PUBLIC NOTICE

The Boston Redevelopment Authority ("BRA"), pursuant to Article 80 of the Boston Zoning Code, hereby gives notice that an Expanded Project Notification Form for Large Project Review ("PNF") was filed by AvalonBay on Monday, August 8, 2011 for the 45 Stuart Street Residences project (the "Proposed Project").

The Proposed Project includes the construction of a new 29-story residential building on the site of an existing surface parking lot. The new approximately 390,000 square foot building (excluding off-street parking) will house approximately 404 residential units (studio, one-bedroom and two-bedroom units) on the upper 22 floors, approximately 198 managed parking spaces on the ground floor and floors two through five, and lobby and support space on the ground floor.

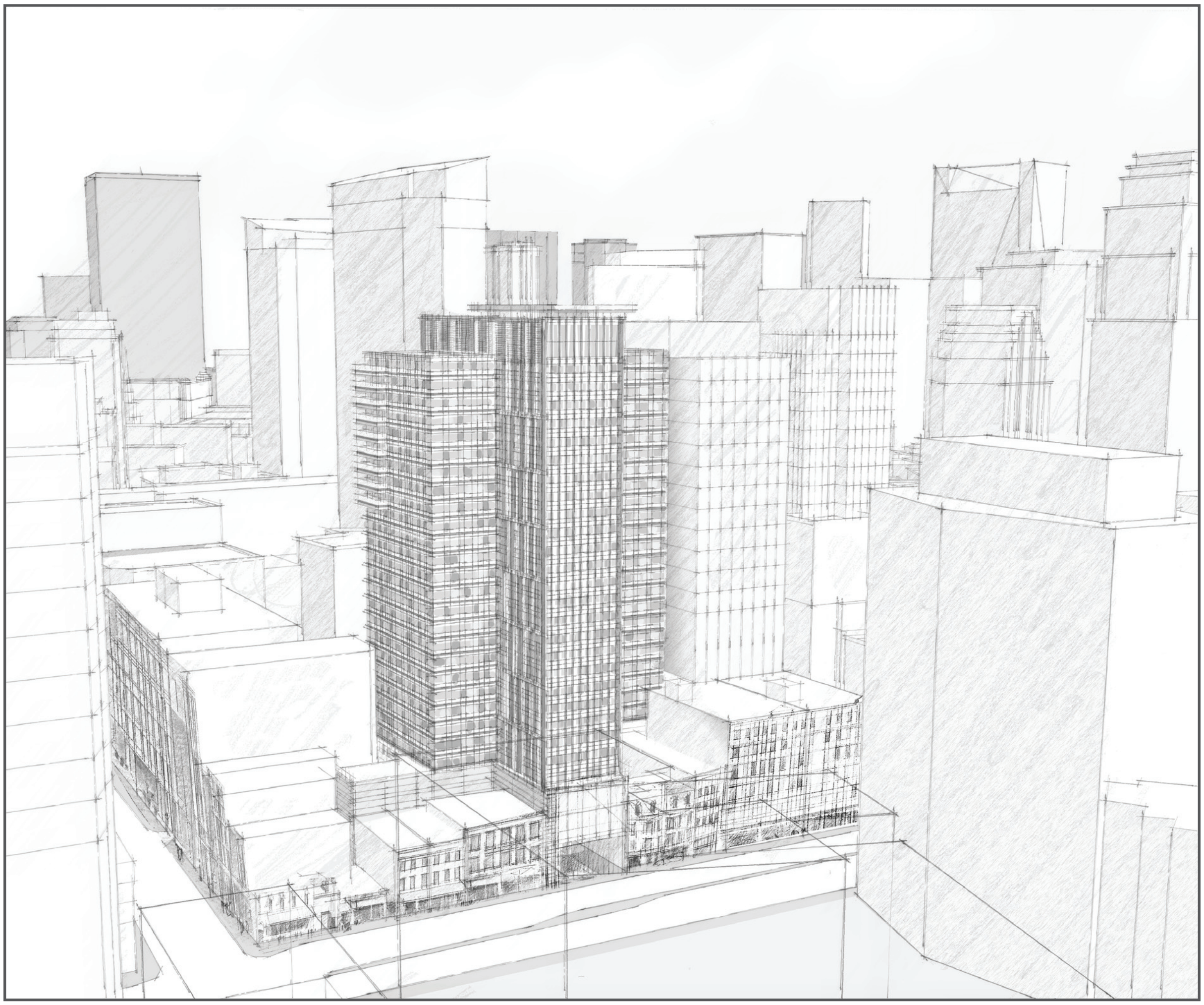
Approvals are requested of the BRA pursuant to Article 80 for the issuance of a Certificate of Compliance by the Director of the BRA. The BRA in the Scoping Determination for such PNF may waive further review pursuant to Section 80B-5.3(d), if, after reviewing public comments, the BRA finds that such PNF adequately describes the Proposed Project's impacts.

The PNF may be reviewed in the office of the Secretary of the BRA, Room 910, Boston City Hall, Boston, MA 02201, between 9:00 AM and 5:00 PM, Monday through Friday, except legal holidays. Public comments on the PNF should be transmitted to Geoffrey Lewis, BRA, at the address stated above within 45 days of the date of this notice or by September 22, 2011.

BOSTON REDEVELOPMENT AUTHORITY
Brian Golden, Executive Director / Secretary

Expanded Project Notification Form

Submitted Pursuant to Article 80 of the Boston Zoning Code



45 Stuart Street Residences

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

Submitted by:
AvalonBay Communities, Inc.
51 Sleeper Street, Suite 750
Boston, MA 02210

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

In Association with:
cbt architects
Goulston & Storrs
Howard/Stein-Hudson Associates
Nitsch Engineering
Sanborn, Head & Associates
The Green Engineer

August 8, 2011

Epsilon
ASSOCIATES INC.

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Table of Contents

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

List of Appendices

List of Figures

List of Figures (Continued)

List of Tables

Section 1.0

General Information and Project Description

1.0 GENERAL INFORMATION AND PROJECT DESCRIPTION

1.1 Introduction

The proposed 45 Stuart Street Residences (the "Project") includes the construction of a new 29-story residential building on a site where Boston's vibrant Downtown/Chinatown/ Theater District neighborhoods come together. The new approximately 390,000 square foot (sf) building (excluding off-street parking) will replace an existing surface parking lot and will house approximately 404 residential units (studio, one-bedroom and two-bedroom units) on the upper 22 floors, approximately 198 managed parking spaces on the ground floor and floors two through five, and lobby and support space on the ground floor.

The new building will create a 5 to 6-story street wall along Stuart Street that will align with the scale and detail of the adjacent Jacob Wirth building and the collection of small buildings towards the corner of Stuart and Tremont Streets. Above the sixth floor, the majority of the massing will be set back 10 feet from Stuart Street at the height of the adjacent buildings to reduce the building's visibility from the street level and create a contextual street wall. The massing of the structure has been sculpted to appear as a collection of buildings that work together to best display the building's proportions. A range of window fenestrations, balconies, and wall details create differing patterns that act as scaling elements for the overall mass. The tower will relate to the massing and heights of the nearby W Hotel and Residences, Archstone Boston Common, and the Kensington Place project. The Project will activate Stuart Street and reinforce its identity in the Theater District with active signage on the Stuart Street building façade from level three up to level five. The Stuart Street entrance to the building will create an inviting pedestrian zone through the use of lighting, permeable materials and paving materials. The active signage, which is still in the process of design, is planned to be truly theatrical, drawing people to the building to see the dynamic display which will relate the building to the energy of the Theater District.

The new building also will activate LaGrange Street through a new building entrance as well as design of active lighting and architectural elements to improve the character of the building and pedestrian experience. Careful attention is being given to the pedestrian entrance on LaGrange Street as well as the vehicular drive, using attractive paving materials, fenestration and materials that will be attractive at the pedestrian level.

1.2 Summary of Benefits and Impacts

1.2.1 Summary of Public Benefits

The Project will result in many public benefits for the Downtown/Chinatown/Theater District neighborhoods and overall for the City of Boston. The Project will transform an underutilized site, which currently is an open-air surface parking lot, into a residential

"24/7" neighborhood. The Project will contribute to the continued revitalization of this area and provide additional residential opportunities for a variety of income levels to complement the surrounding cultural, medical, and educational resources.

Specific public benefits include:

- Increased housing;
- The Project will create and/or contribute to affordable housing in accordance with the Inclusionary Development Program approved by the BRA;
- Improved street and pedestrian environment;
- Enhancing the Theater District through dynamic signage;
- Groundwater recharge;
- Leadership in Energy and Environmental Design (LEED) certifiable building;
- Availability of public parking for the Theater District;
- New construction and permanent jobs; and
- Tax payments to the City of Boston.

1.2.2 Summary of Impacts

Following is a summary of the impacts as described in this Expanded PNF. The project has been designed to enhance the urban fabric of the neighborhood, bringing residential uses and active frontage to the site. Impacts associated with the project are minor and can be mitigated as described in this Expanded PNF.

1.2.2.1 Transportation

The Project is expected to have a minimal impact on the transportation operations in the study area. Due to recent traffic signal re-timing along the Stuart Street/Kneeland Street, Tremont Street, and Washington Street corridors, implemented by the Boston Transportation Department, all study area intersections are projected to continue to operate at an acceptable overall LOS (LOS D or better) with the Project in place.

1.2.2.2 Wind

A qualitative assessment was made to determine the effect of the proposed Project on pedestrian level winds (PLWs) in its vicinity based on the BRA Protocol for Pedestrian Level Wind Impact Analyses. Of the 108 locations studied for both the existing and build conditions, only one on-site and three LaGrange Street locations saw an increase in wind levels resulting in uncomfortable conditions during specific seasons of the year. If necessary, mitigation measures will be considered during the design development phase of the Project.

1.2.2.3 Shadow

Shadow impacts from the proposed Project will be minor. Based on the BRA Protocol for Shadow Analyses, during 12 of the 14 time periods studied, new shadows from the Project are limited to the facades of buildings in the surrounding area without increasing shadow on open spaces, sidewalks or streets. During one time period (June at 6:00 p.m.), new shadows are cast onto minor portions of nearby streets and their sidewalks. During one time period (December at 9:00 a.m.), new shadows are cast onto Boston Common.

The Project will be in compliance with the Public Commons Shadow Act adopted in 1990. The Project will not cast shadow on the Boston Common for more than two hours from 8:00 a.m. through 2:30 p.m. on any day from March 21 through October 31, inclusive, except on October 21 when a maximum of 0.022 acre will be in shadow for more than the two hour limit. As permitted by the Act, the Proponent is seeking approval through the BRA for the additional shadow, as a portion of permitted new shadow approved since 1989 which does not exceed one acre in aggregate.

1.2.2.4 Daylight

The daylight analysis conducted for the Project describes existing and proposed daylight obstruction conditions at the Project site and in the surrounding area. The Project site places most of the new construction behind existing buildings along Stuart Street. The design steps the massing back from Stuart Street, but also matches the massing of other buildings in the near vicinity. The results of the Boston Redevelopment Authority Daylight Analysis ("BRADA") analysis indicate that the development of the Project will result in increased daylight obstruction at the site over existing conditions since the site is used as a surface parking lot. The resulting conditions, however, generally will be consistent with the area context.

1.2.2.5 Solar Glare

Solar glare impacts are not anticipated due to the use of materials that are not highly reflective.

1.2.2.6 Air Quality

Microscale and stationary source analyses were conducted to determine the Project's impact on air quality. Using conservative estimates, the CO concentrations at the nearest receptors for impacts from the traffic at nearby intersections, the heating boilers, and emergency generator units, plus monitored background values, are well under the CO

NAAQS thresholds. In addition, maximum cumulative impacts from the heating boilers, garage vents, cooling towers, and emergency generators plus monitored background values are also below the NAAQS thresholds for SO2, NOx, PM-10, and PM-2.5.

1.2.2.7 Noise

The Project will not introduce significant outdoor mechanical equipment noise into the surrounding community. The noise analysis indicates that noise levels attributable to the Project will comply with the City of Boston Noise Ordinance requirements and the Massachusetts Department of Environmental Protection (MassDEP) noise limits.

1.2.2.8 Solid and Hazardous Wastes

It is anticipated that hazardous wastes will not be encountered during construction. If hazardous wastes are encountered, they will be handled according to local, state and federal regulations.

During operation, the Project will generate approximately 432.2 tons of solid waste per year. The Project includes recycling areas within the building and will promote recycling throughout the building to minimize solid wastes.

1.2.2.9 Flood Hazard Zones / Wetlands

The Project is not located in a 500-year floor zone. There are no wetlands on or near the Project site.

1.2.2.10 Geotechnical / Groundwater

In general, potential impacts during excavation and foundation construction include temporary lowering of area groundwater levels, ground vibrations, noise, and ground movements outside of the excavation. The foundation design and construction will be conducted to control and limit potential adverse impacts, especially to adjacent structures and to groundwater levels. The Project will comply with the provisions of the Groundwater Conservation Overlay District. Groundwater will be recharged into the groundwater table by means of a recharge system.

1.2.2.11 Construction

A Construction Management Plan (CMP) in compliance with the City of Boston's Construction Management Program will be submitted to the Boston Transportation Department (BTD) once final plans are developed and the construction schedule is established. Periodic meetings will also be held with neighborhood representatives to describe the ongoing work and to discuss measures that will be taken to minimize impacts on the community. The Proponent or contractor will designate a construction contact who will be available to the community to respond to issues relating to the construction process.

1.2.2.12 Sustainability

The Project will meet sustainability criteria, enhancing the future of buildings in Boston. The Project will be certifiable under the Leadership in Energy and Environmental Design (LEED) rating system.

1.2.2.13 Historic Resources

The Project has been designed to relate to the Stuart Street streetwall, including that of the adjacent Jacob Wirth building, a Boston landmark, and not result in any physical alteration to the Jacob Wirth building.

1.2.2.14 Infrastructure

The Project will generate approximately 65,120 gallons per day (gpd) of wastewater and use approximately 71,632 gpd of water. The Proponent will submit a General Service Application and a site plan to the Boston Water and Sewer Commission for review and approval prior to construction. The site plan will indicate the existing and proposed water mains, sanitary sewers, storm sewers, telephone, gas, electric, steam, and cable television lines. The plan will include the disconnections of the existing services as well as the proposed connections. The Project will also meet the Massachusetts Department of Environmental Protection's Stormwater Management Standards.

1.3 Project Identification and Team

Project Name:	45 Stuart Street Residences
Location:	The Project is located on the north side of Stuart Street between Stuart Street and LaGrange Street.
Proponent:	AvalonBay Communities, Inc. 51 Sleeper Street, Suite 750 Boston, MA 02210 (617) 654-9500 Michael Roberts David Gillespie
Architect:	cbt architects, Inc. 110 Canal Street Boston, MA 02114 (617) 262-4354 Alfred Wojciechowski Philip Casey

Attorney:	Goulston & Storrs 400 Atlantic Avenue Boston, MA 02110 (617) 482-1776 Marilyn Sticklor
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Peggy Briggs Doug Kelleher
	Exclusive Real Estate 10 Derne Street Boston, MA 02114 (617) 263-1157 Harry R. Collings
Transportation Consultant:	Howard / Stein – Hudson, Inc. 38 Chauncy Street, 9th Floor Boston, MA 02111 (617) 482-7080 Guy Busa Joseph SanClemente
Civil Engineer:	Nitsch Engineering 186 Lincoln Street, Suite 200 Boston, MA 02111 (617) 338-0063 John Schmid
Geotechnical Consultant / Hazardous Waste Consultant:	Sanborn, Head & Associates, Inc. 1 Technology Park Drive Westford, MA 01886 (978) 392-0900 Mathew DiPilato Kevin Stetson

1.4 Project Description

1.4.1 Existing Site and Area Context

The Project Site is an irregularly shaped mid-block parcel of land, approximately 21,273 sf (0.49 acres) in size, at 45 Stuart Street at the intersection of Boston's Downtown/Chinatown/Theater District neighborhoods, along with air rights above the adjacent 4,839 sf Jacob Wirth Parcel. The Project site is bounded by Stuart Street to the south, LaGrange Street to the north, the buildings at 59-61 Stuart Street and 216 Tremont Street to the west, and by 31-39 Stuart Street and 22 LaGrange Street to the east. The Project Site is currently occupied by a surface parking lot and includes a small amount of frontage along Stuart Street. The historic Jacob Wirth building is directly adjacent to this frontage to the east and low-rise commercial buildings are to the west. Figure 1-1 shows the location of the Project site.

The greater area surrounding the Project includes a variety of commercial, institutional, residential, and academic uses and many of Boston's performing arts institutions located at the heart of the vibrant Theater District. The site is particularly well connected to vehicular circulation located along Stuart Street, a main through-fare of the Theater District, and is bounded to the east and west by the major cross streets of Tremont Street and Washington Street. The site also has excellent pedestrian access to public transportation with Green Line, Silver Line, and Orange Line transit stops all within a block.

1.4.2 Proposed Development Program

The proposed Project includes the construction of an approximately 390,000 square foot (sf) (excluding off-street parking), 29-story residential building that will replace an existing surface parking lot. The Project includes approximately 404 apartment units (studio, one-bedroom and two-bedroom units) on the upper 22 floors, and approximately 198 managed parking spaces on the ground floor and floors two through five, and lobby and support space on the ground floor. The Project will retain the existing 89 on-site commercial parking spaces. The development program is shown in Table 1-1.

Table 1-1 Project Program

Project Element	Dimension
Project Site	0.49 acres plus air rights over 4,839 sf of the parcel at 31-39 Stuart Street
Residential	404 units
Parking	198 spaces / 74,000 sf (excluding ground level parking)
Building Height	29 stories / 289 feet
Total Square Footage (excluding off-street parking)	390,000 sf

45 Stuart Street **Boston, MA**

cbt

Figure 1-1

Locus Map

Figures 1-2 to 1-14 show the site plan, proposed floor plans, sections, and elevations.

The Project includes a small, mechanical and storage basement area of approximately 5,000 gross square feet, while the remaining development will occur above-grade. The first floor includes the lobby, with the main entrance from Stuart Street and a secondary entrance from LaGrange Street. Loading will be located in the northwest portion of the ground floor off of LaGrange Street. Parking will be valet only with access from both Stuart Street and LaGrange Street. Vehicles will then be placed on a car elevator leading to floors two through five. The exit from the parking area will be to LaGrange Street. The sixth through 29^{th} floors will be residential. Floors nine to 29 will cantilever over a portion of the rear kitchen wing of the adjacent Jacob Wirth building. The cantilever, which will not extend more than 16 feet into the air rights over the Jacob Wirth Parcel, will be a minimum of 20 feet above the height of the tallest chimney of the Jacob Wirth building. A roof terrace will be located on the western side of the building on the sixth floor.

1.5 Public Participation

The Proponent is committed to comprehensive and effective community outreach and will continue to engage the community to ensure public input on the Project. Prior to the filing of this Expanded PNF, the Proponent has begun meeting with community groups to review and discuss the Project, as indicated by the list below, and the Proponent will continue such community outreach throughout the approval process.

Chinatown Safety Committee	April 6, 2011
Midtown Park Plaza Neighborhood Association	April 13, 2011
Chinatown Neighborhood Association	April 19, 2011
Park Plaza Civic Advisory Committee	May 25, 2011 & June 6, 2011
Bay Village Neighborhood Association	May 31, 2011
Impact Advisory Group	July 12, 2011

1.6 Public Benefits

The Project will result in many public benefits for the Downtown/Chinatown/Theater District neighborhoods and overall for the City of Boston. The Project will transform an underutilized site, which currently is an open-air surface parking lot, into a residential "24/7" neighborhood. The Project will contribute to the continued revitalization of this area and provide additional residential opportunities to complement the surrounding cultural, medical, and educational resources.

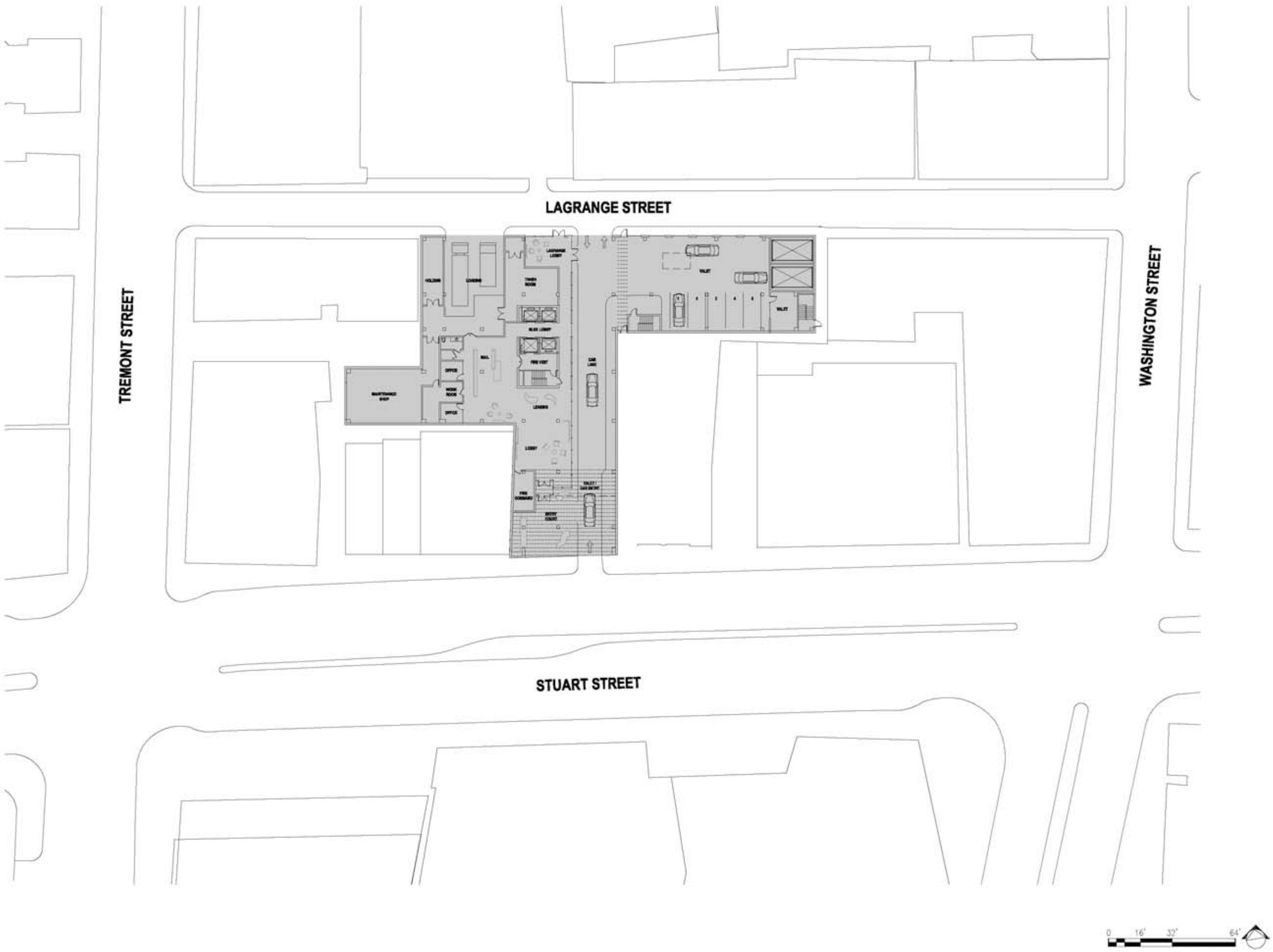

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Figure 1-2

Site Plan

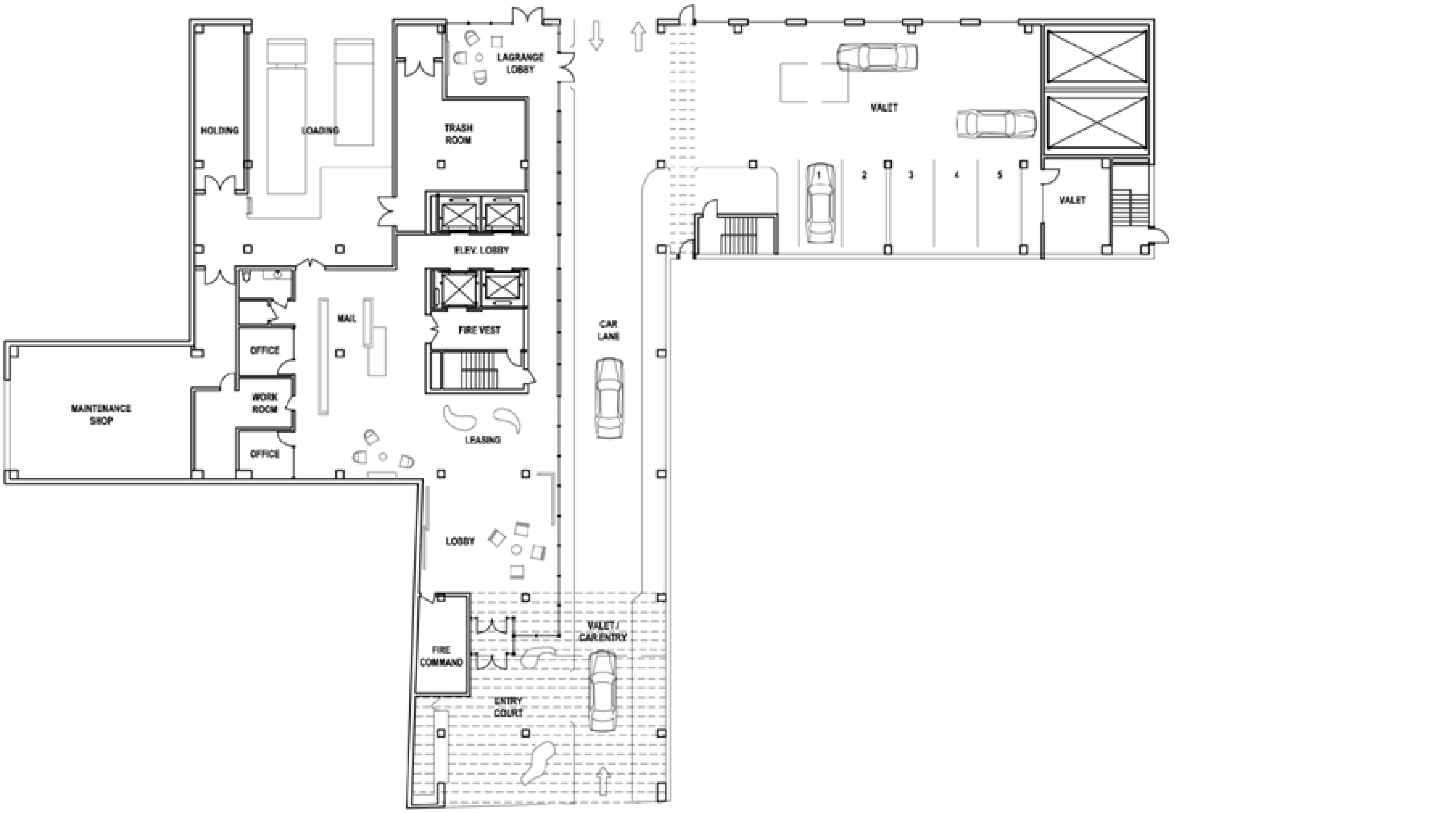

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Figure 1-3

Ground Floor Plan

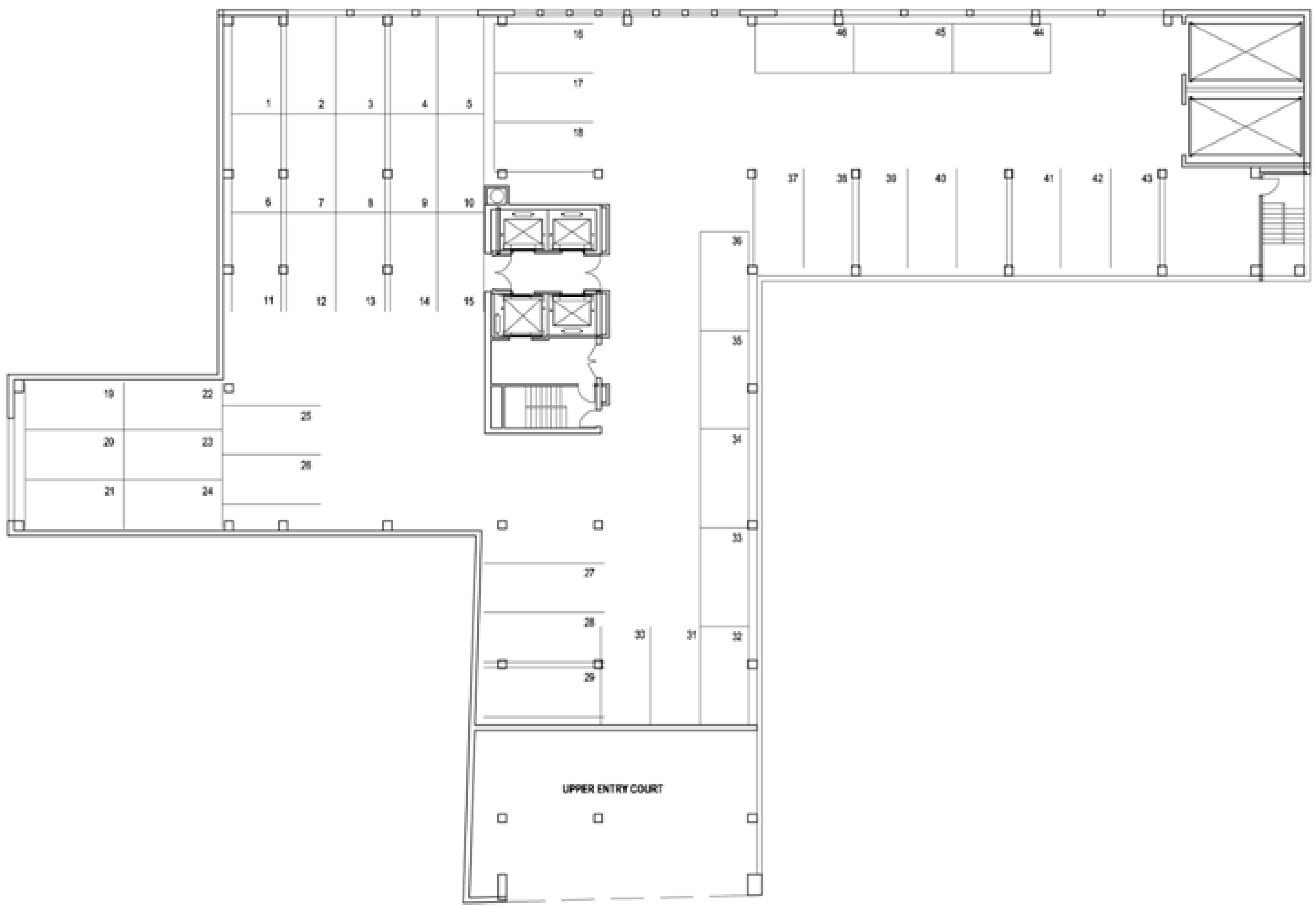

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Figure 1-4

Second Floor Garage Plan

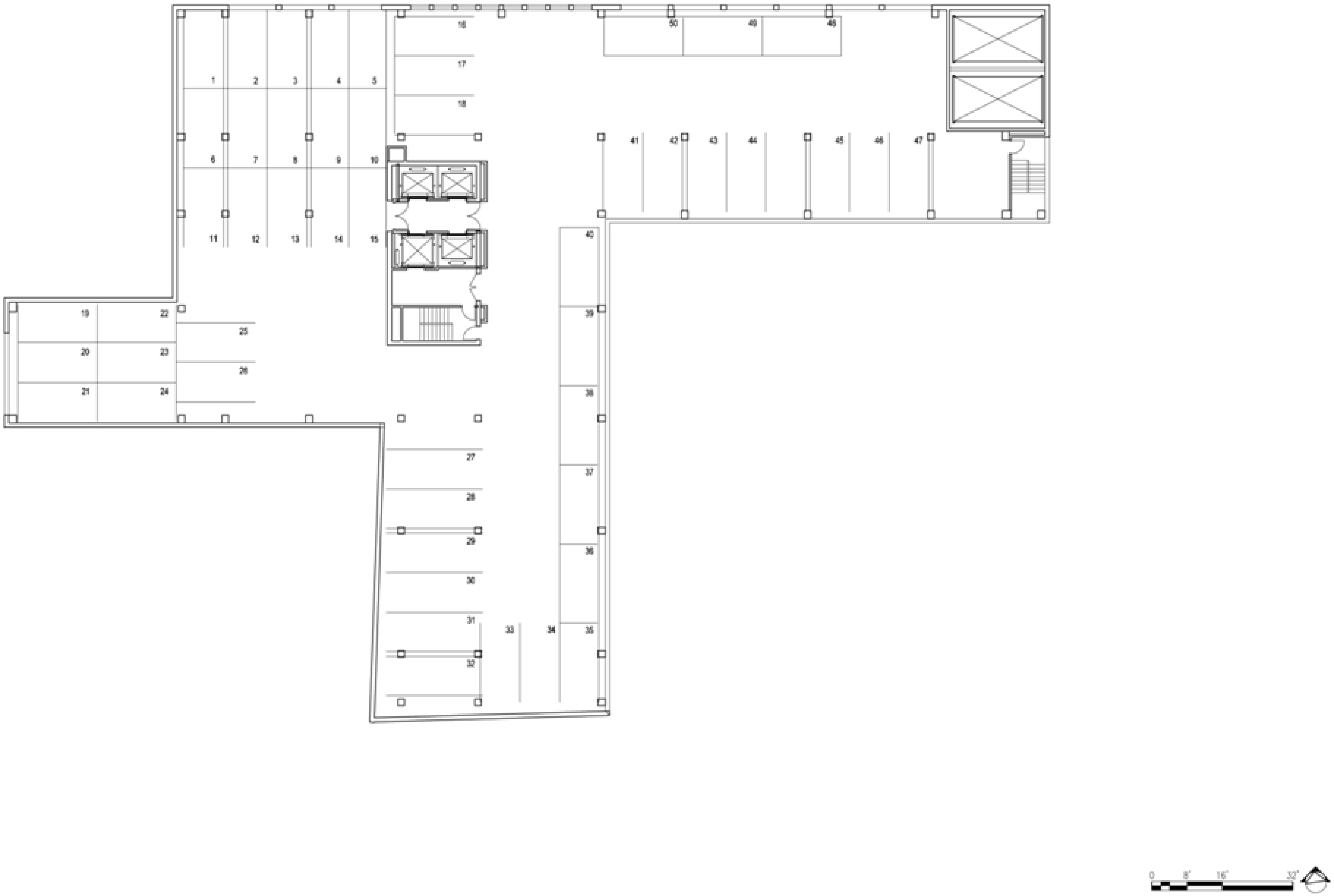

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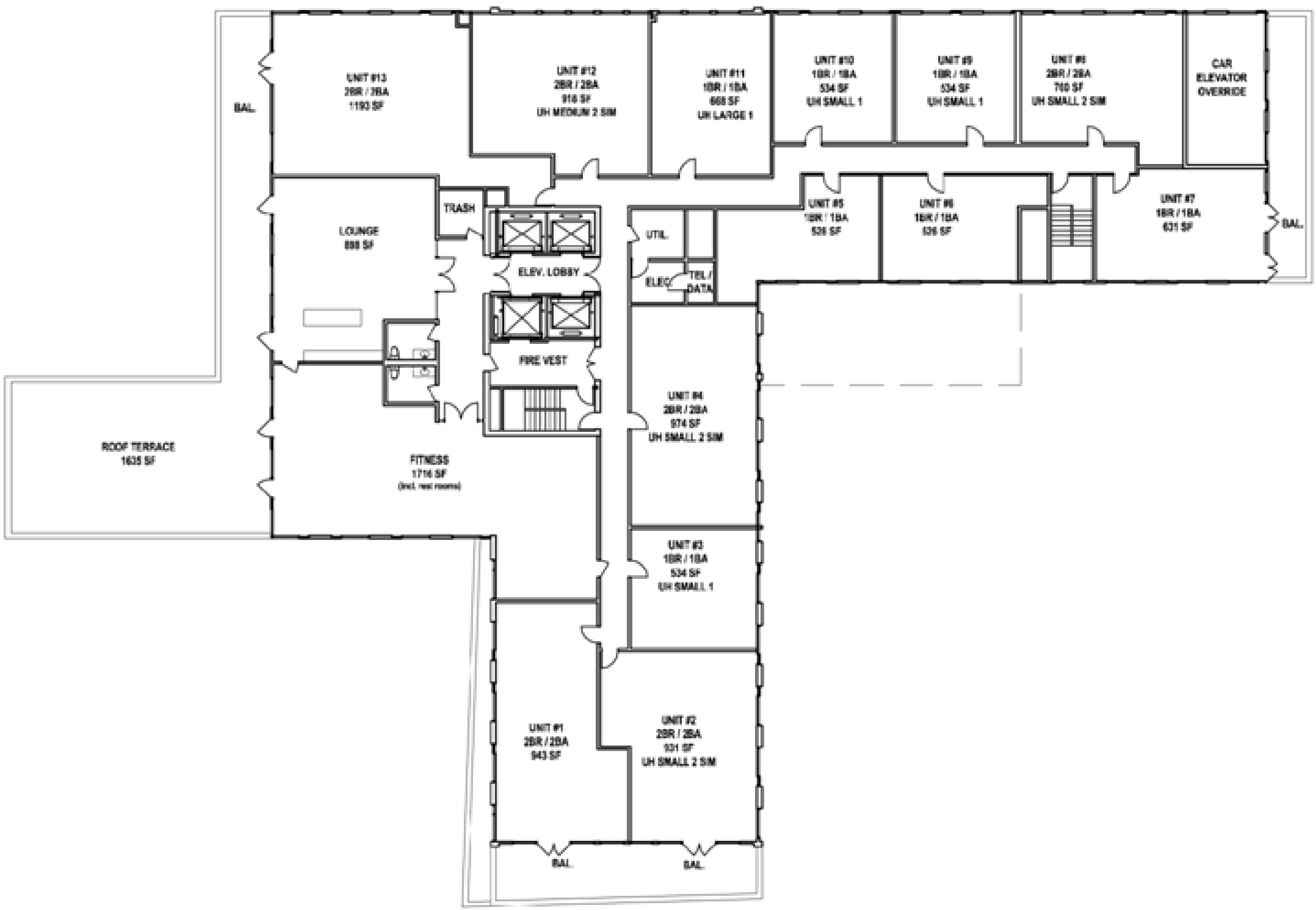
Figure 1-5

