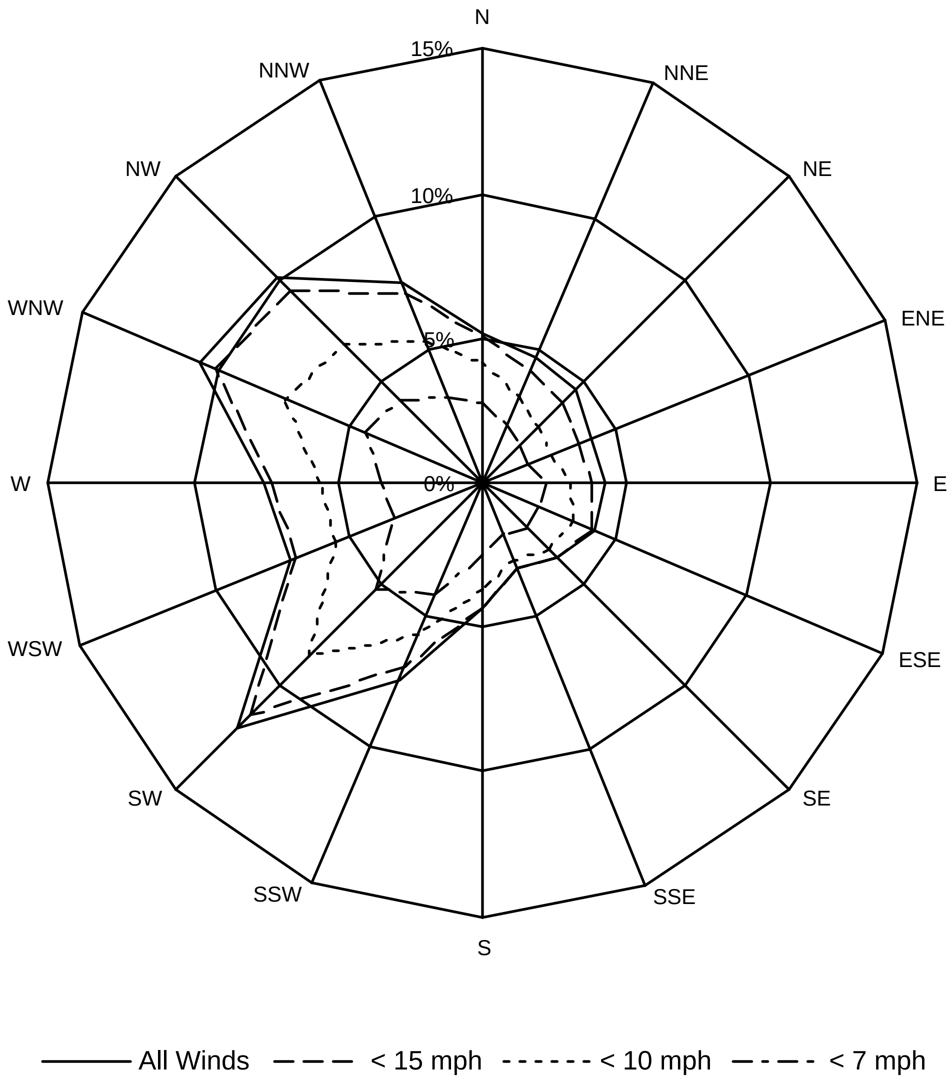
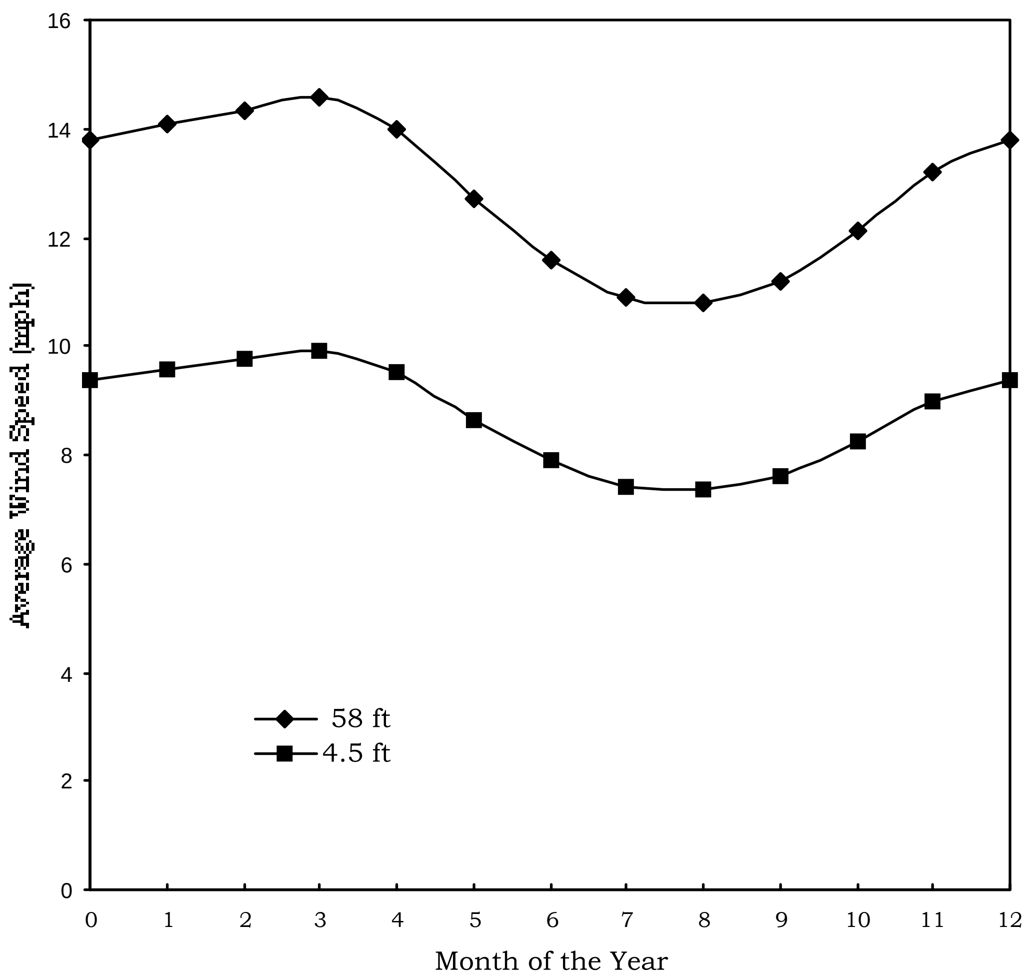


Figure 9 Fall (September, October, November) Pedestrian Level Wind Rose for Boston based on Surface Data from Logan Air Field 1945-1965



Yearly Average is 12.9 mph at 58 feet

Figure 10 Average Wind Speed at Logan Airfield Based on Surface Data from 1945-1965

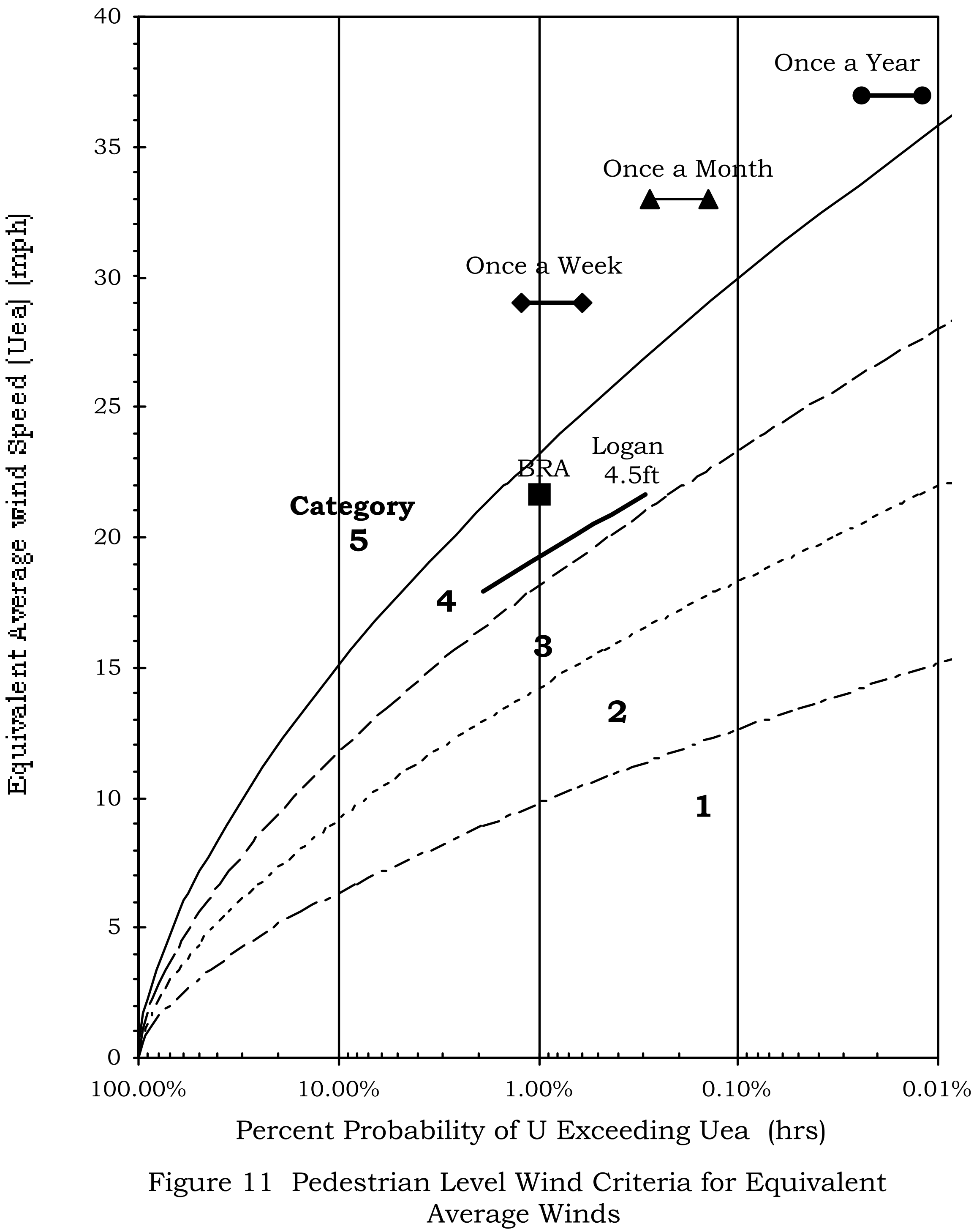


Figure 11 Pedestrian Level Wind Criteria for Equivalent Average Winds

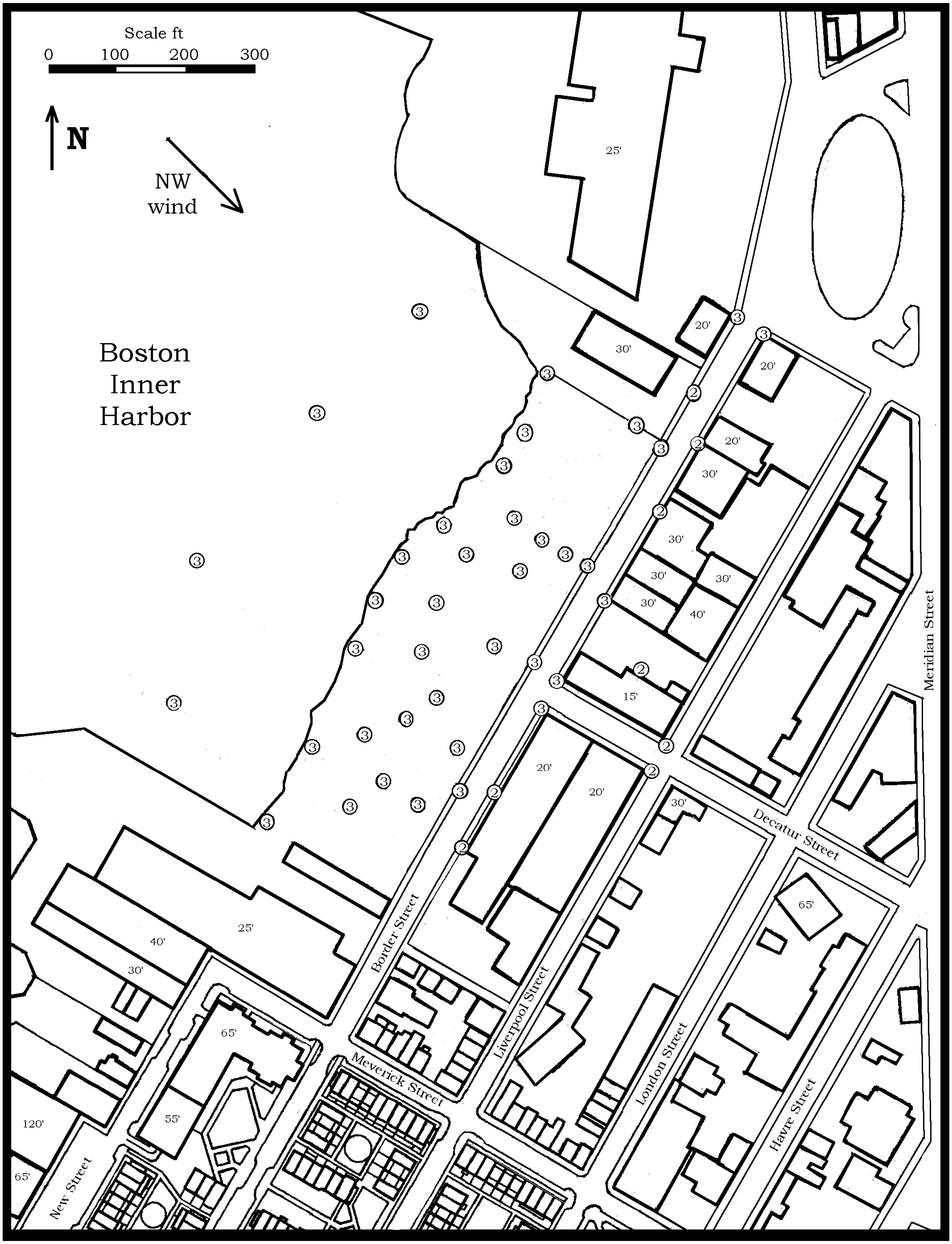


Figure 12. Map of Existing Conditions with
PLW Categories for NW winds

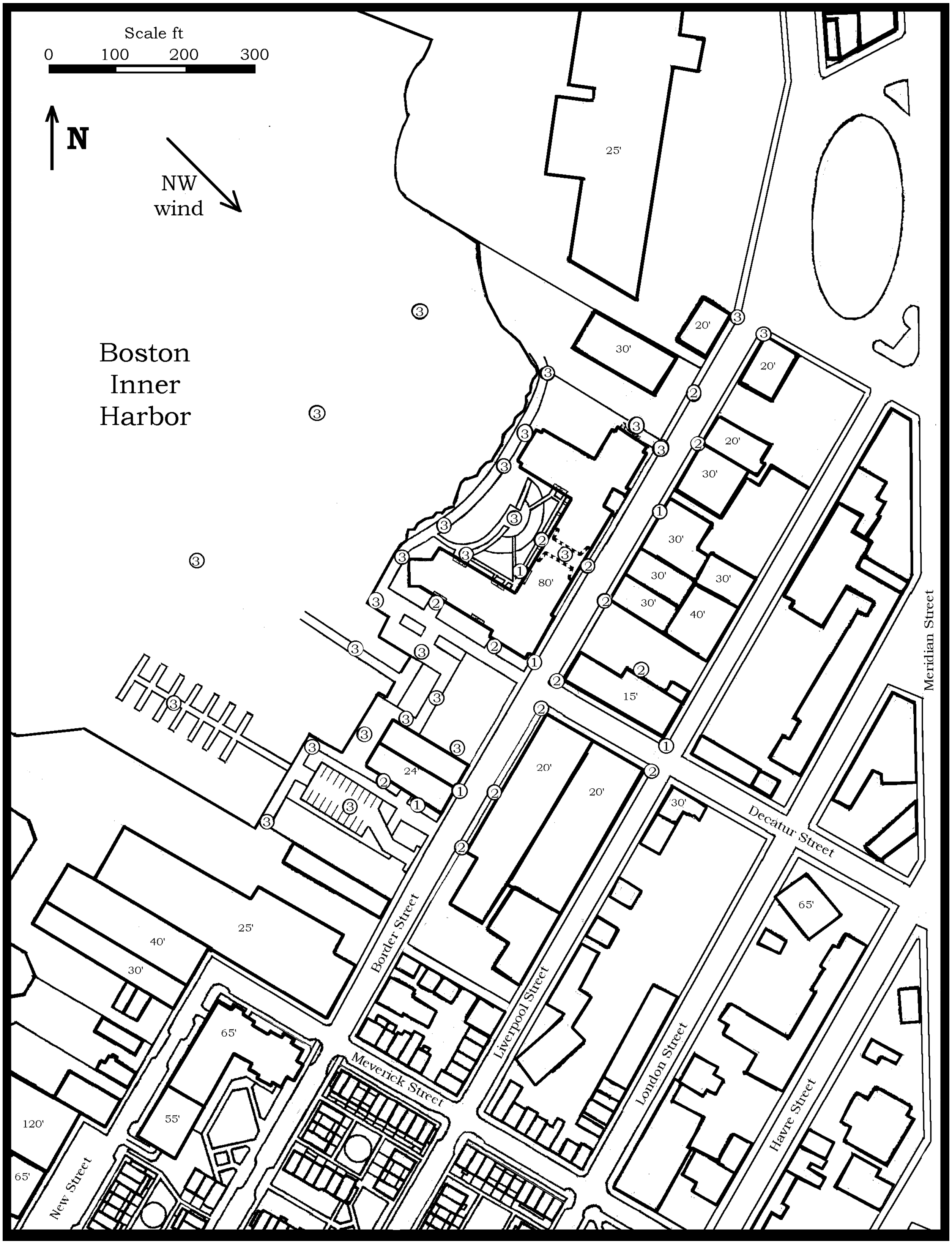


Figure 13. Map of Build Conditions with
PLW Categories for NW Winds

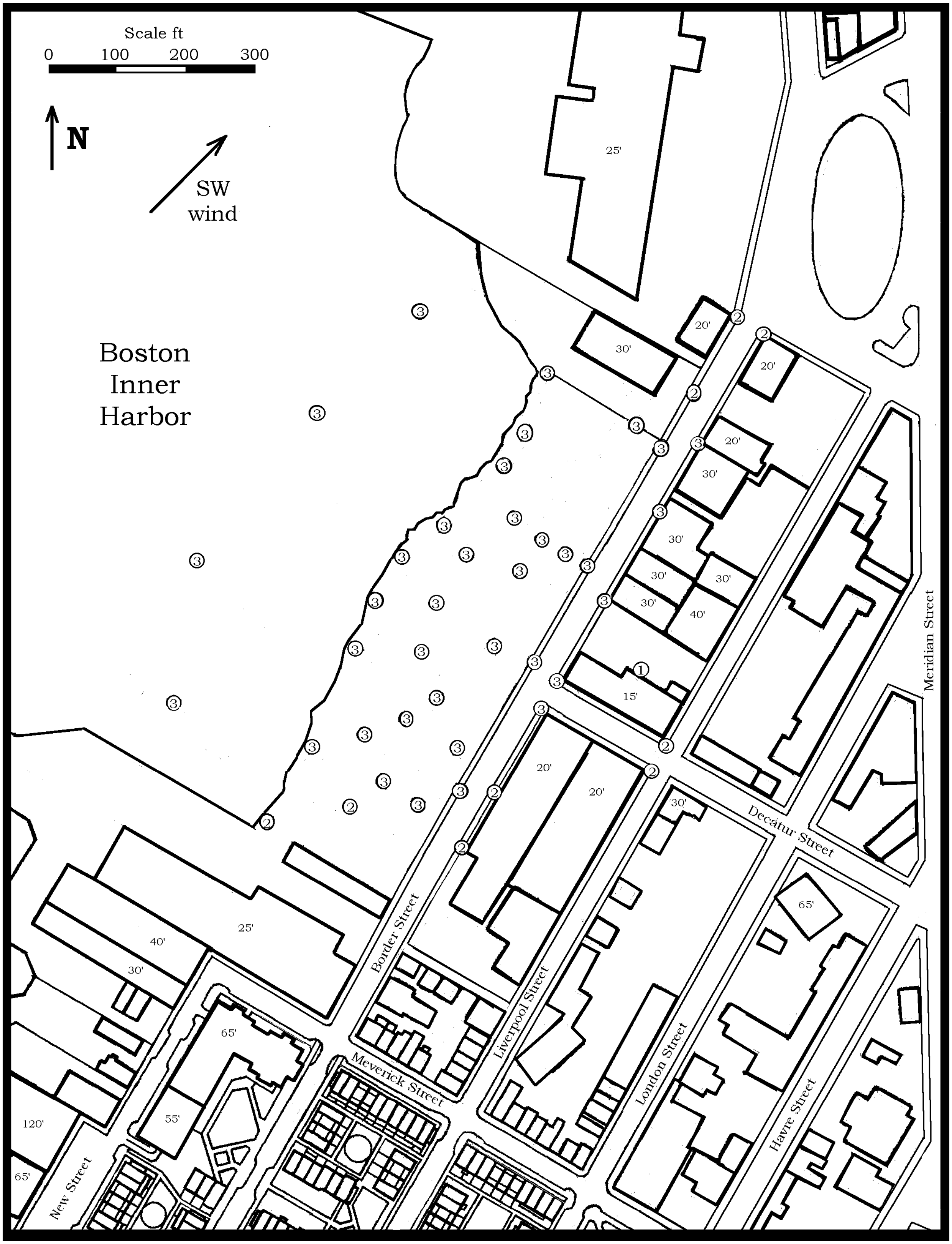


Figure 14. Map of Existing Conditions with
PLW Categories for SW Winds

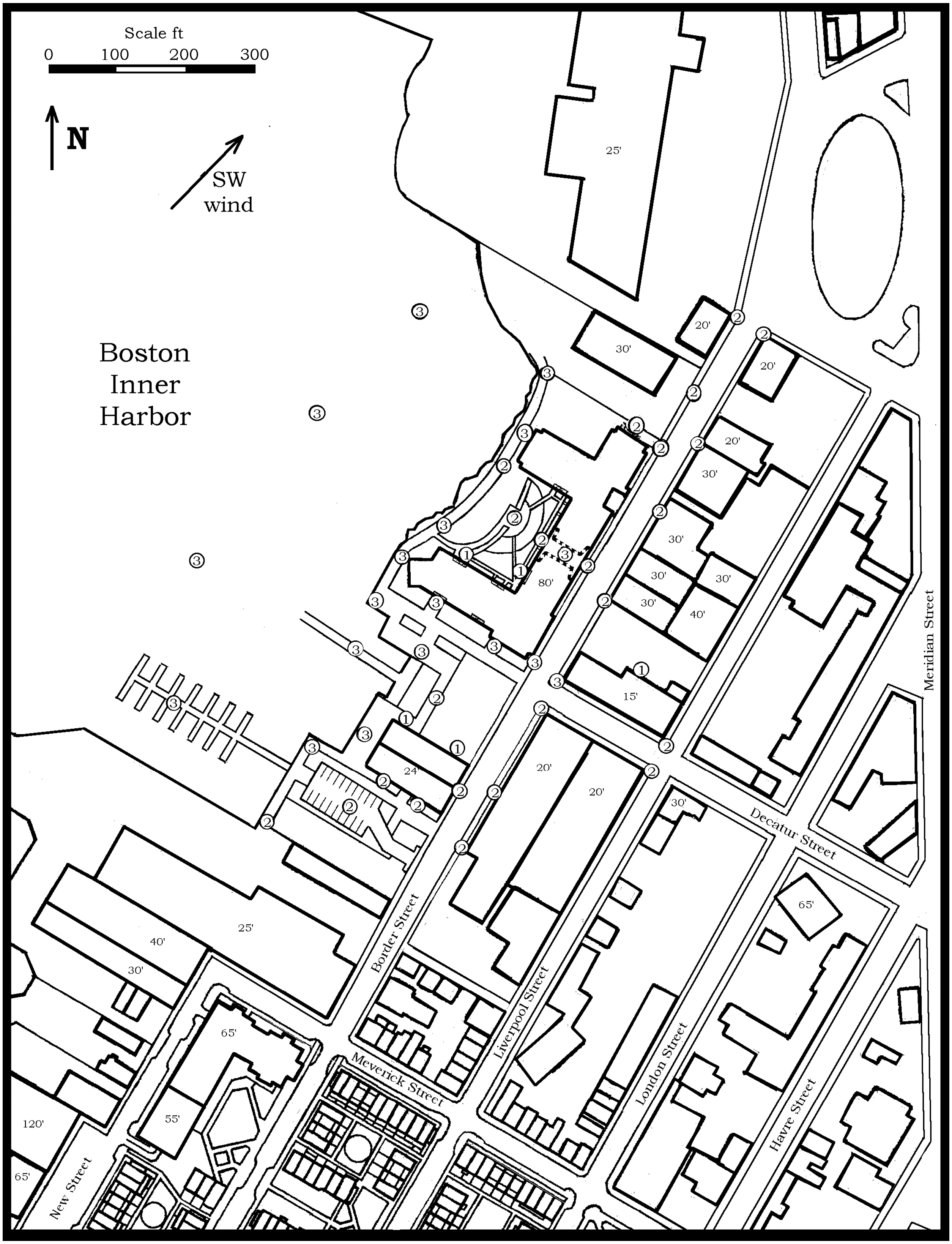


Figure 15. Map of Build Conditions with PLW Categories for SW Winds

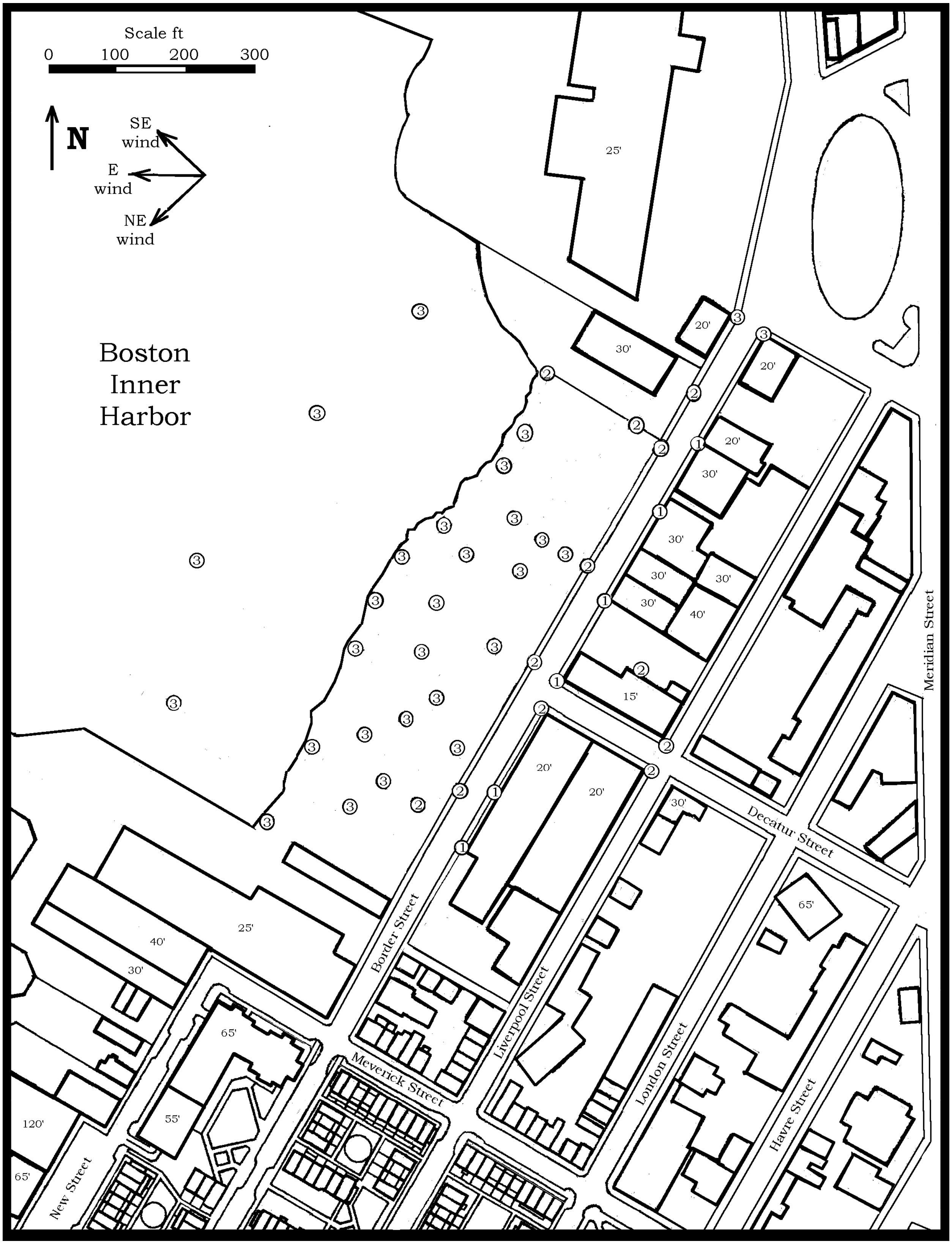


Figure 16. Map of Existing Conditions with PLW Categories for Easterly Storm Winds

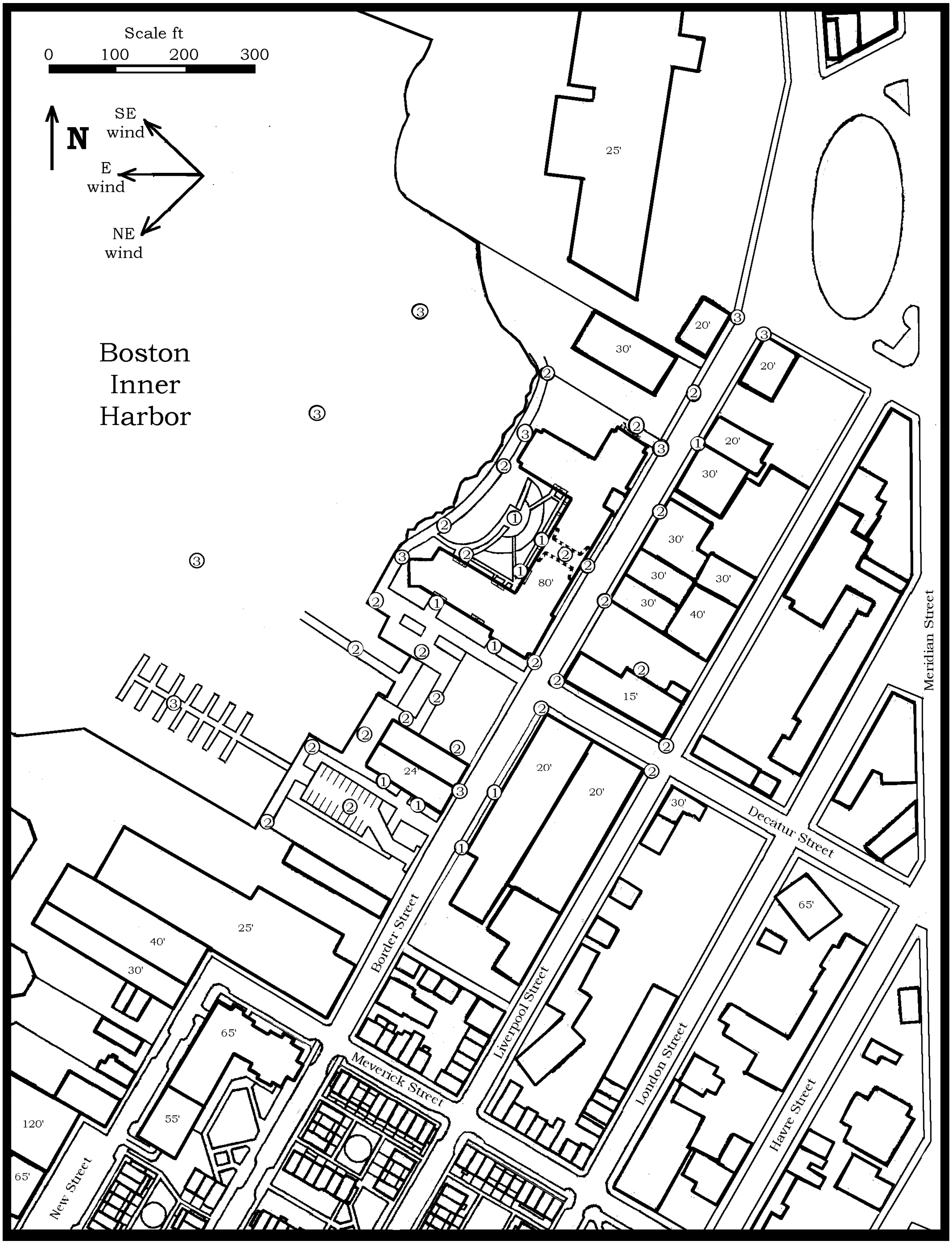


Figure 17. Map of Build Conditions with PLW Categories for Easterly Storm Winds

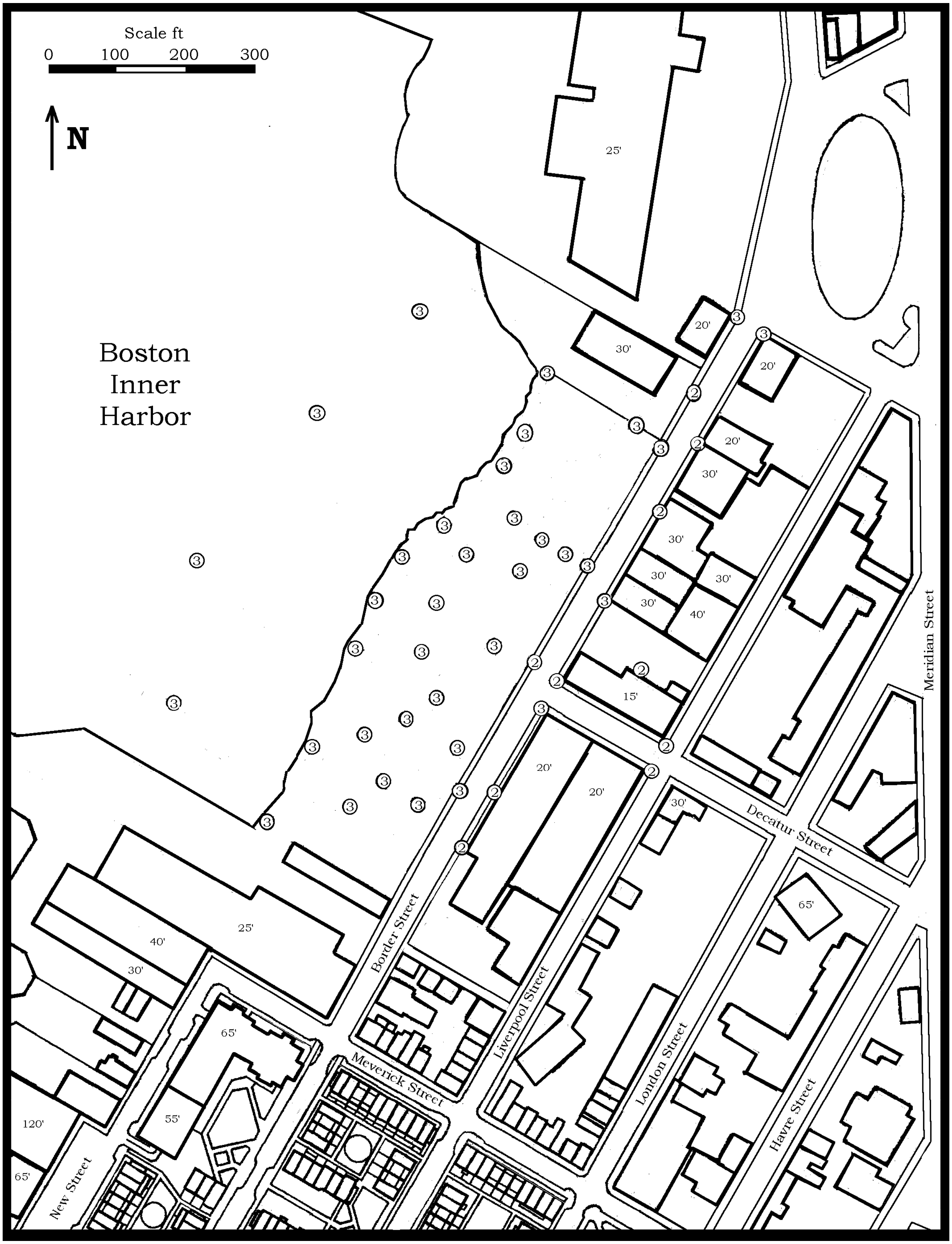


Figure 18. Map of Existing Conditions with
PLW Categories for Annual Winds

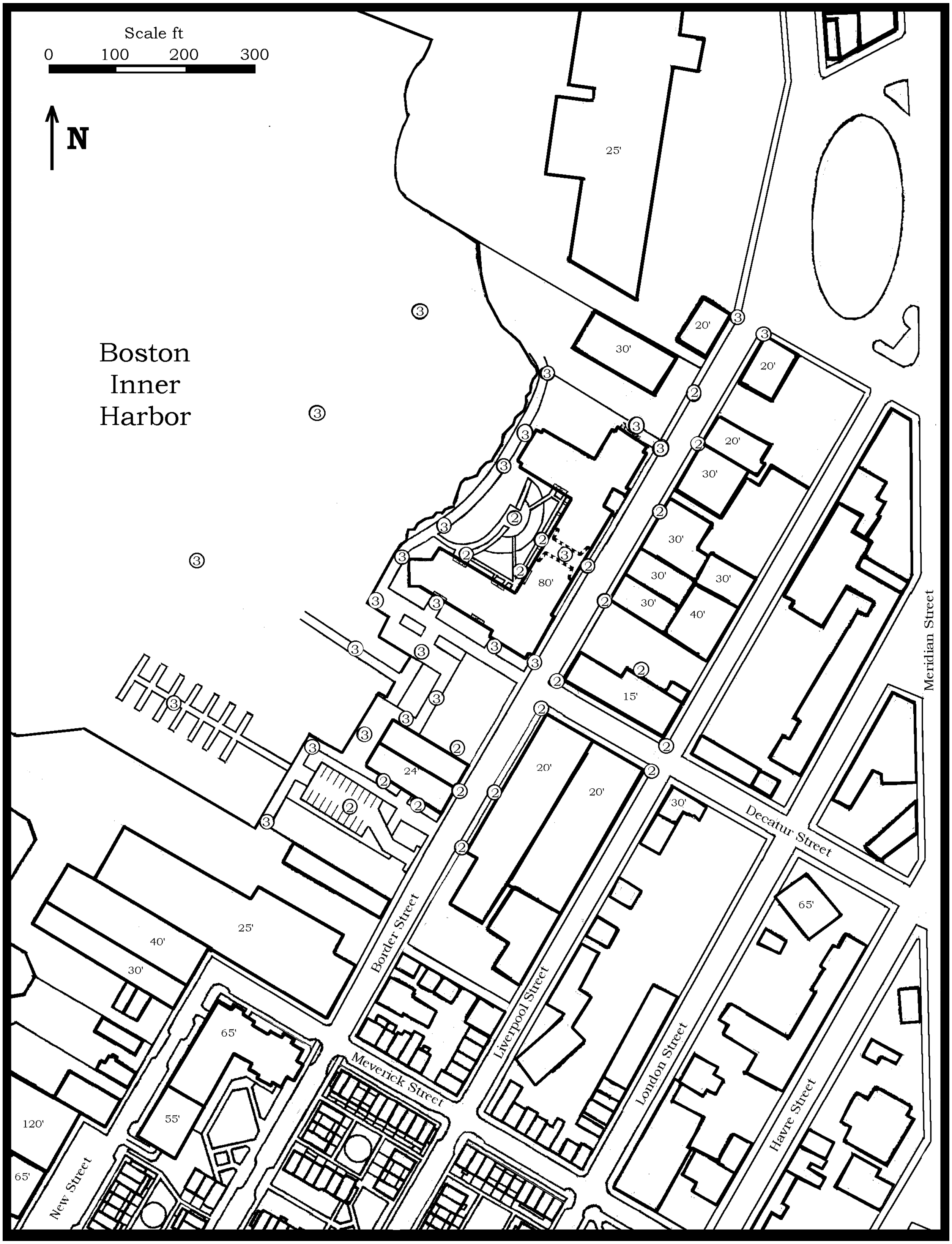


Figure 19. Map of Build Conditions with PLW Categories for Annual Winds

Appendix 8

LEED Checklist

LEED for New Construction v2.2
Registered Project Checklist

Boston East
East Boston, Massachusetts

Yes	?	No			
11		3		**Sustainable Sites**	**14** Points
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
1			Credit 2	**Development Density & Community Connectivity**	1
1			Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
		1	Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel-Efficient Vehicles	1
1			Credit 4.4	**Alternative Transportation**, Parking Capacity	1
		1	Credit 5.1	**Site Development,** Protect or Restore Habitat	1
1			Credit 5.2	**Site Development,** Maximize Open Space	1
1			Credit 6.1	**Stormwater Design,** Quantity Control	1
		1	Credit 6.2	**Stormwater Design,** Quality Control	1
1			Credit 7.1	**Heat Island Effect,** Non-Roof	1
1			Credit 7.2	**Heat Island Effect,** Roof	1
1			Credit 8	**Light Pollution Reduction**	1

Yes	?	No			
1	1	3		**Water Efficiency**	**5** Points
1			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	1		Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
		1	Credit 2	**Innovative Wastewater Technologies**	1
		1	Credit 3.1	**Water Use Reduction**, 20% Reduction	1
		1	Credit 3.2	**Water Use Reduction**, 30% Reduction	1

6	1	3			**Energy & Atmosphere**	**17** Points
Y			Prereq 1		**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 2		**Minimum Energy Performance**	Required
Y			Prereq 3		**Fundamental Refrigerant Management**	Required

***Note for EAc1**: All LEED for New Construction projects registered after June 26th, 2007 are required to achieve at least two (2) points under EAc1.

5			Credit 1		**Optimize Energy Performance**	1 to 10
					10.5% New Buildings or 3.5% Existing Building Renovations	1
					14% New Buildings or 7% Existing Building Renovations	2
					17.5% New Buildings or 10.5% Existing Building Renovations	3
					21% New Buildings or 14% Existing Building Renovations	4
				5	24.5% New Buildings or 17.5% Existing Building Renovations	5
					28% New Buildings or 21% Existing Building Renovations	6
					31.5% New Buildings or 24.5% Existing Building Renovations	7
					35% New Buildings or 28% Existing Building Renovations	8
					38.5% New Buildings or 31.5% Existing Building Renovations	9
					42% New Buildings or 35% Existing Building Renovations	10
		1	Credit 2		**On-Site Renewable Energy**	1 to 3
					2.5% Renewable Energy	1
					7.5% Renewable Energy	2
					12.5% Renewable Energy	3
	1		Credit 3		**Enhanced Commissioning**	1
1			Credit 4		**Enhanced Refrigerant Management**	1
		1	Credit 5		**Measurement & Verification**	1
		1	Credit 6		**Green Power**	1

continued…

Yes	?	No			
3	3	7	**Materials & Resources**		**13** Points
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Walls, Floors & Roof	1
		1	Credit 1.3	**Building Reuse**, Maintain 50% of Interior Non-Structural Elements	1
	1		Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
	1		Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
		1	Credit 3.1	**Materials Reuse**, 5%	1
		1	Credit 3.2	**Materials Reuse**,10%	1
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + ½ pre-consumer)	1
1			Credit 4.2	**Recycled Content**, 20% (post-consumer + ½ pre-consumer)	1
1			Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured Regio	1
	1		Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured Regio	1
		1	Credit 6	**Rapidly Renewable Materials**	1
		1	Credit 7	**Certified Wood**	1
Yes	?	No			
9	4	2	**Indoor Environmental Quality**		**15** Points
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
		1	Credit 1	**Outdoor Air Delivery Monitoring**	1
	1		Credit 2	**Increased Ventilation**	1
	1		Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
	1		Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
1			Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6.1	**Controllability of Systems**, Lighting	1
1			Credit 6.2	**Controllability of Systems**, Thermal Comfort	1
	1		Credit 7.1	**Thermal Comfort**, Design	1
		1	Credit 7.2	**Thermal Comfort**, Verification	1
1			Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
1			Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1
Yes	?	No			
1		4	**Innovation & Design Process**		**5** Points
		1	Credit 1.1	**Innovation in Design**: Provide Specific Title	1
		1	Credit 1.2	**Innovation in Design**: Provide Specific Title	1
		1	Credit 1.3	**Innovation in Design**: Provide Specific Title	1
		1	Credit 1.4	**Innovation in Design**: Provide Specific Title	1
1			Credit 2	**LEED® Accredited Professional**	1
Yes	?	No			
31	9	22	**Project Totals** (pre-certification estimates)		**69** Points

Certified: 26-32 points, **Silver:** 33-38 points, **Gold:** 39-51 points, **Platinum:** 52-69 pc

FORT POINT ASSOCIATES, INC.
Union Street, 3rd floor . Boston, MA 02108

Boston East

East Boston, Massachusetts

DRAFT ENVIRONMENTAL IMPACT REPORT
DRAFT PROJECT IMPACT REPORT
Volume 2 of 2

June 2, 2008

submitted to:
Boston Redevelopment Authority

Executive Office of Energy and Environmental Affairs
MEPA Office

prepared by:
Fort Point Associates, Inc.

in association with:
ICON architecture, inc.
McPhail Associates, Inc.
Nitsch Engineering
Woodland Design Group
Childs Engineering Corporation
WilmerHale
Public Archaeology Laboratory, Inc.

submitted by:
Trinity Border Street, LLC
a partnership between Trinity Financial, Inc. and
the East Boston Community Development Corporation

Appendix 6

TRANSPORTATION

APPENDIX 6. Transportation

6.1. Existing Traffic Volumes
6.2. Parking Counts
6.3. Central Square Conceptual Improvements
6.4. Project Trip Arrival Departure Patterns
6.5. Traffic Projection Model
6.6. Intersection Capacity Analysis
6.7. Traffic Signal Warrants

Border Street
North of Tellos

	9/26/2007			Hourly Total, every 15 min
	SB	NB	Total	
12:00	4	2	6	
12:15	3	3	6	
12:30	2	4	6	
12:45	4	4	8	26
1:00	0	2	2	22
1:15	0	5	5	21
1:30	5	3	8	23
1:45	0	4	4	19
2:00	0	2	2	19
2:15	0	2	2	16
2:30	1	1	2	10
2:45	3	1	4	10
3:00	3	1	4	12
3:15	1	3	4	14
3:30	2	3	5	17
3:45	1	1	2	15
4:00	5	3	8	19
4:15	4	6	10	25
4:30	6	6	12	32
4:45	2	12	14	44
5:00	12	10	22	58
5:15	15	13	28	76
5:30	20	21	41	105
5:45	19	19	38	129
6:00	23	29	52	159
6:15	39	54	93	224
6:30	47	58	105	288
6:45	43	33	76	326
7:00	29	35	64	**338**
7:15	32	37	69	314
7:30	47	30	77	286
7:45	45	45	90	300
8:00	42	34	76	312
8:15	46	31	77	320
8:30	33	36	69	312
8:45	38	43	81	303
9:00	30	45	75	302
9:15	22	38	60	285
9:30	32	41	73	289
9:45	31	54	85	293
10:00	24	33	57	275
10:15	31	35	66	281
10:30	22	57	79	287
10:45	29	52	81	283
11:00	35	42	77	303
11:15	35	68	103	340

11:30	36	54	90	351	
11:45	40	51	91	361	
12:00	89	48	137	421	
12:15	8	1	9	327	Vehicle parked on tube
12:30	14	2	16	253	Vehicle parked on tube
12:45	33	34	67	229	Vehicle parked on tube
13:00	51	84	135	227	
13:15	55	59	114	332	
13:30	44	61	105	421	
13:45	52	63	115	469	
14:00	57	73	130	464	
14:15	59	43	102	452	
14:30	53	28	81	428	
14:45	57	95	152	465	
15:00	65	79	144	**479**	
15:15	37	57	94	471	
15:30	32	49	81	471	
15:45	43	64	107	426	
16:00	38	49	87	369	
16:15	53	56	109	384	
16:30	51	50	101	404	
16:45	47	50	97	394	
17:00	16	34	50	357	
17:15	23	42	65	313	
17:30	29	34	63	275	
17:45	24	51	75	253	
18:00	31	39	70	273	
18:15	17	20	37	245	
18:30	16	28	44	226	
18:45	15	21	36	187	
19:00	11	12	23	140	
19:15	15	16	31	134	
19:30	15	24	39	129	
19:45	7	8	15	108	
20:00	9	12	21	106	
20:15	2	9	11	86	
20:30	9	6	15	62	
20:45	8	9	17	64	
21:00	5	4	9	52	
21:15	5	11	16	57	
21:30	2	1	3	45	
21:45	2	3	5	33	
22:00	3	5	8	32	
22:15	4	6	10	26	
22:30	5	2	7	30	
22:45	2	2	4	29	
23:00	4	4	8	29	
23:15	0	2	2	21	
23:30	1	0	1	15	
23:45	3	0	3	14	
Total	2164	2616	4780		

PRECISION
DATA
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Border Street bewteen
Central Square and Decatur Street
City, State: East Boston, MA
Client: Woodland Design/R. Woodland

71415Avolume
Site Code: 0607212

Start Time	SB A.M.		SB P.M.		NB A.M.		NB P.M.		Combined A.M.		Combined P.M.		03-Jan-08 Thu
12:00	4		16		1		23		5		39		
12:15	6		22		0		23		6		45		
12:30	6		28		0		28		6		56		
12:45	5	21	28	94	1	2	27	101	6	23	55	195	
01:00	3		21		2		35		5		56		
01:15	1		25		1		22		2		47		
01:30	3		23		2		25		5		48		
01:45	2	9	28	97	1	6	34	116	3	15	62	213	
02:00	1		26		0		20		1		46		
02:15	1		34		1		32		2		66		
02:30	3		42		0		34		3		76		
02:45	1	6	24	126	0	1	34	120	1	7	58	246	
03:00	2		22		0		32		2		54		
03:15	2		33		0		36		2		69		
03:30	0		30		0		38		0		68		
03:45	0	4	26	111	0	0	24	130	0	4	50	241	
04:00	1		33		0		37		1		70		
04:15	3		36		0		41		3		77		
04:30	2		37		3		33		5		70		
04:45	3	9	35	141	0	3	32	143	3	12	67	284	
05:00	6		42		2		38		8		80		
05:15	6		41		3		34		9		75		
05:30	4		40		1		26		5		66		
05:45	12	28	34	157	2	8	16	114	14	36	50	271	
06:00	7		27		2		23		9		50		
06:15	14		27		1		22		15		49		
06:30	14		18		0		11		14		29		
06:45	16	51	33	105	2	5	6	62	18	56	39	167	
07:00	14		27		1		13		15		40		
07:15	36		22		9		7		45		29		
07:30	22		26		8		15		30		41		
07:45	31	103	20	95	7	25	12	47	38	128	32	142	
08:00	45		18		20		6		65		24		
08:15	31		17		11		9		42		26		
08:30	34		20		15		7		49		27		
08:45	34	144	14	69	21	67	6	28	55	211	20	97	
09:00	40		16		16		7		56		23		
09:15	33		12		17		7		50		19		
09:30	19		11		11		6		30		17		
09:45	29	121	11	50	14	58	7	27	43	179	18	77	
10:00	21		5		10		4		31		9		
10:15	31		6		19		7		50		13		
10:30	29		14		15		2		44		16		
10:45	30	111	5	30	17	61	2	15	47	172	7	45	
11:00	31		6		20		2		51		8		
11:15	22		8		17		1		39		9		
11:30	32		5		9		3		41		8		
11:45	27	112	3	22	22	68	3	9	49	180	6	31	
Total	719		1097		304		912		1023		2009		
Percent	70.3%		54.6%		29.7%		45.4%						
Day Total		1816				1216				3032			
Peak	08:00		04:45		10:15		04:15		08:00		04:15		
Vol.	144		158		71		144		211		294		
P.H.F.	0.800		0.940		0.845		0.878		0.812		0.919		

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Border Street bewteen
Central Square and Decatur Street
City, State: East Boston, MA
Client: Woodland Design/R. Woodland

71415Avolume
Site Code: 0607212

Start Time	SB A.M.		SB P.M.		NB A.M.		NB P.M.		Combined A.M.		Combined P.M.		04-Jan-08 Fri
12:00	6		48		2		38		8		86		
12:15	6		30		0		26		6		56		
12:30	6		33		3		23		9		56		
12:45	1	19	29	140	2	7	28	115	3	26	57	255	
01:00	1		24		0		19		1		43		
01:15	1		33		1		29		2		62		
01:30	3		26		0		37		3		63		
01:45	2	7	30	113	0	1	33	118	2	8	63	231	
02:00	0		39		0		40		0		79		
02:15	2		34		1		39		3		73		
02:30	0		35		2		46		2		81		
02:45	4	6	36	144	0	3	32	157	4	9	68	301	
03:00	3		33		0		40		3		73		
03:15	1		39		0		38		1		77		
03:30	1		25		1		41		2		66		
03:45	0	5	31	128	1	2	57	176	1	7	88	304	
04:00	0		39		0		42		0		81		
04:15	0		45		3		32		3		77		
04:30	3		32		4		45		7		77		
04:45	2	5	30	146	0	7	49	168	2	12	79	314	
05:00	1		33		1		36		2		69		
05:15	1		33		2		40		3		73		
05:30	2		24		1		52		3		76		
05:45	5	9	32	122	2	6	18	146	7	15	50	268	
06:00	8		26		7		24		15		50		
06:15	20		24		4		32		24		56		
06:30	18		21		3		18		21		39		
06:45	14	60	24	95	7	21	29	103	21	81	53	198	
07:00	20		19		5		13		25		32		
07:15	24		19		8		10		32		29		
07:30	22		22		18		11		40		33		
07:45	24	90	15	75	17	48	18	52	41	138	33	127	
08:00	27		27		24		22		51		49		
08:15	28		13		16		14		44		27		
08:30	18		15		12		15		30		30		
08:45	46	119	14	69	21	73	17	68	67	192	31	137	
09:00	35		20		11		15		46		35		
09:15	31		17		14		13		45		30		
09:30	28		12		20		4		48		16		
09:45	20	114	12	61	23	68	7	39	43	182	19	100	
10:00	23		8		22		10		45		18		
10:15	17		12		34		8		51		20		
10:30	28		16		18		13		46		29		
10:45	20	88	14	50	15	89	5	36	35	177	19	86	
11:00	24		6		18		6		42		12		
11:15	19		9		20		4		39		13		
11:30	20		4		22		7		42		11		
11:45	29	92	12	31	50	110	6	23	79	202	18	54	
Total	614		1174		435		1201		1049		2375		
Percent	58.5%		49.4%		41.5%		50.6%						
Day Total		1788				1636				3424			
Peak	08:45		03:45		11:00		03:15		08:45		03:45		
Vol.	140		147		110		178		206		323		
P.H.F.	0.761		0.817		0.550		0.781		0.769		0.918		

PRECISION DATA INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Border Street bewteen
Central Square and Decatur Street
City, State: East Boston, MA
Client: Woodland Design/R. Woodland

71415Avolume
Site Code: 0607212

Start Time	SB A.M.		SB P.M.		NB A.M.		NB P.M.		Combined A.M.		Combined P.M.		05-Jan-08 Sat
12:00	5		17		6		32		11		49		
12:15	4		29		10		22		14		51		
12:30	1		26		7		16		8		42		
12:45	0	10	27	99	3	26	29	99	3	36	56	198	
01:00	4		27		3		46		7		73		
01:15	2		27		5		24		7		51		
01:30	7		30		1		23		8		53		
01:45	1	14	40	124	0	9	21	114	1	23	61	238	
02:00	2		27		7		30		9		57		
02:15	4		26		5		26		9		52		
02:30	2		29		0		26		2		55		
02:45	0	8	22	104	0	12	35	117	0	20	57	221	
03:00	4		31		3		30		7		61		
03:15	1		26		0		24		1		50		
03:30	2		24		1		22		3		46		
03:45	3	10	38	119	1	5	21	97	4	15	59	216	
04:00	2		28		2		27		4		55		
04:15	2		22		2		17		4		39		
04:30	2		22		2		21		4		43		
04:45	0	6	34	106	2	8	22	87	2	14	56	193	
05:00	0		24		3		35		3		59		
05:15	2		18		0		21		2		39		
05:30	0		29		2		22		2		51		
05:45	1	3	27	98	1	6	19	97	2	9	46	195	
06:00	5		22		7		28		12		50		
06:15	4		18		2		13		6		31		
06:30	7		22		3		17		10		39		
06:45	4	20	22	84	3	15	17	75	7	35	39	159	
07:00	5		22		2		20		7		42		
07:15	0		20		4		10		4		30		
07:30	4		15		4		7		8		22		
07:45	5	14	19	76	7	17	14	51	12	31	33	127	
08:00	13		15		10		24		23		39		
08:15	6		19		9		9		15		28		
08:30	15		17		6		21		21		38		
08:45	17	51	11	62	10	35	15	69	27	86	26	131	
09:00	20		14		18		13		38		27		
09:15	12		10		16		7		28		17		
09:30	22		14		13		13		35		27		
09:45	19	73	14	52	16	63	7	40	35	136	21	92	
10:00	23		9		19		13		42		22		
10:15	21		8		25		12		46		20		
10:30	17		7		27		13		44		20		
10:45	19	80	5	29	26	97	6	44	45	177	11	73	
11:00	20		3		32		6		52		9		
11:15	21		0		23		9		44		9		
11:30	27		9		25		6		52		15		
11:45	24	92	5	17	27	107	2	23	51	199	7	40	
Total	381		970		400		913		781		1883		
Percent	48.8%		51.5%		51.2%		48.5%						
Day Total		1351				1313				2664			
Peak	11:00		01:00		10:15		00:45		11:00		01:00		
Vol.	92		124		110		122		199		238		
P.H.F.	0.852		0.775		0.859		0.663		0.957		0.815		

Decatur Street
east of Border Street
City, State: East Boston, MA
Client: Woodland Design/R. Woodland

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

71415Bvolume
Site Code: 0607212

Start	WB				EB				Combined				03-Jan-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	1		5		1		11		2		16		
12:15	0		9		0		9		0		18		
12:30	1		11		0		10		1		21		
12:45	2	4	9	34	0	1	9	39	2	5	18	73	
01:00	0		11		0		8		0		19		
01:15	0		7		0		6		0		13		
01:30	0		4		1		10		1		14		
01:45	0	0	11	33	0	1	9	33	0	1	20	66	
02:00	0		8		0		9		0		17		
02:15	0		9		1		8		1		17		
02:30	0		14		0		13		0		27		
02:45	0	0	15	46	0	1	7	37	0	1	22	83	
03:00	1		19		0		10		1		29		
03:15	0		11		0		7		0		18		
03:30	1		17		0		25		1		42		
03:45	0	2	5	52	1	1	12	54	1	3	17	106	
04:00	0		15		0		13		0		28		
04:15	0		5		1		15		1		20		
04:30	1		11		0		7		1		18		
04:45	0	1	18	49	0	1	5	40	0	2	23	89	
05:00	0		12		2		12		2		24		
05:15	2		11		0		15		2		26		
05:30	0		14		0		10		0		24		
05:45	1	3	7	44	2	4	7	44	3	7	14	88	
06:00	3		11		2		6		5		17		
06:15	0		7		1		6		1		13		
06:30	0		13		1		5		1		18		
06:45	4	7	10	41	5	9	12	29	9	16	22	70	
07:00	4		8		4		6		8		14		
07:15	3		5		4		3		7		8		
07:30	3		6		7		7		10		13		
07:45	6	16	12	31	12	27	11	27	18	43	23	58	
08:00	4		0		16		3		20		3		
08:15	9		4		7		5		16		9		
08:30	4		3		10		11		14		14		
08:45	4	21	1	8	18	51	3	22	22	72	4	30	
09:00	5		1		7		0		12		1		
09:15	10		1		6		1		16		2		
09:30	8		1		5		3		13		4		
09:45	8	31	4	7	10	28	2	6	18	59	6	13	
10:00	4		3		3		1		7		4		
10:15	5		3		5		1		10		4		
10:30	7		3		11		0		18		3		
10:45	5	21	3	12	16	35	0	2	21	56	3	14	
11:00	15		1		13		0		28		1		
11:15	7		0		10		1		17		1		
11:30	4		3		7		2		11		5		
11:45	10	36	0	4	8	38	0	3	18	74	0	7	
Total	142		361		197		336		339		697		
Percent	41.9%		51.8%		58.1%		48.2%						
Day Total		503				533				1036			
Peak	11:00		02:45		08:00		03:30		10:30		02:45		
Vol.	36		62		51		65		84		111		
P.H.F.	0.600		0.816		0.708		0.650		0.750		0.661		

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Decatur Street
east of Border Street
City, State: East Boston, MA
Client: Woodland Design/R. Woodland

71415Bvolume
Site Code: 0607212

Start Time	WB A.M.		WB P.M.		EB A.M.		EB P.M.		Combined A.M.		Combined P.M.		04-Jan-08 Fri
12:00	2		18		1		14		3		32		
12:15	1		21		1		12		2		33		
12:30	0		10		1		9		1		19		
12:45	0	3	15	64	0	3	16	51	0	6	31	115	
01:00	1		11		0		14		1		25		
01:15	0		9		0		10		0		19		
01:30	0		12		0		10		0		22		
01:45	0	1	18	50	0	0	14	48	0	1	32	98	
02:00	0		16		0		12		0		28		
02:15	1		16		0		9		1		25		
02:30	0		26		1		13		1		39		
02:45	0	1	15	73	1	2	9	43	1	3	24	116	
03:00	0		16		1		17		1		33		
03:15	1		20		0		22		1		42		
03:30	0		12		0		20		0		32		
03:45	2	3	17	65	1	2	10	69	3	5	27	134	
04:00	0		31		0		13		0		44		
04:15	0		12		0		9		0		21		
04:30	0		18		0		14		0		32		
04:45	0	0	17	78	0	0	9	45	0	0	26	123	
05:00	0		17		1		7		1		24		
05:15	1		18		0		16		1		34		
05:30	1		39		1		12		2		51		
05:45	1	3	9	83	1	3	8	43	2	6	17	126	
06:00	4		11		1		13		5		24		
06:15	4		10		3		2		7		12		
06:30	0		7		7		7		7		14		
06:45	3	11	7	35	5	16	7	29	8	27	14	64	
07:00	4		3		4		13		8		16		
07:15	6		8		4		5		10		13		
07:30	3		4		4		13		7		17		
07:45	3	16	1	16	9	21	8	39	12	37	9	55	
08:00	7		5		7		6		14		11		
08:15	12		9		8		5		20		14		
08:30	1		6		11		4		12		10		
08:45	6	26	11	31	6	32	1	16	12	58	12	47	
09:00	8		6		9		4		17		10		
09:15	8		8		10		0		18		8		
09:30	10		2		6		3		16		5		
09:45	12	38	5	21	12	37	5	12	24	75	10	33	
10:00	10		3		11		2		21		5		
10:15	6		0		9		1		15		1		
10:30	16		3		8		3		24		6		
10:45	5	37	7	13	10	38	4	10	15	75	11	23	
11:00	10		2		12		1		22		3		
11:15	6		1		7		6		13		7		
11:30	4		3		7		3		11		6		
11:45	19	39	2	8	9	35	2	12	28	74	4	20	
Total	178		537		189		417		367		954		
Percent	48.5%		56.3%		51.5%		43.7%						
Day Total		715				606				1321			
Peak	09:45		04:45		09:45		03:00		09:45		03:15		
Vol.	44		91		40		69		84		145		
P.H.F.	0.688		0.583		0.833		0.784		0.875		0.824		

Decatur Street
east of Border Street
City, State: East Boston, MA
Client: Woodland Design/R. Woodland

PRECISION DATA INDUSTRIES, LLC
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71415Bvolume
Site Code: 0607212

Start	WB				EB				Combined				05-Jan-08
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	2		8		2		12		4		20		
12:15	0		4		0		8		0		12		
12:30	6		6		1		5		7		11		
12:45	0	8	9	27	0	3	10	35	0	11	19	62	
01:00	2		19		0		11		2		30		
01:15	1		14		0		8		1		22		
01:30	0		9		0		13		0		22		
01:45	1	4	10	52	6	6	7	39	7	10	17	91	
02:00	1		15		1		17		2		32		
02:15	2		5		2		9		4		14		
02:30	1		4		1		11		2		15		
02:45	0	4	12	36	0	4	12	49	0	8	24	85	
03:00	2		17		0		6		2		23		
03:15	0		11		1		9		1		20		
03:30	0		13		1		8		1		21		
03:45	0	2	5	46	2	4	8	31	2	6	13	77	
04:00	0		8		0		6		0		14		
04:15	0		10		1		8		1		18		
04:30	1		6		0		6		1		12		
04:45	1	2	12	36	1	2	8	28	2	4	20	64	
05:00	4		14		0		11		4		25		
05:15	0		13		0		8		0		21		
05:30	0		10		1		6		1		16		
05:45	1	5	3	40	1	2	2	27	2	7	5	67	
06:00	0		5		2		5		2		10		
06:15	0		4		2		6		2		10		
06:30	1		0		4		9		5		9		
06:45	3	4	7	16	1	9	8	28	4	13	15	44	
07:00	1		6		0		10		1		16		
07:15	1		4		1		7		2		11		
07:30	0		7		1		5		1		12		
07:45	1	3	7	24	2	4	6	28	3	7	13	52	
08:00	3		2		4		3		7		5		
08:15	2		8		1		5		3		13		
08:30	2		2		4		5		6		7		
08:45	4	11	6	18	5	14	3	16	9	25	9	34	
09:00	6		2		5		4		11		6		
09:15	4		0		3		4		7		4		
09:30	3		4		7		4		10		8		
09:45	6	19	3	9	5	20	3	15	11	39	6	24	
10:00	8		3		6		1		14		4		
10:15	8		5		8		3		16		8		
10:30	4		2		7		3		11		5		
10:45	9	29	2	12	10	31	2	9	19	60	4	21	
11:00	10		2		20		3		30		5		
11:15	13		5		8		1		21		6		
11:30	9		2		10		3		19		5		
11:45	13	45	0	9	10	48	2	9	23	93	2	18	
Total	136		325		147		314		283		639		
Percent	48.1%		50.9%		51.9%		49.1%						
Day Total		461				461				922			
Peak	11:00		02:45		10:45		02:00		11:00		00:45		
Vol.	45		53		48		49		93		93		
P.H.F.	0.865		0.779		0.600		0.721		0.775		0.775		

Accurate Counts
978-664-2565

N/S Street : Meridian Street
E/W Street: Saratoga Street
City/State : Boston, MA
Weather : Clear

File Name : 71490001
Site Code : 71490001
Start Date : 9/13/2007
Page No : 1

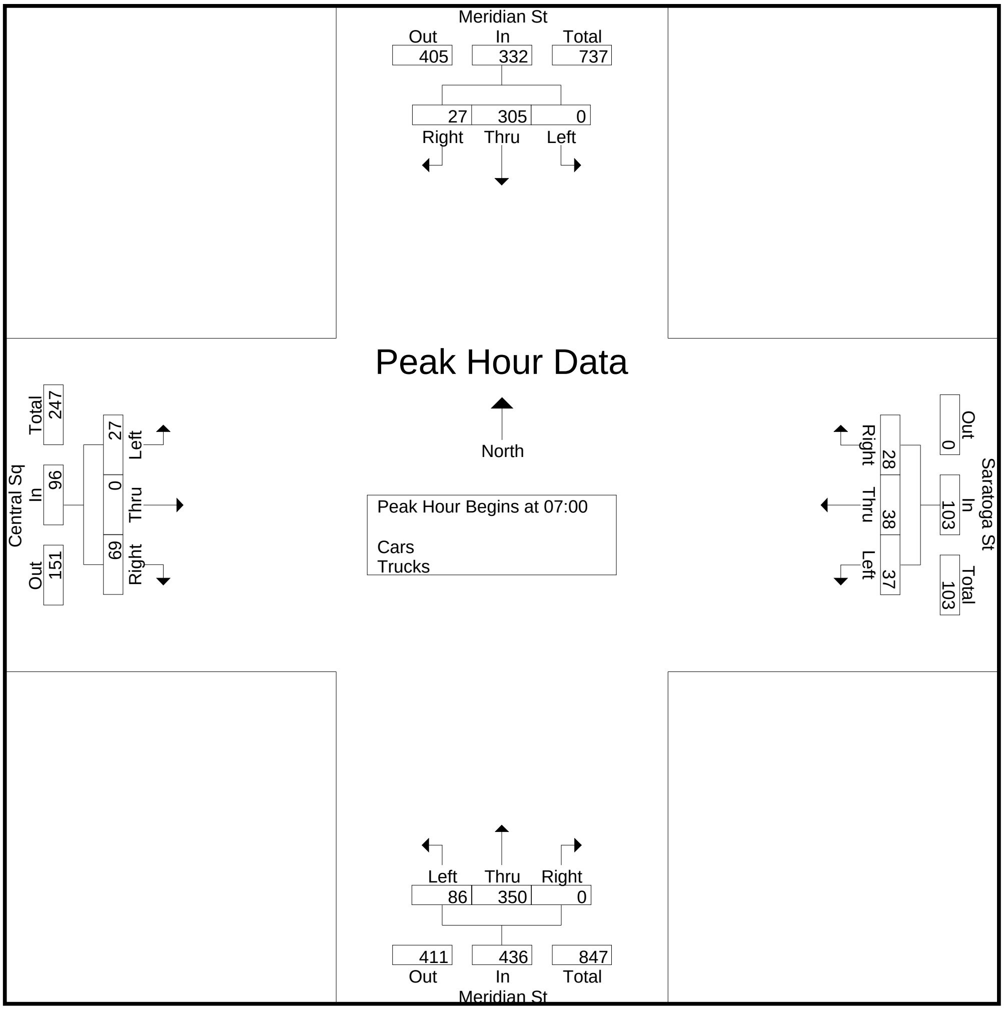
Groups Printed- Cars - Trucks

	Meridian St From North				Saratoga St From East				Meridian St From South				Central Sq From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	0	68	6	15	8	15	11	27	32	99	0	5	5	0	14	13	60	258	318
07:15	0	87	7	15	11	8	6	32	24	92	0	18	9	0	25	37	102	269	371
07:30	0	68	9	17	10	8	6	35	13	95	0	14	10	0	18	17	83	237	320
07:45	0	82	5	5	8	7	5	34	17	64	0	6	3	0	12	24	69	203	272
Total	0	305	27	52	37	38	28	128	86	350	0	43	27	0	69	91	314	967	1281
08:00	0	101	6	16	16	8	8	34	17	67	0	11	5	0	17	23	84	245	329
08:15	0	93	4	15	14	6	6	26	20	81	0	13	12	0	19	20	74	255	329
08:30	0	85	4	10	5	3	3	25	16	79	0	4	5	0	10	17	56	210	266
08:45	0	90	8	15	1	10	3	42	15	84	0	15	8	0	17	14	86	236	322
Total	0	369	22	56	36	27	20	127	68	311	0	43	30	0	63	74	300	946	1246
Grand Total	0	674	49	108	73	65	48	255	154	661	0	86	57	0	132	165	614	1913	2527
Apprch %	0	93.2	6.8		39.2	34.9	25.8		18.9	81.1	0		30.2	0	69.8				
Total %	0	35.2	2.6		3.8	3.4	2.5		8.1	34.6	0		3	0	6.9		24.3	75.7	
Cars	0	614	44		68	62	46		136	585	0		49	0	109		0	0	2327
% Cars	0	91.1	89.8	100	93.2	95.4	95.8	100	88.3	88.5	0	100	86	0	82.6	100	0	0	92.1
Trucks	0	60	5		5	3	2		18	76	0		8	0	23		0	0	200
% Trucks	0	8.9	10.2	0	6.8	4.6	4.2	0	11.7	11.5	0	0	14	0	17.4	0	0	0	7.9

	Meridian St From North				Saratoga St From East				Meridian St From South				Central Sq From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	68	6	74	8	15	11	34	32	99	0	131	5	0	14	19	258
07:15	0	87	7	94	11	8	6	25	24	92	0	116	9	0	25	34	269
07:30	0	68	9	77	10	8	6	24	13	95	0	108	10	0	18	28	237
07:45	0	82	5	87	8	7	5	20	17	64	0	81	3	0	12	15	203
Total Volume	0	305	27	332	37	38	28	103	86	350	0	436	27	0	69	96	967
% App. Total	0	91.9	8.1		35.9	36.9	27.2		19.7	80.3	0		28.1	0	71.9		
PHF	.000	.876	.750	.883	.841	.633	.636	.757	.672	.884	.000	.832	.675	.000	.690	.706	.899

Accurate Counts
978-664-2565

File Name : 71490001
Site Code : 71490001
Start Date : 9/13/2007
Page No : 2



N/S Street : Meridian Street
E/W Street: Saratoga Street
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490001
Site Code : 71490001
Start Date : 9/13/2007
Page No : 1

Groups Printed- Cars - Trucks

	Meridian St From North				Saratoga St From East				Meridian St From South				Central Sq From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	0	67	6	66	8	8	9	86	17	108	0	23	24	0	19	21	196	266	462
16:15	0	83	6	41	7	10	5	104	18	119	0	33	11	0	21	30	208	280	488
16:30	0	65	9	52	12	10	13	89	26	123	0	12	16	0	28	34	187	302	489
16:45	0	78	5	50	11	11	12	79	32	101	0	14	13	0	28	24	167	291	458
Total	0	293	26	209	38	39	39	358	93	451	0	82	64	0	96	109	758	1139	1897
17:00	0	77	9	33	11	13	11	44	26	103	0	17	33	0	24	34	128	307	435
17:15	0	81	13	43	5	16	7	93	30	118	0	30	15	0	20	21	187	305	492
17:30	0	66	7	36	4	9	10	68	30	110	0	21	14	0	13	26	151	263	414
17:45	0	81	10	49	4	13	11	69	32	98	0	18	7	0	27	19	155	283	438
Total	0	305	39	161	24	51	39	274	118	429	0	86	69	0	84	100	621	1158	1779
Grand Total	0	598	65	370	62	90	78	632	211	880	0	168	133	0	180	209	1379	2297	3676
Apprch %	0	90.2	9.8		27	39.1	33.9		19.3	80.7	0		42.5	0	57.5				
Total %	0	26	2.8		2.7	3.9	3.4		9.2	38.3	0		5.8	0	7.8		37.5	62.5	
Cars	0	577	63		61	90	75		206	843	0		129	0	161		0	0	3584
% Cars	0	96.5	96.9	100	98.4	100	96.2	100	97.6	95.8	0	100	97	0	89.4	100	0	0	97.5
Trucks	0	21	2		1	0	3		5	37	0		4	0	19		0	0	92
% Trucks	0	3.5	3.1	0	1.6	0	3.8	0	2.4	4.2	0	0	3	0	10.6	0	0	0	2.5

	Meridian St From North				Saratoga St From East				Meridian St From South				Central Sq From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	0	65	9	74	12	10	13	35	26	123	0	149	16	0	28	44	302
16:45	0	78	5	83	11	11	12	34	32	101	0	133	13	0	28	41	291
17:00	0	77	9	86	11	13	11	35	26	103	0	129	33	0	24	57	307
17:15	0	81	13	94	5	16	7	28	30	118	0	148	15	0	20	35	305
Total Volume	0	301	36	337	39	50	43	132	114	445	0	559	77	0	100	177	1205
% App. Total	0	89.3	10.7		29.5	37.9	32.6		20.4	79.6	0		43.5	0	56.5		
PHF	.000	.929	.692	.896	.813	.781	.827	.943	.891	.904	.000	.938	.583	.000	.893	.776	.981

Accurate Counts
978-664-2565

File Name : 71490001
Site Code : 71490001
Start Date : 9/13/2007
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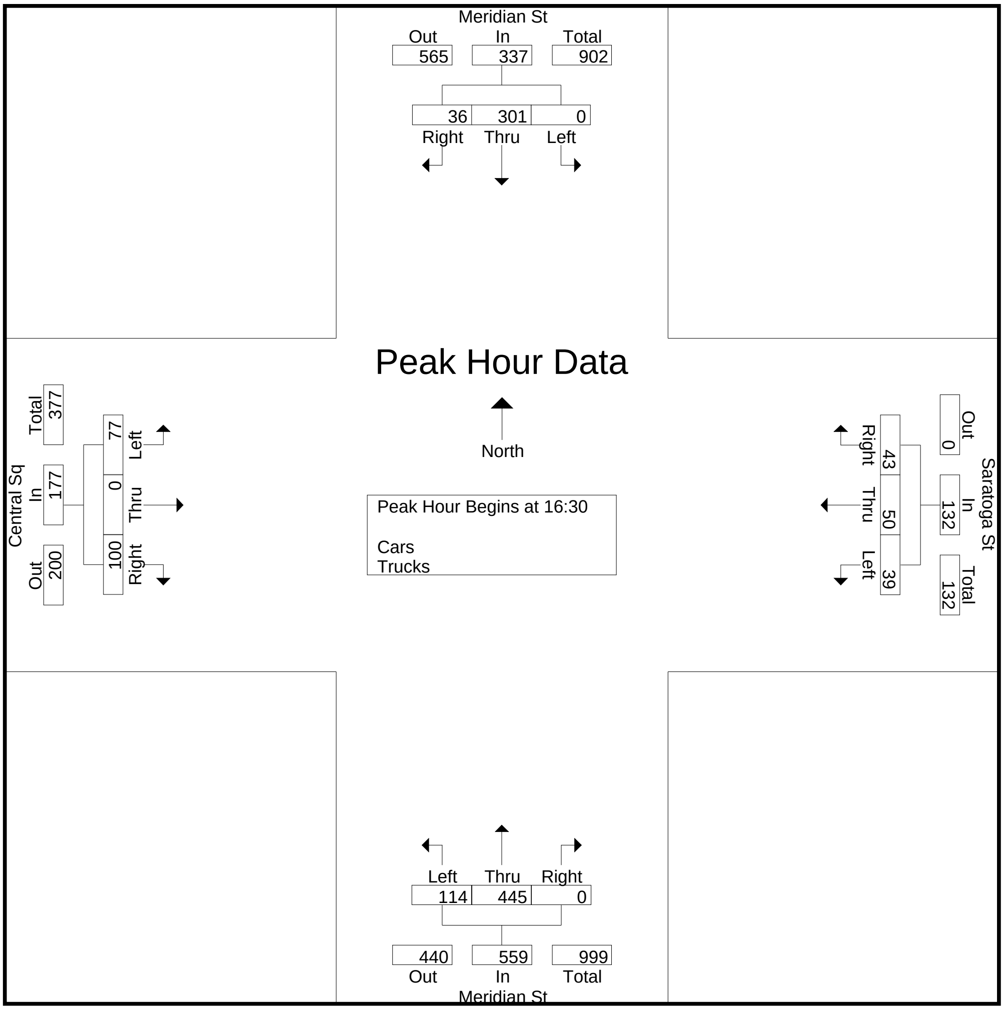


N/S Street : Meridian Street
E/W Street: Bennington St / Porter St
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490006
Site Code : 71490006
Start Date : 9/13/2007
Page No : 1

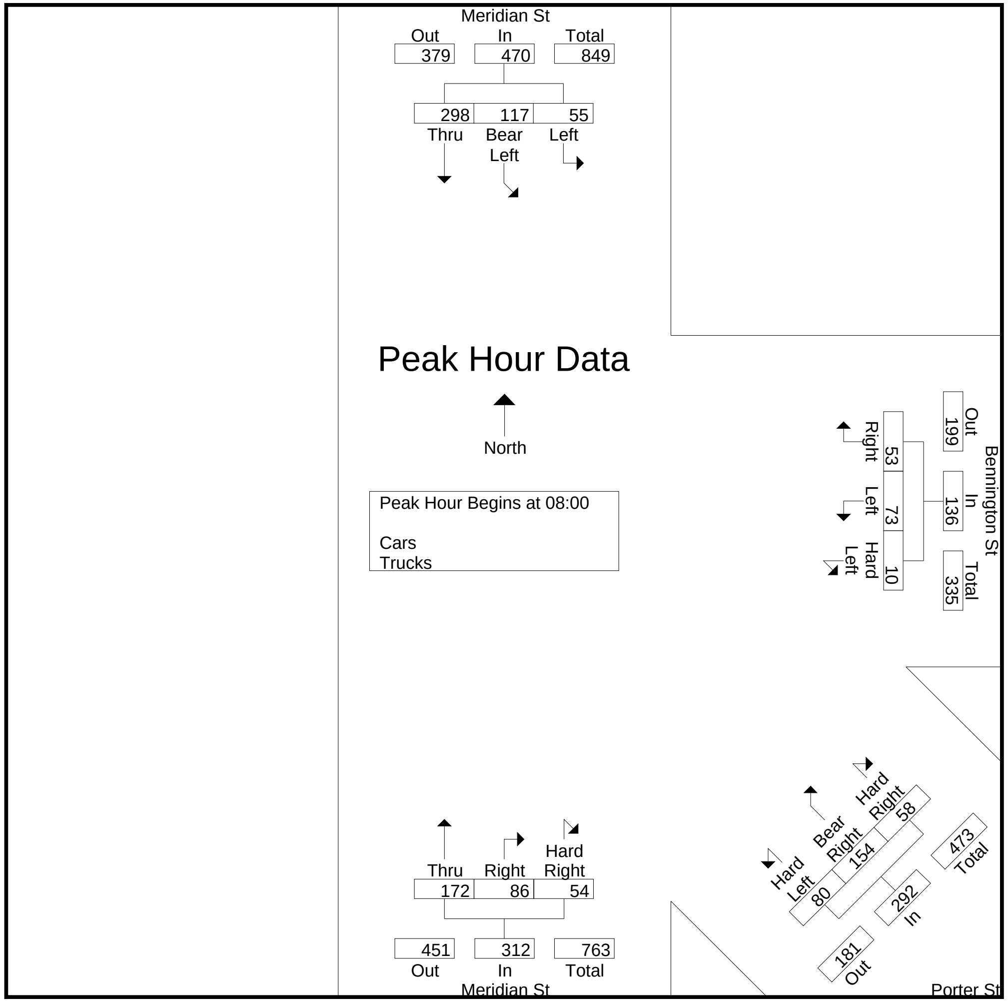
Groups Printed- Cars - Trucks

	Meridian St From North					Bennington St From East				Porter St From Southeast					Meridian St From South							
Start Time	Left	Bear Left	Thru	U-Trn	Peds	Hard Left	Left	Right	Peds	Hard Left	Bear Right	Hard Right	U-Trn	Peds	Thru	Right	Hard Right	U-Trn	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	14	24	49	3	9	2	14	18	35	13	52	6	1	25	63	9	6	0	2	75	270	345
07:15	26	29	71	5	4	2	21	7	43	16	58	5	1	46	48	20	12	0	13	112	315	427
07:30	11	32	47	7	4	4	11	9	41	11	43	3	2	39	39	18	14	0	3	96	242	338
07:45	11	25	67	2	19	4	18	6	32	7	41	5	2	40	29	19	14	1	3	99	246	345
Total	62	110	234	17	36	12	64	40	151	47	194	19	6	150	179	66	46	1	21	382	1073	1455
08:00	20	25	95	6	18	5	20	10	40	18	44	11	4	45	31	25	19	0	9	122	323	445
08:15	19	35	70	4	22	0	13	14	61	21	37	9	6	43	49	18	17	0	11	147	302	449
08:30	7	30	66	1	18	2	18	15	62	21	35	16	2	59	47	23	10	0	14	156	290	446
08:45	9	27	67	1	18	3	22	14	75	20	38	22	1	67	45	20	8	0	4	166	295	461
Total	55	117	298	12	76	10	73	53	238	80	154	58	13	214	172	86	54	0	38	591	1210	1801
Grand Total	117	227	532	29	112	22	137	93	389	127	348	77	19	364	351	152	100	1	59	973	2283	3256
Apprch %	13.4	25.9	60.7			8.7	54.4	36.9		23	63	13.9			58.2	25.2	16.6					
Total %	5.1	9.9	23.3			1	6	4.1		5.6	15.2	3.4			15.4	6.7	4.4			29.9	70.1	
Cars	94	215	476			21	124	83		119	324	75			290	138	90			0	0	3022
% Cars	80.3	94.7	89.5	100	100	95.5	90.5	89.2	100	93.7	93.1	97.4	100	100	82.6	90.8	90	100	100	0	0	92.8
Trucks	23	12	56			1	13	10		8	24	2			61	14	10			0	0	234
% Trucks	19.7	5.3	10.5	0	0	4.5	9.5	10.8	0	6.3	6.9	2.6	0	0	17.4	9.2	10	0	0	0	0	7.2

	Meridian St From North				Bennington St From East				Porter St From Southeast				Meridian St From South				
Start Time	Left	Bear Left	Thru	App. Total	Hard Left	Left	Right	App. Total	Hard Left	Bear Right	Hard Right	App. Total	Thru	Right	Hard Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	20	25	95	140	5	20	10	35	18	44	11	73	31	25	19	75	323
08:15	19	35	70	124	0	13	14	27	21	37	9	67	49	18	17	84	302
08:30	7	30	66	103	2	18	15	35	21	35	16	72	47	23	10	80	290
08:45	9	27	67	103	3	22	14	39	20	38	22	80	45	20	8	73	295
Total Volume	55	117	298	470	10	73	53	136	80	154	58	292	172	86	54	312	1210
% App. Total	11.7	24.9	63.4		7.4	53.7	39		27.4	52.7	19.9		55.1	27.6	17.3		
PHF	.688	.836	.784	.839	.500	.830	.883	.872	.952	.875	.659	.913	.878	.860	.711	.929	.937

Accurate Counts
978-664-2565

File Name : 71490006
Site Code : 71490006
Start Date : 9/13/2007
Page No : 2



N/S Street : Meridian Street
E/W Street: Bennington St / Porter St
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490006
Site Code : 71490006
Start Date : 9/13/2007
Page No : 1

Groups Printed- Cars - Trucks

	Meridian St From North					Bennington St From East				Porter St From Southeast					Meridian St From South							
Start Time	Left	Bear Left	Thru	U-Trn	Peds	Hard Left	Left	Right	Peds	Hard Left	Bear Right	Hard Right	U-Trn	Peds	Thru	Right	Hard Right	U-Trn	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	24	15	56	4	52	5	24	15	127	17	31	19	1	100	78	30	4	0	0	284	318	602
16:15	28	22	64	3	5	2	14	14	88	18	41	12	3	114	82	54	14	0	0	213	365	578
16:30	30	18	63	7	5	4	22	18	87	28	48	17	1	113	82	52	9	0	0	213	391	604
16:45	38	14	65	10	5	2	31	21	88	20	39	17	3	103	76	48	10	0	0	209	381	590
Total	120	69	248	24	67	13	91	68	390	83	159	65	8	430	318	184	37	0	0	919	1455	2374
17:00	11	15	88	6	3	1	19	18	107	18	30	19	3	135	82	45	16	0	0	254	362	616
17:15	24	17	63	12	2	3	29	28	96	13	37	14	2	145	85	56	14	0	0	257	383	640
17:30	29	17	54	4	0	3	16	17	107	18	25	26	1	103	103	55	19	0	0	215	382	597
17:45	36	9	50	3	0	3	16	11	0	19	47	9	0	137	66	51	18	1	0	141	335	476
Total	100	58	255	25	5	10	80	74	310	68	139	68	6	520	336	207	67	1	0	867	1462	2329
Grand Total	220	127	503	49	72	23	171	142	700	151	298	133	14	950	654	391	104	1	0	1786	2917	4703
Apprch %	25.9	14.9	59.2			6.8	50.9	42.3		25.9	51.2	22.9			56.9	34	9.1					
Total %	7.5	4.4	17.2			0.8	5.9	4.9		5.2	10.2	4.6			22.4	13.4	3.6			38	62	
Cars	209	120	479			22	163	133		147	289	126			625	384	102			0	0	4534
% Cars	95	94.5	95.2	100	29.2	95.7	95.3	93.7	100	97.4	97	94.7	100	100	95.6	98.2	98.1	100	0	0	0	96.4
Trucks	11	7	24			1	8	9		4	9	7			29	7	2			0	0	169
% Trucks	5	5.5	4.8	0	70.8	4.3	4.7	6.3	0	2.6	3	5.3	0	0	4.4	1.8	1.9	0	0	0	0	3.6

	Meridian St From North				Bennington St From East				Porter St From Southeast				Meridian St From South				
Start Time	Left	Bear Left	Thru	App. Total	Hard Left	Left	Right	App. Total	Hard Left	Bear Right	Hard Right	App. Total	Thru	Right	Hard Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	30	18	63	111	4	22	18	44	28	48	17	93	82	52	9	143	391
16:45	38	14	65	117	2	31	21	54	20	39	17	76	76	48	10	134	381
17:00	11	15	88	114	1	19	18	38	18	30	19	67	82	45	16	143	362
17:15	24	17	63	104	3	29	28	60	13	37	14	64	85	56	14	155	383
Total Volume	103	64	279	446	10	101	85	196	79	154	67	300	325	201	49	575	1517
% App. Total	23.1	14.3	62.6		5.1	51.5	43.4		26.3	51.3	22.3		56.5	35	8.5		
PHF	.678	.889	.793	.953	.625	.815	.759	.817	.705	.802	.882	.806	.956	.897	.766	.927	.970

Accurate Counts
978-664-2565

File Name : 71490006
Site Code : 71490006
Start Date : 9/13/2007
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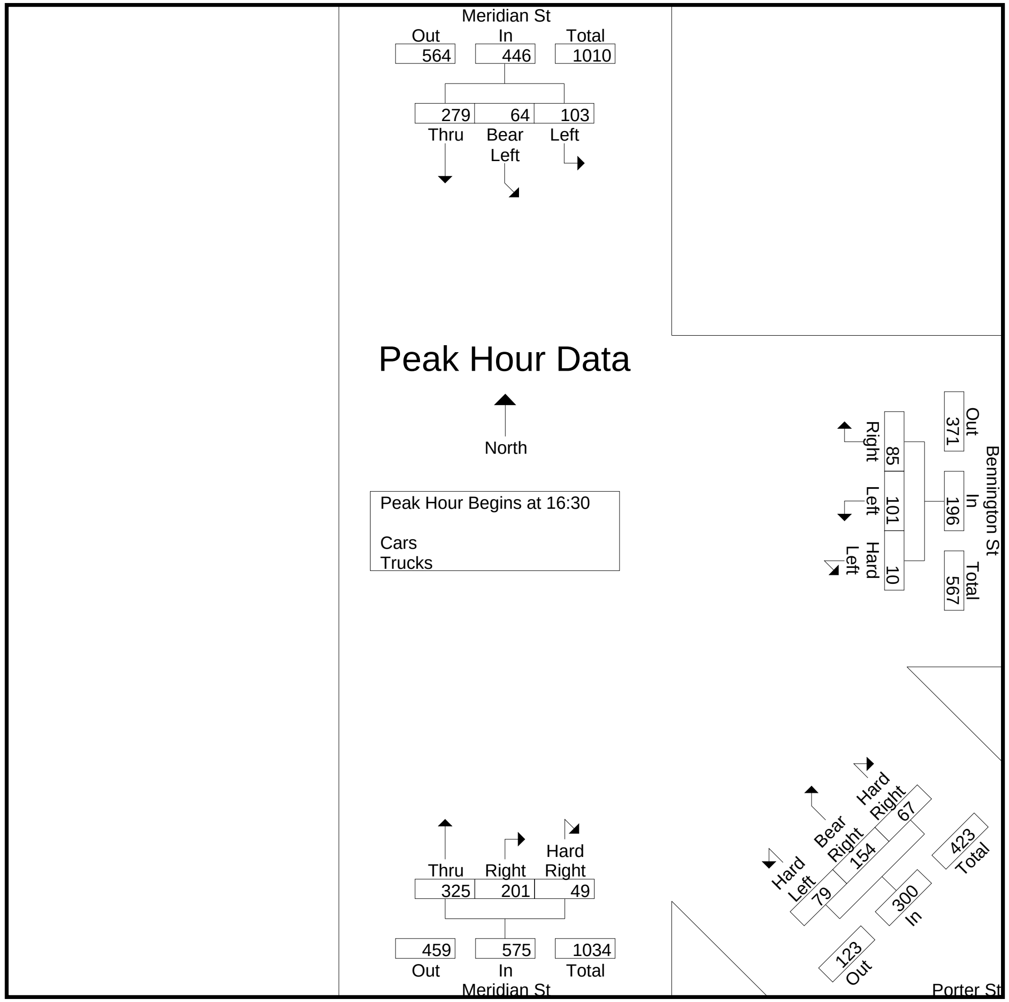


N/S Street : Meridian St / Liverpool St
E/W Street: Central Square
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490005
Site Code : 71490005
Start Date : 9/13/2007
Page No : 1

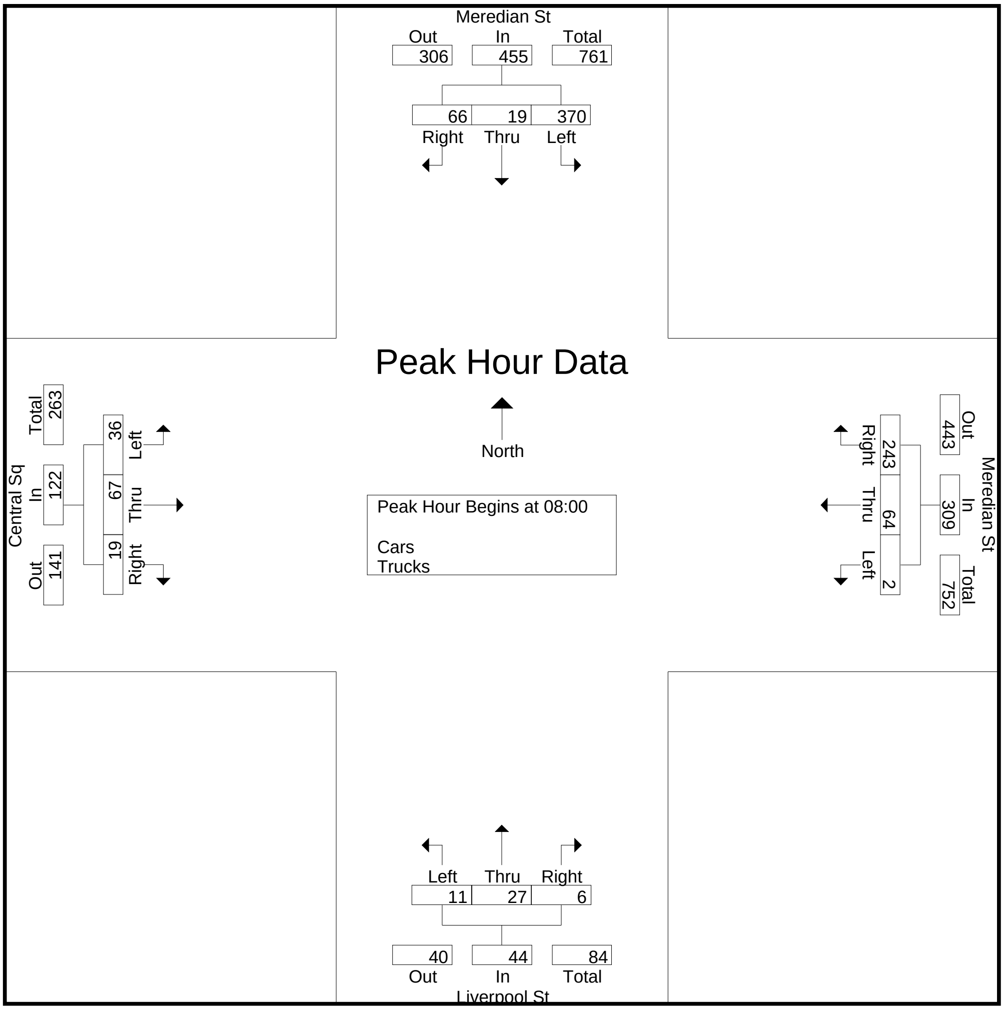
Groups Printed- Cars - Trucks

	Meredian St From North				Meredian St From East				Liverpool St From South				Central Sq From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	65	5	5	4	0	25	67	6	0	5	1	9	7	3	10	0	19	193	212
07:15	97	1	5	0	0	19	69	7	0	0	1	8	10	9	13	1	16	224	240
07:30	73	2	4	0	0	13	57	4	5	0	0	5	12	2	8	1	10	176	186
07:45	83	6	6	1	0	14	47	3	1	8	0	7	4	19	5	0	11	193	204
Total	318	14	20	5	0	71	240	20	6	13	2	29	33	33	36	2	56	786	842
08:00	115	6	17	3	1	15	57	6	4	5	2	7	15	13	3	6	22	253	275
08:15	90	4	13	0	1	14	67	7	1	11	4	10	4	17	9	2	19	235	254
08:30	81	5	15	0	0	21	64	9	2	4	0	7	11	20	5	3	19	228	247
08:45	84	4	21	0	0	14	55	5	4	7	0	11	6	17	2	1	17	214	231
Total	370	19	66	3	2	64	243	27	11	27	6	35	36	67	19	12	77	930	1007
Grand Total	688	33	86	8	2	135	483	47	17	40	8	64	69	100	55	14	133	1716	1849
Apprch %	85.3	4.1	10.7		0.3	21.8	77.9		26.2	61.5	12.3		30.8	44.6	24.6				
Total %	40.1	1.9	5		0.1	7.9	28.1		1	2.3	0.5		4	5.8	3.2		7.2	92.8	
Cars	636	32	75		2	120	426		17	37	8		59	91	47		0	0	1683
% Cars	92.4	97	87.2	100	100	88.9	88.2	100	100	92.5	100	100	85.5	91	85.5	100	0	0	91
Trucks	52	1	11		0	15	57		0	3	0		10	9	8		0	0	166
% Trucks	7.6	3	12.8	0	0	11.1	11.8	0	0	7.5	0	0	14.5	9	14.5	0	0	0	9

	Meredian St From North				Meredian St From East				Liverpool St From South				Central Sq From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	115	6	17	138	1	15	57	73	4	5	2	11	15	13	3	31	253
08:15	90	4	13	107	1	14	67	82	1	11	4	16	4	17	9	30	235
08:30	81	5	15	101	0	21	64	85	2	4	0	6	11	20	5	36	228
08:45	84	4	21	109	0	14	55	69	4	7	0	11	6	17	2	25	214
Total Volume	370	19	66	455	2	64	243	309	11	27	6	44	36	67	19	122	930
% App. Total	81.3	4.2	14.5		0.6	20.7	78.6		25	61.4	13.6		29.5	54.9	15.6		
PHF	.804	.792	.786	.824	.500	.762	.907	.909	.688	.614	.375	.688	.600	.838	.528	.847	.919

Accurate Counts
978-664-2565

File Name : 71490005
Site Code : 71490005
Start Date : 9/13/2007
Page No : 2



N/S Street : Meridian St / Liverpool St
E/W Street: Central Square
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490005
Site Code : 71490005
Start Date : 9/13/2007
Page No : 1

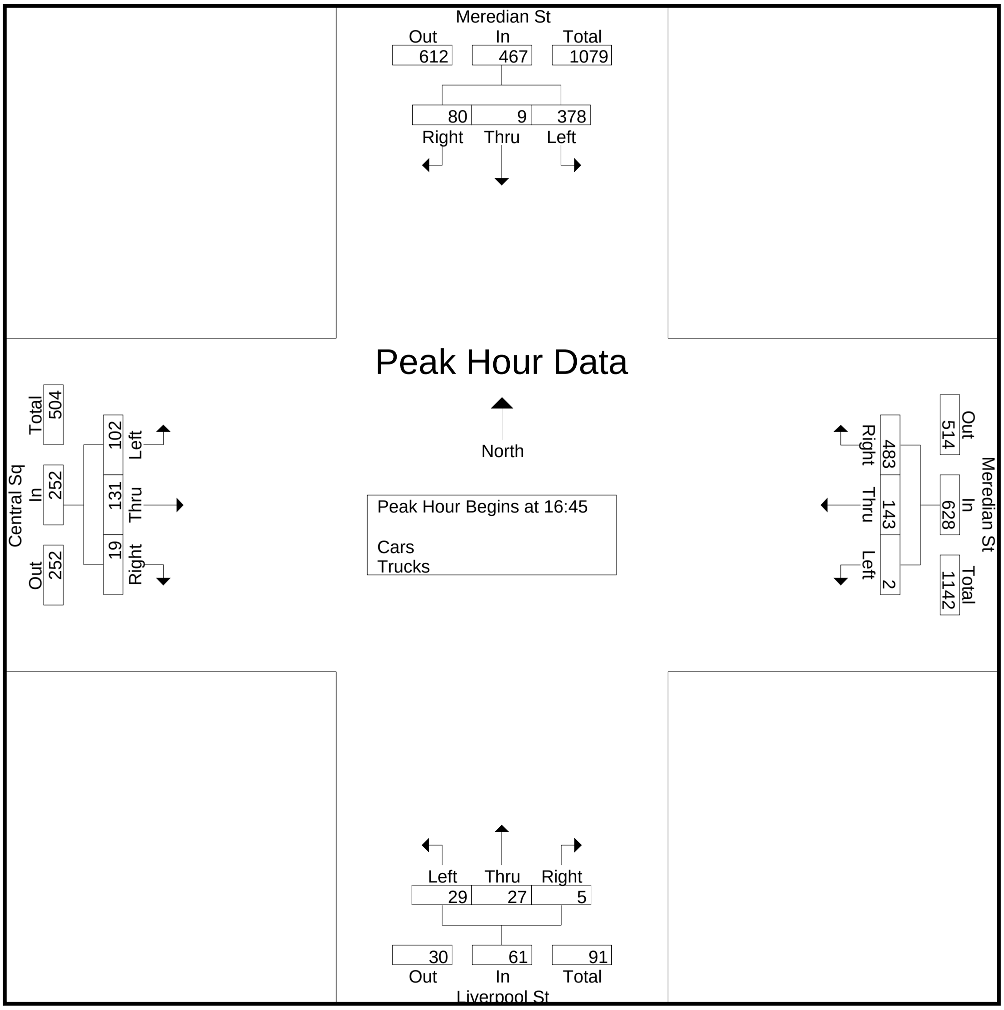
Groups Printed- Cars - Trucks

	Meredian St From North				Meredian St From East				Liverpool St From South				Central Sq From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	71	3	26	15	1	32	101	16	4	3	5	61	19	20	9	3	95	294	389
16:15	89	5	15	8	1	29	120	4	4	7	4	41	14	30	8	0	53	326	379
16:30	87	0	26	14	0	32	106	8	5	7	4	30	14	29	2	3	55	312	367
16:45	95	4	24	3	1	36	110	9	4	8	0	15	14	32	7	4	31	335	366
Total	342	12	91	40	3	129	437	37	17	25	13	147	61	111	26	10	234	1267	1501
17:00	111	0	21	5	0	36	101	6	15	8	2	25	39	36	2	1	37	371	408
17:15	98	3	17	2	1	45	124	5	7	6	2	28	25	35	6	7	42	369	411
17:30	74	2	18	6	0	26	148	12	3	5	1	32	24	28	4	0	50	333	383
17:45	71	2	18	4	0	29	111	7	4	2	0	22	19	43	5	2	35	304	339
Total	354	7	74	17	1	136	484	30	29	21	5	107	107	142	17	10	164	1377	1541
Grand Total	696	19	165	57	4	265	921	67	46	46	18	254	168	253	43	20	398	2644	3042
Apprch %	79.1	2.2	18.8		0.3	22.3	77.4		41.8	41.8	16.4		36.2	54.5	9.3				
Total %	26.3	0.7	6.2		0.2	10	34.8		1.7	1.7	0.7		6.4	9.6	1.6		13.1	86.9	
Cars	671	19	159		4	257	893		46	46	18		164	247	42		0	0	2961
% Cars	96.4	100	96.4	100	100	97	97	95.5	100	100	100	100	97.6	97.6	97.7	100	0	0	97.3
Trucks	25	0	6		0	8	28		0	0	0		4	6	1		0	0	81
% Trucks	3.6	0	3.6	0	0	3	3	4.5	0	0	0	0	2.4	2.4	2.3	0	0	0	2.7

	Meredian St From North				Meredian St From East				Liverpool St From South				Central Sq From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	95	4	24	123	1	36	110	147	4	8	0	12	14	32	7	53	335
17:00	111	0	21	132	0	36	101	137	15	8	2	25	39	36	2	77	371
17:15	98	3	17	118	1	45	124	170	7	6	2	15	25	35	6	66	369
17:30	74	2	18	94	0	26	148	174	3	5	1	9	24	28	4	56	333
Total Volume	378	9	80	467	2	143	483	628	29	27	5	61	102	131	19	252	1408
% App. Total	80.9	1.9	17.1		0.3	22.8	76.9		47.5	44.3	8.2		40.5	52	7.5		
PHF	.851	.563	.833	.884	.500	.794	.816	.902	.483	.844	.625	.610	.654	.910	.679	.818	.949

Accurate Counts
978-664-2565

File Name : 71490005
Site Code : 71490005
Start Date : 9/13/2007
Page No : 2



N/S Street : Border Street
E/W Street: Liberty Plaza North Drive
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490002
Site Code : 71490002
Start Date : 9/13/2007
Page No : 1

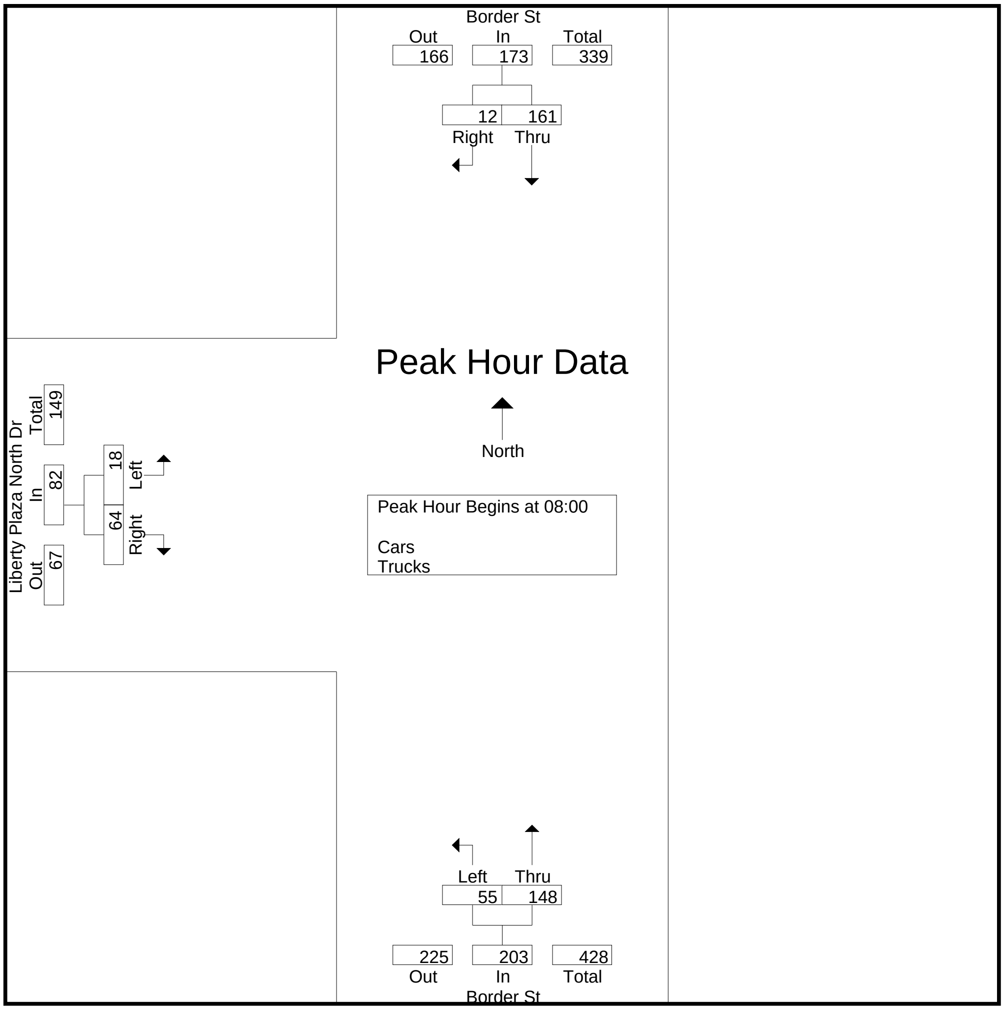
Groups Printed- Cars - Trucks

	Border St From North			Border St From South			Liberty Plaza North Dr From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	38	2	3	11	62	0	5	11	44	47	129	176
07:15	46	2	1	13	40	2	1	10	52	55	112	167
07:30	27	2	2	8	39	1	2	13	10	13	91	104
07:45	38	2	1	10	22	0	4	14	4	5	90	95
Total	149	8	7	42	163	3	12	48	110	120	422	542
08:00	33	1	1	14	41	2	4	18	9	12	111	123
08:15	52	4	1	15	27	1	5	16	1	3	119	122
08:30	38	2	2	10	38	4	5	10	7	13	103	116
08:45	38	5	2	16	42	1	4	20	7	10	125	135
Total	161	12	6	55	148	8	18	64	24	38	458	496
Grand Total	310	20	13	97	311	11	30	112	134	158	880	1038
Apprch %	93.9	6.1		23.8	76.2		21.1	78.9				
Total %	35.2	2.3		11	35.3		3.4	12.7		15.2	84.8	
Cars	287	19		86	292		30	96		0	0	968
% Cars	92.6	95	100	88.7	93.9	100	100	85.7	100	0	0	93.3
Trucks	23	1		11	19		0	16		0	0	70
% Trucks	7.4	5	0	11.3	6.1	0	0	14.3	0	0	0	6.7

	Border St From North			Border St From South			Liberty Plaza North Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00										
08:00	33	1	34	14	41	55	4	18	22	111
08:15	52	4	56	15	27	42	5	16	21	119
08:30	38	2	40	10	38	48	5	10	15	103
08:45	38	5	43	16	42	58	4	20	24	125
Total Volume	161	12	173	55	148	203	18	64	82	458
% App. Total	93.1	6.9		27.1	72.9		22	78		
PHF	.774	.600	.772	.859	.881	.875	.900	.800	.854	.916

Accurate Counts
978-664-2565

File Name : 71490002
Site Code : 71490002
Start Date : 9/13/2007
Page No : 2



N/S Street : Border Street
E/W Street: Liberty Plaza North Drive
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490002
Site Code : 71490002
Start Date : 9/13/2007
Page No : 1

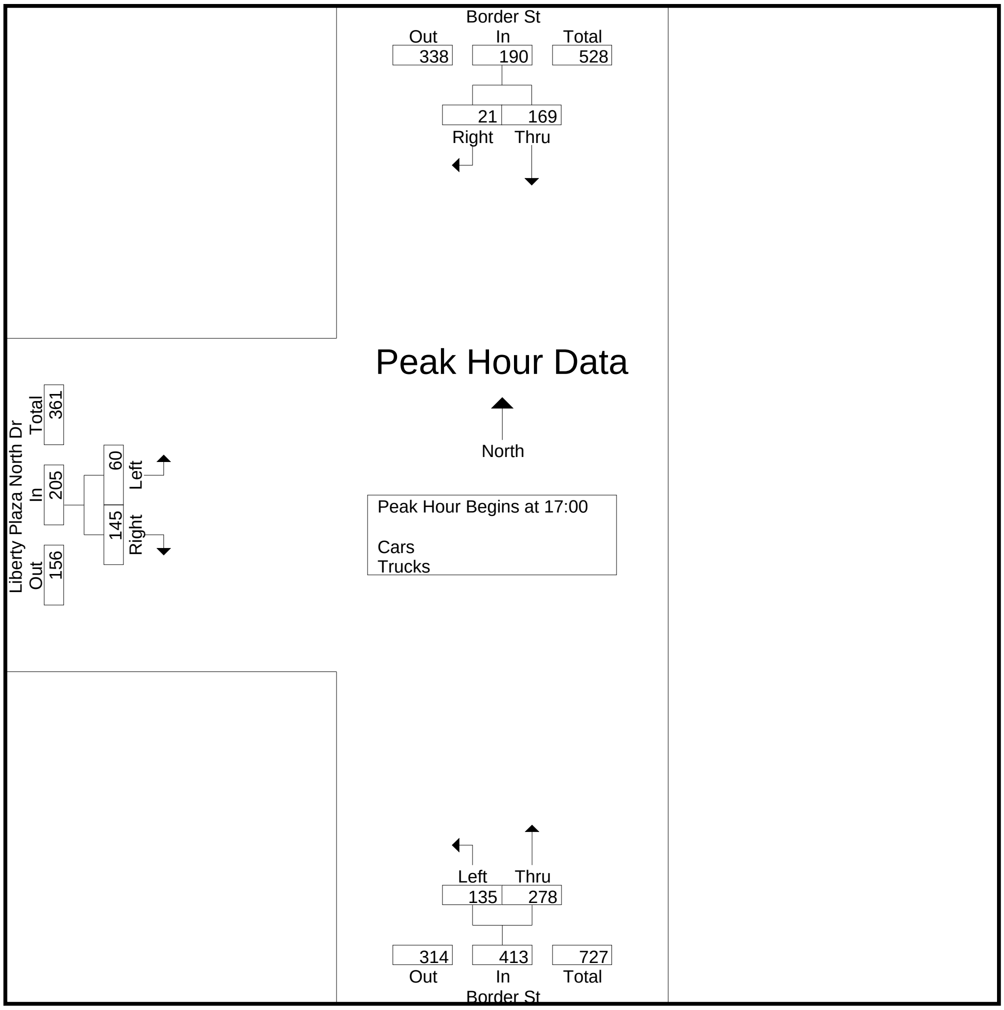
Groups Printed- Cars - Trucks

	Border St From North			Border St From South			Liberty Plaza North Dr From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	54	8	8	16	73	9	15	31	173	190	197	387
16:15	62	5	12	26	63	13	18	27	38	63	201	264
16:30	40	6	7	34	66	9	7	32	29	45	185	230
16:45	33	8	3	34	63	19	18	33	27	49	189	238
Total	189	27	30	110	265	50	58	123	267	347	772	1119
17:00	52	9	7	34	69	4	18	38	12	23	220	243
17:15	37	4	8	34	85	8	14	27	9	25	201	226
17:30	36	3	2	36	59	14	14	41	22	38	189	227
17:45	44	5	10	31	65	6	14	39	18	34	198	232
Total	169	21	27	135	278	32	60	145	61	120	808	928
Grand Total	358	48	57	245	543	82	118	268	328	467	1580	2047
Apprch %	88.2	11.8		31.1	68.9		30.6	69.4				
Total %	22.7	3		15.5	34.4		7.5	17		22.8	77.2	
Cars	346	48		243	539		118	264		0	0	2025
% Cars	96.6	100	100	99.2	99.3	100	100	98.5	100	0	0	98.9
Trucks	12	0		2	4		0	4		0	0	22
% Trucks	3.4	0	0	0.8	0.7	0	0	1.5	0	0	0	1.1

	Border St From North			Border St From South			Liberty Plaza North Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 17:00										
17:00	52	9	61	34	69	103	18	38	56	220
17:15	37	4	41	34	85	119	14	27	41	201
17:30	36	3	39	36	59	95	14	41	55	189
17:45	44	5	49	31	65	96	14	39	53	198
Total Volume	169	21	190	135	278	413	60	145	205	808
% App. Total	88.9	11.1		32.7	67.3		29.3	70.7		
PHF	.813	.583	.779	.938	.818	.868	.833	.884	.915	.918

Accurate Counts
978-664-2565

File Name : 71490002
Site Code : 71490002
Start Date : 9/13/2007
Page No : 2



N/S Street : Border Street
E/W Street: Liberty Plaza South Drive
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490004
Site Code : 71490004
Start Date : 9/13/2007
Page No : 1

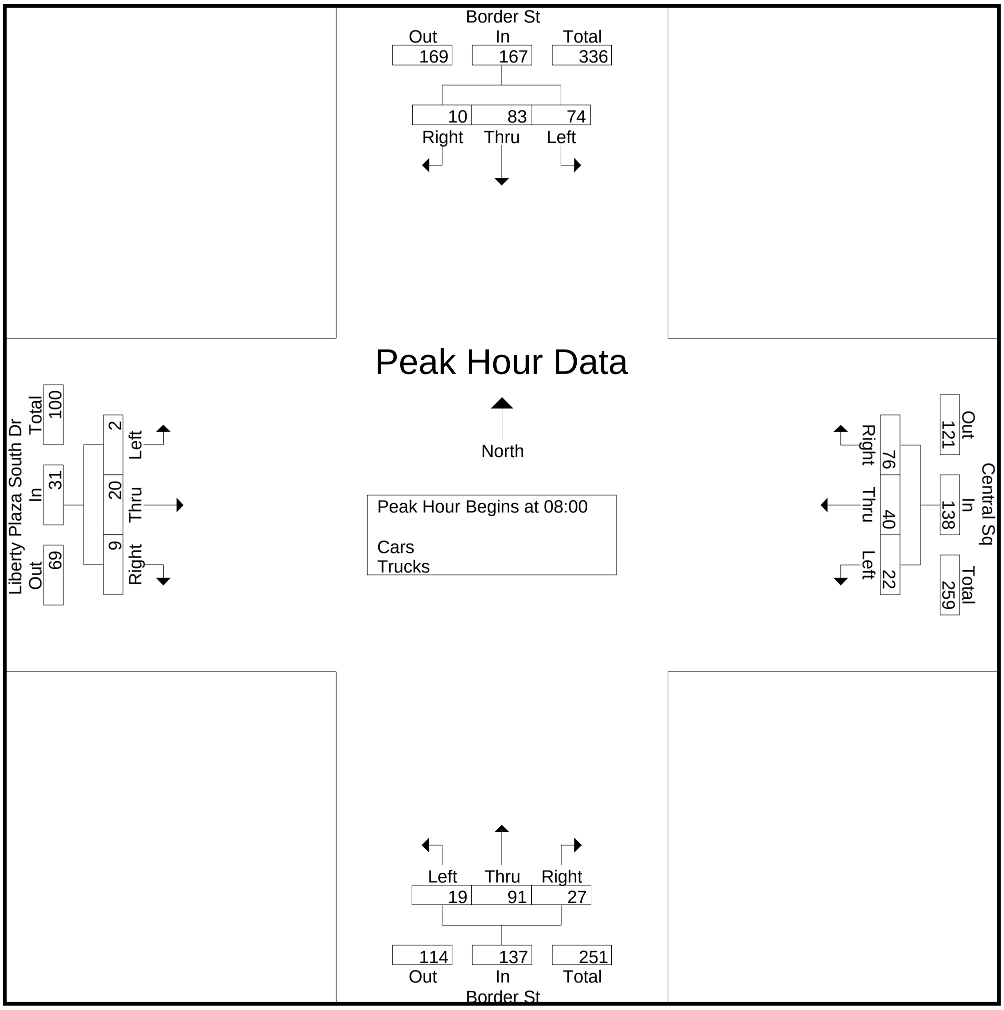
Groups Printed- Cars - Trucks

	Border St From North				Central Sq From East				Border St From South				Liberty Plaza South Dr From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	14	15	4	2	2	8	29	0	0	12	5	7	0	0	2	10	19	91	110
07:15	22	12	3	0	3	7	25	1	3	10	5	2	0	6	2	4	7	98	105
07:30	11	10	9	0	0	9	15	0	1	21	6	1	0	7	2	4	5	91	96
07:45	22	20	4	0	3	8	11	0	1	9	4	3	0	4	3	4	7	89	96
Total	69	57	20	2	8	32	80	1	5	52	20	13	0	17	9	22	38	369	407
08:00	15	18	5	0	2	13	21	0	4	24	10	4	0	5	3	2	6	120	126
08:15	23	25	1	1	6	8	18	4	1	21	3	9	1	8	1	2	16	116	132
08:30	22	17	1	0	8	9	16	0	8	21	7	1	1	3	3	6	7	116	123
08:45	14	23	3	3	6	10	21	0	6	25	7	2	0	4	2	0	5	121	126
Total	74	83	10	4	22	40	76	4	19	91	27	16	2	20	9	10	34	473	507
Grand Total	143	140	30	6	30	72	156	5	24	143	47	29	2	37	18	32	72	842	914
Apprch %	45.7	44.7	9.6		11.6	27.9	60.5		11.2	66.8	22		3.5	64.9	31.6				
Total %	17	16.6	3.6		3.6	8.6	18.5		2.9	17	5.6		0.2	4.4	2.1		7.9	92.1	
Cars	139	133	30		29	71	155		24	138	47		2	36	18		0	0	894
% Cars	97.2	95	100	100	96.7	98.6	99.4	100	100	96.5	100	100	100	97.3	100	100	0	0	97.8
Trucks	4	7	0		1	1	1		0	5	0		0	1	0		0	0	20
% Trucks	2.8	5	0	0	3.3	1.4	0.6	0	0	3.5	0	0	0	2.7	0	0	0	0	2.2

	Border St From North				Central Sq From East				Border St From South				Liberty Plaza South Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	15	18	5	38	2	13	21	36	4	24	10	38	0	5	3	8	120
08:15	23	25	1	49	6	8	18	32	1	21	3	25	1	8	1	10	116
08:30	22	17	1	40	8	9	16	33	8	21	7	36	1	3	3	7	116
08:45	14	23	3	40	6	10	21	37	6	25	7	38	0	4	2	6	121
Total Volume	74	83	10	167	22	40	76	138	19	91	27	137	2	20	9	31	473
% App. Total	44.3	49.7	6		15.9	29	55.1		13.9	66.4	19.7		6.5	64.5	29		
PHF	.804	.830	.500	.852	.688	.769	.905	.932	.594	.910	.675	.901	.500	.625	.750	.775	.977

Accurate Counts
978-664-2565

File Name : 71490004
Site Code : 71490004
Start Date : 9/13/2007
Page No : 2



N/S Street : Border Street
E/W Street: Liberty Plaza South Drive
City/State : Boston, MA
Weather : Clear

Accurate Counts
978-664-2565

File Name : 71490004
Site Code : 71490004
Start Date : 9/13/2007
Page No : 1

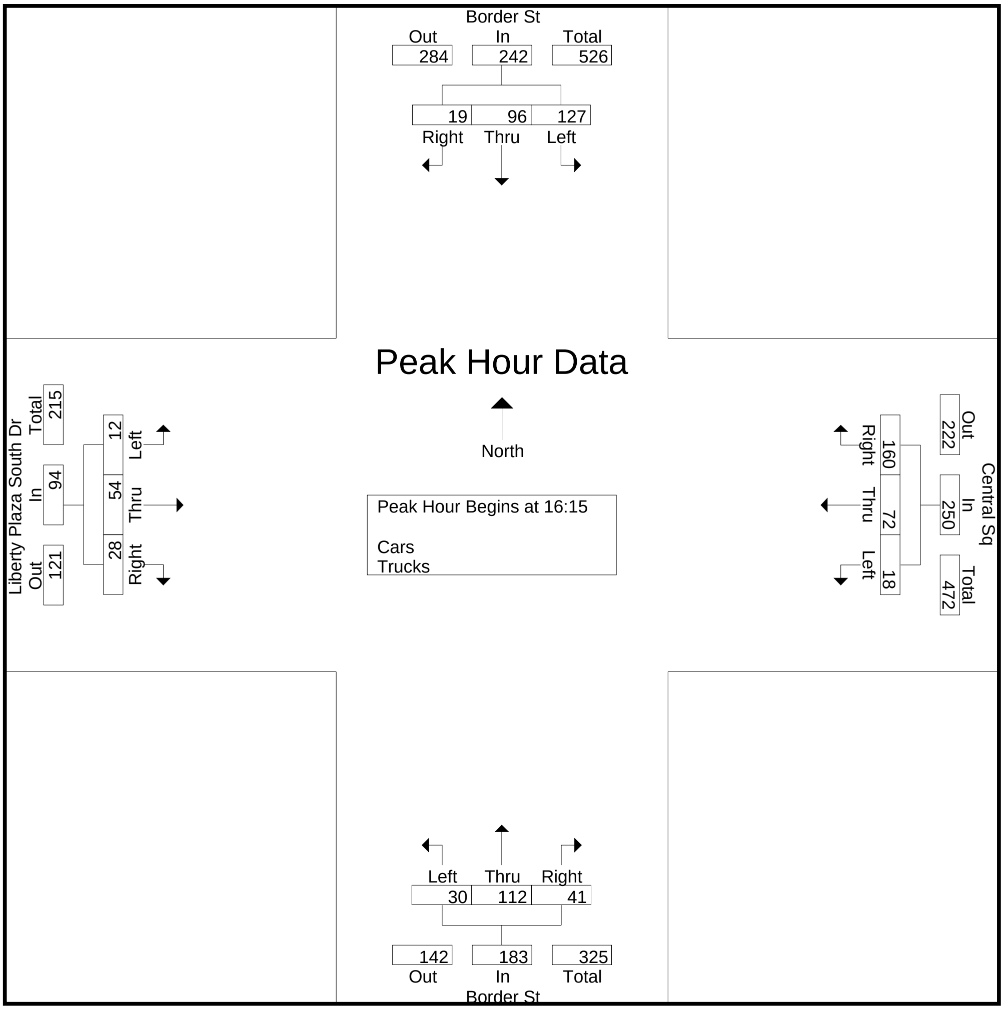
Groups Printed- Cars - Trucks

	Border St From North				Central Sq From East				Border St From South				Liberty Plaza South Dr From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	20	24	5	6	2	18	43	1	8	27	13	59	4	9	6	54	120	179	299
16:15	32	31	7	1	1	11	32	4	5	43	10	34	1	12	11	35	74	196	270
16:30	30	23	3	1	5	23	40	2	9	24	4	24	3	8	8	13	40	180	220
16:45	25	24	3	0	8	14	43	2	10	18	9	28	4	22	3	4	34	183	217
Total	107	102	18	8	16	66	158	9	32	112	36	145	12	51	28	106	268	738	1006
17:00	40	18	6	7	4	24	45	2	6	27	18	16	4	12	6	19	44	210	254
17:15	31	24	6	7	2	37	40	0	4	14	7	34	1	12	6	6	47	184	231
17:30	35	19	9	0	2	12	32	2	13	34	4	16	3	15	7	5	23	185	208
17:45	32	26	6	3	1	12	40	2	6	28	13	26	4	18	4	15	46	190	236
Total	138	87	27	17	9	85	157	6	29	103	42	92	12	57	23	45	160	769	929
Grand Total	245	189	45	25	25	151	315	15	61	215	78	237	24	108	51	151	428	1507	1935
Apprch %	51.1	39.5	9.4		5.1	30.8	64.2		17.2	60.7	22		13.1	59	27.9				
Total %	16.3	12.5	3		1.7	10	20.9		4	14.3	5.2		1.6	7.2	3.4		22.1	77.9	
Cars	242	187	45		25	151	313		61	214	77		24	108	51		0	0	1926
% Cars	98.8	98.9	100	100	100	100	99.4	100	100	99.5	98.7	100	100	100	100	100	0	0	99.5
Trucks	3	2	0		0	0	2		0	1	1		0	0	0		0	0	9
% Trucks	1.2	1.1	0	0	0	0	0.6	0	0	0.5	1.3	0	0	0	0	0	0	0	0.5

	Border St From North				Central Sq From East				Border St From South				Liberty Plaza South Dr From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	32	31	7	70	1	11	32	44	5	43	10	58	1	12	11	24	196
16:30	30	23	3	56	5	23	40	68	9	24	4	37	3	8	8	19	180
16:45	25	24	3	52	8	14	43	65	10	18	9	37	4	22	3	29	183
17:00	40	18	6	64	4	24	45	73	6	27	18	51	4	12	6	22	210
Total Volume	127	96	19	242	18	72	160	250	30	112	41	183	12	54	28	94	769
% App. Total	52.5	39.7	7.9		7.2	28.8	64		16.4	61.2	22.4		12.8	57.4	29.8		
PHF	.794	.774	.679	.864	.563	.750	.889	.856	.750	.651	.569	.789	.750	.614	.636	.810	.915

Accurate Counts
978-664-2565

File Name : 71490004
Site Code : 71490004
Start Date : 9/13/2007
Page No : 2



PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Border Street
E: Decatur Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415C
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars - Heavy Vehicles

	Border Street From North		Decatur Street From East		Border Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	7	2	0	1	2	11	23
07:15 AM	13	2	5	2	4	13	39
07:30 AM	13	3	1	2	0	23	42
07:45 AM	13	7	6	0	4	17	47
Total	46	14	12	5	10	64	151
08:00 AM	14	5	3	1	3	22	48
08:15 AM	15	2	5	0	2	23	47
08:30 AM	16	1	5	0	1	18	41
08:45 AM	17	1	8	2	3	19	50
Total	62	9	21	3	9	82	186
Grand Total	108	23	33	8	19	146	337
Apprch %	82.4	17.6	80.5	19.5	11.5	88.5	
Total %	32	6.8	9.8	2.4	5.6	43.3	
Cars	105	20	32	6	18	139	320
% Cars	97.2	87	97	75	94.7	95.2	95
Heavy Vehicles	3	3	1	2	1	7	17
% Heavy Vehicles	2.8	13	3	25	5.3	4.8	5

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	14	**5**	**19**	3	1	4	**3**	22	**25**	48
08:15 AM	15	2	17	5	0	5	2	**23**	25	47
08:30 AM	16	1	17	5	0	5	1	18	19	41
08:45 AM	**17**	1	18	**8**	**2**	**10**	3	19	22	**50**
Total Volume	**62**	**9**	**71**	**21**	**3**	**24**	**9**	**82**	**91**	**186**
% App. Total	**87.3**	**12.7**		**87.5**	**12.5**		**9.9**	**90.1**		
PHF	**.912**	**.450**	**.934**	**.656**	**.375**	**.600**	**.750**	**.891**	**.910**	**.930**
Cars	**61**	**8**	**69**	**20**	**3**	**23**	**8**	**79**	**87**	**179**
% Cars	**98.4**	**88.9**	**97.2**	**95.2**	**100**	**95.8**	**88.9**	**96.3**	**95.6**	**96.2**
Heavy Vehicles	**1**	**1**	**2**	**1**	**0**	**1**	**1**	**3**	**4**	**7**
% Heavy Vehicles	**1.6**	**11.1**	**2.8**	**4.8**	**0**	**4.2**	**11.1**	**3.7**	**4.4**	**3.8**

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Border Street
E: Decatur Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415C
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Border Street From North		Decatur Street From East		Border Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	7	2	0	1	2	11	23
07:15 AM	13	1	5	1	4	12	36
07:30 AM	12	3	1	1	0	21	38
07:45 AM	12	6	6	0	4	16	44
Total	44	12	12	3	10	60	141
08:00 AM	14	4	3	1	2	20	44
08:15 AM	14	2	5	0	2	23	46
08:30 AM	16	1	5	0	1	17	40
08:45 AM	17	1	7	2	3	19	49
Total	61	8	20	3	8	79	179
Grand Total	105	20	32	6	18	139	320
Apprch %	84	16	84.2	15.8	11.5	88.5	
Total %	32.8	6.2	10	1.9	5.6	43.4	

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	14	**4**	**18**	3	1	4	2	20	22	44
08:15 AM	14	2	16	5	0	5	2	**23**	**25**	46
08:30 AM	16	1	17	5	0	5	1	17	18	40
08:45 AM	**17**	1	18	**7**	**2**	**9**	**3**	19	22	**49**
Total Volume	**61**	**8**	**69**	**20**	**3**	**23**	**8**	**79**	**87**	**179**
% App. Total	**88.4**	**11.6**		**87**	**13**		**9.2**	**90.8**		
PHF	**.897**	**.500**	**.958**	**.714**	**.375**	**.639**	**.667**	**.859**	**.870**	**.913**

PRECISION DATA INDUSTRIES, LLC

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N/S: Border Street
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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415C
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Heavy Vehicles

	Border Street From North		Decatur Street From East		Border Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	1	0	1	0	1	3
07:30 AM	1	0	0	1	0	2	4
07:45 AM	1	1	0	0	0	1	3
Total	2	2	0	2	0	4	10
08:00 AM	0	1	0	0	1	2	4
08:15 AM	1	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	1	1
08:45 AM	0	0	1	0	0	0	1
Total	1	1	1	0	1	3	7
Grand Total	3	3	1	2	1	7	17
Apprch %	50	50	33.3	66.7	12.5	87.5	
Total %	17.6	17.6	5.9	11.8	5.9	41.2	

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	**1**	1	0	**1**	**1**	0	1	1	3
07:30 AM	**1**	0	1	0	1	1	0	**2**	2	**4**
07:45 AM	**1**	**1**	**2**	0	0	0	0	1	1	3
08:00 AM	0	1	1	0	0	0	**1**	2	**3**	4
Total Volume	2	3	5	0	2	2	1	6	7	14
% App. Total	40	60		0	100		14.3	85.7		
PHF	.500	.750	.625	.000	.500	.500	.250	.750	.583	.875

PRECISION
D A T A
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N/S: Border Street
E: Decatur Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415C
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Peds and Bicycles

	Border Street From North				Decatur Street From East				Border Street From South				
Start Time	Thru	Left	Peds from East	Peds from West	Right	Left	Peds from South	Peds from North	Right	Thru	Peds from West	Peds from East	Int. Total
07:00 AM	0	0	0	0	0	0	5	0	0	0	0	0	5
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	2	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	7	0	0	0	0	0	7
08:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
08:45 AM	0	0	1	0	0	0	1	1	0	0	0	0	3
Total	0	0	1	0	0	0	3	1	0	0	1	0	6
Grand Total	0	0	1	0	0	0	10	1	0	0	1	0	13
Apprch %	0	0	100	0	0	0	90.9	9.1	0	0	100	0	
Total %	0	0	7.7	0	0	0	76.9	7.7	0	0	7.7	0	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

	Border Street From North					Decatur Street From East					Border Street From South					
Start Time	Thru	Left	Peds from East	Peds from West	App. Total	Right	Left	Peds from South	Peds from North	App. Total	Right	Thru	Peds from West	Peds from East	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	**5**	**0**	**5**	0	0	0	0	0	**5**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	7
% App. Total	0	0	0	0		0	0	100	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.350	.000	.350	.000	.000	.000	.000	.000	.350

PRECISION
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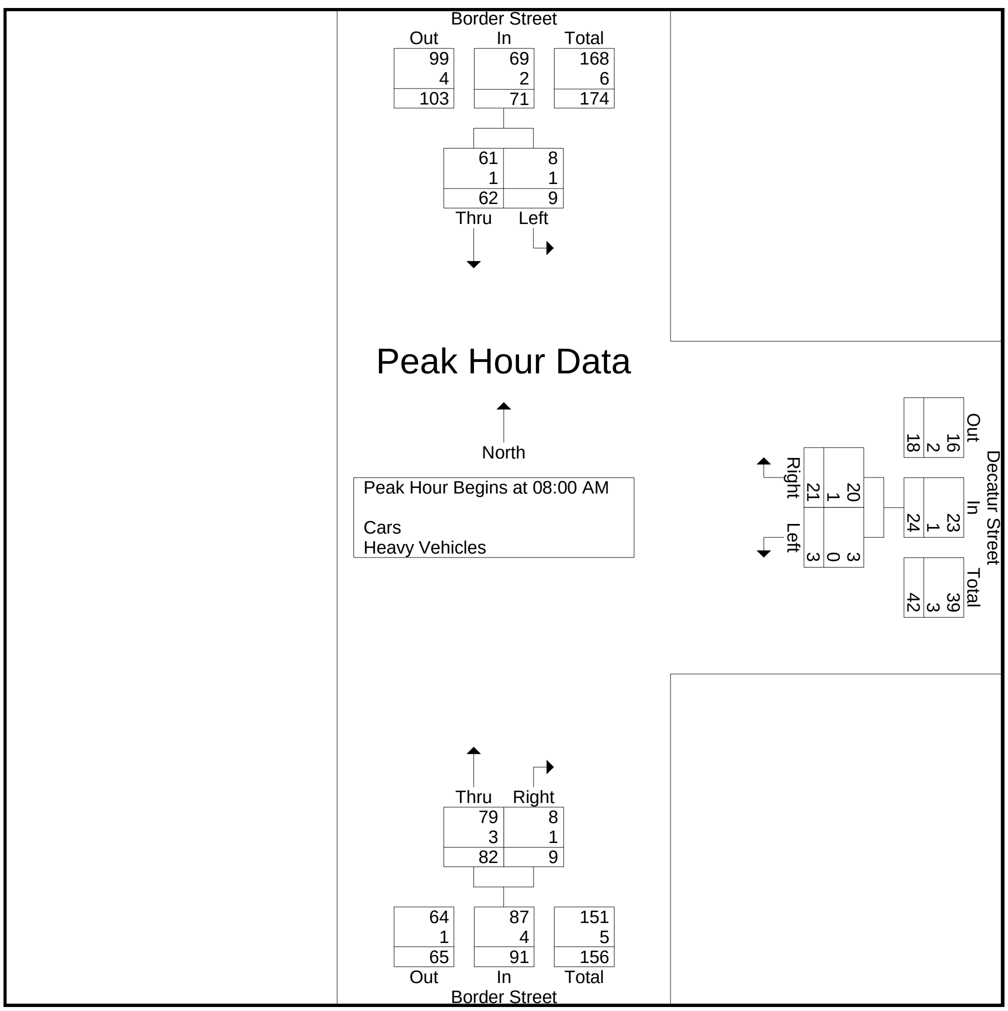
N/S: Border Street
E: Decatur Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415C
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	14	**5**	**19**	3	1	4	**3**	22	**25**	48
08:15 AM	15	2	17	5	0	5	2	**23**	25	47
08:30 AM	16	1	17	5	0	5	1	18	19	41
08:45 AM	**17**	1	18	**8**	**2**	**10**	3	19	22	**50**
Total Volume	**62**	**9**	**71**	**21**	**3**	**24**	**9**	**82**	**91**	**186**
% App. Total	**87.3**	**12.7**		**87.5**	**12.5**		**9.9**	**90.1**		
PHF	**.912**	**.450**	**.934**	**.656**	**.375**	**.600**	**.750**	**.891**	**.910**	**.930**
Cars	**61**	**8**	**69**	**20**	**3**	**23**	**8**	**79**	**87**	**179**
% Cars	**98.4**	**88.9**	**97.2**	**95.2**	**100**	**95.8**	**88.9**	**96.3**	**95.6**	**96.2**
Heavy Vehicles	**1**	**1**	**2**	**1**	**0**	**1**	**1**	**3**	**4**	**7**
% Heavy Vehicles	**1.6**	**11.1**	**2.8**	**4.8**	**0**	**4.2**	**11.1**	**3.7**	**4.4**	**3.8**



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Client: Woodland Design/ R. Woodland

File Name : 71415CC
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Border Street From North		Decatur Street From East		Border Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	27	3	13	3	6	31	83
04:15 PM	24	9	9	1	0	31	74
04:30 PM	23	10	14	4	3	40	94
04:45 PM	21	7	10	0	2	30	70
Total	95	29	46	8	11	132	321
05:00 PM	25	7	6	1	5	36	80
05:15 PM	25	8	5	0	0	23	61
05:30 PM	13	10	13	0	3	19	58
05:45 PM	30	5	9	1	3	21	69
Total	93	30	33	2	11	99	268
Grand Total	188	59	79	10	22	231	589
Apprch %	76.1	23.9	88.8	11.2	8.7	91.3	
Total %	31.9	10	13.4	1.7	3.7	39.2	
Cars	186	59	78	10	21	223	577
% Cars	98.9	100	98.7	100	95.5	96.5	98
Heavy Vehicles	2	0	1	0	1	8	12
% Heavy Vehicles	1.1	0	1.3	0	4.5	3.5	2

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**27**	3	30	13	3	16	**6**	31	37	83
04:15 PM	24	9	**33**	9	1	10	0	31	31	74
04:30 PM	23	**10**	33	**14**	**4**	**18**	3	**40**	**43**	**94**
04:45 PM	**21**	**7**	**28**	**10**	**0**	**10**	**2**	**30**	**32**	**70**
Total Volume	**95**	**29**	**124**	**46**	**8**	**54**	**11**	**132**	**143**	**321**
% App. Total	**76.6**	**23.4**		**85.2**	**14.8**		**7.7**	**92.3**		
PHF	**.880**	**.725**	**.939**	**.821**	**.500**	**.750**	**.458**	**.825**	**.831**	**.854**
Cars	**94**	**29**	**123**	**45**	**8**	**53**	**10**	**125**	**135**	**311**
% Cars	**98.9**	**100**	**99.2**	**97.8**	**100**	**98.1**	**90.9**	**94.7**	**94.4**	**96.9**
Heavy Vehicles	**1**	**0**	**1**	**1**	**0**	**1**	**1**	**7**	**8**	**10**
% Heavy Vehicles	**1.1**	**0**	**0.8**	**2.2**	**0**	**1.9**	**9.1**	**5.3**	**5.6**	**3.1**

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415CC
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Border Street From North		Decatur Street From East		Border Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	27	3	13	3	5	29	80
04:15 PM	24	9	9	1	0	29	72
04:30 PM	22	10	14	4	3	38	91
04:45 PM	21	7	9	0	2	29	68
Total	94	29	45	8	10	125	311
05:00 PM	25	7	6	1	5	36	80
05:15 PM	25	8	5	0	0	22	60
05:30 PM	13	10	13	0	3	19	58
05:45 PM	29	5	9	1	3	21	68
Total	92	30	33	2	11	98	266
Grand Total	186	59	78	10	21	223	577
Apprch %	75.9	24.1	88.6	11.4	8.6	91.4	
Total %	32.2	10.2	13.5	1.7	3.6	38.6	

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**27**	3	30	13	3	16	**5**	29	34	80
04:15 PM	24	9	**33**	9	1	10	0	29	29	72
04:30 PM	22	**10**	32	**14**	**4**	**18**	3	**38**	**41**	**91**
04:45 PM	**21**	**7**	**28**	**9**	**0**	**9**	**2**	**29**	**31**	**68**
Total Volume	**94**	**29**	**123**	**45**	**8**	**53**	**10**	**125**	**135**	**311**
% App. Total	**76.4**	**23.6**		**84.9**	**15.1**		**7.4**	**92.6**		
PHF	**.870**	**.725**	**.932**	**.804**	**.500**	**.736**	**.500**	**.822**	**.823**	**.854**

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E: Decatur Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415CC
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Heavy Vehicles

	Border Street From North		Decatur Street From East		Border Street From South		
Start Time	Thru	Left	Right	Left	Right	Thru	Int. Total
04:00 PM	0	0	0	0	1	2	3
04:15 PM	0	0	0	0	0	2	2
04:30 PM	1	0	0	0	0	2	3
04:45 PM	0	0	1	0	0	1	2
Total	1	0	1	0	1	7	10
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0
05:45 PM	1	0	0	0	0	0	1
Total	1	0	0	0	0	1	2
Grand Total	2	0	1	0	1	8	12
Apprch %	100	0	100	0	11.1	88.9	
Total %	16.7	0	8.3	0	8.3	66.7	

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	**1**	**2**	**3**	**3**
04:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**2**
04:30 PM	**1**	0	**1**	0	0	0	0	2	2	3
04:45 PM	0	0	0	**1**	0	**1**	0	1	1	2
Total Volume	1	0	1	1	0	1	1	7	8	10
% App. Total	100	0		100	0		12.5	87.5		
PHF	.250	.000	.250	.250	.000	.250	.250	.875	.667	.833

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Client: Woodland Design/ R. Woodland

File Name : 71415CC
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Peds and Bicycles

	Border Street From North				Decatur Street From East				Border Street From South				
Start Time	Thru	Left	Peds from East	Peds from West	Right	Left	Peds from South	Peds from North	Right	Thru	Peds from West	Peds from East	Int. Total
04:00 PM	0	0	5	3	0	0	0	2	0	0	0	0	10
04:15 PM	0	0	0	0	0	0	2	1	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	2	2	0	0	3	0	7
Total	0	0	5	3	0	0	5	5	0	0	3	0	21
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	0	2	0	0	0	0	3
05:30 PM	0	0	1	0	0	0	1	0	0	0	3	0	5
05:45 PM	1	0	0	0	0	0	0	1	0	0	0	0	2
Total	2	0	1	0	0	0	1	3	0	0	3	0	10
Grand Total	2	0	6	3	0	0	6	8	0	0	6	0	31
Apprch %	18.2	0	54.5	27.3	0	0	42.9	57.1	0	0	100	0	
Total %	6.5	0	19.4	9.7	0	0	19.4	25.8	0	0	19.4	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Border Street From North					Decatur Street From East					Border Street From South					
Start Time	Thru	Left	Peds from East	Peds from West	App. Total	Right	Left	Peds from South	Peds from North	App. Total	Right	Thru	Peds from West	Peds from East	App. Total	Int. Total
04:00 PM	0	0	5	3	8	0	0	0	2	2	0	0	0	0	0	10
04:15 PM	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	2	2	4	0	0	3	0	3	7
Total Volume	**0**	**0**	**5**	**3**	**8**	**0**	**0**	**5**	**5**	**10**	**0**	**0**	**3**	**0**	**3**	**21**
% App. Total	**0**	**0**	**62.5**	**37.5**		**0**	**0**	**50**	**50**		**0**	**0**	**100**	**0**		
PHF	**.000**	**.000**	**.250**	**.250**	**.250**	**.000**	**.000**	**.625**	**.625**	**.625**	**.000**	**.000**	**.250**	**.000**	**.250**	**.525**

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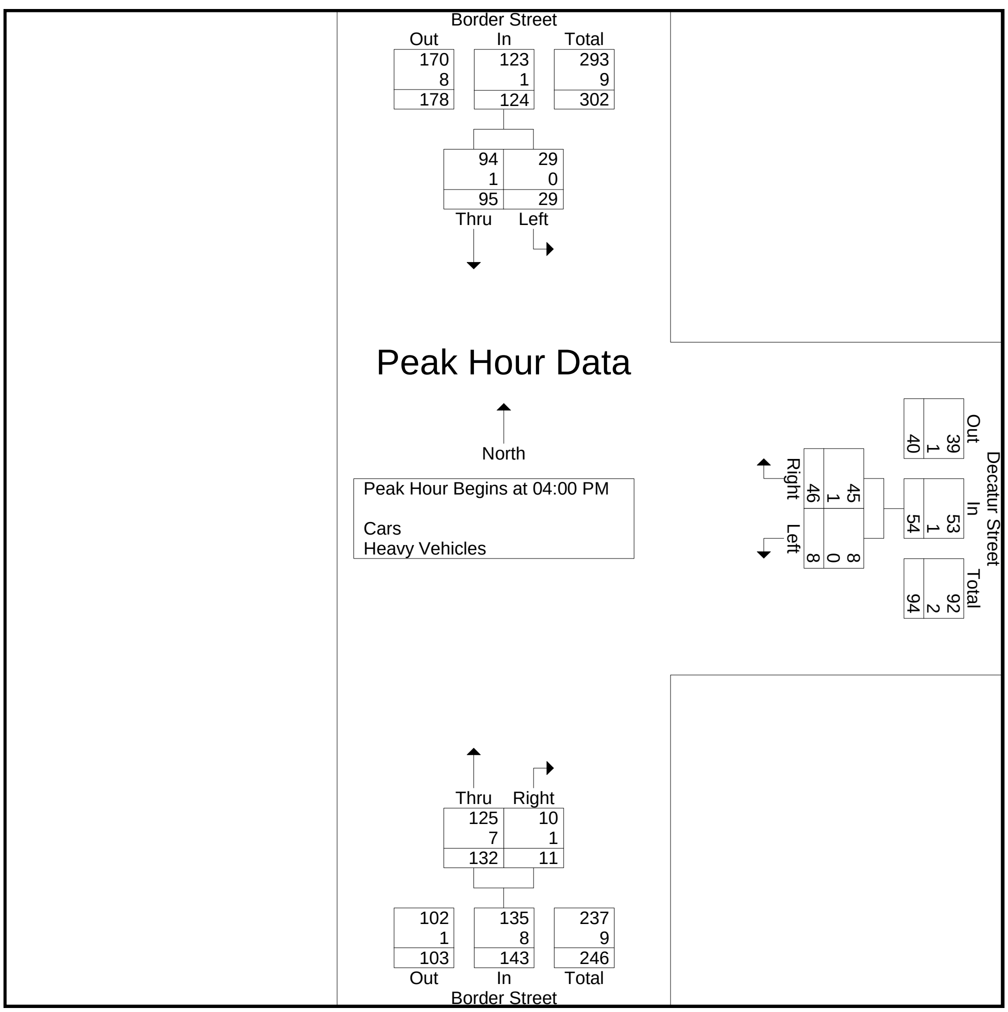
E: Decatur Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415CC
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

	Border Street From North			Decatur Street From East			Border Street From South			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**27**	3	30	13	3	16	**6**	31	37	83
04:15 PM	24	9	**33**	9	1	10	0	31	31	74
04:30 PM	23	**10**	33	**14**	**4**	**18**	3	**40**	**43**	**94**
04:45 PM	**21**	**7**	**28**	**10**	**0**	**10**	**2**	**30**	**32**	**70**
Total Volume	**95**	**29**	**124**	**46**	**8**	**54**	**11**	**132**	**143**	**321**
% App. Total	**76.6**	**23.4**		**85.2**	**14.8**		**7.7**	**92.3**		
PHF	**.880**	**.725**	**.939**	**.821**	**.500**	**.750**	**.458**	**.825**	**.831**	**.854**
Cars	**94**	**29**	**123**	**45**	**8**	**53**	**10**	**125**	**135**	**311**
% Cars	**98.9**	**100**	**99.2**	**97.8**	**100**	**98.1**	**90.9**	**94.7**	**94.4**	**96.9**
Heavy Vehicles	**1**	**0**	**1**	**1**	**0**	**1**	**1**	**7**	**8**	**10**
% Heavy Vehicles	**1.1**	**0**	**0.8**	**2.2**	**0**	**1.9**	**9.1**	**5.3**	**5.6**	**3.1**



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N/S: Border Street
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415B
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Border Street From North			Maverick Street From East			Border Street From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	7	0	7	3	5	0	0	0	0	0	6	28
07:15 AM	5	8	0	6	0	1	0	0	0	0	0	9	29
07:30 AM	2	12	0	8	3	3	0	0	0	0	0	15	43
07:45 AM	3	10	0	10	3	0	0	0	0	0	0	12	38
Total	10	37	0	31	9	9	0	0	0	0	0	42	138
08:00 AM	6	10	0	21	6	2	0	0	0	0	0	7	52
08:15 AM	3	9	0	15	5	5	0	0	0	0	0	9	46
08:30 AM	3	11	0	11	4	3	0	0	0	0	0	7	39
08:45 AM	5	9	0	11	3	2	0	0	0	1	0	9	40
Total	17	39	0	58	18	12	0	0	0	1	0	32	177
Grand Total	27	76	0	89	27	21	0	0	0	1	0	74	315
Apprch %	26.2	73.8	0	65	19.7	15.3	0	0	0	1.3	0	98.7	
Total %	8.6	24.1	0	28.3	8.6	6.7	0	0	0	0.3	0	23.5	
Cars	27	70	0	86	17	18	0	0	0	1	0	69	288
% Cars	100	92.1	0	96.6	63	85.7	0	0	0	100	0	93.2	91.4
Heavy Vehicles	0	6	0	3	10	3	0	0	0	0	0	5	27
% Heavy Vehicles	0	7.9	0	3.4	37	14.3	0	0	0	0	0	6.8	8.6

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	**12**	0	14	8	3	3	14	0	0	0	0	0	0	**15**	**15**	43
07:45 AM	3	10	0	13	10	3	0	13	0	0	0	0	0	0	12	12	38
08:00 AM	**6**	10	0	**16**	**21**	**6**	2	**29**	0	0	0	0	0	0	7	7	**52**
08:15 AM	3	9	0	12	15	5	**5**	25	0	0	0	0	0	0	9	9	46
Total Volume	14	41	0	55	54	17	10	81	0	0	0	0	0	0	43	43	179
% App. Total	25.5	74.5	0		66.7	21	12.3		0	0	0		0	0	100		
PHF	.583	.854	.000	.859	.643	.708	.500	.698	.000	.000	.000	.000	.000	.000	.717	.717	.861
Cars	14	37	0	51	52	13	9	74	0	0	0	0	0	0	41	41	166
% Cars	100	90.2	0	92.7	96.3	76.5	90.0	91.4	0	0	0	0	0	0	95.3	95.3	92.7
Heavy Vehicles	0	4	0	4	2	4	1	7	0	0	0	0	0	0	2	2	13
% Heavy Vehicles	0	9.8	0	7.3	3.7	23.5	10.0	8.6	0	0	0	0	0	0	4.7	4.7	7.3

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N/S: Border Street
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415B
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Border Street From North			Maverick Street From East			Border Street From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	6	0	7	0	3	0	0	0	0	0	6	22
07:15 AM	5	7	0	5	0	1	0	0	0	0	0	8	26
07:30 AM	2	10	0	8	2	2	0	0	0	0	0	14	38
07:45 AM	3	9	0	10	2	0	0	0	0	0	0	11	35
Total	10	32	0	30	4	6	0	0	0	0	0	39	121
08:00 AM	6	10	0	19	5	2	0	0	0	0	0	7	49
08:15 AM	3	8	0	15	4	5	0	0	0	0	0	9	44
08:30 AM	3	11	0	11	3	3	0	0	0	0	0	6	37
08:45 AM	5	9	0	11	1	2	0	0	0	1	0	8	37
Total	17	38	0	56	13	12	0	0	0	1	0	30	167
Grand Total	27	70	0	86	17	18	0	0	0	1	0	69	288
Apprch %	27.8	72.2	0	71.1	14	14.9	0	0	0	1.4	0	98.6	
Total %	9.4	24.3	0	29.9	5.9	6.2	0	0	0	0.3	0	24	

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**6**	10	0	**16**	**19**	**5**	2	**26**	0	0	0	0	0	0	7	7	**49**
08:15 AM	3	8	0	11	15	4	**5**	24	0	0	0	0	0	0	**9**	**9**	44
08:30 AM	3	**11**	0	14	11	3	3	17	0	0	0	0	0	0	6	6	37
08:45 AM	5	9	0	14	11	1	2	14	0	0	0	0	**1**	0	8	9	37
Total Volume	17	38	0	55	56	13	12	81	0	0	0	0	1	0	30	31	167
% App. Total	30.9	69.1	0		69.1	16	14.8		0	0	0		3.2	0	96.8		
PHF	.708	.864	.000	.859	.737	.650	.600	.779	.000	.000	.000	.000	.250	.000	.833	.861	.852

PRECISION DATA INDUSTRIES, LLC
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N/S: Border Street
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415B
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Heavy Vehicles

	Border Street From North			Maverick Street From East			Border Street From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	1	0	0	3	2	0	0	0	0	0	0	6
07:15 AM	0	1	0	1	0	0	0	0	0	0	0	1	3
07:30 AM	0	2	0	0	1	1	0	0	0	0	0	1	5
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	3
Total	0	5	0	1	5	3	0	0	0	0	0	3	17
08:00 AM	0	0	0	2	1	0	0	0	0	0	0	0	3
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	1	0	0	0	0	0	0	1	2
08:45 AM	0	0	0	0	2	0	0	0	0	0	0	1	3
Total	0	1	0	2	5	0	0	0	0	0	0	2	10
Grand Total	0	6	0	3	10	3	0	0	0	0	0	5	27
Apprch %	0	100	0	18.8	62.5	18.8	0	0	0	0	0	100	
Total %	0	22.2	0	11.1	37	11.1	0	0	0	0	0	18.5	

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	1	0	1	0	**3**	**2**	**5**	0	0	0	0	0	0	0	0	**6**
07:15 AM	0	1	0	1	**1**	0	0	1	0	0	0	0	0	0	**1**	**1**	3
07:30 AM	0	**2**	0	**2**	0	1	1	2	0	0	0	0	0	0	1	1	5
07:45 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
Total Volume	0	5	0	5	1	5	3	9	0	0	0	0	0	0	3	3	17
% App. Total	0	100	0		11.1	55.6	33.3		0	0	0		0	0	100		
PHF	.000	.625	.000	.625	.250	.417	.375	.450	.000	.000	.000	.000	.000	.000	.750	.750	.708

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Page No : 1

Groups Printed- Peds and Bicycles

	Border Street From North					Maverick Street From East					Border Street From South					Maverick Street From West					
Start	Right	Thru	Left	Peds from East	Peds from West	Right	Thru	Left	Peds from South	Peds from North	Right	Thru	Left	Peds from West	Peds from East	Right	Thru	Left	Peds from North	Peds from South	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	4	0	0	0	0	1	3	0	0	0	0	0	8
07:15 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	5
07:30 AM	0	0	0	0	1	0	0	0	3	2	0	0	0	2	0	0	0	0	0	2	10
07:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	4
Total	0	0	0	0	3	0	0	0	7	3	0	0	0	5	5	0	0	0	0	4	27
08:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	0	0	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	6	3	0	0	0	0	0	11
08:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	0	0	0	0	0	2	6	0	0	0	9	4	0	0	0	0	0	21
Grand Total	0	0	0	0	3	0	0	0	9	9	0	0	0	14	9	0	0	0	0	4	48
Apprch %	0	0	0	0	100	0	0	0	50	50	0	0	0	60.9	39.1	0	0	0	0	100	
Total %	0	0	0	0	6.2	0	0	0	18.8	18.8	0	0	0	29.2	18.8	0	0	0	0	8.3	

	Border Street From North						Maverick Street From East						Border Street From South						Maverick Street From West						
Start Time	Right	Thru	Left	Peds from East	Peds from West	App. Total	Right	Thru	Left	Peds from South	Peds from North	App. Total	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	0	0	0	0	0	0	0	0	0	**4**	**0**	**4**	**0**	**0**	**0**	**1**	**3**	**4**	0	0	0	0	0	0	8
07:15 AM	0	0	0	0	**1**	**1**	0	0	0	0	1	1	0	0	0	1	1	2	0	0	0	0	1	1	5
07:30 AM	0	0	0	0	1	1	0	0	0	3	**2**	**5**	0	0	0	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**2**	**10**
07:45 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	1	4
Total Volume	0	0	0	0	3	3	0	0	0	7	3	10	0	0	0	5	5	10	0	0	0	0	4	4	27
% App. Total	0	0	0	0	100		0	0	0	70	30		0	0	0	50	50		0	0	0	0	100		
PHF	.000	.000	.000	.000	.750	.750	.000	.000	.000	.438	.375	.500	.000	.000	.000	.625	.417	.625	.000	.000	.000	.000	.500	.500	.675

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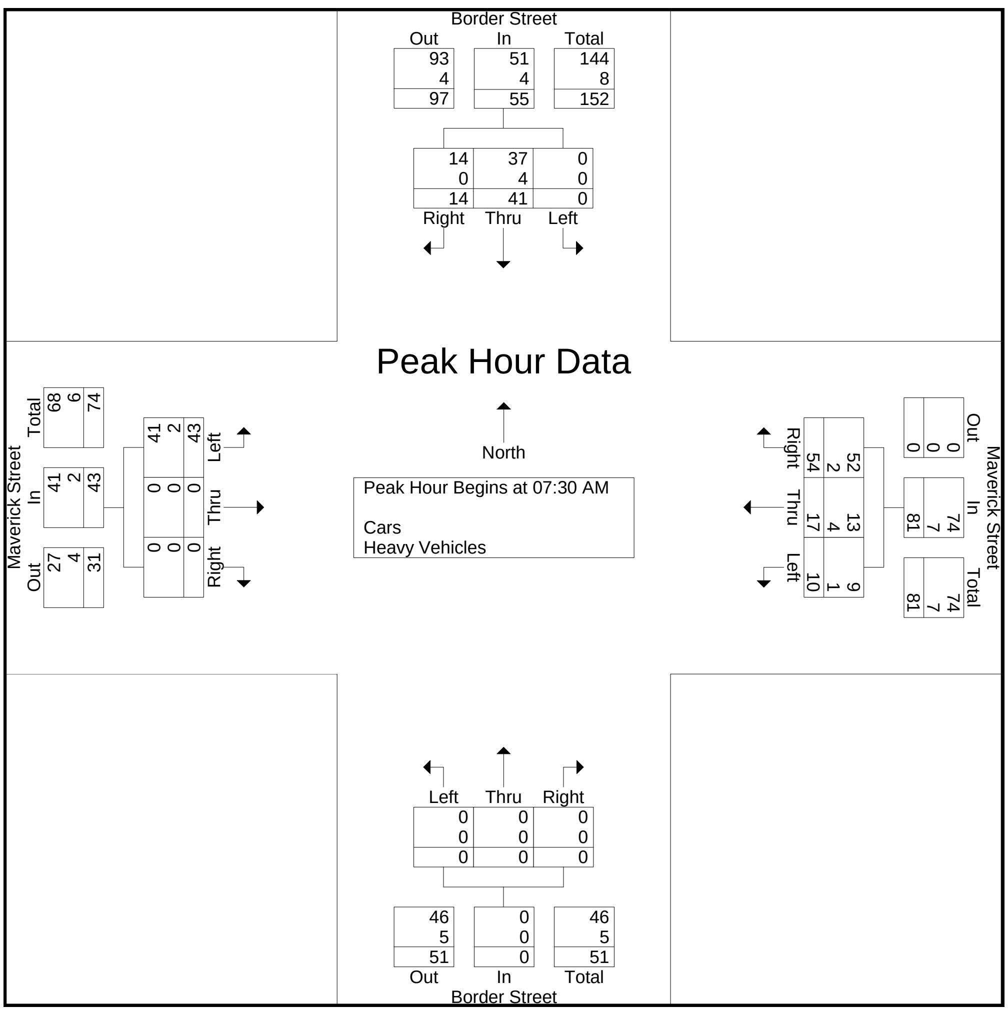
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415B
Site Code : 00000000
Start Date : 12/11/2007