Typical Garage Plan



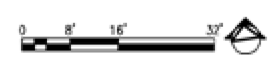


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Figure 1-6

Sixth Floor Plan

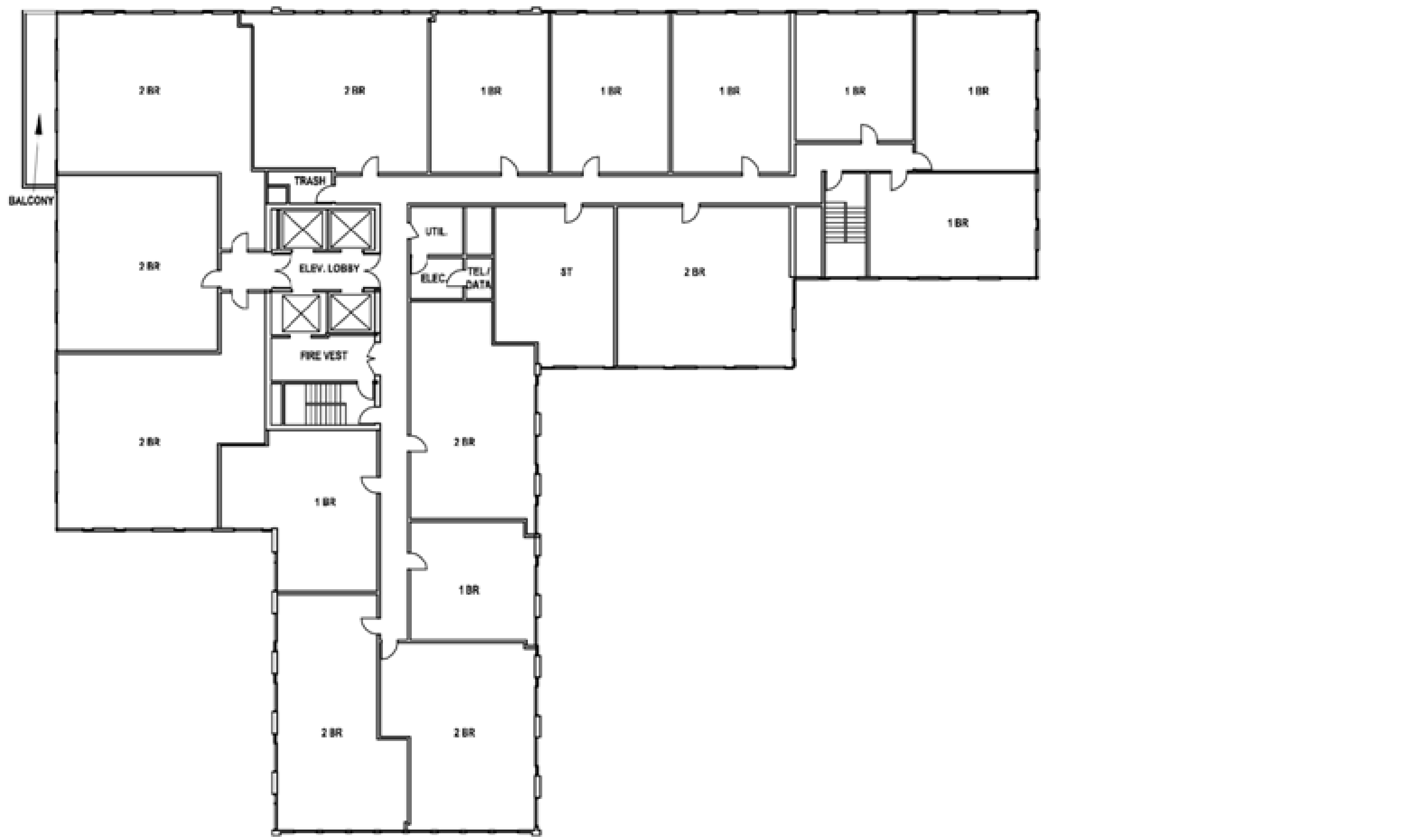

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Figure 1-7

Typical Floor Plan

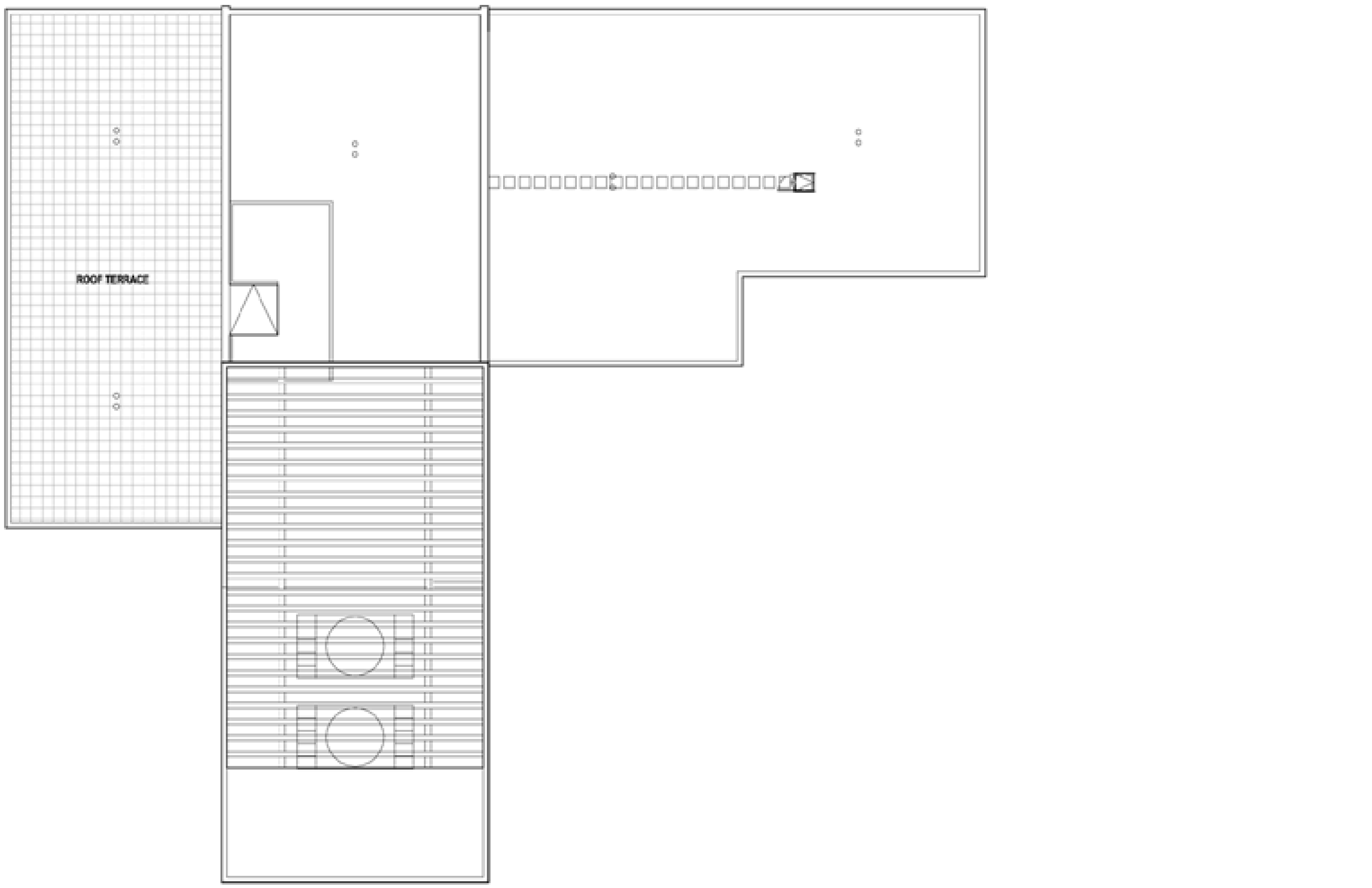

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Figure 1-8

Roof Plan

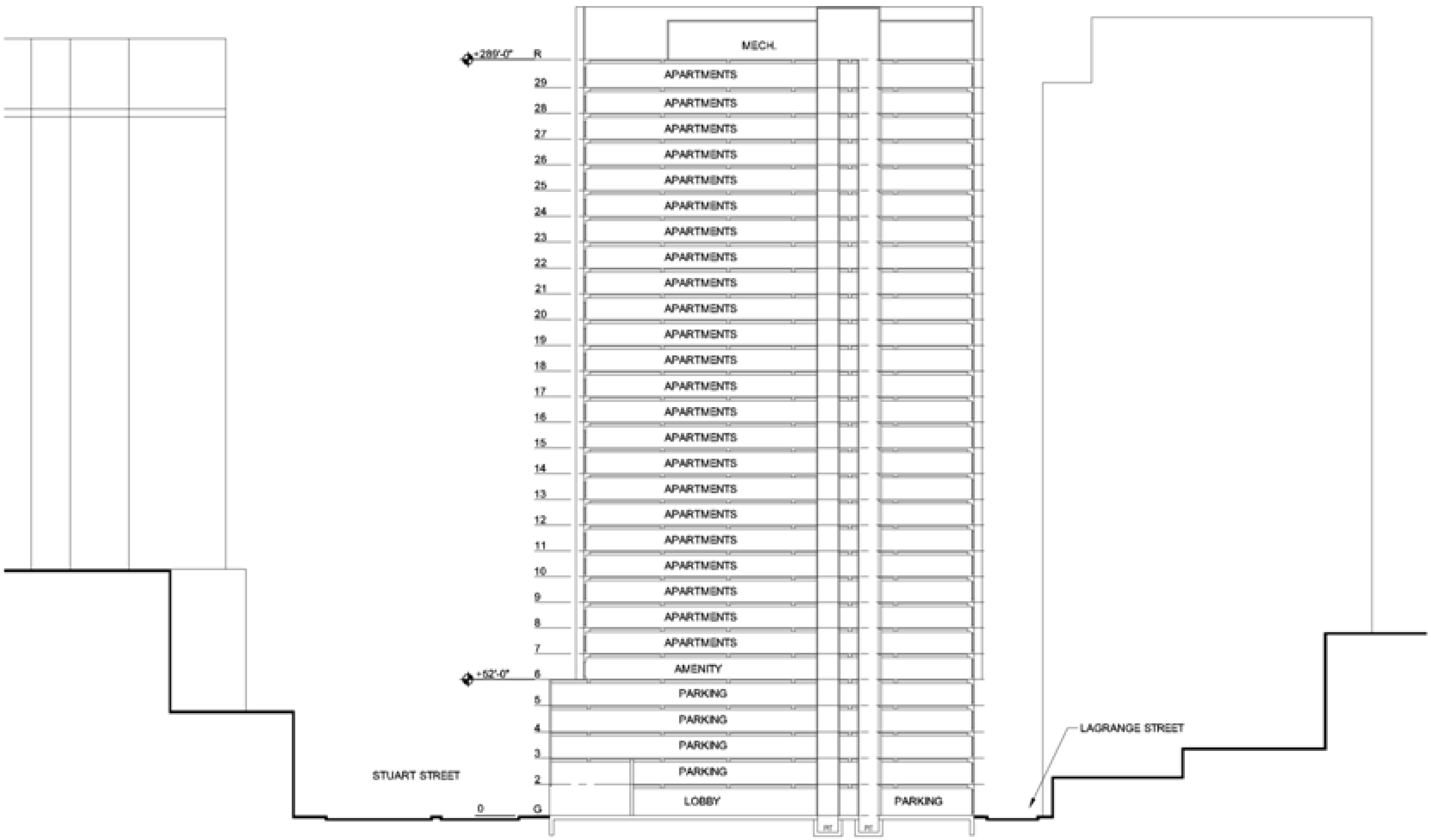

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Figure 1-9

South to North Section

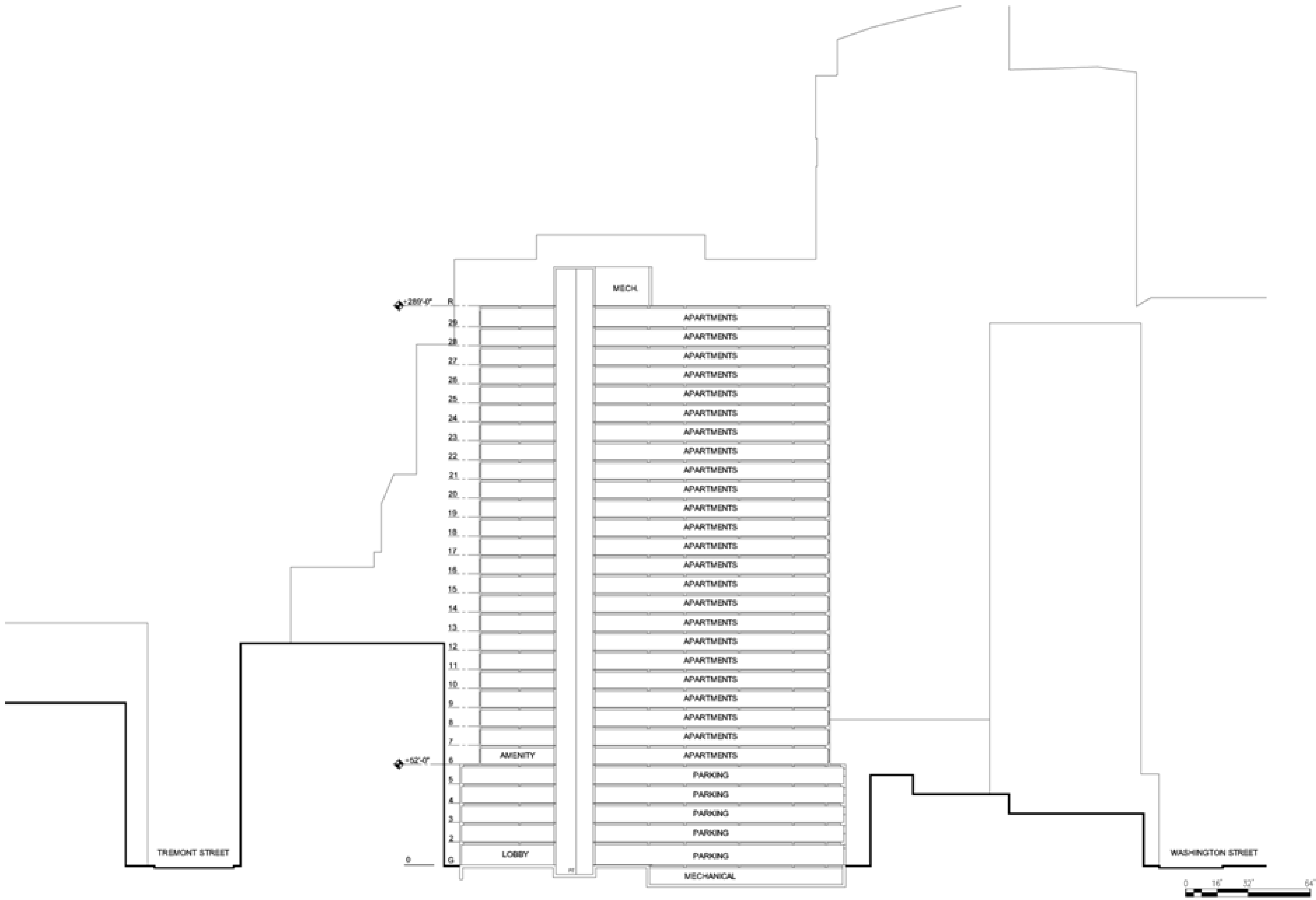

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Figure 1-10

West to East Section

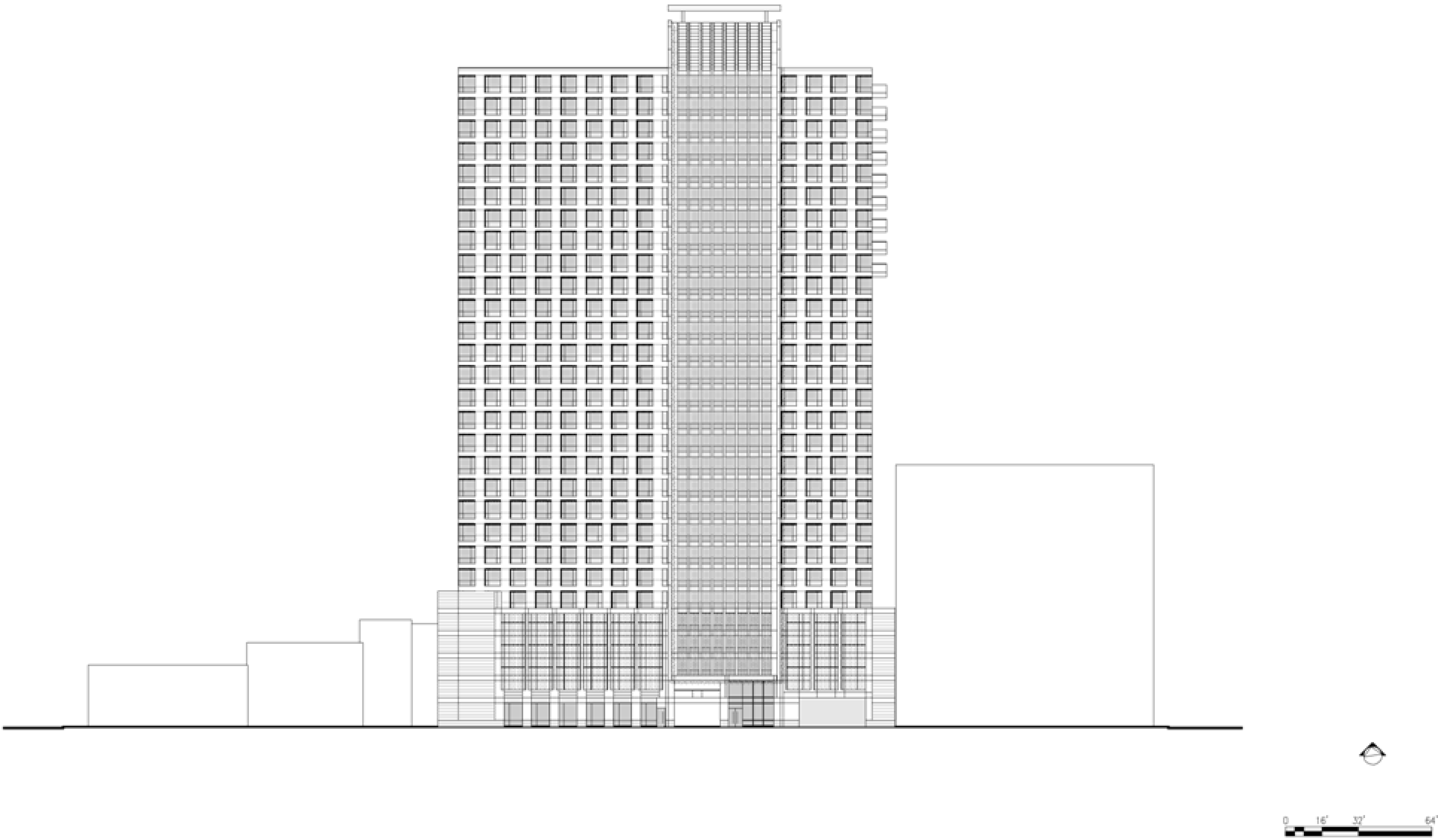

Figure 1-11

North Elevation

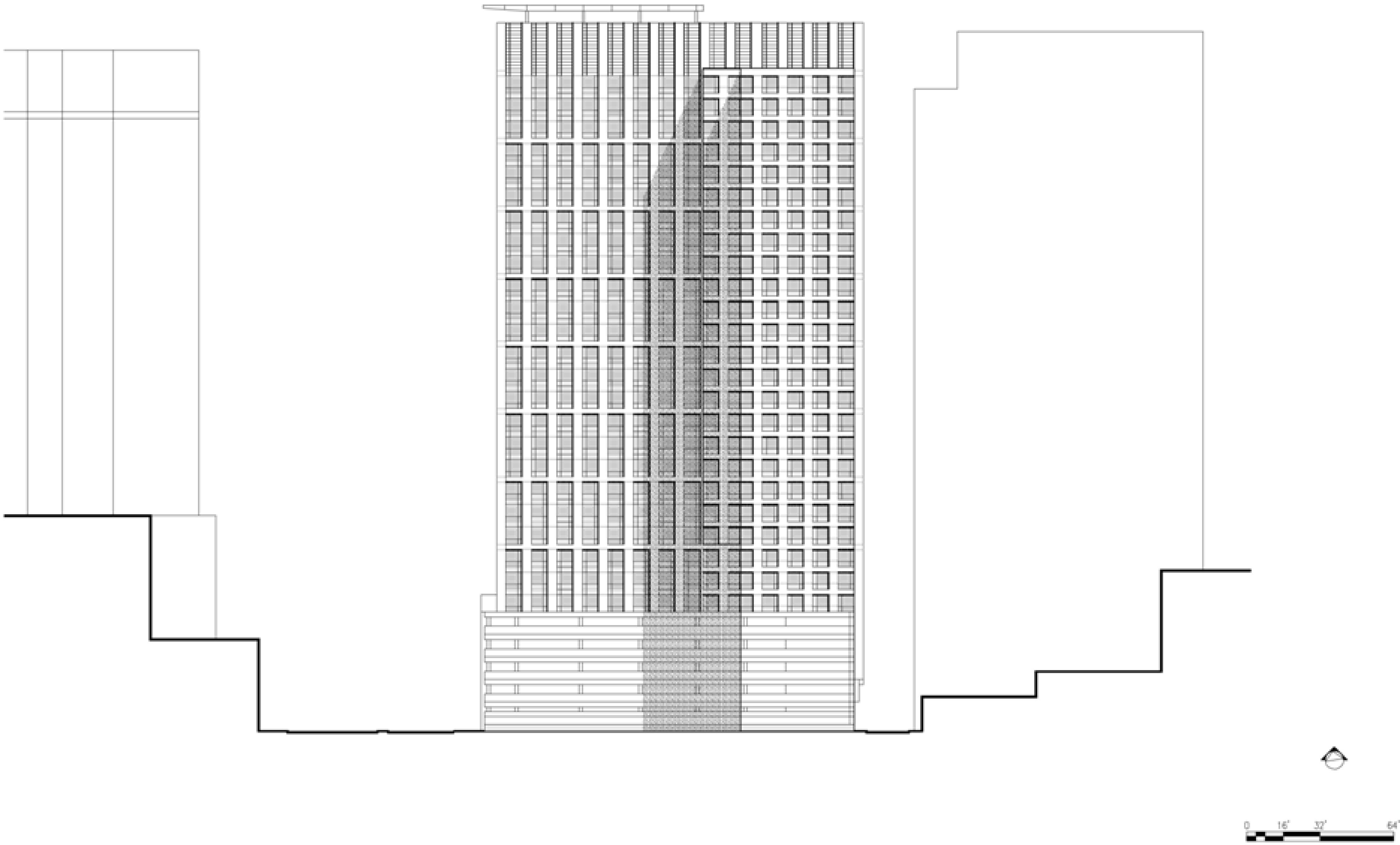

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Figure 1-12

East Elevation

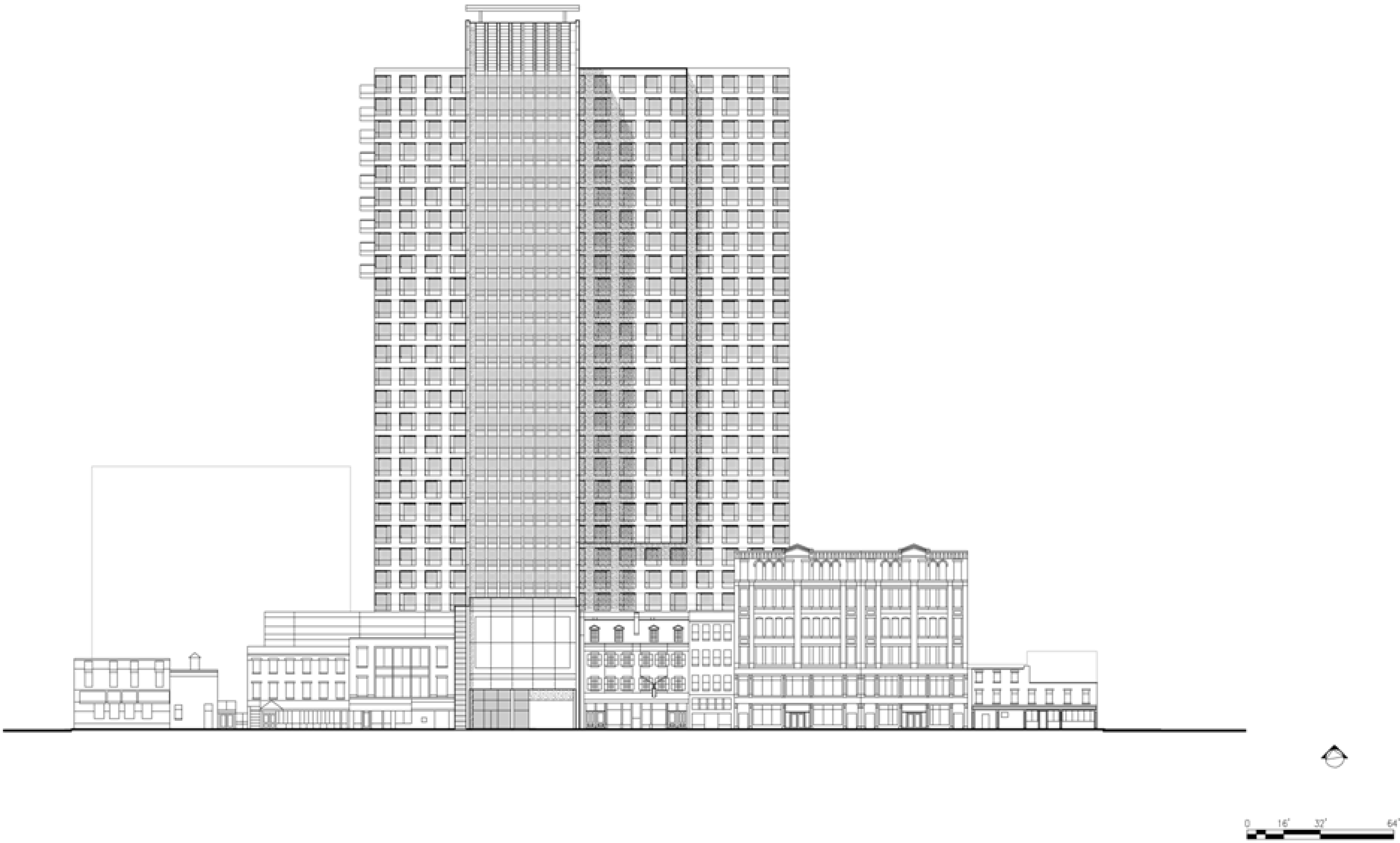

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Figure 1-13

South Elevation

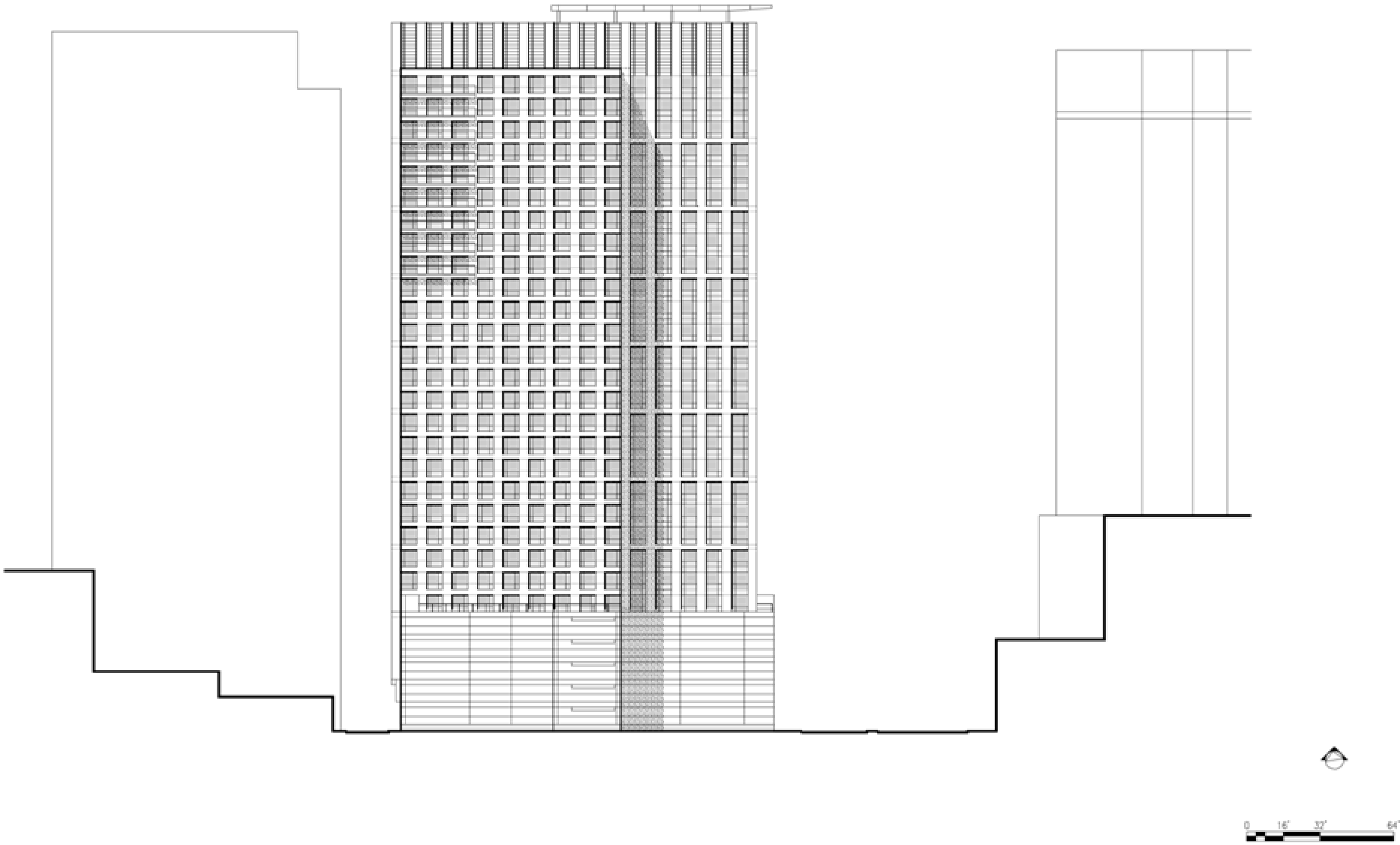

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Figure 1-14

West Elevation

Design

The Project will introduce height and massing that will create the appearance of multiple buildings at a human scale and preserve light and air through alternative massing and subtle differentiation of the façade. Roof top mechanical equipment is hidden by a screen wall which will match the building façade such that mechanicals are not visible from the side elevations. The Project does not involve any alterations to the adjacent Jacob Wirth building, a Boston landmark.

Increased Housing

The Project will create over 400 residential units in the City of Boston. The Project will promote the vibrant mixed-use neighborhood that the City envisions for this area.

Affordable Housing

The Inclusionary Development Program ("IDP"), approved by the BRA on June 22, 2010, implementing the Mayor's Executive Order dated February 29, 2000, and later modified as of February 3, 2005, May 16, 2006, and September 27, 2007, established as City policy that any residential project seeking zoning relief must set aside at least 15% of its market rate units as affordable to specified levels of income households, or create such units off-site or contribute to a housing creation fund a per unit subsidy for 15% of the total number of project units. The Project will create and/or contribute to affordable housing in accordance with the IDP.

Smart Growth/Transit-Oriented Development

This infill development will enhance the Midtown Cultural District/Chinatown/Theater District areas to create a thriving urban space. The existing surface parking lot on the Project site will be replaced by a new, attractive building. With over 400 residential units located on the edge of the commercial employment core, the Project site is ideal for promoting walking as a means of transport to and from work. As a development within close proximity to the MBTA's Red, Orange and Green, and Silver lines, the Project embodies the major tenets of a transit-oriented development.

Improved Street and Pedestrian Environment

The Project proposes to feature electronic signage, including public service signage, on the Stuart Street façade, thus reinforcing the connection of the Project site to the Theater District. With creative nighttime lighting and attractive building façades, signage and plantings, the Project will foster pedestrian activity and contribute to the increased safety and vitality of the area throughout the day and into the evening. The Project also will feature entrances on both LaGrange Street and Stuart Street, so as to allow connectivity from both streets.

Sustainable Design/Green Building

The Proponent will incorporate energy conservation measures into the Project to protect the environment. The Project will employ energy-efficient and water-conservation features for mechanical, electrical, architectural, and structural systems, assemblies, and materials where possible. The base configuration of the proposed building will meet the Boston Stretch Code. Mechanical and HVAC systems will be installed to the current industry standards and full cooperation with the local utility providers will be maintained during design and construction.

Groundwater Recharge

The Project will comply with Article 32 of the Boston Zoning Code, Groundwater Conservation Overlay District (GCOD). The Proponent is committed to recharging groundwater.

Retention of Public Parking

The existing 89 commercial surface parking spaces will be retained on-site and will continue to be available to the public, providing an important amenity to visitors to the Theater District.

Increased Employment

The Project will create approximately 600 new construction jobs and approximately 15-20 permanent jobs.

New Property Tax Revenue

The new development will generate approximately $1,300,000 in annual property taxes as a result of converting an undeveloped parcel into a 29-story residential building with public and residential parking.

1.7 Legal Information

1.7.1 Legal Judgments Adverse to the Proposed Project

The Proponent is not aware of any legal judgments in effect or other legal actions pending which involve the Project.

1.7.2 History of Tax Arrears on Property

Neither the Proponent nor the current owner, 45 Stuart Street LLC, owns any real estate in Boston on which real estate tax payments are in arrears.

1.7.3 *Evidence of Site Control/Nature of Public Easements*

The Project Site, except for a 1,249 sf parcel (24 LaGrange Street), is owned by 45 Stuart Street LLC. The Proponent and 45 Stuart Street LLC are parties to a purchase and sale agreement regarding the Project Site. The 1,249 sf parcel is owned by the BRA, which is being requested to convey such area to the Proponent.

1.7.4 *Nature of Easements*

There are no public easements in or through the Project Site. The site is subject to certain easements for the benefit of the continued operation of the adjacent Jacob Wirth building and an emergency egress easement for the benefit of 216-218 Tremont Street (now owned by Emerson College). The 1,249 sf parcel owned by the BRA (24 LaGrange Street) is subject to certain easement rights for a fire escape or emergency egress stair and pedestrian passage for the benefit of 22 LaGrange Street. All easements in effect will be accommodated as part of the design of the Project.

1.8 Consistency with Zoning and Urban Renewal Plan

The Project Site is located in the "General Area" of the Midtown Cultural District, a downtown district, which is governed by Article 38 of the City of Boston Zoning Code (the "Code") and is shown on Map 1A on the Zoning Map of the City of Boston. The Jacob Wirth Restaurant Air Rights Parcel, which comprises approximately 4,835 square feet of Air Rights within the Project Site, lies within the Jacob Wirth Protection Area. The entirety of the Project Site is located within the Groundwater Conservation Overlay District ("GCOD") and the Restricted Parcel Overlay District. In addition, the Project Site is also located within the PDA IV area of the Midtown Cultural District within which a Planned Development Area is allowed for parcels exceeding 1 acre in size. The Project Site is a portion of Parcel 4 within the Park Plaza Urban Renewal Plan (the "Urban Renewal Plan") Area.

The Proponent will seek zoning relief through U District designation of the Project site and a minor modification of the Urban Renewal Plan from the BRA and will seek conditional use permits from the Boston Zoning Board of Appeal for work in the GCOD and for electronic signage in the Theater District. Within a U District, the use, dimensional, parking and loading provisions are established by the Urban Renewal Plan in combination with a land disposition agreement.

1.8.1 *Uses*

The uses of the Project for residential and garage accessory use are permitted by Section 38-18 of the Code. Commercial parking garage is allowed with a conditional use permit under Section 38-18 or as continuation of a pre-existing nonconforming use (parking lot). The Project site is located within a Restricted Parking Overlay District in which no off-street parking is required for any use.

Article 11 of the Code regulates signage in the Midtown Cultural District. It specifies allowable on-premise signs, and provides for electronic signage within the Theater District by conditional use permit.

1.8.2 Dimensional Requirements

Section 38-7 of the Code imposes the a maximum Floor Area Ratio ("FAR") of 10 and a maximum height of 155 feet on the Project Site (exclusive of the air rights on the Jacob Wirth Parcel) for projects undergoing Large Project Review under Article 80B. The site is located within a PDA zone allowing heights with approval of the Board of Appeal of up to 290 feet and an FAR of up to 15 or greater under certain circumstances. Within the Jacob Wirth Protection Area, the maximum height is 65 feet and maximum FAR is 4. The Urban Renewal Plan also approves a height of 650' and an FAR of 15.00 for the Site.

The Project proposes a height of 289 feet. In terms of FAR calculations, the U District designation will reflect the Urban Renewal Plan, which provides that off-street parking is not included in the FAR calculation. The FAR calculations for the Project area are complicated by the fact that a portion of the improvements is in air rights over the abutting Jacob Wirth Parcel. The FAR calculations for the Project are set forth in Table 1-2.

Table 1-2 Calculations for the Project Under Various Scenarios

	Lot Size	SF of Improvements for FAR (excluding off-street parking)	FAR	Notes
Site with Wirth Parcel	26,112	389,043 + 7,422 = 396,465 Note: 7,422 sf represents Jacob Wirth building	15.18	Includes 7, 422 SF of improvements on Wirth Parcel
Site w/o Wirth Parcel	21,273	389,043	18.29	

Section 38-19 of the Code imposes certain "Specific Design Requirements," including a "street wall" height limit of 90 feet; street wall continuity aligning with 80% of the alignment of existing buildings; a "skyplane setback" of 10 feet above a height of 90 feet and 15 feet above a height of 155 feet for portions of the Project facing Stuart and LaGrange Streets; and requirements for display window areas and transparency to be determined by the BRA through design review. Under Section 38-19 of the Code, the Board of Appeal can grant relief from these provisions. The project will seek relief from these provisions through the U District designation.

1.8.3 Off-Street Parking and Loading

Article 38 of the Code does not require any minimum number of off-street parking spaces or off-street loading facilities for proposed projects in the Midtown Cultural District. Under Article 80, the BRA determines off-street parking and loading requirements during Large

Project Review under Article 80B of the Code. The Project includes 198 managed parking spaces. The Site currently is used as a commercial parking lot for 89 automobiles; 89 of the 198 structured parking spaces inside the building will retain their status as being available for commercial parking as an amenity to patrons of the Theater District, as well as for residential parking.

1.8.4 Groundwater Conservation Overlay District

Under Article 32 of the Code, a conditional use permit is required for projects within the Groundwater Conservation Overlay District involving paving or other surfacing of lot area, extension of a structure occupying more than 50 SF of lot area, and construction of a structure involving excavation below grade to a depth of 7 or more feet below Boston City Base. As required under Section 32-6, the Project will infiltrate not less than 1 inch of rainfall across the portion of the Site to be occupied by the Project, thus replenishing groundwater to a greater extent than the current surface parking lot.

1.8.5 Inclusionary Housing

The Inclusionary Development Program ("IDP"), approved by the BRA on June 22, 2010, implementing the Mayor's Executive Order dated February 29, 2000, and later modified as of February 3, 2005, May 16, 2006, and September 27, 2007, established as City policy that any residential project seeking zoning relief must set aside at least 15% of its market rate units as affordable to specified levels of income households, or create such units off-Site or contribute to a housing creation fund a per unit subsidy for 15% of the total number of project units. The Project will create and/or contribute to affordable housing in accordance with the IDP.

1.8.6 Conformity with Park Plaza Urban Renewal Plan

The Project Site lies within Parcel 4 of the Park Plaza Urban Renewal Plan (the "Plan") area. As noted above, the Project's proposed uses are permitted under the Urban Renewal Plan. With respect to dimensional requirements, the Urban Renewal Plan, as amended by the BRA in 1977, provides a maximum height of up to 650 feet on the Project site and a maximum FAR of 15.0 (exclusive of above-grade parking).

1.8.7 Conformity with City of Boston Planning Studies

As part of the ongoing planning process undertaken by the Boston Redevelopment Authority as planning board under G.L. c. 41, Section 70, Chapter 652 of the Acts of 1960 and Section 3 of Chapter 4 of the Ordinances of 1952, the BRA continues to work with community groups to seek input in development of planning studies, which then are reviewed by the BRA and form the basis, as appropriate, of amendments to the Code.

As noted above, the site is located within the Midtown Cultural District and is also for various purposes included within the neighborhood areas referred to as the Hinge Block and Chinatown. These areas have been the subject of planning studies as follows:

- The Midtown Cultural District Plan was adopted by the BRA on January 12, 1989. It formed the basis of Article 38 of the Code which was inserted in the Code on March 20, 1989. The provisions of the Midtown Cultural District Plan which were adopted by the BRA are reflected in Article 38.

- The Hinge Block Plan is dated September 1990. It identifies the Hinge Block as the area located midway between Downtown and Copley Square and at the center of the Midtown Cultural District and Chinatown. The Hinge Block study identified many goals for the area, including incorporating existing historic buildings into revitalization schemes, reactivation of La Grange Street as an active pedestrian way and increasing housing opportunities. The study included alternative design schemes which involved a mix of open space and facilities, some of which required a single parcel owner for the entire block or an agreement among all parcel owners for joint development.

  20 years have passed since adoption of the Hinge Block Plan, which has become outpaced by actual developments in the area. However, the current proposal for the site is consistent with the original goals of general revitalization, retention of existing historic buildings, activation of La Grange Street and increased housing opportunities.

- A Chinatown Community Plan was originally adopted in March 1990. More recently, a Chinatown Master Plan 2010 has been promulgated by the Chinatown Master Plan 2010 Oversight Committee. The 2010 Plan recognizes that "the Jacob Wirth parking lot at 45 Stuart Street is proposing a mixed-use housing development with parking and ground floor retail. As this project evolves, Chinatown will have opportunities to discuss community benefits as well as housing and job creation linkage." As part of its community outreach process, the Proponent is committed to discussing community benefits with members of the Chinatown community.

1.9 Compliance with Chapter 362 of the Acts of 1990

The Public Commons Shadow Act prohibits a permit-granting authority such as the BRA from authorizing a structure within the Midtown Cultural District which would cast "new shadow" on the Public Commons for more than two hours from 8:00 a.m. through 2:30 p.m. on any day from March 21 through October 31, inclusive, with certain exceptions set forth in Section 2 of the Act.

Section 1 of the Act defines "new shadow," in pertinent part, as "the casting of a shadow at any time on an area which is not cast in shadow at such time by a structure which exists or for which a building permit has been granted on the date upon which application is made to a permit-granting authority for a proposed structure and which would not be cast in shadow by a structure conforming to as-of-right height limits allowed by the Boston... Zoning Code ... as in force on May first, nineteen hundred and ninety." As permitted by the Act, the Proponent is seeking approval through the BRA for 0.022 acre of shadow beyond the two hour limit as a portion of the permitted new shadow approved since 1989 which does not exceed one acre in aggregate.

1.10 Regulatory Controls and Permits

Table 1-3 below presents a list of state and local agencies from which permits or other actions are expected to be required

Table 1-3 List of Anticipated Permits and Approvals

Agency Name	Permit / Approval
LOCAL	
Boston Redevelopment Authority	Article 80 Review and Execution of Related Agreements; Approval under St. 1990 c. 362 (Act Protecting Certain Public Commons); Recommendation of U District Designation; Minor Modification to Urban Renewal Plan; Land Disposition Agreement; Design Review
Boston Zoning Commission	U District Designation
Boston Zoning Board of Appeal	Conditional Use Permits for Groundwater Conservation District and Electronic Signage
Boston Civic Design Commission	Schematic Plan Design Review
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Boston Landmarks Commission	Certificate of Exemption for Construction in Air Rights
Boston Air Pollution Control Commission	Confirmation of Exemption of Parking Spaces for Residents
Boston Water and Sewer Commission	Water and sewer connection permits; Construction Dewatering Permit (if required); Cross-connection permit (if required); Site Plan Review
Public Works Department	Curb cut permit
Public Safety Commission	Permit to erect and maintain parking structure
Joint Committee on Licenses	Flammable storage license

Table 1-3 List of Anticipated Permits and Approvals (Continued)

Agency Name	Permit / Approval
LOCAL	
Public Improvement Commission	Improvements within public streets or sidewalks (if applicable)
Inspectional Services Department	Building Permit
STATE	
Massachusetts Historical Commission	State Register Review
Department of Environmental Protection	Sewer Connection Permit
Massachusetts Water Resources Authority	Construction Dewatering Discharge Permit (if required)
FEDERAL	
Federal Aviation Administration U.S. Environmental Protection Agency	Determination of No Hazard NPDES Notice of Intent for Construction (if required)

Table 1-3 presents a preliminary list of permits and approvals from governmental agencies which are presently expected to be required for the Project, based on Project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits or actions may be needed, all of which will become evident during Project design and development.

With respect to the Massachusetts Environmental Policy Act ("MEPA"), although the current Project will involve a Land Transfer from the BRA, the aspects of the Project within the area subject to the Land Transfer do not exceed any MEPA review threshold. In connection with a prior proposed project on the Project site in which MEPA had jurisdiction (EEA No. 13870), an Environmental Notification Form was filed but MEPA determined that no EIR was required to be filed.

1.11 Schedule

The filing of this Expanded PNF initiates the formal public review process for the Project. The Proponent anticipates completing the permitting of the Project by January 2012. Construction is anticipated to commence in mid 2012. The Proponent envisions a phased completion of the Project with the first residential tenants taking occupancy in mid 2014 and final completion of the Project by the end of 2014.

Section 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

In accordance with the City of Boston's *Transportation Access Plan Guidelines* (2001) and the *BRA Development Review Guidelines* (2006), this chapter describes roadway, pedestrian, and bicycle conditions; transportation issues; parking and loading; pedestrian and bicycle circulation; proposed mitigation; and transportation goals for the Project. This report adheres to the general format requested by BTD in its scoping decision on the prior project for the Site issued in 2009.

2.1.1 Project Description

The Project site is located at 45 Stuart Street where Boston's vibrant Downtown/Chinatown/ Theater District neighborhoods come together. The Project site is bounded by LaGrange Street to the north, Stuart Street to the south, and mixed-use buildings to the east and west and currently consists of an 89-space commercial, surface parking lot.

The proposed Project includes construction of a new 29-story residential building, in place of the existing surface parking lot, with approximately 404 apartment units. Parking for approximately 198 vehicles will be provided within an on-site valet –managed parking garage, including retention of the existing 89 commercial spaces and 109 additional spaces to support the residential units.

Vehicular access to the site will continue to be provided on Stuart Street with a right-turn in only access driveway located approximately 10-feet east of the existing curb cut and approximately 200-feet east of Tremont Street. The proposed one-way access driveway on Stuart Street would be narrower than the existing two-way curb-cut, which will improve the pedestrian environment in front of the proposed building. A second access driveway, allowing right-turns in and right-turns out only, will be provided on LaGrange Street, approximately 60 feet east of the existing two-way curb cut and approximately 250-feet west of Washington Street. The two driveways will be connected by an internal driveway, providing access to ground-level parking and the car elevators, which will allow for vehicles to queue on-site within the building upon entering and exiting the garage.

Access to the on-site loading dock will be provided from LaGrange Street. The main pedestrian entry will be provided on Stuart Street, with secondary access/egress on LaGrange Street.

2.1.2 Methodology

In accordance with BTD *Transportation Access Plan Guidelines* (2001) the study team conducted a transportation analysis for the proposed Project. The analysis is summarized in the following sections:

- The first comprises an inventory of existing transportation conditions, including roadway capacities, parking, transit, pedestrian and bicycle circulation, loading, and site conditions.

- The second evaluates future transportation conditions and assesses potential traffic impacts associated with the proposed development and other neighboring projects. Long-term impacts are evaluated for the year 2016, based on a five-year horizon from the 2011 base year. Expected roadway, parking, transit, pedestrian, and loading capacities and deficiencies are identified. This section includes the following scenarios:

- The No-Build Scenario (2016) includes general background growth and additional vehicular traffic associated with specific proposed or planned developments and roadway changes in the vicinity of the site; and

- The Build Scenario (2016) includes specific travel demand forecasts for the Project.

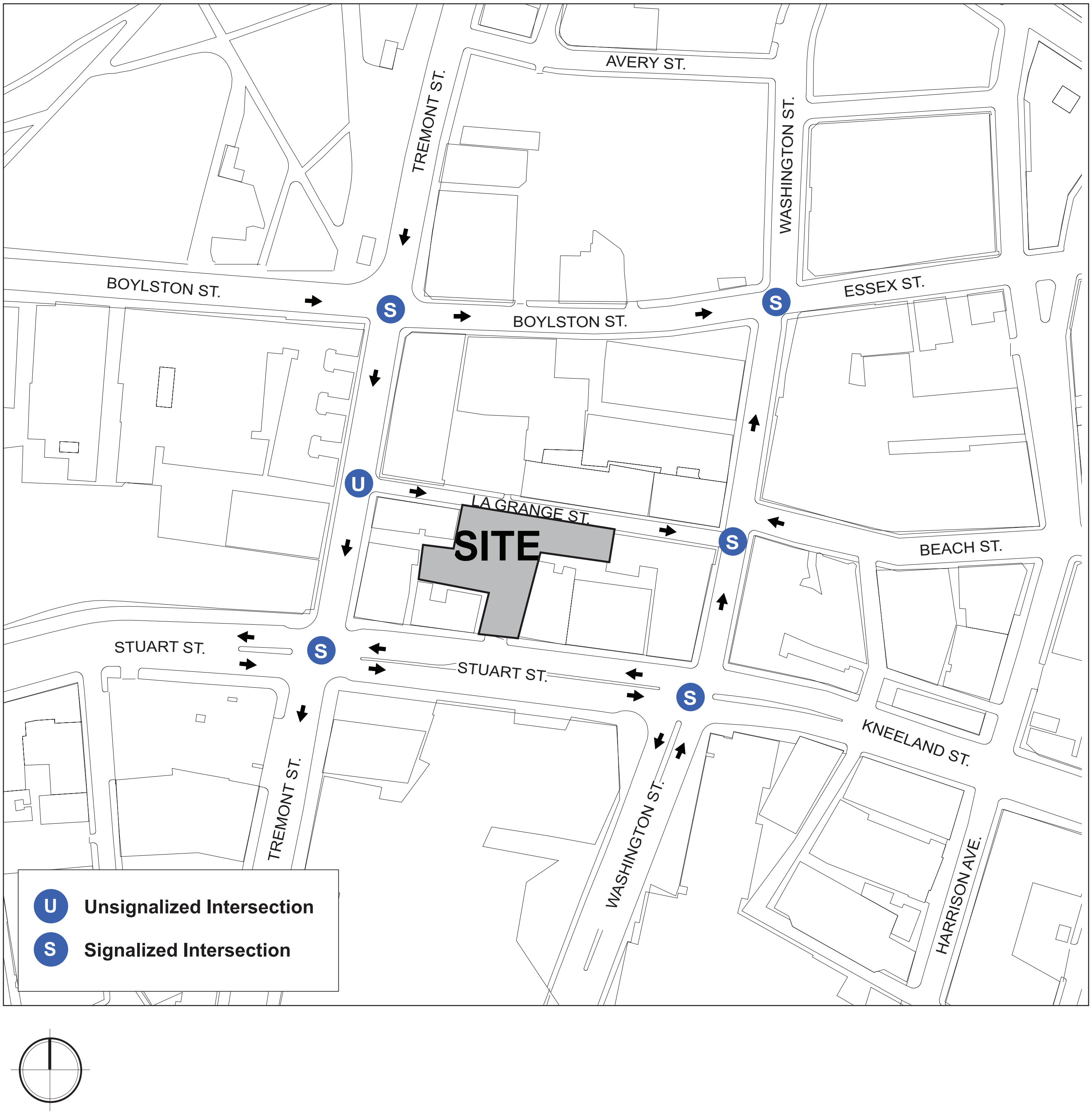
- A third section identifies appropriate measures to mitigate Project-related impacts identified in the previous phase.

- Finally, an evaluation of short-term traffic impacts associated with construction activities is also included.

2.1.3 Study Area

The Project's traffic impact study area is generally bounded by Boylston Street and Essex Street to the north, Stuart Street and Kneeland Street to the south, Washington Street to the east, and Tremont Street to the west. As shown in Figure 2-1, the study area includes the following 6 intersections:

1. Stuart Street/Tremont Street (signalized);
2. Stuart Street/Kneeland Street/Washington Street (signalized);
3. Washington Street/LaGrange Street/Beach Street (signalized);
4. Boylston Street/ Washington Street/Essex Street (signalized);
5. Boylston Street/Tremont Street (signalized); and
6. Tremont Street/LaGrange Street (unsignalized).



Not to scale.

45 Stuart Street PNF Boston, Massachusetts

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Figure 2-1
Study Area Intersections

2.2 Existing Conditions

2.2.1 Roadway Network

The study area includes the following roadways, which are categorized according to the Massachusetts Department of Transportation Office of Transportation Planning functional classifications:

Stuart Street is an east–west urban principal arterial that runs from Huntington Avenue to Washington Street, where it becomes Kneeland Street. At the Project site, Stuart Street is a two-way street that provides four lanes of traffic separated by a median, with two travel lanes in each direction. Metered parking is provided on both the north and the south sides of the street adjacent to the Project site.

Kneeland Street is an east-west principal arterial that runs from Washington Street to Atlantic Avenue, where it becomes Stuart Street. Sidewalks are located on both north and south sides of Kneeland Street. Metered parking is provided on both sides of Kneeland Street between Washington St and Surface Road; parking is generally restricted east of Surface road.

Tremont Street is an urban principal arterial that begins at Cambridge Street in downtown Boston and runs one-way southbound to Oak Street, where it turns to converge with Charles Street and becomes two-way through the South End into Roxbury. Four southbound lanes are provided between Winter Street and Stuart Street. Sidewalks are located on both of Tremont Street. In the vicinity of the Project, parking on Tremont Street is generally prohibited to the north of Stuart Street and consists of a mix of valet, cab stand, and metered spaces to the south of Stuart Street.

Washington Street is an urban principal arterial that runs from downtown Boston through the South End, Roxbury, and Jamaica Plain. South of Kneeland Street, in Boston, Washington Street consists of metered parking on both sides of the street. To the north of Kneeland Street in Boston, Washington Street becomes a one-way street, northbound with two travel lanes. Through the Downtown Crossing shopping area, Washington Street is a pedestrian- service vehicle- and emergency-only roadway. In the vicinity of the Project, parking on Washington Street consists of metered spaces to the south of Kneeland Street and is generally prohibited to the north of Kneeland Street. There is a small pickup/drop off zone located in front of the Archstone Boston Common building on the east side of Washington Street just south of Essex Street. On the west side of Washington Street, there is State Police parking only provided for the Department of Motor Vehicles. Sidewalks are located on both sides all along Washington Street.

LaGrange Street is a one-way local road that runs eastbound from Tremont Street to Washington Street. Parking is prohibited at any time on either side of the roadway and sidewalks are provided on both sides.

Beach Street is a local road that runs one-way westbound from Atlantic Avenue to Surface Road, then from Hudson Street to Washington Street; vehicular travel is prohibited between Surface Road and Hudson Street due to the presence of the Chinatown Gate and pedestrian plaza. Parking is provided on either side of the roadway and generally consists of a mix of metered, residential, and commercial spaces. Sidewalks are provided on both sides of the street.

Boylston Street is an urban minor arterial that runs from Brookline Avenue in the Fens to Washington Street, where it becomes Essex Street, terminating at Atlantic Avenue. Within the study area, Boylston Street is a two-way between Tremont Street and Charles Street and one-way between Tremont Street and Washington Street. Commercial parking only is provided on the south side of Boylston Street between Tremont Street and Washington Street. Sidewalks are provided on both sides of the street.

Essex Street is an urban minor arterial that runs one-way eastbound from Washington Street and terminates at Atlantic Avenue. Within the study area the roadway consists of two travel lanes and a bus-only lane for MBTA operations. Within the study area, parking for commercial vehicles is provided on the south side of the street.

2.2.2 Intersection Conditions

2.2.2.1 Signalized Intersections

Stuart Street/Tremont Street is a signalized intersection with three approaches. The Stuart Street eastbound approach consists of two through lanes and an exclusive right-turn only lane. The Stuart Street westbound approach consists of an exclusive left-turn only lane and two through lanes. The Tremont Street southbound approach consists of an exclusive left-turn only lane, two through lanes and a shared through/right-turn lane. A median is provided on Stuart Street to separate the eastbound and westbound travel lanes. On the Stuart Street westbound approach parking is allowed on the north and south side. On the Stuart Street eastbound approach parking is allowed on the north side. Crosswalks and wheelchairs ramps are provided across all legs of the intersection.

Stuart Street/Kneeland Street/Washington Street is a signalized intersection with three approaches. The Stuart Street eastbound approach consists of an exclusive left-turn lane, a through lane and a shared through/right-turn lane. The Kneeland Street westbound approach consists of a shared left-turn/through lane, a through lane, and an exclusive right-turn lane. The Washington Street northbound approach consists of a shared left-turn/through lane and a shared through/right-turn lane. Parking is provided along all approaches. Crosswalks and wheelchair ramps are provided across all legs of the intersection.

Washington Street/LaGrange Street/Beach Street is a signalized intersection with three approaches. The LaGrange Street eastbound approach consists of one left-turn only lane. Beach Street intersects Washington Street approximately 45-feet north of LaGrange. The Beach Street westbound approach consists of two right-turn only lanes. The Washington Street northbound approach consists of two through lanes. Parking is provided on the north and south side of the Beach Street westbound approach. Crosswalks are provided across all legs of the intersection. With the exception of the southernmost crosswalk on the east side of Washington Street, wheelchair ramps are provided across all legs of the intersection.

Boylston Street/Washington Street/Essex Street is a signalized intersection with two approaches. The Boylston Street eastbound approach consists of a shared left-turn/through lane and a through lane. The Washington Street northbound approach consists of a through lane and shared through/right-turn lane. There is a small pickup/drop off zone for the Arch Stone Apartment building located on the east side of the street just south of Essex Street. On the west side of the street, there is State Police parking only provided for the Department of Motor Vehicles. Crosswalks and wheelchair ramps are provided across all sides of the intersection.

Boylston Street/Tremont is a signalized intersection with two approaches. The Boylston Street eastbound approach consists of a through lane and a shared through/right-turn lane. The Tremont Street southbound approach consists of a shared left-turn/through lane, two through lanes and a shared through/right-turn lane. Parking is allowed along the south side of the Boylston Street eastbound approach mainly for Emerson College Police and commercial vehicles. Crosswalks and wheelchair ramps are provided across all sides of the intersection.

2.2.2.2 Unsignalized Intersections

Tremont Street/LaGrange Street is an unsignalized intersection of LaGrange and Tremont Street, mid-block between Boylston Street and Stuart Street. LaGrange is a one-lane eastbound one-way street. Parking is prohibited along both sides of LaGrange Street.

2.2.3 Traffic Conditions

Turning movement counts were based on data collected during the weekday morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 a.m. to 6:00 p.m.) peak periods on April 14, 2011. Based on these counts, the weekday peak hours were identified as 8:00–9:00 a.m. and 5:00–6:00 p.m.

Figure 2-2 and Figure 2-3 show the existing peak-hour turning volumes for the study area intersections. The existing traffic volumes include the traffic generated by the existing, 89 space commercial parking lot. Complete traffic count data are provided in Appendix A.

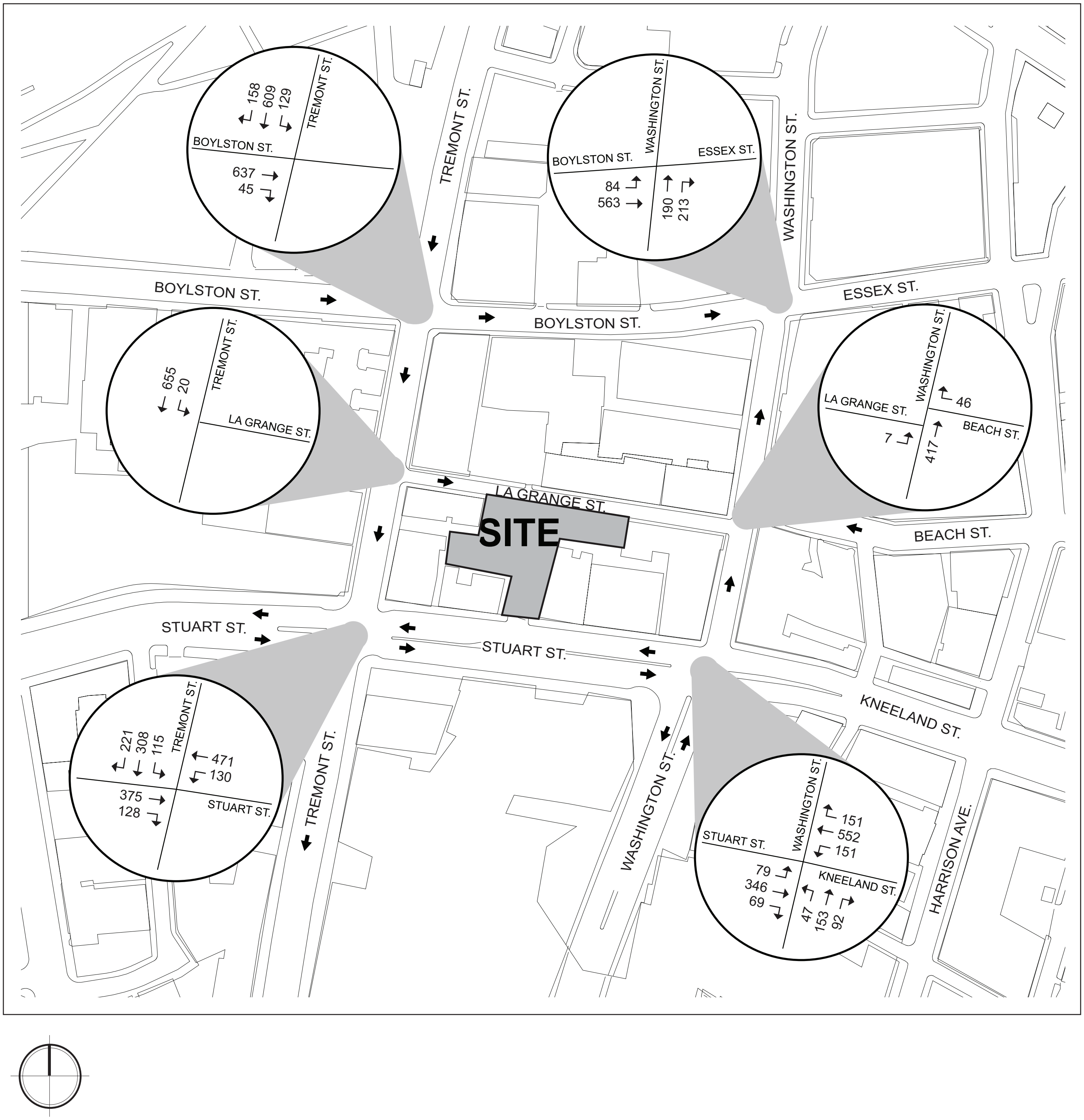

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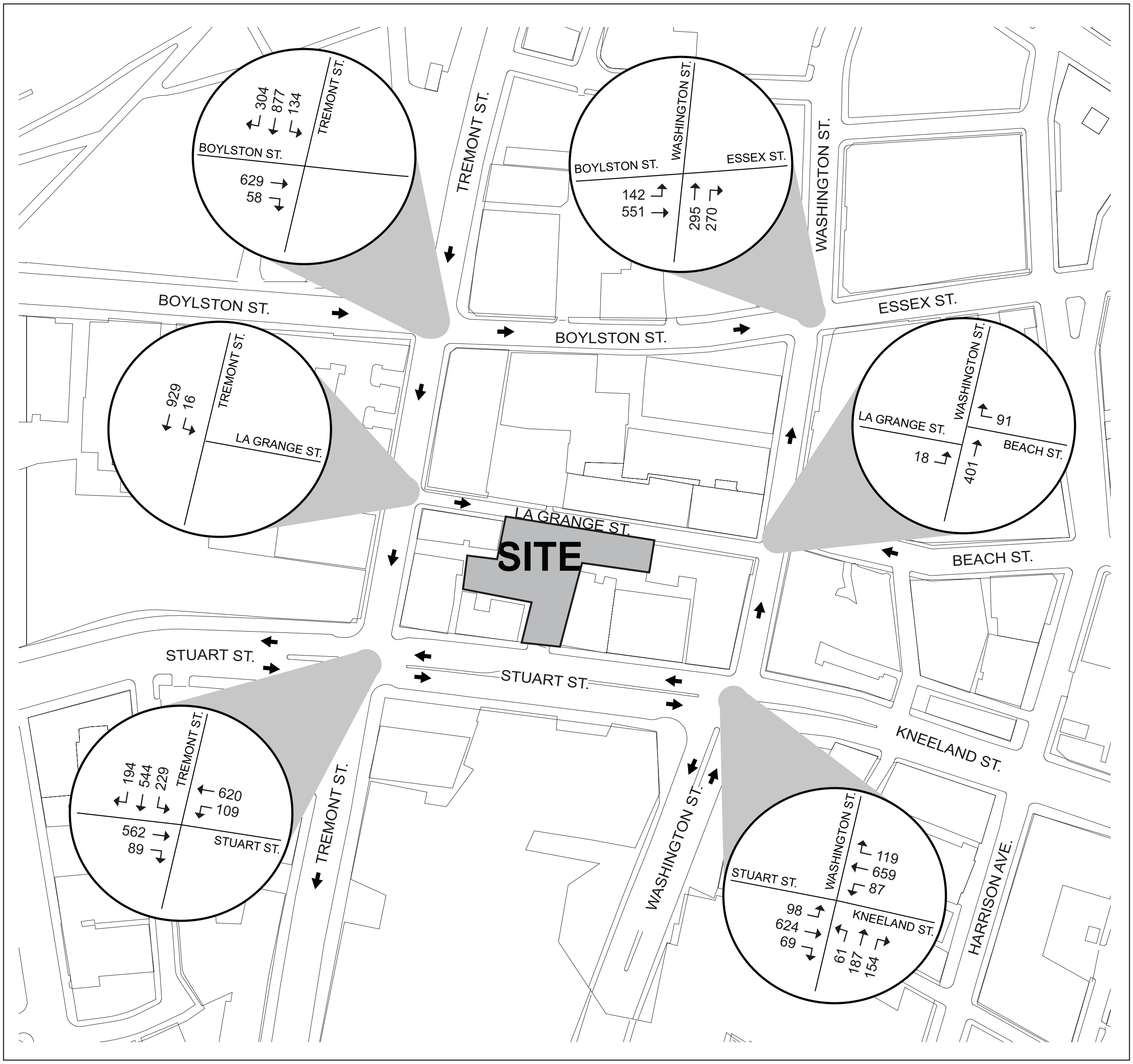
Figure 2-2
Existing Conditions (2011) Turning Movement Volumes, a.m. Peak-hour (8:00-9:00 a.m.)



Not to scale.

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Figure 2-3
Existing Conditions (2011) Turning Movement Volumes, p.m. Peak-hour (5:00-6:00 p.m.)

2.2.3.1 Traffic Operations

Traffic operations are determined through an analysis of intersection Level of Service (LOS). LOS and delay at the study area intersections were analyzed using Synchro 6 software developed by Trafficware. Synchro is based on the traffic operational analysis methodology of the Transportation Research Board's *2000 Highway Capacity Manual* (HCM); LOS and delay (in seconds) are determined based on intersection geometry and available traffic data for each intersection.

The Existing Conditions signal timing and phasing information for the intersections of Stuart Street/Tremont Street and Stuart Street/Kneeland Street/Washington Street that was input into Synchro was derived from a signal re-timing study along the Stuart Street/Kneeland Street corridor performed by Howard/Stein-Hudson Associates for the Boston Transportation Department (BTD).[1]

The Existing Conditions signal timing and phasing information for the intersections of Washington Street/LaGrange Street/Beach Street, Boylston Street/Essex Street/Washington Street, and Boylston Street/Tremont Street that was input into Synchro was derived from a signal re-timing study provided by Boston Transportation Department (BTD), along the Tremont Street and Washington Street corridors. The Existing Conditions model was accepted and approved by BTD.

The study team also conducted field observations to verify Synchro model accuracy as well as to calibrate the model as necessary to match existing traffic conditions as closely as possible.

Table 2-1, derived from the HCM, shows LOS criteria for signalized and unsignalized intersections. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (over capacity), with significant traffic delay. LOS D is generally considered acceptable in an urban environment.

Table 2-1 Level of Service Criteria (HCM Excerpt)

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

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

1 Stuart-Kneeland Traffic Signal Optimization, 2009.

Table 2-2 and Table 2-3 present Level of Service summaries for the Existing Conditions a.m. and p.m. peak hours.

Table 2-2 Existing Conditions (2011) Level of Service Summary, a.m. Peak Hour

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Signalized Intersections				
1. Stuart Street/Tremont Street	**C**	**23.2**	**-**	**-**
Stuart EB thru | thru	B	19.6	0.50	171
Stuart EB right	A	2.9	0.28	m9
Stuart WB left	B	19.8	0.53	m61
Stuart WB thru | thru	B	13.2	0.34	92
Tremont SB left	D	52.4	0.67	124
Tremont SB thru | thru | thru/right	C	33.0	0.75	129
2. Stuart Street/Washington Street/ Kneeland Street	**C**	**24.6**	**-**	**-**
Stuart EB left	C	28.8	0.62	m#35
Stuart EB thru | thru/right	B	14.7	0.68	54
Kneeland WB left/thru | thru	C	23.1	0.76	221
Kneeland WB right	B	14.8	0.24	97
Washington NB left/thru | thru/right	D	46.2	0.70	152
3. Washington Street/LaGrange Street/ Beach Street	**B**	**12.0**	**-**	**-**
LaGrange EB left	A	0.0	0.02	0
Beach WB right | right	A	0.1	0.05	0
Washington NB thru | thru	B	13.7	0.31	97
4. Boylston Street/Washington Street/ Essex Street	**A**	**6.8**	**-**	**-**
Boylston EB left/thru | thru	A	9.0	0.62	41
Washington NB thru | thru/right	A	3.3	0.42	15
5. Boylston Street/Tremont Street	**B**	**10.8**	**-**	**-**
Boylston EB thru | thru/right	A	8.2	0.72	37
Tremont SB left/thru | thru | thru | thru/right	B	12.8	0.70	33
Unsignalized Intersections				
6. Tremont Street/LaGrange Street				
Tremont SB left/thru | thru | thru | thru	A	N/A	N/A	N/A

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
m = Queue is metered by upstream intersections.

Table 2-3 Existing Conditions (2011) Level of Service Summary, p.m. Peak Hour

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Signalized Intersections				
1. Stuart Street/Tremont Street	B	18.4	-	-
Stuart EB thru | thru	C	24.3	0.68	m248
Stuart EB right	A	3.9	0.22	m9
Stuart WB left	C	22.7	0.52	m39
Stuart WB thru | thru	B	15.6	0.50	m105
Tremont SB left	C	27.4	0.77	m#195
Tremont SB thru | thru | thru/right	B	14.7	0.80	m112
2. Stuart Street/Washington Street/ Kneeland Street	D	36.4	-	-
Stuart EB left	D	53.0	0.81	m#116
Stuart EB thru | thru/right	C	31.0	0.90	#205
Kneeland WB left/thru | thru	C	34.9	0.88	#289
Kneeland WB right	B	17.1	0.20	85
Washington NB left/thru | thru/right	D	47.4	0.83	204
3. Washington Street/LaGrange Street/ Beach Street	B	15.2	-	-
LaGrange EB left	A	0.1	0.03	0
Beach WB right | right	A	0.1	0.08	0
Washington NB thru | thru	B	19.5	0.28	m120
4. Boylston Street/Washington Street/ Essex Street	A	8.0	-	-
Boylston EB left/thru | thru	A	8.6	0.64	38
Washington NB thru | thru/right	A	7.5	0.51	15
5. Boylston Street/Tremont Street	C	21.4	-	-
Boylston EB thru | thru/right	C	31.0	0.93	#360
Tremont SB left/thru | thru | thru | thru/right	B	16.1	0.64	270
Unsignalized Intersections				
6. Tremont Street/LaGrange Street				
Tremont SB left/thru | thru | thru | thru	A	N/A	N/A	N/A

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
m = Queue is metered by upstream intersections.

All intersection approaches within the study operate at acceptable LOS (LOS D or better) during the a.m. and p.m. peak hours – a result of recent signal timing improvements made by the BTD along the Tremont Street, Washington Street, and Stuart Street/Kneeland Street corridors.

2.2.4 Parking

2.2.4.1 Local Curbside Inventory

Curb use regulations adjacent to the Project site include a mix of metered parking, commercial loading, and restricted parking, as shown in Figure 2-4. Parking is prohibited along Tremont Street, Washington Street, and LaGrange Street adjacent to the Project site. Parking along the north side of Stuart Street abutting the Project site consists of a mix of commercial loading and metered parking.

2.2.4.2 Off-street Parking

Approximately 8,022 off-street parking spaces are available to the public in garages and lots within a quarter-mile (5 to10-minute walk) radius of the Project. Of these, approximately 566 are found in parking lots and 7,456 are in parking garages. These parking facilities and their capacities are identified in Figure 2-5 and Table 2-4.

Table 2-4 Off-street Parking within a Quarter-mile of the Site

Map No.	Facility	Public Spaces
	Lots	
1	267 Tremont Street	35
2	564-568 Washington Street (BRA Lot)	150
3	33-37 Essex Street	49
4	17-21 Tyler Street	63
5	85 Essex Street (Lappos Lot)	50
6	47-55 LaGrange Street	50
7	41-47 LaGrange Street 28 LaGrange Street	89
8	290 Tremont Street (Auto Park)	80
	Sub Total	566
	Garages	
9	247 Tremont St (Tufts Med. Cntr)	937
10	Boston Common	1,500
11	2 Avery Street (Millennium South Garage)	563
12	1 Avenue De Lafayette	1,276
13	40 Beach Street	500
14	84-96 Beach Street	275
15	100 Stuart Street (W Hotel)	95
16	200 Stuart Street (Radisson Hotel)	900
17	City Place Garage	333
18	Archstone Apartments	177
19	Motormart	900
	Sub Total	7,456
Total Off-street Parking		8,022

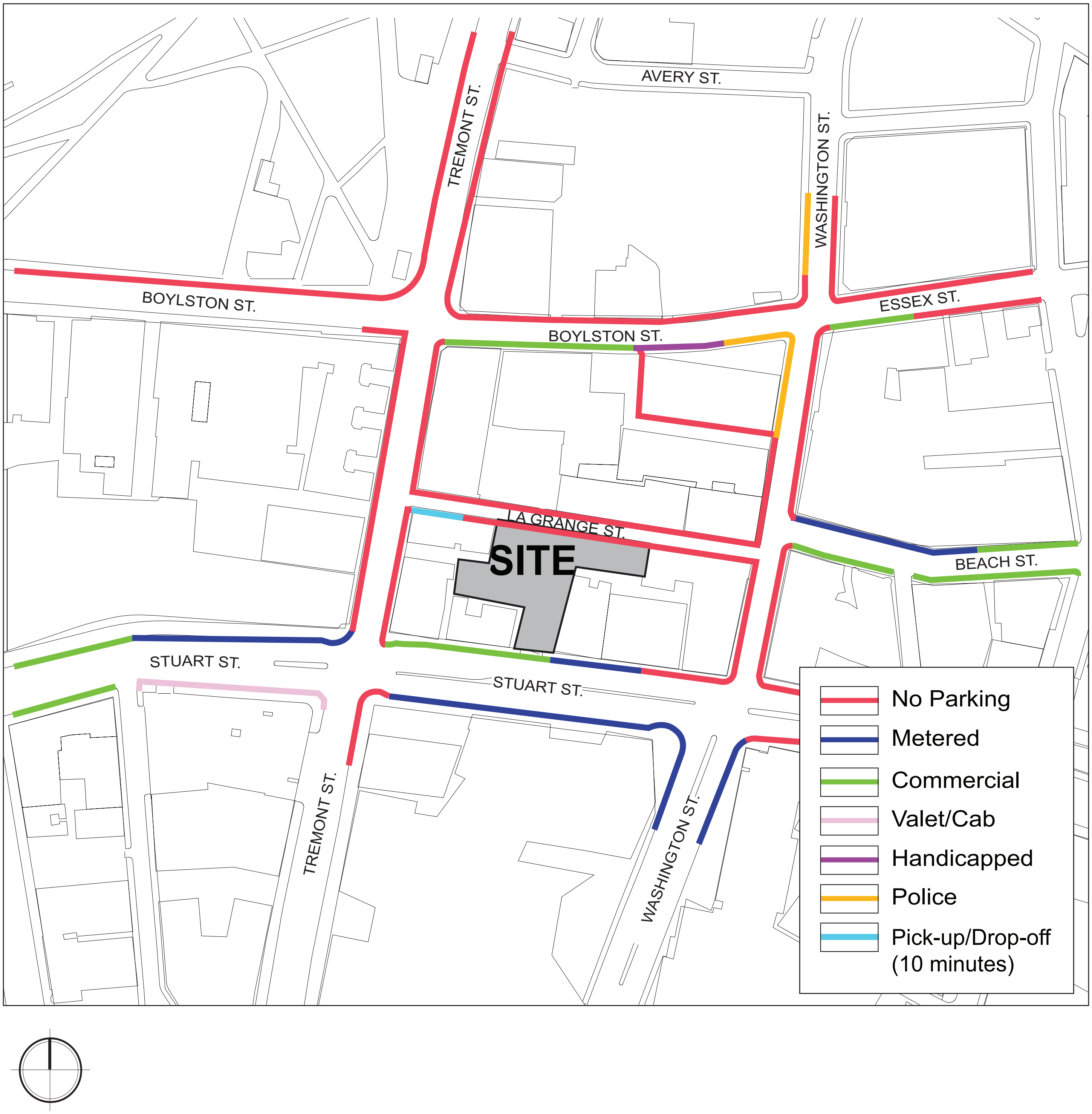

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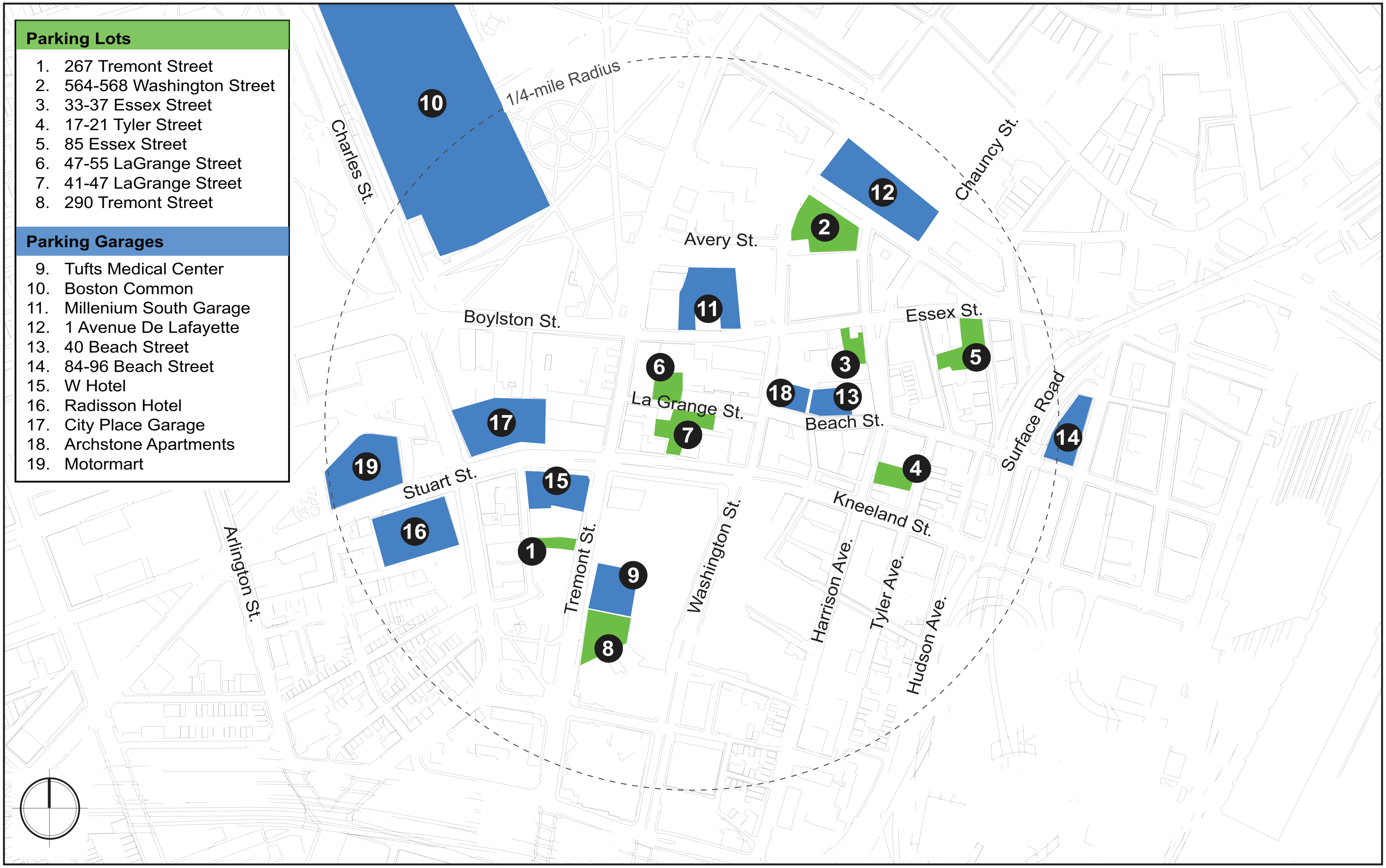
Figure 2-4
Curbside Inventory



Not to scale.

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Figure 2-5
Off-street Parking in the Study Area

2.2.5 Public Transportation in the Study Area

The Project site is well-served by public transportation. The MBTA public transportation services are shown in Figure 2-6 and summarized in Table 2-5.

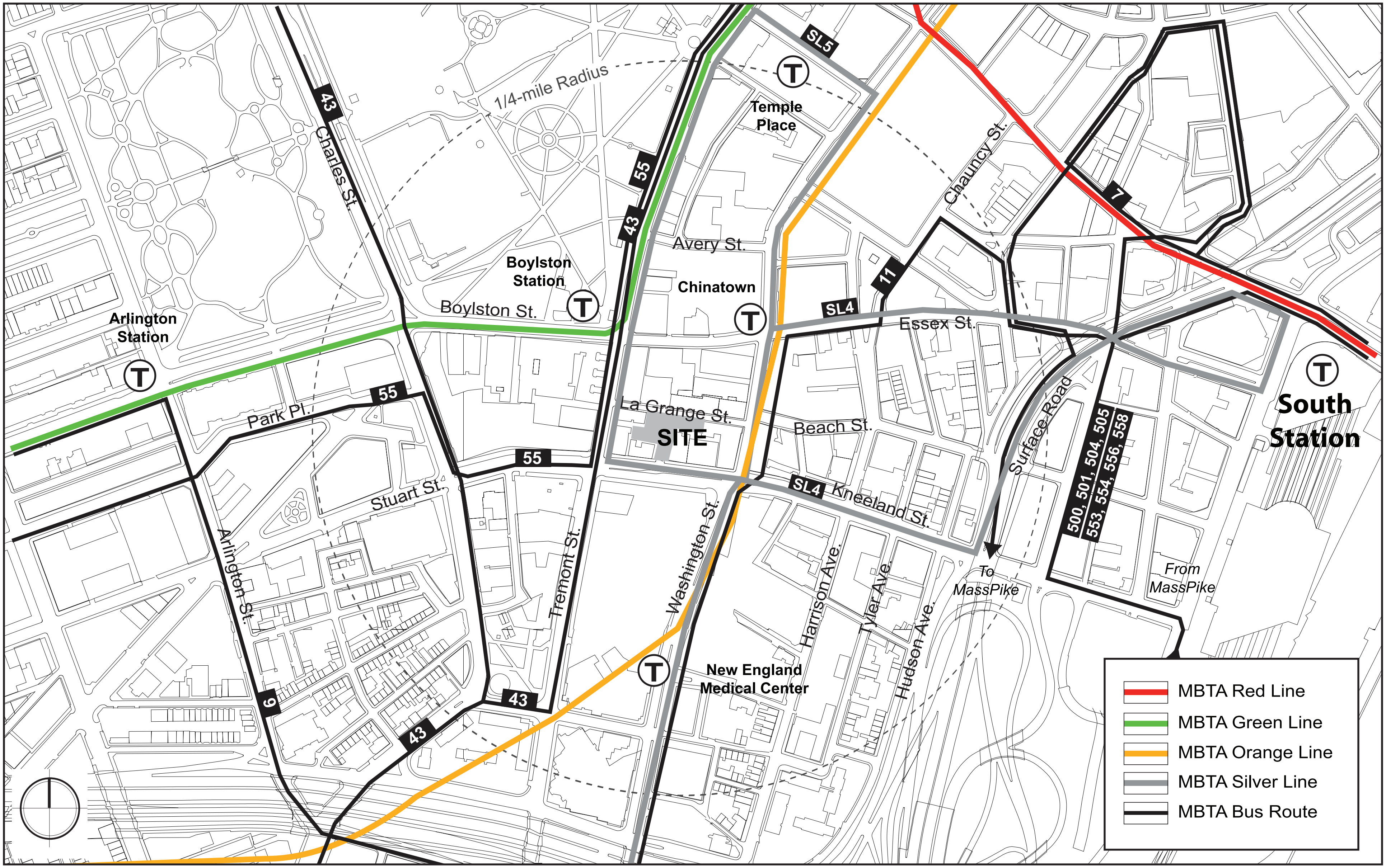
Located less than one-quarter mile from the Project site is the MBTA Boylston Street Station on the Green Line, Chinatown Station on the Orange and Silver Lines, and the Tufts Medical Center Station, which also serves the Orange and Silver Lines.