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	**12**	0	14	8	3	3	14	0	0	0	0	0	0	**15**	**15**	43
07:45 AM	3	10	0	13	10	3	0	13	0	0	0	0	0	0	12	12	38
08:00 AM	**6**	10	0	**16**	**21**	**6**	2	**29**	0	0	0	0	0	0	7	7	**52**
08:15 AM	3	9	0	12	15	5	**5**	25	0	0	0	0	0	0	9	9	46
Total Volume	14	41	0	55	54	17	10	81	0	0	0	0	0	0	43	43	179
% App. Total	25.5	74.5	0		66.7	21	12.3		0	0	0		0	0	100		
PHF	.583	.854	.000	.859	.643	.708	.500	.698	.000	.000	.000	.000	.000	.000	.717	.717	.861
Cars	14	37	0	51	52	13	9	74	0	0	0	0	0	0	41	41	166
% Cars	100	90.2	0	92.7	96.3	76.5	90.0	91.4	0	0	0	0	0	0	95.3	95.3	92.7
Heavy Vehicles	0	4	0	4	2	4	1	7	0	0	0	0	0	0	2	2	13
% Heavy Vehicles	0	9.8	0	7.3	3.7	23.5	10.0	8.6	0	0	0	0	0	0	4.7	4.7	7.3



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N/S: Border Street
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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415BB
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Border Street From North			Maverick Street From East			Border Street From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	26	0	20	2	4	0	0	0	0	0	20	76
04:15 PM	1	24	0	21	1	8	0	0	0	1	0	9	65
04:30 PM	5	24	0	28	4	2	0	0	0	0	0	18	81
04:45 PM	3	21	0	20	1	5	0	0	0	0	0	7	57
Total	13	95	0	89	8	19	0	0	0	1	0	54	279
05:00 PM	4	23	0	19	3	5	0	0	0	1	0	18	73
05:15 PM	5	22	0	15	2	3	0	0	0	0	0	9	56
05:30 PM	1	14	0	7	2	1	0	0	0	1	0	17	43
05:45 PM	2	29	0	13	1	7	0	0	0	2	0	9	63
Total	12	88	0	54	8	16	0	0	0	4	0	53	235
Grand Total	25	183	0	143	16	35	0	0	0	5	0	107	514
Apprch %	12	88	0	73.7	8.2	18	0	0	0	4.5	0	95.5	
Total %	4.9	35.6	0	27.8	3.1	6.8	0	0	0	1	0	20.8	
Cars	24	182	0	134	11	35	0	0	0	5	0	105	496
% Cars	96	99.5	0	93.7	68.8	100	0	0	0	100	0	98.1	96.5
Heavy Vehicles	1	1	0	9	5	0	0	0	0	0	0	2	18
% Heavy Vehicles	4	0.5	0	6.3	31.2	0	0	0	0	0	0	1.9	3.5

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	**26**	0	**30**	20	2	4	26	0	0	0	0	0	0	**20**	**20**	76
04:15 PM	1	24	0	25	21	1	**8**	30	0	0	0	0	**1**	0	9	10	65
04:30 PM	**5**	24	0	29	**28**	**4**	2	**34**	0	0	0	0	0	0	18	18	**81**
04:45 PM	3	21	0	24	20	1	5	26	0	0	0	0	0	0	7	7	57
Total Volume	13	95	0	108	89	8	19	116	0	0	0	0	1	0	54	55	279
% App. Total	12	88	0		76.7	6.9	16.4		0	0	0		1.8	0	98.2		
PHF	.650	.913	.000	.900	.795	.500	.594	.853	.000	.000	.000	.000	.250	.000	.675	.688	.861
Cars	12	94	0	106	81	5	19	105	0	0	0	0	1	0	52	53	264
% Cars	92.3	98.9	0	98.1	91.0	62.5	100	90.5	0	0	0	0	100	0	96.3	96.4	94.6
Heavy Vehicles	1	1	0	2	8	3	0	11	0	0	0	0	0	0	2	2	15
% Heavy Vehicles	7.7	1.1	0	1.9	9.0	37.5	0	9.5	0	0	0	0	0	0	3.7	3.6	5.4

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File Name : 71415BB
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars

	Border Street From North			Maverick Street From East			Border Street From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	4	25	0	17	1	4	0	0	0	0	0	19	70
04:15 PM	1	24	0	19	1	8	0	0	0	1	0	8	62
04:30 PM	4	24	0	26	2	2	0	0	0	0	0	18	76
04:45 PM	3	21	0	19	1	5	0	0	0	0	0	7	56
Total	12	94	0	81	5	19	0	0	0	1	0	52	264
05:00 PM	4	23	0	18	2	5	0	0	0	1	0	18	71
05:15 PM	5	22	0	15	1	3	0	0	0	0	0	9	55
05:30 PM	1	14	0	7	2	1	0	0	0	1	0	17	43
05:45 PM	2	29	0	13	1	7	0	0	0	2	0	9	63
Total	12	88	0	53	6	16	0	0	0	4	0	53	232
Grand Total	24	182	0	134	11	35	0	0	0	5	0	105	496
Apprch %	11.7	88.3	0	74.4	6.1	19.4	0	0	0	4.5	0	95.5	
Total %	4.8	36.7	0	27	2.2	7.1	0	0	0	1	0	21.2	

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	1	**24**	0	25	19	1	**8**	28	0	0	0	0	**1**	0	8	9	62
04:30 PM	**4**	24	0	**28**	**26**	**2**	2	**30**	0	0	0	0	0	0	**18**	18	**76**
04:45 PM	3	21	0	24	19	1	5	25	0	0	0	0	0	0	7	7	56
05:00 PM	4	23	0	27	18	2	5	25	0	0	0	0	1	0	18	**19**	71
Total Volume	12	92	0	104	82	6	20	108	0	0	0	0	2	0	51	53	265
% App. Total	11.5	88.5	0		75.9	5.6	18.5		0	0	0		3.8	0	96.2		
PHF	.750	.958	.000	.929	.788	.750	.625	.900	.000	.000	.000	.000	.500	.000	.708	.697	.872

N/S: Border Street
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File Name : 71415BB
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Page No : 1

Groups Printed- Heavy Vehicles

	Border Street From North			Maverick Street From East			Border Street From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	1	0	3	1	0	0	0	0	0	0	1	6
04:15 PM	0	0	0	2	0	0	0	0	0	0	0	1	3
04:30 PM	1	0	0	2	2	0	0	0	0	0	0	0	5
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
Total	1	1	0	8	3	0	0	0	0	0	0	2	15
05:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	2	0	0	0	0	0	0	0	3
Grand Total	1	1	0	9	5	0	0	0	0	0	0	2	18
Apprch %	50	50	0	64.3	35.7	0	0	0	0	0	0	100	
Total %	5.6	5.6	0	50	27.8	0	0	0	0	0	0	11.1	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	0	**1**	0	**1**	**3**	1	0	**4**	0	0	0	0	0	0	**1**	**1**	**6**
04:15 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	1	3
04:30 PM	**1**	0	0	1	2	**2**	0	4	0	0	0	0	0	0	0	0	5
04:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	1	1	0	2	8	3	0	11	0	0	0	0	0	0	2	2	15
% App. Total	50	50	0		72.7	27.3	0		0	0	0		0	0	100		
PHF	.250	.250	.000	.500	.667	.375	.000	.688	.000	.000	.000	.000	.000	.000	.500	.500	.625

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Groups Printed- Peds and Bicycles

	Border Street From North					Maverick Street From East					Border Street From South					Maverick Street From West					
Start	Right	Thru	Left	Peds from East	Peds from West	Right	Thru	Left	Peds from South	Peds from North	Right	Thru	Left	Peds from West	Peds from East	Right	Thru	Left	Peds from North	Peds from South	Int. Total
04:00 PM	0	0	0	2	1	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	10
04:15 PM	0	0	0	0	2	0	0	0	0	1	0	0	0	2	4	0	0	0	4	0	13
04:30 PM	0	0	0	1	3	0	0	0	0	0	0	0	0	0	3	0	0	0	1	2	10
04:45 PM	0	0	0	0	3	0	0	0	1	0	0	0	0	2	3	0	0	0	0	0	9
Total	0	0	0	3	9	0	0	0	1	1	0	0	0	7	13	0	0	0	5	3	42
05:00 PM	0	0	0	2	2	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	10
05:15 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	2	1	0	0	0	0	2	10
05:30 PM	0	0	0	1	0	0	0	0	2	2	0	0	0	1	3	0	0	0	2	0	11
05:45 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	2	4	0	0	0	0	0	8
Total	0	0	0	3	2	0	0	0	4	13	0	0	0	5	8	0	0	0	2	2	39
Grand Total	0	0	0	6	11	0	0	0	5	14	0	0	0	12	21	0	0	0	7	5	81
Apprch %	0	0	0	35.3	64.7	0	0	0	26.3	73.7	0	0	0	36.4	63.6	0	0	0	58.3	41.7	
Total %	0	0	0	7.4	13.6	0	0	0	6.2	17.3	0	0	0	14.8	25.9	0	0	0	8.6	6.2	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Border Street From North						Maverick Street From East						Border Street From South						Maverick Street From West						
Start Time	Right	Thru	Left	Peds from East	Peds from West	App. Total	Right	Thru	Left	Peds from South	Peds from North	App. Total	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
04:00 PM	0	0	0	**2**	1	3	0	0	0	0	0	0	0	0	0	**3**	**3**	**6**	0	0	0	0	1	1	10
04:15 PM	0	0	0	0	2	2	0	0	0	0	**1**	**1**	0	0	0	2	**4**	**6**	**0**	**0**	**0**	**4**	0	**4**	**13**
04:30 PM	0	0	0	1	**3**	**4**	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	1	**2**	**3**	**10**
04:45 PM	0	0	0	0	3	3	0	0	0	**1**	**0**	**1**	**0**	**0**	**0**	**2**	**3**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**9**
Total Volume	0	0	0	3	9	12	0	0	0	1	1	2	0	0	0	7	13	20	0	0	0	5	3	8	42
% App. Total	0	0	0	25	75		0	0	0	50	50		0	0	0	35	65		0	0	0	62.5	37.5		
PHF	.000	.000	.000	.375	.750		.000	.000	.000	.250	.250		.000	.000	.000	.583	.813	.833	.000	.000	.000	.313	.375	.500	.808

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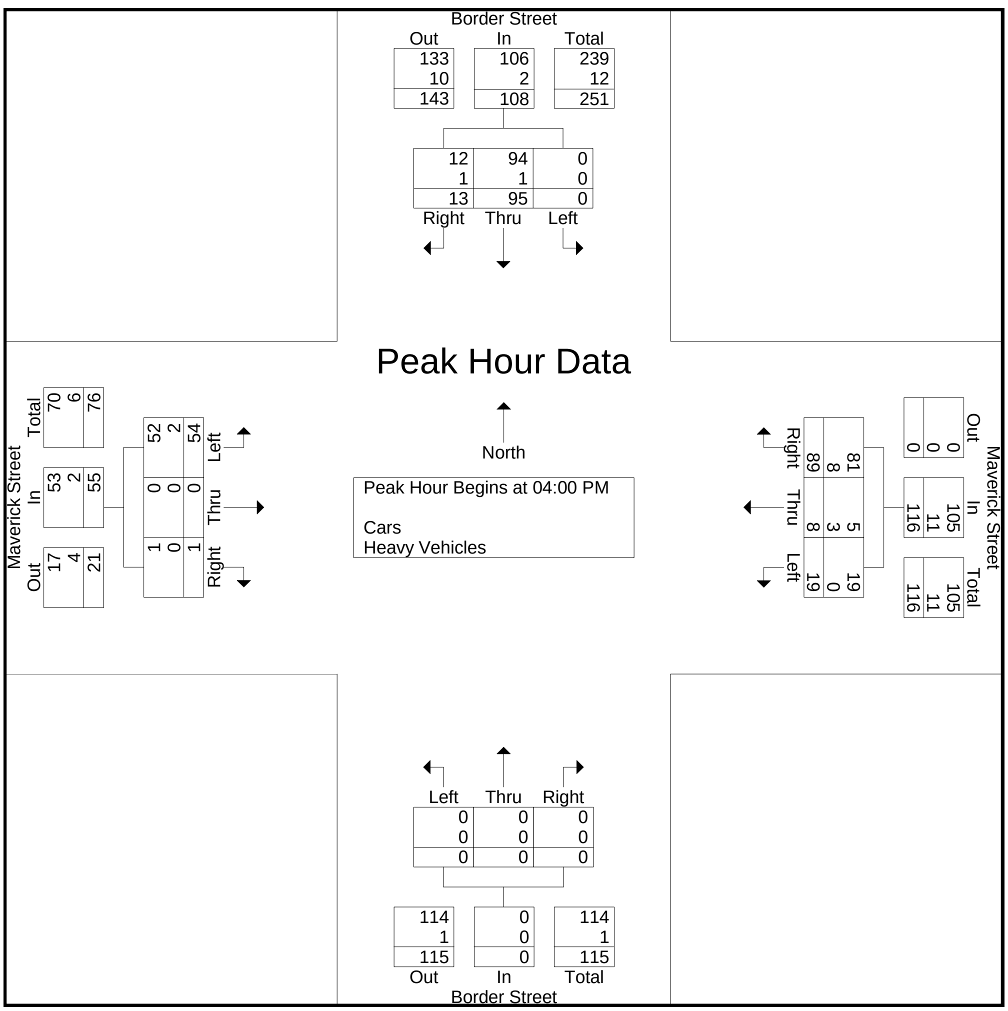
N/S: Border Street
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415BB
Site Code : 00000000
Start Date : 12/11/2007

	Border Street From North				Maverick Street From East				Border Street From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	**26**	0	**30**	20	2	4	26	0	0	0	0	0	0	**20**	**20**	76
04:15 PM	1	24	0	25	21	1	**8**	30	0	0	0	0	**1**	0	9	10	65
04:30 PM	**5**	24	0	29	**28**	**4**	2	**34**	0	0	0	0	0	0	18	18	**81**
04:45 PM	3	21	0	24	20	1	5	26	0	0	0	0	0	0	7	7	57
Total Volume	13	95	0	108	89	8	19	116	0	0	0	0	1	0	54	55	279
% App. Total	12	88	0		76.7	6.9	16.4		0	0	0		1.8	0	98.2		
PHF	.650	.913	.000	.900	.795	.500	.594	.853	.000	.000	.000	.000	.250	.000	.675	.688	.861
Cars	12	94	0	106	81	5	19	105	0	0	0	0	1	0	52	53	264
% Cars	92.3	98.9	0	98.1	91.0	62.5	100	90.5	0	0	0	0	100	0	96.3	96.4	94.6
Heavy Vehicles	1	1	0	2	8	3	0	11	0	0	0	0	0	0	2	2	15
% Heavy Vehicles	7.7	1.1	0	1.9	9.0	37.5	0	9.5	0	0	0	0	0	0	3.7	3.6	5.4



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N: Border Street
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

Groups Printed- Cars - Heavy Vehicles

	Border Street From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	3	8	0	3	3	0	17
07:15 AM	2	5	0	4	4	0	15
07:30 AM	3	12	0	13	3	0	31
07:45 AM	1	10	0	7	1	0	19
Total	9	35	0	27	11	0	82
08:00 AM	1	8	0	6	4	0	19
08:15 AM	2	8	0	9	4	0	23
08:30 AM	0	13	0	7	4	0	24
08:45 AM	1	13	0	9	6	0	29
Total	4	42	0	31	18	0	95
Grand Total	13	77	0	58	29	0	177
Apprch %	14.4	85.6	0	100	100	0	
Total %	7.3	43.5	0	32.8	16.4	0	
Cars	11	71	0	52	20	0	154
% Cars	84.6	92.2	0	89.7	69	0	87
Heavy Vehicles	2	6	0	6	9	0	23
% Heavy Vehicles	15.4	7.8	0	10.3	31	0	13

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	1	8	9	0	6	6	4	0	4	19
08:15 AM	**2**	8	10	0	**9**	**9**	4	0	4	23
08:30 AM	0	**13**	13	0	7	7	4	0	4	24
08:45 AM	1	13	**14**	0	9	9	**6**	0	**6**	**29**
Total Volume	**4**	**42**	**46**	**0**	**31**	**31**	**18**	**0**	**18**	**95**
% App. Total	**8.7**	**91.3**		**0**	**100**		**100**	**0**		
PHF	**.500**	**.808**	**.821**	**.000**	**.861**	**.861**	**.750**	**.000**	**.750**	**.819**
Cars	**4**	**41**	**45**	**0**	**28**	**28**	**14**	**0**	**14**	**87**
% Cars	**100**	**97.6**	**97.8**	**0**	**90.3**	**90.3**	**77.8**	**0**	**77.8**	**91.6**
Heavy Vehicles	**0**	**1**	**1**	**0**	**3**	**3**	**4**	**0**	**4**	**8**
% Heavy Vehicles	**0**	**2.4**	**2.2**	**0**	**9.7**	**9.7**	**22.2**	**0**	**22.2**	**8.4**

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N: Border Street
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415A
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars

	Border Street From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	3	5	0	3	0	0	11
07:15 AM	2	5	0	3	4	0	14
07:30 AM	1	11	0	12	2	0	26
07:45 AM	1	9	0	6	0	0	16
Total	7	30	0	24	6	0	67
08:00 AM	1	8	0	5	4	0	18
08:15 AM	2	8	0	9	3	0	22
08:30 AM	0	12	0	5	3	0	20
08:45 AM	1	13	0	9	4	0	27
Total	4	41	0	28	14	0	87
Grand Total	11	71	0	52	20	0	154
Apprch %	13.4	86.6	0	100	100	0	
Total %	7.1	46.1	0	33.8	13	0	

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	1	8	9	0	5	5	**4**	0	**4**	18
08:15 AM	**2**	8	10	0	**9**	**9**	3	0	3	22
08:30 AM	0	12	12	0	5	5	3	0	3	20
08:45 AM	1	**13**	**14**	0	9	9	4	0	4	**27**
Total Volume	**4**	**41**	**45**	**0**	**28**	**28**	**14**	**0**	**14**	**87**
% App. Total	**8.9**	**91.1**		**0**	**100**		**100**	**0**		
PHF	**.500**	**.788**	**.804**	**.000**	**.778**	**.778**	**.875**	**.000**	**.875**	**.806**

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415A
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Heavy Vehicles

	Border Street From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	0	3	0	0	3	0	6
07:15 AM	0	0	0	1	0	0	1
07:30 AM	2	1	0	1	1	0	5
07:45 AM	0	1	0	1	1	0	3
Total	2	5	0	3	5	0	15
08:00 AM	0	0	0	1	0	0	1
08:15 AM	0	0	0	0	1	0	1
08:30 AM	0	1	0	2	1	0	4
08:45 AM	0	0	0	0	2	0	2
Total	0	1	0	3	4	0	8
Grand Total	2	6	0	6	9	0	23
Apprch %	25	75	0	100	100	0	
Total %	8.7	26.1	0	26.1	39.1	0	

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	**3**	**3**	0	0	0	**3**	0	**3**	**6**
07:15 AM	**0**	**0**	**0**	**0**	**1**	**1**	0	0	0	1
07:30 AM	**2**	1	3	0	1	1	1	0	1	5
07:45 AM	0	1	1	0	1	1	1	0	1	3
Total Volume	2	5	7	0	3	3	5	0	5	15
% App. Total	28.6	71.4		0	100		100	0		
PHF	.250	.417	.583	.000	.750	.750	.417	.000	.417	.625

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415A
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Peds and Bicycles

	Border Street From North				Sumner Street From East				Sumner Street From West				
Start Time	Right	Left	Peds from East	Peds from West	Right	Thru	Peds from South	Peds from North	Thru	Left	Peds from North	Peds from South	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	2
07:15 AM	0	0	1	4	0	0	0	1	0	0	0	1	7
07:30 AM	0	0	0	3	0	0	1	1	0	0	0	0	5
07:45 AM	0	0	6	2	0	0	0	2	0	0	2	0	12
Total	0	0	7	9	0	0	1	4	0	0	3	2	26
08:00 AM	0	0	0	0	0	0	0	2	0	0	1	1	4
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
08:30 AM	0	0	2	0	0	0	0	1	0	0	0	0	3
08:45 AM	0	0	2	0	0	0	1	3	0	0	1	0	7
Total	0	0	4	0	0	0	1	7	0	0	2	1	15
Grand Total	0	0	11	9	0	0	2	11	0	0	5	3	41
Apprch %	0	0	55	45	0	0	15.4	84.6	0	0	62.5	37.5	
Total %	0	0	26.8	22	0	0	4.9	26.8	0	0	12.2	7.3	

	Border Street From North					Sumner Street From East					Sumner Street From West					
Start Time	Right	Left	Peds from East	Peds from West	App. Total	Right	Thru	Peds from South	Peds from North	App. Total	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:15 AM																
07:15 AM	0	0	1	**4**	5	0	0	0	1	1	0	0	0	**1**	**1**	**7**
07:30 AM	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**1**	**1**	**2**	0	0	0	0	0	5
07:45 AM	0	0	**6**	**2**	**8**	0	0	0	**2**	**2**	**0**	**0**	**2**	0	**2**	**12**
08:00 AM	0	0	0	0	0	0	0	0	2	2	0	0	1	1	2	4
Total Volume	0	0	7	9	16	0	0	1	6	7	0	0	3	2	5	28
% App. Total	0	0	43.8	56.2		0	0	14.3	85.7		0	0	60	40		
PHF	.000	.000	.292	.563	.500	.000	.000	.250	.750	.875	.000	.000	.375	.500	.625	.583

PRECISION
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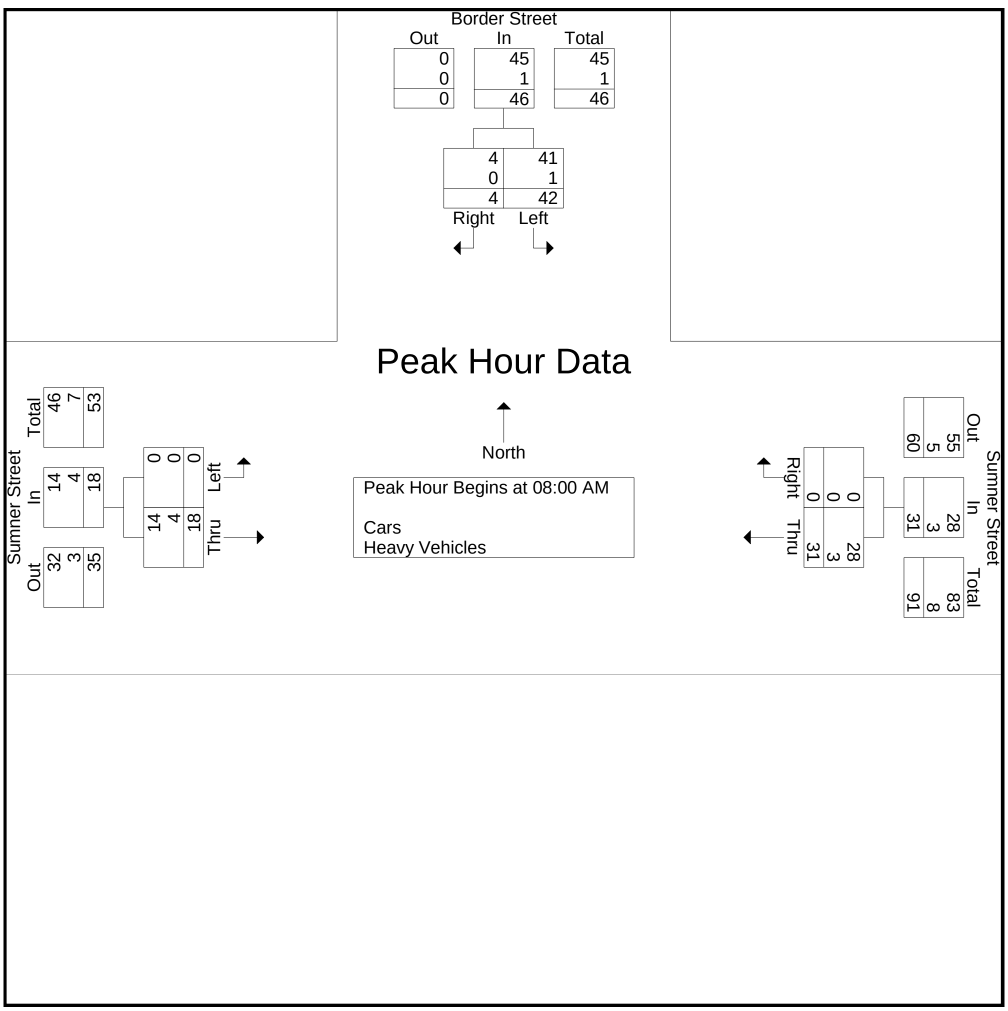
N: Border Street
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415A
Site Code : 00000000
Start Date : 12/11/2007

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	1	8	9	0	6	6	4	0	4	19
08:15 AM	**2**	8	10	0	**9**	**9**	4	0	4	23
08:30 AM	0	**13**	13	0	7	7	4	0	4	24
08:45 AM	1	13	**14**	0	9	9	**6**	0	**6**	**29**
Total Volume	**4**	**42**	**46**	**0**	**31**	**31**	**18**	**0**	**18**	**95**
% App. Total	**8.7**	**91.3**		**0**	**100**		**100**	**0**		
PHF	**.500**	**.808**	**.821**	**.000**	**.861**	**.861**	**.750**	**.000**	**.750**	**.819**
Cars	**4**	**41**	**45**	**0**	**28**	**28**	**14**	**0**	**14**	**87**
% Cars	**100**	**97.6**	**97.8**	**0**	**90.3**	**90.3**	**77.8**	**0**	**77.8**	**91.6**
Heavy Vehicles	**0**	**1**	**1**	**0**	**3**	**3**	**4**	**0**	**4**	**8**
% Heavy Vehicles	**0**	**2.4**	**2.2**	**0**	**9.7**	**9.7**	**22.2**	**0**	**22.2**	**8.4**



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N: Border Street
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415AA
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars - Heavy Vehicles

	Border Street From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	3	25	0	17	6	0	51
04:15 PM	3	26	0	6	4	0	39
04:30 PM	2	24	0	17	7	0	50
04:45 PM	0	22	0	5	4	0	31
Total	8	97	0	45	21	0	171
05:00 PM	3	24	0	13	5	0	45
05:15 PM	1	24	0	5	7	0	37
05:30 PM	3	16	0	12	2	0	33
05:45 PM	1	27	0	7	8	0	43
Total	8	91	0	37	22	0	158
Grand Total	16	188	0	82	43	0	329
Apprch %	7.8	92.2	0	100	100	0	
Total %	4.9	57.1	0	24.9	13.1	0	
Cars	16	186	0	78	35	0	315
% Cars	100	98.9	0	95.1	81.4	0	95.7
Heavy Vehicles	0	2	0	4	8	0	14
% Heavy Vehicles	0	1.1	0	4.9	18.6	0	4.3

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
04:00 PM	**3**	25	28	0	**17**	**17**	6	0	6	**51**
04:15 PM	**3**	**26**	**29**	0	6	6	4	0	4	39
04:30 PM	2	24	26	0	17	17	**7**	0	**7**	50
04:45 PM	0	22	22	0	5	5	4	0	4	31
Total Volume	8	97	105	0	45	45	21	0	21	171
% App. Total	7.6	92.4		0	100		100	0		
PHF	.667	.933	.905	.000	.662	.662	.750	.000	.750	.838
Cars	8	96	104	0	42	42	16	0	16	162
% Cars	100	99.0	99.0	0	93.3	93.3	76.2	0	76.2	94.7
Heavy Vehicles	0	1	1	0	3	3	5	0	5	9
% Heavy Vehicles	0	1.0	1.0	0	6.7	6.7	23.8	0	23.8	5.3

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N: Border Street
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415AA
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars

	Border Street From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	3	24	0	16	5	0	48
04:15 PM	3	26	0	5	4	0	38
04:30 PM	2	24	0	16	5	0	47
04:45 PM	0	22	0	5	2	0	29
Total	8	96	0	42	16	0	162
05:00 PM	3	24	0	13	4	0	44
05:15 PM	1	24	0	5	6	0	36
05:30 PM	3	16	0	11	1	0	31
05:45 PM	1	26	0	7	8	0	42
Total	8	90	0	36	19	0	153
Grand Total	16	186	0	78	35	0	315
Apprch %	7.9	92.1	0	100	100	0	
Total %	5.1	59	0	24.8	11.1	0	

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**3**	24	27	0	**16**	**16**	**5**	0	**5**	**48**
04:15 PM	**3**	**26**	**29**	0	5	5	4	0	4	38
04:30 PM	2	24	26	0	16	16	5	0	5	47
04:45 PM	0	22	22	0	5	5	2	0	2	29
Total Volume	8	96	104	0	42	42	16	0	16	162
% App. Total	7.7	92.3		0	100		100	0		
PHF	.667	.923	.897	.000	.656	.656	.800	.000	.800	.844

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415AA
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Heavy Vehicles

	Border Street From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	1	0	1	1	0	3
04:15 PM	0	0	0	1	0	0	1
04:30 PM	0	0	0	1	2	0	3
04:45 PM	0	0	0	0	2	0	2
Total	0	1	0	3	5	0	9
05:00 PM	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	1	0	1
05:30 PM	0	0	0	1	1	0	2
05:45 PM	0	1	0	0	0	0	1
Total	0	1	0	1	3	0	5
Grand Total	0	2	0	4	8	0	14
Apprch %	0	100	0	100	100	0	
Total %	0	14.3	0	28.6	57.1	0	

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	**1**	**1**	0	**1**	**1**	1	0	1	**3**
04:15 PM	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**
04:30 PM	**0**	**0**	**0**	**0**	**1**	**1**	**2**	0	**2**	3
04:45 PM	0	0	0	0	0	0	2	0	2	2
Total Volume	0	1	1	0	3	3	5	0	5	9
% App. Total	0	100		0	100		100	0		
PHF	.000	.250	.250	.000	.750	.750	.625	.000	.625	.750

PRECISION DATA INDUSTRIES, LLC
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Email: datarequests@pdillc.com

N: Border Street
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415AA
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Peds and Bicycles

	Border Street From North				Sumner Street From East				Sumner Street From West				
Start Time	Right	Left	Peds from East	Peds from West	Right	Thru	Peds from South	Peds from North	Thru	Left	Peds from North	Peds from South	Int. Total
04:00 PM	0	0	3	0	0	0	3	4	0	0	0	0	10
04:15 PM	0	0	1	1	0	0	2	1	0	0	0	0	5
04:30 PM	0	0	1	3	0	0	2	0	0	0	0	0	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	5	4	0	0	7	5	0	0	0	1	22
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	4	2	0	0	2	0	0	0	0	0	8
05:45 PM	0	0	1	0	0	0	0	1	0	0	0	0	2
Total	0	0	6	4	0	0	2	1	0	0	0	0	13
Grand Total	0	0	11	8	0	0	9	6	0	0	0	1	35
Apprch %	0	0	57.9	42.1	0	0	60	40	0	0	0	100	
Total %	0	0	31.4	22.9	0	0	25.7	17.1	0	0	0	2.9	

	Border Street From North					Sumner Street From East					Sumner Street From West					
Start Time	Right	Left	Peds from East	Peds from West	App. Total	Right	Thru	Peds from South	Peds from North	App. Total	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:00 PM																
04:00 PM	0	0	**3**	**0**	**3**	**0**	**0**	**3**	**4**	**7**	0	0	0	0	0	**10**
04:15 PM	0	0	1	1	2	0	0	2	1	3	0	0	0	0	0	5
04:30 PM	0	0	1	**3**	**4**	0	0	2	0	2	0	0	0	0	0	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	**1**
Total Volume	**0**	**0**	**5**	**4**	**9**	**0**	**0**	**7**	**5**	**12**	**0**	**0**	**0**	**1**	**1**	**22**
% App. Total	**0**	**0**	**55.6**	**44.4**		**0**	**0**	**58.3**	**41.7**		**0**	**0**	**0**	**100**		
PHF	**.000**	**.000**	**.417**	**.333**	**.563**	**.000**	**.000**	**.583**	**.313**	**.429**	**.000**	**.000**	**.000**	**.250**	**.250**	**.550**

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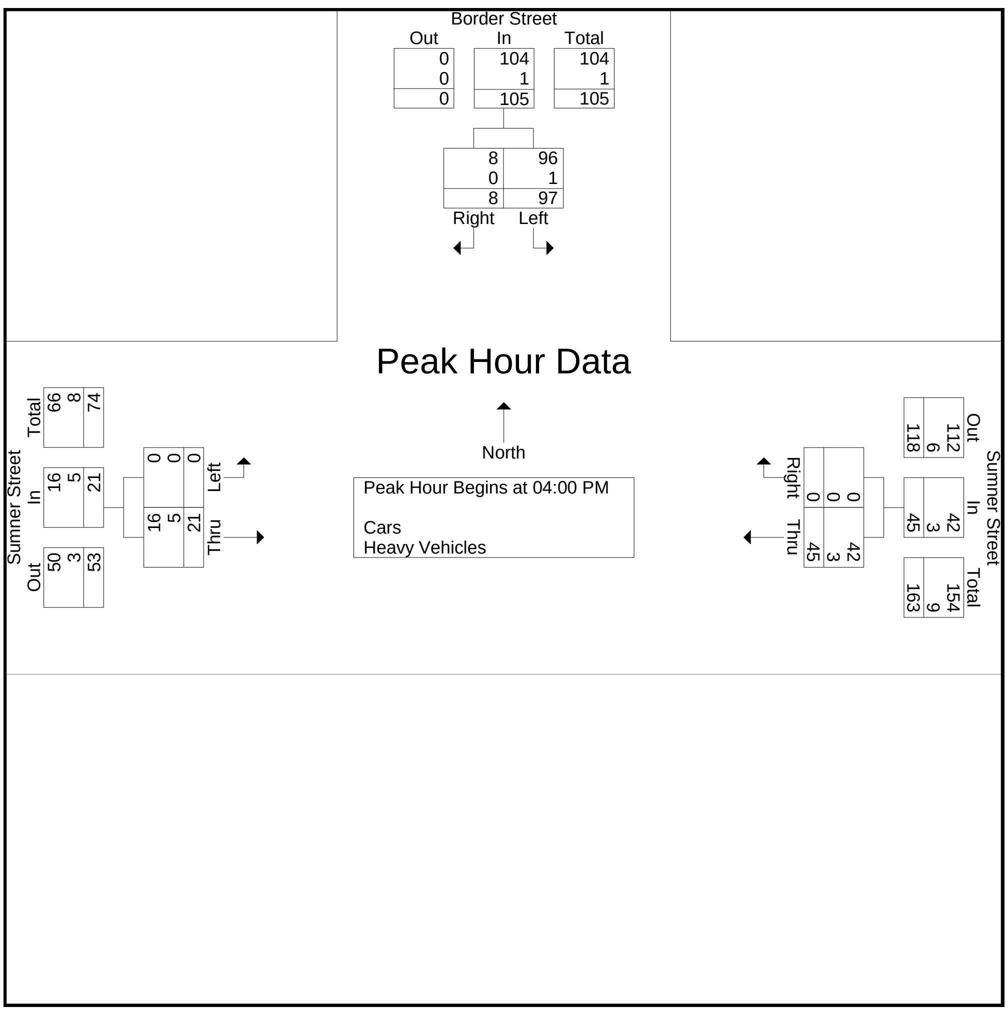
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415AA
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

	Border Street From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**3**	25	28	0	**17**	**17**	6	0	6	**51**
04:15 PM	**3**	**26**	**29**	0	6	6	4	0	4	39
04:30 PM	2	24	26	0	17	17	**7**	0	**7**	50
04:45 PM	0	22	22	0	5	5	4	0	4	31
Total Volume	8	97	105	0	45	45	21	0	21	171
% App. Total	7.6	92.4		0	100		100	0		
PHF	.667	.933	.905	.000	.662	.662	.750	.000	.750	.838
Cars	8	96	104	0	42	42	16	0	16	162
% Cars	100	99.0	99.0	0	93.3	93.3	76.2	0	76.2	94.7
Heavy Vehicles	0	1	1	0	3	3	5	0	5	9
% Heavy Vehicles	0	1.0	1.0	0	6.7	6.7	23.8	0	23.8	5.3



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N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462A
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North			London Street From East			Meridian Street From South			London Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	71	3	2	3	14	27	71	1	0	1	0	196
07:15 AM	9	89	0	1	5	23	21	58	0	2	3	1	212
07:30 AM	6	69	0	0	3	12	30	73	1	0	0	0	194
07:45 AM	14	98	3	1	9	20	15	76	0	0	0	2	238
Total	32	327	6	4	20	69	93	278	2	2	4	3	840
08:00 AM	21	105	0	1	34	19	29	84	1	3	1	1	299
08:15 AM	8	107	3	1	10	24	31	82	0	1	0	1	268
08:30 AM	6	101	5	2	1	22	23	74	0	1	2	0	237
08:45 AM	6	84	1	0	3	19	19	61	2	1	0	1	197
Total	41	397	9	4	48	84	102	301	3	6	3	3	1001
Grand Total	73	724	15	8	68	153	195	579	5	8	7	6	1841
Apprch %	9	89.2	1.8	3.5	29.7	66.8	25	74.3	0.6	38.1	33.3	28.6	
Total %	4	39.3	0.8	0.4	3.7	8.3	10.6	31.5	0.3	0.4	0.4	0.3	
Cars	66	643	14	7	64	140	182	509	5	8	7	6	1651
% Cars	90.4	88.8	93.3	87.5	94.1	91.5	93.3	87.9	100	100	100	100	89.7
Heavy Vehicles	7	81	1	1	4	13	13	70	0	0	0	0	190
% Heavy Vehicles	9.6	11.2	6.7	12.5	5.9	8.5	6.7	12.1	0	0	0	0	10.3

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	14	98	3	115	1	9	20	30	15	76	0	91	0	0	**2**	2	238
08:00 AM	**21**	105	0	**126**	1	**34**	19	**54**	29	**84**	**1**	**114**	**3**	1	1	**5**	**299**
08:15 AM	8	**107**	3	118	1	10	**24**	35	**31**	82	0	113	1	0	1	2	268
08:30 AM	6	101	**5**	112	**2**	1	22	25	23	74	0	97	1	**2**	0	3	237
Total Volume	49	411	11	471	5	54	85	144	98	316	1	415	5	3	4	12	1042
% App. Total	10.4	87.3	2.3		3.5	37.5	59		23.6	76.1	0.2		41.7	25	33.3		
PHF	.583	.960	.550	.935	.625	.397	.885	.667	.790	.940	.250	.910	.417	.375	.500	.600	.871
Cars	45	368	10	423	5	52	80	137	94	281	1	376	5	3	4	12	948
% Cars	91.8	89.5	90.9	89.8	100	96.3	94.1	95.1	95.9	88.9	100	90.6	100	100	100	100	91.0
Heavy Vehicles	4	43	1	48	0	2	5	7	4	35	0	39	0	0	0	0	94
% Heavy Vehicles	8.2	10.5	9.1	10.2	0	3.7	5.9	4.9	4.1	11.1	0	9.4	0	0	0	0	9.0

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N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462A
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Cars

	Meridian Street From North			London Street From East			Meridian Street From South			London Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	62	3	1	3	13	24	63	1	0	1	0	174
07:15 AM	7	78	0	1	5	20	19	50	0	2	3	1	186
07:30 AM	5	60	0	0	2	11	29	60	1	0	0	0	168
07:45 AM	13	90	3	1	8	18	15	67	0	0	0	2	217
Total	28	290	6	3	18	62	87	240	2	2	4	3	745
08:00 AM	21	92	0	1	34	19	29	75	1	3	1	1	277
08:15 AM	7	100	3	1	9	22	30	74	0	1	0	1	248
08:30 AM	4	86	4	2	1	21	20	65	0	1	2	0	206
08:45 AM	6	75	1	0	2	16	16	55	2	1	0	1	175
Total	38	353	8	4	46	78	95	269	3	6	3	3	906
Grand Total	66	643	14	7	64	140	182	509	5	8	7	6	1651
Apprch %	9.1	88.9	1.9	3.3	30.3	66.4	26.1	73.1	0.7	38.1	33.3	28.6	
Total %	4	38.9	0.8	0.4	3.9	8.5	11	30.8	0.3	0.5	0.4	0.4	

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	13	90	3	106	1	8	18	27	15	67	0	82	0	0	**2**	2	217
08:00 AM	**21**	92	0	**113**	1	**34**	19	**54**	29	**75**	**1**	**105**	**3**	1	1	**5**	**277**
08:15 AM	7	**100**	3	110	1	9	**22**	32	**30**	74	0	104	1	0	1	2	248
08:30 AM	4	86	**4**	94	**2**	1	21	24	20	65	0	85	1	**2**	0	3	206
Total Volume	45	368	10	423	5	52	80	137	94	281	1	376	5	3	4	12	948
% App. Total	10.6	87	2.4		3.6	38	58.4		25	74.7	0.3		41.7	25	33.3		
PHF	.536	.920	.625	.936	.625	.382	.909	.634	.783	.937	.250	.895	.417	.375	.500	.600	.856

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City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462A
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Heavy Vehicles

	Meridian Street From North			London Street From East			Meridian Street From South			London Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	9	0	1	0	1	3	8	0	0	0	0	22
07:15 AM	2	11	0	0	0	3	2	8	0	0	0	0	26
07:30 AM	1	9	0	0	1	1	1	13	0	0	0	0	26
07:45 AM	1	8	0	0	1	2	0	9	0	0	0	0	21
Total	4	37	0	1	2	7	6	38	0	0	0	0	95
08:00 AM	0	13	0	0	0	0	0	9	0	0	0	0	22
08:15 AM	1	7	0	0	1	2	1	8	0	0	0	0	20
08:30 AM	2	15	1	0	0	1	3	9	0	0	0	0	31
08:45 AM	0	9	0	0	1	3	3	6	0	0	0	0	22
Total	3	44	1	0	2	6	7	32	0	0	0	0	95
Grand Total	7	81	1	1	4	13	13	70	0	0	0	0	190
Apprch %	7.9	91	1.1	5.6	22.2	72.2	15.7	84.3	0	0	0	0	
Total %	3.7	42.6	0.5	0.5	2.1	6.8	6.8	36.8	0	0	0	0	

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	9	0	9	**1**	0	1	2	**3**	8	0	11	0	0	0	0	22
07:15 AM	**2**	**11**	0	**13**	0	0	**3**	**3**	2	8	0	10	0	0	0	0	**26**
07:30 AM	1	9	0	10	0	**1**	1	2	1	**13**	0	**14**	0	0	0	0	26
07:45 AM	1	8	0	9	0	1	2	3	0	9	0	9	0	0	0	0	21
Total Volume	4	37	0	41	1	2	7	10	6	38	0	44	0	0	0	0	95
% App. Total	9.8	90.2	0		10	20	70		13.6	86.4	0		0	0	0		
PHF	.500	.841	.000	.788	.250	.500	.583	.833	.500	.731	.000	.786	.000	.000	.000	.000	.913

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City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462A
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Meridian Street From North					London Street From East					Meridian Street From South					London Street From West					
Start	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	14	9	0	0	0	0	0	0	0	0	5	5	34
07:15 AM	0	0	0	0	3	0	0	0	10	16	0	0	0	0	1	0	0	0	6	6	42
07:30 AM	0	0	0	1	2	0	0	0	17	6	0	0	0	0	0	0	0	0	5	9	40
07:45 AM	0	0	0	0	0	0	0	0	23	4	0	0	0	0	0	0	0	0	5	13	45
Total	0	0	0	1	6	0	0	0	64	35	0	0	0	0	1	0	0	0	21	33	161
08:00 AM	0	0	0	1	3	0	0	0	19	8	0	1	0	0	2	0	0	0	7	8	49
08:15 AM	0	0	0	2	1	0	0	0	20	9	0	0	0	0	0	0	0	0	6	19	57
08:30 AM	0	0	0	4	2	0	0	0	15	10	0	0	0	0	0	0	0	0	6	9	46
08:45 AM	0	1	0	1	1	0	0	0	16	31	0	0	0	0	0	0	0	0	3	15	68
Total	0	1	0	8	7	0	0	0	70	58	0	1	0	0	2	0	0	0	22	51	220
Grand Total	0	1	0	9	13	0	0	0	134	93	0	1	0	0	3	0	0	0	43	84	381
Apprch %	0	4.3	0	39.1	56.5	0	0	0	59	41	0	25	0	0	75	0	0	0	33.9	66.1	
Total %	0	0.3	0	2.4	3.4	0	0	0	35.2	24.4	0	0.3	0	0	0.8	0	0	0	11.3	22	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	Meridian Street From North						London Street From East						Meridian Street From South						London Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
08:00 AM	0	0	0	1	**3**	4	0	0	0	19	8	27	0	**1**	0	0	**2**	**3**	0	0	0	**7**	8	15	49
08:15 AM	0	0	0	2	1	3	0	0	0	**20**	**9**	**29**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**19**	**25**	57
08:30 AM	0	0	0	**4**	2	**6**	0	0	0	15	10	25	0	0	0	0	0	0	0	0	0	6	9	15	46
08:45 AM	0	**1**	**0**	**1**	**1**	**3**	**0**	**0**	**0**	**16**	**31**	**47**	0	0	0	0	0	0	0	0	0	3	15	18	**68**
Total Volume	0	1	0	8	7	16	0	0	0	70	58	128	0	1	0	0	2	3	0	0	0	22	51	73	220
% App. Total	0	6.2	0	50	43.8		0	0	0	54.7	45.3		0	33.3	0	0	66.7		0	0	0	30.1	69.9		
PHF	.000	.250	.000	.500	.583		.000	.000	.000	.875	.468		.000	.250	.000	.000	.250	.250	.000	.000	.000	.786	.671	.730	.809

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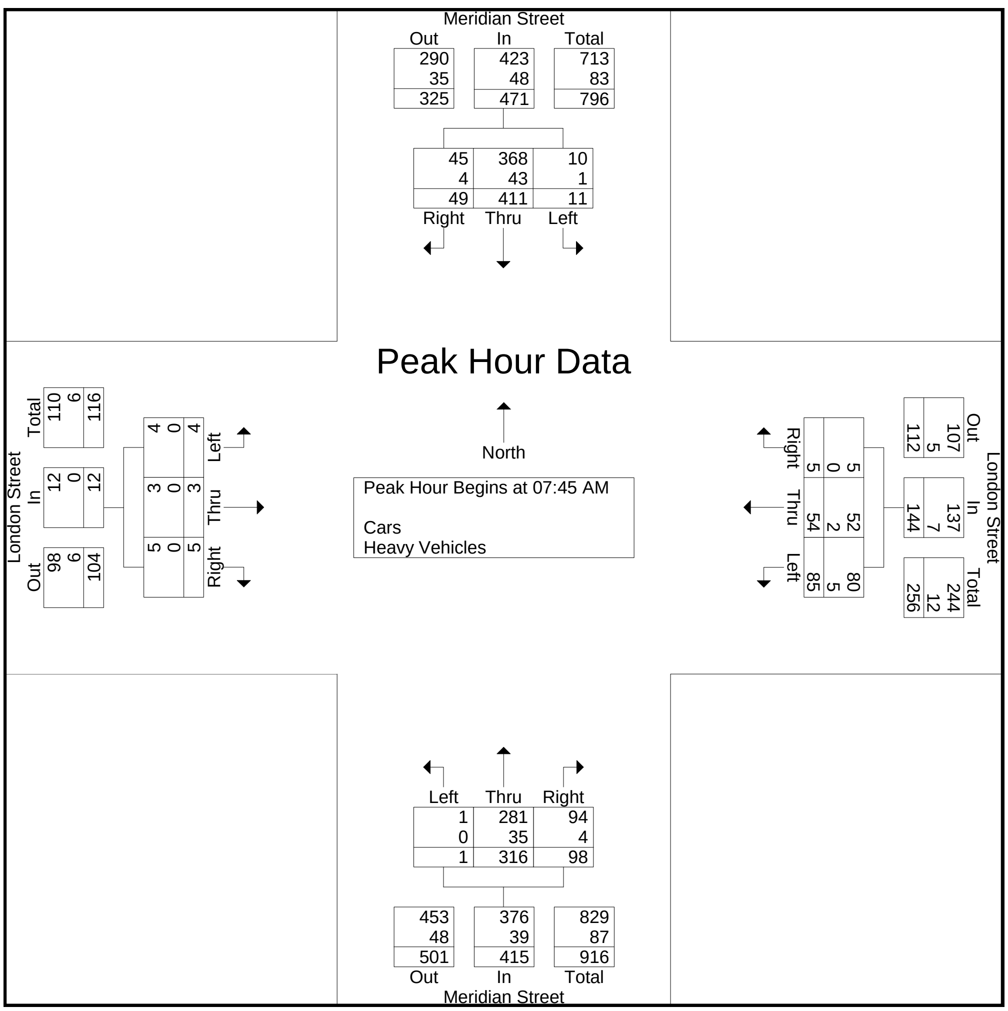
File Name : 81462A
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	14	98	3	115	1	9	20	30	15	76	0	91	0	0	**2**	2	238
08:00 AM	**21**	105	0	**126**	1	**34**	19	**54**	29	**84**	**1**	**114**	**3**	1	1	**5**	**299**
08:15 AM	8	**107**	3	118	1	10	**24**	35	**31**	82	0	113	1	0	1	2	268
08:30 AM	6	101	**5**	112	**2**	1	22	25	23	74	0	97	1	**2**	0	3	237
Total Volume	49	411	11	471	5	54	85	144	98	316	1	415	5	3	4	12	1042
% App. Total	10.4	87.3	2.3		3.5	37.5	59		23.6	76.1	0.2		41.7	25	33.3		
PHF	.583	.960	.550	.935	.625	.397	.885	.667	.790	.940	.250	.910	.417	.375	.500	.600	.871
Cars	45	368	10	423	5	52	80	137	94	281	1	376	5	3	4	12	948
% Cars	91.8	89.5	90.9	89.8	100	96.3	94.1	95.1	95.9	88.9	100	90.6	100	100	100	100	91.0
Heavy Vehicles	4	43	1	48	0	2	5	7	4	35	0	39	0	0	0	0	94
% Heavy Vehicles	8.2	10.5	9.1	10.2	0	3.7	5.9	4.9	4.1	11.1	0	9.4	0	0	0	0	9.0



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N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462AA
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North			London Street From East			Meridian Street From South			London Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	9	99	3	5	9	25	18	119	0	0	0	1	288
04:15 PM	5	107	4	8	7	23	24	126	2	1	0	3	310
04:30 PM	9	97	3	6	7	21	21	122	2	4	0	3	295
04:45 PM	1	89	1	8	3	28	20	121	1	0	6	0	278
Total	24	392	11	27	26	97	83	488	5	5	6	7	1171
05:00 PM	5	103	1	4	7	19	22	130	3	0	2	3	299
05:15 PM	8	101	2	3	5	27	22	116	3	1	5	1	294
05:30 PM	7	94	2	5	5	26	24	136	0	0	3	1	303
05:45 PM	5	81	5	4	4	26	16	108	1	1	1	1	253
Total	25	379	10	16	21	98	84	490	7	2	11	6	1149
Grand Total	49	771	21	43	47	195	167	978	12	7	17	13	2320
Apprch %	5.8	91.7	2.5	15.1	16.5	68.4	14.4	84.5	1	18.9	45.9	35.1	
Total %	2.1	33.2	0.9	1.9	2	8.4	7.2	42.2	0.5	0.3	0.7	0.6	
Cars	49	734	21	42	46	193	159	940	12	7	17	13	2233
% Cars	100	95.2	100	97.7	97.9	99	95.2	96.1	100	100	100	100	96.2
Heavy Vehicles	0	37	0	1	1	2	8	38	0	0	0	0	87
% Heavy Vehicles	0	4.8	0	2.3	2.1	1	4.8	3.9	0	0	0	0	3.8

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	5	**107**	**4**	**116**	**8**	**7**	23	38	**24**	126	2	152	1	0	**3**	4	**310**
04:30 PM	**9**	97	3	109	6	7	21	34	21	122	2	145	**4**	0	3	**7**	295
04:45 PM	1	89	1	91	8	3	**28**	**39**	20	121	1	142	0	**6**	0	6	278
05:00 PM	5	103	1	109	4	7	19	30	22	**130**	**3**	**155**	0	2	3	5	299
Total Volume	20	396	9	425	26	24	91	141	87	499	8	594	5	8	9	22	1182
% App. Total	4.7	93.2	2.1		18.4	17	64.5		14.6	84	1.3		22.7	36.4	40.9		
PHF	.556	.925	.563	.916	.813	.857	.813	.904	.906	.960	.667	.958	.313	.333	.750	.786	.953
Cars	20	373	9	402	26	24	89	139	83	478	8	569	5	8	9	22	1132
% Cars	100	94.2	100	94.6	100	100	97.8	98.6	95.4	95.8	100	95.8	100	100	100	100	95.8
Heavy Vehicles	0	23	0	23	0	0	2	2	4	21	0	25	0	0	0	0	50
% Heavy Vehicles	0	5.8	0	5.4	0	0	2.2	1.4	4.6	4.2	0	4.2	0	0	0	0	4.2

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N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462AA
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars

	Meridian Street From North			London Street From East			Meridian Street From South			London Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	9	95	3	5	9	25	17	113	0	0	0	1	277
04:15 PM	5	98	4	8	7	22	22	120	2	1	0	3	292
04:30 PM	9	93	3	6	7	20	19	116	2	4	0	3	282
04:45 PM	1	83	1	8	3	28	20	117	1	0	6	0	268
Total	24	369	11	27	26	95	78	466	5	5	6	7	1119
05:00 PM	5	99	1	4	7	19	22	125	3	0	2	3	290
05:15 PM	8	99	2	3	5	27	21	112	3	1	5	1	287
05:30 PM	7	89	2	4	4	26	23	134	0	0	3	1	293
05:45 PM	5	78	5	4	4	26	15	103	1	1	1	1	244
Total	25	365	10	15	20	98	81	474	7	2	11	6	1114
Grand Total	49	734	21	42	46	193	159	940	12	7	17	13	2233
Apprch %	6.1	91.3	2.6	14.9	16.4	68.7	14.3	84.6	1.1	18.9	45.9	35.1	
Total %	2.2	32.9	0.9	1.9	2.1	8.6	7.1	42.1	0.5	0.3	0.8	0.6	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:45 PM	1	83	1	85	**8**	3	**28**	**39**	20	117	1	138	0	**6**	0	6	268
05:00 PM	5	**99**	1	105	4	**7**	19	30	22	125	**3**	150	0	2	**3**	5	290
05:15 PM	**8**	99	**2**	**109**	3	5	27	35	21	112	3	136	**1**	5	1	**7**	287
05:30 PM	7	89	2	98	4	4	26	34	**23**	**134**	0	**157**	0	3	1	4	**293**
Total Volume	21	370	6	397	19	19	100	138	86	488	7	581	1	16	5	22	1138
% App. Total	5.3	93.2	1.5		13.8	13.8	72.5		14.8	84	1.2		4.5	72.7	22.7		
PHF	.656	.934	.750	.911	.594	.679	.893	.885	.935	.910	.583	.925	.250	.667	.417	.786	.971

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N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462AA
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Heavy Vehicles

	Meridian Street From North			London Street From East			Meridian Street From South			London Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	4	0	0	0	0	1	6	0	0	0	0	11
04:15 PM	0	9	0	0	0	1	2	6	0	0	0	0	18
04:30 PM	0	4	0	0	0	1	2	6	0	0	0	0	13
04:45 PM	0	6	0	0	0	0	0	4	0	0	0	0	10
Total	0	23	0	0	0	2	5	22	0	0	0	0	52
05:00 PM	0	4	0	0	0	0	0	5	0	0	0	0	9
05:15 PM	0	2	0	0	0	0	1	4	0	0	0	0	7
05:30 PM	0	5	0	1	1	0	1	2	0	0	0	0	10
05:45 PM	0	3	0	0	0	0	1	5	0	0	0	0	9
Total	0	14	0	1	1	0	3	16	0	0	0	0	35
Grand Total	0	37	0	1	1	2	8	38	0	0	0	0	87
Apprch %	0	100	0	25	25	50	17.4	82.6	0	0	0	0	
Total %	0	42.5	0	1.1	1.1	2.3	9.2	43.7	0	0	0	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	0	4	0	4	0	0	0	0	1	**6**	0	7	0	0	0	0	11
04:15 PM	0	**9**	0	**9**	0	0	**1**	**1**	**2**	6	0	**8**	0	0	0	0	**18**
04:30 PM	0	4	0	4	0	0	1	1	2	6	0	8	0	0	0	0	13
04:45 PM	0	6	0	6	0	0	0	0	0	4	0	4	0	0	0	0	10
Total Volume	0	23	0	23	0	0	2	2	5	22	0	27	0	0	0	0	52
% App. Total	0	100	0		0	0	100		18.5	81.5	0		0	0	0		
PHF	.000	.639	.000	.639	.000	.000	.500	.500	.625	.917	.000	.844	.000	.000	.000	.000	.722

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N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462AA
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Meridian Street From North					London Street From East					Meridian Street From South					London Street From West					
Start	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	8	9	0	0	0	36	65	0	1	0	0	0	0	0	0	26	31	176
04:15 PM	0	0	0	4	23	0	0	0	37	61	0	0	0	0	0	0	0	0	24	30	179
04:30 PM	0	0	0	3	7	0	0	0	29	39	0	0	0	0	0	0	0	1	24	25	128
04:45 PM	0	1	0	9	9	1	0	0	34	52	0	0	0	0	0	0	0	0	21	22	149
Total	0	1	0	24	48	1	0	0	136	217	0	1	0	0	0	0	0	1	95	108	632
05:00 PM	0	0	0	3	6	0	0	0	29	30	0	0	0	0	0	0	0	0	40	24	132
05:15 PM	0	0	0	9	3	0	0	0	28	50	0	0	0	0	0	0	0	0	17	27	134
05:30 PM	0	0	0	4	4	0	0	0	32	57	0	0	0	0	0	0	0	0	24	20	141
05:45 PM	0	0	0	7	5	0	0	0	19	26	0	0	0	0	0	0	0	0	19	15	91
Total	0	0	0	23	18	0	0	0	108	163	0	0	0	0	0	0	0	0	100	86	498
Grand Total	0	1	0	47	66	1	0	0	244	380	0	1	0	0	0	0	0	1	195	194	1130
Apprch %	0	0.9	0	41.2	57.9	0.2	0	0	39	60.8	0	100	0	0	0	0	0	0.3	50	49.7	
Total %	0	0.1	0	4.2	5.8	0.1	0	0	21.6	33.6	0	0.1	0	0	0	0	0	0.1	17.3	17.2	

	Meridian Street From North						London Street From East						Meridian Street From South						London Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	0	0	8	9	17	0	0	0	36	**65**	**101**	0	**1**	0	0	0	**1**	0	0	0	**26**	**31**	**57**	176
04:15 PM	0	0	0	4	**23**	**27**	0	0	0	**37**	**61**	**98**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24**	**30**	**54**	**179**
04:30 PM	0	0	0	3	7	10	0	0	0	29	39	68	0	0	0	0	0	0	0	0	**1**	24	25	50	128
04:45 PM	0	**1**	**0**	**9**	9	19	**1**	0	0	34	52	87	0	0	0	0	0	0	0	0	0	21	22	43	149
Total Volume	0	1	0	24	48	73	1	0	0	136	217	354	0	1	0	0	0	1	0	0	1	95	108	204	632
% App. Total	0	1.4	0	32.9	65.8		0.3	0	0	38.4	61.3		0	100	0	0	0		0	0	0.5	46.6	52.9		
PHF	.000	.250	.000	.667	.522		.250	.000	.000	.919	.835		.000	.250	.000	.000	.000	.250	.000	.000	.250	.913	.871	.895	.883

PRECISION
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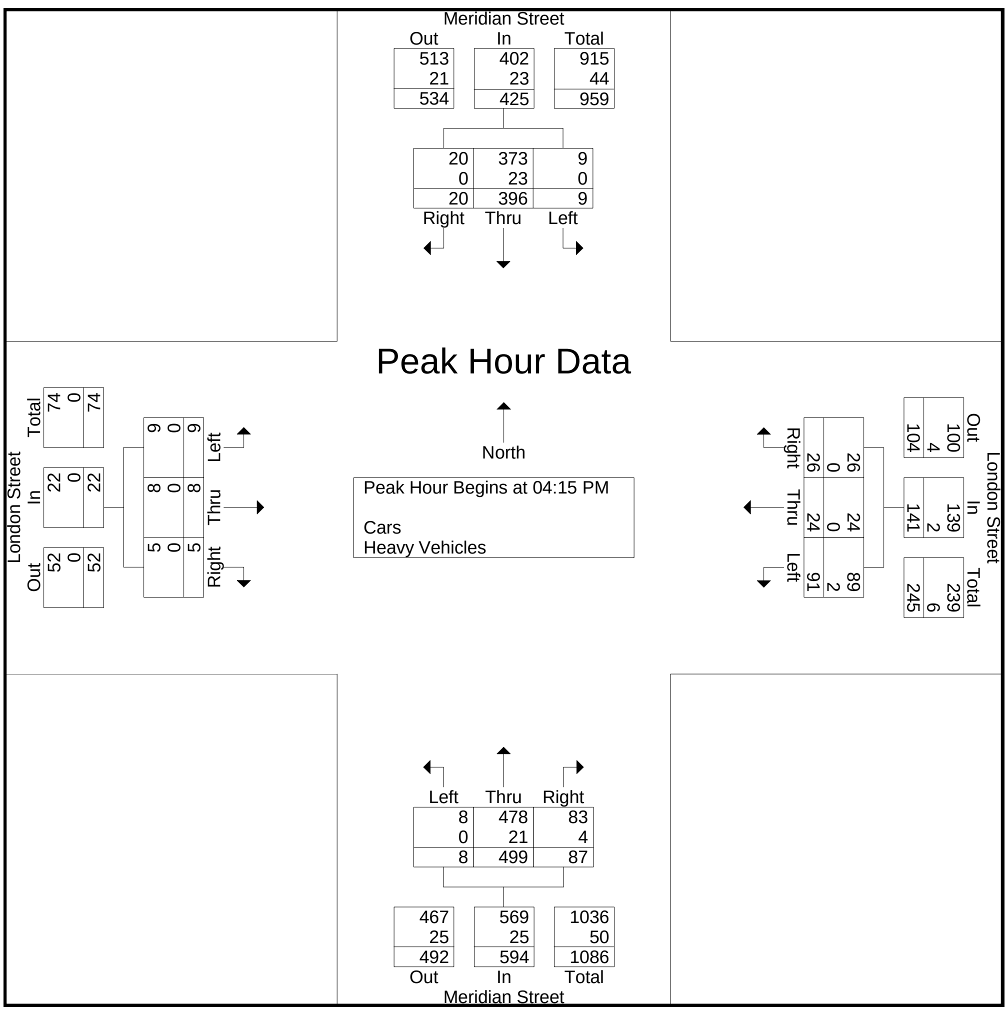
N/S: Meridian Street
E/W: London Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462AA
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

	Meridian Street From North				London Street From East				Meridian Street From South				London Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	5	**107**	**4**	**116**	**8**	**7**	23	38	**24**	126	2	152	1	0	**3**	4	**310**
04:30 PM	**9**	97	3	109	6	7	21	34	21	122	2	145	**4**	0	3	**7**	295
04:45 PM	1	89	1	91	8	3	**28**	**39**	20	121	1	142	0	**6**	0	6	278
05:00 PM	5	103	1	109	4	7	19	30	22	**130**	**3**	**155**	0	2	3	5	299
Total Volume	20	396	9	425	26	24	91	141	87	499	8	594	5	8	9	22	1182
% App. Total	4.7	93.2	2.1		18.4	17	64.5		14.6	84	1.3		22.7	36.4	40.9		
PHF	.556	.925	.563	.916	.813	.857	.813	.904	.906	.960	.667	.958	.313	.333	.750	.786	.953
Cars	20	373	9	402	26	24	89	139	83	478	8	569	5	8	9	22	1132
% Cars	100	94.2	100	94.6	100	100	97.8	98.6	95.4	95.8	100	95.8	100	100	100	100	95.8
Heavy Vehicles	0	23	0	23	0	0	2	2	4	21	0	25	0	0	0	0	50
% Heavy Vehicles	0	5.8	0	5.4	0	0	2.2	1.4	4.6	4.2	0	4.2	0	0	0	0	4.2



N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

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File Name : 71415F
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North					Havre Street From East			Gove Street From Southeast				Meridian Street From South				Havre Street From West					Dedatur Street From Northwest				
Start Time	Hard Right	Thru	Bear Left	Left	Peds from	Bear Right	Left	Hard Left	Hard Right	Bear Right	Thru	Hard Left	Hard Right	Right	Thru	Bear Left	Right	Bear Right	Thru	Left	Hard Left	Bear Right	Thru	Bear Left	Hard Left	Int. Total
07:00 AM	3	45	5	20	0	0	0	0	9	27	2	0	0	9	72	1	0	0	2	10	1	2	0	3	3	214
07:15 AM	4	58	7	43	0	0	0	0	2	18	1	4	2	7	56	2	0	0	5	14	5	4	0	5	0	237
07:30 AM	0	57	5	41	0	0	0	0	10	16	0	2	1	6	77	1	2	0	6	14	0	1	0	2	1	242
07:45 AM	2	74	7	44	0	0	0	0	17	24	1	5	2	11	43	4	3	0	10	16	3	1	0	6	2	275
Total	9	234	24	148	0	0	0	0	38	85	4	11	5	33	248	8	5	0	23	54	9	8	0	16	6	968
08:00 AM	1	60	11	37	0	0	0	0	14	24	0	4	0	13	68	3	1	0	17	15	7	4	0	4	0	283
08:15 AM	4	79	10	32	0	0	0	0	17	20	1	2	1	12	70	5	2	0	9	11	4	6	0	8	2	295
08:30 AM	2	69	11	38	0	0	0	0	8	9	1	1	2	13	57	4	2	1	9	21	0	1	0	1	1	251
08:45 AM	2	68	11	40	0	0	0	0	15	22	0	6	4	18	44	3	3	0	6	9	0	3	0	6	0	260
Total	9	276	43	147	0	0	0	0	54	75	2	13	7	56	239	15	8	1	41	56	11	14	0	19	3	1089
Grand Total	18	510	67	295	0	0	0	0	92	160	6	24	12	89	487	23	13	1	64	110	20	22	0	35	9	2057
Apprch %	2	57.3	7.5	33.1	0	0	0	0	32.6	56.7	2.1	8.5	2	14.6	79.7	3.8	6.2	0.5	30.8	52.9	9.6	33.3	0	53	13.6	
Total %	0.9	24.8	3.3	14.3	0	0	0	0	4.5	7.8	0.3	1.2	0.6	4.3	23.7	1.1	0.6	0	3.1	5.3	1	1.1	0	1.7	0.4	
Cars	18	448	66	284	0	0	0	0	82	156	6	22	12	84	416	23	12	1	61	103	20	21	0	31	9	1875
% Cars	100	87.8	98.5	96.3	0	0	0	0	89.1	97.5	100	91.7	100	94.4	85.4	100	92.3	100	95.3	93.6	100	95.5	0	88.6	100	91.2
Heavy Vehicles																										
% Heavy Vehicles	0	12.2	1.5	3.7	0	0	0	0	10.9	2.5	0	8.3	0	5.6	14.6	0	7.7	0	4.7	6.4	0	4.5	0	11.4	0	8.8

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

	Meridian Street From North						Havre Street From East				Gove Street From Southeast					Meridian Street From South					Havre Street From West						Dedatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	Peds from East	App. Total	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
07:45 AM	2	74	7	**44**	0	**127**	0	0	0	0	**17**	**24**	**1**	**5**	**47**	**2**	11	43	4	60	**3**	0	10	16	3	32	1	0	6	**2**	9	275
08:00 AM	1	60	**11**	37	0	109	0	0	0	0	14	24	0	4	42	0	**13**	68	3	84	1	0	**17**	15	**7**	**40**	4	0	4	0	8	283
08:15 AM	**4**	**79**	10	32	0	125	0	0	0	0	17	20	1	2	40	1	12	**70**	**5**	**88**	2	0	9	11	4	26	**6**	0	**8**	2	**16**	**295**
08:30 AM	2	69	11	38	0	120	0	0	0	0	8	9	1	1	19	2	13	57	4	76	2	**1**	9	**21**	0	33	1	0	1	1	3	251
Total Volume	9	282	39	151	0	481	0	0	0	0	56	77	3	12	148	5	49	238	16	308	8	1	45	63	14	131	12	0	19	5	36	1104
% App. Total	1.9	58.6	8.1	31.4	0		0	0	0		37.8	52	2	8.1		1.6	15.9	77.3	5.2		6.1	0.8	34.4	48.1	10.7		33.3	0	52.8	13.9		
PHF	.563	.892	.886	.858	.000	.947	.000	.000	.000	.000	.824	.802	.750	.600	.787	.625	.942	.850	.800	.875	.667	.250	.662	.750	.500	.819	.500	.000	.594	.625	.563	.936
Cars	9	254	38	144	0	445	0	0	0	0	49	76	3	12	140	5	48	204	16	273	7	1	44	60	14	126	11	0	17	5	33	1017
% Cars	100	90.1	97.4	95.4	0	92.5	0	0	0	0	87.5	98.7	100	100	94.6	100	98.0	85.7	100	88.6	87.5	100	97.8	95.2	100	96.2	91.7	0	89.5	100	91.7	92.1
Heavy Vehicles	0	28	1	7	0	36	0	0	0	0	7	1	0	0	8	0	1	34	0	35	1	0	1	3	0	5	1	0	2	0	3	87
% Heavy Vehicles	0	9.9	2.6	4.6	0	7.5	0	0	0	0	12.5	1.3	0	0	5.4	0	2.0	14.3	0	11.4	12.5	0	2.2	4.8	0	3.8	8.3	0	10.5	0	8.3	7.9

PRECISION
D A T A
INDUSTRIES, LLC
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N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415F
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars

	Meridian Street From North					Havre Street From East			Gove Street From Southeast				Meridian Street From South				Havre Street From West					Dedatur Street From Northwest				
Start Time	Hard Right	Thru	Bear Left	Left	Peds from	Bear Right	Left	Hard Left	Hard Right	Bear Right	Thru	Hard Left	Hard Right	Right	Thru	Bear Left	Right	Bear Right	Thru	Left	Hard Left	Bear Right	Thru	Bear Left	Hard Left	Int. Total
07:00 AM	3	37	5	20	0	0	0	0	9	26	2	0	0	9	63	1	0	0	2	8	1	2	0	3	3	194
07:15 AM	4	48	7	41	0	0	0	0	2	17	1	2	2	6	47	2	0	0	4	13	5	4	0	5	0	210
07:30 AM	0	52	5	40	0	0	0	0	9	16	0	2	1	4	68	1	2	0	5	14	0	1	0	1	1	222
07:45 AM	2	65	7	41	0	0	0	0	17	23	1	5	2	11	35	4	2	0	10	15	3	1	0	5	2	251
Total	9	202	24	142	0	0	0	0	37	82	4	9	5	30	213	8	4	0	21	50	9	8	0	14	6	877
08:00 AM	1	57	11	36	0	0	0	0	11	24	0	4	0	12	58	3	1	0	17	14	7	3	0	4	0	263
08:15 AM	4	67	9	31	0	0	0	0	15	20	1	2	1	12	64	5	2	0	9	11	4	6	0	7	2	272
08:30 AM	2	65	11	36	0	0	0	0	6	9	1	1	2	13	47	4	2	1	8	20	0	1	0	1	1	231
08:45 AM	2	57	11	39	0	0	0	0	13	21	0	6	4	17	34	3	3	0	6	8	0	3	0	5	0	232
Total	9	246	42	142	0	0	0	0	45	74	2	13	7	54	203	15	8	1	40	53	11	13	0	17	3	998
Grand Total	18	448	66	284	0	0	0	0	82	156	6	22	12	84	416	23	12	1	61	103	20	21	0	31	9	1875
Apprch %	2.2	54.9	8.1	34.8	0	0	0	0	30.8	58.6	2.3	8.3	2.2	15.7	77.8	4.3	6.1	0.5	31	52.3	10.2	34.4	0	50.8	14.8	
Total %	1	23.9	3.5	15.1	0	0	0	0	4.4	8.3	0.3	1.2	0.6	4.5	22.2	1.2	0.6	0.1	3.3	5.5	1.1	1.1	0	1.7	0.5	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

	Meridian Street From North						Havre Street From East				Gove Street From Southeast					Meridian Street From South					Havre Street From West						Dedatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	Peds from East	App. Total	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
07:45 AM	2	65	7	**41**	0	**115**	0	0	0	0	**17**	23	**1**	**5**	**46**	**2**	11	35	4	52	**2**	0	10	15	3	30	1	0	5	**2**	8	251
08:00 AM	1	57	**11**	36	0	105	0	0	0	0	11	**24**	0	4	39	0	12	58	3	73	1	0	**17**	14	**7**	**39**	3	0	4	0	7	263
08:15 AM	**4**	**67**	9	31	0	111	0	0	0	0	15	20	1	2	38	1	12	**64**	**5**	**82**	2	0	9	11	4	26	**6**	0	**7**	2	**15**	**272**
08:30 AM	2	65	11	36	0	114	0	0	0	0	6	9	1	1	17	2	**13**	47	4	66	2	**1**	8	**20**	0	31	1	0	1	1	3	231
Total Volume	9	254	38	144	0	445	0	0	0	0	49	76	3	12	140	5	48	204	16	273	7	1	44	60	14	126	11	0	17	5	33	1017
% App. Total	2	57.1	8.5	32.4	0		0	0	0		35	54.3	2.1	8.6		1.8	17.6	74.7	5.9		5.6	0.8	34.9	47.6	11.1		33.3	0	51.5	15.2		
PHF	.563	.948	.864	.878	.000	.967	.000	.000	.000	.000	.721	.792	.750	.600	.761	.625	.923	.797	.800	.832	.875	.250	.647	.750	.500	.808	.458	.000	.607	.625	.550	.935

N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

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File Name : 71415F
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Heavy Vehicles

	Meridian Street From North					Havre Street From East			Gove Street From Southeast				Meridian Street From South				Havre Street From West					Dedatur Street From Northwest				
Start Time	Hard Right	Thru	Bear Left	Left	Peds from	Bear Right	Left	Hard Left	Hard Right	Bear Right	Thru	Hard Left	Hard Right	Right	Thru	Bear Left	Right	Bear Right	Thru	Left	Hard Left	Bear Right	Thru	Bear Left	Hard Left	Int. Total
07:00 AM	0	8	0	0	0	0	0	0	0	1	0	0	0	0	9	0	0	0	0	2	0	0	0	0	0	20
07:15 AM	0	10	0	2	0	0	0	0	0	1	0	2	0	1	9	0	0	0	1	1	0	0	0	0	0	27
07:30 AM	0	5	0	1	0	0	0	0	1	0	0	0	0	2	9	0	0	0	1	0	0	0	0	1	0	20
07:45 AM	0	9	0	3	0	0	0	0	0	1	0	0	0	0	8	0	1	0	0	1	0	0	0	1	0	24
Total	0	32	0	6	0	0	0	0	1	3	0	2	0	3	35	0	1	0	2	4	0	0	0	2	0	91
08:00 AM	0	3	0	1	0	0	0	0	3	0	0	0	0	1	10	0	0	0	0	1	0	1	0	0	0	20
08:15 AM	0	12	1	1	0	0	0	0	2	0	0	0	0	0	6	0	0	0	0	0	0	0	0	1	0	23
08:30 AM	0	4	0	2	0	0	0	0	2	0	0	0	0	0	10	0	0	0	1	1	0	0	0	0	0	20
08:45 AM	0	11	0	1	0	0	0	0	2	1	0	0	0	1	10	0	0	0	0	1	0	0	0	1	0	28
Total	0	30	1	5	0	0	0	0	9	1	0	0	0	2	36	0	0	0	1	3	0	1	0	2	0	91
Grand Total	0	62	1	11	0	0	0	0	10	4	0	2	0	5	71	0	1	0	3	7	0	1	0	4	0	182
Apprch %	0	83.8	1.4	14.9	0	0	0	0	62.5	25	0	12.5	0	6.6	93.4	0	9.1	0	27.3	63.6	0	20	0	80	0	
Total %	0	34.1	0.5	6	0	0	0	0	5.5	2.2	0	1.1	0	2.7	39	0	0.5	0	1.6	3.8	0	0.5	0	2.2	0	

	Meridian Street From North						Havre Street From East				Gove Street From Southeast					Meridian Street From South					Havre Street From West						Dedatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	Peds from East	App. Total	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																																
Peak Hour for Entire Intersection Begins at 07:00 AM																																
07:00 AM	0	8	0	0	0	8	0	0	0	0	0	**1**	0	0	1	0	0	**9**	0	9	0	0	0	**2**	0	**2**	0	0	0	0	0	20
07:15 AM	0	**10**	0	2	0	**12**	0	0	0	0	0	1	0	**2**	**3**	0	1	9	0	10	0	0	**1**	1	0	2	0	0	0	0	0	**27**
07:30 AM	0	5	0	1	0	6	0	0	0	0	**1**	0	0	0	1	0	**2**	9	0	**11**	0	0	1	0	0	1	0	0	**1**	0	**1**	20
07:45 AM	0	9	0	**3**	0	12	0	0	0	0	0	1	0	0	1	0	0	8	0	8	**1**	0	0	1	0	2	0	0	1	0	1	24
Total Volume	0	32	0	6	0	38	0	0	0	0	1	3	0	2	6	0	3	35	0	38	1	0	2	4	0	7	0	0	2	0	2	91
% App. Total	0	84.2	0	15.8	0		0	0	0		16.7	50	0	33.3		0	7.9	92.1	0		14.3	0	28.6	57.1	0		0	0	100	0		
PHF	.000	.800	.000	.500	.000	.792	.000	.000	.000	.000	.250	.750	.000	.250	.500	.000	.375	.972	.000	.864	.250	.000	.500	.500	.000	.875	.000	.000	.500	.000	.500	.843

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N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415F
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Peds and Bicycles