Table 2-5 MBTA Transit Service in the Study Area

Route #/Line	Description	Peak-hour Headway (in minutes)*
Rapid Transit Routes		
Orange Line	Forest Hills–Oak Grove	5
Green Line	Lechmere–Boston College, Cleveland Circle, Riverside, or Heath Street	6–7
Silver Line SL4	Dudley Station–South Station at Essex Street - via Washington Street	10
Silver Line SL5	Dudley Station–Downtown Crossing at Temple Street - via Washington Street	7
Red Line	Alewife-Braintree/Mattapan	5-9
Local Bus Routes		
7	City Point–Otis & Summer Streets via Summer Street & South Station	5-6
9	City Point–Copley Square via Broadway Station	6-12
11	City Point–Downtown via Bayview	6-10
43	Ruggles Station–Park and Tremont streets via Tremont Street	10–12
55	Jersey and Queensberry Streets–Copley Square or Park and Tremont streets via Ipswich Street	16–30
Express Bus Routes		
500	Riverside - Downtown via Mass. Turnpike	10-15
501	Brighton Center - Downtown via Oak Square & Mass. Turnpike	5-10
504	Watertown/Newton Corner–Downtown via MassPike	8-10
553	Roberts - Downtown Boston via Newton Corner & Central Square, Waltham	60
554	Waverly Square – Downtown Boston	60
556	Waltham Highlands – Downtown Boston	60
558	Auburndale – Downtown Boston	70
*Commuter Rail Routes***		
–	Fairmount – South Station	40-45
–	Framingham/Worcester – South Station	15–45
–	Franklin – South Station	20–30
–	Greenbush – South Station	30-60
	Needham – South Station	30–45
–	Providence/Stoughton – South Station	12–30

* Headway is the scheduled time between trains or buses, as applicable.

** Commuter rail routes have irregular headways; customers typically plan trips according to schedule rather than utilizing walk-up service.



Not to scale.

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Figure 2-6
Public Transportation in the Study Area

Additionally, all routes of the MBTA Green Line stop at Park Street are within the seven-minute walk radius.

Several local and express bus routes also operate within a 5 to 10-minute walk of the Project site, including the #11, #43, #55, #500, #501, #504, #505, #553, #554, #556, and #558. Express bus service provides convenient connections to points west of the Project site via Massachusetts Turnpike, including Brighton, Newton, Waltham, and Watertown.

The Project site is also located within one-half-mile of Park Street Station on the Red and Green Lines and to South Station, a transportation hub that provides access to the Red Line, Silver Line, 6 Commuter rail lines, and local and regional bus service. South Station also serves as the terminus for Amtrak service along the northeast corridor.

2.2.6 Pedestrian Access and Circulation

2.2.6.1 Existing Pedestrian Conditions

Pedestrian counts were conducted at study area intersections on April 14, 2011 from 7:00 to 9:00 a.m. and from 4:00 to 6:00 p.m. Existing a.m. and p.m. peak-hour pedestrian volumes appear in Figure 2-7 and Figure 2-8, respectively.

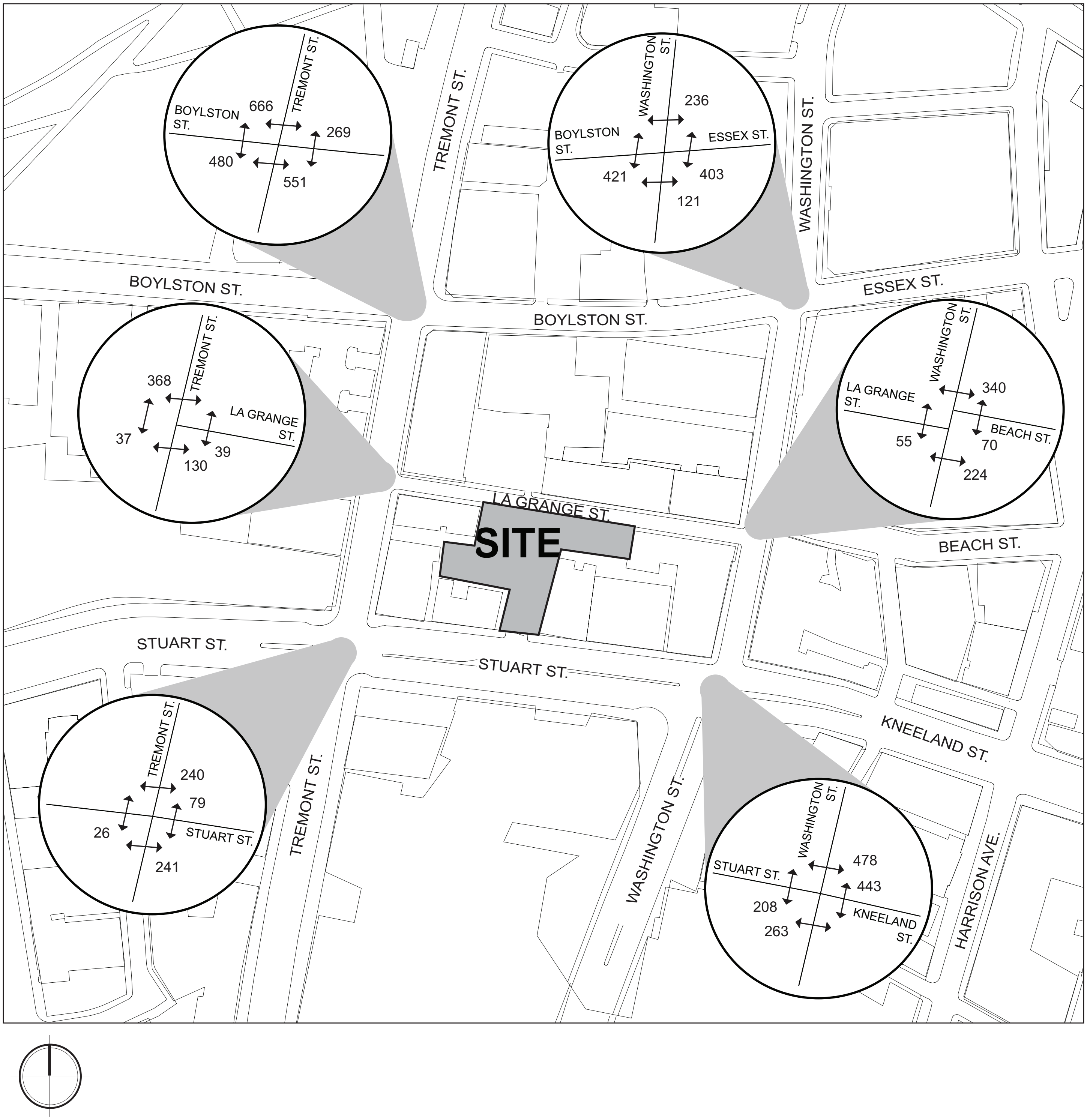
As in most of downtown Boston, the level of pedestrian activity on and around the Project site is high with the exception of LaGrange Street. Area office buildings, institutions, residential buildings, restaurants, and transit stations generate high levels of pedestrian activity. Sidewalks in the study area are generally in good condition, and supply more than adequate capacity. Although the study team noted that the sidewalks along LaGrange were generally in deteriorated condition. Handicapped-accessible ramps and crosswalks are provided at most study area intersections.

2.2.7 Bicycle Access and Circulation

Currently, the roadways adjacent to the Project site have no designated bicycle lanes or markings. According to the *Bike Routes of Boston* maps published by the City of Boston, Tremont Street and Washington Street are designated intermediate-level bike routes-suitable for users with some on-road experience. LaGrange Street, Stuart Street, and Kneeland Street are advanced-level bike routes-suitable for experienced and traffic confident cyclist.

No bicycle racks are currently provided on-site.

The Existing a.m. and p.m. peak-hour bicycle turning movement counts appear in Figure 2-9 and Figure 2-10. Bicycle counts are also included as part of the traffic count data in the Transportation Appendix A.



Not to scale.

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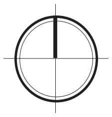
Figure 2-7

Existing Conditions (2011) Pedestrian Volumes, a.m. Peak-hour



Not to scale.

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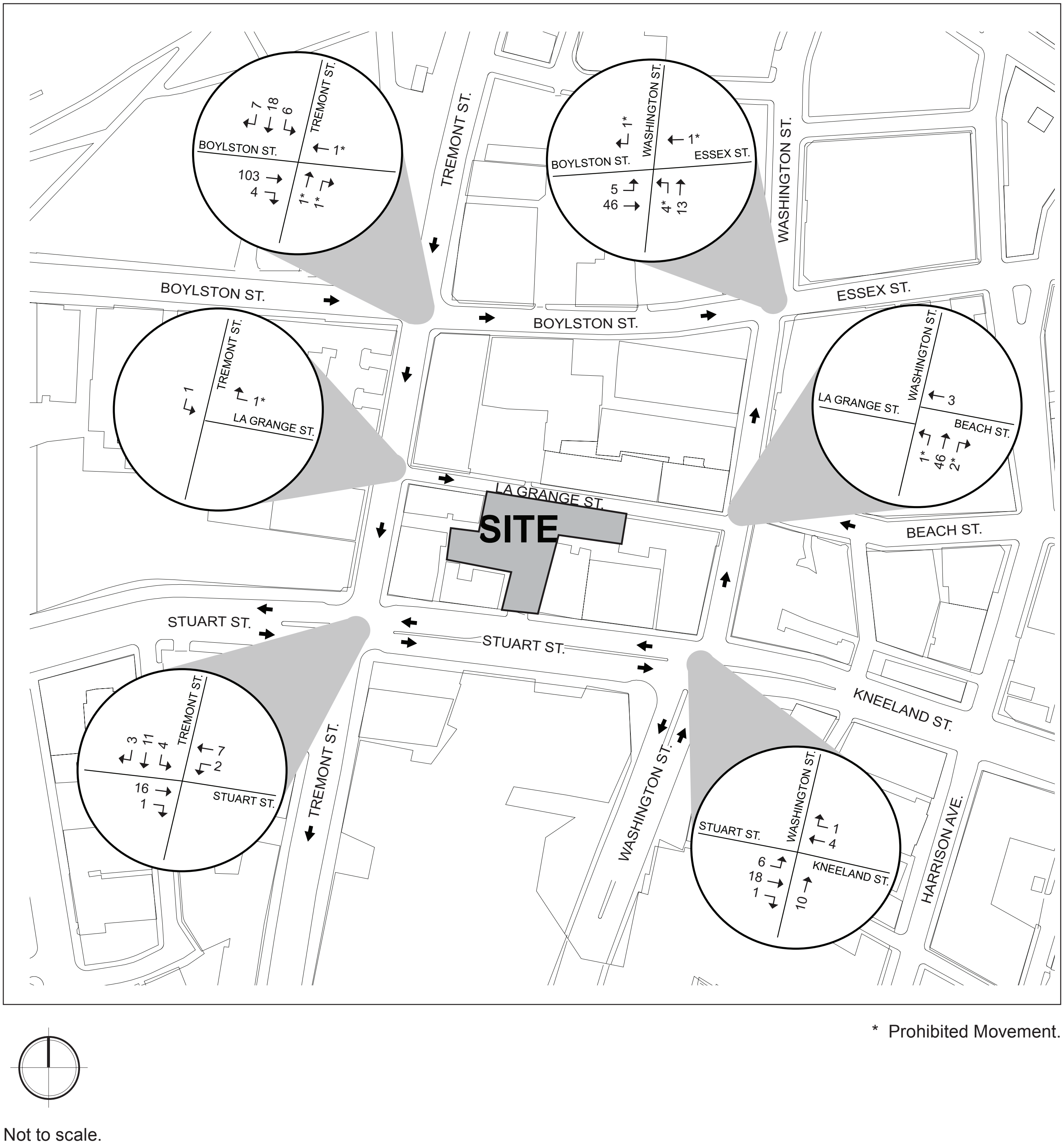
Figure 2-8
Existing Conditions (2011) Pedestrian Volumes, p.m. Peak-hour



* Prohibited Movement.

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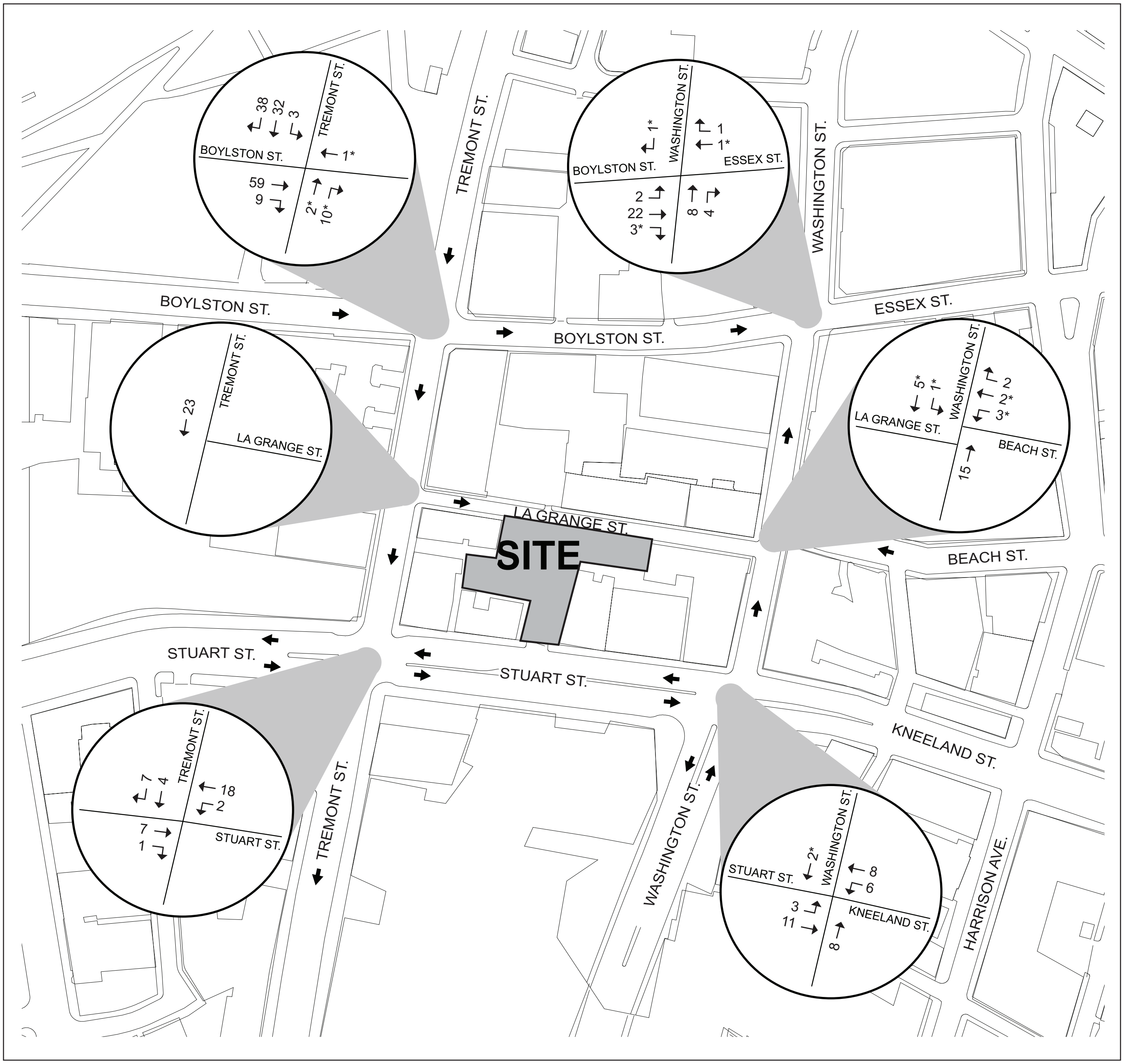
Figure 2-9
Existing Conditions (2011) Bicycle Turning Movement Counts, a.m. Peak-hour



* Prohibited Movement.

Not to scale.

Figure 2-10

Existing Conditions (2011) Bicycle Turning Movement Counts, p.m. Peak-hour

2.2.8 Loading and Service

The existing site currently consists of a surface parking lot. No loading or service activity occurs on-site today.

2.3 Evaluation of Long-term Impacts

This section describes and evaluates the projected 2016 No-Build and Build Conditions.

2.3.1 No-Build Conditions

2.3.1.1 Background Traffic Growth

No-Build traffic conditions are those that would occur independent of the proposed Project and include all existing traffic and any new traffic resulting from both general background growth and any identified development projects in the area. Two procedures are used to determine background traffic growth.

The first procedure is to estimate and distribute specific traffic volumes generated by planned new major developments and anticipated roadway changes. Additional traffic generated by the following projects, depicted in Figure 2-11, was included in this background analysis:

- ***Kensington Place.*** This project, located across from the Project site on LaGrange Street involves 385 residential units and approximately 4,400 sf of retail in a new building.
- ***Hayward Place.*** A proposal to build approximately 265 residential apartment units, approximately 12,000 sf of ground-floor retail, and up to 125 underground parking spaces.
- ***Parcel 24.*** A 325 mixed-use, mixed income residential development is proposed at a 58,000 square foot vacant site bounded by Hudson Street, Kneeland Street and Albany Street.
- ***South Station Air Rights.*** Air rights project above South Station comprising: 1,375,000 sf office, 170,000 sf residential, a 200-room hotel in 3 phases, and 934 parking spaces.
- ***100 Arlington.*** Rehabilitation of the former Renaissance School at 100 Arlington Street into approximately 128 residential condominium units.
- ***120 Kingston Street.*** Mixed-use building with 200 residential units and ground floor retail and 70 parking spaces.

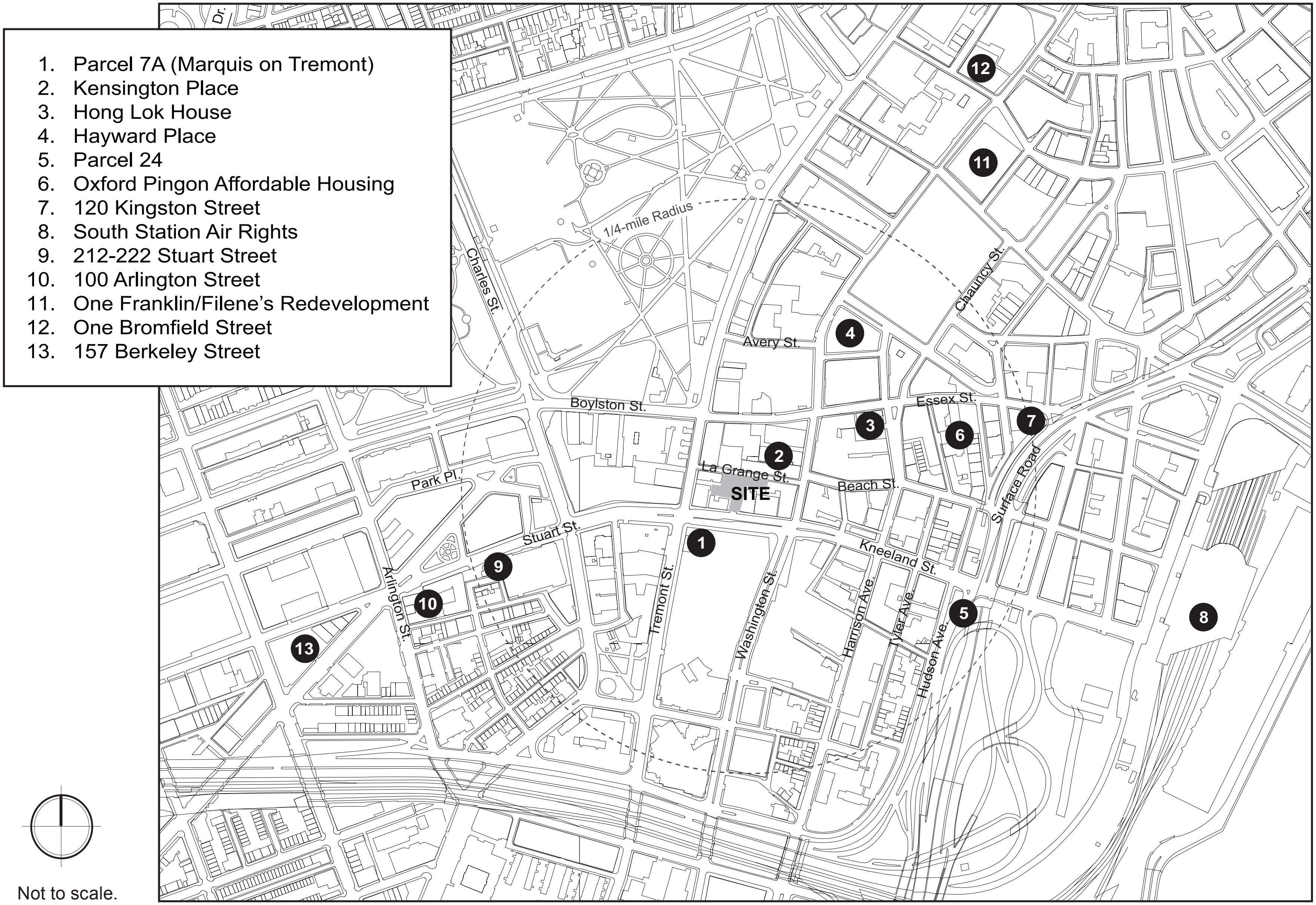


Figure 2-11
Area Projects

- ***212–222 Stuart Street Residential Redevelopment.*** This project proposes redevelopment of a site in Bay Village currently occupied by parking and the now vacant Jae's Restaurant, to be occupied by 10 stories of retail, commercial, and office space.

- ***One Franklin Street.*** Currently on hold, this mixed-use project involves the preservation of and renovations to the existing eight-story Filene's building at the corner of Washington and Summer Streets and the nine-story building at the corner of Hawley and Franklin Streets and the construction of a new mixed-use tower.

- ***One Bromfield Street.*** Demolition of existing buildings and the construction of a 407,000sf structure containing 28 stories for the provision of retail, 276 rental units and 200 parking spaces.

- ***157 Berkeley Street.*** Construction of a new approximately 590,000 sf, 22-story office building and 205 parking spaces for use by Liberty Mutual. Renovations will also be made to existing Liberty Mutual buildings on Stuart Street, Berkley Street, St. James Street and Columbus Avenue.

The second method of determining background growth rate is to apply a general growth rate to account for changes in demographics, auto usage, and ownership. Based on an assessment of 2007 to 2011 traffic volume data at downtown intersections, traffic volumes have remained relatively constant in recent years. However, to provide a conservative estimate, this analysis assumes a general background growth rate of one-half percent per year. The background growth rate is assumed to include study area background traffic from the following small projects:

- ***Marquis on Tremont (Parcel 7A).*** This small but prominent site at the corner of Tremont Street and Stuart Street in Boston's Theater District will create a 14-story building with 72 residential units and 6,400 sf of commercial space. This project is currently stalled due to the economic environment.

- ***Hong Lok House.*** New construction of 75 elderly assisted living units in a combination of new construction and restoration on Essex Street in Chinatown.

- ***Oxford Ping-on Affordable Housing.*** Off-site affordable component for 120 Kingston project. The proposal calls for 47 units of affordable housing.

2.3.1.2 Background Transportation Improvements and Planning Initiatives

W Boston Hotel & Residences Stuart Street–Kneeland Street Signal Optimization. As part of Transportation Access Plan Agreement (TAPA) commitments with the City of Boston, the W Hotel team evaluated traffic signal timings, lane use, and parking regulations along the Stuart Street–Kneeland Street corridor between Charles Street and Tyler Street. The city has already implemented several short-term improvements; however, because a schedule and funding have not been defined, implementation of more substantial long-term improvements in the corridor was therefore not included in the No-Build model.

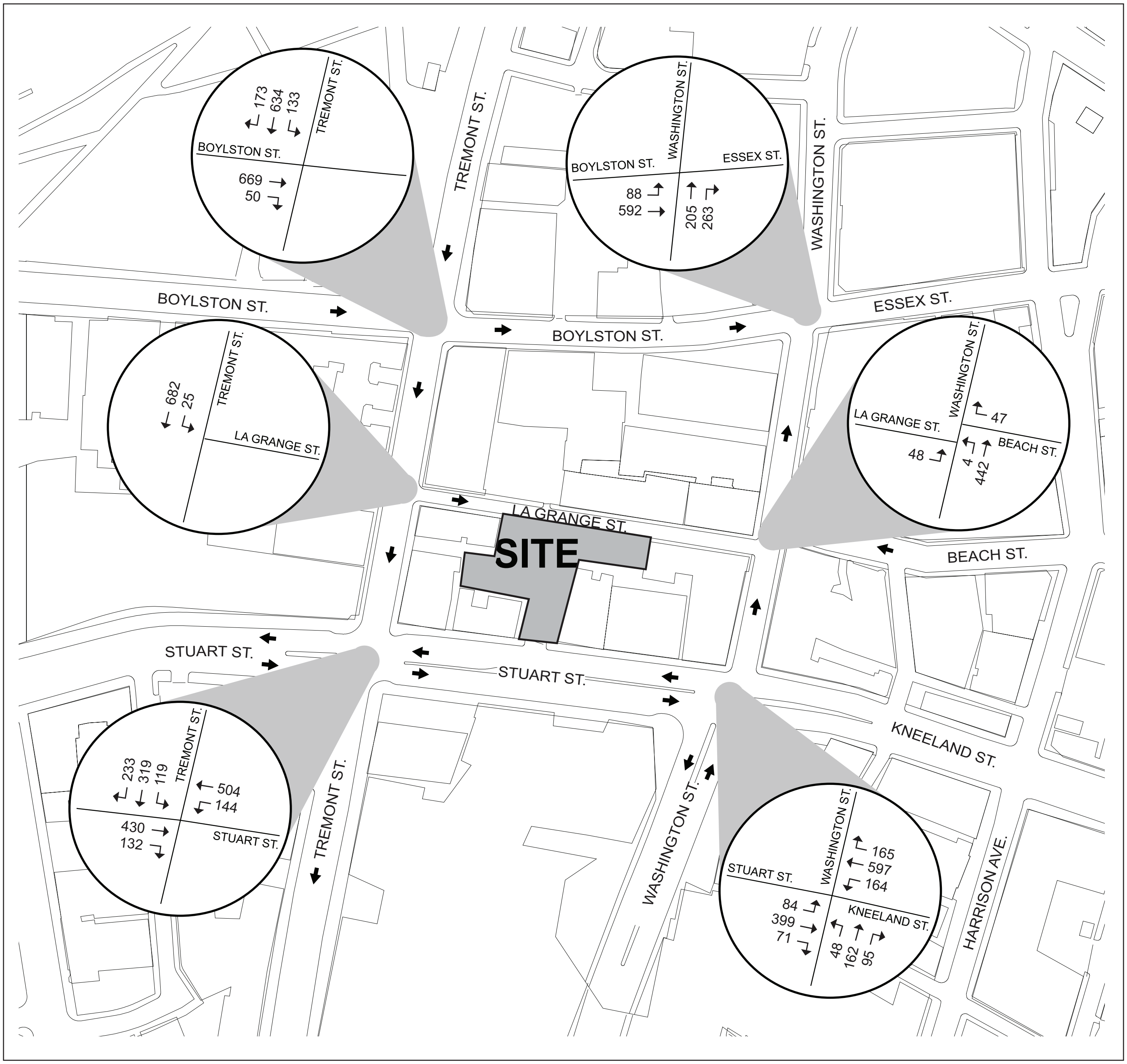
Improvements at LaGrange Street/Washington Street/Beach Street Intersection. The Kensington project mitigation includes improved signalization and crosswalks at this intersection. In addition, LaGrange Street will be widened and made two-way from the Kensington Garage entrance to Washington Street. The new geometry and signal plans were taken into account in the No-Build traffic analyses.

Tufts University School of Dental Medicine Addition. As part of Transportation Access Plan Agreement (TAPA) commitments with the City of Boston, Tufts performed a study evaluating potential short-term and long-term improvements to the intersection of Washington Street/Stuart Street/Kneeland Street. Tufts agreed to traffic signal system improvements at the intersection including, converting the exclusive pedestrian phase to concurrent pedestrian phases, with 4-second lead-walk-phase, and the installation of two new mast arms and foundations, new vehicle indications, and replacing all pedestrian indications where the new mast arms are installed. At the time of this study, these improvements were not yet implemented and therefore were not included in the No-Build Conditions traffic model.

The study also identified potential long-term improvements, by others, consisting of realigning the westbound approach to allow for a short left-turn pocket by removing the median, allowing improvements to the signal phasing.

2.3.1.3 No-Build Conditions Traffic Operations

The 2016 No-Build analysis uses the methodology described for Existing Conditions. No-Build traffic volumes are shown in Figure 2-12 and Figure 2-13. The resulting intersection operations are shown in Table 2-6 and Table 2-7. Complete Synchro reports are provided in Appendix A.



Not to scale.

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Figure 2-12
No-Build Conditions (2016) Turning Movement Volumes, a.m. Peak-hour

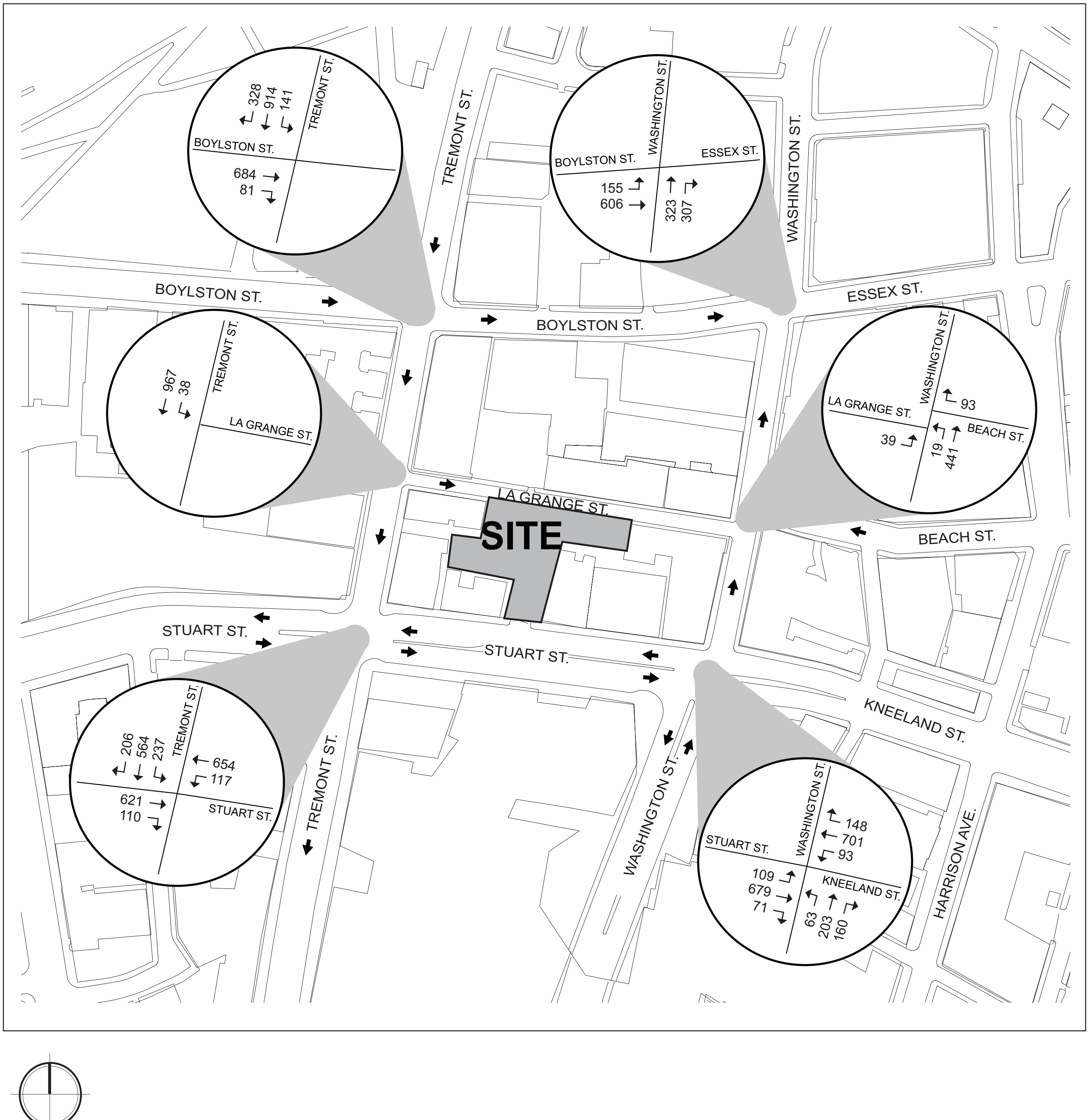

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Figure 2-13
No-Build Conditions (2016) Turning Movement Volumes, p.m. Peak-hour

Table 2-6 No-Build Conditions (2016) Level of Service Summary, a.m. Peak Hour

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Signalized Intersections				
1. Stuart Street/Tremont Street	**C**	**25.2**		
Stuart EB thru | thru	C	23.2	0.59	198
Stuart EB right	A	4.4	0.30	m10
Stuart WB left	C	27.4	0.63	m73
Stuart WB thru | thru	B	14.2	0.37	m92
Tremont SB left	D	52.6	0.68	128
Tremont SB thru | thru | thru/right	C	33.8	0.77	136
2. Stuart Street/Washington Street/ Kneeland Street	**C**	**27.5**		
Stuart EB left	D	37.5	0.70	m#111
Stuart EB thru | thru/right	B	18.1	0.76	79
Kneeland WB left/thru | thru	C	28.1	0.85	#255
Kneeland WB right	B	15.1	0.26	106
Washington NB left/thru | thru/right	D	44.9	0.73	164
3. Washington Street/LaGrange Street/ Beach Street	**B**	**19.7**		
LaGrange EB left	C	31.6	0.31	50
Beach WB thru | right	A	0.1	0.05	0
Washington NB left/thru | thru	B	19.8	0.39	147
4. Boylston Street/Washington Street/ Essex Street	**A**	**7.6**		
Boylston EB left/thru | thru	A	9.4	0.66	41
Washington NB thru | thru/right	A	4.9	0.47	5
5. Boylston Street/Tremont Street	**B**	**12.0**		
Boylston EB thru | thru/right	A	9.9	0.76	41
Tremont SB left/thru | thru | thru | thru/right	B	13.6	0.74	35
Unsignalized Intersections				
6. Tremont Street/LaGrange Street				
Tremont SB left/thru | thru | thru | thru	A	0.0	0.0	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
m = Queue is metered by upstream intersections.
Cell shading indicates that LOS has worsened from Existing Conditions

Table 2-7 No-Build Conditions (2016) Level of Service Summary, p.m. Peak Hour

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Signalized Intersections				
1. Stuart Street/Tremont Street	C	20.3		
Stuart EB thru | thru	C	28.9	0.76	m#283
Stuart EB right	A	5.1	0.27	m14
Stuart WB left	C	28.9	0.61	m38
Stuart WB thru | thru	B	16.4	0.53	m98
Tremont SB left	C	28.1	0.79	m#206
Tremont SB thru | thru | thru/right	B	15.5	0.82	m119
2. Stuart Street/Washington Street/ Kneeland Street	D	45.2		
Stuart EB left	F	80.9	0.96	m#127
Stuart EB thru | thru/right	D	42.7	0.98	#372
Kneeland WB left/thru | thru	D	49.0	0.97	#358
Kneeland WB right	B	17.8	0.25	104
Washington NB left/thru | thru/right	D	42.3	0.88	#189
3. Washington Street/LaGrange Street/ Beach Street	B	11.7		
LaGrange EB left	D	46.8	0.35	54
Beach WB thru | right	A	0.2	0.09	0
Washington NB left/thru | thru	B	10.9	0.24	123
4. Boylston Street/Washington Street/ Essex Street	B	13.9		
Boylston EB left/thru | thru	A	7.2	0.65	m37
Washington NB thru | thru/right	B	21.4	0.60	176
5. Boylston Street/Tremont Street	C	32.5		
Boylston EB thru | thru/right	E	59.7	>1.00	#426
Tremont SB left/thru | thru | thru | thru/right	B	16.9	0.68	286
Unsignalized Intersections				
6. Tremont Street/LaGrange Street				
Tremont SB left/thru | thru | thru | thru	A	0.0	0.0	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
m = Queue is metered by upstream intersections.
Cell shading indicates that LOS has worsened from Existing Conditions

Under No Build Conditions, all intersection approaches within the study will continue operate at an acceptable LOS during the a.m. and p.m. peak hours, with the exception of one approach on Stuart Street/Washington Street/Kneeland Street and one approach on Boylston Street/Tremont Street; specifically:

- ***Stuart Street/Washington Street/Kneeland Street*** **–** The Stuart Street eastbound left-turn to Washington Street worsens from LOS D to LOS F during the evening peak hour. The increase in delay is approximately 28-seconds. The change in LOS is mainly attributed to the new traffic resulting from both general background growth and any identified development projects in the area.

- ***Boylston Street/Tremont Street*** **–** The Boylston Street eastbound through-right-turn movement worsens from LOS C to LOS E during the evening peak hour. The increase in delay is approximately 29-seconds (4.7-seconds over the LOS E threshold). The change in LOS is mainly attributed to the new traffic resulting from both general background growth and any identified development projects in the area.

2.3.2 Build Conditions

As summarized in **Section 2.1.1 Project Description**, the Project will result in construction of 404 apartments and 198 parking spaces, of which 109 spaces will be new parking spaces since 89 spaces are currently provided in the parking lot and are reflected in the Existing Conditions.

2.3.2.1 Site Access and Circulation

Vehicular access and egress to and from the site will be afforded by a right-turn-in only access driveway on Stuart Street, approximately 10-feet east of the exiting curb cut and approximately 200-feet east of Tremont Street. The proposed one-way access driveway on Stuart Street would be narrower than the existing two-way curb-cut, which will improve the pedestrian environment in front of the proposed building. A second right-turn in, right-turn-out only access driveway will be provided on LaGrange Street approximately 60 feet east of the existing curb cut and approximately 250-feet west of Washington Street. The two driveways will be connected by an internal driveway, providing access to ground-level parking and the car elevators, which will allow for vehicles to queue on-site upon entering and exiting the garage. All parking will be managed by valet.

The primary access and egress from the loading dock will be via LaGrange Street. Pedestrian access will be afforded from an entry court on Stuart Street and a smaller lobby on LaGrange Street.

2.3.2.2 Trip Generation and Mode Split

Based on pertinent data provided by the LAZ Parking Company, the parking operator for the existing 89-space surface parking lot, the existing site currently generates an average of approximately 374 vehicle trips over the course of a typical weekday, including 17 entering and 2 exiting vehicle trips during the morning peak hour and 11 entering and 15 exiting vehicle trips during the evening peak hour. These existing trips associated with the parking lot will, in the future, use the proposed on-site parking garage. As such, the study team redistributed these trips on the adjacent roadway network based on the proposed access and egress points for the Project.

Trip generation for the proposed 404 residential units was derived from the Institute of Transportation Engineers' (ITE) *Trip Generation* (8th edition, 2008), using the methodology described previously to generate existing site trips (see Section 2.2.3). The fitted curve equations for Land Use Code (LUC) 220 - Apartment were used to determine Project-generated trips.

BTD publishes vehicle, transit, and walking mode split rates for different areas of Boston; the Project is located within designated Area 3. Mode split assumptions based on BTD's Area 3 data are shown in Table 2-8.

Table 2-8 Peak-hour Mode Split

Period/Direction		Bike/Walk	Transit	Auto
Daily	In	39%	30%	31%
	Out	39%	30%	31%
a.m. Peak Hour	In	17%	38%	45%
	Out	7%	70%	23%
p.m. Peak Hour	In	7%	70%	23%
	Out	17%	38%	45%

Based on the land use trip rates, mode split assumptions, and local vehicle occupancy rates, the resulting bike/walk, transit, and auto trips were identified. The Project-generated vehicle trips are summarized in Table 2-9, with detailed trip generation information provided in Appendix A.

Table 2-9 Project-Generated Vehicle Trips

Period	Direction	New Uses (404 apartments)
Daily	In	399
	Out	399
	Total	798
a.m. Peak Hour	In	18
	Out	37
	Total	55
p.m. Peak Hour	In	36
	Out	38
	Total	74

The Project is expected to generate approximately 798 new daily vehicle trips (399 trips in and 399 trips out), with 55 new vehicle trips (18 in and 37 out) during the a.m. peak hour and 74 new vehicle trips (36 in and 38 out) during the p.m. peak hour.

2.3.2.3 Trip Distribution

Vehicular trip distribution was developed using origin–destination data from BTD for Area 3 and knowledge of the local roadway network. Due to the one-way street pattern in the area, separate distributions were developed for traffic entering and leaving the site. The trip distribution is shown in Figure 2-14 and Figure 2-15.

2.3.2.4 Build Conditions Traffic Operations

Figure 2-16 and Figure 2-17 show the 2016 Build morning and evening peak-hour traffic volumes, accounting for background growth rate, anticipated development by others, and Project-generated trips. The LOS analysis for Build Conditions, which was conducted using the methodology described for Existing Conditions, appears in Table 2-10 and Table 2-11.

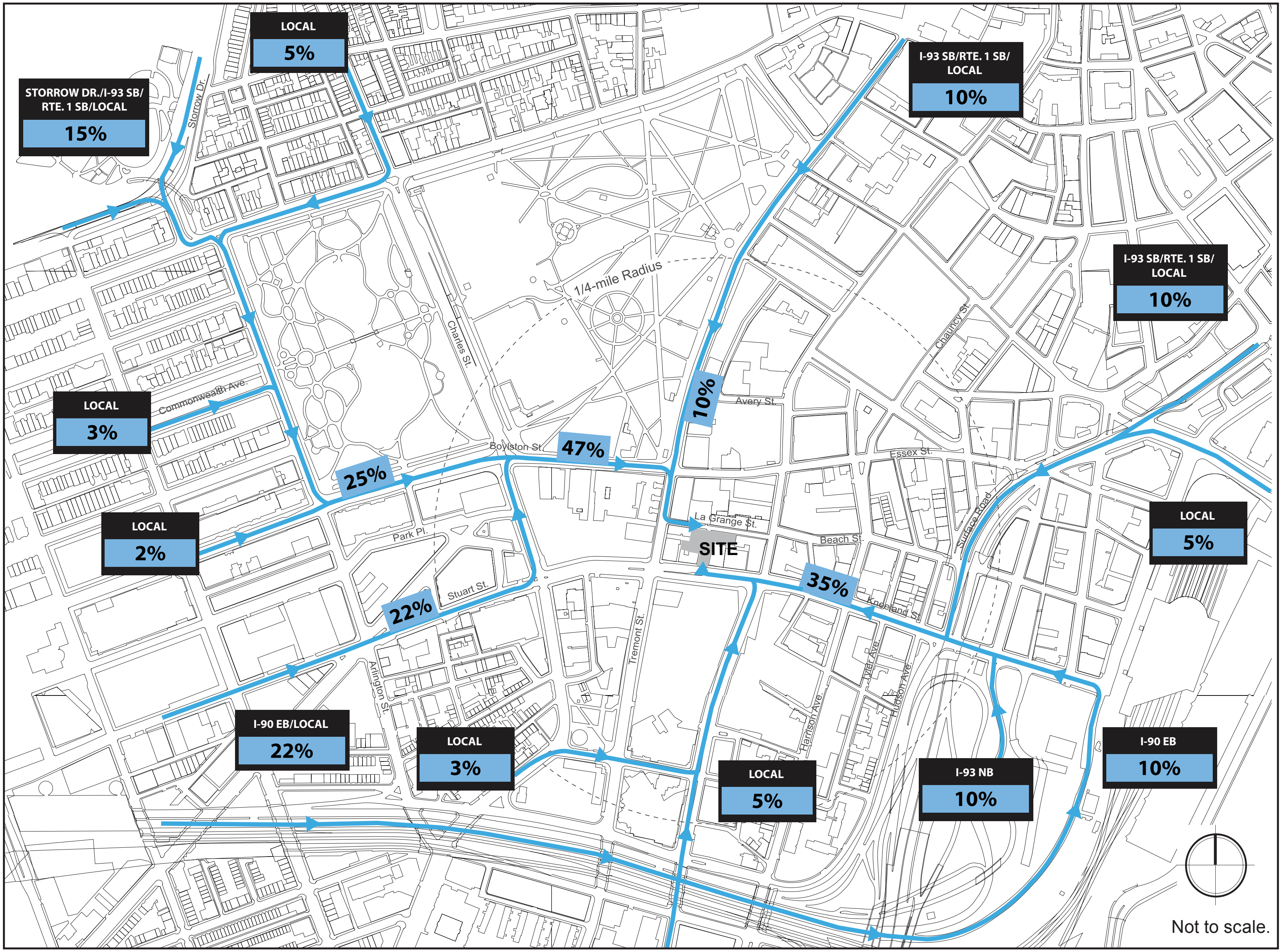

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Figure 2-14
Trip Distribution: Entering

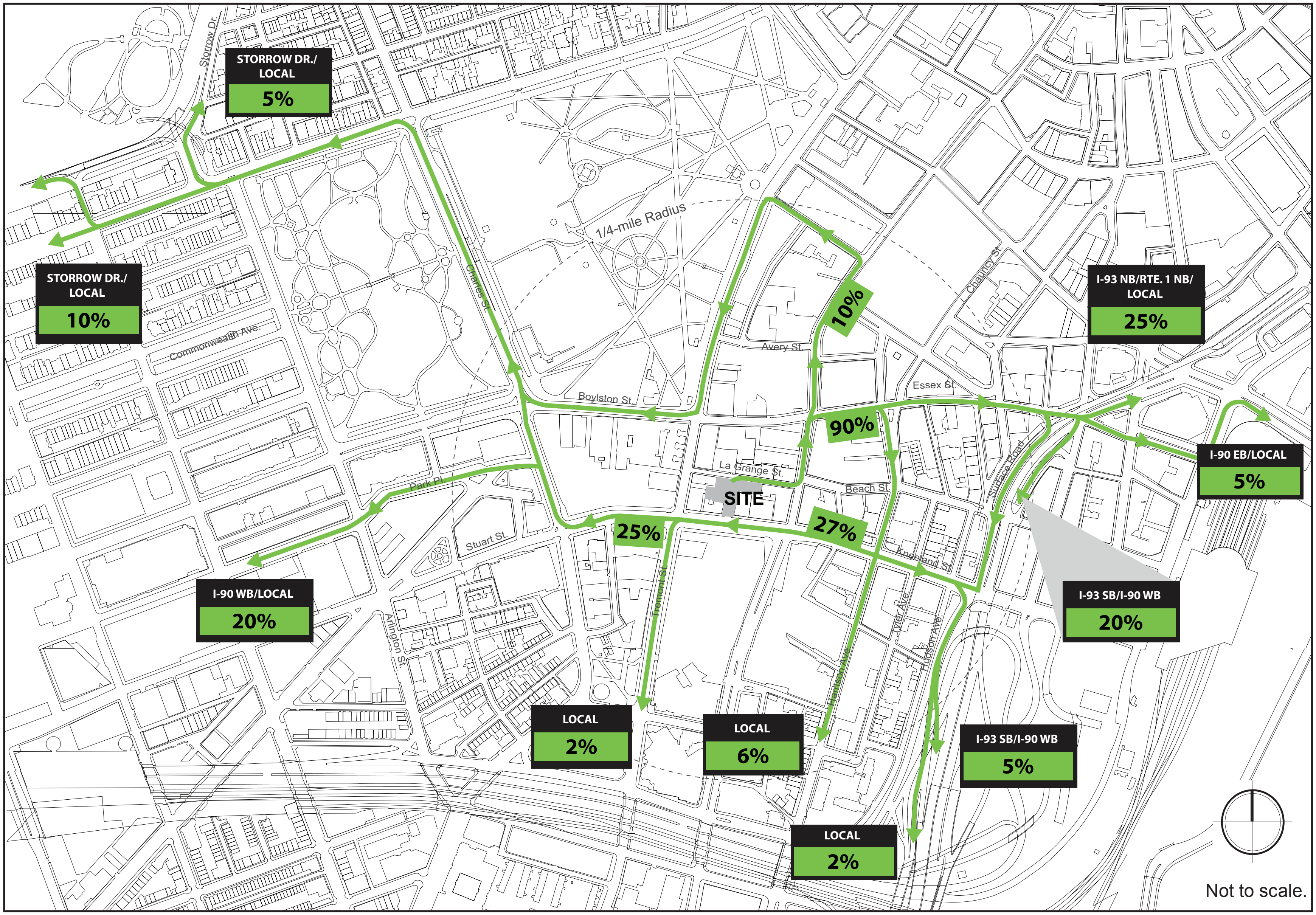

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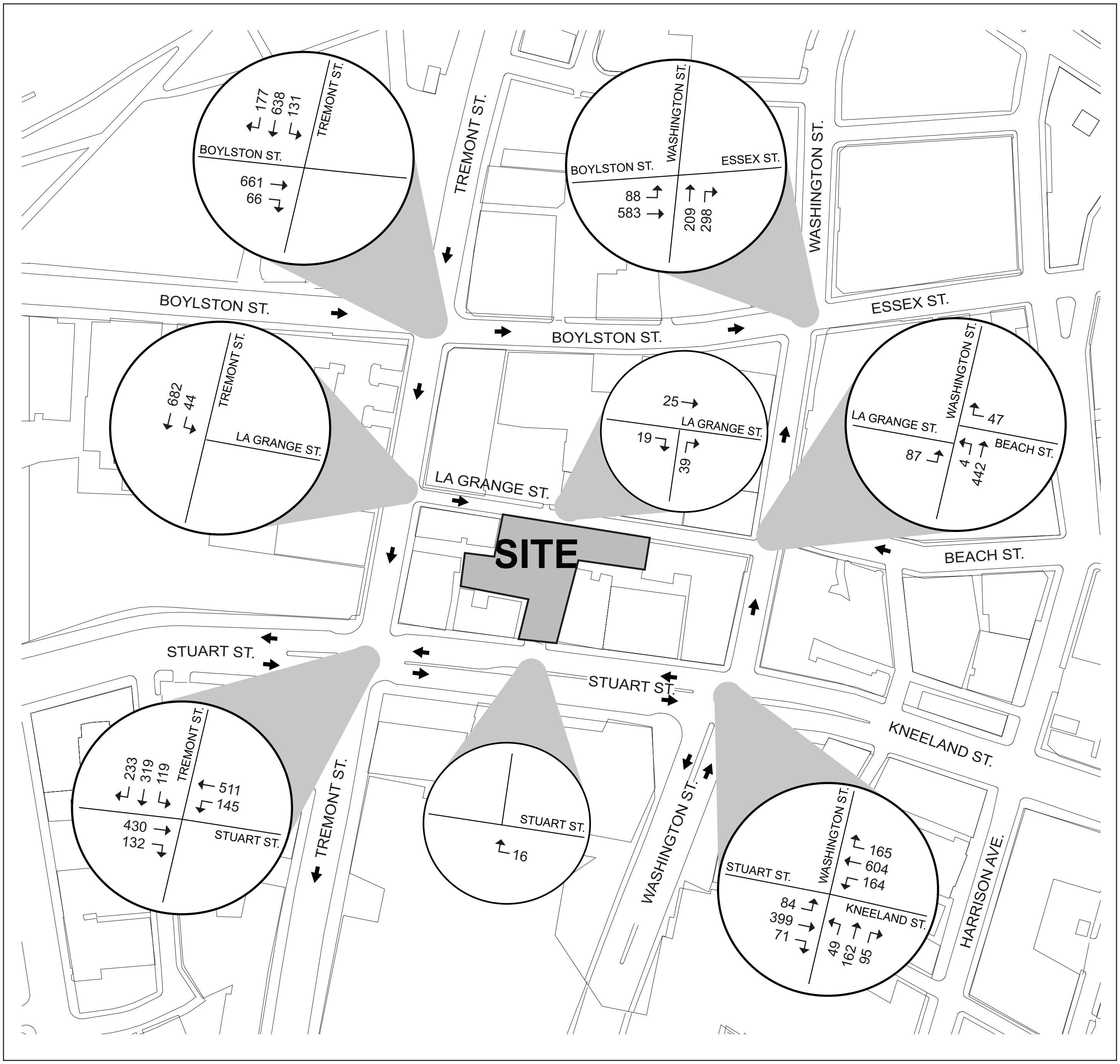
Figure 2-15
Trip Distribution: Exiting



Not to scale.

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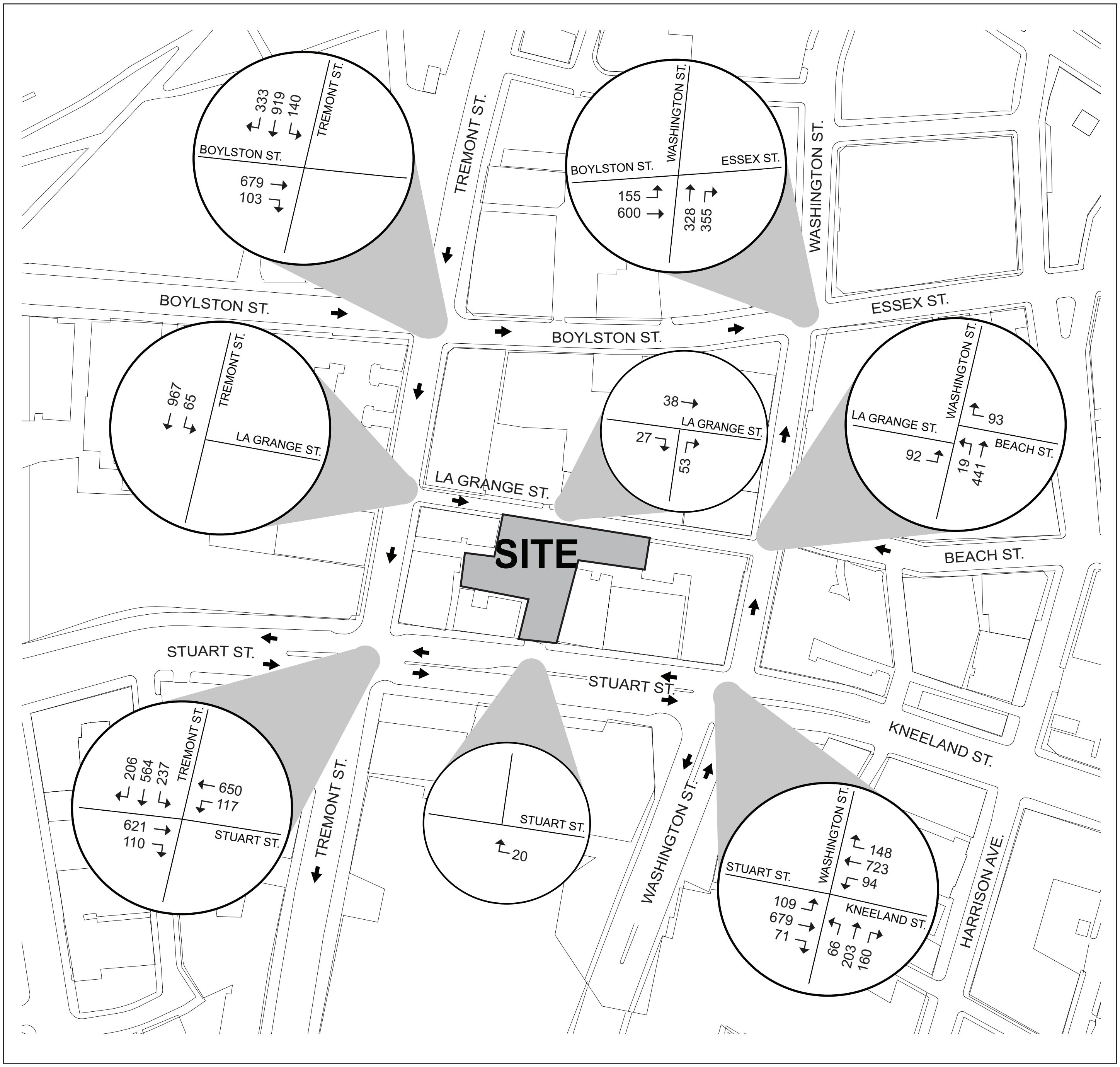
Figure 2-16
Build Conditions (2016) Turning Movement Volumes, a.m. Peak-hour



Not to scale.

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Figure 2-17

Build Conditions (2016) Turning Movement Volumes, p.m. Peak-hour

Table 2-10 Build Conditions (2016) Level of Service Summary, a.m. Peak Hour

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Signalized Intersections				
1. Stuart Street/Tremont Street	C	25.3		
Stuart EB thru | thru	C	23.4	0.60	198
Stuart EB right	A	4.4	0.30	m11
Stuart WB left	C	27.6	0.63	m74
Stuart WB thru | thru	B	14.4	0.38	m94
Tremont SB left	D	52.6	0.68	128
Tremont SB thru | thru | thru/right	C	33.8	0.77	136
2. Stuart Street/Washington Street/ Kneeland Street	C	28.5		
Stuart EB left	D	42.5	0.71	m#115
Stuart EB thru | thru/right	C	21.2	0.76	92
Kneeland WB left/thru | thru	C	28.7	0.85	#262
Kneeland WB right	B	15.1	0.26	106
Washington NB left/thru | thru/right	D	42.8	0.73	159
3. Washington Street/LaGrange Street/ Beach Street	C	22.4		
LaGrange EB left	D	38.3	0.56	78
Beach WB thru | right	A	0.1	0.05	0
Washington NB left/thru | thru	C	19.8	0.39	147
4. Boylston Street/Washington Street/ Essex Street	A	8.6		
Boylston EB left/thru | thru	A	9.7	0.66	40
Washington NB thru | thru/right	B	7.1	0.49	26
5. Boylston Street/Tremont Street	B	12.3		
Boylston EB thru | thru/right	B	10.4	0.77	44
Tremont SB left/thru | thru | thru | thru/right	B	13.7	0.74	35
Unsignalized Intersections				
6. Tremont Street/LaGrange Street				
Tremont SB left/thru | thru | thru | thru	A	0.0	0.0	0
7. LaGrange Street/Site Driveway				
LaGrange EB thru/right	A	0.0	0.03	0
Site Driveway NB right only.	A	8.6	0.04	3
8. Stuart Street/Site Driveway				
Stuart WB thru | thru/right	A	0.0	0.00	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
m = Queue is metered by upstream intersections.
Cell shading indicates that LOS has worsened from No-Build Conditions

Table 2-11 Build Conditions (2016) Level of Service Summary, p.m. Peak Hour

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Signalized Intersections				
1. Stuart Street/Tremont Street	C	20.5		
Stuart EB thru | thru	C	28.9	0.76	m#283
Stuart EB right	A	5.1	0.27	m14
Stuart WB left	C	28.5	0.61	m37
Stuart WB thru | thru	B	16.8	0.53	m95
Tremont SB left	C	28.4	0.79	m#198
Tremont SB thru | thru | thru/right	B	15.9	0.82	m123
2. Stuart Street/Washington Street/ Kneeland Street	D	50.2		
Stuart EB left	F	87.8	0.98	m#130
Stuart EB thru | thru/right	D	43.0	0.98	#371
Kneeland WB left/thru | thru	E	55.6	1.00	#384
Kneeland WB right	B	17.8	0.25	104
Washington NB left/thru | thru/right	D	52.4	0.89	#238
3. Washington Street/LaGrange Street/ Beach Street	B	17.7		
LaGrange EB left	E	58.7	0.64	107
Beach WB right | right	A	0.2	0.11	0
Washington NB left/thru | thru	B	12.6	0.26	127
4. Boylston Street/Washington Street/ Essex Street	B	14.5		
Boylston EB left/thru | thru	A	6.7	0.65	m35
Washington NB thru | thru/right	C	22.2	0.64	190
5. Boylston Street/Tremont Street	D	36.5		
Boylston EB thru | thru/right	E	70.0	>1.00	#440
Tremont SB left/thru | thru | thru | thru/right	B	17.0	0.68	289
Unsignalized Intersections				
6. Tremont Street/LaGrange Street				
Tremont SB left/thru | thru | thru | thru	A	0.0	0.0	0
7. LaGrange Street/Site Driveway				
LaGrange EB thru/right	A	0.0	0.04	0
Site Driveway NB right only.	A	8.8	0.06	5
8. Stuart Street/Site Driveway				
Stuart WB thru | thru/right	A	0.0	0.00	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
m = Queue is metered by upstream intersections.
Cell shading indicates that LOS has worsened from No-Build Conditions

With the Project trips added, all intersections in the study operate at an overall acceptable LOS during the a.m. and p.m. peak hours, again with the exception of the westbound approach on Stuart Street/Washington Street/Kneeland Street and the eastbound approach on Washington Street/LaGrange Street/Beach Street.

- ***Stuart Street/Washington Street/Kneeland Street* –** The Stuart Street westbound left-turn to Washington Street worsens from LOS D to LOS E during the evening peak hour. The change in delay is approximately 7-seconds (0.6 seconds over the LOS E threshold).

- ***Washington Street/LaGrange Street/Beach Street* –** The LaGrange Street eastbound left-turn only onto Washington Street worsens from LOS D to LOS E during the evening peak hour. The change in delay is approximately 12-seconds (3.7 seconds over the LOS E threshold).

2.3.2.5 Build Conditions Parking Supply

The Project will provide parking for approximately 198 vehicles within a new on-site garage located on floors 1 through 5 of the proposed building. Vehicular access and egress will be provided on Stuart Street (right-in only) and LaGrange Street (right-in/right-out only).

The 89 spaces currently provided on the site will be maintained as commercial spaces for public use. The remaining 109 spaces will serve the 404 apartments, for a ratio of 0.27 spaces per unit. Given the type of units envisioned and the proximity of the site to transit, it is anticipated that the parking provisions, although somewhat lower than BTD maximum parking guidelines for the area (up to 0.5 – 1 space per dwelling unit), will be appropriate. If residential parking demand increases beyond the initial 109 spaces, the 89 commercial parking spaces could also be made available for residential use resulting in a ratio of up to 0.49 spaces per dwelling unit, in line with BTD ratios.

All parking within the proposed garage will be managed by valet. Residents will be able to pick-up or drop-off their vehicles via the internal driveway located within the ground floor of the building that will extend through the building from Stuart Street to LaGrange Street. The ground floor will allow for the storage of approximately 17 vehicles on-site, including 5 vehicles in striped parking spaces and approximately 12 vehicles within the internal driveway.

2.3.2.6 Build Conditions Public Transportation

The Project will generate an estimated 926 new transit trips daily. Approximately 22 new transit trips (14 boarding and 8 alighting) will occur during the a.m. peak hour, and 30 new trips (17 boarding and 13 alighting) will occur during the p.m. peak hour. Transit trip generation is summarized in Table 2-12, with detailed trip generation data provided in Appendix A.

Table 2-12 Transit Trip Generation

Period	Direction	Transit Trips (404 apartments)
Daily	In	463
	Out	463
	Total	926
a.m. Peak Hour	In	8
	Out	14
	Total	22
p.m. Peak Hour	In	13
	Out	17
	Total	30

2.3.2.7 Build Pedestrian Conditions

Pedestrian and Bicycle Trip Generation

On a daily basis, the Project will generate an estimated 1,204 new pedestrian and bicycle trips and an additional 926 new transit trips that will require a walk to or from the site. This results in an additional 2,130 new pedestrian or bicycle trips per day. Approximately 154 pedestrian or bicycle trips in and out of the site will occur during the a.m. peak hour, and 169 pedestrian or bicycle trips in and out will occur during the p.m. peak hour, plus 22 and 30 transit trips, respectively. This results in approximately 4 additional pedestrian trips per minute during the a.m. and p.m. peak hours. Pedestrian and bicycle trip generation is summarized in Table 2-13, with detailed trip generation data provided in Appendix A.

Table 2-13 Pedestrian and Bicycle Trip Generation

Period	Direction	Pedestrian & Bicycle Trips (404 apartments)
Daily	In	602
	Out	602
	Total	1,204
a.m. Peak Hour	In	18
	Out	136
	Total	154
p.m. Peak Hour	In	131
	Out	38
	Total	169

2.3.2.8 Build Bicycle Accommodations

Secure bicycle storage will be made available in the garage and/or within some of the 1- and 2-bedroom units for residents of the building. Additional racks for the studio units as well as visitors and guests of the building are being evaluating at the ground level of the building and within each level of the parking garage structure.

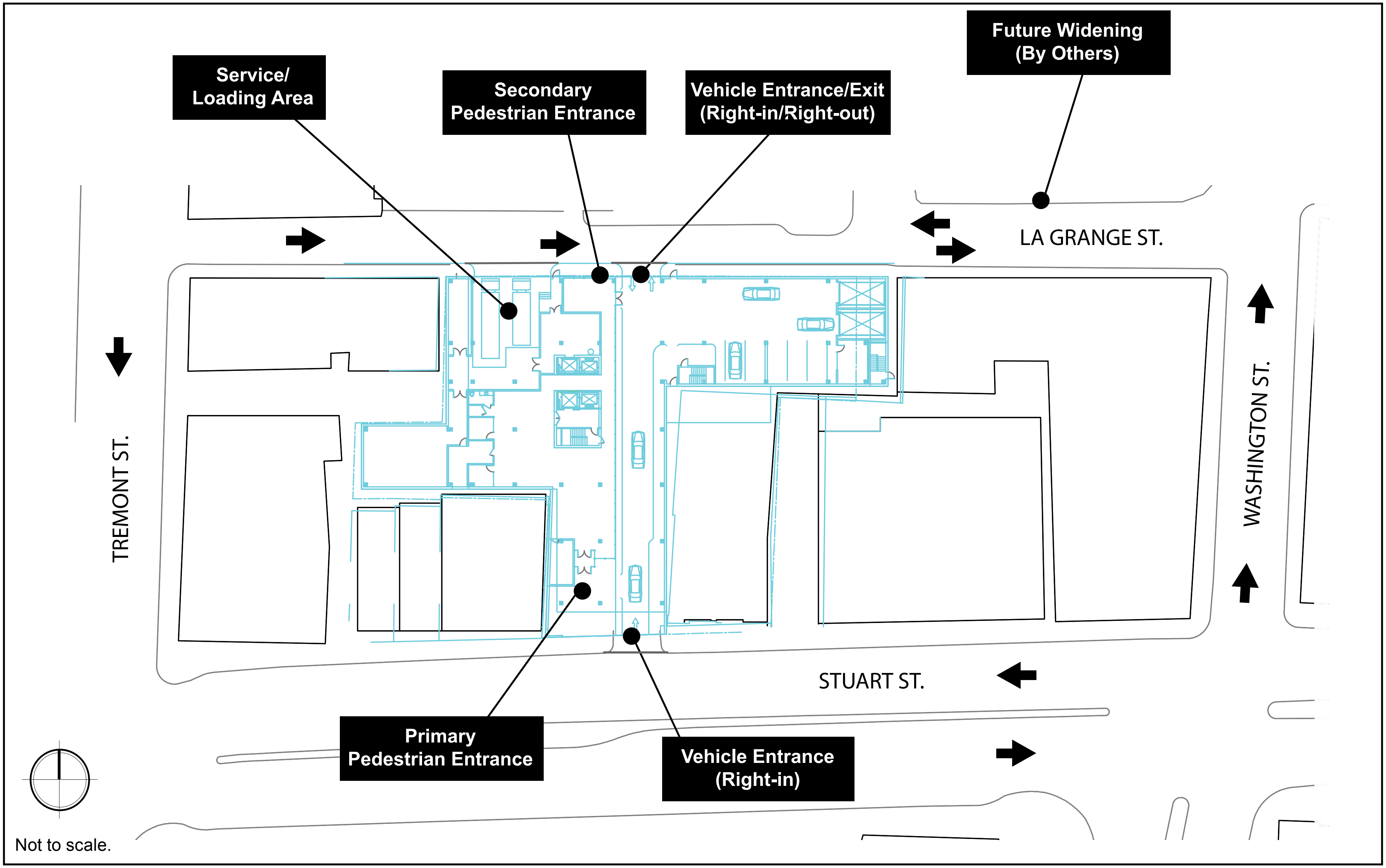
All bicycle racks, signs, and parking areas will conform to BTD standards and be sited in safe, secure locations. The Proponent will work with BTD to identify the most appropriate quantity and location for bicycle racks on the Project Site as part of the Transportation Access Plan Agreement (TAPA) process. The Proponent is also committed to providing the appropriate level of bicycle accommodations necessary for LEED certification.

2.3.2.9 Build Conditions Loading and Service

All recycling, trash collection, and loading activities for the proposed residential apartment building will occur on-site within the enclosed loading and service area (see Figure 2-18, "Site Plan"). The proposed loading area will be able to accommodation up to 2 vehicles; one at 36 feet in length and one shorter (FedEx/UPS delivery size).

Most residential deliveries are made in smaller vehicles—cars, vans, or small panel trucks. Deliveries in this size of vehicle will be made within the designated loading area inside the building. Trash will be stored in a designated room within a building and serviced through the loading area. Building management will coordinate all residential move-in and move-out activity and schedule this activity during off-peak hours, where possible.

The expected future loading and service demands were estimated using average rates from a day-long survey at Tremont-on-the-Common conducted by Howard/Stein-Hudson Associates. Based on this data is estimated that the proposed residential project will generate approximately 0.04 deliveries per day per 1,000 sf of residential use – or between 15 and 20 service/loading vehicles per day assuming an approximately 460,000 sf building. Residential service/loading activities generally occur between the hours of 7:00 a.m. to 7:00 p.m.



45 Stuart Street PNF Boston, Massachusetts

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Figure 2-18
Site Plan

2.4 Transportation Mitigation Measures

Table 2-14 and Table 2-15 compare Existing, No-Build, and Build, Conditions for the a.m. and p.m. peak hours, respectively.

Table 2-14 Level of Service Summary, Comparison Table, a.m. Peak Hour

Intersection	Existing	No-Build	Build
Signalized Intersections			
1. Stuart Street/Tremont Street	C	C	C
Stuart EB thru | thru	B	C	C
Stuart EB right	A	A	A
Stuart WB left	B	C	C
Stuart WB thru | thru	B	B	B
Tremont SB left	D	D	D
Tremont SB thru | thru | thru/right	C	C	C
2. Stuart Street/Washington Street/ Kneeland Street	C	C	C
Stuart EB left	C	D	D
Stuart EB thru | thru/right	B	B	C
Kneeland WB left/thru | thru	C	C	C
Kneeland WB right	B	B	B
Washington NB left/thru | thru/right	D	D	D
3. Washington Street/LaGrange Street/ Beach Street	B	B	C
LaGrange EB left	A	C	D
Beach WB thru | right	A	A	A
Washington NB thru | thru	B	-	-
Washington Street NB left/thru | thru		B	C
4. Boylston Street/Washington Street/ Essex Street	A	A	A
Boylston EB left/thru | thru	A	A	A
Washington NB thru | thru/right	A	A	B
5. Boylston Street/Tremont Street	B	B	B
Boylston EB thru | thru/right	A	A	B
Tremont SB left/thru | thru | thru | thru/right	B	B	B
Unsignalized Intersections			
6. Tremont Street/LaGrange Street			
Tremont SB left/thru | thru | thru | thru	A	A	A
7. LaGrange Street/Site Driveway			
LaGrange EB thru/right	-	-	A
Site Driveway NB right only.	-	-	A
8. Stuart Street/Site Driveway			
Stuart WB thru | thru/right	-	-	A

Table 2-15 Level of Service Summary, Comparison Table, p.m. Peak Hour

Intersection	Existing	No-Build	Build
Signalized Intersections			
1. Stuart Street/Tremont Street	**B**	**C**	**C**
Stuart EB thru | thru	C	C	C
Stuart EB right	A	A	A
Stuart WB left	C	C	C
Stuart WB thru | thru	B	B	B
Tremont SB left	C	C	C
Tremont SB thru | thru | thru/right	B	B	B
2. Stuart Street/Washington Street/ Kneeland Street	**D**	**D**	**D**
Stuart EB left	D	F	F
Stuart EB thru | thru/right	C	D	D
Kneeland WB left/thru | thru	C	D	E
Kneeland WB right	B	B	B
Washington NB left/thru | thru/right	D	D	D
3. Washington Street/LaGrange Street/ Beach Street	**B**	**B**	**B**
LaGrange EB left	A	D	E
Beach WB right | right	A	A	A
Washington NB thru | thru	B	-	-
Washington Street NB left/thru | thru		B	B
4. Boylston Street/Washington Street/ Essex Street	**A**	**B**	**B**
Boylston EB left/thru | thru	A	A	A
Washington NB thru | thru/right	A	B	C
5. Boylston Street/Tremont Street	**C**	**C**	**D**
Boylston EB thru | thru/right	C	E	E
Tremont SB left/thru | thru | thru | thru/right	B	B	B
Unsignalized Intersections			
6. Tremont Street/LaGrange Street			
Tremont SB left/thru | thru | thru | thru	A	A	A
7. LaGrange Street/Site Driveway			
LaGrange EB thru/right	-	-	A
Site Driveway NB right only.	-	-	A
8. Stuart Street/Site Driveway			
Stuart WB thru | thru/right	A		A

Due to the recent re-timing of traffic control signals, implemented by the BTD, all study area intersections continue to operate at an acceptable overall LOS (LOS D or better). Therefore no mitigation is warranted.

2.5 Evaluation of Short-term Construction Impacts

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

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

- Construction worker parking will be prohibited on-site. Personnel will arrive at the job site by either MBTA transit or personal vehicles. Workers will be encouraged to use public transportation and/or carpool. Those arriving in personal vehicles (i.e., via carpool) will be required to park in a nearby parking garage. These arrangements are typical of downtown Boston jobs, and workers are aware that carpooling and public transportation are needed to access the job site;

- A subsidy for MBTA passes will be considered for full-time employees; and

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

Additional information on the Project's construction-period impacts is presented in Section 3.11 of this Expanded PNF.

2.6 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures that support the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak periods. TDM will be facilitated by the nature of the Project and its proximity to the downtown area, local businesses and institutions, and numerous public transit alternatives.

The Proponent will emphasize the site's convenient transit and pedestrian access in marketing the 45 Stuart Street Residences to future residents. On-site management will provide transit information (schedules, maps, fare information) in the building lobbies for workers and visitors. On-site management will also work with new employees to raise awareness of public transportation alternatives.

Additional TDM measures may include, but are not limited to, the following:

- ***Bicycle Storage.*** The Project Proponent will provide secure bicycle storage available to residents and visitors.

- ***Constrained Parking.*** The Project does not exceed BTD district maximum parking ratios.

- ***Electric Vehicle Charging Capability.*** The Proponent will explore the feasibility of providing electric vehicle charging capability on-site to facilitate the future addition of an electric charging station(s) once it is warranted by demand.

- ***Project Web Site.*** Inclusion of public transportation information for residents and visitors on the Project's Web Site.

- ***Tenant and Employee Orientation Packet.*** These packets will provide all new tenants with information concerning available TDM programs and public transportation in the area, including route maps, schedules, and fare information.

- ***TMA Membership.*** The Proponent will join a Transportation Management Association (TMA)—in this case, A Better City TMA (www.abctma.com).

- ***Transportation Coordinator.*** An on-site transportation coordinator will oversee transportation issues, including parking, residential move-in and move-out, and service and loading. The transportation coordinator will also work with residents as they move in to raise awareness of public transportation alternatives.

Section 3.0

Environmental Protection Component

3.0 ENVIRONMENTAL PROTECTION COMPONENT

3.1 Pedestrian Level Winds

3.1.1 Introduction

A pedestrian wind study was conducted by Rowen Williams Davies & Irwin, Inc. (RWDI) for the Project with the objective to assess the effect of the proposed development on local conditions in pedestrian areas around the study site and provide recommendations for minimizing adverse effects, where required.

The study involved wind simulations on a 1:400 scale model of the proposed building and surroundings. These simulations were conducted in RWDI's boundary-layer wind tunnel at Guelph, Ontario, for the purpose of quantifying local wind speed conditions and comparing to appropriate criteria for gauging wind comfort in pedestrian areas. The criteria recommended by the BRA (the Protocol for Quantitative Wind Impact Analysis) were used in this study.

3.1.2 Overview

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

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

3.1.3 Methodology

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

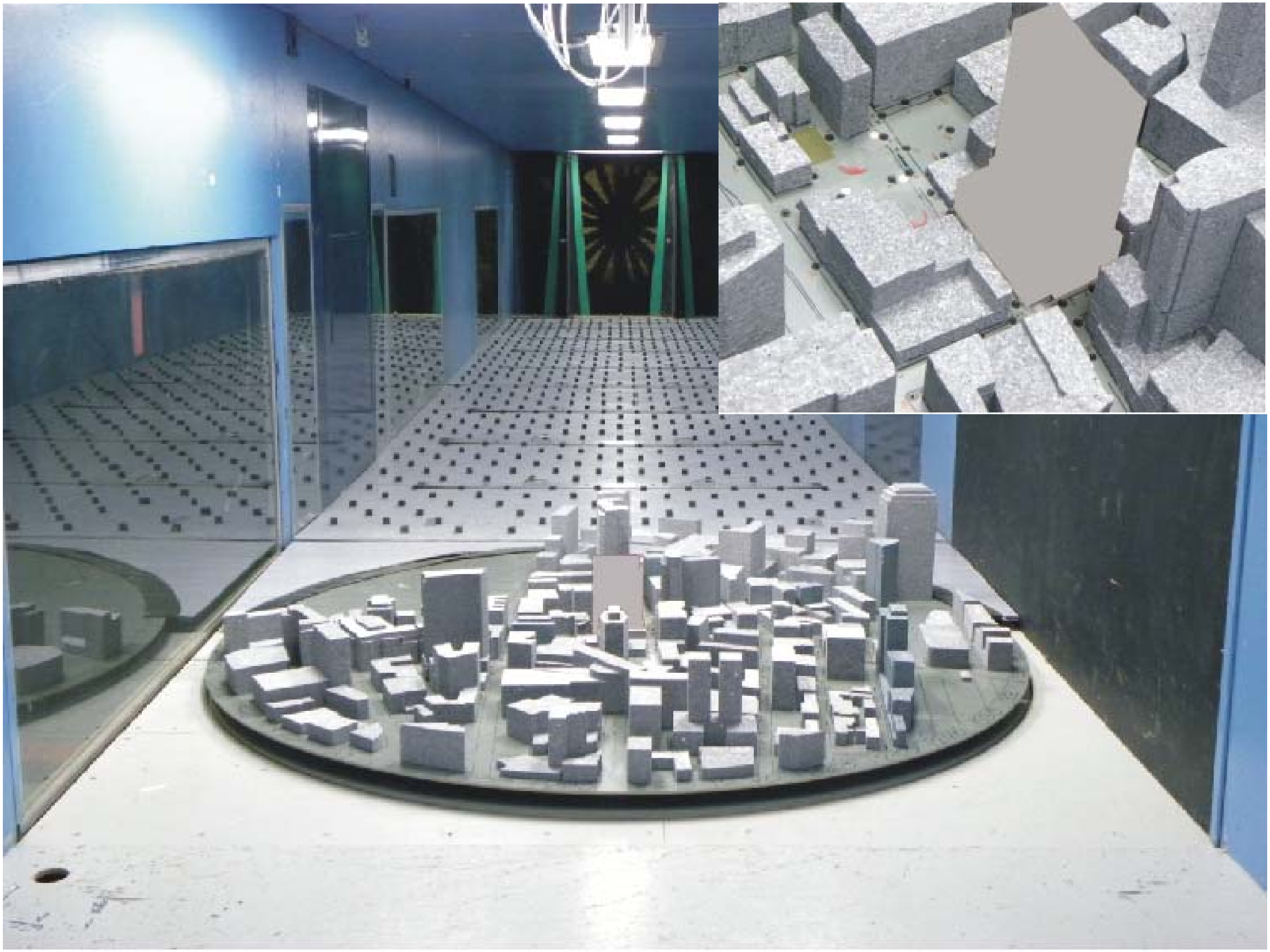
No Build Configuration: includes all existing and approved surrounding buildings; and

Build Configuration: includes the proposed 45 Stuart development with all existing and approved surrounding buildings.

As shown in Figures 3.1-1 and 3.1-2, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1600 ft radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modelled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 108 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of 5 feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. The results were then combined with long-term meteorological data, recorded during the years 1945 to 1998 at Boston's Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year.

Figures 3.1-3 – 3.1-5 present "wind roses", summarizing the annual and seasonal wind climates in the Boston area, based on the data from Boston Logan International Airport. The left-hand wind roses, in Figures 3.1-3 and 3.1-4, are based on all observed wind readings for the given season, and the right-hand wind roses are based on strong winds for one percent of the time. The upper wind roses in Figure 3.1-3, for example summarize the spring (March, April, and May) wind data. In general, the prevailing winds at this time of year are from the west-northwest, northwest, west, southwest and east. In the case of strong winds, however, the most common wind direction is northeast and west.

On an annual basis (Figure 3.1-5) the most common wind directions are those between southwest and northwest. Winds from the east and east-southeast are also relatively common. In the case of strong winds, northeast and west-northwest are the dominant wind directions.