	Meridian Street From North						Havre Street From East							Gove Street From Southeast						Meridian Street From South						Havre Street From West									Dedatur Street From Northwest							
Start Time	Hard Right	Thru	Bear Left	Left	Peds from East	Peds from West	Bear Right	Thru	Left	Hard Left	Peds Xwalk from S	Peds from North	Peds from South	Hard Right	Bear Right	Thru	Hard Left	Peds from South	Peds from North	Hard Right	Right	Bear Left	Left	Peds from West	Peds from East	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk from S	Peds Xwalk from N	Peds from North	Peds from South	Hard Right	Bear Right	Thru	Bear Left	Hard Left	Peds from South	Peds from North	Int. Total
07:00 AM	0	0	0	0	0	14	0	0	0	0	5	0	8	0	0	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	7	3	3	0	0	0	0	0	0	1	3	54
07:15 AM	0	0	0	0	0	7	0	0	0	0	9	12	2	0	0	0	0	6	4	0	0	0	0	0	0	0	0	0	0	0	7	15	2	0	0	0	0	0	0	4	0	68
07:30 AM	0	0	0	0	1	16	0	0	0	0	5	3	2	0	0	0	0	9	3	0	0	0	0	0	1	0	0	0	0	0	3	10	5	1	0	0	0	0	0	0	0	59
07:45 AM	0	0	0	0	2	4	0	0	0	0	3	17	6	0	0	0	0	8	5	0	0	0	0	0	0	0	0	0	0	0	3	4	1	1	0	0	0	0	0	0	2	56
Total	0	0	0	0	3	41	0	0	0	0	22	32	18	0	0	0	0	32	13	0	0	0	0	0	1	0	0	0	0	0	20	32	11	2	0	0	0	0	0	5	5	237
08:00 AM						13																										10										
08:15 AM	0	0	0	0	0	12	0	0	0	0	7	6	3	0	0	0	0	10	4	0	0	0	0	2	0	0	0	0	0	0	3	13	4	0	0	0	0	0	0	0	2	66
08:30 AM	0	0	0	0	0	18	0	0	0	0	16	11	9	0	0	0	0	14	5	0	0	0	0	0	0	0	0	0	0	0	9	7	2	1	0	0	0	0	0	0	0	92
08:45 AM	0	0	0	0	0	14	0	0	0	0	19	25	9	0	0	0	0	10	3	0	0	0	0	2	0	0	0	0	0	0	8	10	6	0	0	0	0	0	0	0	0	106
Total	0	0	0	0	4	57					45	51																														
Grand Total	0	0	0	0	7	98	0	0	0	0	67	83	43	0	0	0	0	75	28	0	0	0	0	5	3	0	0	0	0	0	45	72	25	3	0	0	0	0	0	7	10	571
Apprch %	0	0	0	0	6.7	93.3	0	0	0	0	34.7	43	22.3	0	0	0	0	72.8	27.2	0	0	0	0	62.5	37.5	0	0	0	0	0	31	49.7	17.2	2.1	0	0	0	0	0	41.2	58.8	
Total %	0	0	0	0	1.2	17.2	0	0	0	0	11.7	14.5	7.5	0	0	0	0	13.1	4.9	0	0	0	0	0.9	0.5	0	0	0	0	0	7.9	12.6	4.4	0.5	0	0	0	0	0	1.2	1.8	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	Meridian Street From North							Havre Street From East								Gove Street From Southeast							Meridian Street From South							Havre Street From West										Dedatur Street From Northwest								
Start Time				Le			App. Total	Bear Rig	Thru	Left	Hard Lef	Peds Xw	Peds fro	Peds fro	App. Total	Hard Rig	Bear Rig	Thru	Hard Lef	Peds fro	Peds fro	App. Total	Hard Rig	Right	Bear Lef	Left	Peds fro	Peds fro	App. Total				Le						App. Total	Hard Rig	Bear Rig	Thru	Bear Lef	Hard Lef	Peds fro	Peds fro	App. Total	Int. Total
08:00 AM					4	1	17	0	0	0	0	3	9	4	16	0	0	0	0	9	3	12	0	0	0	0	1	2	3										17	0	0	0	0	0	2	3	5	70
08:15 AM							12	0	0	0	0	7	6	3	16	0	0	0	0	10	4	14	0	0	0	0	2		2							13	4	0	20	0	0	0	0	0	0	2	2	66
08:30 AM						18	18	0	0	0	0	16	11	9	36	0	0	0	0	14	5	19	0	0	0	0	0	0	0	0	0	0	0	0	9			1	19	0	0	0	0	0	0	0	0	92
08:45 AM							14	0	0	0	0	19	25	9	53	0	0	0	0	10	3	13	0	0	0	0	2	0	2	0	0	0	0	0	8	10	6		24	0	0	0	0	0	0	0	0	106
Total Volume							61	0	0	0	0	45	51	25	121	0	0	0	0	43	15	58	0	0	0	0	5	2	7	0	0	0	0	0	25	40	14	1	80	0	0	0	0	0	2	5	7	334
% App. Total																																																
PHF	.000	.000	.000	.000	.250	.792	.847	.000	.000	.000	.000	.592	.510	.694	.571	.000	.000	.000	.000	.768	.750	.763	.000	.000	.000	.000	.625	.250	.583	.000	.000	.000	.000	.000	.694	.769	.583	.250	.833	.000	.000	.000	.000	.000	.250	.417	.350	.788

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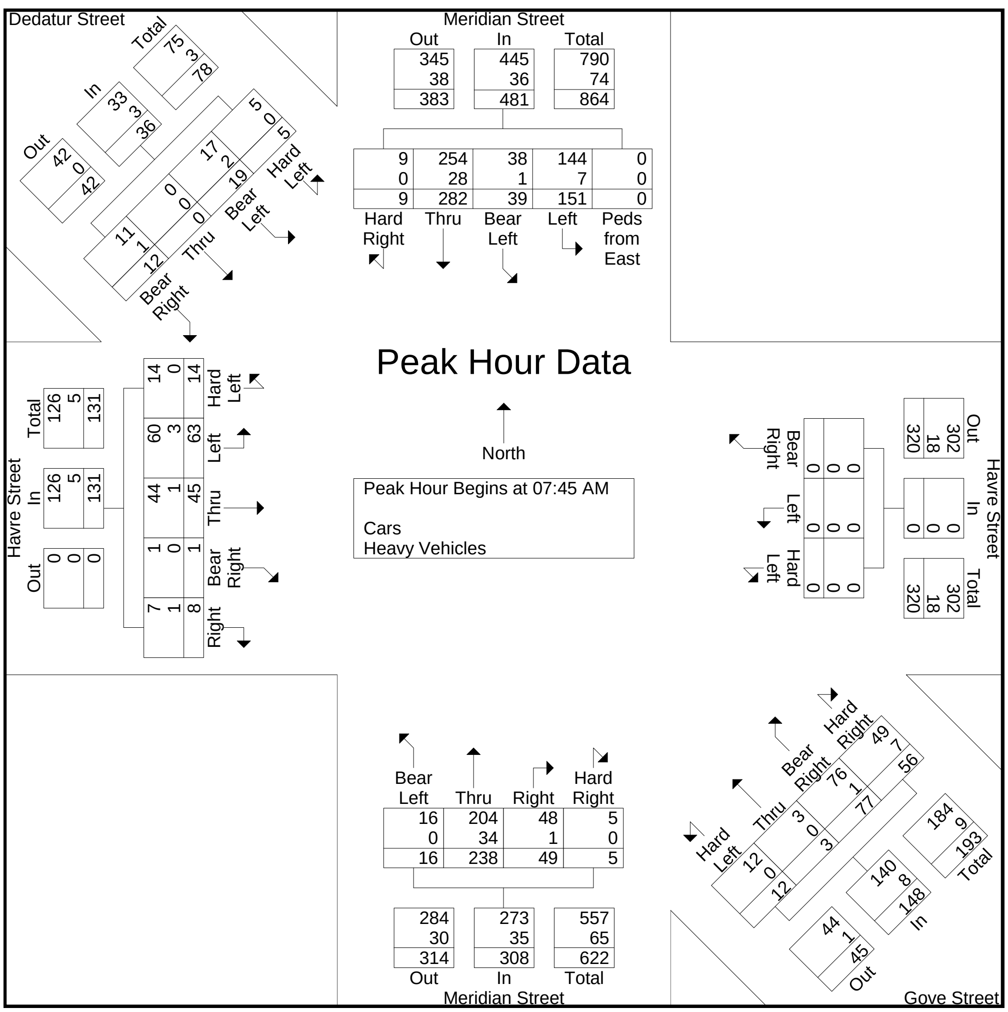
	Meridian Street From North						Havre Street From East				Gove Street From Southeast					Meridian Street From South					Havre Street From West						Dedatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	Peds from East	App. Total	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																																
Peak Hour for Entire Intersection Begins at 07:45 AM																																
07:45 AM	2	74	7	**44**	0	**127**	0	0	0	0	**17**	**24**	**1**	**5**	**47**	**2**	11	43	4	60	**3**	0	10	16	3	32	1	0	6	**2**	9	275
08:00 AM	1	60	**11**	37	0	109	0	0	0	0	14	24	0	4	42	0	**13**	68	3	84	1	0	**17**	15	**7**	**40**	4	0	4	0	8	283
08:15 AM	**4**	**79**	10	32	0	125	0	0	0	0	17	20	1	2	40	1	12	**70**	**5**	**88**	2	0	9	11	4	26	**6**	0	**8**	2	**16**	**295**
08:30 AM	2	69	11	38	0	120	0	0	0	0	8	9	1	1	19	2	13	57	4	76	2	**1**	9	**21**	0	33	1	0	1	1	3	251
Total Volume	9	282	39	151	0	481	0	0	0	0	56	77	3	12	148	5	49	238	16	308	8	1	45	63	14	131	12	0	19	5	36	1104
% App. Total	1.9	58.6	8.1	31.4	0		0	0	0		37.8	52	2	8.1		1.6	15.9	77.3	5.2		6.1	0.8	34.4	48.1	10.7		33.3	0	52.8	13.9		
PHF	.563	.892	.886	.858	.000	.947	.000	.000	.000	.000	.824	.802	.750	.600	.787	.625	.942	.850	.800	.875	.667	.250	.662	.750	.500	.819	.500	.000	.594	.625	.563	.936
Cars	9	254	38	144	0	445	0	0	0	0	49	76	3	12	140	5	48	204	16	273	7	1	44	60	14	126	11	0	17	5	33	1017
% Cars	100	90.1	97.4	95.4	0	92.5	0	0	0	0	87.5	98.7	100	100	94.6	100	98.0	85.7	100	88.6	87.5	100	97.8	95.2	100	96.2	91.7	0	89.5	100	91.7	92.1
Heavy Vehicles	0	28	1	7	0	36	0	0	0	0	7	1	0	0	8	0	1	34	0	35	1	0	1	3	0	5	1	0	2	0	3	87
% Heavy Vehicles	0	9.9	2.6	4.6	0	7.5	0	0	0	0	12.5	1.3	0	0	5.4	0	2.0	14.3	0	11.4	12.5	0	2.2	4.8	0	3.8	8.3	0	10.5	0	8.3	7.9



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N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415FF
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North				Havre Street From East				Gove Street From Southeast				Meridian Street From South				Havre Street From West						Decatur Street From Northwest				
Start Time	Hard Right	Thru	Bear Left	Left	Right	Bear Right	Left	Hard Left	Hard Right	Bear Right	Thru	Hard Left	Hard Right	Right	Thru	Bear Left	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk	Bear Right	Thru	Bear Left	Hard Left	Int. Total
04:00 PM	2	59	7	39	0	0	0	0	19	42	0	3	2	13	69	4	0	0	3	10	7	0	2	0	1	0	282
04:15 PM	2	70	2	34	0	0	0	0	12	38	0	1	3	11	88	2	3	0	9	5	0	0	5	1	4	3	293
04:30 PM	1	58	8	51	0	0	0	0	10	24	0	1	4	11	78	3	0	0	7	19	1	0	13	0	7	6	302
04:45 PM	5	80	11	24	0	0	0	0	10	28	0	2	1	8	97	3	0	1	13	20	3	0	5	0	8	1	320
Total	10	267	28	148	0	0	0	0	51	132	0	7	10	43	332	12	3	1	32	54	11	0	25	1	20	10	1197
05:00 PM	8	74	9	32	0	0	0	0	10	39	0	4	4	17	96	2	2	1	3	16	0	0	1	0	8	2	328
05:15 PM	3	62	5	39	0	0	0	0	8	30	0	0	1	21	68	3	1	0	6	13	2	0	1	1	7	3	274
05:30 PM	3	63	5	44	0	0	0	0	12	45	2	1	2	18	77	3	2	0	9	14	1	0	8	0	2	1	312
05:45 PM	2	52	11	42	0	0	0	0	7	40	1	2	4	13	73	2	2	0	5	10	2	0	3	0	3	4	278
Total	16	251	30	157	0	0	0	0	37	154	3	7	11	69	314	10	7	1	23	53	5	0	13	1	20	10	1192
Grand Total	26	518	58	305	0	0	0	0	88	286	3	14	21	112	646	22	10	2	55	107	16	0	38	2	40	20	2389
Apprch %	2.9	57.1	6.4	33.6	0	0	0	0	22.5	73.1	0.8	3.6	2.6	14	80.6	2.7	5.3	1.1	28.9	56.3	8.4	0	38	2	40	20	
Total %	1.1	21.7	2.4	12.8	0	0	0	0	3.7	12	0.1	0.6	0.9	4.7	27	0.9	0.4	0.1	2.3	4.5	0.7	0	1.6	0.1	1.7	0.8	
Cars	26	487	58	296	0	0	0	0	83	284	3	14	21	112	607	22	10	2	53	104	15	0	38	2	40	20	2297
% Cars	100	94	100	97	0	0	0	0	94.3	99.3	100	100	100	100	94	100	100	100	96.4	97.2	93.8	0	100	100	100	100	96.1
Heavy Vehicles	0	31	0	9	0	0	0	0	5	2	0	0	0	0	39	0	0	0	2	3	1	0	0	0	0	0	92
% Heavy Vehicles	0	6	0	3	0	0	0	0	5.7	0.7	0	0	0	0	6	0	0	0	3.6	2.8	6.2	0	0	0	0	0	3.9

	Meridian Street From North					Havre Street From East					Gove Street From Southeast					Meridian Street From South					Havre Street From West							Decatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	App. Total	Right	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk fro m N	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

Start Time	Hard Right	Thru	Bear Left	Left	App. Total	Right	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk fro m N	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
04:15 PM	2	70	2	34	108	0	0	0	0	0	**12**	38	0	1	51	3	11	88	2	104	**3**	**0**	**9**	**5**	**0**	**0**	**17**	**5**	**1**	4	3	13	293
04:30 PM	1	58	8	**51**	118	0	0	0	0	0	10	24	0	1	35	**4**	11	78	**3**	96	0	0	7	19	1	0	27	**13**	0	7	**6**	**26**	302
04:45 PM	5	**80**	**11**	24	120	0	0	0	0	0	10	28	0	2	40	1	8	**97**	3	109	0	**1**	**13**	**20**	**3**	0	**37**	**5**	**0**	**8**	**1**	**14**	320
05:00 PM	**8**	74	9	32	**123**	0	0	0	0	0	10	**39**	0	**4**	**53**	4	**17**	96	2	**119**	**2**	**1**	**3**	16	0	0	22	1	0	8	2	11	**328**
Total Volume	16	282	30	141	469	0	0	0	0	0	42	129			179	12	47	359	10	428	5	2	32	60	4	0	103	24		27	12		1243
% App. Total	3.4	60.1	6.4	30.1		0	0	0	0		23.5	72.1	0	4.5		2.8	11	83.9	2.3		4.9	1.9	31.1	58.3	3.9	0		37.5	1.6	42.2	18.8		
PHF	.500	.881	.682	.691	.953	.000	.000	.000	.000	.000	.875	.827	.000	.500	.844	.750	.691	.925	.833	.899	.417	.500	.615	.750	.333	.000	.696	.462	.250	.844	.500	.615	.947
Cars	16	267	30	135	448	0	0	0	0	0	40	129	0	8	177	12	47	341	10	410	5	2	31	58	4	0	100	24	1	27	12	64	1199
% Cars	100	94.7	100	95.7	95.5	0	0	0	0	0	95.2	100	0	100	98.9	100	100	95.0	100	95.8	100	100	96.9	96.7	100	0	97.1	100	100	100	100	100	96.5
Heavy Vehicles	0	15	0	6	21	0	0	0	0	0	2	0	0	0	2	0	0	18	0	18	0	0	1	2	0	0	3	0	0	0	0	0	44
% Heavy Vehicles	0	5.3	0	4.3	4.5	0	0	0	0	0	4.8	0	0	0	1.1	0	0	5.0	0	4.2	0	0	3.1	3.3	0	0	2.9	0	0	0	0	0	3.5

PRECISION
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N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415FF
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Meridian Street From North				Havre Street From East				Gove Street From Southeast				Meridian Street From South				Havre Street From West						Decatur Street From Northwest				
Start Time	Hard Right	Thru	Bear Left	Left	Right	Bear Right	Left	Hard Left	Hard Right	Bear Right	Thru	Hard Left	Hard Right	Right	Thru	Bear Left	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk	Bear Right	Thru	Bear Left	Hard Left	Int. Total
04:00 PM	2	55	7	39	0	0	0	0	18	41	0	3	2	13	63	4	0	0	3	10	6	0	2	0	1	0	269
04:15 PM	2	64	2	31	0	0	0	0	12	38	0	1	3	11	86	2	3	0	9	5	0	0	5	1	4	3	282
04:30 PM	1	54	8	50	0	0	0	0	9	24	0	1	4	11	74	3	0	0	6	17	1	0	13	0	7	6	289
04:45 PM	5	77	11	23	0	0	0	0	9	28	0	2	1	8	92	3	0	1	13	20	3	0	5	0	8	1	310
Total	10	250	28	143	0	0	0	0	48	131	0	7	10	43	315	12	3	1	31	52	10	0	25	1	20	10	1150
05:00 PM	8	72	9	31	0	0	0	0	10	39	0	4	4	17	89	2	2	1	3	16	0	0	1	0	8	2	318
05:15 PM	3	58	5	38	0	0	0	0	8	30	0	0	1	21	65	3	1	0	6	13	2	0	1	1	7	3	266
05:30 PM	3	57	5	44	0	0	0	0	11	44	2	1	2	18	71	3	2	0	8	14	1	0	8	0	2	1	297
05:45 PM	2	50	11	40	0	0	0	0	6	40	1	2	4	13	67	2	2	0	5	9	2	0	3	0	3	4	266
Total	16	237	30	153	0	0	0	0	35	153	3	7	11	69	292	10	7	1	22	52	5	0	13	1	20	10	1147
Grand Total	26	487	58	296	0	0	0	0	83	284	3	14	21	112	607	22	10	2	53	104	15	0	38	2	40	20	2297
Apprch %	3	56.2	6.7	34.1	0	0	0	0	21.6	74	0.8	3.6	2.8	14.7	79.7	2.9	5.4	1.1	28.8	56.5	8.2	0	38	2	40	20	
Total %	1.1	21.2	2.5	12.9	0	0	0	0	3.6	12.4	0.1	0.6	0.9	4.9	26.4	1	0.4	0.1	2.3	4.5	0.7	0	1.7	0.1	1.7	0.9	

	Meridian Street From North					Havre Street From East					Gove Street From Southeast					Meridian Street From South					Havre Street From West							Decatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	App. Total	Right	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk from N	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

04:15 PM	2	64	2	31	99	0	0	0	0	0	**12**	38	0	1	51	3	11	86	2	102	**3**	**0**	**9**	**5**	**0**	**0**	**17**	**5**	**1**	4	3	13	282
04:30 PM	1	54	8	**50**	113	0	0	0	0	0	9	24	0	1	34	**4**	11	74	**3**	92	0	0	6	17	1	0	24	**13**	0	7	**6**	**26**	289
04:45 PM	5	**77**	**11**	23	116	0	0	0	0	0	9	28	0	2	39	1	8	**92**	3	104	0	**1**	**13**	**20**	**3**	0	**37**	**5**	**0**	**8**	**1**	**14**	310
05:00 PM	**8**	72	9	31	**120**	0	0	0	0	0	10	**39**	0	**4**	**53**	4	**17**	89	2	**112**	**2**	**1**	**3**	16	0	0	22	1	0	8	2	11	**318**
Total Volume	16	267	30	135	448	0	0	0	0	0	40	129	0	8	177	12	47	341	10	410	5	2	31	58	4	0	100	24	1	27	12	64	1199
% App. Total	3.6	59.6	6.7	30.1		0	0	0	0		22.6	72.9	0	4.5		2.9	11.5	83.2	2.4		5	2	31	58	4	0		37.5	1.6	42.2	18.8		
PHF	.500	.867	.682	.675	.933	.000	.000	.000	.000	.000	.833	.827	.000	.500	.835	.750	.691	.927	.833	.915	.417	.500	.596	.725	.333	.000	.676	.462	.250	.844	.500	.615	.943

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Groups Printed- Heavy Vehicles

	Meridian Street From North				Havre Street From East				Gove Street From Southeast				Meridian Street From South				Havre Street From West						Decatur Street From Northwest				
Start Time	Hard Right	Thru	Bear Left	Left	Right	Bear Right	Left	Hard Left	Hard Right	Bear Right	Thru	Hard Left	Hard Right	Right	Thru	Bear Left	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk	Bear Right	Thru	Bear Left	Hard Left	Int. Total
04:00 PM	0	4	0	0	0	0	0	0	1	1	0	0	0	0	6	0	0	0	0	0	1	0	0	0	0	0	13
04:15 PM	0	6	0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	11
04:30 PM	0	4	0	1	0	0	0	0	1	0	0	0	0	0	4	0	0	0	1	2	0	0	0	0	0	0	13
04:45 PM	0	3	0	1	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	10
Total	0	17	0	5	0	0	0	0	3	1	0	0	0	0	17	0	0	0	1	2	1	0	0	0	0	0	47
05:00 PM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	10
05:15 PM	0	4	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	8
05:30 PM	0	6	0	0	0	0	0	0	1	1	0	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	15
05:45 PM	0	2	0	2	0	0	0	0	1	0	0	0	0	0	6	0	0	0	0	1	0	0	0	0	0	0	12
Total	0	14	0	4	0	0	0	0	2	1	0	0	0	0	22	0	0	0	1	1	0	0	0	0	0	0	45
Grand Total	0	31	0	9	0	0	0	0	5	2	0	0	0	0	39	0	0	0	2	3	1	0	0	0	0	0	92
Apprch %	0	77.5	0	22.5	0	0	0	0	71.4	28.6	0	0	0	0	100	0	0	0	33.3	50	16.7	0	0	0	0	0	
Total %	0	33.7	0	9.8	0	0	0	0	5.4	2.2	0	0	0	0	42.4	0	0	0	2.2	3.3	1.1	0	0	0	0	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Meridian Street From North					Havre Street From East					Gove Street From Southeast					Meridian Street From South					Havre Street From West							Decatur Street From Northwest					
Start Time	Hard Right	Thru	Bear Left	Left	App. Total	Right	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk from N	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
04:00 PM	0	4	0	0	4	0	0	0	0	0	**1**	**1**	0	0	**2**	0	0	**6**	0	**6**	**0**	**0**	**0**	**0**	**1**	0	1	0	0	0	0	0	**13**
04:15 PM	0	**6**	0	**3**	**9**	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	11
04:30 PM	0	4	0	1	5	0	0	0	0	0	1	0	0	0	1	0	0	4	0	4	0	0	**1**	**2**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**13**
04:45 PM	0	3	0	1	4	0	0	0	0	0	1	0	0	0	1	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	10
Total Volume	0	17	0	5	22	0	0	0	0	0	3	1	0	0	4	0	0	17	0	17	0	0	1	2	1	0	4	0	0	0	0	0	47
% App. Total	0	77.3	0	22.7		0	0	0	0		75	25	0	0		0	0	100	0		0	0	25	50	25	0		0	0	0	0		
PHF	.000	.708	.000	.417	.611	.000	.000	.000	.000	.000	.750	.250	.000	.000	.500	.000	.000	.708	.000	.708	.000	.000	.250	.250	.250	.000	.333	.000	.000	.000	.000	.000	.904

N/S/NW: Meridian Street/ Decatur Street
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Page No : 1

Groups Printed- Peds and Bicycles

	Meridian Street From North						Havre Street From East							Gove Street From Southeast					
Start Time	Hard Right	Thru	Bear Left	Left	Peds from East	Peds from West	Bear Right	Thru	Left	Hard Left	Peds Xwalk from S	Peds from South	Peds from North	Hard Right	Bear Right	Thru	Hard Left	Peds from South	Peds from North
04:00 PM	0	0	0	0	0	11	0	0	0	0	46	19	12	0	0	0	0	7	5
04:15 PM											34	15							
04:30 PM	0	0	0	0	3	8	0	0	0	0	24	20	4	0	0	0	0	2	1
04:45 PM											33	22							
Total	0	0	0	0	7	29	0	0	0	0	137	76	39	0	0	0	0	25	9
05:00 PM											32	20							
05:15 PM	0	0	0	0	7	3	0	0	0	0	33	28	14	0	0	0	0	2	3
05:30 PM											36	16							
05:45 PM	0	0	0	0	4	7	0	0	0	0	26	14	10	0	0	0	0	8	1
Total	0	0	0	0	19	18	0	0	0	0	127	78	49	0	0	0	0	27	15
Grand Total	0	0	0	0	26	47	0	0	0	0	264	154	88	0	0	0	0	52	24
Apprch %	0	0	0	0	35.6	64.4	0	0	0	0	52.2	30.4	17.4	0	0	0	0	68.4	31.6
Total %	0	0	0	0	2.4	4.3	0	0	0	0	23.9	14	8	0	0	0	0	4.7	2.2

	Meridian Street From South						Havre Street From West									Decatur Street From Northwest							
Start Time	Hard Right	Right	Thru	Left	Peds from West	Peds from East	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk from S	Peds Xwalk from N	Peds from North	Peds from South	Hard Right	Bear Right	Thru	Bear Left	Hard Left	Peds from South	Peds from North	Int. Total
04:00 PM	0	0	0	0	3	0	0	0	0	0	0	54	17	6	1	0	0	0	0	0	3	3	187
04:15 PM																							
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	17	22	1	0	0	0	0	0	0	0	0	102
04:45 PM																							
Total	0	0	0	0	3	0	0	0	0	0	0	128	81	17	3	0	0	0	0	0	7	5	566
05:00 PM																							
05:15 PM	0	0	0	0	2	0	0	0	0	0	0	23	16	3	1	0	0	0	0	0	0	0	135
05:30 PM																							
05:45 PM	0	0	0	0	1	1	0	0	0	0	0	12	11	1	0	0	0	0	0	0	0	0	96
Total	0	0	0	0	6	3	0	0	0	0	0	104	61	9	4	0	0	0	0	0	11	6	537
Grand Total	0	0	0	0	9	3	0	0	0	0	0	232	142	26	7	0	0	0	0	0	18	11	1103
Apprch %	0	0	0	0	75	25	0	0	0	0	0	57	34.9	6.4	1.7	0	0	0	0	0	62.1	37.9	
Total %	0	0	0	0	0.8	0.3	0	0	0	0	0	21	12.9	2.4	0.6	0	0	0	0	0	1.6	1	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

	Meridian Street From North							Havre Street From East								Gove Street From Southeast						
Start Time				Le			App. Total	Bear Rig	Thru	Left	Hard Lef	Peds Xw	Peds fro	Peds fro	App. Total	Hard Rig	Bear Rig	Thru	Hard Lef	Peds fro	Peds fro	App. Total
04:45 PM						6	8							1	68	0	0	0	0	7	1	8
05:00 PM							9								59	0	0	0	0	11		15
05:15 PM					7		10	0	0	0	0	3	28	14	75	0	0	0	0	2	3	5
05:30 PM							7					36	16	18	70	0	0	0	0	6	7	13
Total Volume							34	0	0	0	0	13	86	52	272	0	0	0	0	26	15	41
% App. Total																						
PHF	.000	.000	.000	.000	.607	.708	.850	.000	.000	.000	.000	.931	.768	.722	.907	.000	.000	.000	.000	.591	.536	.683

	Meridian Street From South							Havre Street From West										Decatur Street From Northwest								
Start Time	Hard Rig	Right	Thru	Left	Peds fro	Peds fro	App. Total				Le						App. Total	Hard Rig	Bear Rig	Thru	Bear Lef	Hard Lef	Peds fro	Peds fro	App. Total	Int. Total
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	1	7		60	0	0	0	0	0	4	0	4	148
05:00 PM	0	0	0	0	0	1	1							19	3	1	54	0	0	0	0	0	11	6	17	155
05:15 PM	0	0	0	0	2	0	2	0	0	0	0	0	2	1	3	1	43	0	0	0	0	0	0	0	0	135
05:30 PM	0	0	0	0	3	1	4						38	15	2	2	57	0	0	0	0	0	0	0	0	151
Total Volume	0	0	0	0	5	2	7	0	0	0	0	0	12	67	15	4	214	0	0	0	0	0	15	6	21	589
% App. Total																									
PHF	.000	.000	.000	.000	.417	.500	.438	.000	.000	.000	.000	.000	.842	.882	.536	.500	.892	.000	.000	.000	.000	.000	.341	.250	.309	.950

N/S/NW: Meridian Street/ Decatur Street
E/W/SE: Havre Street/ Gove Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

PRECISION DATA INDUSTRIES, LLC
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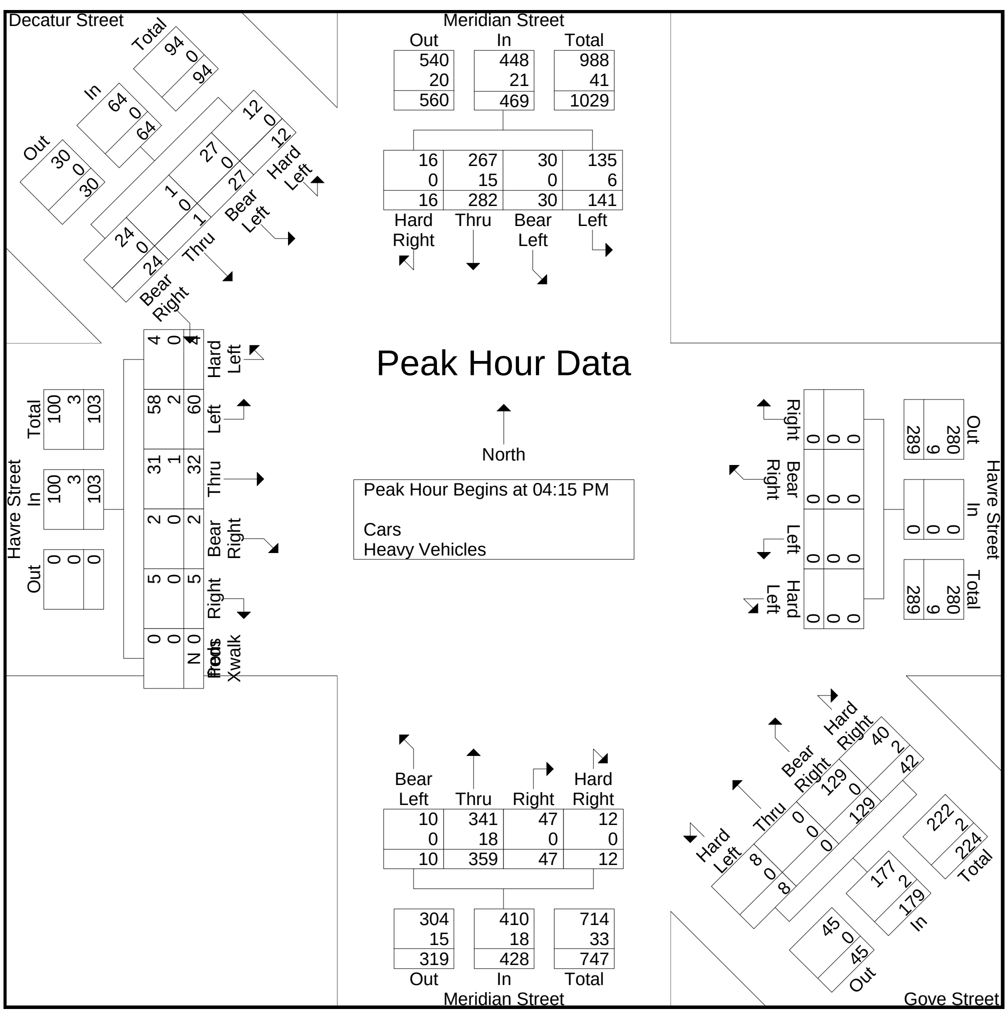
File Name : 71415FF
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

	Meridian Street From North					Havre Street From East					Gove Street From Southeast				
Start Time	Hard Right	Thru	Bear Left	Left	App. Total	Right	Bear Right	Left	Hard Left	App. Total	Hard Right	Bear Right	Thru	Hard Left	App. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 04:15 PM															
04:15 PM	2	70	2	34	108	0	0	0	0	0	**12**	38	0	1	51
04:30 PM	1	58	8	**51**	118	0	0	0	0	0	10	24	0	1	35
04:45 PM	5	**80**	**11**	24	120	0	0	0	0	0	10	28	0	2	40
05:00 PM	**8**	74	9	32	**123**	0	0	0	0	0	10	**39**	0	**4**	**53**
Total Volume	16	282	30	141	469	0	0	0	0	0	42	129			179
% App. Total	3.4	60.1	6.4	30.1		0	0	0	0		23.5	72.1	0	4.5	
PHF	.500	.881	.682	.691	.953	.000	.000	.000	.000	.000	.875	.827	.000	.500	.844
Cars	16	267	30	135	448	0	0	0	0	0	40	129	0	8	177
% Cars	100	94.7	100	95.7	95.5	0	0	0	0	0	95.2	100	0	100	98.9
Heavy Vehicles	0	15	0	6	21	0	0	0	0	0	2	0	0	0	2
% Heavy Vehicles	0	5.3	0	4.3	4.5	0	0	0	0	0	4.8	0	0	0	1.1

	Meridian Street From South					Havre Street From West							Decatur Street From Northwest					
Start Time	Hard Right	Right	Thru	Bear Left	App. Total	Right	Bear Right	Thru	Left	Hard Left	Peds Xwalk from N	App. Total	Bear Right	Thru	Bear Left	Hard Left	App. Total	Int. Total
04:15 PM	3	11	88	2	104	**3**	**0**	**9**	**5**	**0**	**0**	**17**	**5**	**1**	4	3	13	293
04:30 PM	**4**	11	78	**3**	96	0	0	7	19	1	0	27	**13**	0	7	**6**	**26**	302
04:45 PM	1	8	**97**	3	109	0	**1**	**13**	**20**	**3**	0	**37**	**5**	**0**	**8**	**1**	**14**	320
05:00 PM	4	**17**	96	2	**119**	**2**	**1**	**3**	16	0	0	22	1	0	8	2	11	**328**
Total Volume	12	47	359	10	428	5	2	32	60	4	0	103	24		27	12		1243
% App. Total	2.8	11	83.9	2.3		4.9	1.9	31.1	58.3	3.9	0		37.5	1.6	42.2	18.8		
PHF	.750	.691	.925	.833	.899	.417	.500	.615	.750	.333	.000	.696	.462	.250	.844	.500	.615	.947
Cars	12	47	341	10	410	5	2	31	58	4	0	100	24	1	27	12	64	1199
% Cars	100	100	95.0	100	95.8	100	100	96.9	96.7	100	0	97.1	100	100	100	100	100	96.5
Heavy Vehicles	0	0	18	0	18	0	0	1	2	0	0	3	0	0	0	0	0	44
% Heavy Vehicles	0	0	5.0	0	4.2	0	0	3.1	3.3	0	0	2.9	0	0	0	0	0	3.5



PRECISION
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N/S: Meridian Street
E/W/SE: Paris Street/Emmons Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462B
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars

	Meridian Street From North				Paris Street From East				Emmons Street From Southeast				Meridian Street From South				Paris Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
07:00 AM	19	11	2	0	9	5	1	3	0	0	0	0	0	0	50	0	0	0	0	0	100
07:15 AM	17	17	1	0	8	3	1	6	0	0	0	0	0	0	52	2	0	0	0	0	107
07:30 AM	21	18	0	0	9	7	1	7	0	0	0	0	0	0	71	0	0	0	0	0	134
07:45 AM	24	28	7	0	7	8	1	9	0	0	0	0	2	0	61	0	0	0	0	0	147
Total	81	74	10	0	33	23	4	25	0	0	0	0	2	0	234	2	0	0	0	0	488
08:00 AM	24	34	2	0	12	6	1	5	0	0	0	0	0	0	79	0	0	0	0	0	163
08:15 AM	28	29	8	0	16	9	1	12	0	0	0	0	4	0	70	0	0	0	0	0	177
08:30 AM	32	27	2	0	16	1	5	18	0	0	0	0	0	0	59	0	0	0	0	0	160
08:45 AM	27	35	3	0	17	8	4	8	0	0	0	0	3	0	55	0	0	0	0	0	160
Total	111	125	15	0	61	24	11	43	0	0	0	0	7	0	263	0	0	0	0	0	660
Grand Total	192	199	25	0	94	47	15	68	0	0	0	0	9	0	497	2	0	0	0	0	1148
Apprch %	46.2	47.8	6	0	42	21	6.7	30.4	0	0	0	0	1.8	0	97.8	0.4	0	0	0	0	
Total %	16.7	17.3	2.2	0	8.2	4.1	1.3	5.9	0	0	0	0	0.8	0	43.3	0.2	0	0	0	0	

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 08:00 AM																										
08:00 AM	24	34	2	0	60	12	6	1	5	24	0	0	0	0	0	0	0	**79**	**0**	**79**	0	0	0	0	0	163
08:15 AM	28	29	**8**	**0**	**65**	16	**9**	**1**	**12**	**38**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	70	0	74	**0**	**0**	**0**	**0**	**0**	**177**
08:30 AM	**32**	**27**	2	0	61	**16**	1	5	18	40	0	0	0	0	0	0	0	59	0	59	0	0	0	0	0	160
08:45 AM	27	**35**	3	0	65	**17**	8	4	8	37	0	0	0	0	0	3	0	55	0	58	0	0	0	0	0	160
Total Volume	111	125	15	0	251	61	24	11	43	139	0	0	0	0	0	7	0	263	0	270	0	0	0	0	0	660
% App. Total	44.2	49.8				43.9	17.3	7.9	30.9		0	0	0	0		2.6	0	97.4	0		0	0	0	0		
PHF	.867	.893	.469	.000	.965	.897	.667	.550	.597	.869	.000	.000	.000	.000		.438	.000	.832	.000	.854	.000	.000	.000	.000	.000	.932

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E/W/SE: Paris Street/Emmons Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462B
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Meridian Street From North				Paris Street From East				Emmons Street From Southeast				Meridian Street From South				Paris Street From West				
Start	Rig ht	Thr u	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
07:00 AM	5	2	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	15
07:15 AM	8	2	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	16
07:30 AM	7	1	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	18
07:45 AM	4	3	0	0	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0	0	14
Total	24	8	0	0	0	0	1	0	0	0	0	0	0	0	30	0	0	0	0	0	63
08:00 AM	8	3	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	18
08:15 AM	4	2	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	11
08:30 AM	10	4	0	0	0	0	1	0	0	0	0	0	0	0	11	0	0	0	0	0	26
08:45 AM	6	5	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	18
Total	28	14	0	0	0	0	1	0	0	0	0	0	0	0	30	0	0	0	0	0	73
Grand Total	52	22	0	0	0	0	2	0	0	0	0	0	0	0	60	0	0	0	0	0	136
Apprch %	70.3	29.7	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	0	0	0	
Total %	38.2	16.2	0	0	0	0	1.5	0	0	0	0	0	0	0	44.1	0	0	0	0	0	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
08:00 AM	8	3	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	18
08:15 AM	4	2	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	11
08:30 AM	**10**	**4**	**0**	**0**	**14**	0	0	**1**	0	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**11**	0	0	0	0	0	**26**
08:45 AM	6	**5**	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	18
Total Volume	28	14	0	0	42	0	0	1	0	1	0	0	0	0	0	0	0	30	0	30	0	0	0	0	0	73
% App. Total	66.7	33.3	0	0		0	0	100	0		0	0	0	0		0	0	100	0		0	0	0	0		
PHF	.700	.700	.000	.000	.750	.000	.000	.250	.000	.250	.000	.000	.000	.000		.000	.000	.682	.000	.682	.000	.000	.000	.000	.000	.702

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E/W/SE: Paris Street/Emmons Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462B
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Peds and Bicycles

	Meridian Street From North						Paris Street From East						Emmons Street From Southeast						Meridian Street From South						Paris Street From West						
Start Time	Right	Thru	Bear Left	Left	Peds EB	Peds WB	Right	Thru	Left	Hard Left	Peds SB	Peds NB	Hard Right	Bear Right	Bear Left	Hard Left	Peds SB	Peds NB	Hard Right	Right	Thru	Left	Peds WB	Peds EB	Right	Bear Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	0	20	10	0	0	0	0	4	2	0	0	0	0	2	1	0	0	0	0	1	6	47
07:15 AM	0	0	0	0	4	1	0	0	0	0	16	6	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	7	6	42
07:30 AM	0	0	0	0	2	0	0	0	0	0	23	7	0	0	0	0	0	0	0	0	1	0	7	6	0	0	0	0	7	4	57
07:45 AM	0	0	0	0	0	0	0	0	0	0	21	4	0	0	0	0	5	4	0	0	0	0	1	5	0	0	0	0	9	7	56
Total	0	0	0	0	7	1	0	0	0	0	80	27	0	0	0	0	10	7	0	0	1	0	10	12	0	0	0	0	24	23	202
08:00 AM	0	0	0	0	3	0	0	0	0	0	27	12	0	0	0	0	2	8	0	0	0	0	4	6	0	0	0	0	5	4	71
08:15 AM	0	0	0	0	1	4	0	0	0	0	20	15	0	0	0	0	2	3	0	0	0	0	3	12	0	0	0	0	4	5	69
08:30 AM	0	0	0	0	3	3	0	0	0	0	25	10	0	0	0	0	1	7	0	0	0	0	6	12	0	0	0	0	9	7	83
08:45 AM	0	0	0	0	4	1	0	0	0	0	19	13	0	0	0	0	1	4	0	0	0	0	10	9	0	0	0	0	6	2	69
Total	0	0	0	0	11	8	0	0	0	0	91	50	0	0	0	0	6	22	0	0	0	0	23	39	0	0	0	0	24	18	292
Grand Total	0	0	0	0	18	9	0	0	0	0	171	77	0	0	0	0	16	29	0	0	1	0	33	51	0	0	0	0	48	41	494
Apprch %	0	0	0	0	66.7	33.3	0	0	0	0	69	31	0	0	0	0	35.6	64.4	0	0	1.2	0	38.8	60	0	0	0	0	53.9	46.1	
Total %	0	0	0	0	3.6	1.8	0	0	0	0	34.6	15.6	0	0	0	0	3.2	5.9	0	0	0.2	0	6.7	10.3	0	0	0	0	9.7	8.3	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:00 AM

	Meridian Street From North							Paris Street From East							Emmons Street From Southeast							Meridian Street From South							Paris Street From West							
Start Time	Righ t	Thru	Bea r Lef t	Left	Ped s E B	Ped s W B	App. Total	Righ t	Thru	Left	Har d Le ft	Ped s S B	Ped s N B	App. Total	Har d Ri ght	Bea r Ri ght	Bea r Lef t	Har d Le ft	Ped s S B	Ped s N B	App. Total	Har d Ri ght	Rig ht	Thru	Left	Ped s W B	Ped s E B	App. Total	Rig ht	Bea r Ri ght	Thru	Left	Ped s N B	Ped s S B	App. Total	Int. Total
08:00 AM	0	0	0	0	3	0	3	0	0	0	0	**27**	12	**39**	0	0	0	0	**2**	**8**	**10**	0	0	0	0	4	6	10	0	0	0	0	5	4	9	71
08:15 AM	0	0	0	0	1	**4**	5	0	0	0	0	20	**15**	35	0	0	0	0	2	3	5	0	0	0	0	3	**12**	15	0	0	0	0	4	5	9	69
08:30 AM	0	0	0	0	3	3	**6**	0	0	0	0	25	10	35	0	0	0	0	1	7	8	0	0	0	0	6	12	18	0	0	0	0	**9**	**7**	**16**	**83**
08:45 AM	0	0	0	0	**4**	1	5	0	0	0	0	19	13	32	0	0	0	0	1	4	5	0	0	0	0	**10**	9	**19**	0	0	0	0	6	2	8	69
Total Volume	0	0	0	0	11	8	19	0	0	0	0	91	50	141	0	0	0	0	6	22	28	0	0	0	0	23	39	62	0	0	0	0	24	18	42	292
% App. Total	0	0	0	0	57.9	42.1		0	0	0	0	64.5	35.5		0	0	0	0	21.4	78.6		0	0	0	0	37.1	62.9		0	0	0	0	57.1	42.9		
PHF	.000	.000	.000	.000	.688	.500	.792	.000	.000	.000	.000	.843	.833	.904	.000	.000	.000	.000	.750	.688	.700	.000	.000	.000	.000	.575	.813	.816	.000	.000	.000	.000	.667	.643	.656	.880

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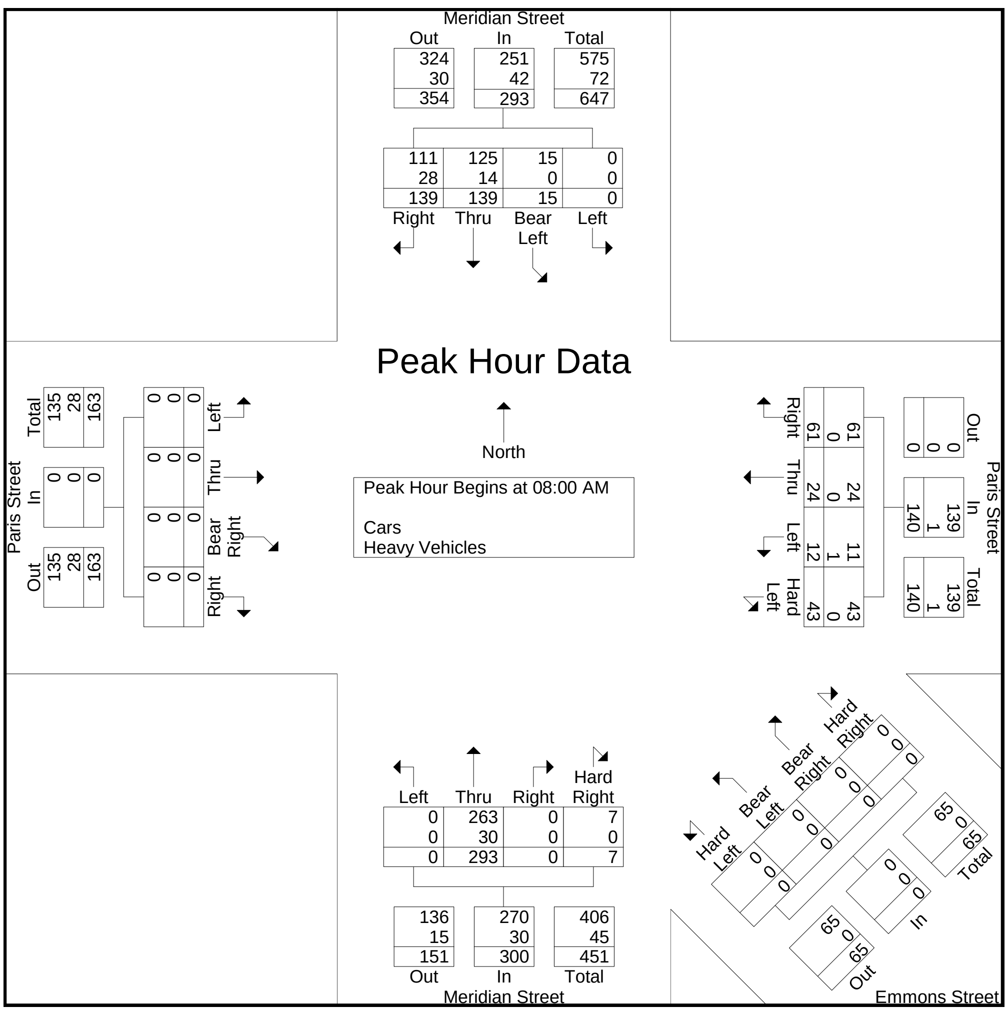
File Name : 81462B
Site Code : 0607212
Start Date : 1/24/2008

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 08:00 AM																										
08:00 AM	32	37	2	0	71	12	6	1	5	24	0	0	0	0	0	0	0	86	0	86	0	0	0	0	0	181
08:15 AM	32	31	8	0	71	16	9	1	12	38	0	0	0	0	0	4	0	75	0	79	0	0	0	0	0	188
08:30 AM	42	31	2	0	75	16	1	6	18	41	0	0	0	0	0	0	0	70	0	70	0	0	0	0	0	186
08:45 AM	33	40	3	0	76	17	8	4	8	37	0	0	0	0	0	3	0	62	0	65	0	0	0	0	0	178
Total Volume	139	139	15	0	293	61	24	12	43	140	0	0	0	0	0	7	0	293	0	300	0	0	0	0	0	733
% App. Total	47.4	47.4				43.6	17.1	8.6	30.7		0	0	0	0		2.3	0	97.7	0		0	0	0	0		
PHF	.827	.869	.469	.000	.964	.897	.667	.500	.597	.854	.000	.000	.000	.000		.438	.000	.852	.000	.872	.000	.000	.000	.000	.000	.975
Cars	111	125																263	0	270	0	0	0	0	0	660
% Cars	79.9	89.9	100	0	85.7	100	100	91.7	100	99.3	0	0	0	0	0	100	0	89.8	0	90.0	0	0	0	0	0	90.0
Heavy Vehicles																										
% Heavy Vehicles	20.1	10.1	0	0	14.3	0	0	8.3	0	0.7	0	0	0	0	0	0	0	10.2	0	10.0	0	0	0	0	0	10.0



PRECISION DATA INDUSTRIES, LLC

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N/S: Meridian Street
E/W/SE: Paris Street/Emmons Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462B
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North				Paris Street From East				Emmons Street From Southeast				Meridian Street From South				Paris Street From West				
Start	Rig ht	Thr u	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
07:00 AM	24	13	2	0	9	5	1	3	0	0	0	0	0	0	58	0	0	0	0	0	115
07:15 AM	25	19	1	0	8	3	1	6	0	0	0	0	0	0	58	2	0	0	0	0	123
07:30 AM	28	19	0	0	9	7	1	7	0	0	0	0	0	0	81	0	0	0	0	0	152
07:45 AM	28	31	7	0	7	8	2	9	0	0	0	0	2	0	67	0	0	0	0	0	161
Total	105	82	10	0	33	23	5	25	0	0	0	0	2	0	264	2	0	0	0	0	551
08:00 AM	32	37	2	0	12	6	1	5	0	0	0	0	0	0	86	0	0	0	0	0	181
08:15 AM	32	31	8	0	16	9	1	12	0	0	0	0	4	0	75	0	0	0	0	0	188
08:30 AM	42	31	2	0	16	1	6	18	0	0	0	0	0	0	70	0	0	0	0	0	186
08:45 AM	33	40	3	0	17	8	4	8	0	0	0	0	3	0	62	0	0	0	0	0	178
Total	139	139	15	0	61	24	12	43	0	0	0	0	7	0	293	0	0	0	0	0	733
Grand Total	244	221	25	0	94	47	17	68	0	0	0	0	9	0	557	2	0	0	0	0	1284
Apprch %	49.8	45.1	5.1	0	41.6	20.8	7.5	30.1	0	0	0	0	1.6	0	98.1	0.4	0	0	0	0	
Total %	19	17.2	1.9	0	7.3	3.7	1.3	5.3	0	0	0	0	0.7	0	43.4	0.2	0	0	0	0	
Cars	192	199	25	0	94	47	15	68	0	0	0	0	9	0	497	2	0	0	0	0	1148
% Cars	78.7	90	100	0	100	100	88.2	100	0	0	0	0	100	0	89.2	100	0	0	0	0	89.4
Heavy Vehicles	52	22	0	0	0	0	2	0	0	0	0	0	0	0	60	0	0	0	0	0	136
% Heavy Vehicles	21.3	10	0	0	0	0	11.8	0	0	0	0	0	0	0	10.8	0	0	0	0	0	10.6

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 08:00 AM																										
08:00 AM	32	37	2	0	71	12	6	1	5	24	0	0	0	0	0	0	0	**86**	**0**	**86**	0	0	0	0	0	181
08:15 AM	32	31	**8**	**0**	**71**	**16**	**9**	**1**	**12**	**38**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**75**	**0**	**79**	**0**	**0**	**0**	**0**	**0**	**188**
08:30 AM	**42**	**31**	**2**	**0**	**75**	**16**	**1**	**6**	**18**	**41**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**0**	**70**	**0**	**0**	**0**	**0**	**0**	**186**
08:45 AM	33	**40**	3	0	**76**	**17**	**8**	**4**	**8**	**37**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**62**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**178**
Total Volume	139	139	15	0	293	61	24	12	43	140	0	0	0	0	0	7	0	293	0	300	0	0	0	0	0	733
% App. Total	47.4	47.4				43.6	17.1	8.6	30.7		0	0	0	0		2.3	0	97.7	0		0	0	0	0		
PHF	.827	.869	.469	.000	.964	.897	.667	.500	.597	.854	.000	.000	.000	.000		.438	.000	.852	.000	.872	.000	.000	.000	.000	.000	.975
Cars	111	125																263	0	270	0	0	0	0	0	660
% Cars	79.9	89.9	100	0	85.7	100	100	91.7	100	99.3	0	0	0	0	0	100	0	89.8	0	90.0	0	0	0	0	0	90.0
Heavy Vehicles																										
% Heavy Vehicles	20.1	10.1	0	0	14.3	0	0	8.3	0	0.7	0	0	0	0	0	0	0	10.2	0	10.0	0	0	0	0	0	10.0

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Client: Woodland Design Group/I. Wong

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File Name : 81462BB
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North				Paris Street From East				Emmons Street From Southeast				Meridian Street From South				Paris Street From West				
Start	Rig ht	Thr u	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
04:00 PM	36	31	1	0	22	7	1	2	0	0	0	0	1	0	98	6	0	0	0	0	205
04:15 PM	28	40	3	0	21	10	2	4	0	0	0	0	3	0	77	4	0	0	0	0	192
04:30 PM	36	36	5	0	12	7	5	7	0	0	0	0	1	0	99	3	0	0	0	0	211
04:45 PM	27	36	5	0	14	2	3	1	0	0	0	0	3	0	89	4	0	0	0	0	184
Total	127	143	14	0	69	26	11	14	0	0	0	0	8	0	363	17	0	0	0	0	792
05:00 PM	28	49	2	0	17	7	1	1	0	0	0	0	1	0	81	2	0	0	0	0	189
05:15 PM	26	41	1	0	16	4	2	2	0	0	0	0	2	0	87	0	0	0	0	0	181
05:30 PM	23	39	7	0	10	9	1	0	0	0	0	0	0	0	93	3	0	0	0	0	185
05:45 PM	25	39	4	0	11	7	3	1	0	0	0	0	0	0	80	2	0	0	0	0	172
Total	102	168	14	0	54	27	7	4	0	0	0	0	3	0	341	7	0	0	0	0	727
Grand Total	229	311	28	0	123	53	18	18	0	0	0	0	11	0	704	24	0	0	0	0	1519
Apprch %	40.3	54.8	4.9	0	58	25	8.5	8.5	0	0	0	0	1.5	0	95.3	3.2	0	0	0	0	
Total %	15.1	20.5	1.8	0	8.1	3.5	1.2	1.2	0	0	0	0	0.7	0	46.3	1.6	0	0	0	0	
Cars	200	304	26	0	122	50	16	18	0	0	0	0	11	0	671	24	0	0	0	0	1442
% Cars	87.3	97.7	92.9	0	99.2	94.3	88.9	100	0	0	0	0	100	0	95.3	100	0	0	0	0	94.9
Heavy Vehicles	29	7	2	0	1	3	2	0	0	0	0	0	0	0	33	0	0	0	0	0	77
% Heavy Vehicles	12.7	2.3	7.1	0	0.8	5.7	11.1	0	0	0	0	0	0	0	4.7	0	0	0	0	0	5.1

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
04:00 PM	36	31	1	0	68	22	7	1	2	32	0	0	0	0	0	1	0	98	6	105	0	0	0	0	0	205
04:15 PM	28	40	3	0	71	21	10	2	4	37	0	0	0	0	0	3	0	77	4	84	0	0	0	0	0	192
04:30 PM	36	36	5	0	77	12	7	5	7	31	0	0	0	0	0	1	0	99	3	103	0	0	0	0	0	211
04:45 PM	27	36	5	0	68	14	2	3	1	20	0	0	0	0	0	3	0	89	4	96	0	0	0	0	0	184
Total Volume	127	143	14	0	284	69	26	11	14	120	0	0	0	0	0	8	0	363	17	388	0	0	0	0	0	792
% App. Total	44.7	50.4				57.5	21.7	9.2	11.7		0	0	0	0		2.1	0	93.6	4.4		0	0	0	0		
PHF	.882	.894	.700	.000	.922	.784	.650	.550	.500	.811	.000	.000	.000	.000		.667	.000	.917	.708	.924	.000	.000	.000	.000	.000	.938
Cars	112	137																343	17	368	0	0	0	0	0	747
% Cars	88.2	95.8	92.9	0	92.3	100	92.3	90.9	100	97.5	0	0	0	0	0	100	0	94.5	100	94.8	0	0	0	0	0	94.3
Heavy Vehicles																										
% Heavy Vehicles	11.8	4.2	7.1	0	7.7	0	7.7	9.1	0	2.5	0	0	0	0	0	0	0	5.5	0	5.2	0	0	0	0	0	5.7

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N/S: Meridian Street
E/W/SE: Paris Street/Emmons Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462BB
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars

	Meridian Street From North				Paris Street From East				Emmons Street From Southeast				Meridian Street From South				Paris Street From West				
Start	Rig ht	Thr u	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
04:00 PM	33	30	1	0	22	7	1	2	0	0	0	0	1	0	92	6	0	0	0	0	195
04:15 PM	23	37	2	0	21	10	2	4	0	0	0	0	3	0	73	4	0	0	0	0	179
04:30 PM	33	34	5	0	12	5	4	7	0	0	0	0	1	0	94	3	0	0	0	0	198
04:45 PM	23	36	5	0	14	2	3	1	0	0	0	0	3	0	84	4	0	0	0	0	175
Total	112	137	13	0	69	24	10	14	0	0	0	0	8	0	343	17	0	0	0	0	747
05:00 PM	25	48	2	0	17	7	1	1	0	0	0	0	1	0	78	2	0	0	0	0	182
05:15 PM	24	41	1	0	15	4	2	2	0	0	0	0	2	0	84	0	0	0	0	0	175
05:30 PM	18	39	6	0	10	8	0	0	0	0	0	0	0	0	90	3	0	0	0	0	174
05:45 PM	21	39	4	0	11	7	3	1	0	0	0	0	0	0	76	2	0	0	0	0	164
Total	88	167	13	0	53	26	6	4	0	0	0	0	3	0	328	7	0	0	0	0	695
Grand Total	200	304	26	0	122	50	16	18	0	0	0	0	11	0	671	24	0	0	0	0	1442
Apprch %	37.7	57.4	4.9	0	59.2	24.3	7.8	8.7	0	0	0	0	1.6	0	95	3.4	0	0	0	0	
Total %	13.9	21.1	1.8	0	8.5	3.5	1.1	1.2	0	0	0	0	0.8	0	46.5	1.7	0	0	0	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
04:00 PM	**33**	**30**	**1**	**0**	**64**	**22**	**7**	**1**	**2**	**32**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**92**	**6**	**99**	0	0	0	0	0	195
04:15 PM	23	**37**	2	0	62	21	**10**	**2**	**4**	**37**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**73**	**4**	**80**	**0**	**0**	**0**	**0**	**0**	**179**
04:30 PM	33	34	**5**	**0**	**72**	12	5	**4**	**7**	28	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**94**	**3**	**98**	**0**	**0**	**0**	**0**	**0**	**198**
04:45 PM	23	36	5	0	64	14	2	3	1	20	0	0	0	0	0	3	0	84	4	91	0	0	0	0	0	175
Total Volume	112	137	13	0	262	69	24	10	14	117	0	0	0	0	0	8	0	343	17	368	0	0	0	0	0	747
% App. Total	42.7	52.3					20.5	8.5	12		0	0	0	0		2.2	0	93.2	4.6		0	0	0	0		
PHF	.848	.926	.650	.000	.910	.784	.600	.625	.500	.791	.000	.000	.000	.000		.667	.000	.912	.708	.929	.000	.000	.000	.000	.000	.943

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Client: Woodland Design Group/I. Wong

File Name : 81462BB
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Meridian Street From North				Paris Street From East				Emmons Street From Southeast				Meridian Street From South				Paris Street From West				
Start	Right	Thru	Bear Left	Left	Right	Thru	Left	Hard Left	Hard Right	Bear Right	Bear Left	Hard Left	Hard Right	Right	Thru	Left	Right	Bear Right	Thru	Left	Int. Total
04:00 PM	3	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	10
04:15 PM	5	3	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	13
04:30 PM	3	2	0	0	0	2	1	0	0	0	0	0	0	0	5	0	0	0	0	0	13
04:45 PM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	9
Total	15	6	1	0	0	2	1	0	0	0	0	0	0	0	20	0	0	0	0	0	45
05:00 PM	3	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	7
05:15 PM	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	6
05:30 PM	5	0	1	0	0	1	1	0	0	0	0	0	0	0	3	0	0	0	0	0	11
05:45 PM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	8
Total	14	1	1	0	1	1	1	0	0	0	0	0	0	0	13	0	0	0	0	0	32
Grand Total	29	7	2	0	1	3	2	0	0	0	0	0	0	0	33	0	0	0	0	0	77
Apprch %	76.3	18.4	5.3	0	16.7	50	33.3	0	0	0	0	0	0	0	100	0	0	0	0	0	
Total %	37.7	9.1	2.6	0	1.3	3.9	2.6	0	0	0	0	0	0	0	42.9	0	0	0	0	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
04:00 PM	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**6**	**0**	**6**	0	0	0	0	0	10
04:15 PM	**5**	**3**	**1**	**0**	**9**	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	**13**
04:30 PM	3	2	0	0	5	0	**2**	**1**	0	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**13**
04:45 PM	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	9
Total Volume	15	6	1	0	22	0	2	1	0	3	0	0	0	0	0	0	0	20	0	20	0	0	0	0	0	45
% App. Total	68.2	27.3	4.5	0		0	66.7	33.3	0		0	0	0	0		0	0	100	0		0	0	0	0		
PHF	.750	.500	.250	.000	.611	.000	.250	.250	.000	.250	.000	.000	.000	.000		.000	.000	.833	.000	.833	.000	.000	.000	.000	.000	.865

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Client: Woodland Design Group/I. Wong

File Name : 81462BB
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Meridian Street From North						Paris Street From East						Emmons Street From Southeast						Meridian Street From South						Paris Street From West						
Start Time	Right	Thru	Bear Left	Left	Peds EB	Peds WB	Right	Thru	Left	Hard Left	Peds SB	Peds NB	Hard Right	Bear Right	Bear Left	Hard Left	Peds SB	Peds NB	Hard Right	Right	Thru	Left	Peds WB	Peds EB	Right	Bear Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	3	6	0	0	0	0	27	29	0	0	0	0	3	3	0	0	0	0	3	4	0	0	0	0	4	2	84
04:15 PM	0	1	0	0	2	6	0	0	0	0	32	34	0	0	0	0	7	9	0	0	0	0	2	9	0	0	0	0	8	11	121
04:30 PM	0	0	0	0	0	2	0	0	0	0	30	39	0	0	0	0	4	4	0	0	0	0	8	6	0	0	0	0	15	2	110
04:45 PM	0	1	0	0	5	2	0	0	0	0	34	26	0	0	0	0	2	4	0	0	0	0	7	5	0	0	0	0	14	2	102
Total	0	2	0	0	10	16	0	0	0	0	123	128	0	0	0	0	16	20	0	0	0	0	20	24	0	0	0	0	41	17	417
05:00 PM	0	0	0	0	1	2	0	0	0	0	28	26	0	0	0	0	4	5	0	0	2	0	4	7	0	0	0	0	22	6	107
05:15 PM	0	0	0	0	2	2	0	0	0	0	25	38	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	4	6	86
05:30 PM	0	0	0	0	0	1	0	0	0	0	25	45	0	0	0	0	5	3	0	0	0	0	9	7	0	0	0	0	14	2	111
05:45 PM	0	0	0	0	1	1	0	0	0	0	20	21	0	0	0	0	1	3	0	0	0	0	2	2	0	0	0	0	6	4	61
Total	0	0	0	0	4	6	0	0	0	0	98	130	0	0	0	0	10	11	0	0	2	0	20	20	0	0	0	0	46	18	365
Grand Total	0	2	0	0	14	22	0	0	0	0	221	258	0	0	0	0	26	31	0	0	2	0	40	44	0	0	0	0	87	35	782
Apprch %	0	5.3	0	0	36.8	57.9	0	0	0	0	46.1	53.9	0	0	0	0	45.6	54.4	0	0	2.3	0	46.5	51.2	0	0	0	0	71.3	28.7	
Total %	0	0.3	0	0	1.8	2.8	0	0	0	0	28.3	33	0	0	0	0	3.3	4	0	0	0.3	0	5.1	5.6	0	0	0	0	11.1	4.5	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

	Meridian Street From North							Paris Street From East							Emmons Street From Southeast							Meridian Street From South							Paris Street From West							
Start Time	Right	Thru	Bear Left	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Hard Left	Peds SB	Peds NB	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds SB	Peds NB	App. Total	Hard Right	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Bear Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
04:15 PM	0	**1**	0	0	2	**6**	**9**	0	0	0	0	32	34	66	0	0	0	0	**7**	**9**	**16**	0	0	0	0	2	**9**	11	0	0	0	0	8	**11**	19	**121**
04:30 PM	0	0	0	0	0	2	2	0	0	0	0	30	**39**	**69**	0	0	0	0	4	4	8	0	0	0	0	**8**	6	**14**	0	0	0	0	15	2	17	110
04:45 PM	0	1	0	0	**5**	2	8	0	0	0	0	**34**	26	60	0	0	0	0	2	4	6	0	0	0	0	7	5	12	0	0	0	0	14	2	16	102
05:00 PM	0	0	0	0	1	2	3	0	0	0	0	28	26	54	0	0	0	0	4	5	9	0	0	**2**	0	4	7	13	0	0	0	0	**22**	6	**28**	107
Total Volume	0	2	0	0	8	12	22	0	0	0	0	124	125	249	0	0	0	0	17	22	39	0	0	2	0	21	27	50	0	0	0	0	59	21	80	440
% App. Total	0	9.1	0	0	36.4	54.5		0	0	0	0	49.8	50.2		0	0	0	0	43.6	56.4		0	0	4	0	42	54		0	0	0	0	73.8	26.2		
PHF	.000	.500	.000	.000	.400	.500	.611	.000	.000	.000	.000	.912	.801	.902	.000	.000	.000	.000	.607	.611	.609	.000	.000	.250	.000	.656	.750	.893	.000	.000	.000	.000	.670	.477	.714	.909

PRECISION DATA INDUSTRIES, LLC
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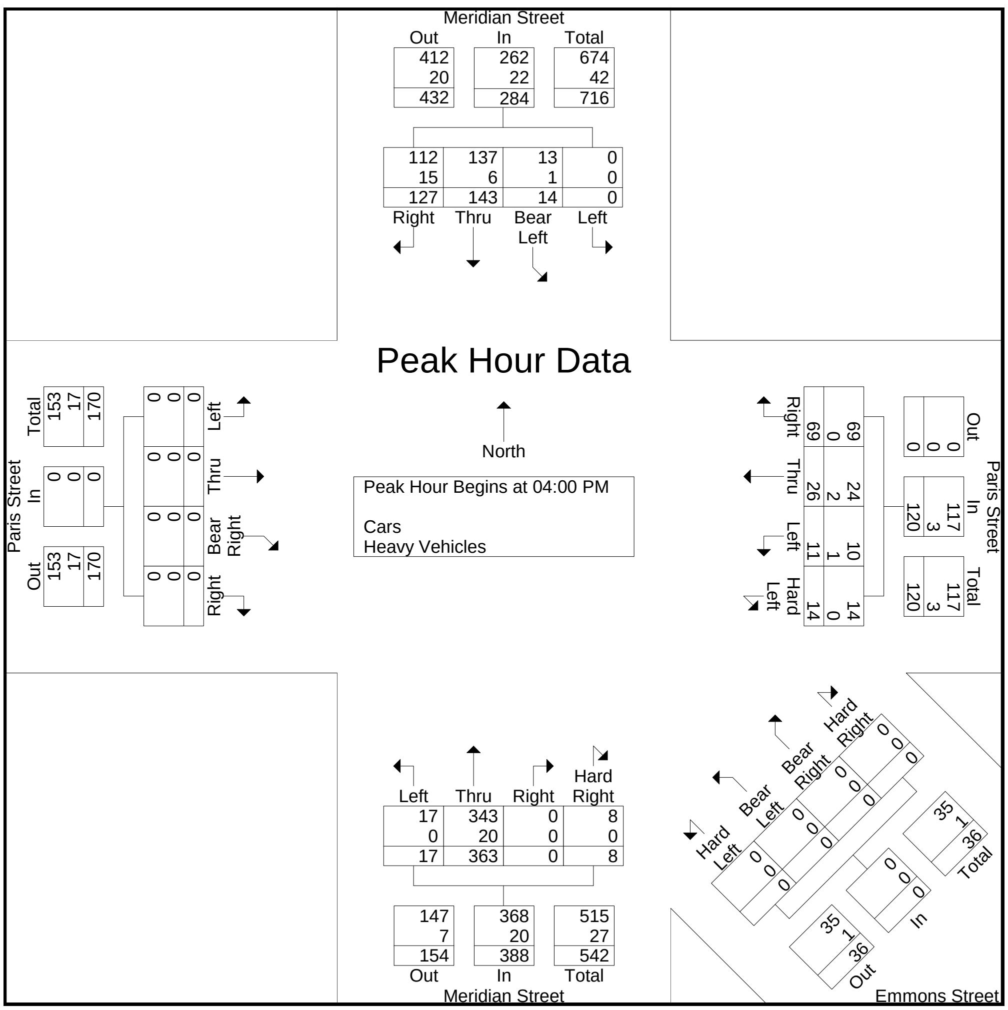
N/S: Meridian Street
E/W/SE: Paris Street/Emmons Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462BB
Site Code : 0607212
Start Date : 1/24/2008

	Meridian Street From North					Paris Street From East					Emmons Street From Southeast					Meridian Street From South					Paris Street From West					
Start Time	Right	Thru	Bear Left	Left	App. Total	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:00 PM																										
04:00 PM	36	31	1	0	68	22	7	1	2	32	0	0	0	0	0	1	0	98	6	105	0	0	0	0	0	205
04:15 PM	28	40	3	0	71	21	10	2	4	37	0	0	0	0	0	3	0	77	4	84	0	0	0	0	0	192
04:30 PM	36	36	5	0	77	12	7	5	7	31	0	0	0	0	0	1	0	99	3	103	0	0	0	0	0	211
04:45 PM	27	36	5	0	68	14	2	3	1	20	0	0	0	0	0	3	0	89	4	96	0	0	0	0	0	184
Total Volume	127	143	14	0	284	69	26	11	14	120	0	0	0	0	0	8	0	363	17	388	0	0	0	0	0	792
% App. Total	44.7	50.4				57.5	21.7	9.2	11.7		0	0	0	0		2.1	0	93.6	4.4		0	0	0	0		
PHF	.882	.894	.700	.000	.922	.784	.650	.550	.500	.811	.000	.000	.000	.000		.667	.000	.917	.708	.924	.000	.000	.000	.000	.000	.938
Cars	112	137																343	17	368	0	0	0	0	0	747
% Cars	88.2	95.8	92.9	0	92.3	100	92.3	90.9	100	97.5	0	0	0	0	0	100	0	94.5	100	94.8	0	0	0	0	0	94.3
Heavy Vehicles																										
% Heavy Vehicles	11.8	4.2	7.1	0	7.7	0	7.7	9.1	0	2.5	0	0	0	0	0	0	0	5.5	0	5.2	0	0	0	0	0	5.7



N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

PRECISION
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INDUSTRIES, LLC
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File Name : 71415E
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	4	0	16	58	14	0	6	15	1	0	0	0	114
07:15 AM	0	0	27	46	14	0	7	13	0	0	0	0	107
07:30 AM	1	0	28	62	15	0	11	31	1	0	0	2	151
07:45 AM	1	0	40	43	30	0	3	14	0	0	0	0	131
Total	6	0	111	209	73	0	27	73	2	0	0	2	503
08:00 AM	2	0	20	63	34	0	11	23	2	0	0	0	155
08:15 AM	2	0	32	55	22	0	10	35	4	0	0	0	160
08:30 AM	5	0	30	42	24	0	6	38	2	0	0	0	147
08:45 AM	1	0	28	46	15	0	10	23	3	0	0	0	126
Total	10	0	110	206	95	0	37	119	11	0	0	0	588
Grand Total	16	0	221	415	168	0	64	192	13	0	0	2	1091
Apprch %	6.8	0	93.2	71.2	28.8	0	23.8	71.4	4.8	0	0	100	
Total %	1.5	0	20.3	38	15.4	0	5.9	17.6	1.2	0	0	0.2	
Cars	13	0	206	354	145	0	58	174	12	0	0	0	962
% Cars	81.2	0	93.2	85.3	86.3	0	90.6	90.6	92.3	0	0	0	88.2
Heavy Vehicles	3	0	15	61	23	0	6	18	1	0	0	2	129
% Heavy Vehicles	18.8	0	6.8	14.7	13.7	0	9.4	9.4	7.7	0	0	100	11.8

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	0	28	29	62	15	0	77	**11**	31	1	43	0	0	**2**	**2**	151
07:45 AM	1	0	**40**	**41**	43	30	0	73	3	14	0	17	0	0	0	0	131
08:00 AM	**2**	0	20	22	**63**	**34**	0	**97**	11	23	2	36	0	0	0	0	155
08:15 AM	2	0	32	34	55	22	0	77	10	**35**	**4**	**49**	0	0	0	0	**160**
Total Volume	6	0	120	126	223	101	0	324	35	103	7	145	0	0	2	2	597
% App. Total	4.8	0	95.2		68.8	31.2	0		24.1	71	4.8		0	0	100		
PHF	.750	.000	.750	.768	.885	.743	.000	.835	.795	.736	.438	.740	.000	.000	.250	.250	.933
Cars	6	0	112	118	194	91	0	285	34	94	6	134	0	0	0	0	537
% Cars	100	0	93.3	93.7	87.0	90.1	0	88.0	97.1	91.3	85.7	92.4	0	0	0	0	89.9
Heavy Vehicles	0	0	8	8	29	10	0	39	1	9	1	11	0	0	2	2	60
% Heavy Vehicles	0	0	6.7	6.3	13.0	9.9	0	12.0	2.9	8.7	14.3	7.6	0	0	100	100	10.1

PRECISION
DATA
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N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415E
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Meridian Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	0	16	50	9	0	5	14	1	0	0	0	97
07:15 AM	0	0	26	37	11	0	5	12	0	0	0	0	91
07:30 AM	1	0	28	54	15	0	10	27	1	0	0	0	136
07:45 AM	1	0	35	37	25	0	3	13	0	0	0	0	114
Total	4	0	105	178	60	0	23	66	2	0	0	0	438
08:00 AM	2	0	20	56	31	0	11	20	2	0	0	0	142
08:15 AM	2	0	29	47	20	0	10	34	3	0	0	0	145
08:30 AM	4	0	29	35	23	0	6	34	2	0	0	0	133
08:45 AM	1	0	23	38	11	0	8	20	3	0	0	0	104
Total	9	0	101	176	85	0	35	108	10	0	0	0	524
Grand Total	13	0	206	354	145	0	58	174	12	0	0	0	962
Apprch %	5.9	0	94.1	70.9	29.1	0	23.8	71.3	4.9	0	0	0	
Total %	1.4	0	21.4	36.8	15.1	0	6	18.1	1.2	0	0	0	

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	0	28	29	54	15	0	69	10	27	1	38	0	0	0	0	136
07:45 AM	1	0	**35**	**36**	37	25	0	62	3	13	0	16	0	0	0	0	114
08:00 AM	**2**	0	20	22	**56**	**31**	0	**87**	**11**	20	2	33	0	0	0	0	142
08:15 AM	2	0	29	31	47	20	0	67	10	**34**	**3**	**47**	0	0	0	0	**145**
Total Volume	6	0	112	118	194	91	0	285	34	94	6	134	0	0	0	0	537
% App. Total	5.1	0	94.9		68.1	31.9	0		25.4	70.1	4.5		0	0	0		
PHF	.750	.000	.800	.819	.866	.734	.000	.819	.773	.691	.500	.713	.000	.000	.000	.000	.926

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E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415E
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Heavy Vehicles

	Meridian Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	0	0	8	5	0	1	1	0	0	0	0	17
07:15 AM	0	0	1	9	3	0	2	1	0	0	0	0	16
07:30 AM	0	0	0	8	0	0	1	4	0	0	0	2	15
07:45 AM	0	0	5	6	5	0	0	1	0	0	0	0	17
Total	2	0	6	31	13	0	4	7	0	0	0	2	65
08:00 AM	0	0	0	7	3	0	0	3	0	0	0	0	13
08:15 AM	0	0	3	8	2	0	0	1	1	0	0	0	15
08:30 AM	1	0	1	7	1	0	0	4	0	0	0	0	14
08:45 AM	0	0	5	8	4	0	2	3	0	0	0	0	22
Total	1	0	9	30	10	0	2	11	1	0	0	0	64
Grand Total	3	0	15	61	23	0	6	18	1	0	0	2	129
Apprch %	16.7	0	83.3	72.6	27.4	0	24	72	4	0	0	100	
Total %	2.3	0	11.6	47.3	17.8	0	4.7	14	0.8	0	0	1.6	

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**2**	0	0	2	8	**5**	0	**13**	1	1	0	2	0	0	0	0	**17**
07:15 AM	0	0	1	1	**9**	3	0	12	**2**	1	0	3	0	0	0	0	16
07:30 AM	0	0	0	0	8	0	0	8	1	**4**	0	**5**	0	0	**2**	**2**	15
07:45 AM	0	0	**5**	**5**	6	5	0	11	0	1	0	1	0	0	0	0	17
Total Volume	2	0	6	8	31	13	0	44	4	7	0	11	0	0	2	2	65
% App. Total	25	0	75		70.5	29.5	0		36.4	63.6	0		0	0	100		
PHF	.250	.000	.300	.400	.861	.650	.000	.846	.500	.438	.000	.550	.000	.000	.250	.250	.956

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N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415E
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Peds and Bicycles

	Meridian Street From North					Maverick Street From East					Maverick Square From South					Maverick Street From West					
Start	Right	Thru	Left	Peds from East	Peds from West	Right	Thru	Left	Peds from South	Peds from North	Right	Thru	Left	Peds from West	Peds from East	Right	Thru	Left	Peds from North	Peds from South	Int. Total
07:00 AM	0	0	0	2	0	0	0	0	2	12	0	0	0	1	8	0	0	0	15	7	47
07:15 AM	0	0	0	12	0	0	0	0	1	17	0	0	0	1	8	0	0	0	26	15	80
07:30 AM	0	0	0	11	0	0	0	0	4	27	0	1	0	7	8	0	0	0	19	10	87
07:45 AM	0	0	0	4	0	0	0	0	6	21	0	0	0	2	17	0	0	0	19	14	83
Total	0	0	0	29	0	0	0	0	13	77	0	1	0	11	41	0	0	0	79	46	297
08:00 AM	0	0	0	8	0	0	0	0	6	30	0	0	0	11	10	0	0	0	28	14	107
08:15 AM	0	0	0	5	0	0	0	0	6	24	0	0	0	8	14	0	0	0	22	16	95
08:30 AM	0	0	0	7	0	0	0	0	13	19	0	0	0	5	13	0	0	0	25	26	108
08:45 AM	0	0	0	12	0	0	0	0	11	17	0	1	0	8	5	0	0	0	25	32	111
Total	0	0	0	32	0	0	0	0	36	90	0	1	0	32	42	0	0	0	100	88	421
Grand Total	0	0	0	61	0	0	0	0	49	167	0	2	0	43	83	0	0	0	179	134	718
Apprch %	0	0	0	100	0	0	0	0	22.7	77.3	0	1.6	0	33.6	64.8	0	0	0	57.2	42.8	
Total %	0	0	0	8.5	0	0	0	0	6.8	23.3	0	0.3	0	6	11.6	0	0	0	24.9	18.7	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	Meridian Street From North						Maverick Street From East						Maverick Square From South						Maverick Street From West						
Start Time	Right	Thru	Left	Peds from East	Peds from West	App. Total	Right	Thru	Left	Peds from South	Peds from North	App. Total	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
08:00 AM	0	0	0	8	0	8	0	0	0	6	**30**	**36**	0	0	0	**11**	**10**	**21**	**0**	**0**	**0**	**28**	14	42	107
08:15 AM	0	0	0	5	0	5	0	0	0	6	24	30	0	0	0	8	**14**	**22**	0	0	0	22	16	38	95
08:30 AM	0	0	0	7	0	7	0	0	0	**13**	**19**	**32**	**0**	**0**	**0**	**5**	**13**	**18**	**0**	**0**	**0**	**25**	**26**	**51**	**108**
08:45 AM	0	0	0	**12**	0	**12**	0	0	0	11	17	28	0	**1**	0	8	5	14	0	0	0	25	**32**	**57**	**111**
Total Volume	0	0	0	32	0	32	0	0	0	36	90	126	0	1	0	32	42	75	0	0	0	100	88	188	421
% App. Total	0	0	0	100	0		0	0	0	28.6	71.4		0	1.3	0	42.7	56		0	0	0	53.2	46.8		
PHF	.000	.000	.000	.667	.000		.000	.000	.000	.692	.750		.000	.250	.000	.727	.750	.852	.000	.000	.000	.893	.688	.825	.948