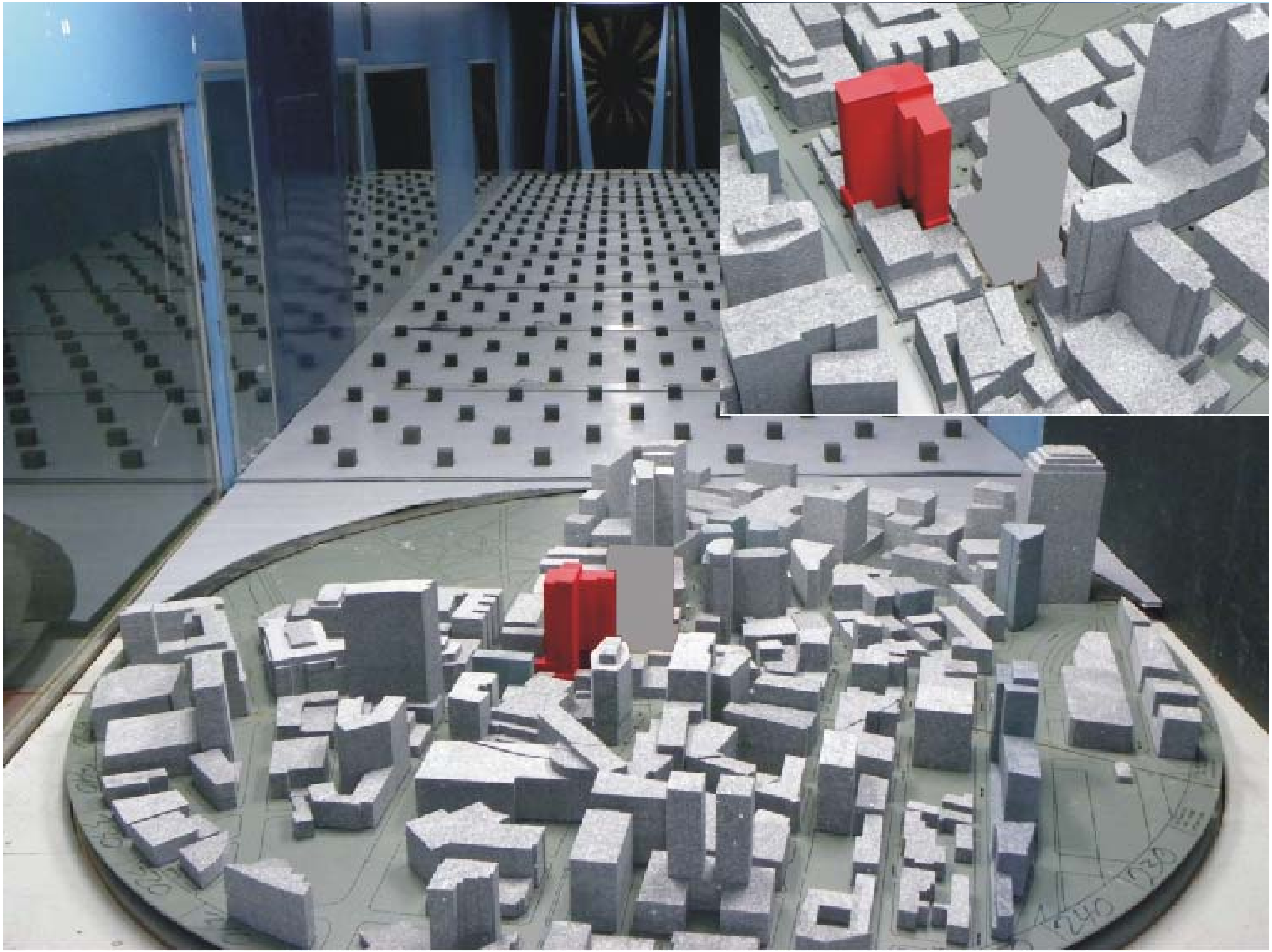


45 Stuart Street **Boston, Massachusetts**

RWDI

Figure 3.1-1

Wind Tunnel Study Model – No Build

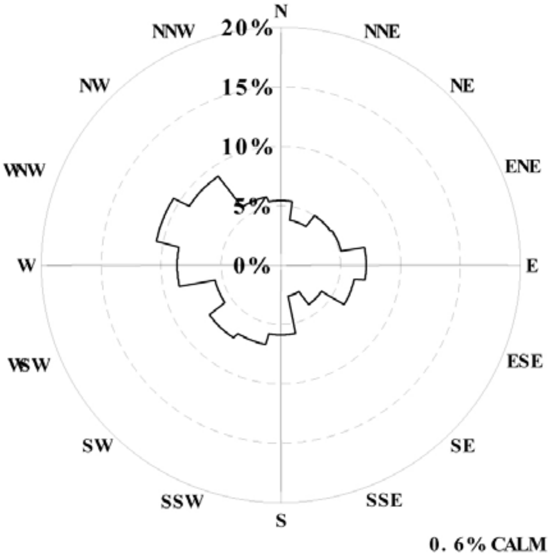


45 Stuart Street   Boston, Massachusetts

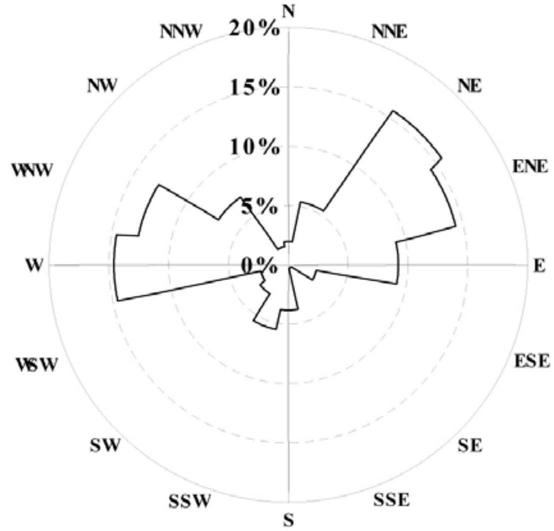
RWDI

Figure 3.1-2

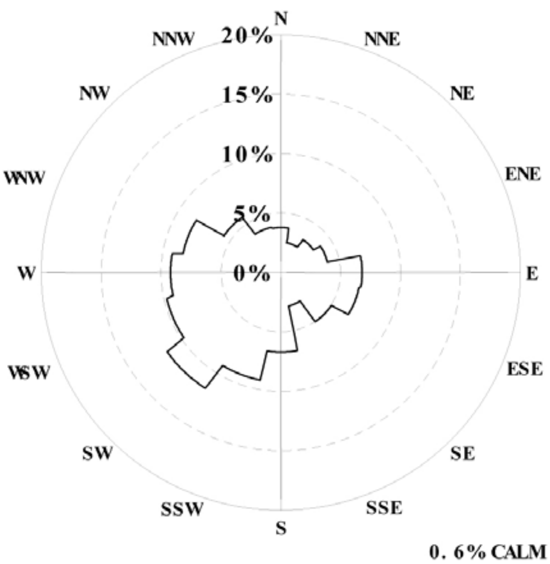
Wind Tunnel Study Model – Build



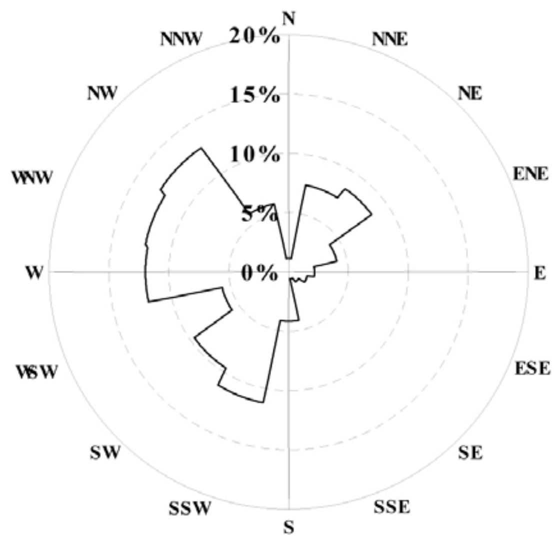
ALL SPRING WINDS



STRONG SPRING WINDS



ALL SUMMER WINDS

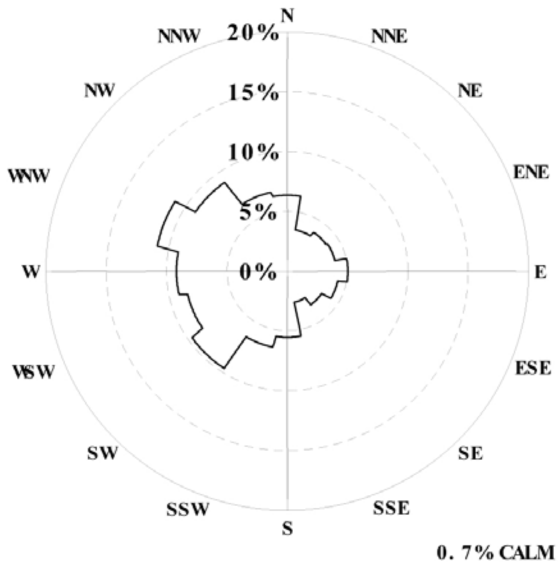


STRONG SUMMER WINDS

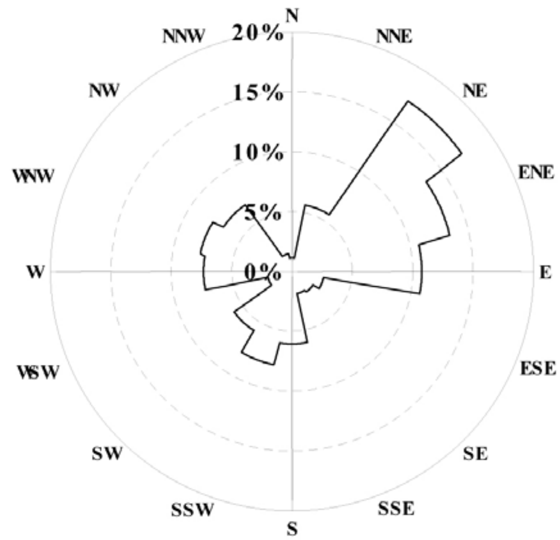
Figure 3.1-3

Directional Distribution (%) of Winds (Blowing From)

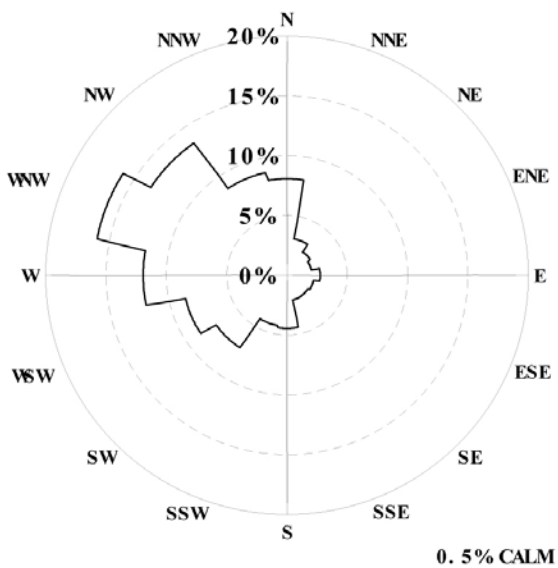
Boston-Logan International Airport, Massachusetts (1945-1998)



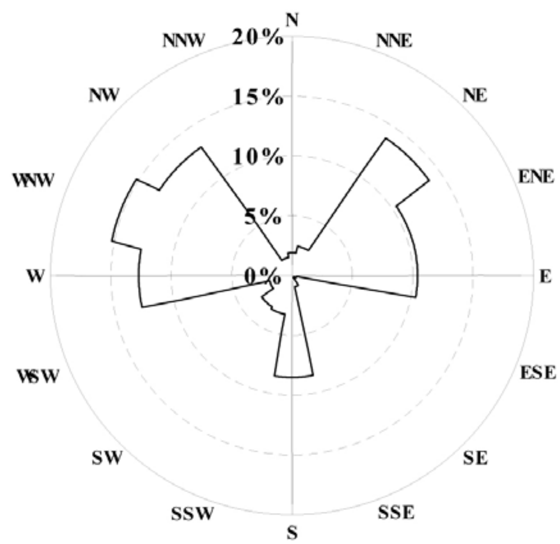
ALL FALL WINDS



STRONG FALL WINDS



ALL WINTER WINDS

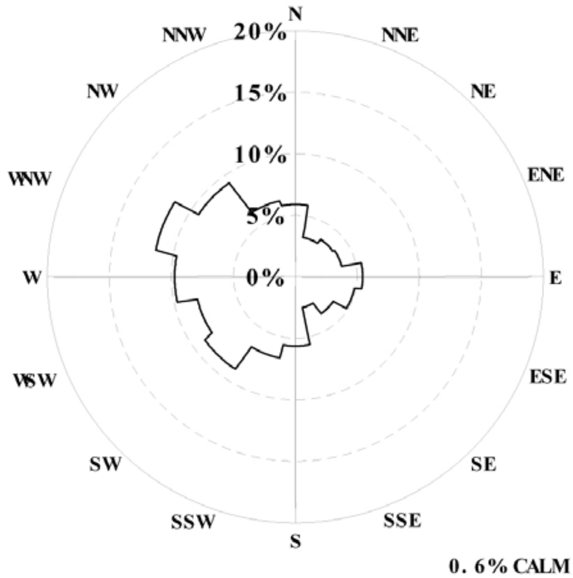


STRONG WINTER WINDS

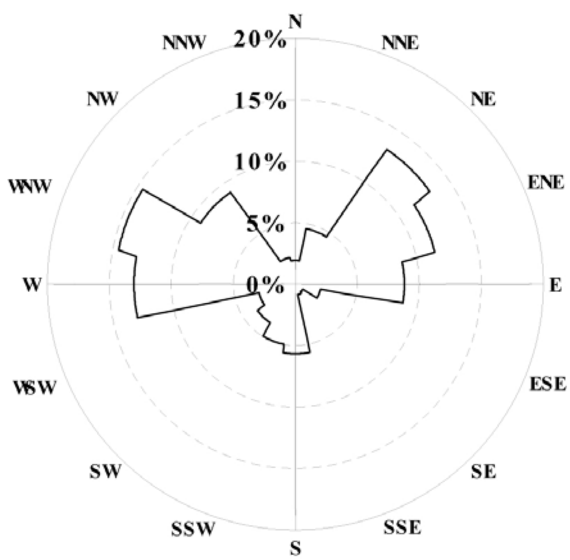
Figure 3.1-4

Directional Distribution (%) of Winds (Blowing From)

Boston-Logan International Airport, Massachusetts (1945-1998)



ALL ANNUAL WINDS



STRONG ANNUAL WINDS

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

3.1.4 Pedestrian Wind Comfort Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of the time. The second set of criteria used by the BRA to determine the acceptability of specific locations is based on the work of Melbourne[1]. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the 1-hour mean wind speed exceeded 1% of the time (i.e., the 99-percentile mean wind speed). They are as follows in Table 3.1-1:

Table 3.1-1 BRA Mean Wind Speed Criteria*

Dangerous	> 27 mph
Uncomfortable for Walking	> 19 and 27 mph
Comfortable for Walking	> 15 and 19 mph
Comfortable for Standing	> 12 and 15 mph
Comfortable for Sitting	< 12 mph
* Applicable to the hourly mean wind speed exceeded one percent of the time.	

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BRA effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

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

3.1.5 Test Results

Appendix B presents the mean and effective gust wind speeds for each season as well as annually. Figures 3.1-6 and 3.1-7 graphically depict the wind comfort conditions at each wind measurement location based on the annual winds. Typically the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested, except where noted below in the text.

3.1.5.1 On-site Areas (Locations 1 through 11)

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

Wind conditions at all on-site locations were generally suitable for the intended use throughout the year for both No Build and Build Configurations, as shown in Figures 3.1-6 and 3.1-7, and in Appendix B. This included the entry court where wind conditions were comfortable for sitting throughout the year for the Build Configuration. The only exception was Location 9 at the exit from the LaGrange Lobby to the car lane underneath the development where northerly and westerly winds caused uncomfortable conditions during certain seasons. Mitigation options may be studied during design development if necessary.

The effective gust criterion was met seasonally and annually at all locations for both configurations.

3.1.5.2 LaGrange and Beach Streets (Locations 12 through 32)

In general, wind conditions along LaGrange and Beach Streets were not affected by the proposed development (see Figures 3.1-6 and 3.1-7). Increased wind speeds were detected at a few areas on LaGrange Street east of the proposed building, resulting in uncomfortable wind conditions annually (Locations 20 and 21 in Figure 3.1-7) and for spring and/or winter seasons (Locations 19, 20 and 21 in Appendix B),but all of these locations met the gust criterion annually and seasonally. Small variations in wind speeds (1 mph) were also observed at Locations 24, 25 and 27, but wind conditions at these locations were comfortable for walking annually and met the gust criterion for every season, for both building configurations.

The increased wind speeds on LaGrange Street are caused by the funnelling of the prevailing winter northwesterly winds between the proposed building and an approved building to the immediate northeast. These winds are most uncomfortable in the winter, when fewer pedestrians are expected to use the street. If necessary, mitigation options will be explored during design development.

45 Street Street **Boston, Massachusetts**

RWDI

Figure 3.1-6

Pedestrian Wind Conditions – No Build

45 Street Street Boston, Massachusetts

RWDI

Figure 3.1-7

Pedestrian Wind Conditions – Build

3.1.5.3 Surrounding Streets (Locations 33 through 97)

Wind conditions comfortable for walking are required for sidewalks and lower wind speeds comfortable for standing are desired for building entrances.

Similar wind conditions were detected for both building configurations, with existing localized high wind speeds at the intersections of Tremont Street with Stuart and Boylston Streets (Locations 49, 50, 55, 56, 60, 63, 64 and 67), as well as at Location 80 at the corner of Washington Street and Essex Street, as shown in Figures 3.1-6 and 3.1-7.

The only area that was subject to some increased wind speeds caused by the proposed Project was the adjacent sidewalks along Stuart Street (Locations 43, 44 and 45), but the resultant wind conditions were comfortable for walking annually and met the gust criterion for every season.

3.1.5.4 North Laneways and Parking Areas (Locations 98 through 107)

Wind conditions in these areas were not affected by the proposed Project. They were comfortable for sitting or standing on an annual basis and met the effective gust criterion throughout the year (Figures 3.1-6 and 3.1-7).

3.1.5.5 Roof Terrace (Location 108)

Wind conditions at the roof terrace were comfortable for standing on an annual basis and comfortable for sitting in the summer. These wind conditions are considered appropriate.

3.1.6 Conclusions

A qualitative assessment has been made to determine the effect of the proposed Project on PLWs in its vicinity. Results were obtained for both existing and build conditions. Detailed results are presented in Figures 3.1-3 to 3.1-7 and in Appendix B.

Of the 108 locations studied for both the existing and build conditions, only one on-site and three LaGrange Street locations saw an increase in wind levels resulting in uncomfortable conditions during specific seasons of the year. If necessary, mitigation measure will be explored during design development.

3.2 Shadow Impacts

3.2.1 Introduction and Methodology

This Expanded PNF includes two separate shadow studies. The first is the typical BRA shadow study looking at various times of day for the four seasons. The second is an analysis to study the compliance of the proposed building with the Public Common Shadow Act.

As is typically required by the BRA, a shadow impact analysis was conducted in accordance with the BRA Protocol to investigate shadow impacts from the Project during three time periods (9:00 am, 12:00 noon, and 3:00 pm) during the summer solstice (June 21), autumnal equinox (September 21), vernal equinox (March 21), and the winter solstice (December 21). In addition, shadow studies were conducted for the 6:00 pm time period during the summer solstice and autumnal equinox.

The shadow analysis presents net new shadow from the building, as well as the existing shadow, and illustrates the incremental impact of the Project. The analysis focuses on public open spaces, major pedestrian areas, and the sidewalks adjacent to and in the vicinity of the Project Site. Since the Project will develop a site currently used for surface parking, new areas of shadow are inevitable. Shadows have been determined using the applicable Altitude and Azimuth data for Boston as is typically requested by the BRA (BRA Development Review Guidelines (2006), Appendix 6).

Shadow impacts from the proposed Project are minor. During 12 of the 14 time periods studied, new shadows from the Project are limited to buildings in the surrounding area without increasing shadow on open spaces, sidewalks or streets. During one time period (June at 6:00 p.m.), new shadows are cast onto minor portions of nearby streets and their sidewalks. During one time period (December at 9:00 a.m.), new shadows are cast onto Boston Common.

The Project will comply with the Public Commons Shadow Act as described in 3.2.6.

3.2.2 Vernal Equinox (March 21)

On March 21 during all three time periods studied (9:00 a.m., 12:00 p.m. and 3:00 p.m.), new shadows from the Project are limited to the nearby buildings. No new shadows are cast onto Boston Common or any other open space in the surrounding area.

New shadow created on the vernal equinox is illustrated in Figures 3.2-1 through 3.2-3.

3.2.3 Summer Solstice (June 21)

On June 21 during all four time periods studied (9:00 a.m., 12:00 p.m., 3:00 p.m. and 6:00 p.m.), new shadows from the Project are cast onto the nearby buildings, except at 6:00 p.m. when new shadow is cast onto minor portions of Kneeland Street, Knapp Street and Harrison Avenue and their sidewalks. No new shadows are cast onto Boston Common or any other open space in the surrounding area.

New shadow created on the summer solstice is illustrated in Figures 3.2-4 through 3.2-7.

45 Stuart Street Boston, MA

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Figure 3.2-1

March 21 – 9:00 a.m.

Figure 3.2-2

March 21 – 12:00 p.m.

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Figure 3.2-3

March 21 – 3:00 p.m.

Figure 3.2-4

June 21 – 9:00 a.m.

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Figure 3.2-5

June 21 – 12:00 p.m.

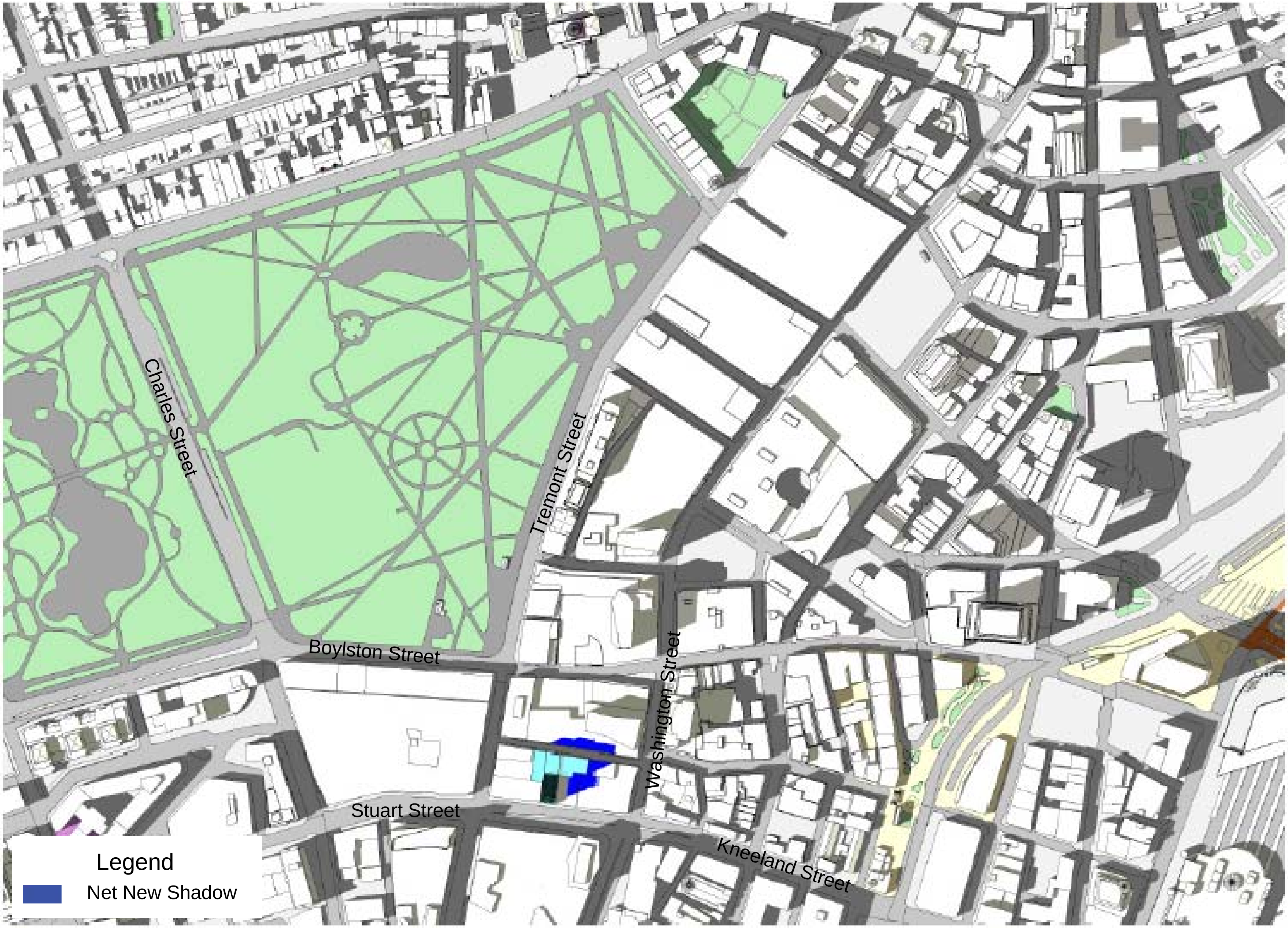

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Figure 3.2-6

June 21 – 3:00 p.m.

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Figure 3.2-7

June 21 – 6:00 p.m.

3.2.4 Autumnal Equinox (September 21)

On September 21 during all four time periods studied (9:00 a.m., 12:00 p.m., 3:00 p.m. and 6:00 p.m.), new shadows from the Project are only cast onto the nearby buildings. No new shadows are cast onto Boston Common or any other open space in the surrounding area.

New shadow created on the autumnal equinox is illustrated in Figures 3.2-8 through 3.2-11.

3.2.5 Winter Solstice (December 21)

The winter solstice creates the least favorable conditions for sunlight in New England. The sun angle during the winter is lower than in any other season, causing the shadows to elongate and create considerable shadow in the area.

On December 21 at 9:00 a.m., new shadows are cast to the northwest. New shadows from the Project are cast onto nearby buildings and nearby public open spaces. At 12:00 p.m. and 3:00 p.m., new shadows are only cast onto buildings in the surrounding area.

New shadow created on the winter solstice is illustrated in Figures 3.2-12 through 3.2-14.

3.2.6 Public Commons Shadow Act

The Public Commons Shadow Act prohibits a permit-granting authority such as the BRA from authorizing a structure within the Midtown Cultural District which would cast "new shadow" on the Public Commons for more than two hours from 8:00 a.m. through 2:30 p.m. on any day from March 21 through October 31, inclusive, with certain exceptions set forth in Section 2 of the Act. "New shadow" is defined as shadow additional to shadow which would be created by structures conforming to as-of-right height limits allowed by the Boston Zoning Code as in effect on May 1, 1990.

Figure 3.2-15 shows the shadow which would be cast on Boston Common by structures conforming to the as-of-right Zoning Code as in effect on May 1, 1990 and compares the shadow which will be case by the proposed Project to that shadow. The Project will not cast shadow on the Boston Common for more than two hours from 8:00 a.m. through 2:30 p.m. on any day from March 21 through October 31, inclusive, except on October 21st when 0.022 acre will be in shadow for more than the two hour limit. Under the Public Commons Shadow Act, the BRA, as the permit-granting authority, may approve such additional shadow as long as the total area shaded for more than a two hour period does not exceed one acre, such area to be calculated as the sum of the areas of new shadow cast beyond such two hour limit by all structures in the Midtown Cultural District approved after March 20, 1989, including PDAs. Implementation of the Project will require approval of .022 acre of shadow beyond the two hour limit from the "shadow bank" by the BRA.

Figure 3.2-8

September 21 – 9:00 a.m.

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Figure 3.2-9

September 21 – 12:00 p.m.

Figure 3.2-10

September 21 – 3:00 p.m.

45 Stuart Street Boston, MA

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Figure 3.2-11

September 21 – 6:00 p.m.

45 Stuart Street Boston, MA

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Figure 3.2-12

December 21 – 9:00 a.m.

45 Stuart Street Boston, MA

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Figure 3.2-13

December 21 – 12:00 p.m.

45 Stuart Street Boston, MA

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Figure 3.2-14

December 21 – 3:00 p.m.

45 Stuart Street   Boston, MA

cbt

Figure 3.2-15

Public Common Shadow Act Analysis

3.2.7 Conclusions

The typical BRA shadow analysis studies the shadow impacts from the Project during 14 time periods. Since the existing site is used as a surface parking lot, new shadows from the Project are inevitable. During 12 of the time periods, new shadows from the Project are only cast onto buildings in the surrounding area. During one time period (June at 6:00 p.m.), new shadows are cast onto minor portions of nearby streets and their sidewalks. During one time period (December at 9:00 a.m.), new shadows are cast onto Boston Common. The Project will comply with the Public Commons Shadow Act as described in Section 3.2.6 above. No other open spaces are impacted by the Project's shadows during the 14 time periods studied.

3.3 Daylight Analysis

3.3.1 Introduction and Summary of Analysis

The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in the immediate vicinity of the project site. As is typically required by the BRA, the daylight analysis for the Project considers both existing and proposed daylight conditions as well as those of the surrounding area.

The Project site is currently used as a surface parking lot. Portions of the site are behind buildings that front Stuart Street, placing the new construction behind existing structures. Although the development of the Project will result in increased daylight obstruction at the site over existing conditions, the resulting conditions are typical of a densely developed area and are similar to daylight obstruction values associated with other existing buildings in the vicinity of the Project site.

3.3.2 Methodology

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

Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent city streets centered on the proposed building. The façade of the building facing the viewpoint, including heights, setbacks, corners and other features, is plotted onto a base map using lateral and elevation angles. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from the viewpoint chosen. Due to the constraints of the BRADA program, the building may be simplified or the building may be divided into sections in some cases. The BRADA program calculates the percentage of daylight that will be obstructed on a scale of 0% to 100% based on the width of the view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building; the lower the number, the lower the percentage of obstruction of daylight from a given viewpoint.

The BRA typically requests that the analysis treats the following elements as controls for data comparison:

- Existing Conditions;
- Proposed Conditions; and
- The Context of the Area.

The daylight analysis examined daylight obstruction from three locations (two on Stuart Street due to the limitations of BRADA) for the existing and proposed conditions: Viewpoint 1 (Stuart Street), Viewpoint 2 (Stuart Street), and Viewpoint 3 (LaGrange Street). Additionally, the study considered area context points to provide a basis of comparison to existing conditions in the surrounding area. The area context viewpoints were taken from Kneeland Street looking north at the block between Washington Street and Knapp Street (AC1), Washington Street looking east at the block between Essex Street and Beach Street (AC2), and Tremont Street looking east at the block between Boylston Street and LaGrange Street (AC3). The viewpoints are illustrated on Figure 3.3-1.

3.3.3 Daylight Analysis Results

The results for each viewpoint under each alternative condition are described in Table 3.3-1. Figures 3.3-2 through 3.3-4 illustrate the BRADA results for each analysis and are located at the end of this section.

Table 3.3-1 Viewpoint Locations

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	Stuart Street Looking North at the Western Portion of the Site	28.5%	32.2%
Viewpoint 2	Stuart Street Looking North at the Eastern Portion of the Site	54.3%	55.1%
Viewpoint 3	LaGrange Street Looking South	9.1%	94.7%
AC1	Kneeland Street Looking North at the Block Between Washington Street and Knapp Street	69.5%	
AC2	Washington Street Looking East at the Block Between Essex Street and Beach Street	82.9%	
AC3	Tremont Street Looking East at the Block Between Boylston Street and LaGrange Street	86.7%	

G:\Projects2\MA\Boston\3090\viewpoint_locs.mxd

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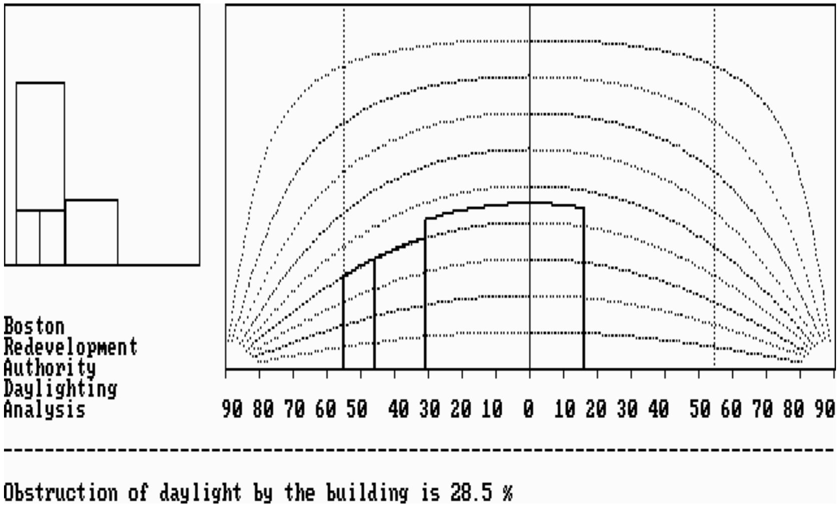
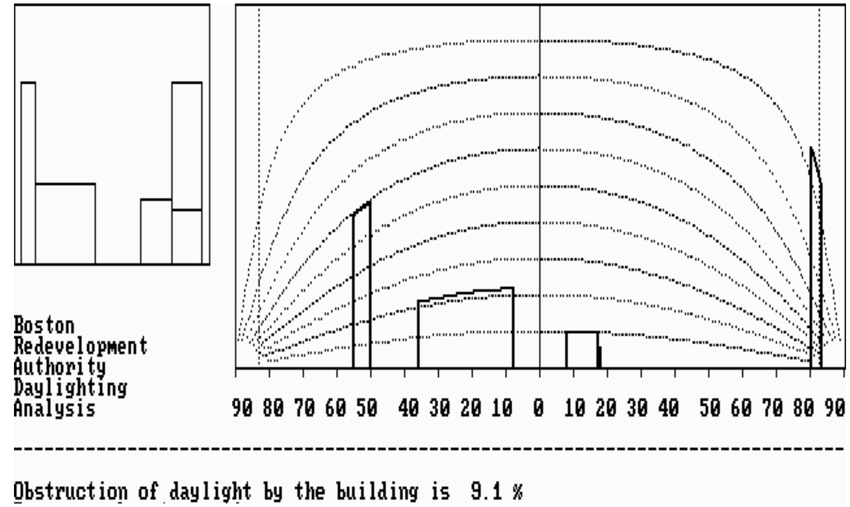
Figure 3.3-1

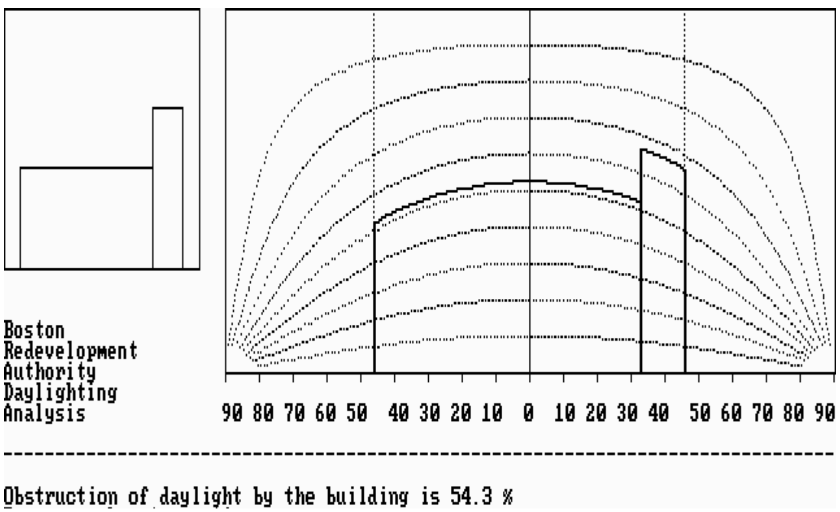
Viewpoint Locations



Viewpoint 1 – Stuart Street



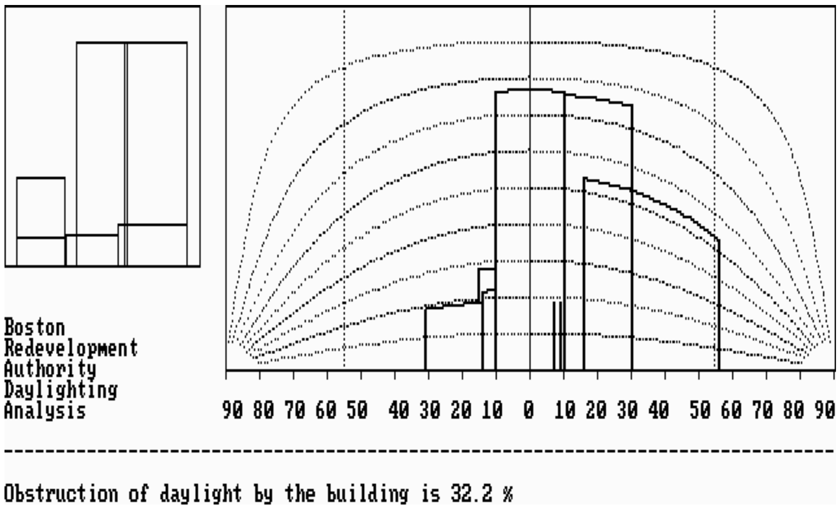
Viewpoint 3 – LaGrange Street



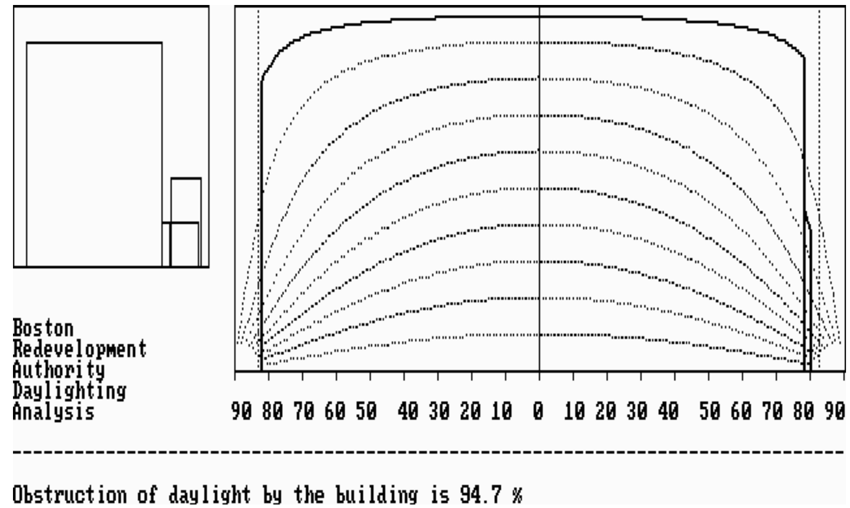
Viewpoint 2 – Stuart Street

Figure 3.3-2

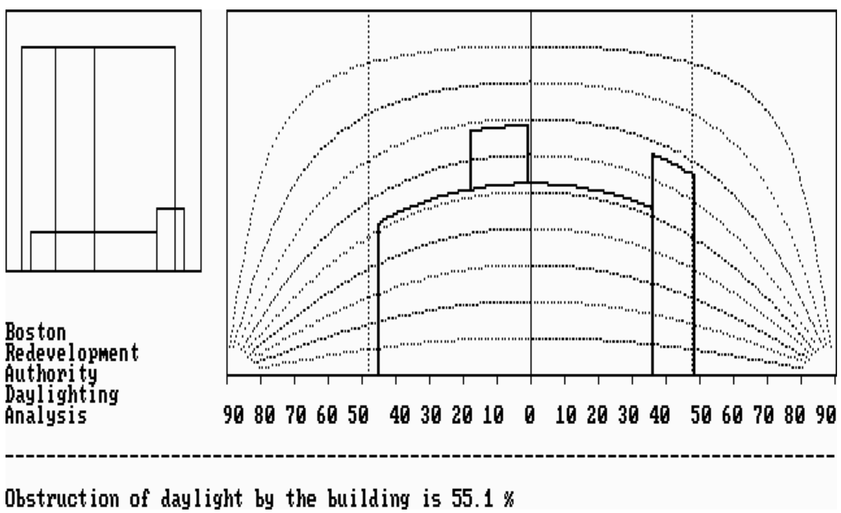
Existing Viewpoints - Results



Viewpoint 1 – Stuart Street



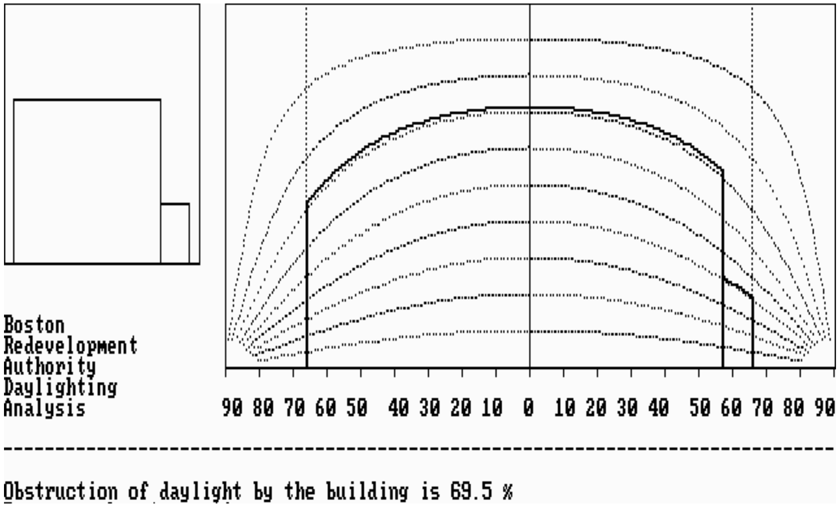
Viewpoint 3 – LaGrange Street



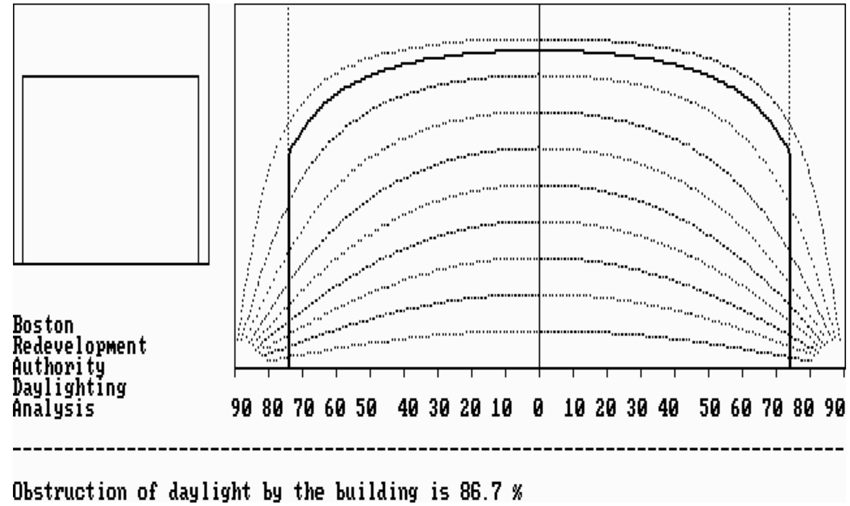
Viewpoint 2 – Stuart Street

Figure 3.3-3

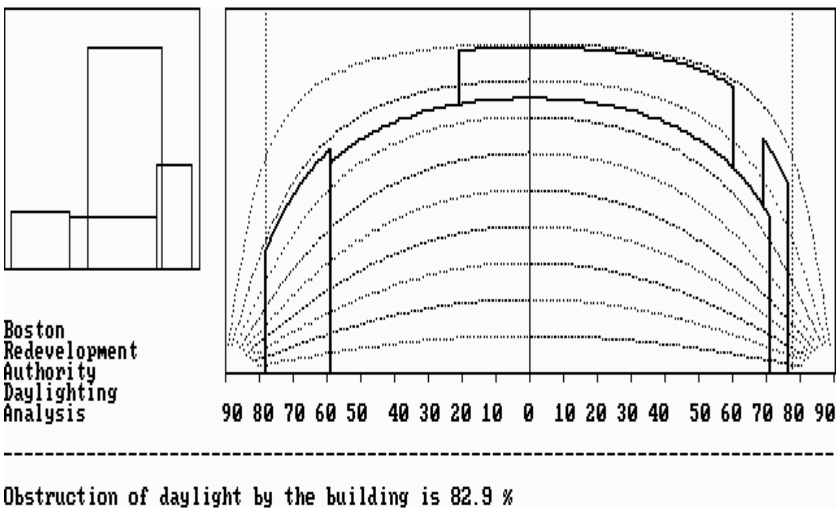
Proposed Viewpoints - Results



Viewpoint 1 – Kneeland Street



Viewpoint 3 – Tremont Street



Viewpoint 2 – Washington Street

3.3.3.1 Viewpoint 1

Viewpoint 1 was taken from the center of Stuart Street looking north at the western portion of the Project site, including the existing buildings along Stuart Street that separate a portion of the Project site from the street edge. Stuart Street is a fairly wide street, and the short stature of the existing buildings creates a daylight obstruction value of 28.5%. With the addition of the proposed Project, the daylight obstruction value will increase to 32.2% because of the height of the structure. This daylight obstruction value will be less than that found in the surrounding area and is typical of a dense, urban area.

3.3.3.2 Viewpoint 2

Viewpoint 2 was taken from the center of Stuart Street looking north at the eastern portion of the Project site, including the existing buildings along Stuart Street that separate a portion of the Project site from the street edge. Due to the height of the existing buildings, the daylight obstruction value is 54.3%. The proposed building on this portion of the site will be set back from Stuart Street and behind the existing buildings. Therefore, the Project will have a minimal impact on the daylight obstruction from this location with a daylight obstruction value just above that for the existing condition of 55.1%.

3.3.3.3 Viewpoint 3

Viewpoint 3 was taken from the center of LaGrange Street looking south at the site. LaGrange Street is a narrow, one-way street between Tremont Street and Washington Street. The majority of street frontage for the Project site is located on LaGrange Street, creating a large, unobstructed area. The existing daylight obstruction value is 9.1% due to the open parking lot and the one existing building in front of the western portion of the site. Due to the narrow street, which is more narrow than most of the surrounding streets, and the construction of the building close to the street edge, the daylight obstruction value for the proposed site will be 94.7%. This daylight obstruction value is higher than for many streets in the surrounding area due to the narrow width of the road, but is similar to other narrow streets in the downtown area.

3.3.3.4 Area Context Viewpoints

The area surrounding the Project site is urban with buildings built to the property line and varying in height from 40 feet to over 400 feet. Three viewpoints were analyzed to find the approximate range of daylight obstruction values in the area surrounding the Project site. The viewpoints were: AC1 - Kneeland Street looking north at the block between Washington Street and Knapp Street; AC2 - Washington Street looking east at the block between Essex Street and Beach Street; and AC3 - Tremont Street looking east at the block between Boylston Street and LaGrange Street. The daylight obstruction values for these locations ranged from 69.5% to 86.7%.

3.3.4 Conclusions

The daylight analysis conducted for the Project describes existing and proposed daylight obstruction conditions at the Project site and in the surrounding area. The Project site places most of the new construction behind existing buildings along Stuart Street. The design steps the massing back from Stuart Street, but also matches the massing of other buildings in the near vicinity. The results of the BRADA analysis indicate that the development of the Project will result in increased daylight obstruction at the site over existing conditions since the site is used as a surface parking lot. The resulting conditions, however, generally will be consistent with the area context.

3.4 Solar Glare

At this time, it is anticipated that the facades of the Project will not be primarily of highly reflective materials that would result in adverse impacts from reflected solar glare.

3.5 Air Quality Impacts

3.5.1 Introduction

The BRA requires that project-induced impacts to ambient air quality be addressed. An air quality analysis was conducted to determine the impact of pollutant emissions from combustion and mobile source emissions generated by the Project. A mesoscale analysis is often performed to determine whether and to what extent the Project will increase the amount of ozone precursors in the area, as well as to determine if the Project is consistent with the Massachusetts State Implementation Plan (SIP). A microscale analysis is typically performed to evaluate the potential air quality impacts of carbon monoxide (CO) due to traffic flow around the Project area. In addition, for stationary sources (i.e., combustion stacks, and garage vents), United States Environmental Protection Agency (EPA) approved air dispersion models were used to estimate project-generated ambient concentrations of nitrogen oxides (NOx), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO_2), in addition to CO.

The impacts were added to monitored background values and compared to the Federal National Ambient Air Quality Standards (NAAQS). The standards were developed by EPA to protect the human health against adverse health effects with a margin of safety.

The modeling methodology was developed in accordance with the latest Massachusetts Department of Environmental Protection (MassDEP) modeling policies and Federal modeling guidelines.[2] The air quality analysis results show that CO, NOx, PM-10, PM-2.5, and SO_2 concentrations at all receptors studied are well under NAAQS thresholds.

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2 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

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

3.5.2 Mesoscale Analysis

A mesoscale analysis is required to ensure that the proposed Project will not adversely impact the existing SIP, which tracks how the state intends to maintain compliance with the NAAQS or plans for reductions in emissions to attain compliance in the future.

The BRA requires a mesoscale analysis when a project will generate more than 10,000 vehicle trips per day.

Since the proposed Project does not generate more than 10,000 trips per day, a mesoscale analysis was not required.

3.5.3 Microscale Analysis

For projects in Boston, the BRA typically requires the analysis of the effect on air quality of the increase in traffic generated by the Project. The Proponent is required to analyze local effects of the potential increase in traffic on ambient air quality near specific intersections. This "microscale" analysis is required for the Project at intersections where 1) project traffic would impact intersections or roadway links currently operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D, E, or F; 2) project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) the project will generate 3,000 or more new average daily trips on roadways providing access to a single location.[3] The microscale analysis involves modeling of carbon monoxide (CO) emissions from vehicles idling at and traveling through both signaled and unsignalized intersections. Predicted ambient concentrations of CO for the build and no-build cases are compared with federal and state ambient air quality standards for CO.

The microscale analysis typically examines ground-level CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. NAAQS have been established by the EPA for CO to protect public health (known as primary standards). These standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period and nine ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on late-model vehicles has reduced the occurrences of CO hotspots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO

[3] BRA, Development Review Guidelines, 2006.

levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The analyses followed the procedure outlined in U.S. EPA's intersection modeling guidance.[4]

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

Baseline (2011) and future year (2016) emission factor data calculated from the MOBILE6.2 model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections. AERMOD was used to estimate potential ground- level impacts due to emissions from the parking garage and combustion sources.

Existing background values of CO at the nearest monitor location in Kenmore Square were obtained from the MassDEP. CAL3QHC and AERMOD results were then added to background CO values of 1.7 ppm (one-hour) and 1.3 ppm (eight-hour), as provided by the MassDEP, to determine total air quality impacts due to the Project. This value was compared to the NAAQS for CO of 35 ppm (one-hour) and nine ppm (eight-hour).

3.5.3.1 Intersection Selection

An analysis of the seven intersections from the traffic study was conducted (see Chapter 2). Microscale modeling was performed for what was determined to be the two intersections that met the aforementioned criteria:

- the intersection of Boylston Street and Tremont Street; and,
- the intersection of Stuart Street and Washington Street.

The traffic volumes and LOS calculations provided in Chapter 2 form the basis of evaluating the traffic data versus the microscale thresholds.

3.5.3.2 Emissions Calculations (MOBILE6.2)

The EPA MOBILE6.2 computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOBILE6.2 model are based on motor vehicle operations typical of daily periods. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the state specific vehicle age registration distribution. The input files for MOBILE6.2 for the

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

existing (2011) and build year (2016) are provided by MassDEP. As is typical, minor edits to the files were necessary to allow the program to output emission factors for the various speeds used in the analyses.

The current version of MOBILE6.2 does not explicitly calculate idle emissions. However, idle emissions can be obtained from a vehicle speed of 2.5 mph (the lowest speed MOBILE6 will model). The resulting emission rate given in (grams/mile) is then multiplied by 2.5 mph to estimate idle emissions (in grams/hour). Moving emissions are calculated based on actual speeds at which free-flowing vehicles travel through the intersections. A speed of 30 mph is used for all free-flow traffic. Speeds of 10 and 15 mph were used for right (and U-turns) and left turns, respectively.

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

3.5.3.3 Receptors and Meteorology Inputs

Sets of up to 90 receptors were placed in the vicinity of each of the modeled intersections. Receptors extended approximately 100 to 200 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersections are presented in Figure 3.5-1 and 3.5-2.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[5], a wind speed of one m/s, stability class D (4), and a mixing height of 1,000 meters was used. To account for the intersection geometry, wind directions from 0° to 350°, every 10° were selected. A surface roughness length of 321 cm corresponding to "City Land Use – Central Business District" was selected.[6]

3.5.3.4 Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-links at intersections, worst-case meteorological conditions, and traffic input data. The one-hour concentrations were scaled by a factor of 0.7 to estimate eight-hour concentrations.[7] The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling runs. Travel speeds were estimated based on field observations, traffic data, and queue links at the intersections. The CAL3QHC input parameters are described in Appendix C.

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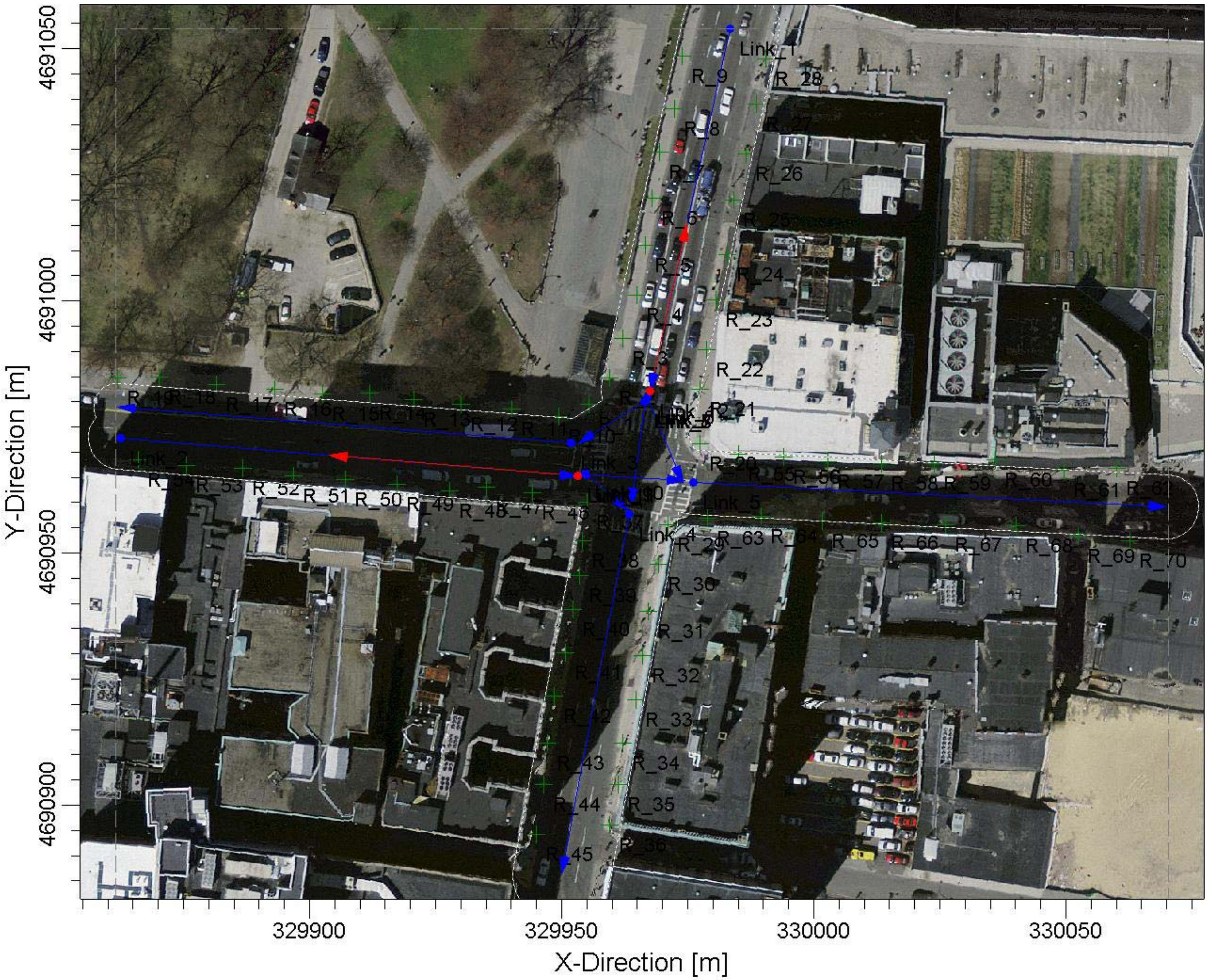
[5] U.S. EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections.* EPA-454/R-92-005, November 1992.

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

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



45 Stuart Street   Boston, MA

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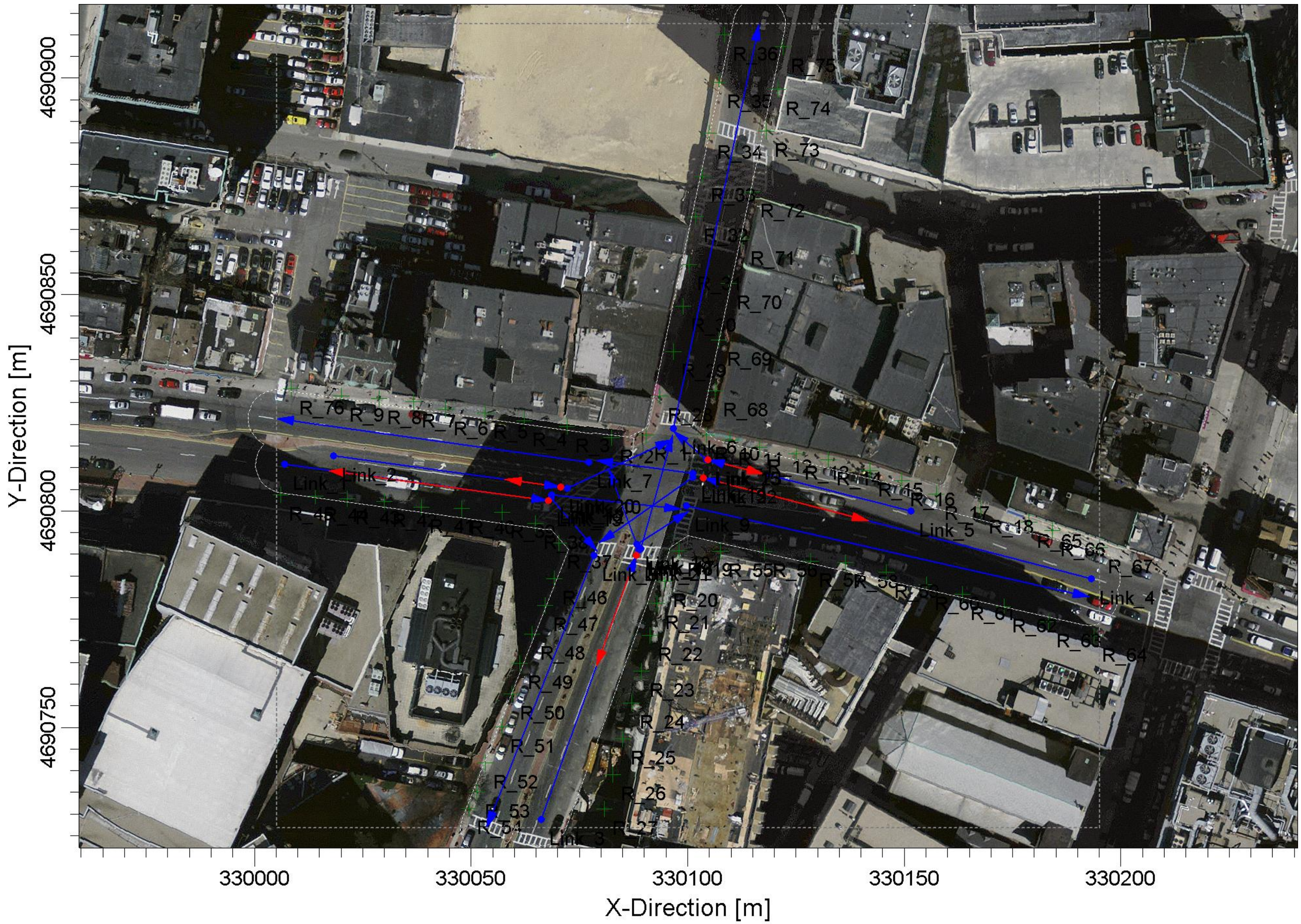
Figure 3.5-1

Link and Receptor Locations for CAL3QHC modeling of Intersection 1: the intersection of Boylston Street and Tremont Street



45 Stuart Street Boston, MA

Figure 3.5-2

Link and Receptor Locations for CAL3QHC modeling of Intersection 2: the intersection of Stuart Street and Washington Street.

3.5.4 Stationary Source Analysis

3.5.4.1 AERMOD Modeling Methodology

The most recent version of the U.S. EPA AERMOD refined dispersion model (Version 11103) was selected to predict concentrations from the stationary sources related to the Project. AERMOD is the EPA's preferred model for regulatory applications. The use of AERMOD provides the benefits of using the most current algorithms available for steady state dispersion modeling.

The ISC-AERMOD View graphical user interface (GUI) Version 7.0.3, created by Lakes Environmental, was used to facilitate model setup and post-processing of data. The AERMOD model was selected for this analysis because it:

- is the required EPA model for all refined regulatory analyses for receptors within 50 km of a source;
- is a refined model for facilities with multiple sources, source types, and building-induced downwash;
- uses actual representative hourly meteorological data;
- incorporates direction-specific building parameters which can be used to predict impacts within the wake region of nearby structures;
- allows the modeling of multiple sources together to predict cumulative downwind impacts;
- provides for variable emission rates;
- provides options to select multiple averaging periods between one-hour and one year (scaling factors can be applied to adjust the one-hour impact to a peak impact less than one-hour); and,
- allows the use of large Cartesian and polar receptor grids, as well as discrete receptor locations.

Regulatory default options adopted for the model include:

- *Use stack-tip downwash (except for building downwash).* Stack-tip downwash is an adjustment of the actual stack release height for conditions when the gas exit velocity is less than 1.5 times the wind speed. For these conditions, the effective release height is reduced a bit, based on the diameter of the stack and the wind and gas exit velocity. This option applies to point sources only, such as emergency generators, cooling towers, boiler units and garage vents.

- *Use the missing data and calms processing routines.* The model treats missing meteorological data in the same way as the calms processing routine, i.e., it sets the concentration values to zero for that hour, and calculates the short term averages according to U.S. EPA's calms policy, as set forth in the Guideline. Since only one-hour averages are being used, concentrations predicted with calm or missing data would not affect model results.

The AERMOD model is able to assign sources to a rural or urban category to allow specified urban sources to use the effects of increased surface heating under stable atmospheric conditions. The urban dispersion classification was selected based on a visual inspection of the area within a three kilometer radius of the Project site. A population estimate of 650,000 was obtained from the U.S. Census website (www.census.gov) and is used in the AERMOD model to estimate the urban boundary layer height.

The regional meteorology in Boston is best approximated with meteorological data collected by the nearby Boston Logan International Airport in East Boston, MA. The station is located approximately three miles (4.6 km) to the east-northeast of the Project site at an elevation of 12 feet (3.7 m) above mean sea level. This station is the closest site for which extensive meteorological data are available which are representative of similar topographic influences that affect the proposed site. Five years (2005-2009) of hourly surface data collected at the station include wind speed and direction, temperature, cloud cover and ceiling height. Upper air data from Gray, Maine was processed along with the surface data. The processed meteorological files for use in AERMOD were provided by MassDEP. These files have been used on other AERMOD applications in the area for review by MassDEP and are presumed to be of sufficient quality for regulatory applications.

A network of 1,144 receptors was used for the refined AERMOD modeling analysis. A nested grid of Cartesian receptors centered on the Project was used. The entire modeling domain encompassed 16 square kilometers. The spacing of the receptors was as follows:

- A 500 meter by 500 meter area bounding the Project with receptors spaced every 20 meters.

- An area extending 200 meters north and south from the 20 meter grid with receptors spaced every 50 meters.

- An area extending 500 meters north and south from the 50 meter grid with receptors spaced every 100 meters.

- An area extending 1,000 meters north and south from the 100 meter grid with receptors spaced every 250 meters.

Terrain data were obtained from the U.S.G.S National Map Seamless Server (www.seamless.usgs.gov) according to guidance set forth by EPA.[8] Source, building, and receptor elevations were processed using the AERMAP processor by way of the Lakes AERMOD View interface. Figures 3.5-3 and 3.5-4 present the source and receptor locations, as well as the buildings used in the GEP stack height/downwash analysis described below.

3.5.4.2 Stationary Sources

Stationary sources of air pollution are typically units that combust fuel. In this case, these sources consist of heating units, electrical generating units, etc.

The design is for two 2 MMBTU/hr heating /hot water boilers to be installed on the new building. In addition, four 3 MMBTU/hr domestic hot water units are to be installed. All units will be natural gas-fired and located in a mechanical area on the roof of the building. The units are expected to be exhausted through individual stacks.

The boilers will be within the requirements of the MassDEP's Environmental Results Program (ERP) since individual estimated heat inputs are within or below the 10 to 40 MMBTU/hour ERP range. Registration with MassDEP would not be required. However, emissions were conservatively estimated for each boiler based on the MassDEP Boiler ERP program emission limits. Dispersion modeled impacts from the heating units were estimated from exhaust stacks 10 feet above the building roof heights above ground level. For all impacts, the heating equipment is assumed to be in operation 24 hours per day, seven days per week.

Current design plans are for one 800-kilowatt emergency generator to be installed on the building. The unit will provide life safety and standby emergency power to the building. The unit will be diesel-fired and located in a mechanical area on the roof of the building. The generator is assumed to be designed such that its exhaust stack extends at least 10 feet above the individual building roof height above ground level.

Typically, the generator will operate for approximately one hour each month for testing and general maintenance. The ERP regulation applies to new emergency generators greater than 37 kW. The regulation is similar to the boiler ERP in that new engines are subject to emission standards, recordkeeping, certification, and compliance with the MassDEP noise policy. Since the generator maximum rating capacity is greater than the ERP limit of 37 kW, it will be subject to the new ERP program. Per the ERP, the generator owner will limit operation of the generator to less than 300 hours per year and submit a certification form to MassDEP within 60 days of installation.

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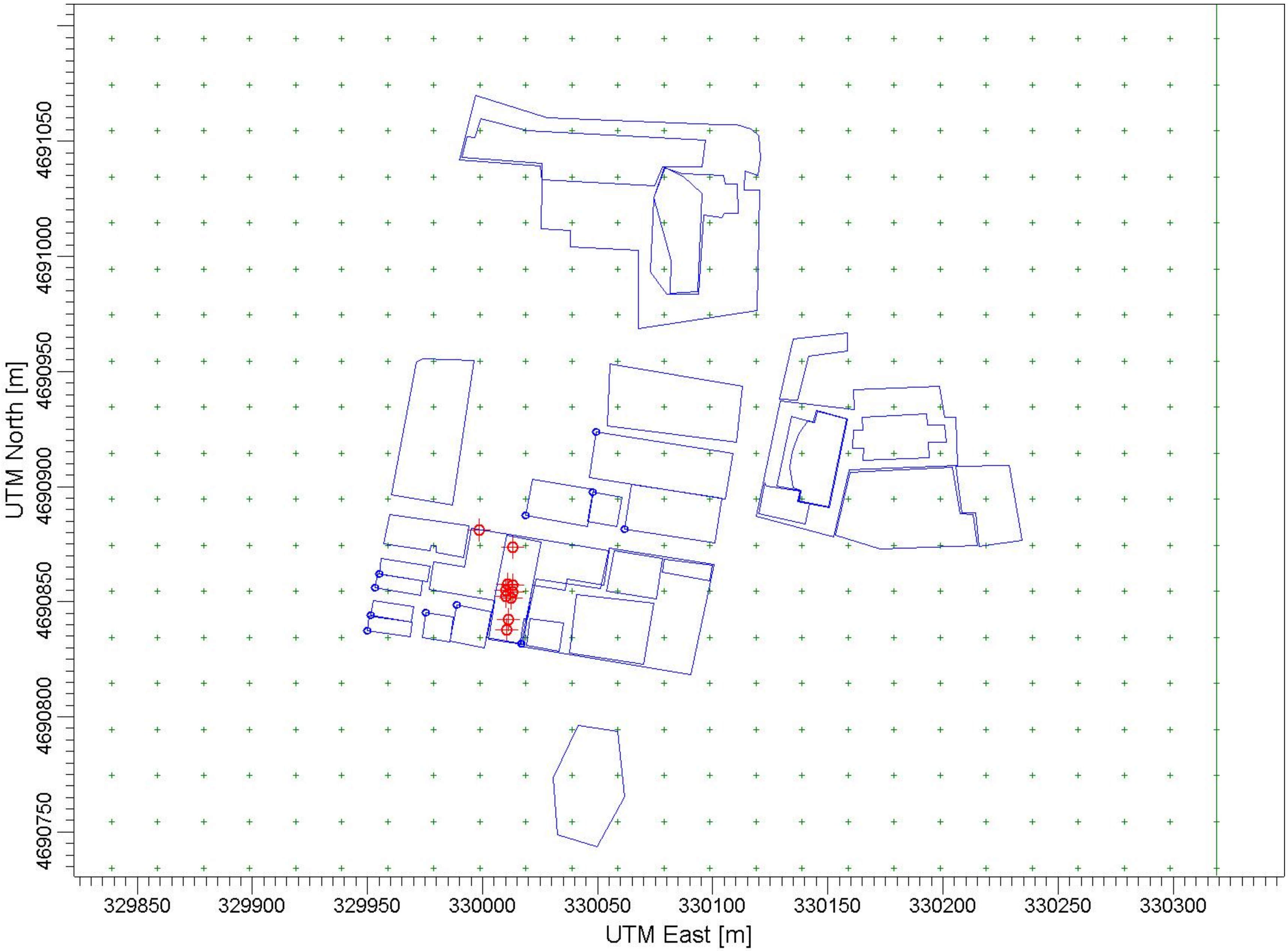
8 U.S. EPA, AERMOD Implementation Guide, March 19, 2009.

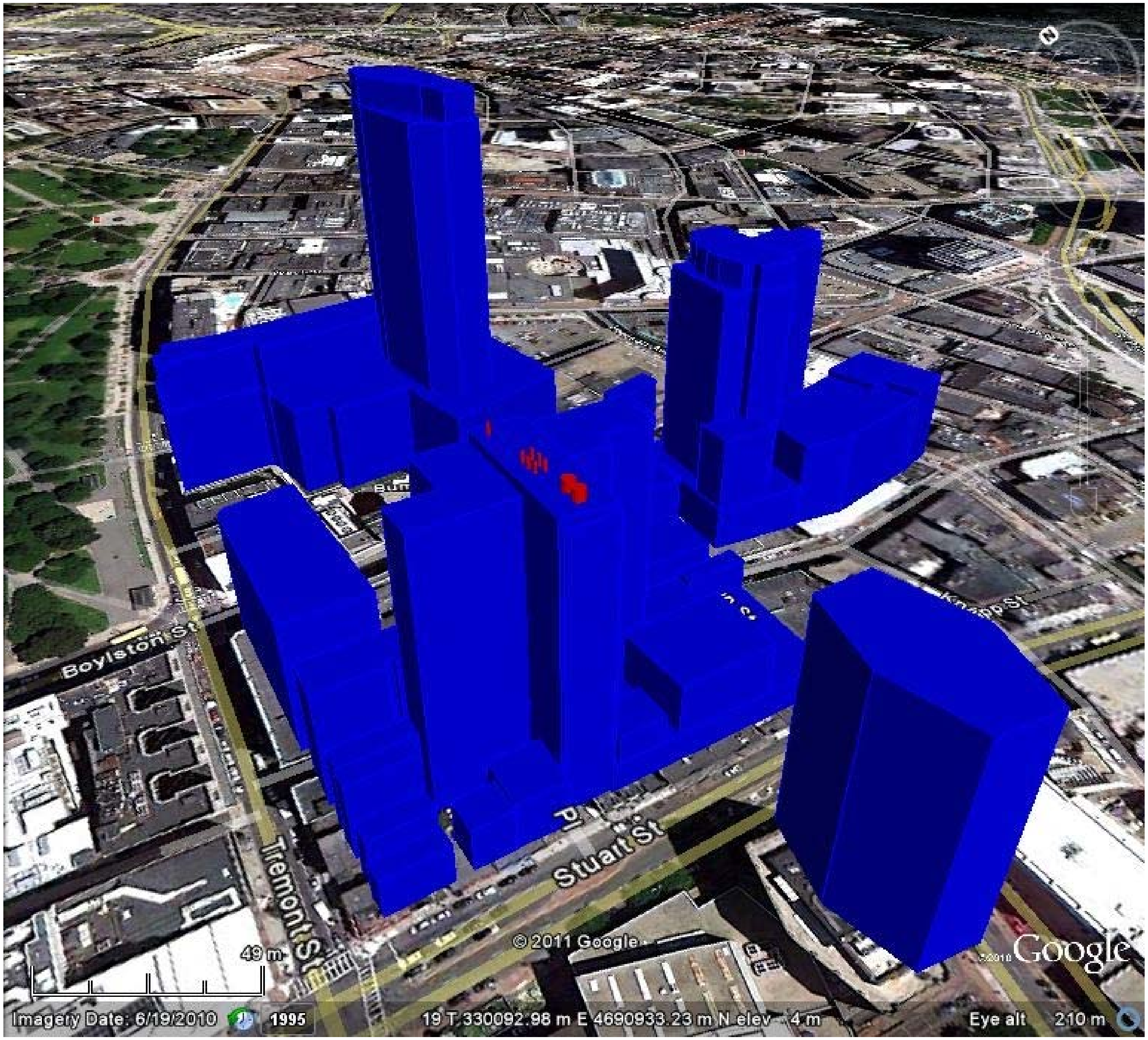


45 Stuart Street Boston, MA

Epsilon ASSOCIATES INC.

Figure 3.5-3

AERMOD stationary source, receptor, and building locations



45 Stuart Street Boston, MA

Epsilon ASSOCIATES INC.

Figure 3.5-4

AERMOD stationary source, receptor, and building locations (three-D image)

Emissions were estimated for the emergency generator based on vendor supplied data. Comparable equipment was assumed where not provided by the Project architect. The generator is assumed to operate 300 of 8,760 hours per year in the modeling for annual averaging times.

The design is for two single-cell cooling towers, capable of providing approximately 1,050 tons of cooling, to be installed on the building. These units will remove the excess heat generated by the building's mechanical equipment. All units will be located on the roof of the building.

Only emissions of particulate matter are assumed to be produced by the cooling tower cells. The cooling towers are assumed to operate at 100% capacity for 8,760 hours per year. Emissions of all other pollutants from the cooling towers are expected to be negligible.

Emissions and exhaust parameters were based on vendor supplied data and/or engineering judgment.

A dual bay loading dock with mechanical ventilation will be part of the proposed building. Carbon monoxide monitors are typically installed within enclosed areas with idling vehicles to insure that levels of CO do not exceed health standards. At this time, it is unclear if monitors will be used to control abatement ventilation when necessary.

Emissions from the loading dock were calculated using MOBILE6.2 and an estimate of the total idling time permitted under Massachusetts law (90 MGL Section 16A). It was conservatively assumed that the dock would be 100% utilized from 7:00 a.m. to 4:00 p.m. and that trucks would idle for five minutes per hour, the Massachusetts legal limit.

To provide a conservative assumption for emissions from the loading dock, an emission rate from MOBILE6.2 of 2.5 miles per hour was conservatively assumed for a midpoint year of 2013. As is accepted, the 2.5 mph emission rate in g/mile is multiplied by 2.5 miles per hour to get an idling emission rate in mass/time. The higher of the summer or winter factors were used, depending on pollutant. Additionally, emission factors were weighted such that only factors for heavy duty gasoline and heavy duty diesel vehicle classes (MOBILE6.2 designations HDGV and HDDV) were used for dock emissions.

High velocity air intake louvers and the dock entry will supply make-up air for the dock's ventilation systems. Based on mechanical estimates, a total ventilation air requirement of 1,000 cubic feet per minute was used. A single vent is expected to be exiting vertically at 20 feet above the sidewalk grade and is assumed to be three square feet in area.

Detailed calculations, assumptions, and exhaust parameters for all stationary sources are presented in Appendix C.

3.5.4.3 GEP Stack Height Analysis

The Good Engineering Practice (GEP) stack height evaluation of the facility has been conducted in accordance with the EPA revised Guidelines for Determination of Good Engineering Practice Stack Height (EPA, 1985). A GEP stack is sufficiently high to avoid aerodynamic downwash effects from nearby buildings or structures. As defined by the EPA guidelines, the formula for computing GEP stack height is the greater of:

1. 65 meters, or
2. for stacks constructed after January 12, 1979,

$$H_{GEP} = H_b + 1.5L$$

where H_{GEP} = GEP stack height,

H_b = Height of adjacent or nearby structures,

L = Lesser of height or maximum projected width of adjacent or nearby building (i.e., the critical dimension), and nearby is within 5L of the stack from downwind (trailing edge) of the building.

The GEP formula was applied to each input building. Facility grade is approximately at mean sea level. The EPA's Building Profile Input Program Prime Version (BPIP-Prime) was run to confirm the GEP height and to calculate direction-specific building dimensions for use in AERMOD.

The point sources subject to building influences are the boiler stacks, dock vents, the cooling towers, and the emergency generator stacks.

The proposed boiler stacks, the cooling towers, dock vents, and emergency generator stacks are all below GEP height; therefore, building downwash effects were considered in the air quality modeling. The AERMOD model determines when and if to include downwash in its calculations. In addition, if downwash applies, the AERMOD downwash algorithm will be used to estimate concentrations in the building cavity areas.

3.5.4.4 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports was obtained for 2007 to 2009. MassDEP guidance specifies the use of the latest three years of available monitoring data from within 10 km of the Project site.

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

Background concentrations were determined from the closest available monitoring stations to the proposed development. The closest monitors are located at One City Square, 174 North Street, and Kenmore Square, all in Boston. It should be noted that monitors record different pollutants and the closest monitor for each pollutant was selected. A summary of the background air quality concentrations are presented in Table 3.5-1.

Table 3.5-1 Observed Ambient Air Quality Concentrations and Selected Background Levels

Pollutant	Averaging Time	2007	2008	2009	Background Concentration ($\mu g/m^3$)	Location
SO_2	1 HOUR	93.6	75.4	65.0	93.6	Kenmore Sq., Boston
	3 HOUR	88.4	62.4	49.4	88.4	Kenmore Sq., Boston
	24 HOUR	52.0	46.8	23.4	52.0	Kenmore Sq., Boston
	ANNUAL	10.9	10.4	6.5	10.9	Kenmore Sq., Boston
PM-10	24 HOUR	54.0	44.0	44.0	54	One City Sq., Boston
	ANNUAL	22.7	18.5	17.9	22.7	One City Sq., Boston
PM-2.5	24 HOUR [1]	31.2	26.2	24.2	27.2	174 North St., Boston
	ANNUAL [2]	11.9	11.2	10.3	11.14	174 North St., Boston
NO_2	1 HOUR [3]	103.4	110.9	101.5	105.3	Kenmore Sq., Boston
	1 HOUR [4]	126.0	133.5	114.7	124.7	Kenmore Sq., Boston
	ANNUAL	38.7	41.4	37.8	41.36	Kenmore Sq., Boston
CO	1 HOUR	1824.0	1938.0	1596.0	1938	Kenmore Sq., Boston
	8 HOUR	1482.0	1482.0	1254.0	1482	Kenmore Sq., Boston

From MassDEP Annual Data Summaries. SO_2, NO_2, and CO reported in ppm. Converted to $\mu g/m^3$.

A value of 1 ppm SO_2 = 2600 $\mu g/m^3$ SO_2

A value of 1 ppm NO_2 = 1880 $\mu g/m^3$ NO_2

A value of 1 ppm CO = 1140 $\mu g/m^3$ CO

[1] Three year average of the 98th percentile 24-hour values.

[2] Three year average of the annual values.

[3] From MassDEP (email from S. Dennis, 1/13/2011). Average of the 98th percentile of the daily maximum one-hour values.

[4] Maximum annual one-hour concentrations.

For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 1.7 ppm for one-hour and 1.3 ppm for eight-hour CO.

3.5.5 Results

3.5.5.1 Mesoscale Analysis

Since the proposed Project does not generate more than 10,000 daily trips, a mesoscale analysis was not required.

3.5.5.2 Microscale Analysis

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3.5-2 through 3.5-4 for the 2011 and 2016 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.7.[9]

The results of the one-hour and eight-hour maximum modeled CO ground-level concentrations from CAL3QHC were added to EPA supplied background levels for comparison to the NAAQS. These values represent the highest potential concentrations at the intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology. The highest one-hour traffic-related concentration predicted in the area of the Project, for the modeled conditions (1.8 ppm) plus background (1.7 ppm) is 3.5 ppm for the 2011 case (at Boylston Street and Tremont Street). The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (1.3 ppm) plus background (1.3 ppm) is 2.6 ppm for the 2011 case. Both concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of nine ppm.

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

3.5.5.3 Stationary Source Analysis

In addition to the microscale analysis, a cumulative impact analysis was also conducted for comparison to the NAAQS for SO_2, NOx, PM-10, and PM-2.5. This analysis addresses emissions from the Project's heating boilers, emergency generators, cooling towers, and the loading dock vent.

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

Worst case maximum predicted impacts from these source groups were added to monitored background values obtained from MassDEP and compared to the NAAQS.

Table 3.5-5 presents the cumulative modeling results for the stationary sources plus monitored background values. The total impacts when combined with the background conditions are below the NAAQS for all pollutants and averaging periods.

When adding the high-second highest AERMOD-predicted one-hour CO concentrations from the stationary sources to the traffic-generated impacts for the future build case (24.5 $\mu g/m^3$, 0.02 ppm), the one-hour modeled concentration from moving vehicles (1.8 ppm) plus background (1.7 ppm) is 3.5 ppm. The total future build concentration includes the highest second-high predicted concentrations from AERMOD for the parking exhaust vents, the heating boilers, and the emergency generators. This combined value is also well below the one-hour NAAQS standard of 35 ppm.

Similarly, when adding the high-second highest AERMOD-predicted eight-hour CO concentrations from the stationary sources to the traffic-generated impacts for the future build case (9.1 $\mu g/m^3$, 0.01 ppm), the eight-hour modeled concentration from moving vehicles (1.3 ppm) plus background (1.3 ppm) is 2.6 ppm. These values are also below the eight-hour NAAQS standard of 9.0 ppm.

This is a highly conservative estimate, since the added values are irrespective of time and space (i.e., the modeled and background concentrations occur at different times and at different locations).

3.5.6 Conclusions

Using conservative estimates, the CO concentrations at the nearest receptors for impacts from the traffic at nearby intersections, the heating boilers, and emergency generator units, plus monitored background values, are well under the CO NAAQS thresholds. In addition, maximum cumulative impacts from the heating boilers, garage vents, cooling towers, and emergency generators plus monitored background values are also below the NAAQS thresholds for SO_2, NOx, PM-10, and PM-2.5.