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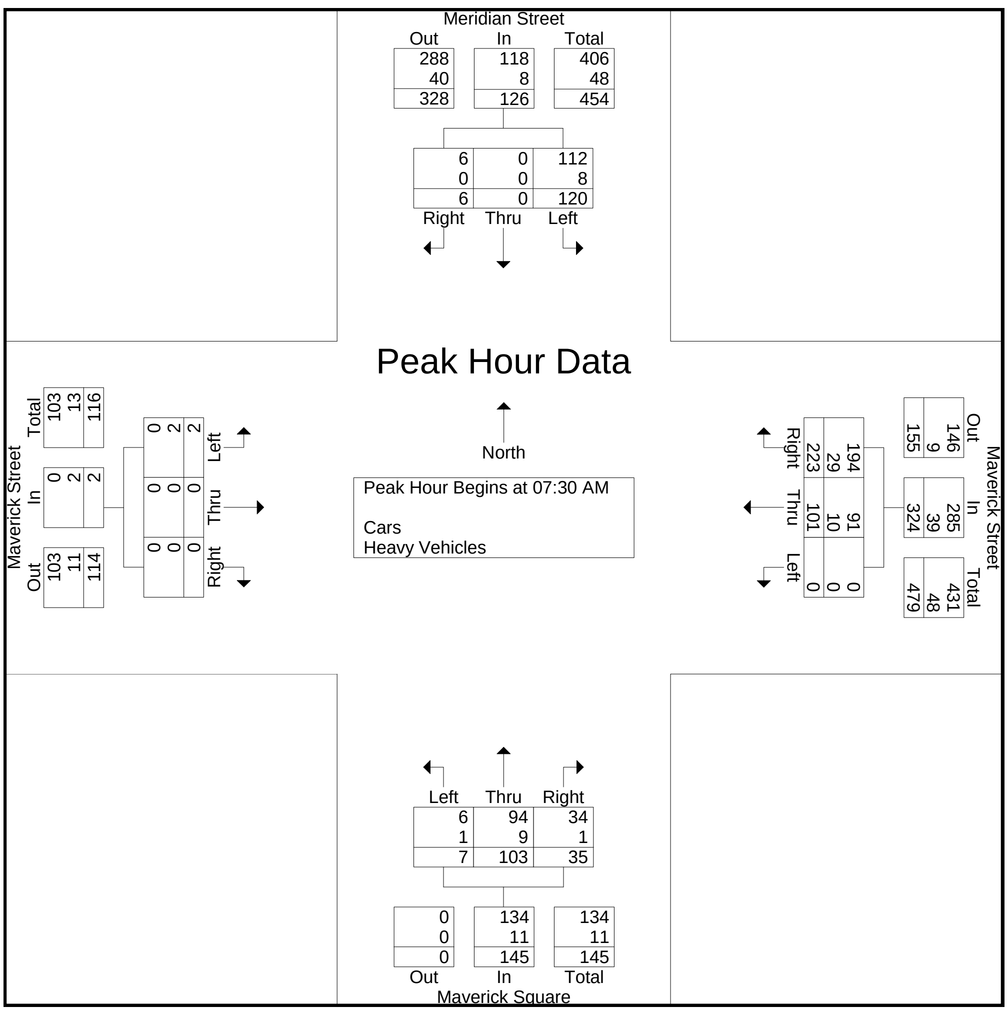
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415E
Site Code : 00000000
Start Date : 12/11/2007

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	0	28	29	62	15	0	77	**11**	31	1	43	0	0	**2**	**2**	151
07:45 AM	1	0	**40**	**41**	43	30	0	73	3	14	0	17	0	0	0	0	131
08:00 AM	**2**	0	20	22	**63**	**34**	0	**97**	11	23	2	36	0	0	0	0	155
08:15 AM	2	0	32	34	55	22	0	77	10	**35**	**4**	**49**	0	0	0	0	**160**
Total Volume	6	0	120	126	223	101	0	324	35	103	7	145	0	0	2	2	597
% App. Total	4.8	0	95.2		68.8	31.2	0		24.1	71	4.8		0	0	100		
PHF	.750	.000	.750	.768	.885	.743	.000	.835	.795	.736	.438	.740	.000	.000	.250	.250	.933
Cars	6	0	112	118	194	91	0	285	34	94	6	134	0	0	0	0	537
% Cars	100	0	93.3	93.7	87.0	90.1	0	88.0	97.1	91.3	85.7	92.4	0	0	0	0	89.9
Heavy Vehicles	0	0	8	8	29	10	0	39	1	9	1	11	0	0	2	2	60
% Heavy Vehicles	0	0	6.7	6.3	13.0	9.9	0	12.0	2.9	8.7	14.3	7.6	0	0	100	100	10.1



PRECISION
D A T A
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
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N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415EE
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Meridian Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	6	0	28	46	26	0	12	33	2	0	0	0	153
04:15 PM	4	0	37	42	17	0	16	28	7	0	0	0	151
04:30 PM	3	0	34	55	19	0	15	26	3	0	0	0	155
04:45 PM	8	0	32	45	17	0	24	39	6	0	0	0	171
Total	21	0	131	188	79	0	67	126	18	0	0	0	630
05:00 PM	5	0	42	54	15	0	18	40	7	0	0	0	181
05:15 PM	6	0	34	50	23	0	21	40	3	0	0	0	177
05:30 PM	9	0	35	53	11	0	15	37	1	0	0	0	161
05:45 PM	3	0	29	53	19	0	20	22	3	0	0	0	149
Total	23	0	140	210	68	0	74	139	14	0	0	0	668
Grand Total	44	0	271	398	147	0	141	265	32	0	0	0	1298
Apprch %	14	0	86	73	27	0	32.2	60.5	7.3	0	0	0	
Total %	3.4	0	20.9	30.7	11.3	0	10.9	20.4	2.5	0	0	0	
Cars	44	0	267	368	130	0	136	255	32	0	0	0	1232
% Cars	100	0	98.5	92.5	88.4	0	96.5	96.2	100	0	0	0	94.9
Heavy Vehicles	0	0	4	30	17	0	5	10	0	0	0	0	66
% Heavy Vehicles	0	0	1.5	7.5	11.6	0	3.5	3.8	0	0	0	0	5.1

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	0	32	40	45	17	0	62	**24**	39	6	**69**	0	0	0	0	171
05:00 PM	5	0	**42**	**47**	**54**	15	0	69	18	**40**	**7**	65	0	0	0	0	**181**
05:15 PM	6	0	34	40	50	**23**	0	**73**	21	40	3	64	0	0	0	0	177
05:30 PM	**9**	0	35	44	53	11	0	64	15	37	1	53	0	0	0	0	161
Total Volume	28	0	143	171	202	66	0	268	78	156	17	251	0	0	0	0	690
% App. Total	16.4	0	83.6		75.4	24.6	0		31.1	62.2	6.8		0	0	0		
PHF	.778	.000	.851	.910	.935	.717	.000	.918	.813	.975	.607	.909	.000	.000	.000	.000	.953
Cars	28	0	141	169	187	58	0	245	77	152	17	246	0	0	0	0	660
% Cars	100	0	98.6	98.8	92.6	87.9	0	91.4	98.7	97.4	100	98.0	0	0	0	0	95.7
Heavy Vehicles	0	0	2	2	15	8	0	23	1	4	0	5	0	0	0	0	30
% Heavy Vehicles	0	0	1.4	1.2	7.4	12.1	0	8.6	1.3	2.6	0	2.0	0	0	0	0	4.3

PRECISION DATA INDUSTRIES, LLC

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N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415EE
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Cars

	Meridian Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	6	0	27	41	24	0	12	32	2	0	0	0	144
04:15 PM	4	0	36	40	14	0	15	28	7	0	0	0	144
04:30 PM	3	0	34	51	16	0	14	24	3	0	0	0	145
04:45 PM	8	0	32	40	14	0	24	37	6	0	0	0	161
Total	21	0	129	172	68	0	65	121	18	0	0	0	594
05:00 PM	5	0	41	49	13	0	18	39	7	0	0	0	172
05:15 PM	6	0	34	47	22	0	20	40	3	0	0	0	172
05:30 PM	9	0	34	51	9	0	15	36	1	0	0	0	155
05:45 PM	3	0	29	49	18	0	18	19	3	0	0	0	139
Total	23	0	138	196	62	0	71	134	14	0	0	0	638
Grand Total	44	0	267	368	130	0	136	255	32	0	0	0	1232
Apprch %	14.1	0	85.9	73.9	26.1	0	32.2	60.3	7.6	0	0	0	
Total %	3.6	0	21.7	29.9	10.6	0	11	20.7	2.6	0	0	0	

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	0	32	40	40	14	0	54	**24**	37	6	**67**	0	0	0	0	161
05:00 PM	5	0	**41**	**46**	49	13	0	62	18	39	**7**	64	0	0	0	0	**172**
05:15 PM	6	0	34	40	47	**22**	0	**69**	20	**40**	3	63	0	0	0	0	172
05:30 PM	**9**	0	34	43	**51**	9	0	60	15	36	1	52	0	0	0	0	155
Total Volume	28	0	141	169	187	58	0	245	77	152	17	246	0	0	0	0	660
% App. Total	16.6	0	83.4		76.3	23.7	0		31.3	61.8	6.9		0	0	0		
PHF	.778	.000	.860	.918	.917	.659	.000	.888	.802	.950	.607	.918	.000	.000	.000	.000	.959

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N/S: Meridian Street/ Maverick Square
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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415EE
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Heavy Vehicles

	Meridian Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	1	5	2	0	0	1	0	0	0	0	9
04:15 PM	0	0	1	2	3	0	1	0	0	0	0	0	7
04:30 PM	0	0	0	4	3	0	1	2	0	0	0	0	10
04:45 PM	0	0	0	5	3	0	0	2	0	0	0	0	10
Total	0	0	2	16	11	0	2	5	0	0	0	0	36
05:00 PM	0	0	1	5	2	0	0	1	0	0	0	0	9
05:15 PM	0	0	0	3	1	0	1	0	0	0	0	0	5
05:30 PM	0	0	1	2	2	0	0	1	0	0	0	0	6
05:45 PM	0	0	0	4	1	0	2	3	0	0	0	0	10
Total	0	0	2	14	6	0	3	5	0	0	0	0	30
Grand Total	0	0	4	30	17	0	5	10	0	0	0	0	66
Apprch %	0	0	100	63.8	36.2	0	33.3	66.7	0	0	0	0	
Total %	0	0	6.1	45.5	25.8	0	7.6	15.2	0	0	0	0	

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	**1**	**1**	**5**	2	0	7	0	1	0	1	0	0	0	0	9
04:15 PM	0	0	1	1	2	**3**	0	5	**1**	0	0	1	0	0	0	0	7
04:30 PM	0	0	0	0	4	3	0	7	1	**2**	0	**3**	0	0	0	0	**10**
04:45 PM	0	0	0	0	5	3	0	**8**	0	2	0	2	0	0	0	0	10
Total Volume	0	0	2	2	16	11	0	27	2	5	0	7	0	0	0	0	36
% App. Total	0	0	100		59.3	40.7	0		28.6	71.4	0		0	0	0		
PHF	.000	.000	.500	.500	.800	.917	.000	.844	.500	.625	.000	.583	.000	.000	.000	.000	.900

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N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415EE
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Peds and Bicycles

	Meridian Street From North					Maverick Street From East					Maverick Square From South					Maverick Street From West					
Start	Right	Thru	Left	Peds from East	Peds from West	Right	Thru	Left	Peds from South	Peds from North	Right	Thru	Left	Peds from West	Peds from East	Right	Thru	Left	Peds from North	Peds from South	Int. Total
04:00 PM	0	1	0	19	28	0	0	0	22	32	0	0	0	20	10	0	0	0	43	26	201
04:15 PM	0	0	0	25	23	0	0	0	30	24	0	0	0	13	9	0	0	0	36	44	204
04:30 PM	0	0	0	24	21	0	0	0	11	24	0	0	0	8	8	0	0	0	32	22	150
04:45 PM	0	0	0	7	21	0	0	0	19	27	0	0	0	13	4	0	0	0	15	47	153
Total	0	1	0	75	93	0	0	0	82	107	0	0	0	54	31	0	0	0	126	139	708
05:00 PM	0	0	0	13	11	0	0	0	8	30	0	0	0	15	10	0	0	0	19	30	136
05:15 PM	0	0	0	16	16	0	0	0	14	30	0	0	0	9	11	0	0	0	24	50	170
05:30 PM	0	0	0	12	12	0	0	0	19	26	0	0	0	7	14	0	0	0	11	53	154
05:45 PM	0	0	0	6	24	0	0	0	9	16	0	0	0	3	6	0	0	0	11	39	114
Total	0	0	0	47	63	0	0	0	50	102	0	0	0	34	41	0	0	0	65	172	574
Grand Total	0	1	0	122	156	0	0	0	132	209	0	0	0	88	72	0	0	0	191	311	1282
Apprch %	0	0.4	0	43.7	55.9	0	0	0	38.7	61.3	0	0	0	55	45	0	0	0	38	62	
Total %	0	0.1	0	9.5	12.2	0	0	0	10.3	16.3	0	0	0	6.9	5.6	0	0	0	14.9	24.3	

	Meridian Street From North						Maverick Street From East						Maverick Square From South						Maverick Street From West						
Start Time	Right	Thru	Left	Peds from East	Peds from West	App. Total	Right	Thru	Left	Peds from South	Peds from North	App. Total	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	**1**	**0**	**19**	**28**	**48**	0	0	0	22	**32**	**54**	0	0	0	**20**	**10**	**30**	0	0	0	**43**	26	69	201
04:15 PM	0	0	0	**25**	23	48	0	0	0	**30**	**24**	**54**	**0**	**0**	**0**	**13**	**9**	**22**	**0**	**0**	**0**	**36**	**44**	**80**	**204**
04:30 PM	0	0	0	24	21	45	0	0	0	11	24	35	0	0	0	8	8	16	0	0	0	32	22	54	150
04:45 PM	0	0	0	7	21	28	0	0	0	19	27	46	0	0	0	13	4	17	0	0	0	15	**47**	**62**	**153**
Total Volume	0	1	0	75	93	169	0	0	0	82	107	189	0	0	0	54	31	85	0	0	0	126	139	265	708
% App. Total	0	0.6	0	44.4	55		0	0	0	43.4	56.6		0	0	0	63.5	36.5		0	0	0	47.5	52.5		
PHF	.000	.250	.000	.750	.830		.000	.000	.000	.683	.836		.000	.000	.000	.675	.775	.708	.000	.000	.000	.733	.739	.828	.868

N/S: Meridian Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

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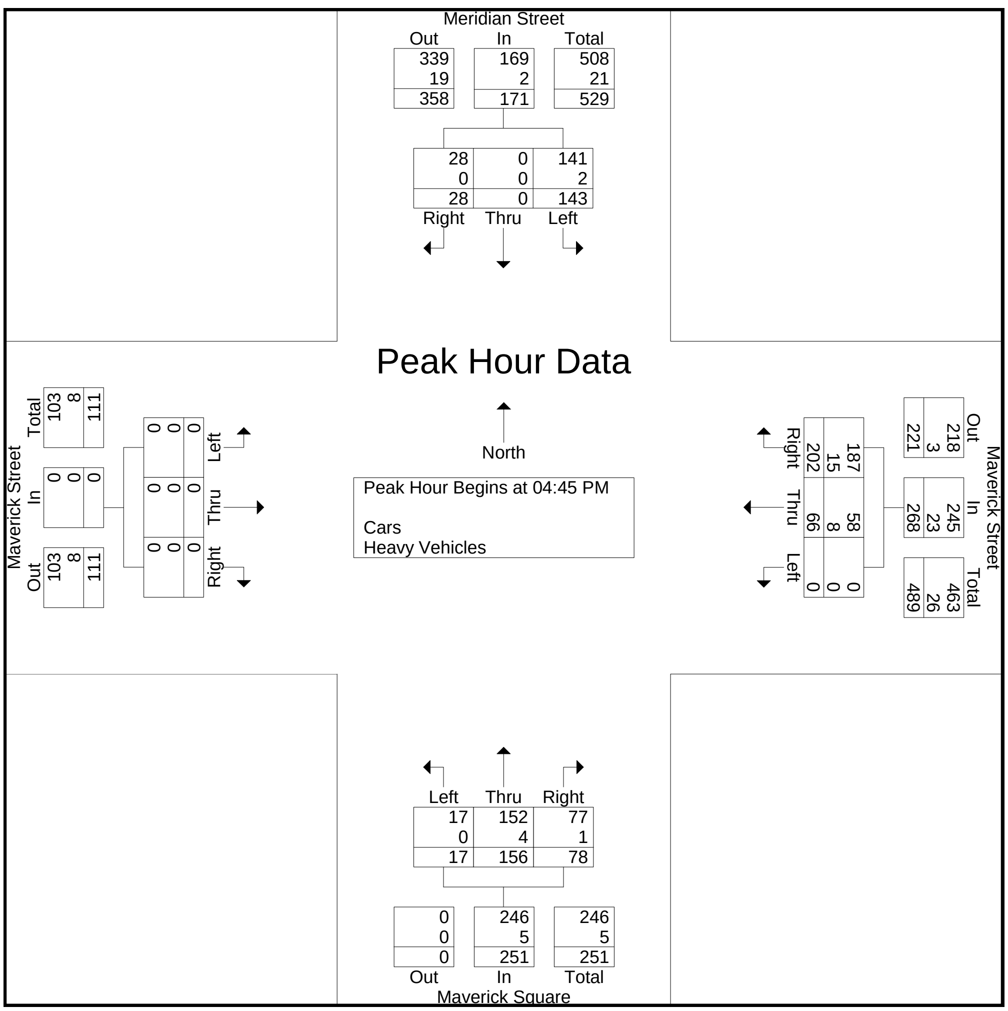
File Name : 71415EE
Site Code : 00000000
Start Date : 12/11/2007

	Meridian Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	0	32	40	45	17	0	62	**24**	39	6	**69**	0	0	0	0	171
05:00 PM	5	0	**42**	**47**	**54**	15	0	69	18	**40**	**7**	65	0	0	0	0	**181**
05:15 PM	6	0	34	40	50	**23**	0	**73**	21	40	3	64	0	0	0	0	177
05:30 PM	**9**	0	35	44	53	11	0	64	15	37	1	53	0	0	0	0	161
Total Volume	28	0	143	171	202	66	0	268	78	156	17	251	0	0	0	0	690
% App. Total	16.4	0	83.6		75.4	24.6	0		31.1	62.2	6.8		0	0	0		
PHF	.778	.000	.851	.910	.935	.717	.000	.918	.813	.975	.607	.909	.000	.000	.000	.000	.953
Cars	28	0	141	169	187	58	0	245	77	152	17	246	0	0	0	0	660
% Cars	100	0	98.6	98.8	92.6	87.9	0	91.4	98.7	97.4	100	98.0	0	0	0	0	95.7
Heavy Vehicles	0	0	2	2	15	8	0	23	1	4	0	5	0	0	0	0	30
% Heavy Vehicles	0	0	1.4	1.2	7.4	12.1	0	8.6	1.3	2.6	0	2.0	0	0	0	0	4.3



N/S: Chelsea Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

PRECISION
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File Name : 71415D
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars - Heavy Vehicles

	Chelsea Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	7	22	0	15	54	4	0	0	0	11	0	11	124
07:15 AM	12	13	0	14	46	6	0	0	0	29	0	5	125
07:30 AM	14	11	0	0	60	2	0	0	0	26	0	13	126
07:45 AM	15	5	0	6	58	6	0	0	0	38	0	6	134
Total	48	51	0	35	218	18	0	0	0	104	0	35	509
08:00 AM	12	19	0	9	85	8	0	2	0	23	0	10	168
08:15 AM	17	18	0	13	60	10	0	0	0	37	0	6	161
08:30 AM	16	25	0	6	49	6	0	0	0	28	0	7	137
08:45 AM	16	17	0	7	47	2	0	0	0	25	0	14	128
Total	61	79	0	35	241	26	0	2	0	113	0	37	594
Grand Total	109	130	0	70	459	44	0	2	0	217	0	72	1103
Apprch %	45.6	54.4	0	12.2	80.1	7.7	0	100	0	75.1	0	24.9	
Total %	9.9	11.8	0	6.3	41.6	4	0	0.2	0	19.7	0	6.5	
Cars	98	117	0	69	386	43	0	2	0	205	0	64	984
% Cars	89.9	90	0	98.6	84.1	97.7	0	100	0	94.5	0	88.9	89.2
Heavy Vehicles	11	13	0	1	73	1	0	0	0	12	0	8	119
% Heavy Vehicles	10.1	10	0	1.4	15.9	2.3	0	0	0	5.5	0	11.1	10.8

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:45 AM	15	5	0	20	6	58	6	70	0	0	0	0	**38**	0	6	**44**	134
08:00 AM	12	19	0	31	9	**85**	8	**102**	0	**2**	0	**2**	23	0	**10**	33	**168**
08:15 AM	**17**	18	0	35	**13**	60	**10**	83	0	0	0	0	37	0	6	43	161
08:30 AM	16	**25**	0	**41**	6	49	6	61	0	0	0	0	28	0	7	35	137
Total Volume	60	67	0	127	34	252	30	316	0	2	0	2	126	0	29	155	600
% App. Total	47.2	52.8	0		10.8	79.7	9.5		0	100	0		81.3	0	18.7		
PHF	.882	.670	.000	.774	.654	.741	.750	.775	.000	.250	.000	.250	.829	.000	.725	.881	.893
Cars	55	61	0	116	33	216	29	278	0	2	0	2	118	0	28	146	542
% Cars	91.7	91.0	0	91.3	97.1	85.7	96.7	88.0	0	100	0	100	93.7	0	96.6	94.2	90.3
Heavy Vehicles	5	6	0	11	1	36	1	38	0	0	0	0	8	0	1	9	58
% Heavy Vehicles	8.3	9.0	0	8.7	2.9	14.3	3.3	12.0	0	0	0	0	6.3	0	3.4	5.8	9.7

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415D
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Chelsea Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	4	18	0	15	45	4	0	0	0	11	0	10	107
07:15 AM	10	12	0	14	37	6	0	0	0	27	0	4	110
07:30 AM	14	11	0	0	52	2	0	0	0	26	0	12	117
07:45 AM	13	5	0	6	48	6	0	0	0	34	0	5	117
Total	41	46	0	35	182	18	0	0	0	98	0	31	451
08:00 AM	11	16	0	9	76	8	0	2	0	23	0	10	155
08:15 AM	15	17	0	12	51	10	0	0	0	34	0	6	145
08:30 AM	16	23	0	6	41	5	0	0	0	27	0	7	125
08:45 AM	15	15	0	7	36	2	0	0	0	23	0	10	108
Total	57	71	0	34	204	25	0	2	0	107	0	33	533
Grand Total	98	117	0	69	386	43	0	2	0	205	0	64	984
Apprch %	45.6	54.4	0	13.9	77.5	8.6	0	100	0	76.2	0	23.8	
Total %	10	11.9	0	7	39.2	4.4	0	0.2	0	20.8	0	6.5	

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	13	5	0	18	6	48	6	60	0	0	0	0	**34**	0	5	39	117
08:00 AM	11	16	0	27	9	**76**	8	**93**	0	**2**	0	**2**	23	0	**10**	33	**155**
08:15 AM	15	17	0	32	**12**	51	**10**	73	0	0	0	0	34	0	6	**40**	145
08:30 AM	**16**	**23**	0	**39**	6	41	5	52	0	0	0	0	27	0	7	34	125
Total Volume	55	61	0	116	33	216	29	278	0	2	0	2	118	0	28	146	542
% App. Total	47.4	52.6	0		11.9	77.7	10.4		0	100	0		80.8	0	19.2		
PHF	.859	.663	.000	.744	.688	.711	.725	.747	.000	.250	.000	.250	.868	.000	.700	.913	.874

PRECISION
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N/S: Chelsea Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415D
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

Groups Printed- Heavy Vehicles

	Chelsea Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	3	4	0	0	9	0	0	0	0	0	0	1	17
07:15 AM	2	1	0	0	9	0	0	0	0	2	0	1	15
07:30 AM	0	0	0	0	8	0	0	0	0	0	0	1	9
07:45 AM	2	0	0	0	10	0	0	0	0	4	0	1	17
Total	7	5	0	0	36	0	0	0	0	6	0	4	58
08:00 AM	1	3	0	0	9	0	0	0	0	0	0	0	13
08:15 AM	2	1	0	1	9	0	0	0	0	3	0	0	16
08:30 AM	0	2	0	0	8	1	0	0	0	1	0	0	12
08:45 AM	1	2	0	0	11	0	0	0	0	2	0	4	20
Total	4	8	0	1	37	1	0	0	0	6	0	4	61
Grand Total	11	13	0	1	73	1	0	0	0	12	0	8	119
Apprch %	45.8	54.2	0	1.3	97.3	1.3	0	0	0	60	0	40	
Total %	9.2	10.9	0	0.8	61.3	0.8	0	0	0	10.1	0	6.7	

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	**3**	0	**4**	0	9	0	9	0	0	0	0	0	0	0	0	13
08:15 AM	**2**	1	0	3	**1**	9	0	10	0	0	0	0	**3**	0	0	3	16
08:30 AM	0	2	0	2	0	8	**1**	9	0	0	0	0	1	0	0	1	12
08:45 AM	1	2	0	3	0	**11**	0	**11**	0	0	0	0	2	0	**4**	**6**	**20**
Total Volume	4	8	0	12	1	37	1	39	0	0	0	0	6	0	4	10	61
% App. Total	33.3	66.7	0		2.6	94.9	2.6		0	0	0		60	0	40		
PHF	.500	.667	.000	.750	.250	.841	.250	.886	.000	.000	.000	.000	.500	.000	.250	.417	.763

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415D
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Peds and Bicycles

	Chelsea Street From North					Maverick Street From East					Maverick Square From South					Maverick Street From West					
Start	Rig ht	Thr u	Left	Peds from East	Peds from West	Right	Thru	Left	Peds from South	Peds from North	Right	Thru	Left	Peds from West	Peds from East	Right	Thru	Left	Peds from South	Peds from North	Int. Total
07:00 AM	0	0	0	2	0	0	0	0	4	9	0	0	0	0	5	0	0	0	0	0	20
07:15 AM	0	0	0	4	0	0	0	0	4	20	0	0	0	2	2	0	0	0	0	0	32
07:30 AM	0	0	0	0	0	0	0	0	3	6	0	0	0	0	1	0	0	0	0	0	10
07:45 AM	0	0	0	1	0	0	0	0	1	9	0	0	0	4	4	0	0	0	0	0	19
Total	0	0	0	7	0	0	0	0	12	44	0	0	0	6	12	0	0	0	0	0	81
08:00 AM	0	0	0	1	0	0	0	1	2	11	0	0	0	15	7	0	0	0	0	0	37
08:15 AM	0	0	0	0	0	0	0	0	6	11	0	0	0	5	8	0	0	0	0	0	30
08:30 AM	0	0	0	0	1	0	0	1	2	10	0	0	0	3	10	0	0	0	0	0	27
08:45 AM	0	0	0	0	7	0	0	0	10	8	0	0	0	4	3	0	0	0	0	0	32
Total	0	0	0	1	8	0	0	2	20	40	0	0	0	27	28	0	0	0	0	0	126
Grand Total	0	0	0	8	8	0	0	2	32	84	0	0	0	33	40	0	0	0	0	0	207
Apprch %	0	0	0	50	50	0	0	1.7	27.1	71.2	0	0	0	45.2	54.8	0	0	0	0	0	
Total %	0	0	0	3.9	3.9	0	0	1	15.5	40.6	0	0	0	15.9	19.3	0	0	0	0	0	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:00 AM

	Chelsea Street From North						Maverick Street From East						Maverick Square From South						Maverick Street From West						
Start Time	Right	Thru	Left	Peds from East	Peds from West	App. Total	Right	Thru	Left	Peds from South	Peds from North	App. Total	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Thru	Left	Peds from South	Peds from North	App. Total	Int. Total
08:00 AM	0	0	0	**1**	0	1	0	0	**1**	**2**	**11**	14	0	0	0	**15**	**7**	**22**	0	0	0	0	0	0	**37**
08:15 AM	0	0	0	0	0	0	0	0	0	6	11	17	0	0	0	5	8	13	0	0	0	0	0	0	30
08:30 AM	0	0	0	0	1	1	0	0	1	2	10	13	0	0	0	3	**10**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**27**
08:45 AM	0	0	0	0	**7**	**7**	0	0	0	**10**	**8**	**18**	0	0	0	4	3	7	0	0	0	0	0	0	32
Total Volume	0	0	0	1	8	9	0	0	2	20	40	62	0	0	0	27	28	55	0	0	0	0	0	0	126
% App. Total	0	0	0	11.1	88.9		0	0	3.2	32.3	64.5		0	0	0	49.1	50.9		0	0	0	0	0		
PHF	.000	.000	.000	.250	.286		.000	.000	.500	.500	.909		.000	.000	.000	.450	.700	.625	.000	.000	.000	.000	.000	.000	.851

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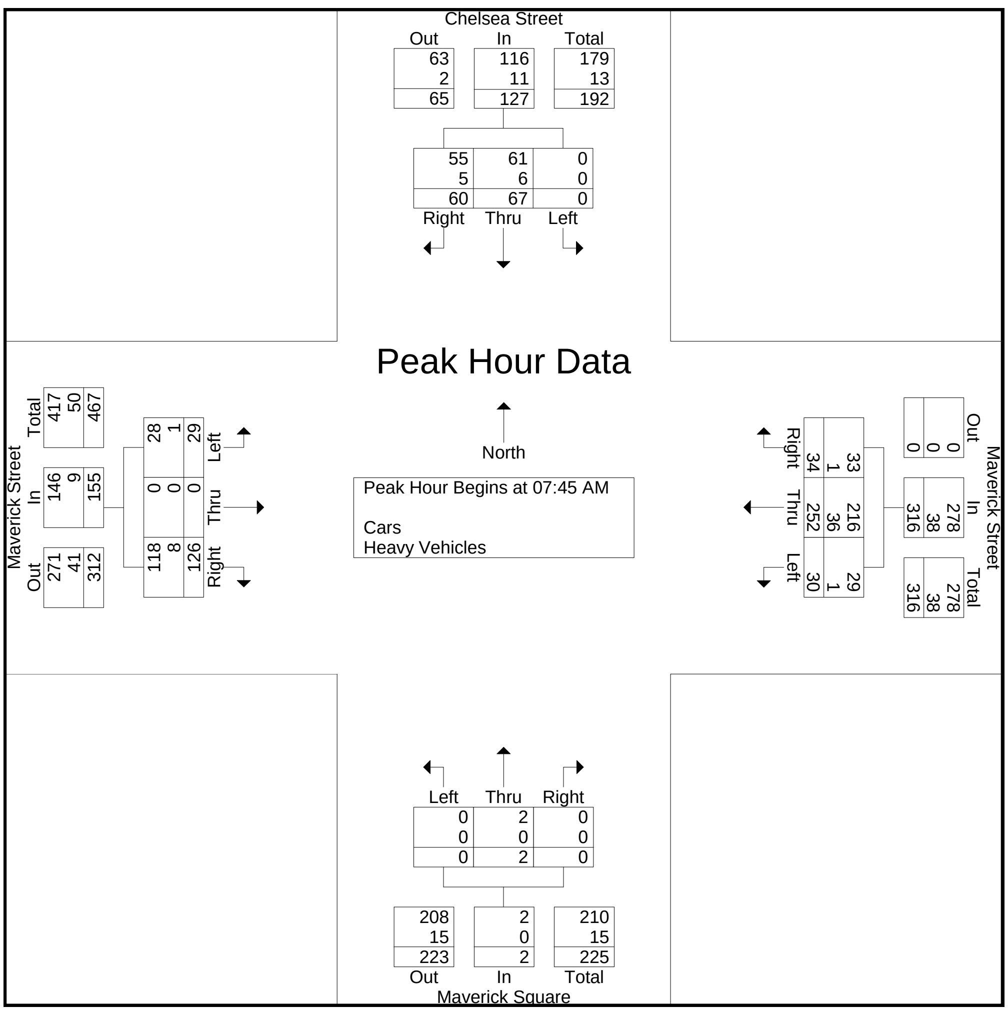
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415D
Site Code : 00000000
Start Date : 12/11/2007

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	15	5	0	20	6	58	6	70	0	0	0	0	**38**	0	6	**44**	134
08:00 AM	12	19	0	31	9	**85**	8	**102**	0	**2**	0	**2**	23	0	**10**	33	**168**
08:15 AM	**17**	18	0	35	**13**	60	**10**	83	0	0	0	0	37	0	6	43	161
08:30 AM	16	**25**	0	**41**	6	49	6	61	0	0	0	0	28	0	7	35	137
Total Volume	60	67	0	127	34	252	30	316	0	2	0	2	126	0	29	155	600
% App. Total	47.2	52.8	0		10.8	79.7	9.5		0	100	0		81.3	0	18.7		
PHF	.882	.670	.000	.774	.654	.741	.750	.775	.000	.250	.000	.250	.829	.000	.725	.881	.893
Cars	55	61	0	116	33	216	29	278	0	2	0	2	118	0	28	146	542
% Cars	91.7	91.0	0	91.3	97.1	85.7	96.7	88.0	0	100	0	100	93.7	0	96.6	94.2	90.3
Heavy Vehicles	5	6	0	11	1	36	1	38	0	0	0	0	8	0	1	9	58
% Heavy Vehicles	8.3	9.0	0	8.7	2.9	14.3	3.3	12.0	0	0	0	0	6.3	0	3.4	5.8	9.7



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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415DD
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars - Heavy Vehicles

	Chelsea Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	22	20	0	19	55	5	0	0	0	24	0	17	162
04:15 PM	15	19	0	17	42	4	0	0	0	34	0	22	153
04:30 PM	22	20	0	25	52	10	0	0	0	28	0	21	178
04:45 PM	19	19	0	22	43	10	0	0	0	31	0	25	169
Total	78	78	0	83	192	29	0	0	0	117	0	85	662
05:00 PM	14	18	0	25	50	10	0	0	0	34	0	25	176
05:15 PM	17	12	0	25	55	11	0	0	0	31	0	24	175
05:30 PM	24	13	0	23	41	3	0	0	0	27	0	23	154
05:45 PM	11	20	0	27	55	5	0	0	0	23	0	28	169
Total	66	63	0	100	201	29	0	0	0	115	0	100	674
Grand Total	144	141	0	183	393	58	0	0	0	232	0	185	1336
Apprch %	50.5	49.5	0	28.9	62	9.1	0	0	0	55.6	0	44.4	
Total %	10.8	10.6	0	13.7	29.4	4.3	0	0	0	17.4	0	13.8	
Cars	133	137	0	177	359	58	0	0	0	230	0	178	1272
% Cars	92.4	97.2	0	96.7	91.3	100	0	0	0	99.1	0	96.2	95.2
Heavy Vehicles	11	4	0	6	34	0	0	0	0	2	0	7	64
% Heavy Vehicles	7.6	2.8	0	3.3	8.7	0	0	0	0	0.9	0	3.8	4.8

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**22**	**20**	0	**42**	**25**	52	10	87	0	0	0	0	28	0	21	49	**178**
04:45 PM	19	19	0	38	22	43	10	75	0	0	0	0	31	0	**25**	56	169
05:00 PM	14	18	0	32	25	50	10	85	0	0	0	0	**34**	0	25	**59**	176
05:15 PM	17	12	0	29	25	**55**	**11**	**91**	0	0	0	0	31	0	24	55	175
Total Volume	72	69	0	141	97	200	41	338	0	0	0	0	124	0	95	219	698
% App. Total	51.1	48.9	0		28.7	59.2	12.1		0	0	0		56.6	0	43.4		
PHF	.818	.863	.000	.839	.970	.909	.932	.929	.000	.000	.000	.000	.912	.000	.950	.928	.980
Cars	67	67	0	134	93	180	41	314	0	0	0	0	124	0	92	216	664
% Cars	93.1	97.1	0	95.0	95.9	90.0	100	92.9	0	0	0	0	100	0	96.8	98.6	95.1
Heavy Vehicles	5	2	0	7	4	20	0	24	0	0	0	0	0	0	3	3	34
% Heavy Vehicles	6.9	2.9	0	5.0	4.1	10.0	0	7.1	0	0	0	0	0	0	3.2	1.4	4.9

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City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415DD
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Cars

	Chelsea Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	20	19	0	19	50	5	0	0	0	24	0	16	153
04:15 PM	13	18	0	16	39	4	0	0	0	33	0	21	144
04:30 PM	20	19	0	23	47	10	0	0	0	28	0	20	167
04:45 PM	16	18	0	22	38	10	0	0	0	31	0	25	160
Total	69	74	0	80	174	29	0	0	0	116	0	82	624
05:00 PM	14	18	0	24	43	10	0	0	0	34	0	24	167
05:15 PM	17	12	0	24	52	11	0	0	0	31	0	23	170
05:30 PM	23	13	0	22	38	3	0	0	0	27	0	22	148
05:45 PM	10	20	0	27	52	5	0	0	0	22	0	27	163
Total	64	63	0	97	185	29	0	0	0	114	0	96	648
Grand Total	133	137	0	177	359	58	0	0	0	230	0	178	1272
Apprch %	49.3	50.7	0	29.8	60.4	9.8	0	0	0	56.4	0	43.6	
Total %	10.5	10.8	0	13.9	28.2	4.6	0	0	0	18.1	0	14	

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**20**	**19**	0	**39**	23	47	10	80	0	0	0	0	28	0	20	48	167
04:45 PM	16	18	0	34	22	38	10	70	0	0	0	0	31	0	**25**	56	160
05:00 PM	14	18	0	32	**24**	43	10	77	0	0	0	0	**34**	0	24	**58**	167
05:15 PM	17	12	0	29	24	**52**	**11**	**87**	0	0	0	0	31	0	23	54	**170**
Total Volume	67	67	0	134	93	180	41	314	0	0	0	0	124	0	92	216	664
% App. Total	50	50	0		29.6	57.3	13.1		0	0	0		57.4	0	42.6		
PHF	.838	.882	.000	.859	.969	.865	.932	.902	.000	.000	.000	.000	.912	.000	.920	.931	.976

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Client: Woodland Design/ R. Woodland

File Name : 71415DD
Site Code : 00000000
Start Date : 12/11/2007

Groups Printed- Heavy Vehicles

	Chelsea Street From North			Maverick Street From East			Maverick Square From South			Maverick Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	2	1	0	0	5	0	0	0	0	0	0	1	9
04:15 PM	2	1	0	1	3	0	0	0	0	1	0	1	9
04:30 PM	2	1	0	2	5	0	0	0	0	0	0	1	11
04:45 PM	3	1	0	0	5	0	0	0	0	0	0	0	9
Total	9	4	0	3	18	0	0	0	0	1	0	3	38
05:00 PM	0	0	0	1	7	0	0	0	0	0	0	1	9
05:15 PM	0	0	0	1	3	0	0	0	0	0	0	1	5
05:30 PM	1	0	0	1	3	0	0	0	0	0	0	1	6
05:45 PM	1	0	0	0	3	0	0	0	0	1	0	1	6
Total	2	0	0	3	16	0	0	0	0	1	0	4	26
Grand Total	11	4	0	6	34	0	0	0	0	2	0	7	64
Apprch %	73.3	26.7	0	15	85	0	0	0	0	22.2	0	77.8	
Total %	17.2	6.2	0	9.4	53.1	0	0	0	0	3.1	0	10.9	

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	2	**1**	0	3	0	**5**	0	5	0	0	0	0	0	0	**1**	1	9
04:15 PM	2	1	0	3	1	3	0	4	0	0	0	0	**1**	0	1	**2**	9
04:30 PM	2	1	0	3	**2**	5	0	**7**	0	0	0	0	0	0	1	1	**11**
04:45 PM	**3**	1	0	**4**	0	5	0	5	0	0	0	0	0	0	0	0	9
Total Volume	9	4	0	13	3	18	0	21	0	0	0	0	1	0	3	4	38
% App. Total	69.2	30.8	0		14.3	85.7	0		0	0	0		25	0	75		
PHF	.750	1.000	.000	.813	.375	.900	.000	.750	.000	.000	.000	.000	.250	.000	.750	.500	.864

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File Name : 71415DD
Site Code : 00000000
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Page No : 1

Groups Printed- Peds and Bicycles

	Chelsea Street From North					Maverick Street From East				Maverick Square From South					Maverick Street From West					
Start Time	Right	Thru	Left	Peds from West	Peds from East	Right	Left	Peds from South	Peds from North	Right	Thru	Left	Peds from West	Peds from East	Right	Thru	Left	Peds from North	Peds from South	Int. Total
04:00 PM	0	0	0	28	23	0	0	31	13	0	0	0	12	5	0	0	0	0	0	112
04:15 PM	0	0	0	18	26	0	0	29	17	0	0	0	16	19	0	0	0	0	0	125
04:30 PM	0	0	0	12	17	0	0	37	18	0	0	0	19	5	0	0	0	0	0	108
04:45 PM	1	1	0	9	12	0	0	30	22	0	0	0	11	18	0	0	0	0	0	104
Total	1	1	0	67	78	0	0	127	70	0	0	0	58	47	0	0	0	0	0	449
05:00 PM	0	0	0	8	16	0	0	30	21	0	0	0	12	7	0	0	0	0	0	94
05:15 PM	0	0	0	12	26	0	0	28	21	0	0	0	11	7	0	0	0	0	0	105
05:30 PM	0	0	0	10	23	0	0	37	17	0	0	0	9	14	0	0	0	0	0	110
05:45 PM	0	0	0	15	14	0	0	27	8	0	0	0	7	5	0	0	0	0	0	76
Total	0	0	0	45	79	0	0	122	67	0	0	0	39	33	0	0	0	0	0	385
Grand Total	1	1	0	112	157	0	0	249	137	0	0	0	97	80	0	0	0	0	0	834
Apprch %	0.4	0.4	0	41.3	57.9	0	0	64.5	35.5	0	0	0	54.8	45.2	0	0	0	0	0	
Total %	0.1	0.1	0	13.4	18.8	0	0	29.9	16.4	0	0	0	11.6	9.6	0	0	0	0	0	

	Chelsea Street From North						Maverick Street From East					Maverick Square From South						Maverick Street From West						
Start Time	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Left	Peds from South	Peds from North	App. Total	Right	Thru	Left	Peds from West	Peds from East	App. Total	Right	Thru	Left	Peds from North	Peds from South	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																								
Peak Hour for Entire Intersection Begins at 04:00 PM																								
04:00 PM	0	0	0	**28**	23	**51**	0	0	31	13	44	0	0	0	12	5	17	0	0	0	0	0	0	112
04:15 PM	0	0	0	18	**26**	44	0	0	29	17	46	0	0	0	16	**19**	**35**	0	0	0	0	0	0	**125**
04:30 PM	0	0	0	12	17	29	0	0	**37**	18	**55**	0	0	0	**19**	5	24	0	0	0	0	0	0	108
04:45 PM	**1**	**1**	0	9	12	23	0	0	30	**22**	52	0	0	0	11	18	29	0	0	0	0	0	0	104
Total Volume	1	1	0	67	78	147	0	0	127	70	197	0	0	0	58	47	105	0	0	0	0	0	0	449
% App. Total	0.7	0.7	0	45.6	53.1		0	0	64.5	35.5		0	0	0	55.2	44.8		0	0	0	0	0		
PHF	.250	.250	.000	.598	.750	.721	.000	.000	.858	.795	.895	.000	.000	.000	.763	.618	.750	.000	.000	.000	.000	.000	.000	.898

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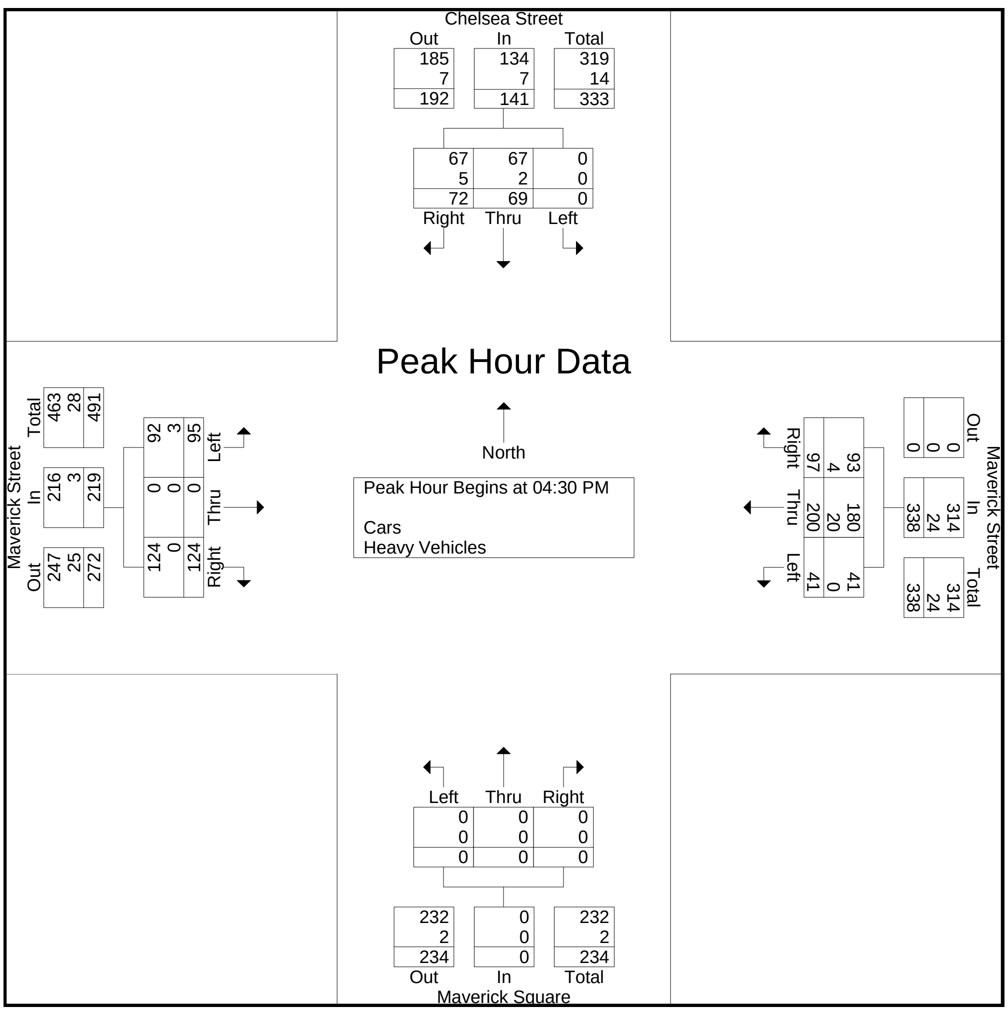
N/S: Chelsea Street/ Maverick Square
E/W: Maverick Street
City, State: East Boston, MA
Client: Woodland Design/ R. Woodland

File Name : 71415DD
Site Code : 00000000
Start Date : 12/11/2007
Page No : 1

	Chelsea Street From North				Maverick Street From East				Maverick Square From South				Maverick Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**22**	**20**	0	**42**	**25**	52	10	87	0	0	0	0	28	0	21	49	**178**
04:45 PM	19	19	0	38	22	43	10	75	0	0	0	0	31	0	**25**	56	169
05:00 PM	14	18	0	32	25	50	10	85	0	0	0	0	**34**	0	25	**59**	176
05:15 PM	17	12	0	29	25	**55**	**11**	**91**	0	0	0	0	31	0	24	55	175
Total Volume	72	69	0	141	97	200	41	338	0	0	0	0	124	0	95	219	698
% App. Total	51.1	48.9	0		28.7	59.2	12.1		0	0	0		56.6	0	43.4		
PHF	.818	.863	.000	.839	.970	.909	.932	.929	.000	.000	.000	.000	.912	.000	.950	.928	.980
Cars	67	67	0	134	93	180	41	314	0	0	0	0	124	0	92	216	664
% Cars	93.1	97.1	0	95.0	95.9	90.0	100	92.9	0	0	0	0	100	0	96.8	98.6	95.1
Heavy Vehicles	5	2	0	7	4	20	0	24	0	0	0	0	0	0	3	3	34
% Heavy Vehicles	6.9	2.9	0	5.0	4.1	10.0	0	7.1	0	0	0	0	0	0	3.2	1.4	4.9



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N: Maverick Square (E)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462C
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Cars - Heavy Vehicles

	Maverick Square (E) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	9	15	0	9	11	0	44
07:15 AM	9	23	0	11	27	0	70
07:30 AM	11	23	0	12	11	0	57
07:45 AM	16	31	0	11	25	0	83
Total	45	92	0	43	74	0	254
08:00 AM	15	36	0	23	24	0	98
08:15 AM	19	33	0	16	17	0	85
08:30 AM	23	38	0	18	24	0	103
08:45 AM	19	39	0	21	24	0	103
Total	76	146	0	78	89	0	389
Grand Total	121	238	0	121	163	0	643
Apprch %	33.7	66.3	0	100	100	0	
Total %	18.8	37	0	18.8	25.3	0	
Cars	108	225	0	112	116	0	561
% Cars	89.3	94.5	0	92.6	71.2	0	87.2
Heavy Vehicles	13	13	0	9	47	0	82
% Heavy Vehicles	10.7	5.5	0	7.4	28.8	0	12.8

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	15	36	51	0	**23**	**23**	**24**	0	**24**	98
08:15 AM	19	33	52	0	16	16	17	0	17	85
08:30 AM	**23**	38	**61**	0	18	18	24	0	24	**103**
08:45 AM	**19**	**39**	58	0	21	21	24	0	24	103
Total Volume	76	146	222	0	78	78	89	0	89	389
% App. Total	34.2	65.8		0	100		100	0		
PHF	.826	.936	.910	.000	.848	.848	.927	.000	.927	.944
Cars	67	140	207	0	71	71	67	0	67	345
% Cars	88.2	95.9	93.2	0	91.0	91.0	75.3	0	75.3	88.7
Heavy Vehicles	9	6	15	0	7	7	22	0	22	44
% Heavy Vehicles	11.8	4.1	6.8	0	9.0	9.0	24.7	0	24.7	11.3

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N: Maverick Square (E)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462C
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Cars

	Maverick Square (E) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	8	15	0	9	4	0	36
07:15 AM	9	21	0	9	21	0	60
07:30 AM	10	21	0	12	7	0	50
07:45 AM	14	28	0	11	17	0	70
Total	41	85	0	41	49	0	216
08:00 AM	13	35	0	19	19	0	86
08:15 AM	17	32	0	15	15	0	79
08:30 AM	20	36	0	17	17	0	90
08:45 AM	17	37	0	20	16	0	90
Total	67	140	0	71	67	0	345
Grand Total	108	225	0	112	116	0	561
Apprch %	32.4	67.6	0	100	100	0	
Total %	19.3	40.1	0	20	20.7	0	

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	13	35	48	0	19	19	**19**	0	**19**	86
08:15 AM	17	32	49	0	15	15	15	0	15	79
08:30 AM	**20**	36	**56**	0	17	17	17	0	17	**90**
08:45 AM	**17**	**37**	54	0	**20**	**20**	16	0	16	90
Total Volume	67	140	207	0	71	71	67	0	67	345
% App. Total	32.4	67.6		0	100		100	0		
PHF	.838	.946	.924	.000	.888	.888	.882	.000	.882	.958

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City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462C
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Heavy Vehicles

	Maverick Square (E) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	1	0	0	0	7	0	8
07:15 AM	0	2	0	2	6	0	10
07:30 AM	1	2	0	0	4	0	7
07:45 AM	2	3	0	0	8	0	13
Total	4	7	0	2	25	0	38
08:00 AM	2	1	0	4	5	0	12
08:15 AM	2	1	0	1	2	0	6
08:30 AM	3	2	0	1	7	0	13
08:45 AM	2	2	0	1	8	0	13
Total	9	6	0	7	22	0	44
Grand Total	13	13	0	9	47	0	82
Apprch %	50	50	0	100	100	0	
Total %	15.9	15.9	0	11	57.3	0	

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	2	**3**	**5**	0	0	0	**8**	0	**8**	**13**
08:00 AM	**2**	**1**	**3**	**0**	**4**	**4**	5	0	5	12
08:15 AM	2	1	3	0	1	1	2	0	2	6
08:30 AM	**3**	2	5	0	1	1	7	0	7	13
Total Volume	9	7	16	0	6	6	22	0	22	44
% App. Total	56.2	43.8		0	100		100	0		
PHF	.750	.583	.800	.000	.375	.375	.688	.000	.688	.846

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E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462C
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Maverick Square (E) From North				Sumner Street From East				Sumner Street From West				
Start Time	Right	Left	Peds EB	Peds WB	Right	Thru	Peds SB	Peds NB	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	1	0	0	40	10	0	0	0	0	51
07:15 AM	0	0	1	0	0	0	66	11	0	0	0	0	78
07:30 AM	0	0	0	0	0	0	58	13	0	0	0	0	71
07:45 AM	0	0	0	0	0	0	36	14	0	0	0	0	50
Total	0	0	1	1	0	0	200	48	0	0	0	0	250
08:00 AM	0	0	0	1	0	1	33	16	0	0	0	0	51
08:15 AM	0	0	0	0	0	0	35	17	0	0	0	0	52
08:30 AM	0	0	2	1	0	0	42	5	0	0	0	0	50
08:45 AM	0	0	2	1	0	0	26	14	0	0	0	0	43
Total	0	0	4	3	0	1	136	52	0	0	0	0	196
Grand Total	0	0	5	4	0	1	336	100	0	0	0	0	446
Apprch %	0	0	55.6	44.4	0	0.2	76.9	22.9	0	0	0	0	
Total %	0	0	1.1	0.9	0	0.2	75.3	22.4	0	0	0	0	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

	Maverick Square (E) From North					Sumner Street From East					Sumner Street From West					
Start Time	Right	Left	Peds EB	Peds WB	App. Total	Right	Thru	Peds SB	Peds NB	App. Total	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
07:00 AM	0	0	0	**1**	**1**	0	0	40	10	50	0	0	0	0	0	51
07:15 AM	0	0	**1**	**0**	**1**	**0**	**0**	**66**	**11**	**77**	0	0	0	0	0	**78**
07:30 AM	0	0	0	0	0	0	0	58	13	71	0	0	0	0	0	71
07:45 AM	0	0	0	0	0	0	0	36	**14**	**50**	**0**	**0**	**0**	**0**	**0**	**50**
Total Volume	**0**	**0**	**1**	**1**	**2**	**0**	**0**	**200**	**48**	**248**	**0**	**0**	**0**	**0**	**0**	**250**
% App. Total	**0**	**0**	**50**	**50**		**0**	**0**	**80.6**	**19.4**		**0**	**0**	**0**	**0**		
PHF	**.000**	**.000**	**.250**	**.250**	**.500**	**.000**	**.000**	**.758**	**.857**	**.805**	**.000**	**.000**	**.000**	**.000**	**.000**	**.801**

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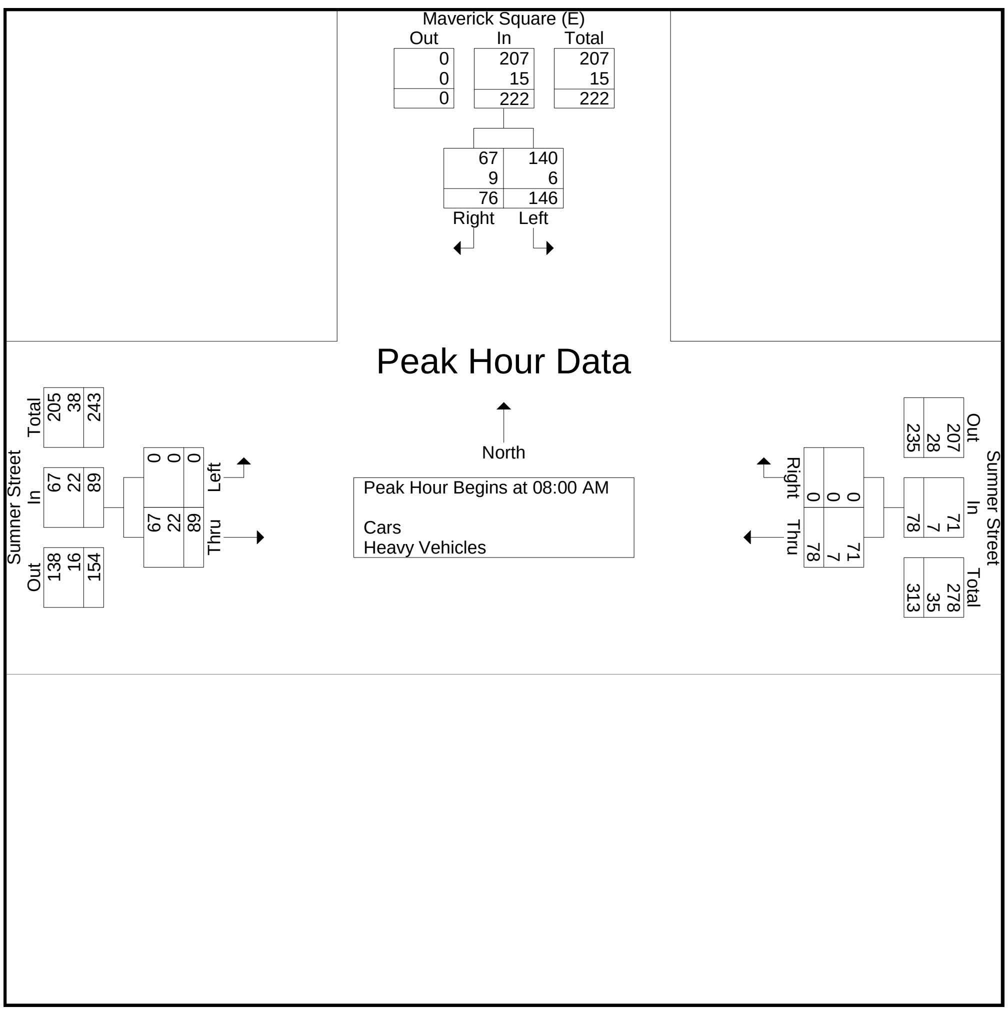
N: Maverick Square (E)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462C
Site Code : 0607212
Start Date : 1/24/2008

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	15	36	51	0	**23**	**23**	**24**	0	**24**	98
08:15 AM	19	33	52	0	16	16	17	0	17	85
08:30 AM	**23**	38	**61**	0	18	18	24	0	24	**103**
08:45 AM	**19**	**39**	58	0	21	21	24	0	24	103
Total Volume	76	146	222	0	78	78	89	0	89	389
% App. Total	34.2	65.8		0	100		100	0		
PHF	.826	.936	.910	.000	.848	.848	.927	.000	.927	.944
Cars	67	140	207	0	71	71	67	0	67	345
% Cars	88.2	95.9	93.2	0	91.0	91.0	75.3	0	75.3	88.7
Heavy Vehicles	9	6	15	0	7	7	22	0	22	44
% Heavy Vehicles	11.8	4.1	6.8	0	9.0	9.0	24.7	0	24.7	11.3



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N: Maverick Square (E)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462CC
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Maverick Square (E) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	21	44	0	15	23	0	103
04:15 PM	17	40	0	23	43	0	123
04:30 PM	25	35	0	20	41	0	121
04:45 PM	27	28	0	14	39	0	108
Total	90	147	0	72	146	0	455
05:00 PM	29	41	0	24	35	0	129
05:15 PM	20	28	0	27	32	0	107
05:30 PM	24	40	0	24	24	0	112
05:45 PM	19	25	0	22	21	0	87
Total	92	134	0	97	112	0	435
Grand Total	182	281	0	169	258	0	890
Apprch %	39.3	60.7	0	100	100	0	
Total %	20.4	31.6	0	19	29	0	
Cars	176	274	0	166	225	0	841
% Cars	96.7	97.5	0	98.2	87.2	0	94.5
Heavy Vehicles	6	7	0	3	33	0	49
% Heavy Vehicles	3.3	2.5	0	1.8	12.8	0	5.5

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	17	40	57	0	23	23	**43**	0	**43**	123
04:30 PM	25	35	60	0	20	20	41	0	41	121
04:45 PM	27	28	55	0	14	14	39	0	39	108
05:00 PM	**29**	**41**	**70**	0	**24**	**24**	35	0	35	**129**
Total Volume	**98**	**144**	**242**	**0**	**81**	**81**	**158**	**0**	**158**	**481**
% App. Total	**40.5**	**59.5**		**0**	**100**		**100**	**0**		
PHF	**.845**	**.878**	**.864**	**.000**	**.844**	**.844**	**.919**	**.000**	**.919**	**.932**
Cars	**96**	**140**	**236**	**0**	**79**	**79**	**142**	**0**	**142**	**457**
% Cars	**98.0**	**97.2**	**97.5**	**0**	**97.5**	**97.5**	**89.9**	**0**	**89.9**	**95.0**
Heavy Vehicles	**2**	**4**	**6**	**0**	**2**	**2**	**16**	**0**	**16**	**24**
% Heavy Vehicles	**2.0**	**2.8**	**2.5**	**0**	**2.5**	**2.5**	**10.1**	**0**	**10.1**	**5.0**

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City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462CC
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Cars

	Maverick Square (E) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	18	43	0	15	22	0	98
04:15 PM	17	40	0	23	37	0	117
04:30 PM	24	33	0	19	36	0	112
04:45 PM	27	27	0	13	35	0	102
Total	86	143	0	70	130	0	429
05:00 PM	28	40	0	24	34	0	126
05:15 PM	20	28	0	26	28	0	102
05:30 PM	23	39	0	24	19	0	105
05:45 PM	19	24	0	22	14	0	79
Total	90	131	0	96	95	0	412
Grand Total	176	274	0	166	225	0	841
Apprch %	39.1	60.9	0	100	100	0	
Total %	20.9	32.6	0	19.7	26.8	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
04:15 PM	17	**40**	57	0	23	23	**37**	0	**37**	117
04:30 PM	24	33	57	0	19	19	36	0	36	112
04:45 PM	27	27	54	0	13	13	35	0	35	102
05:00 PM	**28**	40	**68**	0	**24**	**24**	34	0	34	**126**
Total Volume	**96**	**140**	**236**	**0**	**79**	**79**	**142**	**0**	**142**	**457**
% App. Total	**40.7**	**59.3**		**0**	**100**		**100**	**0**		
PHF	**.857**	**.875**	**.868**	**.000**	**.823**	**.823**	**.959**	**.000**	**.959**	**.907**

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N: Maverick Square (E)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462CC
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Heavy Vehicles

	Maverick Square (E) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	3	1	0	0	1	0	5
04:15 PM	0	0	0	0	6	0	6
04:30 PM	1	2	0	1	5	0	9
04:45 PM	0	1	0	1	4	0	6
Total	4	4	0	2	16	0	26
05:00 PM	1	1	0	0	1	0	3
05:15 PM	0	0	0	1	4	0	5
05:30 PM	1	1	0	0	5	0	7
05:45 PM	0	1	0	0	7	0	8
Total	2	3	0	1	17	0	23
Grand Total	6	7	0	3	33	0	49
Apprch %	46.2	53.8	0	100	100	0	
Total %	12.2	14.3	0	6.1	67.3	0	

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**3**	1	**4**	0	0	0	1	0	1	5
04:15 PM	0	0	0	0	0	0	**6**	0	**6**	6
04:30 PM	1	**2**	3	0	**1**	**1**	5	0	5	**9**
04:45 PM	**0**	**1**	**1**	**0**	**1**	**1**	**4**	**0**	**4**	**6**
Total Volume	**4**	**4**	**8**	**0**	**2**	**2**	**16**	**0**	**16**	**26**
% App. Total	**50**	**50**		**0**	**100**		**100**	**0**		
PHF	**.333**	**.500**	**.500**	**.000**	**.500**	**.500**	**.667**	**.000**	**.667**	**.722**

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N: Maverick Square (E)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462CC
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Maverick Square (E) From North				Sumner Street From East				Sumner Street From West				
Start Time	Right	Left	Peds EB	Peds WB	Right	Thru	Peds SB	Peds NB	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	4	1	0	0	43	68	0	0	0	0	116
04:15 PM	0	0	0	0	0	0	40	97	0	0	0	0	137
04:30 PM	0	0	0	1	0	0	55	61	0	0	0	0	117
04:45 PM	0	0	0	0	0	0	36	22	0	0	0	0	58
Total	0	0	4	2	0	0	174	248	0	0	0	0	428
05:00 PM	0	0	1	1	0	1	52	57	0	0	0	0	112
05:15 PM	0	0	3	1	0	0	42	53	0	0	0	0	99
05:30 PM	0	1	3	2	0	0	42	54	1	0	0	0	103
05:45 PM	0	0	0	0	0	0	16	36	0	0	0	0	52
Total	0	1	7	4	0	1	152	200	1	0	0	0	366
Grand Total	0	1	11	6	0	1	326	448	1	0	0	0	794
Apprch %	0	5.6	61.1	33.3	0	0.1	42.1	57.8	100	0	0	0	
Total %	0	0.1	1.4	0.8	0	0.1	41.1	56.4	0.1	0	0	0	

	Maverick Square (E) From North					Sumner Street From East					Sumner Street From West					
Start Time	Right	Left	Peds EB	Peds WB	App. Total	Right	Thru	Peds SB	Peds NB	App. Total	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:00 PM																
04:00 PM	0	0	**4**	**1**	**5**	0	0	43	68	111	0	0	0	0	0	116
04:15 PM	0	0	0	0	0	0	0	40	**97**	**137**	0	0	0	0	0	**137**
04:30 PM	0	0	0	1	1	0	0	**55**	**61**	**116**	**0**	**0**	**0**	**0**	**0**	**117**
04:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**36**	**22**	**58**	**0**	**0**	**0**	**0**	**0**	**58**
Total Volume	**0**	**0**	**4**	**2**	**6**	**0**	**0**	**174**	**248**	**422**	**0**	**0**	**0**	**0**	**0**	**428**
% App. Total	**0**	**0**	**66.7**	**33.3**		**0**	**0**	**41.2**	**58.8**		**0**	**0**	**0**	**0**		
PHF	**.000**	**.000**	**.250**	**.500**	**.300**	**.000**	**.000**	**.791**	**.639**	**.770**	**.000**	**.000**	**.000**	**.000**	**.000**	**.781**

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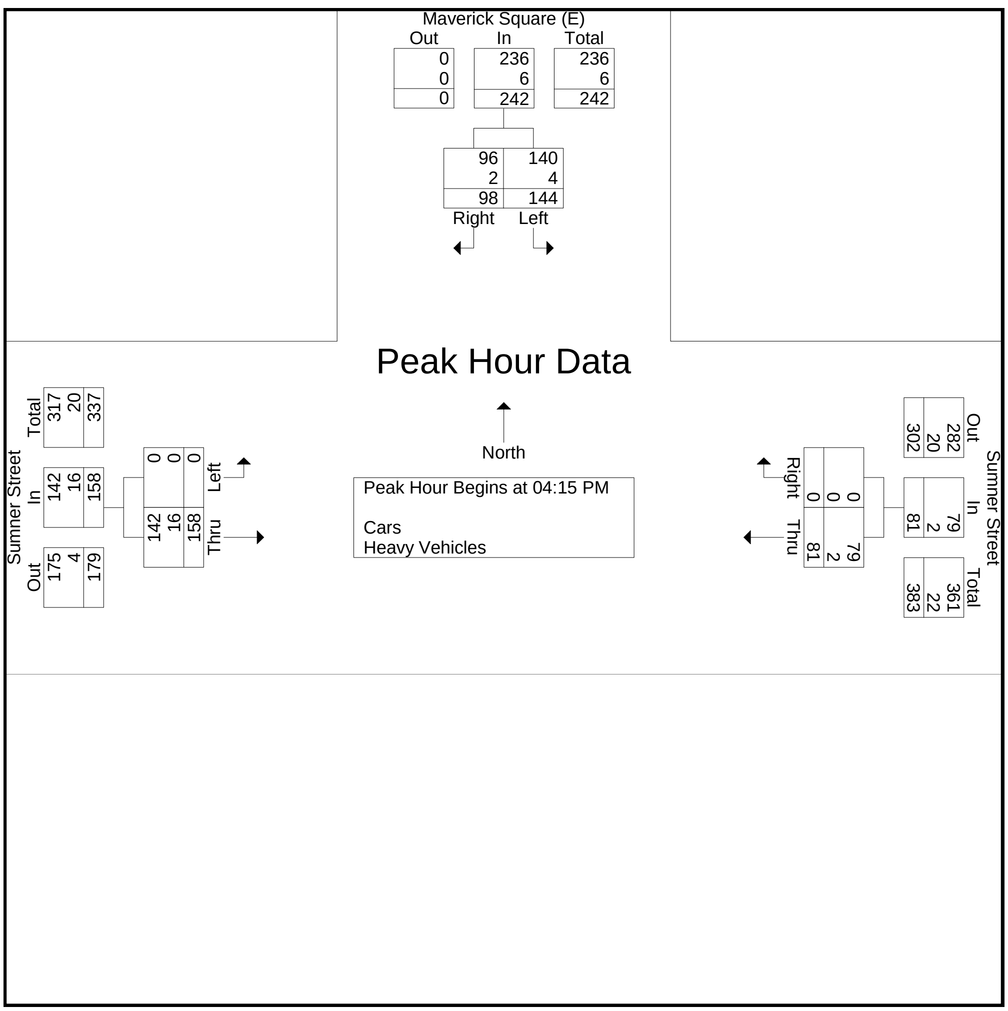
Client: Woodland Design Group/I. Wong

File Name : 81462CC
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

	Maverick Square (E) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	17	40	57	0	23	23	**43**	0	**43**	123
04:30 PM	25	35	60	0	20	20	41	0	41	121
04:45 PM	27	28	55	0	14	14	39	0	39	108
05:00 PM	**29**	**41**	**70**	0	**24**	**24**	35	0	35	**129**
Total Volume	**98**	**144**	**242**	**0**	**81**	**81**	**158**	**0**	**158**	**481**
% App. Total	**40.5**	**59.5**		**0**	**100**		**100**	**0**		
PHF	**.845**	**.878**	**.864**	**.000**	**.844**	**.844**	**.919**	**.000**	**.919**	**.932**
Cars	**96**	**140**	**236**	**0**	**79**	**79**	**142**	**0**	**142**	**457**
% Cars	**98.0**	**97.2**	**97.5**	**0**	**97.5**	**97.5**	**89.9**	**0**	**89.9**	**95.0**
Heavy Vehicles	**2**	**4**	**6**	**0**	**2**	**2**	**16**	**0**	**16**	**24**
% Heavy Vehicles	**2.0**	**2.8**	**2.5**	**0**	**2.5**	**2.5**	**10.1**	**0**	**10.1**	**5.0**



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N: Maverick Square (W)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462D
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Maverick Square (W) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	0	0	7	9	11	8	35
07:15 AM	0	0	18	5	28	9	60
07:30 AM	0	0	18	4	11	13	46
07:45 AM	0	0	19	8	25	16	68
Total	0	0	62	26	75	46	209
08:00 AM	0	0	23	15	25	13	76
08:15 AM	0	0	19	17	16	13	65
08:30 AM	0	0	26	16	24	10	76
08:45 AM	0	0	26	15	24	12	77
Total	0	0	94	63	89	48	294
Grand Total	0	0	156	89	164	94	503
Apprch %	0	0	63.7	36.3	63.6	36.4	
Total %	0	0	31	17.7	32.6	18.7	
Cars	0	0	139	84	117	74	414
% Cars	0	0	89.1	94.4	71.3	78.7	82.3
Heavy Vehicles	0	0	17	5	47	20	89
% Heavy Vehicles	0	0	10.9	5.6	28.7	21.3	17.7

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	23	15	38	**25**	**13**	**38**	76
08:15 AM	0	0	0	19	**17**	36	16	13	29	65
08:30 AM	0	0	0	**26**	16	**42**	24	10	34	76
08:45 AM	0	0	0	26	15	41	24	12	36	**77**
Total Volume	**0**	**0**	**0**	**94**	**63**	**157**	**89**	**48**	**137**	**294**
% App. Total	**0**	**0**		**59.9**	**40.1**		**65**	**35**		
PHF	**.000**	**.000**	**.000**	**.904**	**.926**	**.935**	**.890**	**.923**	**.901**	**.955**
Cars	**0**	**0**	**0**	**83**	**58**	**141**	**67**	**36**	**103**	**244**
% Cars	**0**	**0**	**0**	**88.3**	**92.1**	**89.8**	**75.3**	**75.0**	**75.2**	**83.0**
Heavy Vehicles	**0**	**0**	**0**	**11**	**5**	**16**	**22**	**12**	**34**	**50**
% Heavy Vehicles	**0**	**0**	**0**	**11.7**	**7.9**	**10.2**	**24.7**	**25.0**	**24.8**	**17.0**

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City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462D
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars

	Maverick Square (W) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	0	0	6	9	4	5	24
07:15 AM	0	0	16	5	22	8	51
07:30 AM	0	0	17	4	7	10	38
07:45 AM	0	0	17	8	17	15	57
Total	0	0	56	26	50	38	170
08:00 AM	0	0	19	13	20	10	62
08:15 AM	0	0	16	17	14	11	58
08:30 AM	0	0	23	15	17	5	60
08:45 AM	0	0	25	13	16	10	64
Total	0	0	83	58	67	36	244
Grand Total	0	0	139	84	117	74	414
Apprch %	0	0	62.3	37.7	61.3	38.7	
Total %	0	0	33.6	20.3	28.3	17.9	

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	19	13	32	**20**	10	**30**	62
08:15 AM	0	0	0	16	**17**	33	14	**11**	25	58
08:30 AM	0	0	0	23	15	**38**	17	5	22	60
08:45 AM	0	0	0	**25**	13	38	16	10	26	**64**
Total Volume	**0**	**0**	**0**	**83**	**58**	**141**	**67**	**36**	**103**	**244**
% App. Total	**0**	**0**		**58.9**	**41.1**		**65**	**35**		
PHF	**.000**	**.000**	**.000**	**.830**	**.853**	**.928**	**.838**	**.818**	**.858**	**.953**

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E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462D
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Heavy Vehicles

	Maverick Square (W) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
07:00 AM	0	0	1	0	7	3	11
07:15 AM	0	0	2	0	6	1	9
07:30 AM	0	0	1	0	4	3	8
07:45 AM	0	0	2	0	8	1	11
Total	0	0	6	0	25	8	39
08:00 AM	0	0	4	2	5	3	14
08:15 AM	0	0	3	0	2	2	7
08:30 AM	0	0	3	1	7	5	16
08:45 AM	0	0	1	2	8	2	13
Total	0	0	11	5	22	12	50
Grand Total	0	0	17	5	47	20	89
Apprch %	0	0	77.3	22.7	70.1	29.9	
Total %	0	0	19.1	5.6	52.8	22.5	

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	**4**	**2**	**6**	5	3	8	14
08:15 AM	0	0	0	3	0	3	2	2	4	7
08:30 AM	0	0	0	3	1	4	7	**5**	**12**	**16**
08:45 AM	**0**	**0**	**0**	**1**	**2**	**3**	**8**	2	10	13
Total Volume	0	0	0	11	5	16	22	12	34	50
% App. Total	0	0		68.8	31.2		64.7	35.3		
PHF	.000	.000	.000	.688	.625	.667	.688	.600	.708	.781

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File Name : 81462D
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Maverick Square (W) From North				Sumner Street From East				Sumner Street From West				
Start Time	Right	Left	Peds EB	Peds WB	Right	Thru	Peds SB	Peds NB	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	11	40	51
07:15 AM	0	0	0	0	0	0	0	0	0	0	32	49	81
07:30 AM	0	0	0	0	0	0	0	0	0	0	23	46	69
07:45 AM	0	0	0	0	0	0	0	0	0	0	22	43	65
Total	0	0	0	0	0	0	0	0	0	0	88	178	266
08:00 AM	0	0	0	1	1	0	0	0	0	0	34	58	94
08:15 AM	0	0	0	1	0	0	0	0	0	0	23	52	76
08:30 AM	0	0	2	1	0	0	0	0	0	0	38	45	86
08:45 AM	0	0	2	2	0	0	0	0	0	0	27	41	72
Total	0	0	4	5	1	0	0	0	0	0	122	196	328
Grand Total	0	0	4	5	1	0	0	0	0	0	210	374	594
Apprch %	0	0	44.4	55.6	100	0	0	0	0	0	36	64	
Total %	0	0	0.7	0.8	0.2	0	0	0	0	0	35.4	63	

	Maverick Square (W) From North					Sumner Street From East					Sumner Street From West					
Start Time	Right	Left	Peds EB	Peds WB	App. Total	Right	Thru	Peds SB	Peds NB	App. Total	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 08:00 AM																
08:00 AM	0	0	0	1	1	**1**	0	0	0	**1**	0	0	34	**58**	**92**	**94**
08:15 AM	0	0	0	1	1	0	0	0	0	0	0	0	23	52	75	76
08:30 AM	0	0	**2**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**38**	45	83	86
08:45 AM	0	0	2	**2**	**4**	0	0	0	0	0	0	0	27	41	68	72
Total Volume	0	0	4	5	9	1	0	0	0	1	0	0	122	196	318	328
% App. Total	0	0	44.4	55.6		100	0	0	0		0	0	38.4	61.6		
PHF	.000	.000	.500	.625	.563	.250	.000	.000	.000	.250	.000	.000	.803	.845	.864	.872

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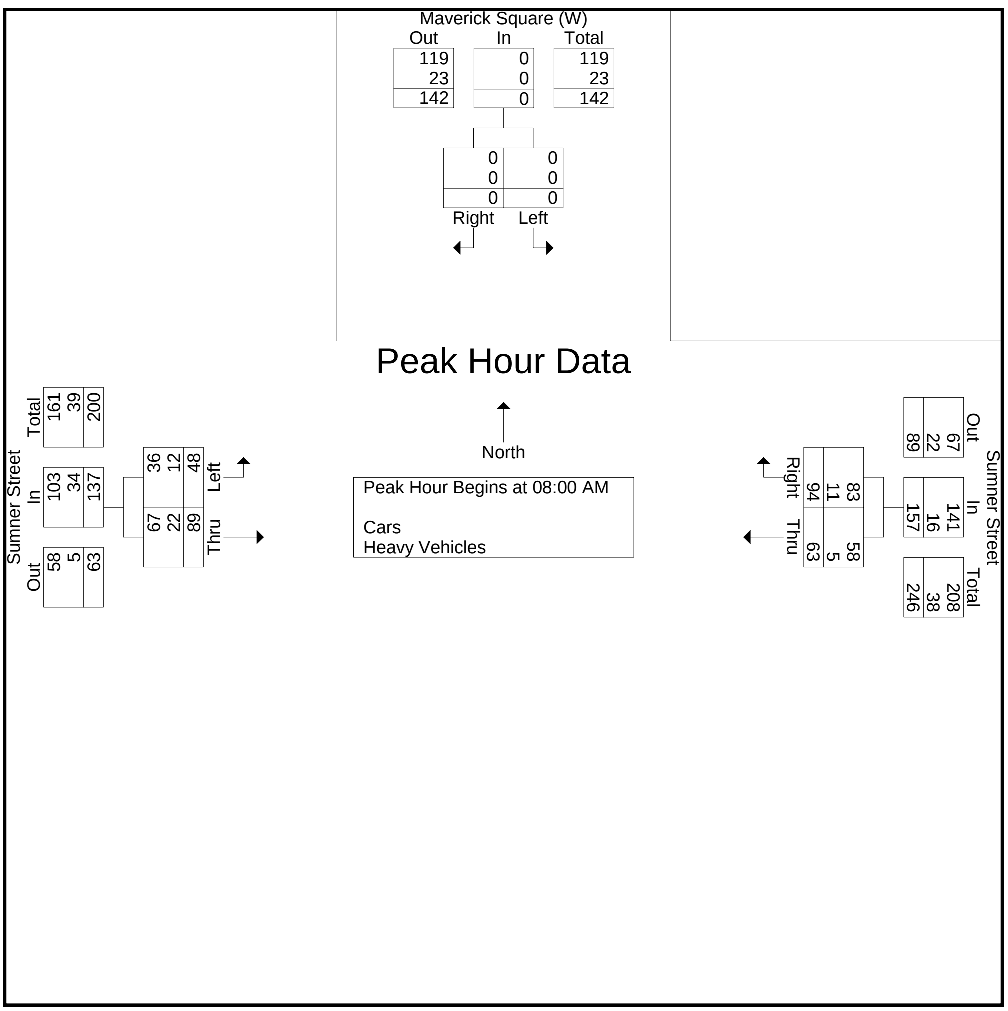
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462D
Site Code : 0607212
Start Date : 1/24/2008

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	23	15	38	**25**	**13**	**38**	76
08:15 AM	0	0	0	19	**17**	36	16	13	29	65
08:30 AM	0	0	0	**26**	16	**42**	24	10	34	76
08:45 AM	0	0	0	26	15	41	24	12	36	**77**
Total Volume	**0**	**0**	**0**	**94**	**63**	**157**	**89**	**48**	**137**	**294**
% App. Total	**0**	**0**		**59.9**	**40.1**		**65**	**35**		
PHF	**.000**	**.000**	**.000**	**.904**	**.926**	**.935**	**.890**	**.923**	**.901**	**.955**
Cars	**0**	**0**	**0**	**83**	**58**	**141**	**67**	**36**	**103**	**244**
% Cars	**0**	**0**	**0**	**88.3**	**92.1**	**89.8**	**75.3**	**75.0**	**75.2**	**83.0**
Heavy Vehicles	**0**	**0**	**0**	**11**	**5**	**16**	**22**	**12**	**34**	**50**
% Heavy Vehicles	**0**	**0**	**0**	**11.7**	**7.9**	**10.2**	**24.7**	**25.0**	**24.8**	**17.0**



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City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462DD
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Maverick Square (W) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	0	17	20	23	18	78
04:15 PM	0	0	21	22	43	21	107
04:30 PM	0	0	30	17	43	19	109
04:45 PM	0	0	27	12	37	10	86
Total	0	0	95	71	146	68	380
05:00 PM	0	0	31	23	36	15	105
05:15 PM	0	0	35	17	31	16	99
05:30 PM	0	0	33	11	24	24	92
05:45 PM	0	0	25	16	21	12	74
Total	0	0	124	67	112	67	370
Grand Total	0	0	219	138	258	135	750
Apprch %	0	0	61.3	38.7	65.6	34.4	
Total %	0	0	29.2	18.4	34.4	18	
Cars	0	0	216	133	225	120	694
% Cars	0	0	98.6	96.4	87.2	88.9	92.5
Heavy Vehicles	0	0	3	5	33	15	56
% Heavy Vehicles	0	0	1.4	3.6	12.8	11.1	7.5

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	21	22	43	**43**	**21**	**64**	107
04:30 PM	0	0	0	30	17	47	43	19	62	**109**
04:45 PM	**0**	**0**	**0**	**27**	**12**	**39**	**37**	**10**	**47**	**86**
05:00 PM	**0**	**0**	**0**	**31**	**23**	**54**	36	15	51	105
Total Volume	0	0	0	109	74	183	159	65	224	407
% App. Total	0	0		59.6	40.4		71	29		
PHF	.000	.000	.000	.879	.804	.847	.924	.774	.875	.933
Cars	0	0	0	107	72	179	142	57	199	378
% Cars	0	0	0	98.2	97.3	97.8	89.3	87.7	88.8	92.9
Heavy Vehicles	0	0	0	2	2	4	17	8	25	29
% Heavy Vehicles	0	0	0	1.8	2.7	2.2	10.7	12.3	11.2	7.1

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

N: Maverick Square (W)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462DD
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Cars

	Maverick Square (W) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	0	17	18	23	16	74
04:15 PM	0	0	21	22	36	17	96
04:30 PM	0	0	29	16	38	18	101
04:45 PM	0	0	26	12	33	8	79
Total	0	0	93	68	130	59	350
05:00 PM	0	0	31	22	35	14	102
05:15 PM	0	0	34	16	27	14	91
05:30 PM	0	0	33	11	19	22	85
05:45 PM	0	0	25	16	14	11	66
Total	0	0	123	65	95	61	344
Grand Total	0	0	216	133	225	120	694
Apprch %	0	0	61.9	38.1	65.2	34.8	
Total %	0	0	31.1	19.2	32.4	17.3	

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	21	**22**	43	36	17	53	96
04:30 PM	0	0	0	29	16	45	**38**	**18**	**56**	101
04:45 PM	0	0	0	26	12	38	33	8	41	79
05:00 PM	0	0	0	**31**	22	**53**	35	14	49	**102**
Total Volume	**0**	**0**	**0**	**107**	**72**	**179**	**142**	**57**	**199**	**378**
% App. Total	**0**	**0**		**59.8**	**40.2**		**71.4**	**28.6**		
PHF	**.000**	**.000**	**.000**	**.863**	**.818**	**.844**	**.934**	**.792**	**.888**	**.926**

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E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462DD
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Heavy Vehicles

	Maverick Square (W) From North		Sumner Street From East		Sumner Street From West		
Start Time	Right	Left	Right	Thru	Thru	Left	Int. Total
04:00 PM	0	0	0	2	0	2	4
04:15 PM	0	0	0	0	7	4	11
04:30 PM	0	0	1	1	5	1	8
04:45 PM	0	0	1	0	4	2	7
Total	0	0	2	3	16	9	30
05:00 PM	0	0	0	1	1	1	3
05:15 PM	0	0	1	1	4	2	8
05:30 PM	0	0	0	0	5	2	7
05:45 PM	0	0	0	0	7	1	8
Total	0	0	1	2	17	6	26
Grand Total	0	0	3	5	33	15	56
Apprch %	0	0	37.5	62.5	68.8	31.2	
Total %	0	0	5.4	8.9	58.9	26.8	

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	**2**	**2**	0	2	2	4
04:15 PM	0	0	0	0	0	0	**7**	**4**	**11**	**11**
04:30 PM	**0**	**0**	**0**	**1**	1	2	5	1	6	8
04:45 PM	0	0	0	1	0	1	4	2	6	7
Total Volume	0	0	0	2	3	5	16	9	25	30
% App. Total	0	0		40	60		64	36		
PHF	.000	.000	.000	.500	.375	.625	.571	.563	.568	.682

PRECISION
DATA
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N: Maverick Square (W)
E/W: Sumner Street
City, State: East Boston, MA
Client: Woodland Design Group/I. Wong

File Name : 81462DD
Site Code : 0607212
Start Date : 1/24/2008

Groups Printed- Peds and Bicycles

	Maverick Square (W) From North				Sumner Street From East				Sumner Street From West				
Start Time	Right	Left	Peds EB	Peds WB	Right	Thru	Peds SB	Peds NB	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	4	1	0	0	0	0	0	0	99	64	168
04:15 PM	0	0	0	2	0	0	0	0	0	0	89	43	134
04:30 PM	0	0	0	1	0	0	0	0	0	0	76	64	141
04:45 PM	0	0	1	0	0	0	0	0	0	0	64	40	105
Total	0	0	5	4	0	0	0	0	0	0	328	211	548
05:00 PM	0	0	0	0	0	1	0	0	0	0	86	52	139
05:15 PM	0	0	2	3	0	0	0	0	0	0	87	59	151
05:30 PM	0	1	2	1	0	0	0	0	0	0	48	42	94
05:45 PM	0	0	0	1	0	0	0	0	0	0	58	21	80
Total	0	1	4	5	0	1	0	0	0	0	279	174	464
Grand Total	0	1	9	9	0	1	0	0	0	0	607	385	1012
Apprch %	0	5.3	47.4	47.4	0	100	0	0	0	0	61.2	38.8	
Total %	0	0.1	0.9	0.9	0	0.1	0	0	0	0	60	38	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	Maverick Square (W) From North					Sumner Street From East					Sumner Street From West					
Start Time	Right	Left	Peds EB	Peds WB	App. Total	Right	Thru	Peds SB	Peds NB	App. Total	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
04:00 PM	0	0	**4**	**1**	**5**	0	0	0	0	0	0	0	**99**	**64**	**163**	**168**
04:15 PM	0	0	0	**2**	2	0	0	0	0	0	0	0	89	43	132	134
04:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	76	64	140	141
04:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	64	40	104	105
Total Volume	0	0	5	4	9	0	0	0	0	0	0	0	328	211	539	548
% App. Total	0	0	55.6	44.4		0	0	0	0		0	0	60.9	39.1		
PHF	.000	.000	.313	.500	.450	.000	.000	.000	.000	.000	.000	.000	.828	.824	.827	.815

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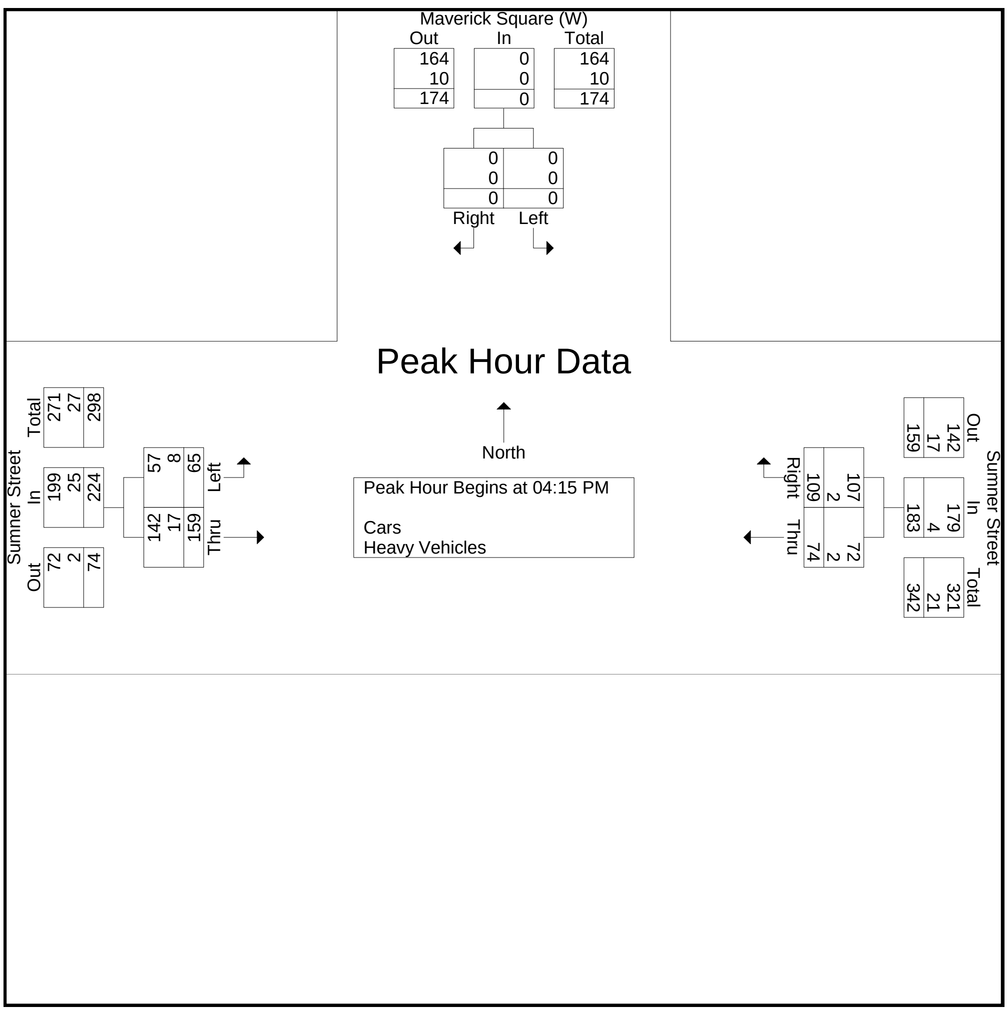
File Name : 81462DD
Site Code : 0607212
Start Date : 1/24/2008
Page No : 1

	Maverick Square (W) From North			Sumner Street From East			Sumner Street From West			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	21	22	43	**43**	**21**	**64**	107
04:30 PM	0	0	0	30	17	47	43	19	62	**109**
04:45 PM	**0**	**0**	**0**	**27**	**12**	**39**	**37**	**10**	**47**	**86**
05:00 PM	**0**	**0**	**0**	**31**	**23**	**54**	36	15	51	105
Total Volume	0	0	0	109	74	183	159	65	224	407
% App. Total	0	0		59.6	40.4		71	29		
PHF	.000	.000	.000	.879	.804	.847	.924	.774	.875	.933
Cars	0	0	0	107	72	179	142	57	199	378
% Cars	0	0	0	98.2	97.3	97.8	89.3	87.7	88.8	92.9
Heavy Vehicles	0	0	0	2	2	4	17	8	25	29
% Heavy Vehicles	0	0	0	1.8	2.7	2.2	10.7	12.3	11.2	7.1



Parking Study
East Boston, MA
Thursday 1/24/2008
11am-1pm

Section	Location					All Available Spaces	All Available HC	Total Marked Spaces	Total Metered Spaces	Total Parked Vehicles	Handicap Vehicles	Additional Notes
1	Liberty Plaza					313	14	317		138	8	
2	Border Street	between	Central Square	and	Lexington Street	56	1			30		2 HR
3	Lexington Street	between	Border Street	and	Meridian Street	12				7		
4	Meridian Street	between	Lexington Street	and	Princeton Street	22	1			12		
5	Meridian Street	between	Princeton Street	and	Saratoga Street	19				21		
6	Princeton Street	between	Meridian Street	and	Marion Street	69	1			34	1	
7	Saratoga Street	between	Meridian Street	and	Marion Street	73	2			45	1	2 HR
8	Bennington Street	between	Parking Lot 9	and	Marion Street	38				29		
Lot 9	Parking Lot	between	Marion Street	and	Central Square	26	2			13	0	2 HR
10	Bennington Street	between	Parking Lot 9	and	Central Square	17				17		
11	London Street	between	Marion Street	and	Porter Street	62	4			37		
12	Porter Street (East Side)	between	Bennington Street	and	London Street	26	2			12		2 HR
13	Porter Street (West Side)	between	Bennington Street	and	London Street	26				13		2 HR
14	Meridian Street (East Side)	between	Saratoga Street	and	Bennington Street	20	2			15		
15	Central Square	between		and		10				10		2 HR
16	Central Square	between		and		12				11		2 HR
17	Central Square	between		and		14				10		2 HR
18	Central Square	between		and		15	3			12		2 HR
19	Central Square	between		and		10				10		2 HR
20	Central Square	between		and		12				7		2 HR
21	Central Square	between		and		5				4		
22	Border Street	between	Central Square	and	Decatur Street	50				30		
23	Border Street	between	Decatur Street	and	Coppersmith Way	32				11		
24	Border Street	between	Coppersmith Way	and	Maverick Street	8				5		
25	Coppersmith Way	between	Border Street	and	Liverpool Street	6				2		Alley Way (No designated parking area)
26	Liverpool Street	between	Maverick Street	and	Coppersmith Way	12				12		
27	Liverpool Street	between	Coppersmith Way	and	Decatur Street	34				19		
28	Decatur Street	between	Border Street	and	Liverpool Street	11				6		
29	Liverpool Street	between	Central Square	and	Decatur Street	41				36		
30	Meridian Street	between	Central Square	and	London Street	28	2			19		
31 lot	Walgreens Lot	between	Meridian Street	and	London Street	40	4			20	0	Walgreens
32	London Street	between	Meridian Street	and	Porter Street	22	2			29		
33	London Street	between	Meridian Street	and	Decatur Street	30				30		
34	Decatur Street	between	London Street	and	Liverpool Street	16				7		Resident Parking Only
35	London Street	between	Decatur Street	and	Maverick Street	44				43		Resident Parking Only
36	Havre Street	between	Maverick Street	and	Decatur Street	53				42		2 HR / Resident
37	Decatur Street	between	London Street	and	Havre Street	18				13		
38	Meridian Street	between	London Street	and	Havre Street	26				18		2 HR
39	Havre Street	between	Gove Street	and	Fast Lane Lot	42				31		Resident Parking Only
40	Havre Street	between	Fast Lane Lot	and	Paris Street	4				3		15 minute only
41	Parking Lot	between	Paris Street	and	Paris Place	32		32		6		Restaurant and Residential Parking
42	Paris Place	between	Paris Street	and	Chelsea Street	10				3		
43	Paris Street	between	Porter Street	and	Gove Street	60	3			46		
44	Gove Street	between	Havre Street	and	Paris Street	6				10		
45	Parking Lot	between	Gove Street	and	Paris Street	17	3			13		
46	Meridian Street	between	Gove Street	and	Paris Street	17				15		
47	Paris Street	between	Emmons Street	and	Gove Street	18				23		
48	Parking Lot	between	Gove Street	and	Paris Court	30		30		25		
49	Gove Street	between	Paris Street	and	Chelsea Street	30				19		Resident Parking Only
50	Chelsea Street	between	Gove Street	and	Paris Place	47	4			25		
51	Chelsea Street	between	Gove Street	and	Emmons Street	23				16		2 HR / Resident
52	Chelsea Street	between	Emmons Street	and	Elbow Street	11				11		
53	Chelsea Street	between	Elbow Street	and	Maverick Street	14	1			11		
54	Emmons Street	between	Gove Street	and	Chelsea Street	29				23		Resident Parking Only
55	Elbow Street	between	Meridian Street	and	Chelsea Street	0				0	0	
56	Meridian Street	between	Maverick Street	and	Paris Street	30	2			25		2 HR / Resident + Police Parking
57	Paris Street	between	Maverick Street	and	Meridian Street	20				18		2 HR / Resident
58	Havre Street	between	Porter Street	and	Marion Street	51	4			33		2 HR / Resident
59	Paris Street	between	Porter Street	and	Marion Street	68	2			45		
60	Porter Street	between	Chelsea Street	and	Paris Street	20				6		2 HR / Resident
60a	Porter Street	between	Havre Street	and	Paris Street	12				1		2 HR / Resident
60b	Parking Lot 4	between	London Street	and	Havre Street	34	2			20		
61	Chelsea Street	between	Porter Street (EB)	and	Porter Street (WB)	8				8		
62	Porte Street (EB)	between	Havre Street	and	Chelsea Street	13				14		
63	Chelsea Street	between	Porter Street (EB)	and	Paris Place	31	5			23		
64	Maverick Street	between	New Street	and	Border Street	7				6		
65	New Street	between	Maverick Street	and	New Street	9				5		
66	New Street	between	Sumner Street	and	New Street	35	1			24		
67	Sumner Street	between	New Street	and	Border Street	14				8		
68	Border Street	between	Maverick Street	and	Sumner Street	40				24		
69	Maverick Street	between	Border Street	and	Liverpool Street	15				11		Resident Parking Only
70	Landing Street	between	Border Street	and	Liverpool Street	16				11		
71	Liverpool Street	between	Maverick Street	and	Sumner Street	37	1			28		
72	Sumner Street	between	Liverpool Street	and	Border Street	16				11		
73	Maverick Street	between	London Street	and	Liverpool Street	16				2		
74	London Street	between	Maverick Street	and	Sumner Street	39				34		Resident Parking Only
75	Sumner Street	between	London Street	and	Liverpool Street	15				14		
76	Maverick Street	between	London Street	and	Havre Street	9	3			5		Resident Parking Only
77	Cunard Way	between	London Street	and	Havre Street	16	1			13		
78	Havre Street	between	Maverick Street	and	Sumner Street	41	1			32		Resident Parking Only
79	Sumner Street	between	Havre Street	and	London Street	16				13		Resident Parking Only
80	Jacobbe Way	between	Sumner Street	and		20		20		14		Resident Parking Only
81	Jacobbe Way	between		and		0				0		
82	Jacobbe Way (Lot)	between	Jacobbe Way	and	Jacobbe Way	15		15		7		Resident Parking Only
83	Jacobbe Way	between	Clipper Ship Lane	and		25				22		
84	Clipper Ship Lane	between	Sumner Street	and	Jacobbe Way	21	1			14		Tenant Parking Only
85a	Parking Lot	between	Clipper Ship Lane	and	Sumner Street	20		20		12		Permit Parking Only
85b	Parking Lot	between	Clipper Ship Lane	and	Sumner Street	14		14		7		Permit Parking Only
86	Sumner Street	between	Paris Street	and	Havre Street	4				13		
87	Paris Street	between	Maverick Street	and	Sumner Street	38				35		2 HR / Resident
88	Maverick Street	between	Paris Street	and	Havre Street	12	1			14		Resident Parking Only
89	Maverick Street	between	Meridian Street	and	Paris Street	12				10		2 HR limit
90	Sumner Street	between	Maverick Square	and	Paris Street	10				12		
91	Maverick Street	between	Chelsea Street	and	Meridian Street	3	3			2	1	
92	Maverick Square	between	Maverick Street	and	Winthrop Street	6				6		
93	Maverick Square NB	between	Maverick Street	and	Henry Street	15	2	15		13		2 HR limit
94	Maverick Square	between	Henry Street	and	Winthrop Street	2				1		No Parking Area
95	Parking Lot	between	Henry Street	and	Winthrop Street	40	4	40		44	2	Photography Lot
96	Winthrop Street	between	Maverick Square	and	Paris Street	14				14		
97	Cab Lot	between	Sumner Street	and	Winthrop Street	25				18		$7.00 Parking Lot
98	Maverick Square NB	between	Winthrop Street	and	Sumner Street	0	0			0		No Parking (Construction)
99	Maverick Square SB	between	Sumner Street	and	Winthrop Street	0	0			0		No Parking (Construction)
100	Maverick Square SB	between	Maverick Street	and	Winthrop Street	15		15		13		2 HR limit
101	Maverick Square SB (East)	between	Maverick Street	and	Winthrop Street	11	1			9		1 HR Parking
102	Henry Street	between	Maverick Square	and	Paris Street	8				6		2 HR / Resident Parking

Source: Woodland Design Group, Inc

Arrival Departure Patterns Boston East Development - East Boston, Massachusetts

	ZONE	Auto	1 Sumner/Callahan	2 Porter Street	3 Route 1A	4 Mass Pike	5 Bennington Street	6 Meridian Street	7 Chelsea Street	8 Local Streets	Total
Beacon Hill	1	1.2	1.2								
Govt. Center, Financial District	2	1.8	1.8								
China Town	3	0.3	0.3								
Back Bay, Fenway	4	1.7	1.7								
LMA, Mission Hill	5	0.6				0.6					
Jamaica Plain	6	0.3				0.3					
East Boston	7	25.3								25.3	
N Dorchester	8	0.8				0.8					
S Dorchester	9	0.4				0.4					
Brighton	10	0.6				0.6					
Charlestown	11	0.7	0.7								
Hyde Park	12	0.1				0.1					
South Boston	13	0.8				0.8					
Mattapan	14	0.3				0.3					
Roxbury	15	1.1				1.1					
Roslindale	16	0.1				0.1					
North of North Beacon, Alston Landing, Harvard Business School	17	0.4				0.4					
Neponset Circle	18	0.2				0.2					
West Roxbury	19	0.2				0.2					
Logan Airport	20	8.1		8.1							
Winhtrop, Revere, Chelsea, Everett, Malden	RBO	29.9			7.4		7	7.6	7.9		
Cambridge, Somerville	RGR	6	6								
Newton, Brookline	RCD	1.6				1.6					
Quincy, Milton, Braintree	RMR	0.8				0.8					
Saugus, Lynn, Salem, Swampscott, Marblehead, Nahant	BNE	3.5							3.5		
Burlington, Woburn, Winchester Stoneham, Wakefiled, Melrose	BNO	1.8							1.8		
Waltham, Watertown, Arlington, Belmont	BNW	1.3				1.3					
Rte 128N, I-95N, I-93N, Rte. 3N	CN	4.9	4.3		0.6						
Rte 2w, Mass Pike West	CW	2.5				2.5					
I-95s, Needham, Franklin,	CSW	1.4				1.4					
Rte 3S, Rte 24S,	CSE	1.3				1.3					
		100	**16**	**8.1**	**8**	**14.8**	**7**	**7.6**	**13.2**	**25.3**	**100**

Source: Woodland Design Group, Inc.based on data from the Boston Transportation Department

Development Review Zones
Outside Boston

RBO
Winthrop, Revere, Chelsea, Everett, Malden, Medford

RGR
Cambridge, Somerville

RCD
Newton, Brookline

RMR
Quincy, Milton, Braintree

BNE
Saugus, Lynn, Salem, Swampscott, Marblehead, Nahant

BNO
Burlington, Woburn, Winchester Stoneham, Wakefield, Melrose

BNW
Waltham, Watertown, Arlington, Belmont

CN
Rte 128N, I-95N, I-93N, Rte. 3N
Rockport, Newburyport, Haverhill and Lowell Commuter Rail Lines
Everything including and Northeast of Dunstable, Tyngsboroughm Westford, Chelmsford, Billerica, Wilmingotn, Reading, Lynnfield, Peabody, Danvers, Beverly

CW
Rte 2W, Mass Pike West
Fitchburg, Worcester Commuter Rail Lines
Everything Southwest of CN
Including and West of Lexington, Lincoln, Weston, Wellesley
Including and North of Natick, Sherborn, Holliston, Hopkinton

CSW
I-95S, Needham, Franklin, Attleboro and Stoughton Commuter Rail Lines
Everything Southeast of CW
Including and South of Needham, Dedham, Westwood, Canton
Including and West of Stoughton, Easton, Raynhma, Taunton

CSE
Rte 3S, Rte. 24S, Middleborough, Plymouth Commuter Rail Lines
Everything East of CSW
Including and South of Randolph, Holbrook, Weymouth, Hingham, Hull

Distribution and Mode Share of Daily Trips by Transportation Zone

Daily Trips

Note that the same number of trips are assumed to begin or end in Zone 7

To/From	Mode Shares			Geographical Distribution of Trips			
ZONE	Auto	Transit	Walk	Total	Auto	Transit	Walk
BeaconH, N End 1	48.2	51.8	0.0	1.3	1.2	5.0	0.0
GOVT. CENT. FIN.D. 2	21.6	78.4	0.0	4.3	1.8	25.8	0.0
CHINATWN, — 3	27.5	72.5	0.0	0.8	0.3	4.7	0.0
BACK BAY, FENWA 4	39.0	61.0	0.0	2.2	1.7	10.2	0.0
LMA, MISSION HILL 5	44.8	55.2	0.0	0.7	0.6	2.8	0.0
JP 6	63.0	37.0	0.0	0.3	0.3	0.7	0.0
7	25.9	4.4	69.7	50.6	25.3	17.1	100.0 EB.
N: DORCHESTER 8	80.1	19.9	0.0	0.5	0.8	0.8	0.0
S.DORCH, MATT. 9	85.3	14.7	0.0	0.2	0.4	0.3	0.0
BRIGHTON 10	76.4	23.6	0.0	0.4	0.6	0.7	0.0
CHARLESTWN 11	78.0	22.0	0.0	0.5	0.7	0.8	0.0
HYDEPARK 12	96.3	3.7	0.0	0.1	0.1	0.0	0.0
13	83.2	16.8	0.0	0.5	0.8	0.6	0.0
14	62.8	37.2	0.0	0.3	0.3	0.7	0.0
15	62.5	37.5	0.0	0.9	1.1	2.5	0.0
16	60.5	39.5	0.0	0.1	0.1	0.2	0.0
17	81.4	18.6	0.0	0.2	0.4	0.3	0.0
18	85.0	15.0	0.0	0.1	0.2	0.2	0.0
19	82.1	17.9	0.0	0.1	0.2	0.2	0.0
LOGAN AIRP. 20	97.9	2.1	0.0	4.2	8.1	0.7	0.0
RBO	88.8	11.2	0.0	17.4	29.9	15.0	0.0
RGR	81.0	19.0	0.0	3.8	6.0	5.6	0.0
RCD	74.4	25.6	0.0	1.1	1.6	2.1	0.0
RMR	90.4	9.6	0.0	0.4	0.8	0.3	0.0
BNE	96.3	3.7	0.0	1.9	3.5	0.5	0.0
BNO	97.9	2.1	0.0	0.9	1.8	0.2	0.0
BNW	89.7	10.3	0.0	0.8	1.3	0.6	0.0
CN	98.8	1.2	0.0	2.6	4.9	0.2	0.0
CW	97.1	2.9	0.0	1.3	2.5	0.3	0.0
CSW	90.6	9.4	0.0	0.8	1.4	0.6	0.0
CSE	93.7	6.3	0.0	0.7	1.3	0.3	0.0
TOTAL	51.6	13.1	35.3	100.0	100.0	100.0	100.0

TRAFFIC PROJECTION MODEL - WEEKDAY AM PEAK HOUR

Boston East Mixed-Use Development - East Boston, Massachusetts

Growth Rate 1.005

#	Intersection	Dir.	Turn	2007/2008 Raw Traffic Counts Wkdy AM	2007 Vols Grown By 0.5 % 2008 Vols Seasnly Adj 3%	2008 Existing Volumes Balanced	Background Growth 5 Years at 0.5% per year	Balanced Background 5 Years at 0.5% per year	Adj Dev Portside at Pier One Wkdy AM	Adj Dev Hodge Boiler Works Wkdy AM	Adj Dev Clippership Wharf Wkdy AM	Adj Dev 6-26 New St Wkdy AM	2013 No-Build Volumes Wkdy AM	PROJECT TRIPS Wkdy AM	2013 Build Volumes Wkdy AM
1	Meridian St/Saratoga St/Central Sq North														
	Meridian St	NB	L	68	68	68	2	2					70	0	70
			T	311	313	313	8	8	3		4		328	0	328
	Meridian St	SB	T	369	371	371	9	9	2		1		383	0	383
			R	22	22	22	1	1				5	28	2	30
	Saratoga St	WB	L	36	36	36	1	1					37	0	37
			T	27	27	27	1	1					28	0	28
			R	20	20	20	1	1					21	0	21
	Central Sq North	EB	L	30	30	30	1	1				9	40	3	43
			R	63	63	63	2	2					65	0	65
2,3	Meridian St/Porter St/Bennington St														
	Meridian St	NB	U	0	0	0	0	0					0	0	0
			T	172	173	173	4	4	3		4		184	0	184
			R	86	86	86	2	2	2	1			91	2	93
			HR	54	54	54	1	1		6			61	0	61
	Meridian St	SB	U	0	0	0	0	0					0	0	0
			L	55	55	55	1	1					56	0	56
			BL	117	118	118	3	3					121	0	121
			T	298	299	299	8	8	2		1		310	0	310
	Bennington St	WB	HL	10	10	10	0	0					10	0	10
			L	73	73	73	2	2	1				76	0	76
			R	53	53	53	1	1					54	0	54
	Porter St	NWB	U	0	0	0	0	0					0	0	0
			HL	80	80	80	2	2					82	0	82
			BR	154	155	155	4	4					159	0	159
			HR	58	58	58	1	1					59	0	59
4	Meridian St/Central Sq South/Liverpool St														
	Liverpool St	NB	L	11	11	11	0	0					11	0	11
			T	27	27	27	1	1		7			35	0	35
			R	6	6	6	0	0					6	0	6
	Meridian St	SB	L	370	372	372	9	9	8		1		390	0	390
			T	19	19	19	0	0					19	0	19
			R	66	66	66	2	2					68	0	68
	Meridian St	WB	L	2	2	2	0	0					2	0	2
			T	64	64	64	2	2					66	0	66
			R	243	244	244	6	6	5		4		259	0	259
	Cemtral Sq South	EB	L	36	36	36	1	1					37	2	39
			T	67	67	67	2	2					69	0	69
			R	19	19	19	0	0					19	0	19
5	Border St/Central Sq North														
	Border St	NB	T	134	135	135	3	3		3	6		147	3	150
			R	45	45	45	1	1				9	55	3	58
	Border St	SB	L	51	51	51	1	1					52	0	52
			T	174	175	175	4	4		1	4		184	2	186
	Central Sq North	WB	L	32	32	32	1	1				5	38	2	40
			R	84	84	84	2	2					86	0	86
6	Border St/Central Sq South/Liberty Plz S Drwy														
	Border St	NB	L	19	19	19	0	0					19	0	19
			T	91	91	91	2	2		3	6	9	111	6	117
			R	27	27	27	1	1					28	2	30
	Border St	SB	L	74	74	74	2	2					76	0	76
			T	83	83	83	2	2		1	4	5	95	4	99
			R	10	10	10	0	0					10	0	10
	Central Sq South	WB	L	22	22	22	1	1					23	0	23
			T	40	40	40	0	0					40	0	40
			R	76	76	76	2	2					78	0	78
	Liberty Plaza South Drwy	EB	L	2	2	2	0	0					2	0	2
			T	20	20	20	0	0					20	0	20
			R	9	9	9	0	0					9	0	9
7	Border St/Decatur St														
	Border St	NB	T	82	82	82	2	2		3	6	9	102	3	105
			R	9	9	9	0	0			3	14	26	1	27
	Border St	SB	L	9	9	9	0	0					9	22	31
			T	62	62	62	2	2		1	4	5	74	4	78
	Decatur St	WB	L	3	3	3	0	0					3	5	8
			R	21	21	21	1	1					22	3	25
8	Border St/Maverick St														
	Border St	SB	T	39	39	39	1	1		1	4		45	2	47
			R	17	17	17	0	0				5	22	0	22
	Maverick St	WB	L	12	12	12	0	0					12	0	12
			T	18	18	18	0	0				17	35	0	35
			R	58	58	58	1	1		3			62	8	70
	Maverick St	EB	L	32	32	32	1	1			9	23	65	0	65
			R	1	1	1	0	0					1	0	1
9	Sumner St/Grady Ct														
	Grady Ct	SB	L	42	42	42	1	1		1	4		48	2	50
			R	4	4	4	0	0					4	0	4
	Sumner St	WB	T	31	31	31	1	1			9		41	0	41
	Sumner St	EB	T	18	18	18	0	0				13	31	0	31
10	Meridian St/London St														
	Meridian St	NB	L	3	3	3	0	0					3	0	3
			T	301	310	310	8	8	5		4		327	0	327
			R	102	105	105	3	3	9		9		126	0	126
	Meridian St	SB	L	9	9	9	0	0					9	0	9
			T	397	409	409	10	10	8				427	0	427
			R	41	42	42	1	1			1		44	0	44
	London St	WB	L	84	87	87	2	2	16				105	0	105
			T	48	49	49	1	1		2	3	8	63	8	71
			R	4	4	4	0	0					4	0	4
	London St	EB	L	3	3	3	0	0					3	0	3
			T	3	3	3	0	0				14	17	5	22
			R	6	6	6	0	0					6	0	6

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TRAFFIC PROJECTION MODEL - WEEKDAY AM PEAK HOUR

Boston East Mixed-Use Development - East Boston, Massachusetts

Growth Rate
1.005

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11 Meridian St/Havre St/Decatur St/Gove St														
Meridian St	NB	BL	15	15	15	0	0					15	0	15
		T	239	240	240	6	6	14				260	0	260
		R	56	56	56	1	1			6		63	0	63
		HR	7	7	7	0	0					7	0	7
Meridian St	SB	L	147	148	148	4	4					152	0	152
		BL	43	43	43	1	1					44	0	44
		T	276	277	277	7	7	24				308	0	308
		HR	9	9	9	0	0					9	0	9
Gove St	NWB	HL	13	13	13	0	0					13	0	13
		T	2	2	2	0	0					2	0	2
		BR	75	75	75	2	2					77	0	77
		HR	54	54	54	1	1	24				79	0	79
Havre St	EB	L	14	14	14	0	0					14	0	14
		BL	56	56	56	1	1			13		70	0	70
		T	42	42	42	1	1		6	8	13	70	0	70
		BR	0	0	0	0	0					0	0	0
		R	8	8	8	0	0					8	0	8
Decatur St	SEB	HL	3	3	3	0	0					3	0	3
		BL	19	19	19	0	0					19	11	30
		T	0	0	0	0	0					0	7	7
		BR	14	14	14	0	0					14	0	14
12 Meridian St/Paris St/Emmons St														
Meridian St	NB	HL	0	0	0	0	0					0	0	0
		T	293	302	302	8	8	14		6		330	0	330
		HR	7	7	7	0	0					7	0	7
Meridian St	SB	BL	15	15	15	0	0					15	0	15
		T	139	143	143	4	4	6				153	0	153
		BR	139	143	143	4	4	18				165	0	165
Paris St	WB	L	43	44	44	1	1					45	0	45
		BL	12	12	12	0	0					12	0	12
		T	24	25	25	1	1		2	2	9	39	3	42
		HR	61	63	63	2	2					65	0	65
13 Maverick St/Meridian St/Maverick Square W														
Maverick Square W	NB	L	11	11	11	0	0					11	0	11
		T	119	120	120	3	3	7		3		133	0	133
		R	37	37	37	1	1		2	2		42	0	42
Meridian St	SB	L	110	111	123	3	3	6				132	0	132
		R	10	10	10	0	0					10	0	10
Maverick St	WB	T	95	95	96	2	3					99	5	104
		R	206	207	207	5	5	7		3		222	0	222
14 MaverickSt/Chelsea St/Maverick Square E														
Chelsea St	SB	T	79	79	79	2	2	5	1	1		88	0	88
		R	61	61	61	2	2					63	3	66
MaverickSt	WB	L	26	26	26	1	1		1			28	0	28
		T	241	242	242	6	6	7		3		258	2	260
		R	35	35	35	1	1	15		2		53	0	53
MaverickSt	EB	L	37	37	37	1	1		2	2		42	0	42
		R	113	114	123	3	3	6				132	0	132
15 Sumner St/Maverick Square E														
Maverick Square E	SB	L	146	150	150	4	4	11		1		166	0	166
		R	76	78	78	2	2		2			82	0	82
Sumner St	WB	T	78	80	84	2	2	9	1	3		99	0	99
Sumner St	EB	T	89	92	92	2	2	20	4			118	2	120
16 Sumner St/Maverick Square W														
Sumner St	WB	T	63	65	65	2	2	2	3			72	0	72
		R	94	97	97	2	2	7		3		109	0	109
Sumner St	EB	L	48	49	49	1	1		2	2		54	0	54
		T	89	92	92	2	2	20	4			118	2	120
17 Border St/Residential Drwy														
Border St	NB	L	0	0	0	*0*	*0*					0	6	6
		T	103	104	103	3	3		3	6	9	124	0	124
Border St	SB	T	71	71	71	2	2		1	4	5	83	2	85
		R	0	0	0	*0*	*0*					0	2	2
Residential Drwy	EB	L	0	0	0	*0*	*0*					0	8	8
		R	0	0	0	*0*	*0*					0	24	24
18 Border St/Industrial Drwy														
Border St	NB	L	0	0	0	*0*	*0*					0	5	5
		T	91	91	91	2	2		3	9	23	128	3	131
Border St	SB	T	65	65	65	2	2		1	4	5	77	2	79
		R	0	0	0	*0*	*0*					0	7	7
Industrial Drwy	EB	L	0	0	0	*0*	*0*					0	1	1
		R	0	0	0	*0*	*0*					0	0	0

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1	Meridian St/Saratoga St/Central Sq North														
	Meridian St	NB	L	114	115	115	3	3					118	0	118
			T	445	447	447	11	11	3		3		464	0	464
	Meridian St	SB	T	301	303	303	8	8	11		6		328	0	328
			R	36	36	36	1	1				12	49	1	50
	Saratoga St	WB	L	39	39	39	1	1					40	0	40
			T	50	50	50	1	1					51	1	52
			R	43	43	43	1	1					44	0	44
	Central Sq North	EB	L	77	77	77	2	2				7	86	3	89
			R	100	101	101	3	3					104	0	104
2,3	Meridian St/Porter St/Bennington St														
	Meridian St	NB	U	0	0	0	0	0					0	0	0
			T	325	327	327	8	8	3		3		341	0	341
			R	201	202	202	5	5	2	1			210	2	212
			HR	49	49	49	1	1		4			54	0	54
	Meridian St	SB	U	0	0	0	0	0					0	0	0
			L	103	104	104	3	3					107	0	107
			BL	64	64	64	2	2					66	0	66
			T	279	280	280	7	7	11		6		304	0	304
	Bennington St	WB	HL	10	10	10	0	0					10	0	10
			L	101	102	102	3	3	8	1			114	0	114
			R	85	85	85	2	2					87	0	87
	Porter St	NWB	U	0	0	0	0	0					0	0	0
			HL	79	79	79	2	2					81	0	81
			BR	154	155	155	4	4					159	0	159
			HR	67	67	67	2	2					69	0	69
4	Meridian St/Central Sq South/Liverpool St														
	Liverpool St	NB	L	31	31	31	1	1					32	0	32
			T	29	29	29	1	1		5			35	0	35
			R	8	8	8	0	0					8	0	8
	Meridian St	SB	L	391	393	393	10	10	19	1	6		429	0	429
			T	7	7	7	0	0					7	0	7
			R	88	88	88	2	2					90	0	90
	Meridian St	WB	L	2	2	2	0	0					2	0	2
			T	149	150	150	4	4					154	0	154
			R	441	443	443	11	11	5		3		462	0	462
	Cemtral Sq South	EB	L	92	92	92	2	2					94	2	96
			T	132	133	133	3	3					136	0	136
			R	17	17	17	0	0					17	0	17
5	Border St/Central Sq North														
	Border St	NB	T	234	235	235	6	6		2	6		249	2	251
			R	36	36	36	1	1				7	44	3	47
	Border St	SB	L	121	122	122	3	3					125	0	125
			T	205	206	206	5	5		3	11		225	2	227
	Central Sq North	WB	L	30	30	30	1	1				12	43	2	45
			R	185	186	186	5	5					191	0	191
6	Border St/Central Sq South/Liberty Plz S Drwy														
	Border St	NB	L	29	29	29	0	0					29	0	29
			T	83	83	83	2	2		2	6	7	100	5	105
			R	38	38	38	1	1					39	2	41
	Border St	SB	L	126	127	127	3	3					130	0	130
			T	89	89	89	2	2		3	11	12	117	4	121
			R	18	18	18	0	0					18	0	18
	Central Sq South	WB	L	19	19	19	0	0					19	0	19
			T	98	98	98	0	0					98	0	98
			R	168	169	169	4	4					173	0	173
	Liberty Plaza South Drwy	EB	L	12	12	12	0	0					12	0	12
			T	54	54	54	0	0					54	0	54
			R	23	23	23	0	0					23	0	23
7	Border St/Decatur St														
	Border St	NB	T	129	130	130	3	3		2	6	7	148	13	161
			R	10	10	10	0	0			2	12	24	10	34
	Border St	SB	L	32	32	32	1	1					33	11	44
			T	94	94	94	2	2		3	11	12	122	1	123
	Decatur St	WB	L	5	5	5	0	0			5		10	1	11
			R	35	35	35	1	1					36	9	45
8	Border St/Maverick St														
	Border St	SB	T	90	90	90	2	2		3	16		111	2	113
			R	17	17	17	0	0				12	29	0	29
	Maverick St	WB	L	15	15	15	0	0					15	0	15
			T	10	10	10	0	0				37	47	0	47
			R	82	82	82	2	2		2			86	10	96
	Maverick St	EB	L	52	52	52	1	1			8	19	80	0	80
			R	1	1	1	0	0					1	0	1
9	Sumner St/Grady Ct														
	Grady Ct	SB	L	94	94	94	2	2		3	16		115	2	117
			R	6	6	6	0	0					6	0	6
	Sumner St	WB	T	40	40	40	1	1			8		49	0	49
	Sumner St	EB	T	23	23	23	1	1				11	35	0	35
10	Meridian St/London St														
	Meridian St	NB	L	9	9	9	0	0					9	0	9
			T	489	504	504	13	13	5		3		525	0	525
			R	85	88	88	2	2	8		7		105	0	105
	Meridian St	SB	L	7	7	7	0	0					7	0	7
			T	390	402	402	10	10	19				431	0	431
			R	23	24	24	1	1		1	6		32	0	32
	London St	WB	L	95	98	98	2	2	36				136	0	136
			T	22	23	23	1	1		8	11	17	60	10	70
			R	21	22	22	1	1					23	0	23
	London St	EB	L	7	7	7	0	0					7	0	7
			T	13	13	13	0	0				12	25	5	30
			R	5	5	5	0	0					5	0	5

Source: Woodland Design Group, Inc.

TRAFFIC PROJECTION MODEL - WEEKDAY PM PEAK HOUR

Boston East Mixed-Use Development - East Boston, Massachusetts

Growth Rate
1.005

Intersection	Dir.	Turn	2007/2008 Raw Traffic Counts Wkdy PM	2007 Vols Grown By 0.5 % 2008 Vols Seasnly Adj 3%	2008 Existing Volumes Balanced	Background Growth 5 Years at 0.5% per year	Balanced Background 5 Years at 0.5% per year	Adj Dev Portside at Pier One Wkdy PM	Adj Dev Hodge Boiler Works Wkdy PM	Adj Dev Clippership Wharf Wkdy PM	Adj Dev 6-26 New St Wkdy PM	2013 No-Build Volumes Wkdy PM	PROJECT TRIPS Wkdy PM	2013 Build Volumes Wkdy PM
11 Meridian St/Havre St/Decatur St/Gove St														
Meridian St	NB	BL	11	11	11	0	0					11	0	11
		T	339	341	341	9	9	13				363	0	363
		R	57	57	57	1	1			5		63	0	63
		HR	10	10	10	0	0					10	0	10
Meridian St	SB	L	146	147	147	4	4					151	0	151
		BL	33	33	33	1	1					34	0	34
		T	274	275	275	7	7	55				337	0	337
		HR	17	17	17	0	0					17	0	17
Gove St	NWB	HL	7	7	7	0	0					7	0	7
		T	10	10	10	0	0					10	0	10
		BR	121	122	122	3	3					125	0	125
		HR	38	38	38	1	1	27				66	0	66
Havre St	EB	L	6	6	6	0	0					6	0	6
		BL	68	68	68	2	2			10		80	0	80
		T	29	29	29	1	1		7	7	11	55	0	55
		BR	2	2	2	0	0					2	0	2
		R	3	3	3	0	0					3	0	3
Decatur St	SEB	HL	12	12	12	0	0					12	0	12
		BL	30	30	30	1	1					31	10	41
		T	1	1	1	0	0					1	6	7
		BR	20	20	20	1	1					21	0	21
12 Meridian St/Paris St/Emmons St														
Meridian St	NB	HL	9	9	9	0	0					9	0	9
		T	356	367	367	9	9	13		5		394	0	394
		HR	7	7	7	0	0					7	0	7
Meridian St	SB	BL	13	13	13	0	0					13	0	13
		T	162	167	167	4	4	10				181	0	181
		BR	117	121	121	3	3	45				169	0	169
Paris St	WB	L	11	11	11	0	0					11	0	11
		BL	11	11	11	0	0					11	0	11
		T	20	21	21	1	1		8	8	20	58	4	62
		HR	59	61	61	2	2					63	0	63
13 Maverick St/Meridian St/Maverick Square W														
Maverick Square W	NB	L	19	19	19	0	0					19	0	19
		T	145	146	146	4	4	6		2		158	0	158
		R	78	78	78	2	2		2	2		84	0	84
Meridian St	SB	L	142	143	147	4	4	10				161	0	161
		R	22	22	22	1	1					23	0	23
Maverick St	WB	T	74	74	74	2	2					76	6	82
		R	204	205	205	5	5	7		3		220	0	220
14 MaverickSt/Chelsea St/Maverick Square E														
Chelsea St	SB	T	69	69	69	2	2	10	3	5		89	0	89
		R	72	72	72	2	2					74	3	77
MaverickSt	WB	L	41	41	41	1	1		3			45	0	45
		T	200	201	207	5	5	7		3		222	3	225
		R	97	97	97	2	2	10		2		111	0	111
MaverickSt	EB	L	95	95	95	2	3		2	2		102	0	102
		R	124	125	130	3	3	10				143	0	143
15 Sumner St/Maverick Square E														
Maverick Square E	SB	L	132	136	136	3	3	20		5		164	0	164
		R	101	104	104	3	3		6			113	0	113
Sumner St	WB	T	85	88	94	2	2	8	1	2		107	0	107
Sumner St	EB	T	147	151	151	4	4	47	3			205	2	207
16 Sumner St/Maverick Square W														
Sumner St	WB	T	123	127	127	3	3	2	7			139	0	139
		R	69	71	71	2	2	6		2		81	0	81
Sumner St	EB	L	60	62	62	2	2		2	2		68	0	68
		T	147	151	151	4	4	47	3			205	2	207
17 Border St/Residential Drwy														
Border St	NB	L	0	0	0	*0*	*0*					0	19	19
		T	164	165	165	4	4		2	6	7	184	3	187
Border St	SB	T	126	127	126	3	3		3	11	12	155	0	155
		R	0	0	0	*0*	*0*					0	4	4
Residential Drwy	EB	L	0	0	0	*0*	*0*					0	4	4
		R	0	0	0	*0*	*0*					0	12	12
18 Border St/Industrial Drwy														
Border St	NB	L	0	0	0	*0*	*0*					0	0	0
		T	139	140	140	4	3		2	8	19	172	10	182
Border St	SB	T	99	99	99	2	2		3	16	12	132	1	133
		R	0	0	0	*0*	*0*					0	1	1
Industrial Drwy	EB	L	0	0	0	*0*	*0*					0	13	13
		R	0	0	0	*0*	*0*					0	1	1

Source: Woodland Design Group, Inc.

TRAFFIC PROJECTION MODEL - RESIDENTIAL PROJECT TRIP DISTRIBUTION

Boston East Mixed-Use Development - East Boston, Massachusetts

Intersection	Dir.	Turn	New Project PERCENT ENTER	ENTER VOL 8 New Project Trips ENTER	New Project Trips ENTER	New Project PERCENT EXIT	EXIT VOL 32 New Project Trips EXIT	New Project Trips EXIT	New Project Trips TOTAL	Pass-By Project Trips TOTAL	TOTAL PROJECT TRIPS Wkdy AM	New Project PERCENT ENTER	ENTER VOL 23 New Project Trips ENTER	New Project Trips ENTER	New Project PERCENT EXIT	EXIT VOL 16 New Project Trips EXIT	New Project Trips EXIT	New Project Trips TOTAL	TOTAL PROJECT TRIPS Wkdy PM
1 Meridian St/Saratoga St/Central Sq North																			
Meridian St	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
Meridian St	SB	T		0			0		0		0		0			0		0	0
		R	7%	1	1		0		1		1	7%	2	1		0		1	1
Saratoga St	WB	L		0			0		0		0		0			0		0	0
		T	3%	0			0		0		0	3%	1	1		0		1	1
		R		0			0		0		0		0			0		0	0
Central Sq North	EB	L		0		10%	3	3	3		3		0		10%	2	2	2	2
		R		0			0		0		0		0			0		0	0
2,3 Meridian St/Porter St/Bennington St																			
Meridian St	NB	U		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0		7%	2	2	2		2		0		7%	1	1	1	1
		HR		0			0		0		0		0			0		0	0
Meridian St	SB	U		0			0		0		0		0			0		0	0
		L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
Bennington St	WB	HL		0			0		0		0		0			0		0	0
		L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Porter St	NWB	U		0			0		0		0		0			0		0	0
		HL		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
4 Meridian St/Central Sq South/Liverpool St																			
Liverpool St	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	WB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Cemtral Sq South	EB	L		0		7%	2	2	2		2		0		7%	1	1	1	1
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
5 Border St/Central Sq North																			
Border St	NB	T		0		8%	3	3	3		3		0		8%	1	1	1	1
		R		0		10%	3	3	3		3		0		10%	2	2	2	2
Border St	SB	L		0			0		0		0		0			0		0	0
		T	8%	1	1		0		1		1	8%	2	2		0		2	2
Central Sq North	WB	L	10%	1	1		0		1		1	10%	2	2		0		2	2
		R		0			0		0		0		0			0		0	0
6 Border St/Central Sq South/Liberty Plz S Drwy																			
Border St	NB	L		0			0		0		0		0			0		0	0
		T		0		18%	6	6	6		6		0		18%	3	3	3	3
		R		0		7%	2	2	2		2		0		7%	1	1	1	1
Border St	SB	L		0			0		0		0		0			0		0	0
		T	18%	1	2		0		2		2	18%	4	4		0		4	4
		R		0			0		0		0		0			0		0	0
Central Sq South	WB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Liberty Plaza South Drwy	EB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
7 Border St/Decatur St																			
Border St	NB	T	42%	3	3		0		3		3	42%	10	10		0		10	10
		R		0			0		0		0		0			0		0	0
Border St	SB	L		0		70%	22	22	22		22		0		70%	11	11	11	11
		T		0		5%	2	2	2		2		0		5%	1	1	1	1
Decatur St	WB	L		0			0		0		0		0			0		0	0
		R	40%	3	3		0		3		3	40%	9	9		0		9	9
8 Border St/Maverick St																			
Border St	SB	T		0		5%	2	2	2		2		0		5%	1	1	1	1
		R		0			0		0		0		0			0		0	0
Maverick St	WB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R	42%	3	3		0		3		3	42%	10	10		0		10	10
Maverick St	EB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
9 Sumner St/Grady Ct																			
Grady Ct	SB	L		0		5%	2	2	2		2		0		5%	1	1	1	1
		R		0			0		0		0		0			0		0	0
Sumner St	WB	T		0			0		0		0		0			0		0	0
Sumner St	EB	T		0			0		0		0		0			0		0	0
10 Meridian St/London St																			
Meridian St	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
London St	WB	L		0			0		0		0		0			0		0	0
		T	40%	3	3		0		3		3	40%	9	9		0		9	9
		R		0			0		0		0		0			0		0	0
London St	EB	L		0			0		0		0		0			0		0	0
		T		0		16%	5	5	5		5		0		16%	3	3	3	3
		R		0			0		0		0		0			0		0	0

Source: Woodland Design Group, Inc.

TRAFFIC PROJECTION MODEL - RESIDENTIAL PROJECT TRIP DISTRIBUTION

Boston East Mixed-Use Development - East Boston, Massachusetts

Intersection	Dir.	Turn	New Project PERCENT ENTER	New Project Trips ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips EXIT	New Project Trips TOTAL	Pass-By Project Trips TOTAL	TOTAL PROJECT TRIPS Wkdy AM	New Project PERCENT ENTER	New Project Trips ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips EXIT	New Project Trips TOTAL	TOTAL PROJECT TRIPS Wkdy PM
				ENTER VOL 8			EXIT VOL 32						ENTER VOL 23			EXIT VOL 16			
11 Meridian St/Havre St/Decatur St/Gove St																			
Meridian St	NB	BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Gove St	NWB	HL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Havre St	EB	L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Decatur St	SEB	HL		0			0		0		0		0			0		0	0
		BL		0		33%	11	10	10		10		0		33%	5	5	5	5
		T		0		21%	7	7	7		7		0		21%	3	3	3	3
		BR		0			0		0		0		0			0		0	0
12 Meridian St/Paris St/Emmons St																			
Meridian St	NB	HL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Meridian St	SB	BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
Paris St	WB	L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T	16%	1	1		0		1		1	16%	4	4		0		4	4
		HR		0			0		0		0		0			0		0	0
13 Maverick St/Meridian St/Maverick Square W																			
Maverick Square W	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Maverick St	WB	T	26%	2	2		0		2		2	26%	6	6		0		6	6
		R		0			0		0		0		0			0		0	0
14 MaverickSt/Chelsea St/Maverick Square																			
Chelsea St	SB	T		0			0		0		0		0			0		0	0
		R	13%	1	1		0		1		1	13%	3	3		0		3	3
MaverickSt	WB	L		0			0		0		0		0			0		0	0
		T	13%	1	1		0		1		1	13%	3	3		0		3	3
		R		0			0		0		0		0			0		0	0
MaverickSt	EB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
15 Sumner St/Maverick Square E																			
Maverick Square E	SB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Sumner St	WB	T		0			0		0		0		0			0		0	0
Sumner St	EB	T		0		5%	2	2	2		2		0		5%	1	1	1	1
16 Sumner St/Maverick Square W																			
Sumner St	WB	T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Sumner St	EB	L		0			0		0		0		0			0		0	0
		T		0		5%	2	2	2		2		0		5%	1	1	1	1
17 Border St/Residential Drwy																			
Border St	NB	L	82%	7	6		0		6		6	82%	19	19		0		19	19
		T		0			0		0		0		0			0		0	0
Border St	SB	T		0			0		0		0		0			0		0	0
		R	18%	1	2		0		2		2	18%	4	4		0		4	4
Residential Drwy	EB	L		0		25%	8	8	8		8		0		25%	4	4	4	4
		R		0		75%	24	24	24		24		0		75%	12	12	12	12
18 Border St/Industrial Drwy																			
Border St	NB	L		0			0		0		0		0			0		0	0
		T	42%	3	3		0		3		3	42%	10	10		0		10	10
Border St	SB	T		0		5%	2	2	2		2		0		5%	1	1	1	1
		R		0			0		0		0		0			0		0	0
Industrial Drwy	EB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0

Source: Woodland Design Group, Inc.

TRAFFIC PROJECTION MODEL - INDUSTRIAL PROJECT TRIP DISTRIBUTION

Boston East Mixed-Use Development - East Boston, Massachusetts

				ENTER VOL 12			EXIT VOL 1						ENTER VOL 1			EXIT VOL 14			
Intersection	Dir.	Turn	New Project PERCENT ENTER	New Project Trips ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips EXIT	New Project Trips TOTAL	Pass-By Project Trips TOTAL	TOTAL PROJECT TRIPS Wkdy AM	New Project PERCENT ENTER	New Project Trips ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips EXIT	New Project Trips TOTAL	TOTAL PROJECT TRIPS Wkdy PM
1 Meridian St/Saratoga St/Central Sq North																			
Meridian St	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
Meridian St	SB	T		0			0		0		0		0			0		0	0
		R	7%	1	1		0		1		1	7%	0			0		0	0
Saratoga St	WB	L		0			0		0		0		0			0		0	0
		T	3%	0			0		0		0	3%	0			0		0	0
		R		0			0		0		0		0			0		0	0
Central Sq North	EB	L		0		10%	0		0		0		0		10%	1	1	1	1
		R		0			0		0		0		0			0		0	0
2,3 Meridian St/Porter St/Bennington St																			
Meridian St	NB	U		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0		7%	0		0		0		0		7%	1	1	1	1
		HR		0			0		0		0		0			0		0	0
Meridian St	SB	U		0			0		0		0		0			0		0	0
		L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
Bennington St	WB	HL		0			0		0		0		0			0		0	0
		L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Porter St	NWB	U		0			0		0		0		0			0		0	0
		HL		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
4 Meridian St/Central Sq South/Liverpool St																			
Liverpool St	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	WB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Cemtral Sq South	EB	L		0		7%	0		0		0		0		7%	1	1	1	1
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
5 Border St/Central Sq North																			
Border St	NB	T		0		8%	0		0		0		0		8%	1	1	1	1
		R		0		10%	0		0		0		0		10%	1	1	1	1
Border St	SB	L		0			0		0		0		0			0		0	0
		T	8%	1	1		0		1		1	8%	0			0		0	0
Central Sq North	WB	L	10%	1	1		0		1		1	10%	0			0		0	0
		R		0			0		0		0		0			0		0	0
6 Border St/Central Sq South/Liberty Plz S Drwy																			
Border St	NB	L		0			0		0		0		0			0		0	0
		T		0		18%	0		0		0		0		18%	3	2	2	2
		R		0		7%	0		0		0		0		7%	1	1	1	1
Border St	SB	L		0			0		0		0		0			0		0	0
		T	18%	2	2		0		2		2	18%	0			0		0	0
		R		0			0		0		0		0			0		0	0
Central Sq South	WB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Liberty Plaza South Drwy	EB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
7 Border St/Decatur St																			
Border St	NB	T		0		25%	0		0		0		0		25%	4	3	3	3
		R		0		70%	1	1	1		1		0		70%	10	10	10	10
Border St	SB	L		0			0		0		0		0			0		0	0
		T	18%	2	2		0		2		2	18%	0			0		0	0
Decatur St	WB	L	40%	5	5		0		5		5	40%	0	1		0		1	1
		R		0			0		0		0		0			0		0	0
8 Border St/Maverick St																			
Border St	SB	T		0		5%	0		0		0		0		5%	1	1	1	1
		R		0			0		0		0		0			0		0	0
Maverick St	WB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R	42%	5	5		0		5		5	42%	0			0		0	0
Maverick St	EB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
9 Sumner St/Grady Ct																			
Grady Ct	SB	L		0		5%	0		0		0		0		5%	1	1	1	1
		R		0			0		0		0		0			0		0	0
Sumner St	WB	T		0			0		0		0		0			0		0	0
Sumner St	EB	T		0			0		0		0		0			0		0	0
10 Meridian St/London St																			
Meridian St	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
London St	WB	L		0			0		0		0		0			0		0	0
		T	40%	5	5		0		5		5	40%	0	1		0		1	1
		R		0			0		0		0		0			0		0	0
London St	EB	L		0			0		0		0		0			0		0	0
		T		0		16%	0		0		0		0		16%	2	2	2	2
		R		0			0		0		0		0			0		0	0

Source: Woodland Design Group, Inc.

TRAFFIC PROJECTION MODEL - INDUSTRIAL PROJECT TRIP DISTRIBUTION

Boston East Mixed-Use Development - East Boston, Massachusetts

				ENTER VOL			EXIT VOL						ENTER VOL			EXIT VOL			
				12			1						1			14			
Intersection	**Dir.**	**Turn**	**New Project PERCENT ENTER**	**New Project Trips ENTER**	**New Project Trips ENTER**	**New Project PERCENT EXIT**	**New Project Trips EXIT**	**New Project Trips EXIT**	**New Project Trips TOTAL**	**Pass-By Project Trips TOTAL**	**TOTAL PROJECT TRIPS Wkdy AM**	**New Project PERCENT ENTER**	**New Project Trips ENTER**	**New Project Trips ENTER**	**New Project PERCENT EXIT**	**New Project Trips EXIT**	**New Project Trips EXIT**	**New Project Trips TOTAL**	**TOTAL PROJECT TRIPS Wkdy PM**
11 Meridian St/Havre St/Decatur St/Gove St																			
Meridian St	NB	BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Gove St	NWB	HL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Havre St	EB	L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Decatur St	SEB	HL		0			0		0		0		0			0		0	0
		BL		0		33%	0	1	1		1		0		33%	5	5	5	5
		T		0		21%	0		0		0		0		21%	3	3	3	3
		BR		0			0		0		0		0			0		0	0
12 Meridian St/Paris St/Emmons St																			
Meridian St	NB	HL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		HR		0			0		0		0		0			0		0	0
Meridian St	SB	BL		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		BR		0			0		0		0		0			0		0	0
Paris St	WB	L		0			0		0		0		0			0		0	0
		BL		0			0		0		0		0			0		0	0
		T	16%	2	2		0		2		2	16%	0			0		0	0
		HR		0			0		0		0		0			0		0	0
13 Maverick St/Meridian St/Maverick Square W																			
Maverick Square W	NB	L		0			0		0		0		0			0		0	0
		T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Meridian St	SB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Maverick St	WB	T	26%	3	3		0		3		3	26%	0			0		0	0
		R		0			0		0		0		0			0		0	0
14 MaverickSt/Chelsea St/Maverick Square																			
Chelsea St	SB	T		0			0		0		0		0			0		0	0
		R	13%	2	2		0		2		2	13%	0			0		0	0
MaverickSt	WB	L		0			0		0		0		0			0		0	0
		T	13%	2	1		0		1		1	13%	0			0		0	0
		R		0			0		0		0		0			0		0	0
MaverickSt	EB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
15 Sumner St/Maverick Square E																			
Maverick Square E	SB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Sumner St	WB	T		0			0		0		0		0			0		0	0
Sumner St	EB	T		0		5%	0		0		0		0		5%	1	1	1	1
16 Sumner St/Maverick Square W																			
Sumner St	WB	T		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
Sumner St	EB	L		0			0		0		0		0			0		0	0
		T		0		5%	0		0		0		0		5%	1	1	1	1
17 Border St/Residential Drwy																			
Border St	NB	L		0			0		0		0		0			0		0	0
		T		0		25%	0		0		0		0		25%	4	3	3	3
Border St	SB	T	18%	2	2		0		2		2	18%	0			0		0	0
		R		0			0		0		0		0			0		0	0
Residential Drwy	EB	L		0			0		0		0		0			0		0	0
		R		0			0		0		0		0			0		0	0
18 Border St/Industrial Drwy																			
Border St	NB	L	42%	5	5		0		5		5	42%	0			0		0	0
		T		0			0		0		0		0			0		0	0
Border St	SB	T		0			0		0		0		0			0		0	0
		R	58%	7	7		0		7		7	58%	1	1		0		1	1
Industrial Drwy	EB	L		0		95%	1	1	1		1		0		95%	13	13	13	13
		R		0		5%	0		0		0		0		5%	1	1	1	1

Source: Woodland Design Group, Inc.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				1.00			1.00			1.00	
Frpb, ped/bikes	1.00				0.97			1.00			0.99	
Flpb, ped/bikes	0.92				0.97			0.99			1.00	
Frt	1.00				0.97			1.00			0.99	
Flt Protected	0.95				0.98			0.99			1.00	
Satd. Flow (prot)	1467				1496			1651			1655	
Flt Permitted	0.72				0.98			0.83			1.00	
Satd. Flow (perm)	1106				1496			1384			1655	
Volume (vph)	30	0	0	36	27	20	68	313	0	0	371	22
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	0	39	29	22	74	340	0	0	403	24
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	0	0	3	0
Lane Group Flow (vph)	33	0	0	0	78	0	0	414	0	0	424	0
Confl. Peds. (#/hr)	56			43		56	74					74
Turn Type	D.Pm			Perm			Perm					
Protected Phases					5			1			1	
Permitted Phases	5			5			1					
Actuated Green, G (s)	26.0				26.0			43.8			43.8	
Effective Green, g (s)	27.0				27.0			44.8			44.8	
Actuated g/C Ratio	0.30				0.30			0.50			0.50	
Clearance Time (s)	5.0				5.0			5.0			5.0	
Vehicle Extension (s)	2.0				2.0			2.0			2.0	
Lane Grp Cap (vph)	332				449			689			824	
v/s Ratio Prot											0.26	
v/s Ratio Perm	0.03				0.05			c0.30				
v/c Ratio	0.10				0.17			0.60			0.52	
Uniform Delay, d1	22.7				23.3			16.2			15.3	
Progression Factor	1.00				1.00			1.00			1.00	
Incremental Delay, d2	0.6				0.8			3.9			2.3	
Delay (s)	23.3				24.1			20.0			17.6	
Level of Service	C				C			C			B	
Approach Delay (s)		23.3			24.1			20.0			17.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

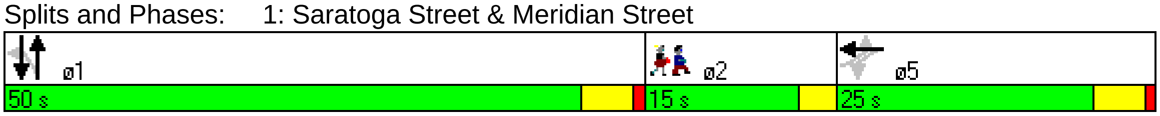
c Critical Lane Group

Lane Group	EBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations						
Volume (vph)	30	27	68	313	371	
Lane Group Flow (vph)	33	90	0	414	427	
Turn Type	D.Pm		Perm			
Protected Phases		5		1	1	2
Permitted Phases	5		1			
Detector Phases	5	5	1	1	1	
Minimum Initial (s)	6.0	6.0	40.0	40.0	40.0	1.0
Minimum Split (s)	25.0	25.0	45.0	45.0	45.0	15.0
Total Split (s)	25.0	25.0	50.0	50.0	50.0	15.0
Total Split (%)	27.8%	27.8%	55.6%	55.6%	55.6%	17%
Maximum Green (s)	20.0	20.0	45.0	45.0	45.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag			Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	Max	Max	C-Max	C-Max	C-Max	None
Walk Time (s)						6.0
Flash Dont Walk (s)						6.0
Pedestrian Calls (#/hr)						40
v/c Ratio	0.10	0.20		0.57	0.50	
Control Delay	27.8	23.5		19.2	16.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	27.8	23.5		19.2	16.9	
Queue Length 50th (ft)	15	34		155	150	
Queue Length 95th (ft)	40	75		248	232	
Internal Link Dist (ft)		251		51	210	
Turn Bay Length (ft)						
Base Capacity (vph)	321	454		720	848	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.10	0.20		0.57	0.50	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 1: Saratoga Street & Meridian Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	153	208	173	0	173	299
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	166	226	188	0	188	325
Pedestrians						76
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						6
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						207
pX, platoon unblocked						
vC, conflicting volume	889	264			188	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	889	264			188	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	39	69			86	
cM capacity (veh/h)	271	726			1386	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	166	226	188	188	325
Volume Left	166	0	0	188	0
Volume Right	0	226	0	0	0
cSH	271	726	1700	1386	1700
Volume to Capacity	0.61	0.31	0.11	0.14	0.19
Queue Length 95th (ft)	93	33	0	12	0
Control Delay (s)	37.3	12.2	0.0	8.0	0.0
Lane LOS	E	B		A	
Approach Delay (s)	22.8		0.0	2.9	
Approach LOS	C				

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Yield	
Volume (vph)	0	86	54	10	0	126	0	235	58	55	118	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	93	59	11	0	137	0	255	63	60	128	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	148	170	148	103	86
Volume Left (vph)	0	11	0	0	60	0
Volume Right (vph)	59	137	0	63	0	0
Hadj (s)	-0.20	-0.51	0.03	-0.26	0.33	0.03
Departure Headway (s)	5.2	4.9	5.6	5.3	6.0	5.7
Degree Utilization, x	0.22	0.20	0.26	0.22	0.17	0.14
Capacity (veh/h)	638	672	616	648	563	591
Control Delay (s)	9.6	9.1	9.4	8.5	9.1	8.4
Approach Delay (s)	9.6	9.1	9.0		8.8	
Approach LOS	A	A	A		A	

Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	63	73	66	244	372	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	79	72	265	404	21
Pedestrians	12			27	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			2	0	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					504	
pX, platoon unblocked						
vC, conflicting volume	838	454	437			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	838	454	437			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	86	94			
cM capacity (veh/h)	311	587	1112			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	68	79	337	425
Volume Left	68	0	72	0
Volume Right	0	79	0	21
cSH	311	587	1112	1700
Volume to Capacity	0.22	0.14	0.06	0.25
Queue Length 95th (ft)	21	12	5	0
Control Delay (s)	19.8	12.1	2.3	0.0
Lane LOS	C	B	A	
Approach Delay (s)	15.7		2.3	0.0
Approach LOS	C			

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	103	19	21	64	11	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	21	23	70	12	36
Pedestrians				15	98	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	8	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			231		336	235
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			231		336	235
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	95
cM capacity (veh/h)			1228		595	729

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	133	92	48
Volume Left	0	23	12
Volume Right	21	0	36
cSH	1700	1228	690
Volume to Capacity	0.08	0.02	0.07
Queue Length 95th (ft)	0	1	6
Control Delay (s)	0.0	2.1	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	2.1	10.6
Approach LOS			B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	135	45	32	84	51	175
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	147	49	35	91	55	190
Pedestrians		8	24		6	
Lane Width (ft)		10.0	16.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	3		1	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			174			
pX, platoon unblocked						
vC, conflicting volume	132				453	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132				453	94
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				89	80
cM capacity (veh/h)	1446				491	952

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	147	49	126	246
Volume Left	147	0	0	55
Volume Right	0	0	91	190
cSH	1446	1700	1700	786
Volume to Capacity	0.10	0.03	0.07	0.31
Queue Length 95th (ft)	8	0	0	33
Control Delay (s)	7.8	0.0	0.0	11.6
Lane LOS	A			B
Approach Delay (s)	5.8		0.0	11.6
Approach LOS				B

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Yield			Stop			Yield	
Volume (vph)	2	20	9	22	40	76	19	91	27	74	83	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	22	10	24	43	83	21	99	29	80	90	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	34	150	149	182
Volume Left (vph)	2	24	21	80
Volume Right (vph)	10	83	29	11
Hadj (s)	-0.13	-0.26	-0.06	0.09
Departure Headway (s)	4.7	4.5	4.5	4.6
Degree Utilization, x	0.04	0.19	0.19	0.23
Capacity (veh/h)	689	748	760	743
Control Delay (s)	8.0	8.5	8.5	9.0
Approach Delay (s)	8.0	8.5	8.5	9.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.6		
HCM Level of Service	A		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	21	82	9	9	62
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	23	89	10	10	67
Pedestrians	4		1			1
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	186	99			103	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	186	99			103	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	795	953			1484	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	99	77
Volume Left	3	0	10
Volume Right	23	10	0
cSH	930	1700	1484
Volume to Capacity	0.03	0.06	0.01
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.0	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	32	0	1	12	18	58	0	0	0	0	39	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	0	1	13	20	63	0	0	0	0	42	18
Pedestrians								13				
Lane Width (ft)								0.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	83			14			200	192	14	147	161	51
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	83			14			200	192	14	147	161	51
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	100	100	100	94	98
cM capacity (veh/h)	1515			1604			694	681	1067	802	709	1017

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	36	96	61
Volume Left	35	13	0
Volume Right	1	63	18
cSH	1515	1604	781
Volume to Capacity	0.02	0.01	0.08
Queue Length 95th (ft)	2	1	6
Control Delay (s)	7.2	1.0	10.0
Lane LOS	A	A	B
Approach Delay (s)	7.2	1.0	10.0
Approach LOS			B

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	18	31	0	42	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	20	34	0	46	4
Pedestrians		3	8			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	1			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	34				61	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	34				61	37
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1578				939	1033

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	20	34	50
Volume Left	0	0	46
Volume Right	0	0	4
cSH	1700	1700	946
Volume to Capacity	0.01	0.02	0.05
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	14.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	310	105	9	409	42	3	3	6	87	49	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	337	114	10	445	46	3	3	7	95	53	4
Pedestrians		2			15			73			128	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			6			11	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					819							
pX, platoon unblocked												
vC, conflicting volume	563			579			1006	1146	542	1026	1111	537
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	563			579			1006	1146	542	1026	1111	537
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	98	99	41	69	99
cM capacity (veh/h)	947			889			134	165	506	160	173	480

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	454	500	13	152
Volume Left	3	10	3	95
Volume Right	114	46	7	4
cSH	947	889	229	168
Volume to Capacity	0.00	0.01	0.06	0.91
Queue Length 95th (ft)	0	1	4	166
Control Delay (s)	0.1	0.3	21.7	101.5
Lane LOS	A	A	C	F
Approach Delay (s)	0.1	0.3	21.7	101.5
Approach LOS			C	F

Intersection Summary			
Average Delay	14.2		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	299	0	191	286	0	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	325	0	208	311	0	82
Pedestrians				61		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				5		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				1100		
pX, platoon unblocked						
vC, conflicting volume			325		1051	386
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			325		1051	386
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		100	87
cM capacity (veh/h)			1235		209	628

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	325	518	82
Volume Left	0	208	0
Volume Right	0	0	82
cSH	1700	1235	628
Volume to Capacity	0.19	0.17	0.13
Queue Length 95th (ft)	0	15	11
Control Delay (s)	0.0	4.5	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	4.5	11.6
Approach LOS			B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	117	7	0	0	0	148	43	0	15	75	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	8	0	0	0	161	47	0	16	82	59
Pedestrians					97						58	
Lane Width (ft)					0.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						5	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			193			327	193	0	212	189	286
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			193			327	193	0	212	189	286
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			68	93	100	97	88	92
cM capacity (veh/h)	1623			1314			502	668	1085	646	672	717

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	135	208	157
Volume Left	0	161	16
Volume Right	8	0	59
cSH	1700	532	685
Volume to Capacity	0.08	0.39	0.23
Queue Length 95th (ft)	0	46	22
Control Delay (s)	0.0	16.0	11.8
Lane LOS		C	B
Approach Delay (s)	0.0	16.0	11.8
Approach LOS		C	B

Intersection Summary			
Average Delay	10.4		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	240	63	0	277	9	59	61	0	13	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	261	68	0	301	10	64	66	0	14	2	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					1214							
pX, platoon unblocked												
vC, conflicting volume	311			329			602	635	306	634	606	295
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311			329			602	635	306	634	606	295
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			84	83	100	96	99	100
cM capacity (veh/h)	1250			1230			410	396	734	341	411	744

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	329	311	130	16
Volume Left	0	0	64	14
Volume Right	68	10	0	0
cSH	1700	1700	403	349
Volume to Capacity	0.19	0.18	0.32	0.05
Queue Length 95th (ft)	0	0	35	4
Control Delay (s)	0.0	0.0	18.2	15.8
Lane LOS			C	C
Approach Delay (s)	0.0	0.0	18.2	15.8
Approach LOS			C	C

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	14	0	0	15	0	14	98	8	0	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	15	0	0	16	0	15	107	9	0	0	10
Pedestrians		65										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		5										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	16			15			154	79	15	141	79	81
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			15			154	79	15	141	79	81
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	87	99	100	100	99
cM capacity (veh/h)	1601			1603			752	799	1064	729	799	926

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	16	130	10
Volume Left	24	0	15	0
Volume Right	0	0	9	10
cSH	1601	1700	806	926
Volume to Capacity	0.01	0.01	0.16	0.01
Queue Length 95th (ft)	1	0	14	1
Control Delay (s)	4.5	0.0	10.3	8.9
Lane LOS	A		B	A
Approach Delay (s)	4.5	0.0	10.3	8.9
Approach LOS			B	A

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	22	15	303	290	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	24	16	329	315	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1301	
pX, platoon unblocked						
vC, conflicting volume	677	315	315			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	677	315	315			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	413	725	1245			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	346	315
Volume Left	0	16	0
Volume Right	24	0	0
cSH	725	1245	1700
Volume to Capacity	0.03	0.01	0.19
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.1	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.1	0.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	302	0	15	286	0	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	328	0	16	311	0	68
Pedestrians				19		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				2		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			328		672	347
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			328		672	347
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	90
cM capacity (veh/h)			1231		416	685

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	328	327	68
Volume Left	0	16	0
Volume Right	0	0	68
cSH	1700	1231	685
Volume to Capacity	0.19	0.01	0.10
Queue Length 95th (ft)	0	1	8
Control Delay (s)	0.0	0.5	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.8
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	15	0	0	0	0	0	0	7	44	37	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	0	0	0	0	0	8	48	40	68
Pedestrians					38							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			16			105	16	54	62	16	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			16			105	16	54	62	16	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	95	95	94
cM capacity (veh/h)	1623			1601			791	878	1013	926	878	1085

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	16	8	157
Volume Left	0	0	48
Volume Right	0	8	68
cSH	1700	1013	975
Volume to Capacity	0.01	0.01	0.16
Queue Length 95th (ft)	0	1	14
Control Delay (s)	0.0	8.6	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	9.4
Approach LOS		A	A

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	302	7	0	143	143	0	0	0	12	25	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	328	8	0	155	155	0	0	0	13	27	0
Pedestrians		64						42				
Lane Width (ft)		12.0						0.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		5						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	353			336			621	611	339	629	685	332
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			336			621	611	339	629	685	332
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	97	93	100
cM capacity (veh/h)	1206			1223			377	409	666	374	371	710

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	336	311	40
Volume Left	0	0	13
Volume Right	8	155	0
cSH	1206	1700	372
Volume to Capacity	0.00	0.18	0.11
Queue Length 95th (ft)	0	0	9
Control Delay (s)	0.0	0.0	15.9
Lane LOS			C
Approach Delay (s)	0.0	0.0	15.9
Approach LOS			C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	96	207	11	120	37	123	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	104	225	12	130	40	134	0	11
Pedestrians		188			126						32	
Lane Width (ft)		0.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			10						3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	361			0			416	361	126	480	249	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361			0			416	361	126	480	249	437
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	76	95	59	100	98
cM capacity (veh/h)	1165			1623			526	551	827	329	636	603

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	329	12	171	145
Volume Left	0	12	0	134
Volume Right	225	0	40	11
cSH	1700	526	598	341
Volume to Capacity	0.19	0.02	0.29	0.42
Queue Length 95th (ft)	0	2	29	51
Control Delay (s)	0.0	12.0	13.4	23.1
Lane LOS		B	B	C
Approach Delay (s)	0.0	13.3		23.1
Approach LOS		B		C

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Volume (vph)	37	0	123	26	242	35	0	0	0	0	79	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	0	134	28	263	38	0	0	0	0	86	66

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	174	329	152
Volume Left (vph)	40	28	0
Volume Right (vph)	134	38	66
Hadj (s)	-0.38	-0.02	-0.23
Departure Headway (s)	4.3	4.5	4.8
Degree Utilization, x	0.21	0.41	0.20
Capacity (veh/h)	800	775	689
Control Delay (s)	8.4	10.5	9.0
Approach Delay (s)	8.4	10.5	9.0
Approach LOS	A	B	A

Intersection Summary			
Delay	9.6		
HCM Level of Service	A		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676	1676		1593	1425
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1676	1676		1593	1425
Volume (vph)	0	92	84	0	150	78
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	100	91	0	163	85
RTOR Reduction (vph)	0	0	0	0	0	44
Lane Group Flow (vph)	0	100	91	0	163	41
Confl. Peds. (#/hr)					188	
Turn Type						Perm
Protected Phases		1	1		3	
Permitted Phases						3
Actuated Green, G (s)		20.2	20.2		35.3	35.3
Effective Green, g (s)		22.2	22.2		37.3	37.3
Actuated g/C Ratio		0.29	0.29		0.48	0.48
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		482	482		770	689
v/s Ratio Prot		c0.06	0.05		c0.10	
v/s Ratio Perm						0.03
v/c Ratio		0.21	0.19		0.21	0.06
Uniform Delay, d1		20.8	20.7		11.5	10.6
Progression Factor		0.08	1.00		1.00	1.00
Incremental Delay, d2		0.9	0.9		0.6	0.2
Delay (s)		2.5	21.6		12.1	10.8
Level of Service		A	C		B	B
Approach Delay (s)		2.5	21.6		11.7	
Approach LOS		A	C		B	

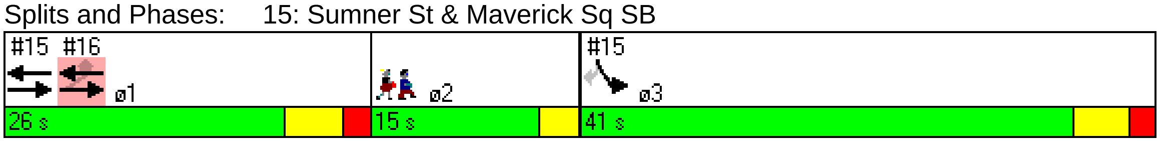
Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	17.7
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR	ø2
Lane Configurations					
Volume (vph)	92	84	150	78	
Lane Group Flow (vph)	100	91	163	85	
Turn Type				Perm	
Protected Phases	1	1	3		2
Permitted Phases				3	
Detector Phases	1	1	3	3	
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0
Minimum Split (s)	19.0	19.0	12.0	12.0	15.0
Total Split (s)	26.0	26.0	41.0	41.0	15.0
Total Split (%)	31.7%	31.7%	50.0%	50.0%	18%
Maximum Green (s)	20.0	20.0	35.0	35.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0
Lead/Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0
Flash Dont Walk (s)	6.0	6.0			5.0
Pedestrian Calls (#/hr)	40	40			40
v/c Ratio	0.20	0.19	0.21	0.11	
Control Delay	2.7	23.7	13.5	3.7	
Queue Delay	0.9	0.0	0.0	0.0	
Total Delay	3.6	23.7	13.5	3.8	
Queue Length 50th (ft)	2	36	49	0	
Queue Length 95th (ft)	3	74	89	24	
Internal Link Dist (ft)	29	412	420		
Turn Bay Length (ft)					
Base Capacity (vph)	490	490	783	744	
Starvation Cap Reductn	224	0	0	0	
Spillback Cap Reductn	0	0	0	58	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.38	0.19	0.21	0.12	

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 15: Sumner St & Maverick Sq SB



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00	0.97		
Flpb, ped/bikes		0.99	1.00	1.00		
Frt		1.00	1.00	0.85		
Flt Protected		0.98	1.00	1.00		
Satd. Flow (prot)		1640	1676	1386		
Flt Permitted		0.88	1.00	1.00		
Satd. Flow (perm)		1471	1676	1386		
Volume (vph)	49	92	65	97	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	100	71	105	0	0
RTOR Reduction (vph)	0	0	0	75	0	0
Lane Group Flow (vph)	0	153	71	30	0	0
Confl. Peds. (#/hr)	9			9		
Turn Type	Perm			Perm		
Protected Phases		1	1			
Permitted Phases	1			1		
Actuated Green, G (s)		20.2	20.2	20.2		
Effective Green, g (s)		22.2	22.2	22.2		
Actuated g/C Ratio		0.29	0.29	0.29		
Clearance Time (s)		6.0	6.0	6.0		
Vehicle Extension (s)		2.0	2.0	2.0		
Lane Grp Cap (vph)		423	482	399		
v/s Ratio Prot			0.04			
v/s Ratio Perm		c0.10		0.02		
v/c Ratio		0.36	0.15	0.08		
Uniform Delay, d1		21.9	20.5	20.0		
Progression Factor		1.00	0.56	0.31		
Incremental Delay, d2		2.4	0.6	0.4		
Delay (s)		24.3	12.0	6.7		
Level of Service		C	B	A		
Approach Delay (s)		24.3	8.8		0.0	
Approach LOS		C	A		A	

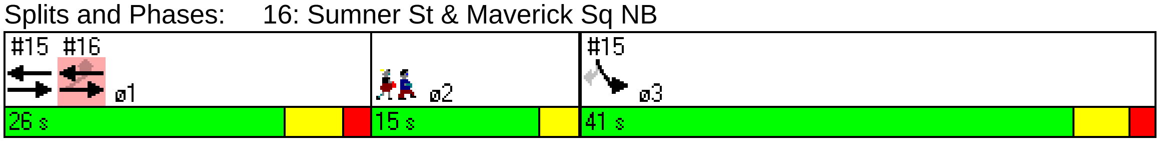
Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	55.0
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	ø2	ø3
Lane Configurations						
Volume (vph)	49	92	65	97		
Lane Group Flow (vph)	0	153	71	105		
Turn Type	Perm			Perm		
Protected Phases		1	1		2	3
Permitted Phases	1			1		
Detector Phases	1	1	1	1		
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0	6.0
Minimum Split (s)	19.0	19.0	19.0	19.0	15.0	12.0
Total Split (s)	26.0	26.0	26.0	26.0	15.0	41.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	18%	50%
Maximum Green (s)	20.0	20.0	20.0	20.0	12.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	5.0	
Pedestrian Calls (#/hr)	40	40	40	40	40	
v/c Ratio		0.36	0.14	0.22		
Control Delay		26.1	13.2	2.8		
Queue Delay		0.0	2.9	1.7		
Total Delay		26.1	16.1	4.5		
Queue Length 50th (ft)		64	14	0		
Queue Length 95th (ft)		118	35	1		
Internal Link Dist (ft)		247	29			
Turn Bay Length (ft)						
Base Capacity (vph)		429	490	479		
Starvation Cap Reductn		0	338	253		
Spillback Cap Reductn		0	0	0		
Storage Cap Reductn		0	0	0		
Reduced v/c Ratio		0.36	0.47	0.46		

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 16: Sumner St & Maverick Sq NB



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0			4.0			4.0	
Lane Util. Factor	1.00				1.00			1.00			1.00	
Frpb, ped/bikes	1.00				0.90			1.00			0.99	
Flpb, ped/bikes	0.78				0.96			0.99			1.00	
Frt	1.00				0.96			1.00			0.99	
Flt Protected	0.95				0.99			0.99			1.00	
Satd. Flow (prot)	1241				1367			1638			1630	
Flt Permitted	0.64				0.99			0.77			1.00	
Satd. Flow (perm)	832				1367			1268			1630	
Volume (vph)	77	0	0	39	50	43	115	447	0	0	303	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	0	0	42	54	47	125	486	0	0	329	39
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	0	0	5	0
Lane Group Flow (vph)	84	0	0	0	125	0	0	611	0	0	363	0
Confl. Peds. (#/hr)	178			73		178	113					113
Turn Type	D.Pm			Perm			Perm					
Protected Phases					5			1			1	
Permitted Phases	5			5			1					
Actuated Green, G (s)	26.0				26.0			43.8			43.8	
Effective Green, g (s)	27.0				27.0			44.8			44.8	
Actuated g/C Ratio	0.30				0.30			0.50			0.50	
Clearance Time (s)	5.0				5.0			5.0			5.0	
Vehicle Extension (s)	2.0				2.0			2.0			2.0	
Lane Grp Cap (vph)	250				410			631			811	
v/s Ratio Prot											0.22	
v/s Ratio Perm	c0.10				0.09			c0.48				
v/c Ratio	0.34				0.30			0.97			0.45	
Uniform Delay, d1	24.5				24.3			21.9			14.6	
Progression Factor	1.00				1.00			1.00			1.00	
Incremental Delay, d2	3.6				1.9			28.8			1.8	
Delay (s)	28.1				26.2			50.8			16.4	
Level of Service	C				C			D			B	
Approach Delay (s)		28.1			26.2			50.8			16.4	
Approach LOS		C			C			D			B	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

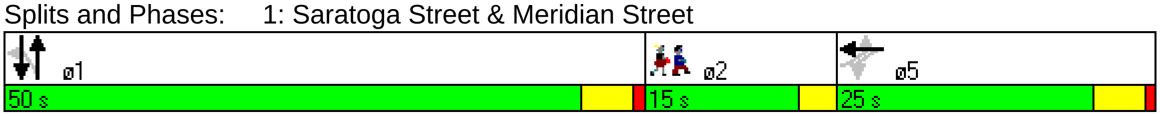
c Critical Lane Group

Lane Group	EBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations						
Volume (vph)	77	50	115	447	303	
Lane Group Flow (vph)	84	143	0	611	368	
Turn Type	D.Pm		Perm			
Protected Phases		5		1	1	2
Permitted Phases	5		1			
Detector Phases	5	5	1	1	1	
Minimum Initial (s)	6.0	6.0	40.0	40.0	40.0	1.0
Minimum Split (s)	25.0	25.0	45.0	45.0	45.0	15.0
Total Split (s)	25.0	25.0	50.0	50.0	50.0	15.0
Total Split (%)	27.8%	27.8%	55.6%	55.6%	55.6%	17%
Maximum Green (s)	20.0	20.0	45.0	45.0	45.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag			Lead	Lead	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	Max	Max	C-Max	C-Max	C-Max	None
Walk Time (s)						6.0
Flash Dont Walk (s)						6.0
Pedestrian Calls (#/hr)						40
v/c Ratio	0.38	0.35		0.93	0.44	
Control Delay	34.4	25.5		43.9	15.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	34.4	25.5		43.9	15.5	
Queue Length 50th (ft)	42	56		307	122	
Queue Length 95th (ft)	90	113		#540	192	
Internal Link Dist (ft)		251		51	210	
Turn Bay Length (ft)						
Base Capacity (vph)	224	412		658	839	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.38	0.35		0.93	0.44	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Saratoga Street & Meridian Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	181	240	327	0	168	280
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	197	261	355	0	183	304
Pedestrians						15
Lane Width (ft)						12.0
Walking Speed (ft/s)						4.0
Percent Blockage						1
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						207
pX, platoon unblocked						
vC, conflicting volume	1025	370			355	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1025	370			355	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	11	61			85	
cM capacity (veh/h)	221	667			1203	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	197	261	355	183	304
Volume Left	197	0	0	183	0
Volume Right	0	261	0	0	0
cSH	221	667	1700	1203	1700
Volume to Capacity	0.89	0.39	0.21	0.15	0.18
Queue Length 95th (ft)	180	46	0	13	0
Control Delay (s)	81.2	13.8	0.0	8.5	0.0
Lane LOS	F	B		A	
Approach Delay (s)	42.8		0.0	3.2	
Approach LOS	E				

Intersection Summary			
Average Delay	16.3		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Yield	
Volume (vph)	0	202	49	10	0	187	0	234	67	104	64	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	220	53	11	0	203	0	254	73	113	70	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	273	214	170	158	136	46
Volume Left (vph)	0	11	0	0	113	0
Volume Right (vph)	53	203	0	73	0	0
Hadj (s)	-0.08	-0.53	0.03	-0.29	0.45	0.03
Departure Headway (s)	5.6	5.3	6.2	5.9	6.9	6.4
Degree Utilization, x	0.42	0.31	0.29	0.26	0.26	0.08
Capacity (veh/h)	601	623	541	568	482	510
Control Delay (s)	12.6	10.7	10.6	9.8	11.1	8.8
Approach Delay (s)	12.6	10.7	10.2		10.5	
Approach LOS	B	B	B		B	

Intersection Summary			
Delay	11.0		
HCM Level of Service	B		
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	121	141	152	443	393	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	132	153	165	482	427	8
Pedestrians	15			28	24	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			2	2	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					504	
pX, platoon unblocked						
vC, conflicting volume	1282	474	450			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1282	474	450			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	12	73	85			
cM capacity (veh/h)	150	569	1097			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	132	153	647	435
Volume Left	132	0	165	0
Volume Right	0	153	0	8
cSH	150	569	1097	1700
Volume to Capacity	0.88	0.27	0.15	0.26
Queue Length 95th (ft)	149	27	13	0
Control Delay (s)	102.5	13.6	3.7	0.0
Lane LOS	F	B	A	
Approach Delay (s)	54.7		3.7	0.0
Approach LOS	F			

Intersection Summary			
Average Delay	13.1		
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	225	17	9	150	31	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	245	18	10	163	34	40
Pedestrians				15	98	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	8	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			361		534	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			361		534	367
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	93
cM capacity (veh/h)			1100		461	615

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	263	173	74
Volume Left	0	10	34
Volume Right	18	0	40
cSH	1700	1100	534
Volume to Capacity	0.15	0.01	0.14
Queue Length 95th (ft)	0	1	12
Control Delay (s)	0.0	0.5	12.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	12.8
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	235	36	30	186	122	206
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	255	39	33	202	133	224
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			174			
pX, platoon unblocked						
vC, conflicting volume	235				684	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	235				684	134
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				60	76
cM capacity (veh/h)	1333				335	915

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	255	39	235	357
Volume Left	255	0	0	133
Volume Right	0	0	202	224
cSH	1333	1700	1700	557
Volume to Capacity	0.19	0.02	0.14	0.64
Queue Length 95th (ft)	18	0	0	113
Control Delay (s)	8.3	0.0	0.0	22.3
Lane LOS	A			C
Approach Delay (s)	7.2		0.0	22.3
Approach LOS				C

Intersection Summary			
Average Delay	11.4		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Yield			Stop			Yield	
Volume (vph)	12	54	23	19	98	169	29	83	38	127	89	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	59	25	21	107	184	32	90	41	138	97	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	97	311	163	254
Volume Left (vph)	13	21	32	138
Volume Right (vph)	25	184	41	20
Hadj (s)	-0.09	-0.31	-0.08	0.10
Departure Headway (s)	5.4	4.9	5.3	5.3
Degree Utilization, x	0.15	0.42	0.24	0.38
Capacity (veh/h)	586	687	610	630
Control Delay (s)	9.4	11.4	10.0	11.5
Approach Delay (s)	9.4	11.4	10.0	11.5
Approach LOS	A	B	A	B

Intersection Summary			
Delay	10.9		
HCM Level of Service	B		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	5	35	130	10	32	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	38	141	11	35	102
Pedestrians	7		3			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	328	154			159	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	328	154			159	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			98	
cM capacity (veh/h)	644	887			1412	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	43	152	137
Volume Left	5	0	35
Volume Right	38	11	0
cSH	847	1700	1412
Volume to Capacity	0.05	0.09	0.02
Queue Length 95th (ft)	4	0	2
Control Delay (s)	9.5	0.0	2.1
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	2.1
Approach LOS	A		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	52	0	1	15	10	82	0	0	0	0	90	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	0	1	16	11	89	0	0	0	0	98	18
Pedestrians		5						75			11	
Lane Width (ft)		12.0						0.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	111			76			349	332	76	213	288	71
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	111			76			349	332	76	213	288	71
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			100	100	100	100	83	98
cM capacity (veh/h)	1465			1523			494	554	986	705	586	978

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	58	116	116
Volume Left	57	16	0
Volume Right	1	89	18
cSH	1465	1523	626
Volume to Capacity	0.04	0.01	0.19
Queue Length 95th (ft)	3	1	17
Control Delay (s)	7.4	1.1	12.1
Lane LOS	A	A	B
Approach Delay (s)	7.4	1.1	12.1
Approach LOS			B

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	23	40	0	94	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	25	43	0	102	7
Pedestrians		1	2			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	43				70	44
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	43				70	44
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				89	99
cM capacity (veh/h)	1565				932	1025

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	25	43	109
Volume Left	0	0	102
Volume Right	0	0	7
cSH	1700	1700	937
Volume to Capacity	0.01	0.03	0.12
Queue Length 95th (ft)	0	0	10
Control Delay (s)	0.0	0.0	9.3
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	16.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	504	88	7	402	24	7	13	5	98	23	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	548	96	8	437	26	8	14	5	107	25	24
Pedestrians					29			200			291	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					2			17			24	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					819							
pX, platoon unblocked												
vC, conflicting volume	663			934			1346	1619	650	1384	1584	916
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	663			934			1346	1619	650	1384	1584	916
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			84	78	99	0	62	90
cM capacity (veh/h)	771			555			48	63	391	53	67	244

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	653	471	27	155
Volume Left	10	8	8	107
Volume Right	96	26	5	24
cSH	771	555	69	63
Volume to Capacity	0.01	0.01	0.40	2.48
Queue Length 95th (ft)	1	1	38	385
Control Delay (s)	0.3	0.4	88.3	813.8
Lane LOS	A	A	F	F
Approach Delay (s)	0.3	0.4	88.3	813.8
Approach LOS			F	F

Intersection Summary			
Average Delay	99.0		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	421	0	180	292	0	122
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	458	0	196	317	0	133
Pedestrians				36		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				3		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				1100		
pX, platoon unblocked						
vC, conflicting volume			458		1166	494
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			458		1166	494
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		100	76
cM capacity (veh/h)			1103		176	558

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	458	513	133
Volume Left	0	196	0
Volume Right	0	0	133
cSH	1700	1103	558
Volume to Capacity	0.27	0.18	0.24
Queue Length 95th (ft)	0	16	23
Control Delay (s)	0.0	4.6	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	4.6	13.4
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	116	13	0	0	0	147	33	0	17	122	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	14	0	0	0	160	36	0	18	133	41
Pedestrians					115						34	
Lane Width (ft)					0.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			174			356	174	0	185	167	282
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			174			356	174	0	185	167	282
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			66	95	100	97	81	94
cM capacity (veh/h)	1623			1363			474	699	1085	709	705	735

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	140	196	192
Volume Left	0	160	18
Volume Right	14	0	41
cSH	1700	504	712
Volume to Capacity	0.08	0.39	0.27
Queue Length 95th (ft)	0	46	27
Control Delay (s)	0.0	16.6	11.9
Lane LOS		C	B
Approach Delay (s)	0.0	16.6	11.9
Approach LOS		C	B

Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	341	67	0	275	17	80	62	0	7	10	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	371	73	0	299	18	87	67	0	8	11	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					1214							
pX, platoon unblocked												
vC, conflicting volume	317			443			721	752	308	749	724	407
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			443			721	752	308	749	724	407
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			74	80	100	97	97	100
cM capacity (veh/h)	1243			1117			335	339	732	278	352	644

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	443	317	154	18
Volume Left	0	0	87	8
Volume Right	73	18	0	0
cSH	1700	1700	337	317
Volume to Capacity	0.26	0.19	0.46	0.06
Queue Length 95th (ft)	0	0	58	5
Control Delay (s)	0.0	0.0	24.4	17.1
Lane LOS			C	C
Approach Delay (s)	0.0	0.0	24.4	17.1
Approach LOS			C	C

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	43	21	0	0	11	0	6	99	3	0	0	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	23	0	0	12	0	7	108	3	0	0	18
Pedestrians		12										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	12			23			159	128	23	185	128	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			23			159	128	23	185	128	24
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	85	100	100	100	98
cM capacity (veh/h)	1607			1592			767	740	1054	672	740	1042

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	70	12	117	18
Volume Left	47	0	7	0
Volume Right	0	0	3	18
cSH	1607	1700	748	1042
Volume to Capacity	0.03	0.01	0.16	0.02
Queue Length 95th (ft)	2	0	14	1
Control Delay (s)	5.0	0.0	10.7	8.5
Lane LOS	A		B	A
Approach Delay (s)	5.0	0.0	10.7	8.5
Approach LOS			B	A

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	23	11	378	282	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	25	12	411	307	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1301	
pX, platoon unblocked						
vC, conflicting volume	741	307	307			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	741	307	307			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	380	733	1254			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	423	307
Volume Left	0	12	0
Volume Right	25	0	0
cSH	733	1254	1700
Volume to Capacity	0.03	0.01	0.18
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.1	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.1	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	367	0	13	288	0	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	399	0	14	313	0	66
Pedestrians				16		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				1		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			399		740	415
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			399		740	415
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	89
cM capacity (veh/h)			1160		379	629

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	399	327	66
Volume Left	0	14	0
Volume Right	0	0	66
cSH	1700	1160	629
Volume to Capacity	0.23	0.01	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.5	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.4
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	0	0	0	0	0	0	7	11	32	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	14	0	0	0	0	0	0	8	12	35	66
Pedestrians					23							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			14			98	14	37	45	14	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			14			98	14	37	45	14	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	96	94
cM capacity (veh/h)	1623			1604			805	880	1035	950	880	1085

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	14	8	113
Volume Left	0	0	12
Volume Right	0	8	66
cSH	1700	1035	999
Volume to Capacity	0.01	0.01	0.11
Queue Length 95th (ft)	0	1	10
Control Delay (s)	0.0	8.5	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	8.5	9.1
Approach LOS		A	A

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	367	7	0	167	121	0	0	0	11	21	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	399	8	0	182	132	0	0	0	12	23	0
Pedestrians		46						71				
Lane Width (ft)		12.0						0.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		4						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	384			407			752	744	364	716	806	403
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	384			407			752	744	364	716	806	403
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	93	100
cM capacity (veh/h)	1174			1152			306	340	655	330	313	648

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	416	313	35
Volume Left	10	0	12
Volume Right	8	132	0
cSH	1174	1700	319
Volume to Capacity	0.01	0.18	0.11
Queue Length 95th (ft)	1	0	9
Control Delay (s)	0.3	0.0	17.7
Lane LOS	A		C
Approach Delay (s)	0.3	0.0	17.7
Approach LOS			C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	74	205	19	146	78	147	0	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	80	223	21	159	85	160	0	24
Pedestrians		239			163						129	
Lane Width (ft)		0.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			14						11	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	432			0			455	432	163	648	321	560
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	432			0			455	432	163	648	321	560
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	66	89	10	100	95
cM capacity (veh/h)	1006			1623			449	461	762	178	532	471

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	303	21	243	184
Volume Left	0	21	0	160
Volume Right	223	0	85	24
cSH	1700	449	534	193
Volume to Capacity	0.18	0.05	0.46	0.95
Queue Length 95th (ft)	0	4	59	193
Control Delay (s)	0.0	13.4	17.3	102.3
Lane LOS		B	C	F
Approach Delay (s)	0.0	17.0		102.3
Approach LOS		C		F

Intersection Summary			
Average Delay	31.0		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Volume (vph)	95	0	130	41	207	97	0	0	0	0	69	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	0	141	45	225	105	0	0	0	0	75	78

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	245	375	153
Volume Left (vph)	103	45	0
Volume Right (vph)	141	105	78
Hadj (s)	-0.23	-0.11	-0.27
Departure Headway (s)	4.5	4.5	5.0
Degree Utilization, x	0.31	0.47	0.21
Capacity (veh/h)	754	773	642
Control Delay (s)	9.5	11.3	9.4
Approach Delay (s)	9.5	11.3	9.4
Approach LOS	A	B	A

Intersection Summary			
Delay	10.4		
HCM Level of Service	B		
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676	1676		1593	1425
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1676	1676		1593	1425
Volume (vph)	0	151	94	0	136	104
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	164	102	0	148	113
RTOR Reduction (vph)	0	0	0	0	0	58
Lane Group Flow (vph)	0	164	102	0	148	55
Confl. Peds. (#/hr)					378	
Turn Type						Perm
Protected Phases		1	1		3	
Permitted Phases						3
Actuated Green, G (s)		20.2	20.2		35.3	35.3
Effective Green, g (s)		22.2	22.2		37.3	37.3
Actuated g/C Ratio		0.29	0.29		0.48	0.48
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		482	482		770	689
v/s Ratio Prot		c0.10	0.06		c0.09	
v/s Ratio Perm						0.04
v/c Ratio		0.34	0.21		0.19	0.08
Uniform Delay, d1		21.7	20.9		11.4	10.7
Progression Factor		0.08	1.00		1.00	1.00
Incremental Delay, d2		1.6	1.0		0.6	0.2
Delay (s)		3.4	21.9		11.9	10.9
Level of Service		A	C		B	B
Approach Delay (s)		3.4	21.9		11.5	
Approach LOS		A	C		B	

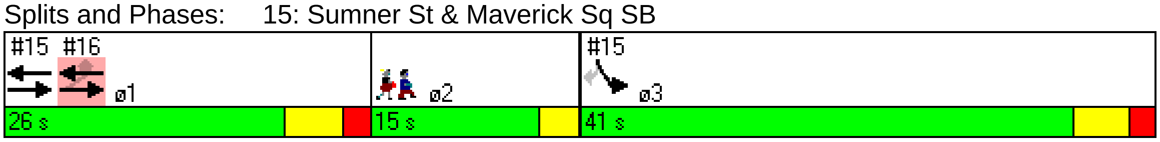
Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	17.7
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR	ø2
Lane Configurations					
Volume (vph)	151	94	136	104	
Lane Group Flow (vph)	164	102	148	113	
Turn Type				Perm	
Protected Phases	1	1	3		2
Permitted Phases				3	
Detector Phases	1	1	3	3	
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0
Minimum Split (s)	19.0	19.0	12.0	12.0	15.0
Total Split (s)	26.0	26.0	41.0	41.0	15.0
Total Split (%)	31.7%	31.7%	50.0%	50.0%	18%
Maximum Green (s)	20.0	20.0	35.0	35.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0
Lead/Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0
Flash Dont Walk (s)	6.0	6.0			5.0
Pedestrian Calls (#/hr)	40	40			40
v/c Ratio	0.33	0.21	0.19	0.15	
Control Delay	3.5	23.9	13.4	3.4	
Queue Delay	1.0	0.0	0.0	0.1	
Total Delay	4.5	23.9	13.4	3.5	
Queue Length 50th (ft)	3	41	44	0	
Queue Length 95th (ft)	6	81	81	27	
Internal Link Dist (ft)	29	412	420		
Turn Bay Length (ft)					
Base Capacity (vph)	490	490	783	758	
Starvation Cap Reductn	156	0	0	0	
Spillback Cap Reductn	0	0	0	169	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.49	0.21	0.19	0.19	

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 15: Sumner St & Maverick Sq SB



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00	0.98		
Flpb, ped/bikes		1.00	1.00	1.00		
Frt		1.00	1.00	0.85		
Flt Protected		0.99	1.00	1.00		
Satd. Flow (prot)		1648	1676	1390		
Flt Permitted		0.87	1.00	1.00		
Satd. Flow (perm)		1458	1676	1390		
Volume (vph)	62	151	127	71	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	164	138	77	0	0
RTOR Reduction (vph)	0	0	0	55	0	0
Lane Group Flow (vph)	0	231	138	22	0	0
Confl. Peds. (#/hr)	7			7		
Turn Type	Perm			Perm		
Protected Phases		1	1			
Permitted Phases	1			1		
Actuated Green, G (s)		20.2	20.2	20.2		
Effective Green, g (s)		22.2	22.2	22.2		
Actuated g/C Ratio		0.29	0.29	0.29		
Clearance Time (s)		6.0	6.0	6.0		
Vehicle Extension (s)		2.0	2.0	2.0		
Lane Grp Cap (vph)		419	482	400		
v/s Ratio Prot			0.08			
v/s Ratio Perm		c0.16		0.02		
v/c Ratio		0.55	0.29	0.06		
Uniform Delay, d1		23.3	21.3	19.9		
Progression Factor		1.00	0.59	0.36		
Incremental Delay, d2		5.1	1.5	0.3		
Delay (s)		28.4	14.1	7.4		
Level of Service		C	B	A		
Approach Delay (s)		28.4	11.7		0.0	
Approach LOS		C	B		A	

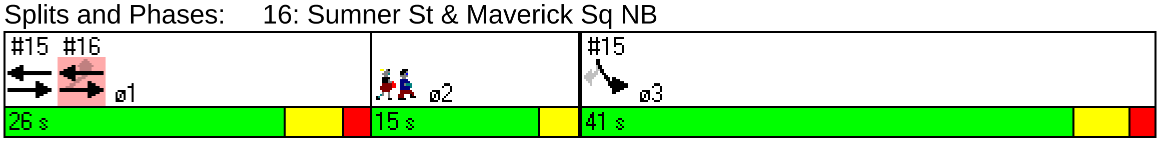
Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	55.0
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	ø2	ø3
Lane Configurations						
Volume (vph)	62	151	127	71		
Lane Group Flow (vph)	0	231	138	77		
Turn Type	Perm			Perm		
Protected Phases		1	1		2	3
Permitted Phases	1			1		
Detector Phases	1	1	1	1		
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0	6.0
Minimum Split (s)	19.0	19.0	19.0	19.0	15.0	12.0
Total Split (s)	26.0	26.0	26.0	26.0	15.0	41.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	18%	50%
Maximum Green (s)	20.0	20.0	20.0	20.0	12.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	5.0	
Pedestrian Calls (#/hr)	40	40	40	40	40	
v/c Ratio		0.54	0.28	0.17		
Control Delay		30.1	15.2	3.1		
Queue Delay		0.0	5.0	1.8		
Total Delay		30.1	20.2	4.9		
Queue Length 50th (ft)		103	30	0		
Queue Length 95th (ft)		178	63	12		
Internal Link Dist (ft)		247	29			
Turn Bay Length (ft)						
Base Capacity (vph)		425	490	461		
Starvation Cap Reductn		0	287	275		
Spillback Cap Reductn		0	0	0		
Storage Cap Reductn		0	0	0		
Reduced v/c Ratio		0.54	0.68	0.41		

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 16: Sumner St & Maverick Sq NB



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.97		1.00	1.00			0.99	
Flpb, ped/bikes		0.97			0.98		0.96	1.00			1.00	
Frt		0.92			0.97		1.00	1.00			0.99	
Flt Protected		0.98			0.98		0.95	1.00			1.00	
Satd. Flow (prot)		1463			1505		1537	1676			1651	
Flt Permitted		0.88			0.86		0.38	1.00			1.00	
Satd. Flow (perm)		1306			1318		618	1676			1651	
Volume (vph)	40	0	65	37	28	21	70	328	0	0	383	28
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	0	71	40	30	23	76	357	0	0	416	30
RTOR Reduction (vph)	0	50	0	0	12	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	64	0	0	81	0	76	357	0	0	443	0
Confl. Peds. (#/hr)	56			43		56	74					74
Turn Type	Perm			Perm			Perm					
Protected Phases		5			5			1			1	
Permitted Phases	5			5			1					
Actuated Green, G (s)		26.0			26.0		43.8	43.8			43.8	
Effective Green, g (s)		27.0			27.0		44.8	44.8			44.8	
Actuated g/C Ratio		0.30			0.30		0.50	0.50			0.50	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		392			395		308	834			822	
v/s Ratio Prot								0.21			c0.27	
v/s Ratio Perm		0.05			c0.06		0.12					
v/c Ratio		0.16			0.21		0.25	0.43			0.54	
Uniform Delay, d1		23.2			23.5		12.9	14.4			15.5	
Progression Factor		1.00			1.00		1.16	1.07			1.00	
Incremental Delay, d2		0.9			1.2		1.7	1.4			2.5	
Delay (s)		24.1			24.7		16.7	16.8			18.0	
Level of Service		C			C		B	B			B	
Approach Delay (s)		24.1			24.7			16.8			18.0	
Approach LOS		C			C			B			B	

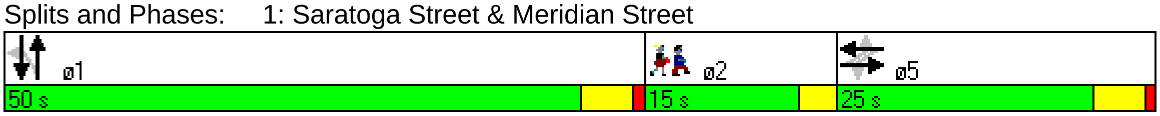
Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations								
Volume (vph)	40	0	37	28	70	328	383	
Lane Group Flow (vph)	0	114	0	93	76	357	446	
Turn Type	Perm		Perm		Perm			
Protected Phases		5		5		1	1	2
Permitted Phases	5		5		1			
Detector Phases	5	5	5	5	1	1	1	
Minimum Initial (s)	6.0	6.0	6.0	6.0	40.0	40.0	40.0	1.0
Minimum Split (s)	25.0	25.0	25.0	25.0	45.0	45.0	45.0	15.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	15.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	55.6%	55.6%	55.6%	17%
Maximum Green (s)	20.0	20.0	20.0	20.0	45.0	45.0	45.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag					Lead	Lead	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio		0.26		0.23	0.24	0.42	0.53	
Control Delay		14.4		24.2	16.6	16.3	17.3	
Queue Delay		0.0		0.0	0.0	2.0	43.5	
Total Delay		14.4		24.2	16.6	18.4	60.8	
Queue Length 50th (ft)		20		35	20	102	159	
Queue Length 95th (ft)		65		79	m40	m159	245	
Internal Link Dist (ft)		95		251		157	210	
Turn Bay Length (ft)					90			
Base Capacity (vph)		435		399	323	857	847	
Starvation Cap Reductn		0		0	0	350	0	
Spillback Cap Reductn		18		4	0	0	429	
Storage Cap Reductn		0		0	0	0	0	
Reduced v/c Ratio		0.27		0.24	0.24	0.70	1.07	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Saratoga Street & Meridian Street



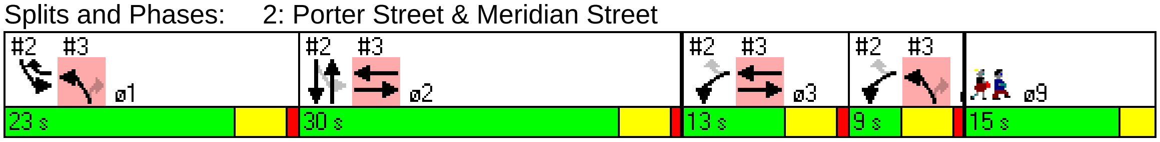
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.96	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1593	1365	1784		1593	1676
Flt Permitted	0.95	1.00	1.00		0.24	1.00
Satd. Flow (perm)	1593	1365	1784		404	1676
Volume (vph)	158	213	184	152	177	310
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	172	232	200	165	192	337
RTOR Reduction (vph)	0	117	34	0	0	0
Lane Group Flow (vph)	172	115	331	0	192	337
Confl. Peds. (#/hr)		76				
Turn Type		pm+ov			pm+pt	
Protected Phases	3 4	1	2		1	2
Permitted Phases		3 4			2	
Actuated Green, G (s)	18.7	42.5	22.3		46.1	22.3
Effective Green, g (s)	19.7	44.5	23.3		48.1	23.3
Actuated g/C Ratio	0.22	0.49	0.26		0.53	0.26
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	349	675	462		544	434
v/s Ratio Prot	c0.11	0.05	0.19		c0.10	c0.20
v/s Ratio Perm		0.04			0.09	
v/c Ratio	0.49	0.17	0.72		0.35	0.78
Uniform Delay, d1	30.8	12.6	30.3		12.3	30.9
Progression Factor	1.05	1.45	1.00		0.47	0.84
Incremental Delay, d2	1.1	0.1	5.2		0.4	7.7
Delay (s)	33.5	18.3	35.6		6.1	33.8
Level of Service	C	B	D		A	C
Approach Delay (s)	24.8		35.6			23.8
Approach LOS	C		D			C

Intersection Summary			
HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT	ø3	ø4	ø9
Lane Configurations								
Volume (vph)	158	213	184	177	310			
Lane Group Flow (vph)	172	232	365	192	337			
Turn Type		pm+ov		pm+pt				
Protected Phases	3 4	1	2	1	2	3	4	9
Permitted Phases		3 4		2				
Detector Phases	3 4	1	2	1	2			
Minimum Initial (s)		4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)		9.0	9.0	9.0	9.0	9.0	9.0	15.0
Total Split (s)	22.0	23.0	30.0	23.0	30.0	13.0	9.0	15.0
Total Split (%)	24.4%	25.6%	33.3%	25.6%	33.3%	14%	10%	17%
Maximum Green (s)		18.0	25.0	18.0	25.0	8.0	4.0	12.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag		Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		C-Max	Min	C-Max	Min	None	None	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio	0.49	0.29	0.73	0.33	0.77			
Control Delay	38.7	2.9	35.6	6.0	37.6			
Queue Delay	0.0	0.0	0.2	0.6	45.9			
Total Delay	38.7	2.9	35.8	6.7	83.5			
Queue Length 50th (ft)	91	0	159	19	190			
Queue Length 95th (ft)	159	13	258	40	297			
Internal Link Dist (ft)	19		186		157			
Turn Bay Length (ft)				90				
Base Capacity (vph)	349	803	548	585	484			
Starvation Cap Reductn	0	0	0	60	169			
Spillback Cap Reductn	0	15	13	168	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.49	0.29	0.68	0.46	1.07			

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 2: Porter Street & Meridian Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.64
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1676	1425		1676	1593	912
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1676	1425		1676	1593	912
Volume (vph)	147	182	0	130	241	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	198	0	141	262	64
RTOR Reduction (vph)	0	0	0	0	0	42
Lane Group Flow (vph)	160	198	0	141	262	22
Confl. Peds. (#/hr)			214			238
Turn Type		Free				Perm
Protected Phases	2 3			2 3	1 4	
Permitted Phases		Free				1 4
Actuated Green, G (s)	35.9	90.0		35.9	28.9	28.9
Effective Green, g (s)	36.9	90.0		36.9	30.9	30.9
Actuated g/C Ratio	0.41	1.00		0.41	0.34	0.34
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	687	1425		687	547	313
v/s Ratio Prot	c0.10			0.08	c0.16	
v/s Ratio Perm		c0.14				0.02
v/c Ratio	0.23	0.14		0.21	0.48	0.07
Uniform Delay, d1	17.3	0.0		17.1	23.2	19.9
Progression Factor	0.37	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.1	0.7	0.1
Delay (s)	6.5	0.2		17.3	23.9	20.0
Level of Service	A	A		B	C	B
Approach Delay (s)	3.0			17.3	23.1	
Approach LOS	A			B	C	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR	ø1	ø2	ø3	ø4	ø9
Lane Configurations										
Volume (vph)	147	182	130	241	59					
Lane Group Flow (vph)	160	198	141	262	64					
Turn Type		Free			Perm					
Protected Phases	2 3		2 3	1 4		1	2	3	4	9
Permitted Phases		Free			1 4					
Detector Phases	2 3		2 3	1 4	1 4					
Minimum Initial (s)						4.0	4.0	4.0	4.0	1.0
Minimum Split (s)						9.0	9.0	9.0	9.0	15.0
Total Split (s)	43.0	0.0	43.0	32.0	32.0	23.0	30.0	13.0	9.0	15.0
Total Split (%)	47.8%	0.0%	47.8%	35.6%	35.6%	26%	33%	14%	10%	17%
Maximum Green (s)						18.0	25.0	8.0	4.0	12.0
Yellow Time (s)						4.0	4.0	4.0	4.0	3.0
All-Red Time (s)						1.0	1.0	1.0	1.0	0.0
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	
Vehicle Extension (s)						3.0	3.0	3.0	3.0	3.0
Recall Mode						C-Max	Min	None	None	None
Walk Time (s)										6.0
Flash Dont Walk (s)										6.0
Pedestrian Calls (#/hr)										40
v/c Ratio	0.23	0.14	0.20	0.44	0.19					
Control Delay	6.9	0.2	17.2	24.2	5.7					
Queue Delay	0.0	0.0	0.4	1.6	0.0					
Total Delay	6.9	0.2	17.6	25.9	5.7					
Queue Length 50th (ft)	33	0	48	89	0					
Queue Length 95th (ft)	m45	m0	87	146	21					
Internal Link Dist (ft)	19		273	210						
Turn Bay Length (ft)										
Base Capacity (vph)	686	1425	686	596	329					
Starvation Cap Reductn	0	0	0	0	0					
Spillback Cap Reductn	0	0	258	188	0					
Storage Cap Reductn	0	0	0	0	0					
Reduced v/c Ratio	0.23	0.14	0.33	0.64	0.19					

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

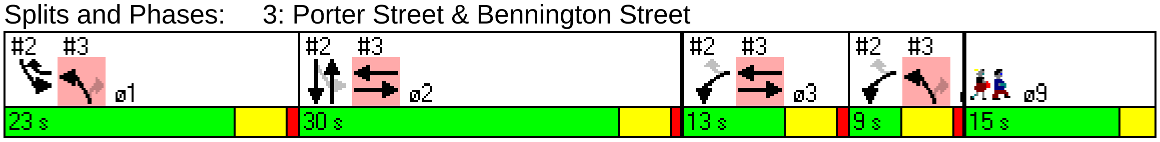
Offset: 9 (10%), Referenced to phase 1:SBL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

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

Splits and Phases: 3: Porter Street & Bennington Street



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	72	75	68	259	390	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	78	82	74	282	424	95
Pedestrians	12			27	3	
Lane Width (ft)	12.0			12.0	16.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			2	0	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					266	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	916	510	530			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	897	402	427			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	84	92			
cM capacity (veh/h)	231	514	919			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	160	355	518
Volume Left	78	74	0
Volume Right	82	0	95
cSH	321	919	1700
Volume to Capacity	0.50	0.08	0.30
Queue Length 95th (ft)	66	7	0
Control Delay (s)	26.8	2.6	0.0
Lane LOS	D	A	
Approach Delay (s)	26.8	2.6	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	106	19	21	134	11	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	115	21	23	146	12	45
Pedestrians				15	98	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	8	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			234		415	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			234		415	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	94
cM capacity (veh/h)			1225		535	726

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	136	168	57
Volume Left	0	23	12
Volume Right	21	0	45
cSH	1700	1225	675
Volume to Capacity	0.08	0.02	0.08
Queue Length 95th (ft)	0	1	7
Control Delay (s)	0.0	1.2	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	10.8
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	147	55	38	86	52	184
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	160	60	41	93	57	200
Pedestrians		8	24		6	
Lane Width (ft)		10.0	16.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	3		0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			175			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	141				497	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				494	96
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				88	79
cM capacity (veh/h)	1433				457	944

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	160	60	135	257
Volume Left	160	0	0	57
Volume Right	0	0	93	200
cSH	1433	1700	1700	764
Volume to Capacity	0.11	0.04	0.08	0.34
Queue Length 95th (ft)	9	0	0	37
Control Delay (s)	7.8	0.0	0.0	12.1
Lane LOS	A			B
Approach Delay (s)	5.7		0.0	12.1
Approach LOS				B

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Yield			Stop			Yield	
Volume (vph)	2	20	9	23	40	78	19	111	28	76	95	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	22	10	25	43	85	21	121	30	83	103	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	34	153	172	197
Volume Left (vph)	2	25	21	83
Volume Right (vph)	10	85	30	11
Hadj (s)	-0.13	-0.27	-0.05	0.08
Departure Headway (s)	4.8	4.6	4.5	4.6
Degree Utilization, x	0.05	0.19	0.22	0.25
Capacity (veh/h)	667	729	753	736
Control Delay (s)	8.1	8.6	8.8	9.2
Approach Delay (s)	8.1	8.6	8.8	9.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.9		
HCM Level of Service	A		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	3	22	102	26	9	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	24	111	28	10	80
Pedestrians	4		1			1
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	230	130			143	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230	130			143	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			99	
cM capacity (veh/h)	750	916			1435	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	139	90
Volume Left	3	0	10
Volume Right	24	28	0
cSH	892	1700	1435
Volume to Capacity	0.03	0.08	0.01
Queue Length 95th (ft)	2	0	1
Control Delay (s)	9.2	0.0	0.9
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.9
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	65	0	1	12	35	62	0	0	0	0	45	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	0	1	13	38	67	0	0	0	0	49	24
Pedestrians								13				
Lane Width (ft)								0.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	105			14			301	286	14	240	253	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	105			14			301	286	14	240	253	72
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			100	100	100	100	92	98
cM capacity (veh/h)	1486			1604			572	589	1067	684	614	991

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	72	118	73
Volume Left	71	13	0
Volume Right	1	67	24
cSH	1486	1604	702
Volume to Capacity	0.05	0.01	0.10
Queue Length 95th (ft)	4	1	9
Control Delay (s)	7.4	0.9	10.7
Lane LOS	A	A	B
Approach Delay (s)	7.4	0.9	10.7
Approach LOS			B

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	31	41	0	48	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	34	45	0	52	4
Pedestrians		3	8			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	1			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	45				86	48
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45				86	48
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1564				909	1019

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	34	45	57
Volume Left	0	0	52
Volume Right	0	0	4
cSH	1700	1700	916
Volume to Capacity	0.02	0.03	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	14.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	327	126	9	427	44	3	17	6	105	63	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	355	137	10	464	48	3	18	7	114	68	4
Pedestrians		2			15			73			128	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			6			11	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					581							
pX, platoon unblocked	0.87						0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	585			620			1065	1208	563	1084	1163	567
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	522			620			1074	1239	497	1097	1188	567
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	85	99	0	49	99
cM capacity (veh/h)	851			858			83	126	467	112	135	461

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	496	522	28	187
Volume Left	3	10	3	114
Volume Right	137	48	7	4
cSH	851	858	141	122
Volume to Capacity	0.00	0.01	0.20	1.53
Queue Length 95th (ft)	0	1	18	334
Control Delay (s)	0.1	0.3	36.8	341.0
Lane LOS	A	A	E	F
Approach Delay (s)	0.1	0.3	36.8	341.0
Approach LOS			E	F

Intersection Summary			
Average Delay	52.7		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	333	0	196	317	0	77
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	362	0	213	345	0	84
Pedestrians				61		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				5		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				862		
pX, platoon unblocked					0.97	
vC, conflicting volume			362		1133	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			362		1136	423
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		100	86
cM capacity (veh/h)			1197		179	599

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	362	558	84
Volume Left	0	213	0
Volume Right	0	0	84
cSH	1700	1197	599
Volume to Capacity	0.21	0.18	0.14
Queue Length 95th (ft)	0	16	12
Control Delay (s)	0.0	4.5	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	4.5	12.0
Approach LOS			B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	152	7	0	0	0	152	44	0	15	77	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	165	8	0	0	0	165	48	0	16	84	86
Pedestrians					97						58	
Lane Width (ft)					0.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						5	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			231			394	231	0	251	227	324
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			231			394	231	0	251	227	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			61	92	100	97	87	87
cM capacity (veh/h)	1623			1272			429	637	1085	607	640	682

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	173	213	186
Volume Left	0	165	16
Volume Right	8	0	86
cSH	1700	463	656
Volume to Capacity	0.10	0.46	0.28
Queue Length 95th (ft)	0	59	29
Control Delay (s)	0.0	19.2	12.6
Lane LOS		C	B
Approach Delay (s)	0.0	19.2	12.6
Approach LOS		C	B

Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	260	70	0	308	9	73	89	0	13	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	283	76	0	335	10	79	97	0	14	2	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					976							
pX, platoon unblocked												
vC, conflicting volume	345			359			661	698	340	709	665	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	345			359			661	698	340	709	665	321
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			79	73	100	95	99	100
cM capacity (veh/h)	1214			1200			374	364	703	278	381	720

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	359	345	176	16
Volume Left	0	0	79	14
Volume Right	76	10	0	0
cSH	1700	1700	369	288
Volume to Capacity	0.21	0.20	0.48	0.06
Queue Length 95th (ft)	0	0	62	4
Control Delay (s)	0.0	0.0	23.4	18.3
Lane LOS			C	C
Approach Delay (s)	0.0	0.0	23.4	18.3
Approach LOS			C	C

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	14	0	0	15	0	14	140	8	0	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	15	0	0	16	0	15	152	9	0	0	10
Pedestrians		65										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		5										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	16			15			154	79	15	164	79	81
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			15			154	79	15	164	79	81
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	81	99	100	100	99
cM capacity (veh/h)	1601			1603			752	799	1064	670	799	926

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	39	16	176	10
Volume Left	24	0	15	0
Volume Right	0	0	9	10
cSH	1601	1700	804	926
Volume to Capacity	0.01	0.01	0.22	0.01
Queue Length 95th (ft)	1	0	21	1
Control Delay (s)	4.5	0.0	10.7	8.9
Lane LOS	A		B	A
Approach Delay (s)	4.5	0.0	10.7	8.9
Approach LOS			B	A

Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	22	15	330	321	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	24	16	359	349	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1063	
pX, platoon unblocked						
vC, conflicting volume	740	349	349			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	740	349	349			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	379	694	1210			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	375	349
Volume Left	0	16	0
Volume Right	24	0	0
cSH	694	1210	1700
Volume to Capacity	0.03	0.01	0.21
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.4	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	0.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	330	0	15	318	0	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	359	0	16	346	0	71
Pedestrians				19		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				2		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				1254		
pX, platoon unblocked						
vC, conflicting volume			359		737	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			359		737	378
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	89
cM capacity (veh/h)			1200		380	658

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	359	362	71
Volume Left	0	16	0
Volume Right	0	0	71
cSH	1700	1200	658
Volume to Capacity	0.21	0.01	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.5	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.1
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	15	0	0	0	0	0	0	7	45	51	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	0	0	0	0	0	8	49	55	71
Pedestrians					38							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			16			115	16	54	62	16	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			16			115	16	54	62	16	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	95	94	93
cM capacity (veh/h)	1623			1601			767	878	1013	926	878	1085

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	16	8	175
Volume Left	0	0	49
Volume Right	0	8	71
cSH	1700	1013	966
Volume to Capacity	0.01	0.01	0.18
Queue Length 95th (ft)	0	1	16
Control Delay (s)	0.0	8.6	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	9.5
Approach LOS		A	A

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	330	7	0	153	165	0	0	0	12	39	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	359	8	0	166	179	0	0	0	13	42	0
Pedestrians		64						42				
Lane Width (ft)		12.0						0.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		5						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	388			366			682	664	362	682	750	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	388			366			682	664	362	682	750	362
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	96	88	100
cM capacity (veh/h)	1171			1192			329	381	646	344	340	682

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	366	346	55
Volume Left	0	0	13
Volume Right	8	179	0
cSH	1171	1700	341
Volume to Capacity	0.00	0.20	0.16
Queue Length 95th (ft)	0	0	14
Control Delay (s)	0.0	0.0	17.6
Lane LOS			C
Approach Delay (s)	0.0	0.0	17.6
Approach LOS			C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	99	222	11	133	42	132	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	108	241	12	145	46	143	0	11
Pedestrians		188			126						32	
Lane Width (ft)		0.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			10						3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	381			0			427	381	126	504	260	448
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	381			0			427	381	126	504	260	448
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	73	94	53	100	98
cM capacity (veh/h)	1146			1623			517	537	827	306	627	594

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	349	12	190	154
Volume Left	0	12	0	143
Volume Right	241	0	46	11
cSH	1700	517	586	316
Volume to Capacity	0.21	0.02	0.32	0.49
Queue Length 95th (ft)	0	2	35	63
Control Delay (s)	0.0	12.1	14.1	26.7
Lane LOS		B	B	D
Approach Delay (s)	0.0	13.9		26.7
Approach LOS		B		D

Intersection Summary			
Average Delay	9.8		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Volume (vph)	42	0	132	28	258	53	0	0	0	0	88	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	143	30	280	58	0	0	0	0	96	68

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	189	368	164
Volume Left (vph)	46	30	0
Volume Right (vph)	143	58	68
Hadj (s)	-0.37	-0.04	-0.22
Departure Headway (s)	4.4	4.5	4.9
Degree Utilization, x	0.23	0.46	0.22
Capacity (veh/h)	770	770	656
Control Delay (s)	8.7	11.3	9.4
Approach Delay (s)	8.7	11.3	9.4
Approach LOS	A	B	A

Intersection Summary			
Delay	10.2		
HCM Level of Service	B		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676	1676		1593	1425
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1676	1676		1593	1425
Volume (vph)	0	118	99	0	166	82
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	128	108	0	180	89
RTOR Reduction (vph)	0	0	0	0	0	46
Lane Group Flow (vph)	0	128	108	0	180	43
Confl. Peds. (#/hr)					188	
Turn Type						Perm
Protected Phases		1	1		3	
Permitted Phases						3
Actuated Green, G (s)		20.2	20.2		35.3	35.3
Effective Green, g (s)		22.2	22.2		37.3	37.3
Actuated g/C Ratio		0.29	0.29		0.48	0.48
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		482	482		770	689
v/s Ratio Prot		c0.08	0.06		c0.11	
v/s Ratio Perm						0.03
v/c Ratio		0.27	0.22		0.23	0.06
Uniform Delay, d1		21.2	20.9		11.6	10.6
Progression Factor		0.08	1.00		1.00	1.00
Incremental Delay, d2		1.2	1.1		0.7	0.2
Delay (s)		2.9	22.0		12.3	10.8
Level of Service		A	C		B	B
Approach Delay (s)		2.9	22.0		11.8	
Approach LOS		A	C		B	

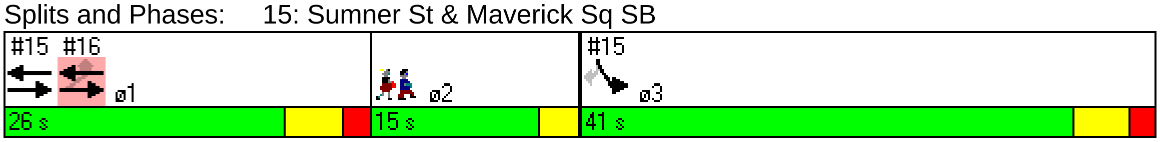
Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	17.7
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR	ø2
Lane Configurations					
Volume (vph)	118	99	166	82	
Lane Group Flow (vph)	128	108	180	89	
Turn Type				Perm	
Protected Phases	1	1	3		2
Permitted Phases				3	
Detector Phases	1	1	3	3	
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0
Minimum Split (s)	19.0	19.0	12.0	12.0	15.0
Total Split (s)	26.0	26.0	41.0	41.0	15.0
Total Split (%)	31.7%	31.7%	50.0%	50.0%	18%
Maximum Green (s)	20.0	20.0	35.0	35.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0
Lead/Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0
Flash Dont Walk (s)	6.0	6.0			5.0
Pedestrian Calls (#/hr)	40	40			40
v/c Ratio	0.26	0.22	0.23	0.12	
Control Delay	3.0	24.0	13.7	3.7	
Queue Delay	0.8	0.0	0.0	0.0	
Total Delay	3.7	24.0	13.7	3.7	
Queue Length 50th (ft)	2	43	55	0	
Queue Length 95th (ft)	4	85	97	24	
Internal Link Dist (ft)	29	412	420		
Turn Bay Length (ft)					
Base Capacity (vph)	490	490	783	746	
Starvation Cap Reductn	174	0	0	0	
Spillback Cap Reductn	0	0	0	60	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.41	0.22	0.23	0.13	

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 15: Sumner St & Maverick Sq SB



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00	0.97		
Flpb, ped/bikes		1.00	1.00	1.00		
Frt		1.00	1.00	0.85		
Flt Protected		0.98	1.00	1.00		
Satd. Flow (prot)		1643	1676	1386		
Flt Permitted		0.89	1.00	1.00		
Satd. Flow (perm)		1479	1676	1386		
Volume (vph)	54	118	72	109	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	128	78	118	0	0
RTOR Reduction (vph)	0	0	0	84	0	0
Lane Group Flow (vph)	0	187	78	34	0	0
Confl. Peds. (#/hr)	9			9		
Turn Type	Perm			Perm		
Protected Phases		1	1			
Permitted Phases	1			1		
Actuated Green, G (s)		20.2	20.2	20.2		
Effective Green, g (s)		22.2	22.2	22.2		
Actuated g/C Ratio		0.29	0.29	0.29		
Clearance Time (s)		6.0	6.0	6.0		
Vehicle Extension (s)		3.0	3.0	3.0		
Lane Grp Cap (vph)		425	482	399		
v/s Ratio Prot			0.05			
v/s Ratio Perm		c0.13		0.02		
v/c Ratio		0.44	0.16	0.09		
Uniform Delay, d1		22.4	20.5	20.1		
Progression Factor		1.00	0.52	0.26		
Incremental Delay, d2		3.3	0.7	0.4		
Delay (s)		25.7	11.4	5.6		
Level of Service		C	B	A		
Approach Delay (s)		25.7	7.9		0.0	
Approach LOS		C	A		A	

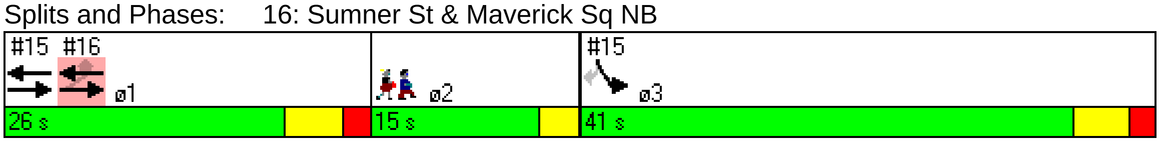
Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	55.0
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	ø2	ø3
Lane Configurations						
Volume (vph)	54	118	72	109		
Lane Group Flow (vph)	0	187	78	118		
Turn Type	Perm			Perm		
Protected Phases		1	1		2	3
Permitted Phases	1			1		
Detector Phases	1	1	1	1		
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0	6.0
Minimum Split (s)	19.0	19.0	19.0	19.0	15.0	12.0
Total Split (s)	26.0	26.0	26.0	26.0	15.0	41.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	18%	50%
Maximum Green (s)	20.0	20.0	20.0	20.0	12.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	5.0	
Pedestrian Calls (#/hr)	40	40	40	40	40	
v/c Ratio		0.43	0.16	0.24		
Control Delay		27.5	12.6	2.5		
Queue Delay		0.0	2.8	1.5		
Total Delay		27.5	15.3	4.1		
Queue Length 50th (ft)		80	14	0		
Queue Length 95th (ft)		143	35	1		
Internal Link Dist (ft)		247	29			
Turn Bay Length (ft)						
Base Capacity (vph)		431	490	488		
Starvation Cap Reductn		0	327	237		
Spillback Cap Reductn		0	0	0		
Storage Cap Reductn		0	0	0		
Reduced v/c Ratio		0.43	0.48	0.47		

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 16: Sumner St & Maverick Sq NB



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.90		1.00	1.00			0.98	
Flpb, ped/bikes		0.90			0.98		0.94	1.00			1.00	
Frt		0.93			0.96		1.00	1.00			0.98	
Flt Protected		0.98			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1368			1385		1501	1676			1619	
Flt Permitted		0.81			0.88		0.41	1.00			1.00	
Satd. Flow (perm)		1130			1239		653	1676			1619	
Volume (vph)	86	0	104	40	51	44	118	464	0	0	328	49
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	0	113	43	55	48	128	504	0	0	357	53
RTOR Reduction (vph)	0	44	0	0	18	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	162	0	0	128	0	128	504	0	0	404	0
Confl. Peds. (#/hr)	178			73		178	113					113
Turn Type	Perm			Perm			Perm					
Protected Phases		5			5			1			1	
Permitted Phases	5			5			1					
Actuated Green, G (s)		26.0			26.0		43.8	43.8			43.8	
Effective Green, g (s)		27.0			27.0		44.8	44.8			44.8	
Actuated g/C Ratio		0.30			0.30		0.50	0.50			0.50	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		339			372		325	834			806	
v/s Ratio Prot								c0.30			0.25	
v/s Ratio Perm		c0.14			0.10		0.20					
v/c Ratio		0.48			0.34		0.39	0.60			0.50	
Uniform Delay, d1		25.7			24.6		14.1	16.2			15.1	
Progression Factor		1.00			1.00		0.46	0.43			1.00	
Incremental Delay, d2		4.8			2.5		2.5	2.3			2.2	
Delay (s)		30.5			27.1		8.9	9.2			17.3	
Level of Service		C			C		A	A			B	
Approach Delay (s)		30.5			27.1			9.2			17.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations								
Volume (vph)	86	0	40	51	118	464	328	
Lane Group Flow (vph)	0	206	0	146	128	504	410	
Turn Type	Perm		Perm		Perm			
Protected Phases		5		5		1	1	2
Permitted Phases	5		5		1			
Detector Phases	5	5	5	5	1	1	1	
Minimum Initial (s)	6.0	6.0	6.0	6.0	40.0	40.0	40.0	1.0
Minimum Split (s)	25.0	25.0	25.0	25.0	45.0	45.0	45.0	15.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	15.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	55.6%	55.6%	55.6%	17%
Maximum Green (s)	20.0	20.0	20.0	20.0	45.0	45.0	45.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag					Lead	Lead	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio		0.58		0.40	0.38	0.59	0.49	
Control Delay		28.5		26.9	8.8	8.9	16.4	
Queue Delay		0.1		0.0	0.7	3.5	0.2	
Total Delay		28.6		26.9	9.4	12.4	16.7	
Queue Length 50th (ft)		75		59	14	65	140	
Queue Length 95th (ft)		#179		120	m24	m94	220	
Internal Link Dist (ft)		95		251		157	210	
Turn Bay Length (ft)					90			
Base Capacity (vph)		357		369	339	857	834	
Starvation Cap Reductn		0		0	59	255	0	
Spillback Cap Reductn		3		1	0	0	85	
Storage Cap Reductn		0		0	0	0	0	
Reduced v/c Ratio		0.58		0.40	0.46	0.84	0.55	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green

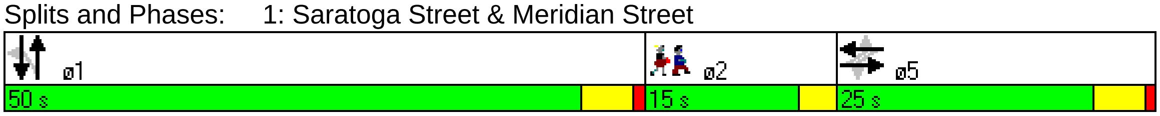
Natural Cycle: 85

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Saratoga Street & Meridian Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1593	1398	1788		1593	1676
Flt Permitted	0.95	1.00	1.00		0.12	1.00
Satd. Flow (perm)	1593	1398	1788		201	1676
Volume (vph)	195	246	341	264	173	304
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	267	371	287	188	330
RTOR Reduction (vph)	0	165	31	0	0	0
Lane Group Flow (vph)	212	102	627	0	188	330
Confl. Peds. (#/hr)		15				
Turn Type		pm+ov			pm+pt	
Protected Phases	3 4	1	2		1	2
Permitted Phases		3 4			2	
Actuated Green, G (s)	15.6	32.4	32.4		49.2	32.4
Effective Green, g (s)	16.6	34.4	33.4		51.2	33.4
Actuated g/C Ratio	0.18	0.38	0.37		0.57	0.37
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	294	534	664		390	622
v/s Ratio Prot	c0.13	0.04	c0.35		c0.10	0.20
v/s Ratio Perm		0.04			0.18	
v/c Ratio	0.72	0.19	0.94		0.48	0.53
Uniform Delay, d1	34.5	18.5	27.4		14.7	22.2
Progression Factor	0.99	2.55	1.00		1.63	0.64
Incremental Delay, d2	7.8	0.2	22.0		0.8	0.8
Delay (s)	41.9	47.4	49.4		24.9	15.0
Level of Service	D	D	D		C	B
Approach Delay (s)	45.0		49.4			18.6
Approach LOS	D		D			B

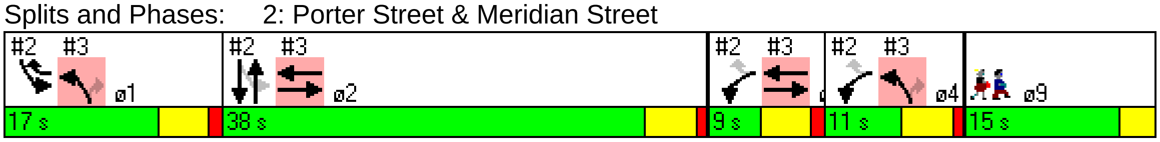
Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT	ø3	ø4	ø9
Lane Configurations								
Volume (vph)	195	246	341	173	304			
Lane Group Flow (vph)	212	267	658	188	330			
Turn Type		pm+ov		pm+pt				
Protected Phases	3 4	1	2	1	2	3	4	9
Permitted Phases		3 4		2				
Detector Phases	3 4	1	2	1	2			
Minimum Initial (s)		4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)		9.0	9.0	9.0	9.0	9.0	9.0	15.0
Total Split (s)	20.0	17.0	38.0	17.0	38.0	9.0	11.0	15.0
Total Split (%)	22.2%	18.9%	42.2%	18.9%	42.2%	10%	12%	17%
Maximum Green (s)		12.0	33.0	12.0	33.0	4.0	6.0	12.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag		Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		C-Max	Min	C-Max	Min	None	None	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio	0.72	0.37	0.95	0.46	0.53			
Control Delay	49.2	6.0	49.8	27.4	17.3			
Queue Delay	0.0	0.0	1.8	2.0	2.1			
Total Delay	49.2	6.0	51.7	29.5	19.3			
Queue Length 50th (ft)	107	9	331	63	106			
Queue Length 95th (ft)	#210	51	#557	128	183			
Internal Link Dist (ft)	19		186		157			
Turn Bay Length (ft)				90				
Base Capacity (vph)	293	713	707	410	633			
Starvation Cap Reductn	0	0	0	0	176			
Spillback Cap Reductn	0	0	13	115	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.72	0.37	0.95	0.64	0.72			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Porter Street & Meridian Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.45
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1676	1425		1676	1593	646
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1676	1425		1676	1593	646
Volume (vph)	317	120	0	201	240	69
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	345	130	0	218	261	75
RTOR Reduction (vph)	0	0	0	0	0	54
Lane Group Flow (vph)	345	130	0	218	261	21
Confl. Peds. (#/hr)			496			378
Turn Type		Free				Perm
Protected Phases	2 3			2 3	1 4	
Permitted Phases		Free				1 4
Actuated Green, G (s)	42.0	90.0		42.0	22.8	22.8
Effective Green, g (s)	43.0	90.0		43.0	24.8	24.8
Actuated g/C Ratio	0.48	1.00		0.48	0.28	0.28
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	801	1425		801	439	178
v/s Ratio Prot	c0.21			0.13	c0.16	
v/s Ratio Perm		c0.09				0.03
v/c Ratio	0.43	0.09		0.27	0.59	0.12
Uniform Delay, d1	15.5	0.0		14.1	28.2	24.4
Progression Factor	0.30	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.2	2.2	0.3
Delay (s)	4.9	0.1		14.3	30.4	24.7
Level of Service	A	A		B	C	C
Approach Delay (s)	3.6			14.3	29.1	
Approach LOS	A			B	C	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

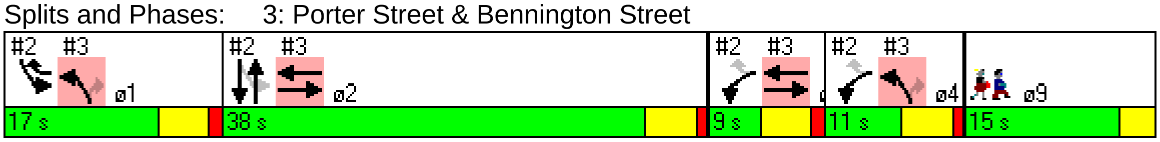
c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR	ø1	ø2	ø3	ø4	ø9
Lane Configurations										
Volume (vph)	317	120	201	240	69					
Lane Group Flow (vph)	345	130	218	261	75					
Turn Type		Free			Perm					
Protected Phases	2 3		2 3	1 4		1	2	3	4	9
Permitted Phases		Free			1 4					
Detector Phases	2 3		2 3	1 4	1 4					
Minimum Initial (s)						4.0	4.0	4.0	4.0	1.0
Minimum Split (s)						9.0	9.0	9.0	9.0	15.0
Total Split (s)	47.0	0.0	47.0	28.0	28.0	17.0	38.0	9.0	11.0	15.0
Total Split (%)	52.2%	0.0%	52.2%	31.1%	31.1%	19%	42%	10%	12%	17%
Yellow Time (s)						4.0	4.0	4.0	4.0	3.0
All-Red Time (s)						1.0	1.0	1.0	1.0	0.0
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?								Yes	Yes	
Recall Mode						C-Max	Min	None	None	None
v/c Ratio	0.43	0.09	0.27	0.53	0.32					
Control Delay	5.9	0.1	15.3	28.9	8.6					
Queue Delay	0.0	0.0	0.8	2.9	0.0					
Total Delay	5.9	0.1	16.0	31.8	8.6					
Queue Length 50th (ft)	56	0	71	98	0					
Queue Length 95th (ft)	m83	m0	119	#182	27					
Internal Link Dist (ft)	19		273	210						
Turn Bay Length (ft)										
Base Capacity (vph)	797	1425	797	488	236					
Starvation Cap Reductn	0	0	0	0	0					
Spillback Cap Reductn	0	0	332	135	0					
Storage Cap Reductn	0	0	0	0	0					
Reduced v/c Ratio	0.43	0.09	0.47	0.74	0.32					

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Porter Street & Bennington Street



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	129	144	156	462	429	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	157	170	502	466	105
Pedestrians	15			28	24	
Lane Width (ft)	12.0			12.0	16.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			2	3	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					266	
pX, platoon unblocked	0.85	0.85	0.85			
vC, conflicting volume	1399	562	587			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1469	486	515			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	67	81			
cM capacity (veh/h)	93	478	884			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	297	672	572
Volume Left	140	170	0
Volume Right	157	0	105
cSH	162	884	1700
Volume to Capacity	1.84	0.19	0.34
Queue Length 95th (ft)	549	18	0
Control Delay (s)	447.3	4.6	0.0
Lane LOS	F	A	
Approach Delay (s)	447.3	4.6	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	88.2		
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	230	17	9	244	32	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	250	18	10	265	35	47
Pedestrians				15	98	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	8	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			366		642	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			366		642	372
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		91	92
cM capacity (veh/h)			1095		399	611

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	268	275	82
Volume Left	0	10	35
Volume Right	18	0	47
cSH	1700	1095	498
Volume to Capacity	0.16	0.01	0.16
Queue Length 95th (ft)	0	1	15
Control Delay (s)	0.0	0.4	13.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	13.6
Approach LOS			B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	249	44	43	191	125	225
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	271	48	47	208	136	245
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			175			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	254				740	151
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230				731	123
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				54	73
cM capacity (veh/h)	1296				298	899

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	271	48	254	380
Volume Left	271	0	0	136
Volume Right	0	0	208	245
cSH	1296	1700	1700	522
Volume to Capacity	0.21	0.03	0.15	0.73
Queue Length 95th (ft)	20	0	0	150
Control Delay (s)	8.5	0.0	0.0	28.2
Lane LOS	A			D
Approach Delay (s)	7.2		0.0	28.2
Approach LOS				D

Intersection Summary			
Average Delay	13.7		
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Yield			Stop			Yield	
Volume (vph)	12	54	23	19	98	173	29	100	39	130	117	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	59	25	21	107	188	32	109	42	141	127	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	97	315	183	288
Volume Left (vph)	13	21	32	141
Volume Right (vph)	25	188	42	20
Hadj (s)	-0.09	-0.31	-0.07	0.09
Departure Headway (s)	5.6	5.1	5.4	5.4
Degree Utilization, x	0.15	0.44	0.28	0.43
Capacity (veh/h)	557	662	598	622
Control Delay (s)	9.6	12.0	10.5	12.5
Approach Delay (s)	9.6	12.0	10.5	12.5
Approach LOS	A	B	B	B

Intersection Summary			
Delay	11.6		
HCM Level of Service	B		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	36	148	24	33	122
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	39	161	26	36	133
Pedestrians	7		3			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	388	181			194	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388	181			194	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	95			97	
cM capacity (veh/h)	594	857			1371	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	50	187	168
Volume Left	11	0	36
Volume Right	39	26	0
cSH	782	1700	1371
Volume to Capacity	0.06	0.11	0.03
Queue Length 95th (ft)	5	0	2
Control Delay (s)	9.9	0.0	1.8
Lane LOS	A		A
Approach Delay (s)	9.9	0.0	1.8
Approach LOS	A		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	0	1	15	47	86	0	0	0	0	111	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	1	16	51	93	0	0	0	0	121	32
Pedestrians		5						75			11	
Lane Width (ft)		12.0						0.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	156			76			477	438	76	316	391	114
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			76			477	438	76	316	391	114
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			100	100	100	100	76	97
cM capacity (veh/h)	1411			1523			368	472	986	592	501	926

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	88	161	152
Volume Left	87	16	0
Volume Right	1	93	32
cSH	1411	1523	553
Volume to Capacity	0.06	0.01	0.28
Queue Length 95th (ft)	5	1	28
Control Delay (s)	7.6	0.8	14.0
Lane LOS	A	A	B
Approach Delay (s)	7.6	0.8	14.0
Approach LOS			B

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	35	49	0	115	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	38	53	0	125	7
Pedestrians		1	2			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	53				93	54
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				93	54
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	99
cM capacity (veh/h)	1552				905	1012

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	38	53	132
Volume Left	0	0	125
Volume Right	0	0	7
cSH	1700	1700	910
Volume to Capacity	0.02	0.03	0.14
Queue Length 95th (ft)	0	0	13
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	525	105	7	431	32	7	25	5	136	60	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	571	114	8	468	35	8	27	5	148	65	25
Pedestrians					29			200			291	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					2			17			24	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					581							
pX, platoon unblocked	0.97						0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	703			976			1435	1696	686	1458	1657	948
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	694			976			1448	1718	676	1473	1677	948
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			0	49	99	0	0	89
cM capacity (veh/h)	729			536			0	53	366	33	57	234

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	695	511	40	238
Volume Left	10	8	8	148
Volume Right	114	35	5	25
cSH	729	536	0	41
Volume to Capacity	0.01	0.01	Err	5.74
Queue Length 95th (ft)	1	1	Err	Err
Control Delay (s)	0.4	0.4	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	0.4	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	455	0	185	337	0	125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	495	0	201	366	0	136
Pedestrians				36		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				3		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				862		
pX, platoon unblocked						
vC, conflicting volume			495		1263	531
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			495		1263	531
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		100	74
cM capacity (veh/h)			1069		152	532

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	495	567	136
Volume Left	0	201	0
Volume Right	0	0	136
cSH	1700	1069	532
Volume to Capacity	0.29	0.19	0.26
Queue Length 95th (ft)	0	17	25
Control Delay (s)	0.0	4.7	14.1
Lane LOS		A	B
Approach Delay (s)	0.0	4.7	14.1
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	149	13	0	0	0	151	34	0	17	125	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	162	14	0	0	0	164	37	0	18	136	72
Pedestrians					115						34	
Lane Width (ft)					0.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			210			424	210	0	222	203	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			210			424	210	0	222	203	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			59	94	100	97	80	90
cM capacity (veh/h)	1623			1322			401	668	1085	669	674	702

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	176	201	226
Volume Left	0	164	18
Volume Right	14	0	72
cSH	1700	433	682
Volume to Capacity	0.10	0.46	0.33
Queue Length 95th (ft)	0	60	36
Control Delay (s)	0.0	20.3	12.9
Lane LOS		C	B
Approach Delay (s)	0.0	20.3	12.9
Approach LOS		C	B

Intersection Summary			
Average Delay	11.6		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	363	73	0	337	17	92	88	0	7	10	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	395	79	0	366	18	100	96	0	8	11	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					976							
pX, platoon unblocked												
vC, conflicting volume	385			474			815	849	376	858	819	434
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	385			474			815	849	376	858	819	434
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			65	68	100	96	96	100
cM capacity (veh/h)	1174			1088			288	298	671	208	310	622

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	474	385	196	18
Volume Left	0	0	100	8
Volume Right	79	18	0	0
cSH	1700	1700	293	258
Volume to Capacity	0.28	0.23	0.67	0.07
Queue Length 95th (ft)	0	0	111	6
Control Delay (s)	0.0	0.0	38.9	20.0
Lane LOS			E	C
Approach Delay (s)	0.0	0.0	38.9	20.0
Approach LOS			E	C

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	44	21	0	0	11	0	6	137	3	0	0	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	23	0	0	12	0	7	149	3	0	0	18
Pedestrians		12										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	12			23			161	130	23	208	130	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			23			161	130	23	208	130	24
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	80	100	100	100	98
cM capacity (veh/h)	1607			1592			764	738	1054	617	738	1042

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	71	12	159	18
Volume Left	48	0	7	0
Volume Right	0	0	3	18
cSH	1607	1700	743	1042
Volume to Capacity	0.03	0.01	0.21	0.02
Queue Length 95th (ft)	2	0	20	1
Control Delay (s)	5.0	0.0	11.2	8.5
Lane LOS	A		B	A
Approach Delay (s)	5.0	0.0	11.2	8.5
Approach LOS			B	A

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	24	11	436	343	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	12	474	373	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1063	
pX, platoon unblocked						
vC, conflicting volume	871	373	373			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	871	373	373			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	99			
cM capacity (veh/h)	318	673	1186			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	26	486	373
Volume Left	0	12	0
Volume Right	26	0	0
cSH	673	1186	1700
Volume to Capacity	0.04	0.01	0.22
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.6	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	394	0	13	350	0	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	428	0	14	380	0	68
Pedestrians				16		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				1		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				1254		
pX, platoon unblocked						
vC, conflicting volume			428		837	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			428		837	444
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	89
cM capacity (veh/h)			1131		333	606

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	428	395	68
Volume Left	0	14	0
Volume Right	0	0	68
cSH	1700	1131	606
Volume to Capacity	0.25	0.01	0.11
Queue Length 95th (ft)	0	1	10
Control Delay (s)	0.0	0.4	11.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.7
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	0	0	0	0	0	0	7	11	69	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	14	0	0	0	0	0	0	8	12	75	68
Pedestrians					23							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			14			120	14	37	45	14	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			14			120	14	37	45	14	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	91	94
cM capacity (veh/h)	1623			1604			749	880	1035	950	880	1085

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	14	8	155
Volume Left	0	0	12
Volume Right	0	8	68
cSH	1700	1035	966
Volume to Capacity	0.01	0.01	0.16
Queue Length 95th (ft)	0	1	14
Control Delay (s)	0.0	8.5	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	8.5	9.4
Approach LOS		A	A

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	394	7	0	181	169	0	0	0	11	58	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	428	8	0	197	184	0	0	0	12	63	0
Pedestrians		46						71				
Lane Width (ft)		12.0						0.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		4						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			436			843	815	406	786	903	432
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451			436			843	815	406	786	903	432
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	77	100
cM capacity (veh/h)	1109			1124			232	309	621	296	275	623

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	446	380	75
Volume Left	10	0	12
Volume Right	8	184	0
cSH	1109	1700	278
Volume to Capacity	0.01	0.22	0.27
Queue Length 95th (ft)	1	0	27
Control Delay (s)	0.3	0.0	22.7
Lane LOS	A		C
Approach Delay (s)	0.3	0.0	22.7
Approach LOS			C

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	76	220	19	158	84	161	0	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	83	239	21	172	91	175	0	25
Pedestrians		239			163						129	
Lane Width (ft)		0.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			14						11	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			0			466	451	163	671	331	570
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451			0			466	451	163	671	331	570
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	62	88	0	100	95
cM capacity (veh/h)	990			1623			440	450	762	163	525	465

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	322	21	263	200
Volume Left	0	21	0	175
Volume Right	239	0	91	25
cSH	1700	440	524	177
Volume to Capacity	0.19	0.05	0.50	1.13
Queue Length 95th (ft)	0	4	70	255
Control Delay (s)	0.0	13.6	18.6	159.5
Lane LOS		B	C	F
Approach Delay (s)	0.0	18.2		159.5
Approach LOS		C		F

Intersection Summary			
Average Delay	46.0		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Volume (vph)	102	0	143	45	222	111	0	0	0	0	89	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	0	155	49	241	121	0	0	0	0	97	80

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	266	411	177
Volume Left (vph)	111	49	0
Volume Right (vph)	155	121	80
Hadj (s)	-0.23	-0.12	-0.24
Departure Headway (s)	4.6	4.6	5.2
Degree Utilization, x	0.34	0.52	0.26
Capacity (veh/h)	731	755	618
Control Delay (s)	10.1	12.5	10.0
Approach Delay (s)	10.1	12.5	10.0
Approach LOS	B	B	A

Intersection Summary			
Delay	11.2		
HCM Level of Service	B		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676	1676		1593	1425
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1676	1676		1593	1425
Volume (vph)	0	205	107	0	164	113
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	223	116	0	178	123
RTOR Reduction (vph)	0	0	0	0	0	64
Lane Group Flow (vph)	0	223	116	0	178	59
Confl. Peds. (#/hr)					378	
Turn Type						Perm
Protected Phases		1	1		3	
Permitted Phases						3
Actuated Green, G (s)		20.2	20.2		35.3	35.3
Effective Green, g (s)		22.2	22.2		37.3	37.3
Actuated g/C Ratio		0.29	0.29		0.48	0.48
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		482	482		770	689
v/s Ratio Prot		c0.13	0.07		c0.11	
v/s Ratio Perm						0.04
v/c Ratio		0.46	0.24		0.23	0.09
Uniform Delay, d1		22.6	21.0		11.6	10.8
Progression Factor		0.14	1.00		1.00	1.00
Incremental Delay, d2		2.3	1.2		0.7	0.2
Delay (s)		5.4	22.2		12.3	11.0
Level of Service		A	C		B	B
Approach Delay (s)		5.4	22.2		11.8	
Approach LOS		A	C		B	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	17.7
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR	ø2
Lane Configurations					
Volume (vph)	205	107	164	113	
Lane Group Flow (vph)	223	116	178	123	
Turn Type				Perm	
Protected Phases	1	1	3		2
Permitted Phases				3	
Detector Phases	1	1	3	3	
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0
Minimum Split (s)	19.0	19.0	12.0	12.0	15.0
Total Split (s)	26.0	26.0	41.0	41.0	15.0
Total Split (%)	31.7%	31.7%	50.0%	50.0%	18%
Maximum Green (s)	20.0	20.0	35.0	35.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0
Lead/Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0
Flash Dont Walk (s)	6.0	6.0			5.0
Pedestrian Calls (#/hr)	40	40			40
v/c Ratio	0.46	0.24	0.23	0.16	
Control Delay	5.5	24.1	13.7	3.4	
Queue Delay	1.7	0.0	0.0	0.1	
Total Delay	7.2	24.1	13.7	3.5	
Queue Length 50th (ft)	4	47	54	0	
Queue Length 95th (ft)	m21	90	97	28	
Internal Link Dist (ft)	29	412	420		
Turn Bay Length (ft)					
Base Capacity (vph)	490	490	783	763	
Starvation Cap Reductn	139	0	0	0	
Spillback Cap Reductn	0	0	0	189	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.64	0.24	0.23	0.21	

Intersection Summary

Cycle Length: 82

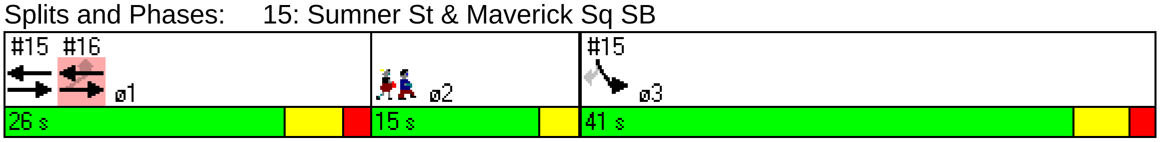
Actuated Cycle Length: 76

Natural Cycle: 50

Control Type: Semi Act-Uncoord

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

Splits and Phases: 15: Sumner St & Maverick Sq SB



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00	0.98		
Flpb, ped/bikes		1.00	1.00	1.00		
Frt		1.00	1.00	0.85		
Flt Protected		0.99	1.00	1.00		
Satd. Flow (prot)		1652	1676	1390		
Flt Permitted		0.88	1.00	1.00		
Satd. Flow (perm)		1474	1676	1390		
Volume (vph)	68	205	139	81	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	223	151	88	0	0
RTOR Reduction (vph)	0	0	0	63	0	0
Lane Group Flow (vph)	0	297	151	25	0	0
Confl. Peds. (#/hr)	7			7		
Turn Type	Perm			Perm		
Protected Phases		1	1			
Permitted Phases	1			1		
Actuated Green, G (s)		20.2	20.2	20.2		
Effective Green, g (s)		22.2	22.2	22.2		
Actuated g/C Ratio		0.29	0.29	0.29		
Clearance Time (s)		6.0	6.0	6.0		
Vehicle Extension (s)		2.0	2.0	2.0		
Lane Grp Cap (vph)		424	482	400		
v/s Ratio Prot			0.09			
v/s Ratio Perm		c0.20		0.02		
v/c Ratio		0.70	0.31	0.06		
Uniform Delay, d1		24.5	21.5	20.0		
Progression Factor		1.00	0.58	0.32		
Incremental Delay, d2		9.3	1.7	0.3		
Delay (s)		33.8	14.1	6.8		
Level of Service		C	B	A		
Approach Delay (s)		33.8	11.4		0.0	
Approach LOS		C	B		A	

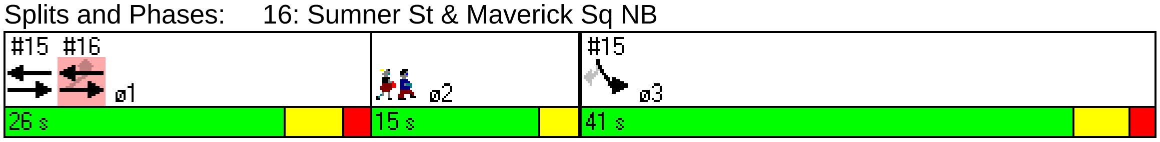
Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	55.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	ø2	ø3
Lane Configurations						
Volume (vph)	68	205	139	81		
Lane Group Flow (vph)	0	297	151	88		
Turn Type	Perm			Perm		
Protected Phases		1	1		2	3
Permitted Phases	1			1		
Detector Phases	1	1	1	1		
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0	6.0
Minimum Split (s)	19.0	19.0	19.0	19.0	15.0	12.0
Total Split (s)	26.0	26.0	26.0	26.0	15.0	41.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	18%	50%
Maximum Green (s)	20.0	20.0	20.0	20.0	12.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	5.0	
Pedestrian Calls (#/hr)	40	40	40	40	40	
v/c Ratio		0.69	0.31	0.19		
Control Delay		35.9	15.1	2.9		
Queue Delay		0.0	5.0	1.8		
Total Delay		35.9	20.1	4.6		
Queue Length 50th (ft)		140	32	0		
Queue Length 95th (ft)		#260	66	12		
Internal Link Dist (ft)		247	29			
Turn Bay Length (ft)						
Base Capacity (vph)		430	490	468		
Starvation Cap Reductn		0	273	266		
Spillback Cap Reductn		0	0	0		
Storage Cap Reductn		0	0	0		
Reduced v/c Ratio		0.69	0.70	0.44		

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Sumner St & Maverick Sq NB



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.97		1.00	1.00			0.99	
Flpb, ped/bikes		0.97			0.98		0.97	1.00			1.00	
Frt		0.92			0.97		1.00	1.00			0.99	
Flt Protected		0.98			0.98		0.95	1.00			1.00	
Satd. Flow (prot)		1463			1505		1537	1676			1649	
Flt Permitted		0.87			0.86		0.38	1.00			1.00	
Satd. Flow (perm)		1294			1317		614	1676			1649	
Volume (vph)	43	0	65	37	28	21	70	328	0	0	383	30
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	71	40	30	23	76	357	0	0	416	33
RTOR Reduction (vph)	0	50	0	0	12	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	81	0	76	357	0	0	446	0
Confl. Peds. (#/hr)	56			43		56	74					74
Turn Type	Perm			Perm			Perm					
Protected Phases		5			5			1			1	
Permitted Phases	5			5			1					
Actuated Green, G (s)		26.0			26.0		43.8	43.8			43.8	
Effective Green, g (s)		27.0			27.0		44.8	44.8			44.8	
Actuated g/C Ratio		0.30			0.30		0.50	0.50			0.50	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		388			395		306	834			821	
v/s Ratio Prot								0.21			c0.27	
v/s Ratio Perm		0.05			c0.06		0.12					
v/c Ratio		0.18			0.21		0.25	0.43			0.54	
Uniform Delay, d1		23.3			23.5		13.0	14.4			15.6	
Progression Factor		1.00			1.00		1.16	1.07			1.00	
Incremental Delay, d2		1.0			1.2		1.7	1.4			2.6	
Delay (s)		24.3			24.7		16.8	16.9			18.1	
Level of Service		C			C		B	B			B	
Approach Delay (s)		24.3			24.7			16.8			18.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

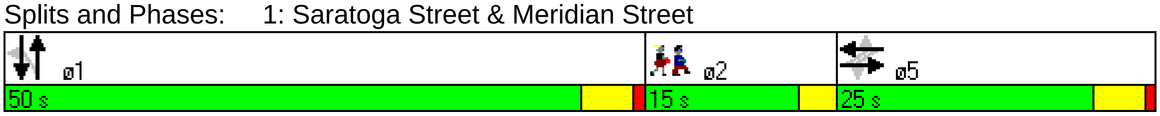
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations								
Volume (vph)	43	0	37	28	70	328	383	
Lane Group Flow (vph)	0	118	0	93	76	357	449	
Turn Type	Perm		Perm		Perm			
Protected Phases		5		5		1	1	2
Permitted Phases	5		5		1			
Detector Phases	5	5	5	5	1	1	1	
Minimum Initial (s)	6.0	6.0	6.0	6.0	40.0	40.0	40.0	1.0
Minimum Split (s)	25.0	25.0	25.0	25.0	45.0	45.0	45.0	15.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	15.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	55.6%	55.6%	55.6%	17%
Maximum Green (s)	20.0	20.0	20.0	20.0	45.0	45.0	45.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag					Lead	Lead	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio		0.27		0.23	0.24	0.42	0.53	
Control Delay		14.9		24.2	16.7	16.4	17.4	
Queue Delay		0.1		0.0	0.0	2.1	47.0	
Total Delay		14.9		24.2	16.7	18.4	64.4	
Queue Length 50th (ft)		21		35	20	102	161	
Queue Length 95th (ft)		68		79	m40	m158	248	
Internal Link Dist (ft)		95		251		157	210	
Turn Bay Length (ft)					90			
Base Capacity (vph)		431		399	320	857	846	
Starvation Cap Reductn		0		0	0	351	0	
Spillback Cap Reductn		18		4	0	0	429	
Storage Cap Reductn		0		0	0	0	0	
Reduced v/c Ratio		0.29		0.24	0.24	0.71	1.08	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated

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

Splits and Phases: 1: Saratoga Street & Meridian Street



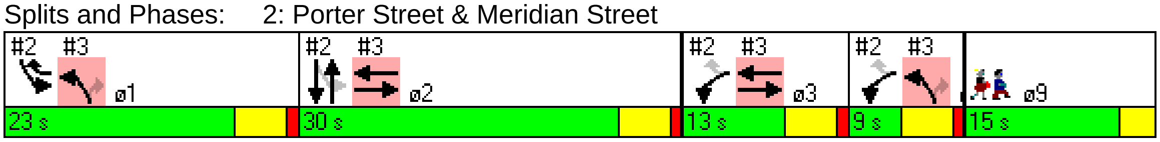
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.96	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1593	1365	1783		1593	1676
Flt Permitted	0.95	1.00	1.00		0.24	1.00
Satd. Flow (perm)	1593	1365	1783		399	1676
Volume (vph)	158	213	184	154	177	310
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	172	232	200	167	192	337
RTOR Reduction (vph)	0	117	35	0	0	0
Lane Group Flow (vph)	172	115	332	0	192	337
Confl. Peds. (#/hr)		76				
Turn Type		pm+ov			pm+pt	
Protected Phases	3 4	1	2		1	2
Permitted Phases		3 4			2	
Actuated Green, G (s)	18.7	42.5	22.3		46.1	22.3
Effective Green, g (s)	19.7	44.5	23.3		48.1	23.3
Actuated g/C Ratio	0.22	0.49	0.26		0.53	0.26
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	349	675	462		542	434
v/s Ratio Prot	c0.11	0.05	0.19		c0.10	c0.20
v/s Ratio Perm		0.04			0.09	
v/c Ratio	0.49	0.17	0.72		0.35	0.78
Uniform Delay, d1	30.8	12.6	30.4		12.3	30.9
Progression Factor	1.05	1.45	1.00		0.47	0.84
Incremental Delay, d2	1.1	0.1	5.3		0.4	7.7
Delay (s)	33.4	18.3	35.7		6.2	33.8
Level of Service	C	B	D		A	C
Approach Delay (s)	24.8		35.7			23.8
Approach LOS	C		D			C

Intersection Summary			
HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT	ø3	ø4	ø9
Lane Configurations								
Volume (vph)	158	213	184	177	310			
Lane Group Flow (vph)	172	232	367	192	337			
Turn Type		pm+ov		pm+pt				
Protected Phases	3 4	1	2	1	2	3	4	9
Permitted Phases		3 4		2				
Detector Phases	3 4	1	2	1	2			
Minimum Initial (s)		4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)		9.0	9.0	9.0	9.0	9.0	9.0	15.0
Total Split (s)	22.0	23.0	30.0	23.0	30.0	13.0	9.0	15.0
Total Split (%)	24.4%	25.6%	33.3%	25.6%	33.3%	14%	10%	17%
Maximum Green (s)		18.0	25.0	18.0	25.0	8.0	4.0	12.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag		Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		C-Max	Min	C-Max	Min	None	None	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio	0.49	0.29	0.74	0.33	0.78			
Control Delay	38.7	2.9	35.7	6.1	37.6			
Queue Delay	0.0	0.0	0.2	0.7	45.9			
Total Delay	38.7	2.9	35.9	6.7	83.5			
Queue Length 50th (ft)	91	0	160	19	190			
Queue Length 95th (ft)	159	13	258	40	296			
Internal Link Dist (ft)	19		186		157			
Turn Bay Length (ft)				90				
Base Capacity (vph)	349	803	549	583	484			
Starvation Cap Reductn	0	0	0	60	169			
Spillback Cap Reductn	0	15	14	168	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.49	0.29	0.69	0.46	1.07			

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 2: Porter Street & Meridian Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.64
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1676	1425		1676	1593	912
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1676	1425		1676	1593	912
Volume (vph)	149	182	0	130	241	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	162	198	0	141	262	64
RTOR Reduction (vph)	0	0	0	0	0	42
Lane Group Flow (vph)	162	198	0	141	262	22
Confl. Peds. (#/hr)			214			238
Turn Type		Free				Perm
Protected Phases	2 3			2 3	1 4	
Permitted Phases		Free				1 4
Actuated Green, G (s)	35.9	90.0		35.9	28.9	28.9
Effective Green, g (s)	36.9	90.0		36.9	30.9	30.9
Actuated g/C Ratio	0.41	1.00		0.41	0.34	0.34
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	687	1425		687	547	313
v/s Ratio Prot	c0.10			0.08	c0.16	
v/s Ratio Perm		c0.14				0.02
v/c Ratio	0.24	0.14		0.21	0.48	0.07
Uniform Delay, d1	17.3	0.0		17.1	23.2	19.9
Progression Factor	0.37	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		0.1	0.7	0.1
Delay (s)	6.6	0.2		17.3	23.9	20.0
Level of Service	A	A		B	C	B
Approach Delay (s)	3.1			17.3	23.1	
Approach LOS	A			B	C	

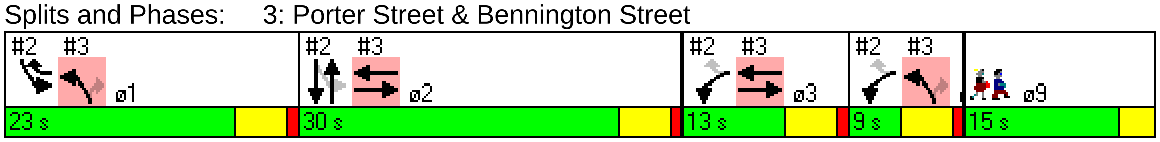
Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR	ø1	ø2	ø3	ø4	ø9
Lane Configurations										
Volume (vph)	149	182	130	241	59					
Lane Group Flow (vph)	162	198	141	262	64					
Turn Type		Free			Perm					
Protected Phases	2 3		2 3	1 4		1	2	3	4	9
Permitted Phases		Free			1 4					
Detector Phases	2 3		2 3	1 4	1 4					
Minimum Initial (s)						4.0	4.0	4.0	4.0	1.0
Minimum Split (s)						9.0	9.0	9.0	9.0	15.0
Total Split (s)	43.0	0.0	43.0	32.0	32.0	23.0	30.0	13.0	9.0	15.0
Total Split (%)	47.8%	0.0%	47.8%	35.6%	35.6%	26%	33%	14%	10%	17%
Maximum Green (s)						18.0	25.0	8.0	4.0	12.0
Yellow Time (s)						4.0	4.0	4.0	4.0	3.0
All-Red Time (s)						1.0	1.0	1.0	1.0	0.0
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?								Yes	Yes	
Vehicle Extension (s)						3.0	3.0	3.0	3.0	3.0
Recall Mode						C-Max	Min	None	None	None
Walk Time (s)										6.0
Flash Dont Walk (s)										6.0
Pedestrian Calls (#/hr)										40
v/c Ratio	0.24	0.14	0.21	0.44	0.19					
Control Delay	6.9	0.2	17.2	24.2	5.7					
Queue Delay	0.0	0.0	0.4	1.6	0.0					
Total Delay	6.9	0.2	17.6	25.8	5.7					
Queue Length 50th (ft)	34	0	48	89	0					
Queue Length 95th (ft)	m45	m0	87	146	21					
Internal Link Dist (ft)	19		273	210						
Turn Bay Length (ft)										
Base Capacity (vph)	686	1425	686	596	329					
Starvation Cap Reductn	0	0	0	0	0					
Spillback Cap Reductn	0	0	258	188	0					
Storage Cap Reductn	0	0	0	0	0					
Reduced v/c Ratio	0.24	0.14	0.33	0.64	0.19					

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Porter Street & Bennington Street



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	74	75	68	259	390	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	82	74	282	424	95
Pedestrians	12			27	3	
Lane Width (ft)	12.0			12.0	16.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			2	0	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					266	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	916	510	530			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	897	402	427			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	84	92			
cM capacity (veh/h)	231	514	919			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	162	355	518
Volume Left	80	74	0
Volume Right	82	0	95
cSH	319	919	1700
Volume to Capacity	0.51	0.08	0.30
Queue Length 95th (ft)	68	7	0
Control Delay (s)	27.3	2.6	0.0
Lane LOS	D	A	
Approach Delay (s)	27.3	2.6	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	108	19	21	134	11	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	21	23	146	12	45
Pedestrians				15	98	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	8	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			236		417	241
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			236		417	241
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	94
cM capacity (veh/h)			1222		534	724

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	138	168	57
Volume Left	0	23	12
Volume Right	21	0	45
cSH	1700	1222	673
Volume to Capacity	0.08	0.02	0.08
Queue Length 95th (ft)	0	1	7
Control Delay (s)	0.0	1.2	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	10.8
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	150	58	40	86	52	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	63	43	93	57	202
Pedestrians		8	24		6	
Lane Width (ft)		10.0	16.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	3		0	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			175			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	143				509	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138				506	99
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				87	79
cM capacity (veh/h)	1430				449	941

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	163	63	137	259
Volume Left	163	0	0	57
Volume Right	0	0	93	202
cSH	1430	1700	1700	759
Volume to Capacity	0.11	0.04	0.08	0.34
Queue Length 95th (ft)	10	0	0	38
Control Delay (s)	7.8	0.0	0.0	12.2
Lane LOS	A			B
Approach Delay (s)	5.7		0.0	12.2
Approach LOS				B

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Yield			Stop			Yield	
Volume (vph)	2	20	9	23	40	78	19	117	30	76	99	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	22	10	25	43	85	21	127	33	83	108	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	34	153	180	201
Volume Left (vph)	2	25	21	83
Volume Right (vph)	10	85	33	11
Hadj (s)	-0.13	-0.27	-0.05	0.08
Departure Headway (s)	4.9	4.6	4.5	4.7
Degree Utilization, x	0.05	0.20	0.23	0.26
Capacity (veh/h)	660	723	752	734
Control Delay (s)	8.1	8.7	8.9	9.3
Approach Delay (s)	8.1	8.7	8.9	9.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.9		
HCM Level of Service	A		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	8	25	105	27	31	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	27	114	29	34	85
Pedestrians	4		1			1
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	286	134			147	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	286	134			147	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			98	
cM capacity (veh/h)	685	911			1429	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	143	118
Volume Left	9	0	34
Volume Right	27	29	0
cSH	844	1700	1429
Volume to Capacity	0.04	0.08	0.02
Queue Length 95th (ft)	3	0	2
Control Delay (s)	9.5	0.0	2.3
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	2.3
Approach LOS	A		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	65	0	1	12	35	70	0	0	0	0	47	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	0	1	13	38	76	0	0	0	0	51	24
Pedestrians								13				
Lane Width (ft)								0.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	114			14			306	295	14	244	258	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			14			306	295	14	244	258	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			100	100	100	100	92	98
cM capacity (veh/h)	1475			1604			565	582	1067	680	611	985

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	72	127	75
Volume Left	71	13	0
Volume Right	1	76	24
cSH	1475	1604	695
Volume to Capacity	0.05	0.01	0.11
Queue Length 95th (ft)	4	1	9
Control Delay (s)	7.5	0.8	10.8
Lane LOS	A	A	B
Approach Delay (s)	7.5	0.8	10.8
Approach LOS			B

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	22.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	31	41	0	50	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	34	45	0	54	4
Pedestrians		3	8			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	1			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	45				86	48
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45				86	48
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1564				909	1019

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	34	45	59
Volume Left	0	0	54
Volume Right	0	0	4
cSH	1700	1700	916
Volume to Capacity	0.02	0.03	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	14.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	327	126	9	427	44	3	22	6	105	71	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	355	137	10	464	48	3	24	7	114	77	4
Pedestrians		2			15			73			128	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			6			11	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					581							
pX, platoon unblocked	0.87						0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	585			620			1069	1208	563	1087	1163	567
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	522			620			1079	1239	497	1100	1188	567
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	81	99	0	43	99
cM capacity (veh/h)	851			858			75	126	467	108	135	461

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	496	522	34	196
Volume Left	3	10	3	114
Volume Right	137	48	7	4
cSH	851	858	136	119
Volume to Capacity	0.00	0.01	0.25	1.64
Queue Length 95th (ft)	0	1	23	365
Control Delay (s)	0.1	0.3	39.9	387.3
Lane LOS	A	A	E	F
Approach Delay (s)	0.1	0.3	39.9	387.3
Approach LOS			E	F

Intersection Summary			
Average Delay	62.0		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	333	0	196	317	0	77
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	362	0	213	345	0	84
Pedestrians				61		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				5		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				862		
pX, platoon unblocked					0.97	
vC, conflicting volume			362		1133	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			362		1136	423
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		100	86
cM capacity (veh/h)			1197		179	599

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	362	558	84
Volume Left	0	213	0
Volume Right	0	0	84
cSH	1700	1197	599
Volume to Capacity	0.21	0.18	0.14
Queue Length 95th (ft)	0	16	12
Control Delay (s)	0.0	4.5	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	4.5	12.0
Approach LOS			B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	163	14	0	0	0	152	44	0	15	77	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	177	15	0	0	0	165	48	0	16	84	86
Pedestrians					97						58	
Lane Width (ft)					0.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						5	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			250			409	250	0	267	243	340
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			250			409	250	0	267	243	340
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			60	92	100	97	87	87
cM capacity (veh/h)	1623			1252			417	621	1085	592	627	669

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	192	213	186
Volume Left	0	165	16
Volume Right	15	0	86
cSH	1700	450	642
Volume to Capacity	0.11	0.47	0.29
Queue Length 95th (ft)	0	62	30
Control Delay (s)	0.0	20.0	12.9
Lane LOS		C	B
Approach Delay (s)	0.0	20.0	12.9
Approach LOS		C	B

Intersection Summary			
Average Delay	11.3		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	260	70	0	308	9	73	107	0	13	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	283	76	0	335	10	79	116	0	14	2	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					976							
pX, platoon unblocked												
vC, conflicting volume	345			359			661	698	340	718	665	321
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	345			359			661	698	340	718	665	321
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			79	68	100	95	99	100
cM capacity (veh/h)	1214			1200			374	364	703	259	381	720

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	359	345	196	16
Volume Left	0	0	79	14
Volume Right	76	10	0	0
cSH	1700	1700	368	270
Volume to Capacity	0.21	0.20	0.53	0.06
Queue Length 95th (ft)	0	0	75	5
Control Delay (s)	0.0	0.0	25.3	19.2
Lane LOS			D	C
Approach Delay (s)	0.0	0.0	25.3	19.2
Approach LOS			D	C

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	40	14	0	0	15	0	14	140	8	0	0	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	15	0	0	16	0	15	152	9	0	0	10
Pedestrians		65										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		5										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	16			15			193	118	15	203	118	81
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			15			193	118	15	203	118	81
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			98	80	99	100	100	99
cM capacity (veh/h)	1601			1603			702	751	1064	619	751	926

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	59	16	176	10
Volume Left	43	0	15	0
Volume Right	0	0	9	10
cSH	1601	1700	757	926
Volume to Capacity	0.03	0.01	0.23	0.01
Queue Length 95th (ft)	2	0	22	1
Control Delay (s)	5.5	0.0	11.2	8.9
Lane LOS	A		B	A
Approach Delay (s)	5.5	0.0	11.2	8.9
Approach LOS			B	A

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	22	15	330	321	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	24	16	359	349	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1063	
pX, platoon unblocked						
vC, conflicting volume	740	349	349			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	740	349	349			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	379	694	1210			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	375	349
Volume Left	0	16	0
Volume Right	24	0	0
cSH	694	1210	1700
Volume to Capacity	0.03	0.01	0.21
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.4	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	0.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	330	0	15	318	0	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	359	0	16	346	0	71
Pedestrians				19		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				2		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				1254		
pX, platoon unblocked						
vC, conflicting volume			359		737	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			359		737	378
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	89
cM capacity (veh/h)			1200		380	658

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	359	362	71
Volume Left	0	16	0
Volume Right	0	0	71
cSH	1700	1200	658
Volume to Capacity	0.21	0.01	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.5	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.1
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	15	0	0	0	0	0	0	7	45	54	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	0	0	0	0	0	8	49	59	71
Pedestrians					38							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			16			116	16	54	62	16	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			16			116	16	54	62	16	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	95	93	93
cM capacity (veh/h)	1623			1601			763	878	1013	926	878	1085

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	16	8	178
Volume Left	0	0	49
Volume Right	0	8	71
cSH	1700	1013	965
Volume to Capacity	0.01	0.01	0.18
Queue Length 95th (ft)	0	1	17
Control Delay (s)	0.0	8.6	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	8.6	9.6
Approach LOS		A	A

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	330	7	0	153	165	0	0	0	12	42	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	359	8	0	166	179	0	0	0	13	46	0
Pedestrians		64						42				
Lane Width (ft)		12.0						0.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		5						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	388			366			683	664	362	682	750	362
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	388			366			683	664	362	682	750	362
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	96	87	100
cM capacity (veh/h)	1171			1192			326	381	646	344	340	682

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	366	346	59
Volume Left	0	0	13
Volume Right	8	179	0
cSH	1171	1700	341
Volume to Capacity	0.00	0.20	0.17
Queue Length 95th (ft)	0	0	15
Control Delay (s)	0.0	0.0	17.7
Lane LOS			C
Approach Delay (s)	0.0	0.0	17.7
Approach LOS			C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	104	222	11	133	42	132	0	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	113	241	12	145	46	143	0	11
Pedestrians		188			126						32	
Lane Width (ft)		0.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			10						3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	386			0			433	386	126	510	266	454
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	386			0			433	386	126	510	266	454
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	73	94	53	100	98
cM capacity (veh/h)	1141			1623			513	533	827	303	623	590

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	354	12	190	154
Volume Left	0	12	0	143
Volume Right	241	0	46	11
cSH	1700	513	583	313
Volume to Capacity	0.21	0.02	0.33	0.49
Queue Length 95th (ft)	0	2	35	64
Control Delay (s)	0.0	12.2	14.1	27.1
Lane LOS		B	B	D
Approach Delay (s)	0.0	14.0		27.1
Approach LOS		B		D

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Volume (vph)	42	0	132	28	260	53	0	0	0	0	88	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	143	30	283	58	0	0	0	0	96	72

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	189	371	167
Volume Left (vph)	46	30	0
Volume Right (vph)	143	58	72
Hadj (s)	-0.37	-0.04	-0.22
Departure Headway (s)	4.4	4.5	4.9
Degree Utilization, x	0.23	0.46	0.23
Capacity (veh/h)	767	768	656
Control Delay (s)	8.7	11.4	9.4
Approach Delay (s)	8.7	11.4	9.4
Approach LOS	A	B	A

Intersection Summary			
Delay	10.2		
HCM Level of Service	B		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676	1676		1593	1425
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1676	1676		1593	1425
Volume (vph)	0	120	99	0	166	82
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	130	108	0	180	89
RTOR Reduction (vph)	0	0	0	0	0	46
Lane Group Flow (vph)	0	130	108	0	180	43
Confl. Peds. (#/hr)					188	
Turn Type						Perm
Protected Phases		1	1		3	
Permitted Phases						3
Actuated Green, G (s)		20.2	20.2		35.3	35.3
Effective Green, g (s)		22.2	22.2		37.3	37.3
Actuated g/C Ratio		0.29	0.29		0.48	0.48
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		482	482		770	689
v/s Ratio Prot		c0.08	0.06		c0.11	
v/s Ratio Perm						0.03
v/c Ratio		0.27	0.22		0.23	0.06
Uniform Delay, d1		21.2	20.9		11.6	10.6
Progression Factor		0.08	1.00		1.00	1.00
Incremental Delay, d2		1.3	1.1		0.7	0.2
Delay (s)		2.9	22.0		12.3	10.8
Level of Service		A	C		B	B
Approach Delay (s)		2.9	22.0		11.8	
Approach LOS		A	C		B	

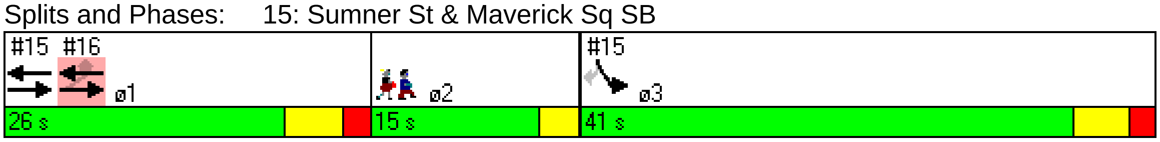
Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	17.7
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR	ø2
Lane Configurations					
Volume (vph)	120	99	166	82	
Lane Group Flow (vph)	130	108	180	89	
Turn Type				Perm	
Protected Phases	1	1	3		2
Permitted Phases				3	
Detector Phases	1	1	3	3	
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0
Minimum Split (s)	19.0	19.0	12.0	12.0	15.0
Total Split (s)	26.0	26.0	41.0	41.0	15.0
Total Split (%)	31.7%	31.7%	50.0%	50.0%	18%
Maximum Green (s)	20.0	20.0	35.0	35.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0
Lead/Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0
Flash Dont Walk (s)	6.0	6.0			5.0
Pedestrian Calls (#/hr)	40	40			40
v/c Ratio	0.27	0.22	0.23	0.12	
Control Delay	3.0	24.0	13.7	3.7	
Queue Delay	0.8	0.0	0.0	0.0	
Total Delay	3.7	24.0	13.7	3.7	
Queue Length 50th (ft)	2	43	55	0	
Queue Length 95th (ft)	4	85	97	24	
Internal Link Dist (ft)	29	412	420		
Turn Bay Length (ft)					
Base Capacity (vph)	490	490	783	746	
Starvation Cap Reductn	170	0	0	0	
Spillback Cap Reductn	0	0	0	60	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.41	0.22	0.23	0.13	

Intersection Summary
Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord

Splits and Phases: 15: Sumner St & Maverick Sq SB



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00	0.97		
Flpb, ped/bikes		1.00	1.00	1.00		
Frt		1.00	1.00	0.85		
Flt Protected		0.98	1.00	1.00		
Satd. Flow (prot)		1643	1676	1386		
Flt Permitted		0.89	1.00	1.00		
Satd. Flow (perm)		1480	1676	1386		
Volume (vph)	54	120	72	109	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	130	78	118	0	0
RTOR Reduction (vph)	0	0	0	84	0	0
Lane Group Flow (vph)	0	189	78	34	0	0
Confl. Peds. (#/hr)	9			9		
Turn Type	Perm			Perm		
Protected Phases		1	1			
Permitted Phases	1			1		
Actuated Green, G (s)		20.2	20.2	20.2		
Effective Green, g (s)		22.2	22.2	22.2		
Actuated g/C Ratio		0.29	0.29	0.29		
Clearance Time (s)		6.0	6.0	6.0		
Vehicle Extension (s)		2.0	2.0	2.0		
Lane Grp Cap (vph)		426	482	399		
v/s Ratio Prot			0.05			
v/s Ratio Perm		c0.13		0.02		
v/c Ratio		0.44	0.16	0.09		
Uniform Delay, d1		22.5	20.5	20.1		
Progression Factor		1.00	0.52	0.26		
Incremental Delay, d2		3.3	0.7	0.4		
Delay (s)		25.8	11.4	5.6		
Level of Service		C	B	A		
Approach Delay (s)		25.8	7.9		0.0	
Approach LOS		C	A		A	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	55.0
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	ø2	ø3
Lane Configurations						
Volume (vph)	54	120	72	109		
Lane Group Flow (vph)	0	189	78	118		
Turn Type	Perm			Perm		
Protected Phases		1	1		2	3
Permitted Phases	1			1		
Detector Phases	1	1	1	1		
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0	6.0
Minimum Split (s)	19.0	19.0	19.0	19.0	15.0	12.0
Total Split (s)	26.0	26.0	26.0	26.0	15.0	41.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	18%	50%
Maximum Green (s)	20.0	20.0	20.0	20.0	12.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	5.0	
Pedestrian Calls (#/hr)	40	40	40	40	40	
v/c Ratio		0.44	0.16	0.24		
Control Delay		27.6	12.6	2.5		
Queue Delay		0.0	2.8	1.5		
Total Delay		27.6	15.3	4.1		
Queue Length 50th (ft)		81	14	0		
Queue Length 95th (ft)		144	35	1		
Internal Link Dist (ft)		247	29			
Turn Bay Length (ft)						
Base Capacity (vph)		432	490	488		
Starvation Cap Reductn		0	327	237		
Spillback Cap Reductn		0	0	0		
Storage Cap Reductn		0	0	0		
Reduced v/c Ratio		0.44	0.48	0.47		

Intersection Summary

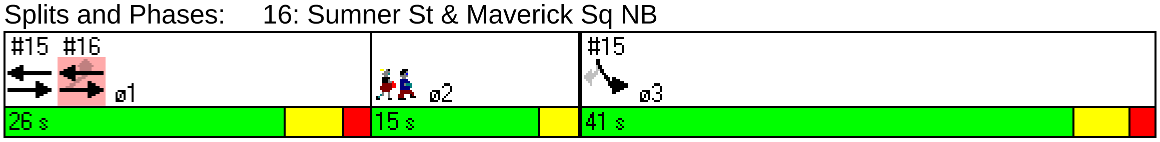
Cycle Length: 82

Actuated Cycle Length: 76

Natural Cycle: 50

Control Type: Semi Act-Uncoord

Splits and Phases: 16: Sumner St & Maverick Sq NB



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	8	24	6	124	85	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	26	7	135	92	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	241	93	95			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	241	93	95			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	100			
cM capacity (veh/h)	744	964	1499			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	141	95
Volume Left	9	7	0
Volume Right	26	0	2
cSH	897	1499	1700
Volume to Capacity	0.04	0.00	0.06
Queue Length 95th (ft)	3	0	0
Control Delay (s)	9.2	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	0	5	131	79	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	5	142	86	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	243	90	93			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	243	90	93			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	743	968	1501			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	148	93
Volume Left	1	5	0
Volume Right	0	0	8
cSH	743	1501	1700
Volume to Capacity	0.00	0.00	0.05
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.9	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	20.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			0.90		1.00	1.00			0.98	
Flpb, ped/bikes		0.90			0.98		0.94	1.00			1.00	
Frt		0.93			0.96		1.00	1.00			0.98	
Flt Protected		0.98			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1366			1389		1501	1676			1618	
Flt Permitted		0.80			0.88		0.41	1.00			1.00	
Satd. Flow (perm)		1116			1244		651	1676			1618	
Volume (vph)	89	0	104	40	52	44	118	464	0	0	328	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	0	113	43	57	48	128	504	0	0	357	54
RTOR Reduction (vph)	0	43	0	0	18	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	167	0	0	131	0	128	504	0	0	405	0
Confl. Peds. (#/hr)	178			73		178	113					113
Turn Type	Perm			Perm			Perm					
Protected Phases		5			5			1			1	
Permitted Phases	5			5			1					
Actuated Green, G (s)		26.0			26.0		43.8	43.8			43.8	
Effective Green, g (s)		27.0			27.0		44.8	44.8			44.8	
Actuated g/C Ratio		0.30			0.30		0.50	0.50			0.50	
Clearance Time (s)		5.0			5.0		5.0	5.0			5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		335			373		324	834			805	
v/s Ratio Prot								c0.30			0.25	
v/s Ratio Perm		c0.15			0.10		0.20					
v/c Ratio		0.50			0.35		0.40	0.60			0.50	
Uniform Delay, d1		25.9			24.6		14.1	16.2			15.1	
Progression Factor		1.00			1.00		0.42	0.39			1.00	
Incremental Delay, d2		5.2			2.6		2.5	2.3			2.2	
Delay (s)		31.2			27.2		8.4	8.6			17.4	
Level of Service		C			C		A	A			B	
Approach Delay (s)		31.2			27.2			8.6			17.4	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

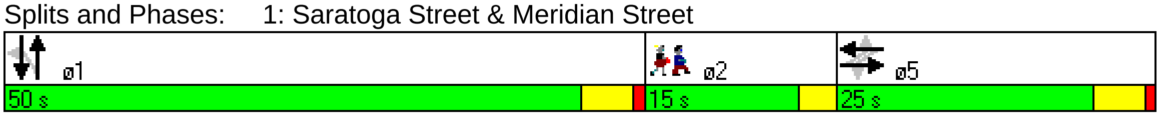
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations								
Volume (vph)	89	0	40	52	118	464	328	
Lane Group Flow (vph)	0	210	0	148	128	504	411	
Turn Type	Perm		Perm		Perm			
Protected Phases		5		5		1	1	2
Permitted Phases	5		5		1			
Detector Phases	5	5	5	5	1	1	1	
Minimum Initial (s)	6.0	6.0	6.0	6.0	40.0	40.0	40.0	1.0
Minimum Split (s)	25.0	25.0	25.0	25.0	45.0	45.0	45.0	15.0
Total Split (s)	25.0	25.0	25.0	25.0	50.0	50.0	50.0	15.0
Total Split (%)	27.8%	27.8%	27.8%	27.8%	55.6%	55.6%	55.6%	17%
Maximum Green (s)	20.0	20.0	20.0	20.0	45.0	45.0	45.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag					Lead	Lead	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio		0.60		0.40	0.38	0.59	0.49	
Control Delay		30.0		27.3	8.2	8.3	16.5	
Queue Delay		0.1		0.0	0.6	3.5	0.2	
Total Delay		30.1		27.3	8.8	11.8	16.7	
Queue Length 50th (ft)		79		60	12	48	141	
Queue Length 95th (ft)		#189		122	m22	m90	221	
Internal Link Dist (ft)		95		251		157	210	
Turn Bay Length (ft)					90			
Base Capacity (vph)		350		369	339	857	833	
Starvation Cap Reductn		0		0	58	256	0	
Spillback Cap Reductn		3		1	0	0	85	
Storage Cap Reductn		0		0	0	0	0	
Reduced v/c Ratio		0.61		0.40	0.46	0.84	0.55	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:NBSB, Start of Green, Master Intersection
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Saratoga Street & Meridian Street



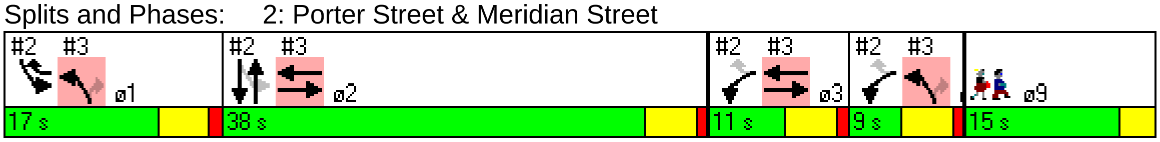
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	16	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1593	1398	1788		1593	1676
Flt Permitted	0.95	1.00	1.00		0.12	1.00
Satd. Flow (perm)	1593	1398	1788		200	1676
Volume (vph)	195	246	341	266	173	304
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	267	371	289	188	330
RTOR Reduction (vph)	0	165	31	0	0	0
Lane Group Flow (vph)	212	102	629	0	188	330
Confl. Peds. (#/hr)		15				
Turn Type		pm+ov			pm+pt	
Protected Phases	3 4	1	2		1	2
Permitted Phases		3 4			2	
Actuated Green, G (s)	15.5	32.3	32.5		49.3	32.5
Effective Green, g (s)	16.5	34.3	33.5		51.3	33.5
Actuated g/C Ratio	0.18	0.38	0.37		0.57	0.37
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	292	533	666		390	624
v/s Ratio Prot	c0.13	0.04	c0.35		c0.10	0.20
v/s Ratio Perm		0.04			0.18	
v/c Ratio	0.73	0.19	0.94		0.48	0.53
Uniform Delay, d1	34.6	18.6	27.3		14.7	22.1
Progression Factor	1.11	2.55	1.00		1.62	0.64
Incremental Delay, d2	8.0	0.2	22.0		0.8	0.7
Delay (s)	46.3	47.5	49.3		24.7	14.8
Level of Service	D	D	D		C	B
Approach Delay (s)	46.9		49.3			18.4
Approach LOS	D		D			B

Intersection Summary			
HCM Average Control Delay	39.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.2
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT	ø3	ø4	ø9
Lane Configurations								
Volume (vph)	195	246	341	173	304			
Lane Group Flow (vph)	212	267	660	188	330			
Turn Type		pm+ov		pm+pt				
Protected Phases	3 4	1	2	1	2	3	4	9
Permitted Phases		3 4		2				
Detector Phases	3 4	1	2	1	2			
Minimum Initial (s)		4.0	4.0	4.0	4.0	4.0	4.0	1.0
Minimum Split (s)		9.0	9.0	9.0	9.0	9.0	9.0	15.0
Total Split (s)	20.0	17.0	38.0	17.0	38.0	11.0	9.0	15.0
Total Split (%)	22.2%	18.9%	42.2%	18.9%	42.2%	12%	10%	17%
Maximum Green (s)		12.0	33.0	12.0	33.0	6.0	4.0	12.0
Yellow Time (s)		4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	0.0
Lead/Lag		Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode		C-Max	Min	C-Max	Min	None	None	None
Walk Time (s)								6.0
Flash Dont Walk (s)								6.0
Pedestrian Calls (#/hr)								40
v/c Ratio	0.73	0.38	0.95	0.46	0.53			
Control Delay	53.5	6.0	50.0	27.3	17.2			
Queue Delay	0.0	0.0	1.9	2.0	2.1			
Total Delay	53.5	6.0	51.9	29.3	19.3			
Queue Length 50th (ft)	116	6	332	62	106			
Queue Length 95th (ft)	#215	49	#559	128	183			
Internal Link Dist (ft)	19		186		157			
Turn Bay Length (ft)				90				
Base Capacity (vph)	292	712	707	410	633			
Starvation Cap Reductn	0	0	0	0	176			
Spillback Cap Reductn	0	0	13	115	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.73	0.38	0.95	0.64	0.72			

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 1:SBL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Porter Street & Meridian Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.44
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1676	1425		1676	1593	630
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1676	1425		1676	1593	630
Volume (vph)	319	120	0	201	240	69
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	130	0	218	261	75
RTOR Reduction (vph)	0	0	0	0	0	56
Lane Group Flow (vph)	347	130	0	218	261	19
Confl. Peds. (#/hr)			496			378
Turn Type		Free				Perm
Protected Phases	2 3			2 3	1 4	
Permitted Phases		Free				1 4
Actuated Green, G (s)	44.0	90.0		44.0	20.8	20.8
Effective Green, g (s)	45.0	90.0		45.0	22.8	22.8
Actuated g/C Ratio	0.50	1.00		0.50	0.25	0.25
Clearance Time (s)						
Vehicle Extension (s)						
Lane Grp Cap (vph)	838	1425		838	404	160
v/s Ratio Prot	c0.21			0.13	c0.16	
v/s Ratio Perm		c0.09				0.03
v/c Ratio	0.41	0.09		0.26	0.65	0.12
Uniform Delay, d1	14.2	0.0		12.9	30.0	25.9
Progression Factor	0.32	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.2	3.5	0.3
Delay (s)	4.8	0.1		13.1	33.5	26.2
Level of Service	A	A		B	C	C
Approach Delay (s)	3.5			13.1	31.9	
Approach LOS	A			B	C	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	NBL	NBR	ø1	ø2	ø3	ø4	ø9
Lane Configurations										
Volume (vph)	319	120	201	240	69					
Lane Group Flow (vph)	347	130	218	261	75					
Turn Type		Free			Perm					
Protected Phases	2 3		2 3	1 4		1	2	3	4	9
Permitted Phases		Free			1 4					
Detector Phases	2 3		2 3	1 4	1 4					
Minimum Initial (s)						4.0	4.0	4.0	4.0	1.0
Minimum Split (s)						9.0	9.0	9.0	9.0	15.0
Total Split (s)	49.0	0.0	49.0	26.0	26.0	17.0	38.0	11.0	9.0	15.0
Total Split (%)	54.4%	0.0%	54.4%	28.9%	28.9%	19%	42%	12%	10%	17%
Yellow Time (s)						4.0	4.0	4.0	4.0	3.0
All-Red Time (s)						1.0	1.0	1.0	1.0	0.0
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?								Yes	Yes	
Recall Mode						C-Max	Min	None	None	None
v/c Ratio	0.41	0.09	0.26	0.58	0.35					
Control Delay	5.7	0.1	14.0	33.6	10.6					
Queue Delay	0.0	0.0	0.6	5.5	0.0					
Total Delay	5.7	0.1	14.6	39.2	10.6					
Queue Length 50th (ft)	56	0	68	102	0					
Queue Length 95th (ft)	m82	m0	113	#216	28					
Internal Link Dist (ft)	19		273	210						
Turn Bay Length (ft)										
Base Capacity (vph)	832	1425	832	453	217					
Starvation Cap Reductn	0	0	0	0	0					
Spillback Cap Reductn	0	0	332	135	0					
Storage Cap Reductn	0	0	0	0	0					
Reduced v/c Ratio	0.42	0.09	0.44	0.82	0.35					

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 80 (89%), Referenced to phase 1:SBL, Start of Green

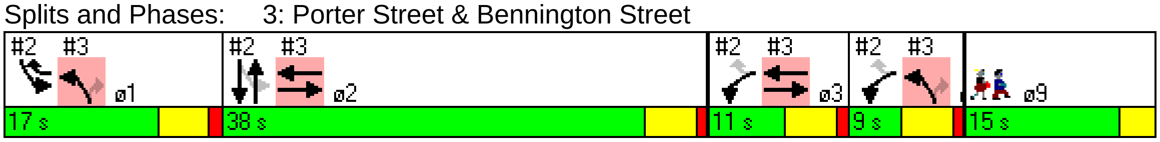
Natural Cycle: 90

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 3: Porter Street & Bennington Street



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	131	144	156	462	429	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	157	170	502	466	105
Pedestrians	15			28	24	
Lane Width (ft)	12.0			12.0	16.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			2	3	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					266	
pX, platoon unblocked	0.85	0.85	0.85			
vC, conflicting volume	1399	562	587			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1469	486	515			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	67	81			
cM capacity (veh/h)	93	478	884			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	299	672	572
Volume Left	142	170	0
Volume Right	157	0	105
cSH	161	884	1700
Volume to Capacity	1.86	0.19	0.34
Queue Length 95th (ft)	557	18	0
Control Delay (s)	457.2	4.6	0.0
Lane LOS	F	A	
Approach Delay (s)	457.2	4.6	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	90.6		
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	232	17	9	244	32	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	252	18	10	265	35	47
Pedestrians				15	98	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				1	8	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			369		644	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			369		644	374
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		91	92
cM capacity (veh/h)			1093		398	609

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	271	275	82
Volume Left	0	10	35
Volume Right	18	0	47
cSH	1700	1093	497
Volume to Capacity	0.16	0.01	0.16
Queue Length 95th (ft)	0	1	15
Control Delay (s)	0.0	0.4	13.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	13.7
Approach LOS			B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	251	47	45	191	125	227
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	273	51	49	208	136	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			175			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	257				749	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	233				741	125
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				54	72
cM capacity (veh/h)	1293				293	896

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	273	51	257	383
Volume Left	273	0	0	136
Volume Right	0	0	208	247
cSH	1293	1700	1700	518
Volume to Capacity	0.21	0.03	0.15	0.74
Queue Length 95th (ft)	20	0	0	155
Control Delay (s)	8.5	0.0	0.0	29.1
Lane LOS	A			D
Approach Delay (s)	7.2		0.0	29.1
Approach LOS				D

Intersection Summary			
Average Delay	14.0		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Yield			Stop			Yield	
Volume (vph)	12	54	23	19	98	173	29	105	41	130	121	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	59	25	21	107	188	32	114	45	141	132	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	97	315	190	292
Volume Left (vph)	13	21	32	141
Volume Right (vph)	25	188	45	20
Hadj (s)	-0.09	-0.31	-0.07	0.09
Departure Headway (s)	5.7	5.1	5.4	5.4
Degree Utilization, x	0.15	0.45	0.29	0.44
Capacity (veh/h)	551	656	597	620
Control Delay (s)	9.7	12.1	10.6	12.6
Approach Delay (s)	9.7	12.1	10.6	12.6
Approach LOS	A	B	B	B

Intersection Summary			
Delay	11.7		
HCM Level of Service	B		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	11	45	161	34	44	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	49	175	37	48	134
Pedestrians	7		3			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	433	200			219	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	433	200			219	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	94			96	
cM capacity (veh/h)	555	836			1343	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	61	212	182
Volume Left	12	0	48
Volume Right	49	37	0
cSH	760	1700	1343
Volume to Capacity	0.08	0.12	0.04
Queue Length 95th (ft)	7	0	3
Control Delay (s)	10.1	0.0	2.3
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	2.3
Approach LOS	B		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	0	1	15	47	96	0	0	0	0	113	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	1	16	51	104	0	0	0	0	123	32
Pedestrians		5						75			11	
Lane Width (ft)		12.0						0.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	166			76			483	448	76	321	397	119
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166			76			483	448	76	321	397	119
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			100	100	100	100	75	97
cM capacity (veh/h)	1399			1523			362	465	986	587	497	920

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	88	172	154
Volume Left	87	16	0
Volume Right	1	104	32
cSH	1399	1523	548
Volume to Capacity	0.06	0.01	0.28
Queue Length 95th (ft)	5	1	29
Control Delay (s)	7.7	0.8	14.1
Lane LOS	A	A	B
Approach Delay (s)	7.7	0.8	14.1
Approach LOS			B

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	35	49	0	117	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	38	53	0	127	7
Pedestrians		1	2			
Lane Width (ft)		12.0	12.0			
Walking Speed (ft/s)		4.0	4.0			
Percent Blockage		0	0			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	53				93	54
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				93	54
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				86	99
cM capacity (veh/h)	1552				905	1012

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	38	53	134
Volume Left	0	0	127
Volume Right	0	0	7
cSH	1700	1700	910
Volume to Capacity	0.02	0.03	0.15
Queue Length 95th (ft)	0	0	13
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	525	105	7	431	32	7	30	5	136	70	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	571	114	8	468	35	8	33	5	148	76	25
Pedestrians					29			200			291	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					2			17			24	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					581							
pX, platoon unblocked	0.97						0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	703			976			1440	1696	686	1461	1657	948
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	694			976			1454	1718	676	1475	1677	948
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			0	39	99	0	0	89
cM capacity (veh/h)	729			536			0	53	366	28	57	234

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	695	511	46	249
Volume Left	10	8	8	148
Volume Right	114	35	5	25
cSH	729	536	0	37
Volume to Capacity	0.01	0.01	Err	6.66
Queue Length 95th (ft)	1	1	Err	Err
Control Delay (s)	0.4	0.4	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	0.4	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	455	0	185	337	0	125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	495	0	201	366	0	136
Pedestrians				36		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				3		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				862		
pX, platoon unblocked						
vC, conflicting volume			495		1263	531
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			495		1263	531
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			81		100	74
cM capacity (veh/h)			1069		152	532

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	495	567	136
Volume Left	0	201	0
Volume Right	0	0	136
cSH	1700	1069	532
Volume to Capacity	0.29	0.19	0.26
Queue Length 95th (ft)	0	17	25
Control Delay (s)	0.0	4.7	14.1
Lane LOS		A	B
Approach Delay (s)	0.0	4.7	14.1
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Free			Free			Yield			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	159	19	0	0	0	151	34	0	17	125	66
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	173	21	0	0	0	164	37	0	18	136	72
Pedestrians					115						34	
Lane Width (ft)					0.0						12.0	
Walking Speed (ft/s)					4.0						4.0	
Percent Blockage					0						3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			227			438	227	0	236	217	332
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			227			438	227	0	236	217	332
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			58	94	100	97	79	90
cM capacity (veh/h)	1623			1303			391	653	1085	654	662	689

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	193	201	226
Volume Left	0	164	18
Volume Right	21	0	72
cSH	1700	422	670
Volume to Capacity	0.11	0.48	0.34
Queue Length 95th (ft)	0	63	37
Control Delay (s)	0.0	21.1	13.1
Lane LOS		C	B
Approach Delay (s)	0.0	21.1	13.1
Approach LOS		C	B

Intersection Summary			
Average Delay	11.6		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	363	73	0	337	17	92	104	0	7	10	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	395	79	0	366	18	100	113	0	8	11	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					976							
pX, platoon unblocked												
vC, conflicting volume	385			474			815	849	376	866	819	434
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	385			474			815	849	376	866	819	434
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			65	62	100	96	96	100
cM capacity (veh/h)	1174			1088			288	298	671	193	310	622

Direction, Lane #	NB 1	SB 1	NE 1	SW 1
Volume Total	474	385	213	18
Volume Left	0	0	100	8
Volume Right	79	18	0	0
cSH	1700	1700	293	248
Volume to Capacity	0.28	0.23	0.73	0.07
Queue Length 95th (ft)	0	0	131	6
Control Delay (s)	0.0	0.0	44.1	20.7
Lane LOS			E	C
Approach Delay (s)	0.0	0.0	44.1	20.7
Approach LOS			E	C

Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	60	21	0	0	11	0	6	137	3	0	0	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	23	0	0	12	0	7	149	3	0	0	18
Pedestrians		12										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		1										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	12			23			196	165	23	243	165	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			23			196	165	23	243	165	24
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			99	79	100	100	100	98
cM capacity (veh/h)	1607			1592			719	698	1054	575	698	1042

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	88	12	159	18
Volume Left	65	0	7	0
Volume Right	0	0	3	18
cSH	1607	1700	704	1042
Volume to Capacity	0.04	0.01	0.23	0.02
Queue Length 95th (ft)	3	0	22	1
Control Delay (s)	5.5	0.0	11.6	8.5
Lane LOS	A		B	A
Approach Delay (s)	5.5	0.0	11.6	8.5
Approach LOS			B	A

Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	24	11	436	343	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	12	474	373	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1063	
pX, platoon unblocked						
vC, conflicting volume	871	373	373			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	871	373	373			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	99			
cM capacity (veh/h)	318	673	1186			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	26	486	373
Volume Left	0	12	0
Volume Right	26	0	0
cSH	673	1186	1700
Volume to Capacity	0.04	0.01	0.22
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.6	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	394	0	13	350	0	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	428	0	14	380	0	68
Pedestrians				16		
Lane Width (ft)				12.0		
Walking Speed (ft/s)				4.0		
Percent Blockage				1		
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				1254		
pX, platoon unblocked						
vC, conflicting volume			428		837	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			428		837	444
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	89
cM capacity (veh/h)			1131		333	606

Direction, Lane #	NB 1	SB 1	NW 1
Volume Total	428	395	68
Volume Left	0	14	0
Volume Right	0	0	68
cSH	1700	1131	606
Volume to Capacity	0.25	0.01	0.11
Queue Length 95th (ft)	0	1	10
Control Delay (s)	0.0	0.4	11.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.7
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	13	0	0	0	0	0	0	7	11	73	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	14	0	0	0	0	0	0	8	12	79	68
Pedestrians					23							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			14			122	14	37	45	14	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			14			122	14	37	45	14	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	99	91	94
cM capacity (veh/h)	1623			1604			744	880	1035	950	880	1085

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	14	8	160
Volume Left	0	0	12
Volume Right	0	8	68
cSH	1700	1035	963
Volume to Capacity	0.01	0.01	0.17
Queue Length 95th (ft)	0	1	15
Control Delay (s)	0.0	8.5	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	8.5	9.5
Approach LOS		A	A

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	394	7	0	181	169	0	0	0	11	62	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	428	8	0	197	184	0	0	0	12	67	0
Pedestrians		46						71				
Lane Width (ft)		12.0						0.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		4						0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	451			436			845	815	406	786	903	432
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451			436			845	815	406	786	903	432
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	75	100
cM capacity (veh/h)	1109			1124			228	309	621	296	275	623

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	446	380	79
Volume Left	10	0	12
Volume Right	8	184	0
cSH	1109	1700	278
Volume to Capacity	0.01	0.22	0.29
Queue Length 95th (ft)	1	0	29
Control Delay (s)	0.3	0.0	23.1
Lane LOS	A		C
Approach Delay (s)	0.3	0.0	23.1
Approach LOS			C

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	82	220	19	158	84	161	0	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	89	239	21	172	91	175	0	25
Pedestrians		239			163						129	
Lane Width (ft)		0.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			14						11	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	457			0			473	457	163	678	338	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	457			0			473	457	163	678	338	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	61	88	0	100	95
cM capacity (veh/h)	985			1623			435	446	762	161	521	461

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	328	21	263	200
Volume Left	0	21	0	175
Volume Right	239	0	91	25
cSH	1700	435	521	175
Volume to Capacity	0.19	0.05	0.50	1.14
Queue Length 95th (ft)	0	4	70	259
Control Delay (s)	0.0	13.7	18.7	165.5
Lane LOS		B	C	F
Approach Delay (s)	0.0	18.4		165.5
Approach LOS		C		F

Intersection Summary			
Average Delay	47.2		
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Stop			Stop			Stop	
Volume (vph)	102	0	143	45	225	111	0	0	0	0	89	77
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	0	155	49	245	121	0	0	0	0	97	84

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	266	414	180
Volume Left (vph)	111	49	0
Volume Right (vph)	155	121	84
Hadj (s)	-0.23	-0.12	-0.24
Departure Headway (s)	4.7	4.6	5.2
Degree Utilization, x	0.34	0.53	0.26
Capacity (veh/h)	728	753	617
Control Delay (s)	10.1	12.7	10.0
Approach Delay (s)	10.1	12.7	10.0
Approach LOS	B	B	B

Intersection Summary			
Delay	11.3		
HCM Level of Service	B		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1676	1676		1593	1425
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1676	1676		1593	1425
Volume (vph)	0	207	107	0	164	113
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	225	116	0	178	123
RTOR Reduction (vph)	0	0	0	0	0	64
Lane Group Flow (vph)	0	225	116	0	178	59
Confl. Peds. (#/hr)					378	
Turn Type						Perm
Protected Phases		1	1		3	
Permitted Phases						3
Actuated Green, G (s)		20.2	20.2		35.3	35.3
Effective Green, g (s)		22.2	22.2		37.3	37.3
Actuated g/C Ratio		0.29	0.29		0.48	0.48
Clearance Time (s)		6.0	6.0		6.0	6.0
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Lane Grp Cap (vph)		482	482		770	689
v/s Ratio Prot		c0.13	0.07		c0.11	
v/s Ratio Perm						0.04
v/c Ratio		0.47	0.24		0.23	0.09
Uniform Delay, d1		22.6	21.0		11.6	10.8
Progression Factor		0.14	1.00		1.00	1.00
Incremental Delay, d2		2.3	1.2		0.7	0.2
Delay (s)		5.4	22.2		12.3	11.0
Level of Service		A	C		B	B
Approach Delay (s)		5.4	22.2		11.8	
Approach LOS		A	C		B	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	17.7
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	SBL	SBR	ø2
Lane Configurations					
Volume (vph)	207	107	164	113	
Lane Group Flow (vph)	225	116	178	123	
Turn Type				Perm	
Protected Phases	1	1	3		2
Permitted Phases				3	
Detector Phases	1	1	3	3	
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0
Minimum Split (s)	19.0	19.0	12.0	12.0	15.0
Total Split (s)	26.0	26.0	41.0	41.0	15.0
Total Split (%)	31.7%	31.7%	50.0%	50.0%	18%
Maximum Green (s)	20.0	20.0	35.0	35.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0
Lead/Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes			Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None
Walk Time (s)	7.0	7.0			7.0
Flash Dont Walk (s)	6.0	6.0			5.0
Pedestrian Calls (#/hr)	40	40			40
v/c Ratio	0.46	0.24	0.23	0.16	
Control Delay	5.5	24.1	13.7	3.4	
Queue Delay	1.8	0.0	0.0	0.1	
Total Delay	7.3	24.1	13.7	3.5	
Queue Length 50th (ft)	4	47	54	0	
Queue Length 95th (ft)	m21	90	97	28	
Internal Link Dist (ft)	29	412	420		
Turn Bay Length (ft)					
Base Capacity (vph)	490	490	783	763	
Starvation Cap Reductn	139	0	0	0	
Spillback Cap Reductn	0	0	0	189	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.64	0.24	0.23	0.21	

Intersection Summary

Cycle Length: 82

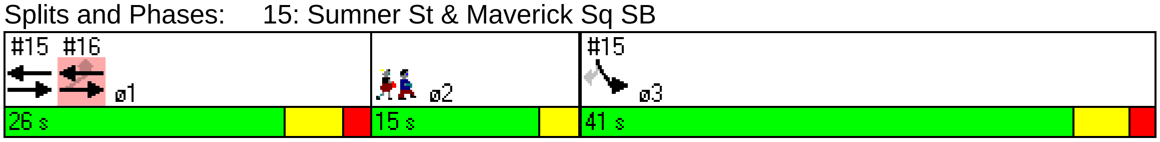
Actuated Cycle Length: 76

Natural Cycle: 50

Control Type: Semi Act-Uncoord

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

Splits and Phases: 15: Sumner St & Maverick Sq SB



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		1.00	1.00	1.00		
Frpb, ped/bikes		1.00	1.00	0.98		
Flpb, ped/bikes		1.00	1.00	1.00		
Frt		1.00	1.00	0.85		
Flt Protected		0.99	1.00	1.00		
Satd. Flow (prot)		1652	1676	1390		
Flt Permitted		0.88	1.00	1.00		
Satd. Flow (perm)		1476	1676	1390		
Volume (vph)	68	207	139	81	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	225	151	88	0	0
RTOR Reduction (vph)	0	0	0	63	0	0
Lane Group Flow (vph)	0	299	151	25	0	0
Confl. Peds. (#/hr)	7			7		
Turn Type	Perm			Perm		
Protected Phases		1	1			
Permitted Phases	1			1		
Actuated Green, G (s)		20.2	20.2	20.2		
Effective Green, g (s)		22.2	22.2	22.2		
Actuated g/C Ratio		0.29	0.29	0.29		
Clearance Time (s)		6.0	6.0	6.0		
Vehicle Extension (s)		2.0	2.0	2.0		
Lane Grp Cap (vph)		424	482	400		
v/s Ratio Prot			0.09			
v/s Ratio Perm		c0.20		0.02		
v/c Ratio		0.71	0.31	0.06		
Uniform Delay, d1		24.6	21.5	20.0		
Progression Factor		1.00	0.58	0.32		
Incremental Delay, d2		9.5	1.7	0.3		
Delay (s)		34.1	14.1	6.8		
Level of Service		C	B	A		
Approach Delay (s)		34.1	11.4		0.0	
Approach LOS		C	B		A	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	55.0
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

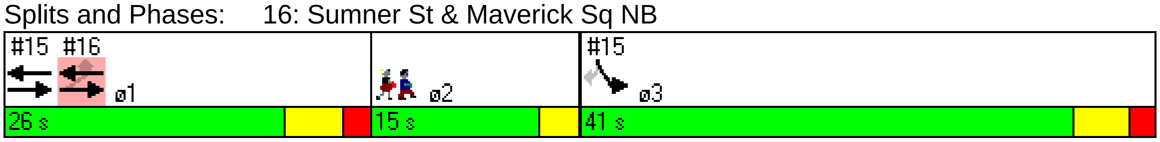
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	ø2	ø3
Lane Configurations						
Volume (vph)	68	207	139	81		
Lane Group Flow (vph)	0	299	151	88		
Turn Type	Perm			Perm		
Protected Phases		1	1		2	3
Permitted Phases	1			1		
Detector Phases	1	1	1	1		
Minimum Initial (s)	6.0	6.0	6.0	6.0	1.0	6.0
Minimum Split (s)	19.0	19.0	19.0	19.0	15.0	12.0
Total Split (s)	26.0	26.0	26.0	26.0	15.0	41.0
Total Split (%)	31.7%	31.7%	31.7%	31.7%	18%	50%
Maximum Green (s)	20.0	20.0	20.0	20.0	12.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	Max	Max	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	6.0	5.0	
Pedestrian Calls (#/hr)	40	40	40	40	40	
v/c Ratio		0.70	0.31	0.19		
Control Delay		36.1	15.1	2.9		
Queue Delay		0.0	5.0	1.8		
Total Delay		36.1	20.1	4.6		
Queue Length 50th (ft)		141	32	0		
Queue Length 95th (ft)		#261	66	12		
Internal Link Dist (ft)		247	29			
Turn Bay Length (ft)						
Base Capacity (vph)		430	490	468		
Starvation Cap Reductn		0	273	266		
Spillback Cap Reductn		0	0	0		
Storage Cap Reductn		0	0	0		
Reduced v/c Ratio		0.70	0.70	0.44		

Intersection Summary

Cycle Length: 82
Actuated Cycle Length: 76
Natural Cycle: 50
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Sumner St & Maverick Sq NB



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	4	12	19	187	155	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	13	21	203	168	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	415	171	173			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	415	171	173			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	585	873	1404			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	224	173
Volume Left	4	21	0
Volume Right	13	0	4
cSH	777	1404	1700
Volume to Capacity	0.02	0.01	0.10
Queue Length 95th (ft)	2	1	0
Control Delay (s)	9.7	0.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	0.8	0.0
Approach LOS	A		

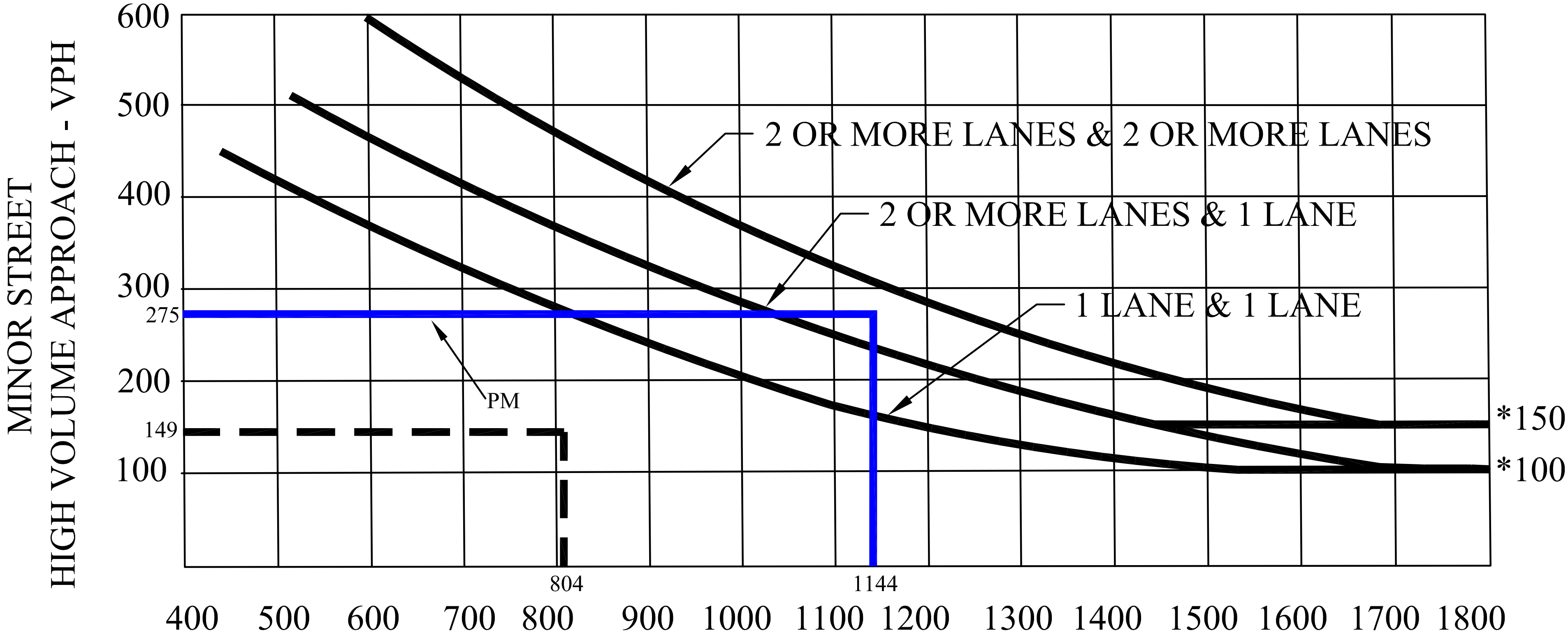
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	13	1	0	182	133	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	1	0	198	145	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	343	145	146			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343	145	146			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	653	902	1436			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	198	146
Volume Left	14	0	0
Volume Right	1	0	1
cSH	666	1436	1700
Volume to Capacity	0.02	0.00	0.09
Queue Length 95th (ft)	2	0	0
Control Delay (s)	10.5	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

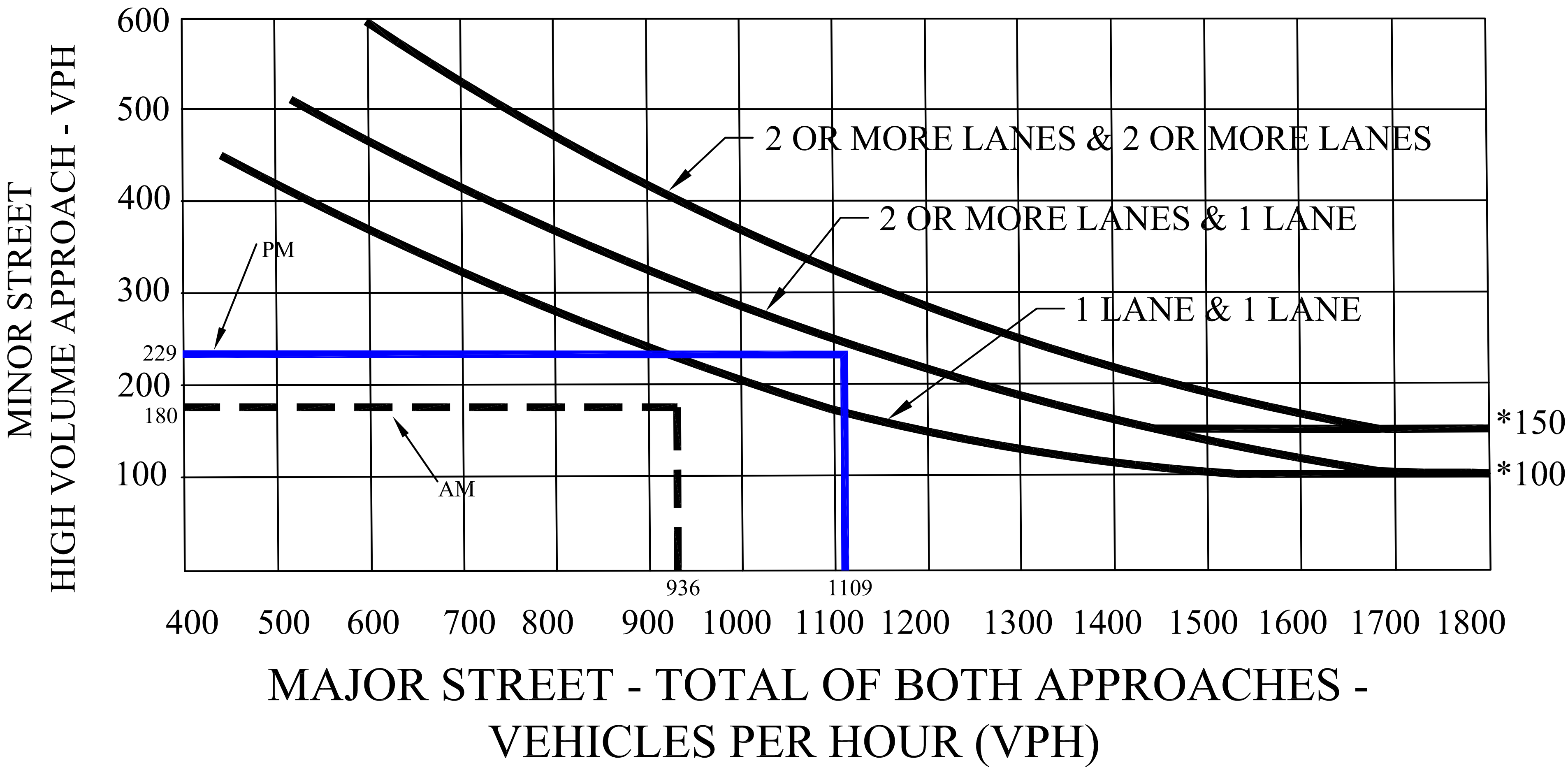
TRAFFIC SIGNAL WARRANT ANALYSIS
MERIDIAN ST/CENTRAL SQ SOUTH
2013 BUILD VOLUMES



MAJOR STREET - TOTAL OF BOTH APPROACHES -
VEHICLES PER HOUR (VPH)

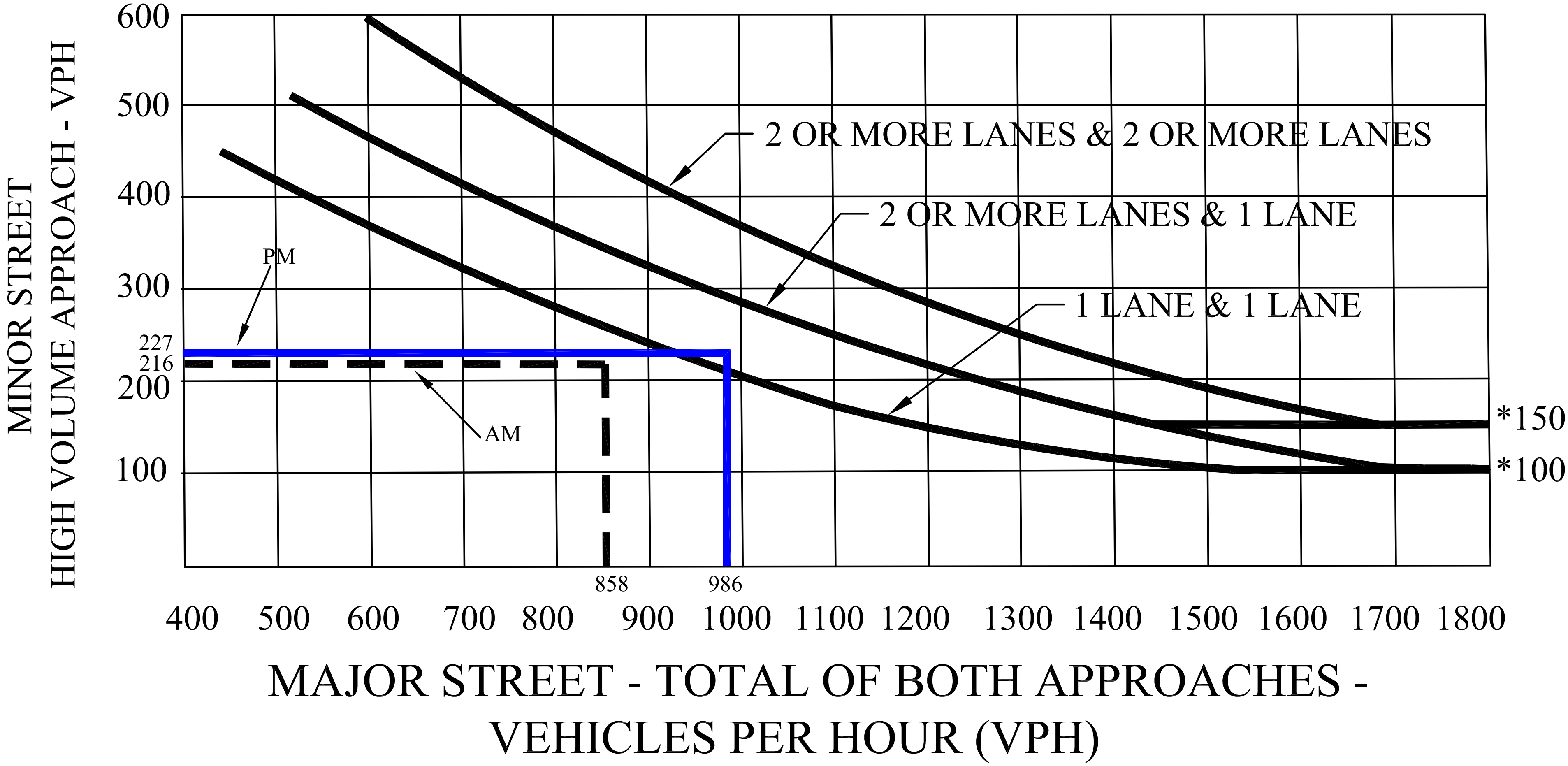
*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS
MERIDIAN ST/LONDON ST
2013 BUILD VOLUMES



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS
MERIDIAN ST/HAVRE ST/GOVE ST/DECATUR ST
2013 BUILD VOLUMES



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

East Boston Transportation Action Plan

Boston Transportation Department

Figure 16 – Central Square, Long-Term Recommendations