Table 3.5-2 Summary of Microscale Modeling Analysis (Existing 2011)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Boylston Street & Tremont Street	AM	1.8	1.7	3.5	35
	PM	1.8	1.7	3.5	35
Stuart Street & Washington Street	AM	1.2	1.7	2.9	35
	PM	1.6	1.7	3.3	35
8-Hour					
Boylston Street & Tremont Street	AM	1.3	1.3	2.6	9
	PM	1.3	1.3	2.6	9
Stuart Street & Washington Street	AM	0.8	1.3	2.1	9
	PM	1.1	1.3	2.4	9

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

Table 3.5-3 Summary of Microscale Modeling Analysis (No-Build 2016)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Boylston Street & Tremont Street	AM	1.5	1.7	3.2	35
	PM	1.6	1.7	3.3	35
Stuart Street & Washington Street	AM	1.1	1.7	2.8	35
	PM	1.4	1.7	3.1	35
8-Hour					
Boylston Street & Tremont Street	AM	1.1	1.3	2.4	9
	PM	1.1	1.3	2.4	9
Stuart Street & Washington Street	AM	0.8	1.3	2.1	9
	PM	1	1.3	2.3	9

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

Table 3.5-4 Summary of Microscale Modeling Analysis (Build 2016)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Boylston Street & Tremont Street	AM	1.5	1.7	3.2	35
	PM	1.6	1.7	3.3	35
Stuart Street & Washington Street	AM	1.1	1.7	2.8	35
	PM	1.4	1.7	3.1	35
8-Hour					
Boylston Street & Tremont Street	AM	1.1	1.3	2.4	9
	PM	1.1	1.3	2.4	9
Stuart Street & Washington Street	AM	0.8	1.3	2.1	9
	PM	1	1.3	2.3	9

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

Table 3.5-5 Summary of NAAQS Stationary Source Modeling Analysis

Pollutant	Averaging Time	Max Modeled Conc. ($\mu g/m^3$)	Year	Background Concentration ($\mu g/m^3$)	Total Conc. ($\mu g/m^3$)	Standard ($\mu g/m^3$)	% Of Standard
SO_2	1-HR (1)	0.18257	2005-09	93.6	93.8	195	48%
	3-HR (2)	0.1486	2006	88.4	88.5	1300	7%
	24-HR (2)	0.06117	2006	52.0	52.1	365	14%
	ANN (3)	0.00902	2007	10.9	10.9	80	14%
PM-10	24-HR (4)	0.6201	2009	54.0	54.6	150	36%
	ANN (3)	0.16406	2007	22.7	22.9	50	46%
PM-2.5	24-HR (5)	0.62703	2005-09	27.2	27.8	35	80%
	ANN (6)	0.15634	2005-09	11.1	11.3	15	75%
NO_2	1-HR (7)	8.61613	2005-09	124.7	133.3	188	71%
	ANN (3)	0.85996	2007	41.4	42.2	100	42%
CO	1-HR (2)	24.52416	2008	1938.0	1962.5	40000	5%
	8-HR (2)	9.13868	2006	1482.0	1491.1	10000	15%

Notes:
(1) Maximum 4th-Highest Maximum Daily 1-Hr Concentration Averaged Over 5 Years
(2) Highest 2nd-High Concentration Over 5 Years
(3) Highest Annual Concentration Over 5 Years
(4) Highest 6th-High Concentration Over 5 Years
(5) Maximum 1st-Highest 24-Hour Concentration Averaged Over 5 Years
(6) Maximum Annual Concentration Averaged Over 5 Years
(7) Maximum 8th Highest Maximum Daily one-hour Concentrations Averaged Over 5 Years.

3.6 Noise Impacts

3.6.1 Introduction

A noise impact analysis for the Project has been performed, based on a baseline noise-monitoring program to determine existing noise levels and based on a conceptual building mechanical design. This analysis predicts the future noise levels after the Project is constructed and is in operation.

With appropriate noise mitigation, the predicted noise levels from the Project's mechanical equipment will be below the City of Boston Noise Ordinance requirements for both nighttime and daytime hours, and well below existing measured baseline noise levels in the area.

3.6.2 Noise Terminology

There are several ways sound (noise) levels are measured and quantified, all of which use the logarithmic decibel (dB) scale. The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment.

One property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a three-decibel increase (to 53 dB), not a doubling to 100 dB. Thus, every 3 dB change in sound level represents a doubling or halving of sound energy. Generally, less than a doubling of sound energy, *i.e.*, a change in sound levels of less than 3 dB, is imperceptible to the human ear.

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

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

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

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.
- L_{50} is the median sound level: the sound level in dBA exceeded 50 percent of the time during the measurement period.
- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises such as those from passing motor vehicles.

The equivalent level, L_{eq}, is the level of a hypothetical steady sound that would have the same energy (*i.e.,* the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is also A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud, intrusive noises. Day-night average sound level, abbreviated as DNL and symbolized as $L_{dn,}$ is the 24-hour average sound level, in decibels, obtained after addition of 10 decibels to sound levels in the night from 10:00 PM to 7:00 AM. The hourly L_{eq} sound level metric is used to calculate the L_{dn}

By using various noise metrics, it is possible to separate prevailing, steady sounds (the L_{90}) from occasional, louder sounds (L_{10}) in the noise environment or combined average levels (L_{eq}). The analysis of sounds expected from the proposed Project treats all noises as though they will be steady and continuous and hence the L_{90} exceedance level was used. In the design of noise control treatments, it is essential to know something about the frequency spectrum of the noise of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design. The spectra of noises are usually stated in terms of octave band sound pressure levels, in dB, with the octave frequency bands being those established by standard. To facilitate the noise-control design process, the estimates of noise levels in this analysis are also presented in terms of octave band sound pressure levels.

Baseline noise levels were measured in the vicinity of the proposed Project and were compared to predicted noise levels that were derived based on information provided by the manufacturers of representative mechanical equipment expected to be installed as part of the Project. The predicted noise levels were compared to the City of Boston Zoning District Noise Standards, as well as the Massachusetts DEP Noise Policy.

3.6.3 Noise Regulations and Criteria

The primary set of regulations relating to the potential increase in noise levels is the City of Boston Noise Standards (City of Boston Code – Ordinances: Section 16–26 Unreasonable Noise and City of Boston Air Pollution Control Commission Regulations for the Control of Noise in the City of Boston). Results of the baseline ambient noise level survey and the modeled noise levels were compared to the City of Boston Zoning District Noise Standards. Separate regulations within the Standard provide criteria to control different types of noise. Regulation 2 is applicable to the effects of the completed proposed buildings and was considered in this noise study. Table 3.6-1 includes the City of Boston Noise Standards.

Table 3.6-1 City of Boston Ordinance Noise Standards, Maximum Allowable Sound Pressure Levels

Octave Band Center	Residential Zoning District		Residential-Industrial Zoning District		Business Zoning District	Industrial Zoning District
Frequency	Daytime	All Other Times	Daytime	All Other Times	Anytime	Anytime
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
31.5	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
A-Weighted (dBA)	60	50	65	55	65	70

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

- ♦ All standards apply at the property line of the receiving property.
- ♦ dB and dBA based on a reference pressure of 20 micropascals.
- ♦ Daytime refers to the period between 7:00 a.m. and 6:00 p.m. daily except Sunday.

The Massachusetts DEP regulates community noise by its Noise Policy: DAQC policy 90-001. The DEP policy limits source sound levels to a 10-dBA increase in the ambient measured noise level (L_{90}) at the Project property line and at the nearest residences. The policy further prohibits pure tone conditions – when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 dB or more.

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

3.6.4 Existing Noise Conditions

3.6.4.1 Baseline Noise Environment

An ambient noise level survey was conducted to characterize the existing "baseline" acoustical environment in the vicinity of the Project. Existing noise sources in the vicinity of the Project include: vehicular traffic (including trucks) on the local roadways; pedestrian traffic; mechanical equipment located on the surrounding buildings; and the general din of the city.

3.6.4.2 Noise Measurement Locations

The selection of the sound monitoring receptor locations was based upon a review of the current land use near the Project site. Four representative noise-monitoring locations were selected to obtain a sampling of the ambient baseline noise environment. The monitoring locations are depicted on Figure 3.6-1 and are described below:

- Location 1 is on Washington Street near the intersection with Beach Street (L1 on Figure 3.6-1);
- Location 2 is on LaGrange Street near the intersection with Tamworth Street (L2 on Figure 3.6-1);
- Location 3 is on Tremont Street near the intersection with Stuart Street (L3 on Figure 3.6-1); and
- Location 4 is on Stuart Street directly across from the Project Site. (L4 on Figure 3.6-1).

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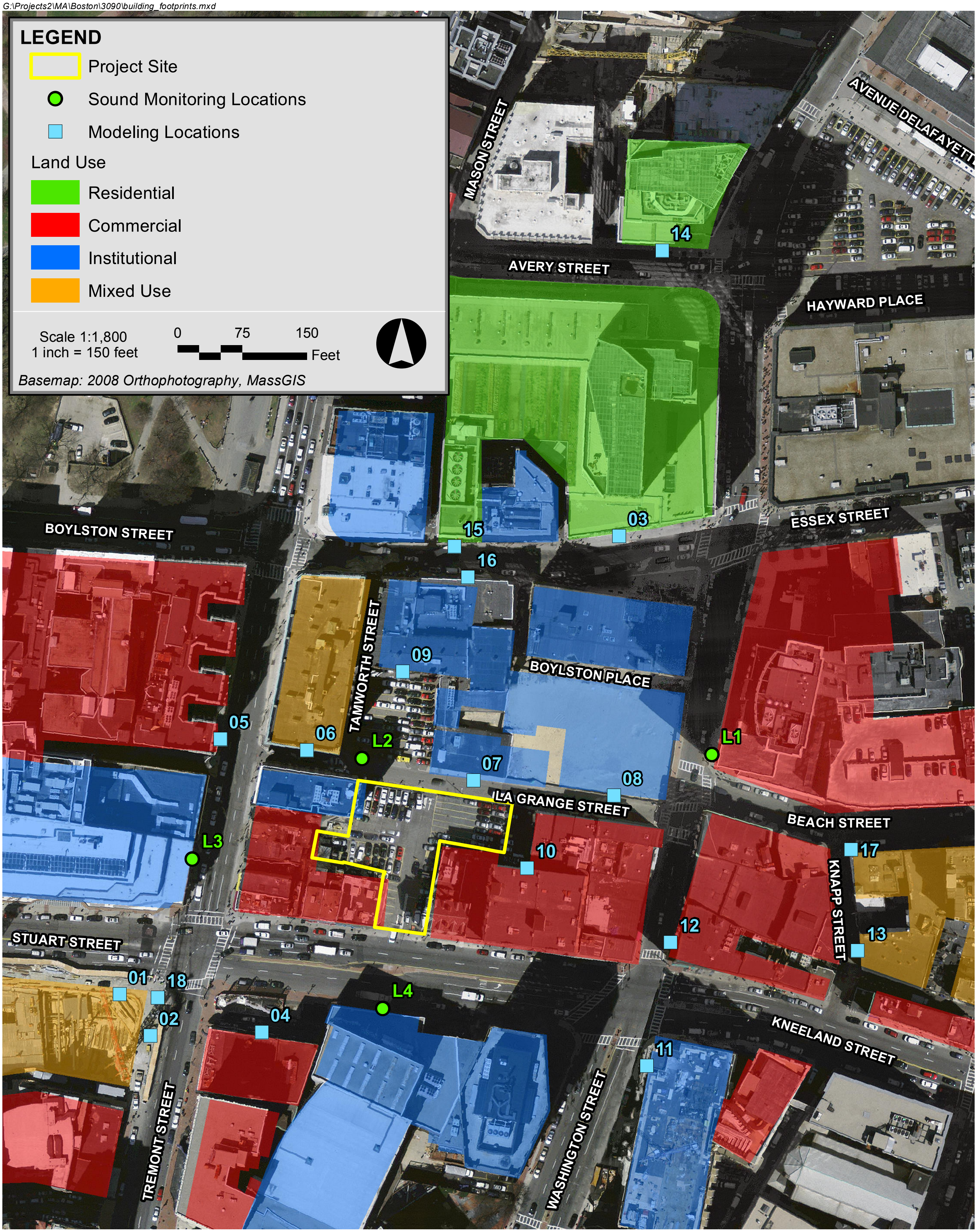

45 Stuart Street Boston, MA

Epsilon ASSOCIATES INC.

Figure 3.6-1

Sound Level Monitoring and Modeling Locations

3.6.4.3 Noise Measurement Methodology

Sound level measurements were made for 20 minutes per location during daytime (12:00 P.M. to 2:00 P.M.) on April 26, 2011, and nighttime hours (12:00 A.M. to 2:00 A.M.) on April 28, 2011. Since noise impacts are generally greatest at night when background noise levels are lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to include peak traffic conditions.

The sound levels were measured at publicly accessible locations at a height of five feet above the ground and at locations where there were no large reflective surfaces to affect the measured levels. The measurements were made under low wind conditions and with dry roadway surfaces. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a General Tools digital psychrometer. Unofficial observations about meteorology or land use in the community were made solely to characterize the existing sound levels in the area and to estimate the noise sensitivity at properties near the proposed Project.

3.6.4.4 Measurement Equipment

A Nor140 Sound Analyzer equipped with a Nor1209 Type 1 Preamplifier, a Nor1225 ½" free-field microphone and a 2 ½" foam windscreen was used to collect broadband and 1/1 octave band ambient sound pressure level data. The Norsonic instrumentation meets the "Type 1 - Precision" requirements set forth in American National Standards Institute (ANSI) S1.4 for acoustical measuring devices. The meter, equipped with an internal octave band filter set along with data logging capabilities, processed one sample per second using the "fast" response setting.

Statistical levels were calculated from the sound levels collected during each 20-minute measurement period. Octave band levels for this study correspond to the same data set processed for the broadband levels. The measurement equipment was calibrated in the field before and after the surveys with a Norsonic 1251 acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1997.

3.6.4.5 Baseline Ambient Noise Levels

The existing ambient noise environment is most affected by traffic on local roads and pedestrian activity. During the nighttime, traffic on local roads was still significant.

The baseline noise monitoring results are summarized below.

- The daytime residual background (L_{90} dBA) measurements ranged from 60 to 64 dBA;
- The nighttime residual background (L_{90} dBA) measurements ranged from 59 to 74 dBA;
- The daytime equivalent level (L_{eq} dBA) measurements ranged from 68 to 75 dBA;
- The nighttime equivalent level (L_{eq} dBA) measurements ranged from 67 to 78 dBA;

Table 3.6-2 on the following page presents the detailed noise monitoring results.

Table 3.6-2 Baseline Ambient Noise Measurements

							Octave Band Center Frequency (Hz)								
Receptor I.D	Start	L10	L50	L90	Leq	Lmax	32	63	125	250	500	1000	2000	4000	8000
	Time	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)
Loc 1 Day	12:11	71	65	61	69	88	78	76	69	65	64	66	62	58	56
Loc 1 Night	00:15	68	61	60	67	87	73	74	71	66	63	63	58	53	47
Loc 2 Day	12:34	68	62	60	69	95	72	70	67	64	64	66	60	54	49
Loc 2 Night	00:37	67	64	61	68	94	70	72	68	64	62	66	59	51	43
Loc 3 Day	12:58	78	70	64	75	96	86	82	81	72	70	70	67	65	63
Loc 3 Night*	01:27	79	78	74	78	101	78	82	83	78	72	72	71	68	62
Loc 4 Day	13:21	71	65	61	68	83	75	75	70	66	65	64	60	54	50
Loc 4 Night	01:04	72	63	59	69	89	74	76	71	67	64	65	61	56	50

Notes:

1. Daytime weather: Temperature = 61 ^{0}F, RH = 57%, overcast skies, winds 0-6 mph from varying directions.
   Nighttime weather: Temperature = 67^0 F, RH = 87%, overcast skies, winds 0-12 mph from varying directions .
2. Road Surfaces were dry during all periods.
3. All sampling periods were 20 minutes duration.
4. Daytime measurements were collected on April 26, 2011
   Nighttime measurements were collected on April 28, 2011

* Nighttime measurements at L3 were contaminated by construction activity on Tremont Street

3.6.5 Overview of Potential Project Noise Sources

Based on the conceptual mechanical and electrical design, the primary outdoor sources of sound from the proposed Project, shown in Table 3.6-3 are dominated by (2) single-cell cooling towers located in the rooftop well, and the supply fans for the rooftop energy recovery units. An 800 kW diesel-powered emergency generator will be located within a dedicated room inside the penthouse area. The generator exhaust fitted with a critical-grade silencer will exit the penthouse roof. Secondary noise sources including boilers, domestic water heaters, and louvered exhaust fans are expected to have much lower sound levels (10 dBA or more) than the other, larger pieces of equipment and are not considered in this analysis. It is understood that the two (2) 2.0 kVA electrical services will be housed in a transformer vault located in the basement and are not expected to contribute significantly to the overall exterior sound level. Additionally, the rooftop stair pressurization fans are designated for emergency use only and are not considered a continuous source of mechanical noise. Noise emissions from the primary sources, as estimated from the equipment's capacity or from manufacturer-provided specifications are presented in Table 3.6-4. To be conservative, the 31.5 Hz sound power level was assumed equal to the 63 Hz octave band when no manufacturer-supplied sound power data was available.

Table 3.6-3 Expected Primary Noise Sources

Noise Source	Quantity	Location	Size/Capacity
Cooling tower	2	Rooftop Well	527 ton
Energy Recovery Unit	2	Roof	10,000 CFM
Pump – Cooling Tower Loop	1	Penthouse	30 HP
Pump – House Loop	1	Penthouse	100 HP
Dryer Exhaust Fan	2	Roof	17,000 CFM
Emergency Generator	1	Penthouse	800 KW

Table 3.6-4 Reference Equipment Sound Power Levels – Total for all units

Noise Source	Lw (dBA)	Octave Band Center Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
Cooling tower (527 ton)[1]	100	104	103	103	98	93	87	82	78
Energy Recovery Unit – Supply (10,000 CFM)[2]	100	105	104	99	95	93	93	92	89
Energy Recovery Unit – Exhaust (10,000 CFM)[3]	81	81	81	75	74	75	76	73	66
Pump – Cooling Tower Loop (30 HP)[4]	87	77	78	80	80	83	80	76	70
Pump – House Loop (100 HP)[4]	92	82	83	85	85	88	85	81	75
Dryer Exhaust Fan (17,000 CFM)[5]	95	90	90	96	93	88	86	80	74
Emergency Generator Exhaust (800 kW)[6]	120	82	108	118	114	113	112	103	84
Emergency Generator Mechanical (800 kW)[7]	124	114	123	118	118	120	116	112	113

[1] BAC Series 3000, Single-Cell Cooling Tower; Model 3552C
[2] Greenheck Supply Outlet Fan Sound Performance Spec
[3] Greenheck Exhaust Inlet Fan Sound Performance Spec
[4] Assumed Bell & Gossett Series 1510 Pump @ 1770 RPM (Bell & Gossett ESP Plus Pump Selection Software); Used Hoover & Keith Table 7-12 to calculate Lw
[5] BESB500-4-1-FC Centrifugal Impellar Fan used on Exhausto Mechanical Dryer Venting System (MDVS); 15,600 cfm
[6] Cat C-27 Diesel Generator Set; Lw Calculated from "Open Exhaust Sound Data" Lp (3.3 ft) provided in Generator Sound Data spec
[7] Cat C-27 Diesel Generator Set; Lw Calculated from "Open Sound Data" Lp (49.2 ft) provided in Generator Sound Data spec

Mitigation will be applied to sources as needed, to ensure compliance with the applicable noise regulations. As mentioned, the emergency generator exhaust will be controlled using a critical-grade exhaust silencer. To further limit impacts from the generator, the required periodic routine testing should occur during daytime hours when background sound levels are highest. Numerous types of acoustical louvers will be considered to mitigate the sound associated with the mechanical equipment in the penthouse. A summary of the additional preliminary noise mitigation required for the project to exhibit compliance is presented in Table 3.6-5.

Table 3.6-5 Attenuation Values Used for Sound Level Modeling (dB)

Noise Source	Form of Mitigation	Octave Band Center Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
Emergency Generator Exhaust[1]	Exhaust Silencer	11	31	37	32	26	21	21	21
Energy Recovery Unit Supply Fan[2]	Enclosure or Quieter Model	0	0	0	0	3	5	3	0
Cooling Tower[3]	Quieter Model	0	0	10	10	10	12	10	10

[1] Silex JB Series Cylindrical Silencer; JB-6 attenuation curve
[2] Minimum noise reduction required to achieve compliance, by enclosure or quieter equipment selection
[3] Minimum noise reduction required to achieve compliance, by quieter equipment selection
[4] As mechanical design develops, alternate mitigation that meets the noise regulation may be used.

3.6.6 Modeling Methodology

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

As a conservative assumption, no credit was taken for attenuation due to the louvered penthouse walls or roof in the final analysis since it was determined that the driving sources, namely the cooling towers and energy recovery units, were located outside the penthouse.

3.6.7 Future Sound Level of Project

3.6.7.1 Rooftop and HVAC Equipment

An initial analysis considered all of the mechanical equipment without the emergency generator running, to simulate typical operating conditions. A second analysis combined the mechanical equipment and the emergency generator, to reflect worse-case conditions during brief, routine, daytime testing of the generator. Results of the analyses are shown in Tables 3.6-6 and 3.6-7, respectively for receptors located 1.5 meters above-grade.

Table 3.6-6 Predicted Project Noise Levels - Mechanical Equipment Only

			Octave Band Center Frequency (Hz)								
Receptor I.D	Zone	dBA	32	63	125	250	500	1000	2000	4000	8000
			(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
1	Res	49	61	60	61	51	46	40	32	26	11
2	Res	49	61	61	60	51	45	40	32	26	11
3	Res	36	54	51	47	40	33	26	23	18	4
4	Com	48	61	61	59	50	44	38	32	27	14
5	Com	41	57	54	51	44	38	32	29	25	15
6	Res	40	55	52	48	42	37	33	29	26	17
7	Inst	40	54	51	48	42	37	32	29	26	17
8	Res	48	61	60	59	49	44	39	32	27	16
9	Inst	41	56	54	50	43	38	34	30	27	17
10	Com	43	58	56	52	45	40	35	32	28	19
11	Inst	49	62	61	61	51	46	40	32	26	11
12	Inst	48	61	60	59	51	46	40	33	27	13
13	Res	37	53	51	49	39	34	28	23	16	0
14	Res	30	46	43	39	32	27	22	18	11	0
15	Res	38	55	52	48	41	34	28	25	21	8
16	Res	37	54	51	47	40	34	28	24	20	8
17	Res	42	52	56	54	44	39	33	25	18	0
18	Res	47	60	59	59	49	43	38	30	25	11

Note: Res(idential) compared to "Residential" limits; Com(mercial) compared to "Residential Industrial" limits; Inst(itutional) compared to "Residential" limits to be conservative.

Predicted mechanical equipment noise levels from the Project at each receptor location, taking into account attenuation due to distance, structures, and noise control measures, are all below the MA DEP criteria of 10 dBA over the quietest nighttime sound levels. The predicted project sound levels with appropriate noise mitigation measures discussed below are expected to comply with the City of Boston Zoning Limits and remain well below existing ambient levels. Additionally, the Project's mechanical equipment should not create or exacerbate any pure tone conditions when combined with existing background sound levels.

3.6.7.2 Emergency Generator

The emergency generator will only operate during the day for brief, routine testing when the background sound levels are high, or during an interruption of the electrical grid in which case the rooftop mechanical equipment will not be operating.

A daytime analysis was conducted combining the rooftop mechanical equipment and the emergency generator to reflect conditions during routine testing of the generator. These results assume the generator room inside the mechanical penthouse provides at least 10 dBA of noise reduction. The sound level contribution from the emergency generator was added to the mechanical equipment and the results are shown in Table 3.6-7. Expected worst-case sound levels will be below the City of Boston daytime noise limit of 60 dBA.

Table 3.6-7 Predicted Project Noise Levels - Mechanical Equipment & Emergency Generator

			Octave Band Center Frequency (Hz)								
Receptor I.D	Zone	dBA	32 (dB)	63 (dB)	125 (dB)	250 (dB)	500 (dB)	1000 (dB)	2000 (dB)	4000 (dB)	8000 (dB)
1	Res	52	62	61	62	53	47	45	39	32	20
2	Res	51	63	62	62	53	47	45	39	32	19
3	Res	55	64	62	64	57	51	50	44	33	18
4	Com	52	63	62	61	53	47	46	41	34	23
5	Com	53	64	61	62	54	48	48	43	36	27
6	Res	53	63	61	62	54	48	48	43	37	29
7	Inst	53	63	61	62	54	47	48	42	36	29
8	Res	54	64	63	62	55	49	49	43	35	26
9	Inst	56	67	65	66	59	51	50	44	38	30
10	Com	52	62	59	59	53	47	48	43	37	29
11	Inst	52	63	62	62	54	47	45	39	32	19
12	Inst	52	63	61	61	53	48	46	40	33	21
13	Res	44	56	53	53	45	39	38	33	24	9
14	Res	45	55	52	53	46	40	40	35	26	7
15	Res	54	63	61	63	56	49	49	44	34	21
16	Res	54	63	61	63	56	49	48	43	33	21
17	Res	48	58	58	58	51	44	43	35	25	9
18	Res	50	62	60	61	51	46	44	38	31	19

Note: Res(idential) compared to "Residential" limits; Com(mercial) compared to "Residential Industrial" limits; Inst(itutional) compared to "Residential" limits to be conservative.

3.6.8 Conclusions

The proposed Project, with appropriate mitigation (listed below), will not introduce significant outdoor mechanical equipment noise into the surrounding community. The noise analysis indicates that noise levels attributable to the Project at the nearest receptors will be equal to or below the City of Boston Noise Ordinance requirements, and will comply with all MassDEP noise limits. It should be noted that the existing ambient background levels immediately surrounding the project already exceed 60 dBA without any contribution from the Project.

The recommended mitigation efforts included in the analysis are as follows:

- The emergency generator exhaust should be fitted with a critical-grade silencer with an insertion loss of at least 25 dBA and a spectrum similar to that specified in Table 3.6-5.

- A cooling tower model with a sound power level of at least 10 dBA lower than the BAC Series 3000 should be considered. A recommended noise reduction spectrum can be found in Table 3.6-5.

- A sound attenuating enclosure with an insertion loss of at least 2 dBA should be applied to the energy recovery unit (ERU) supply fans, or a quieter model should be selected. A recommended noise reduction spectrum can be found in Table 3.6-5.

At this time, the details of the project are conceptual in nature. During the final design phase, mechanical equipment and noise controls will be specified and designed to meet all applicable broadband and octave band limits. Additional mitigation may include absorptive paneling, acoustical louvers, or equipment enclosures, as needed to ensure compliance with applicable City and State requirements.

3.7 Solid and Hazardous Waste

3.7.1 Hazardous Waste

In the spring of 2004, environmental site assessment studies were performed for the Project site. The assessment work included both a Phase I Environmental Site Assessment (ESA) completed to ASTM standard E 1527-00, the standard in place at the time of the assessment, and a Phase II study.

The Phase I ESA identified two Recognized Environmental Conditions (RECs) at the site. The subsurface investigations and chemical testing found no evidence of impacts associated with the RECs identified in the Phase I ESA. Specifically, results of chemical analysis did not indicate the presence of chemical compounds above MassDEP's reporting thresholds. Therefore, based on the information gathered in 2004, it is not anticipated that a release of oil and/or hazardous materials from these RECs is present at the site requiring response actions in accordance with the provisions of the Massachusetts Contingency Plan (MCP). In addition, site use has not changed since 2004 and based on a recent review of MassDEP information, the site is not the location of a MCP release area.

The borings reportedly encountered an urban fill material. Contaminants commonly found in urban fill, such as metals, petroleum hydrocarbons, and polynuclear aromatic hydrocarbons (PAHs), are anticipated to be present in the fill materials which contain ash, cinders, and miscellaneous debris. Therefore, off-site disposal of soils at the site will be performed in accordance with MassDEP policies, as will be outlined in a site-specific Soil Management Plan that will be prepared for the Project and incorporated into the construction contract documents. Specifically, soil to be excavated and shipped off-site will be characterized for disposal purposes prior to shipment.

The reports referenced above also indicated that structures formerly occupied the Project site. The foundations associated with these former structures may not have been removed at the time that the structures were demolished and therefore, will require removal during construction of the new building with various construction demolition materials being transported and disposed of at the appropriate off-site permitted facility.

3.7.2 Operation Solid and Hazardous Waste

The Project will generate solid waste typical of a residential development. Based on a generation rate of four pounds per bedroom per day, solid waste generated by the Project (with approximately 592 bedrooms) will be approximately 432.2 tons per year.

Solid waste will include wastepaper, cardboard, glass, bottles, food waste, and other waste typical of residential uses. Each residential floor will have a trash room with a trash chute that leads to a dumpster in a trash room next to the loading dock on the ground floor.

With the exception of "household hazardous wastes" typical of residential uses (e.g., cleaning fluids), hazardous wastes will not be generated.

3.7.3 Recycling

Recycling facilities will be provided on-site for paper, glass, plastic and metal. A central facility on lower floors of the building will be available for recycling efforts by building residents.

3.8 Water Quality / Stormwater Management

Please see Chapter 6 for a discussion of water quality impacts and stormwater management.

3.9 Flood Hazard Zones / Wetlands

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the site (City of Boston, Community-Panel Number 250286 0077 G). The map for the site shows that it is located in Zone X, "Areas determined to be outside the 0.2% annual chance (500-year) floodplain."

The site is developed and does not contain wetlands.

3.10 Geotechnical / Groundwater Impacts

This section describes subsurface soil and groundwater conditions at the Project site, planned below-grade construction activities, and mitigation measures for protection of adjacent structures and maintaining groundwater levels in the Project's vicinity during foundation and below-grade construction.

3.10.1 Site Conditions

Fronting onto Stuart Street to the south, the Project site consists of a 0.49-acre irregularly-shaped parcel that is currently used for surface parking, along with air rights over the adjacent Jacob Wirth parcel. The site is bounded by LaGrange Street to the north, Stuart Street to the south, and two to ten-story residential/commercial buildings to the east and west. The historic Jacob Wirth building is located to the east of the Project site along Stuart Street. The Project site is relatively flat, with grades ranging from approximately El. 17.5 to El. 21.7, Boston City Base Datum (BCB), sloping gradually upward from south to north.

Buildings in the vicinity of the Project site are supported on similar foundation systems, composed of shallow concrete, stone or brick foundations, likely bearing on the top of marine clay. Each of the surrounding buildings has either a partial basement or a full one-level basement. Municipal utilities are present beneath surrounding streets and sidewalks.

3.10.2 Subsurface Soil and Bedrock Conditions

Based upon available information from nearby construction sites, the subsurface conditions across the Project site are anticipated to include 8 to 12 feet of miscellaneous fill overlying a natural marine deposit consisting chiefly of silty clay, with some interbedded layers of fine sand that extends to a depth of 70 to 90 feet below ground surface. Underlying the marine clay deposit, a thin (5 to 10-foot thick) stratum of dense to very dense glacial till is expected. The glacial till consist of a well graded mixture of sand, silt, and gravel, with cobbles and boulders. Argillite bedrock is anticipated to be encountered below the glacial till at a depth ranging from 80 to 100 feet below the ground surface.

3.10.3 Groundwater

Based upon review of the Boston Groundwater Trust (BGwT) 2008 Reading Zones, revised July 7, 2008, the site lies outside of a Reading Zone, and is located between Zone 18 (Back Bay, Stuart Street) and Zone 20 (Chinatown). Given the above anticipated soil geology, it is not expected that there are buildings within the immediate vicinity of the Project site that are founded on timber piles.

Groundwater is anticipated at depths ranging from approximately 9 to 10 feet below the existing ground surface, and is perched or "trapped" on the surface of the marine clay deposit. Groundwater levels monitored between 2004 and 2011 by the BGwT in Observation Well 23K-1788 located in Zone 20 at the corner of Kneeland and Knapp streets (the closest well to the site) has typically ranged from El. 5 to 7 (BCB).

Groundwater levels in the area could be influenced by leakage into and out of sewers, storm drains and other below grade structures, as well as environmental factors such as precipitation, season and temperature.

3.10.4 Proposed Construction and Foundation Methodology

The Project includes construction of a 29-story residential structure. The majority of the proposed structure will be constructed at grade with a one-level below-grade basement with an approximate footprint of 5,000 sf, occupying the northeast corner of the Project site. The overall depth of the proposed excavation for the basement is anticipated to be between 10 and 15 feet. Based upon the anticipated subsurface conditions, the proposed structure will be supported by a deep foundation system. The deep foundation system would likely consist of high capacity drilled shafts or end-bearing piles which are advanced into the glacial till or bedrock deposits.

The proposed 10 to 15-foot deep excavation will be performed within a continuous earth retention system consisting of interlocking steel sheeting or soldier pile and lagging that will extend below the proposed bottom of excavation into the marine deposit. Either option will most likely require internal bracing to limit movement. A program of instrumentation will be implemented to monitor the performance of the earth retention system.

Based on the anticipated depth of the excavation and depth to groundwater, the excavation may only extend several feet below the groundwater. Construction dewatering will be necessary to remove groundwater within the earth retention system and to remove rainwater following periods of precipitation. However, it is not anticipated that groundwater levels outside of the earth retention will be affected due to the limited depth of the excavation below the groundwater. Construction dewatering will be performed in accordance with applicable U.S. EPA, MWRA, BWSC and Massachusetts Department of Environmental Protection (MassDEP) regulations. A temporary construction dewatering permit will be obtained prior to discharging of dewatering effluent from the site if required. Testing of the effluent will be conducted prior to and during discharge to confirm compliance with permit requirements.

During excavation, all soils will be managed for off-site disposal in accordance the current regulations and policies of MassDEP.

The floor slab for the one-level basement will be either a pressure slab that will resist the uplift groundwater pressures or a pressure-relief slab with an underdrain system. The type of floor system will depend on the final depth of excavation and the ability to create a permanent groundwater cut-off. Any discharge from a pressure-relief system would be circulated into the Project's groundwater recharge system and recharged into the shallow groundwater table in the vicinity of the Project site, rather than into the BWSC drain system. Accordingly, if used the under-slab pressure-relief system would not have a negative impact on groundwater in the vicinity of the Project site.

Groundwater observation wells will be installed in the vicinity of the Project site prior to start of any site excavation or dewatering to monitor the groundwater levels prior to, during, and following construction.

3.10.5 Potential Impacts During Below-Grade Construction

In general, potential impacts during excavation and foundation construction include temporary lowering of area groundwater levels, ground vibrations, noise, and ground movements outside of the excavation. The foundation design and construction will be conducted to control and limit potential adverse impacts, especially to adjacent structures and to groundwater levels.

3.10.6 Mitigation Measures

Significant mitigation measures will be incorporated into the design and construction of the Project to limit potential adverse impacts to immediately adjacent areas, including the following:

- The Project team will conduct studies, prepare designs and specifications, and monitor the contractor's performance for conformance to the Project's contract documents with specific attention to protecting nearby structures and facilities, and preventing groundwater lowering. Selection and design of the excavation support system will be made with careful attention to mitigating adverse temporary and long-term effects outside the site.

- Performance criteria will be established in the Project specifications for the lateral excavation support system with respect to movements, water-tightness and the construction sequence of the below grade portion of the work. The contractor will be required to plan, employ, and modify as necessary, construction methods and take all necessary steps during the work to protect nearby buildings and other facilities.

- Performance criteria will be established for protection of groundwater levels in the vicinity of the Project site. The contractor will be required to plan and implement all necessary steps during the work to not lower groundwater levels outside the limits of the site. The feasibility of recharging temporary dewatering effluent into the ground will be investigated during the design of the Project.

- Groundwater monitoring wells will be installed outside of the excavation by the Proponent in advance of the commencement of construction. The specific locations of these wells will be coordinated with the BRA and reviewed by the BGwT. The Proponent will take periodic readings from these wells, as coordinated with the BRA and BGwT, prior to the commencement of construction to establish baseline conditions; all readings data will be transmitted to the BRA.

- To support the efforts of the BGwT, monitoring data for new groundwater observation wells collected during design and construction will be provided to the BGwT. The Proponent will conduct periodic monitoring of wells in the vicinity of the Project site prior to the commencement of construction, then at periodic intervals during construction, to be coordinated with the BRA and the BGwT. The objective of this monitoring program will be to detect any construction-related impacts.

- The design will comply fully with Article 32 of the Boston Zoning Code and will recharge the required volume of water into the ground in the vicinity of the Project site. This recharge system will help to maintain and possibly raise groundwater levels in the area of the Project. Presently, the Proponent is proposing to recharge water within the Project site.

- The Project will capture rainfall from all roof areas and drain it into a groundwater recharge system beneath the proposed structure. The groundwater recharge system will consist of groundwater recharge chambers below grade within the Project site.

- Geotechnical instrumentation will be installed and monitored before and during the below grade portion of the work to observe the performance of the excavation, adjacent buildings and structures, and area groundwater levels.

3.10.7 Groundwater Conservation Overlay District

The Project site is located within the Groundwater Conservation Overlay District as established by Article 32 of the City of Boston Zoning Code. Accordingly, the Project's design will incorporate the required systems to store and recharge stormwater, and in fact benefit the surrounding area by channeling stormwater into the groundwater table, instead of into the BWSC sewer system as is the case today. Groundwater will be recharged into the groundwater table by means of a recharge system, which has proven to be a highly effective method of recharging groundwater with rainfall collected on a building's roof. The Project will dramatically improve groundwater inflow in the vicinity of the Project site, which is currently almost 100% impervious and contributes little to the groundwater table in the area.

3.11 Construction Impacts

3.11.1 Introduction

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

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

Periodic meetings will also be held with neighborhood representatives to describe the ongoing work and to discuss measures that will be taken to minimize impacts on the community.

During the construction phase of the Project, the Proponent will provide the name, telephone number and address of a contact person to communicate with on issues related to the construction. The construction contact will be a person whose responsibility it is to respond to the questions/comments/complaints of the residents of the neighborhoods.

3.11.2 Construction Methodology/Public Safety

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

It may be necessary to occasionally occupy pedestrian walkways and parking lanes on the surrounding streets. As the design of the Project progresses, the Proponent will meet with BTD to discuss the specific location of barricades, the need for lane closures, pedestrian walkways, and truck queuing areas. Secure fencing, signage, and covered walkways and, if required, the suspension of the use of certain sidewalks during the most hazardous periods of overhead work activity during the construction of the superstructure, may be employed to ensure the safety and efficiency of all pedestrian and vehicular traffic flows. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to protect pedestrians and ensure their safety. Public safety for pedestrians on abutting sidewalks will also include covered pedestrian walkways when appropriate. If required by BTD and the Boston Police Department, police details will be provided to facilitate traffic flow. These measures will be incorporated into the CMP which will be submitted to BTD for approval prior to the commencement of construction work.

3.11.3 Construction Schedule

Site work is anticipated to commence in the summer of 2012. It is anticipated that the Project will be completed at the end of 2014.

Typical construction hours will be from 7:00 a.m. to 6:00 p.m., Monday through Friday, with most shifts ordinarily ending at 3:30 p.m. No substantial sound-generating activity will occur before 7:00 a.m. If longer hours, additional shifts, or Saturday work is required, the construction manager will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. Notification should occur during normal business hours, Monday through Friday. It is noted that some activities such as finishing activities could run beyond 6:00 p.m. to ensure the structural integrity of the finished product; certain components must be completed in a single pour, and placement of concrete cannot be interrupted.

3.11.4 Construction Staging/Access

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

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

3.11.5 Construction Mitigation

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

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

"Don't Dump - Drains to Boston Harbor" plaques will be installed at storm drains that are replaced or installed by the redevelopment.

3.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 600 construction jobs will be created over the length of construction. The Proponent will make reasonable good-faith efforts to have at least 50% of the total employee work hours be for Boston residents, at least 25% of total employee work hours be for minorities and at least 10% of the total employee work hours be for women. The Proponent will enter into a jobs agreement with the City of Boston.

To reduce vehicle trips to and from the construction site, minimal construction worker parking will be available at the site and all workers will be strongly encouraged to use public transportation and ridesharing options. The general contractor will work aggressively to ensure that construction workers are well informed of the public transportation options serving the area. Space on-site will be made available for workers' supplies and tools so they do not have to be brought to the site each day.

3.11.7 Construction Truck Routes and Deliveries

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

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

3.11.8 Construction Air Quality

Short-term air quality impacts from fugitive dust may be expected during excavation and the early phases of construction. Plans for controlling fugitive dust during excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks. The construction contract will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts, pursuant to Article 80 approval. These measures are expected to include:

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

3.11.9 Construction Noise

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

Mitigation measures are expected to include:

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

- Turning off idling equipment; and

- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

3.11.10 Construction Vibration

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

3.11.11 Construction Waste

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

3.11.12 Protection of Utilities

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

3.11.13 Rodent Control

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

3.11.14 Wildlife Habitat

The site is currently developed and, as such, the redevelopment will not impact wildlife habitats as shown on the National Heritage and Endangered Species Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife.

3.12 Sustainable Design

The Project team is committed to developing a building that is sustainably designed, energy efficient, environmentally conscience and healthy for the residents and employees. As required under Article 37 of the Boston Zoning Code, projects that are subject to Article 80B, Large Project Review, shall be U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) certifiable. There are seven categories in the LEED certification guidelines: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design Process and the additional Regional Priority Credits. The Project is targeting several credits which span the seven categories and enable the Project to meet the requirements as described below. The preliminary LEED NC v2009 checklist is included in Appendix D. Please note that this is an initial credit checklist and applicable credits may change as the building design advances.

Credits listed in italics are under consideration at this time and shall be reviewed as the Project design develops.

Sustainable Sites

The Project site is in a dense urban neighborhood close to public transportation options including the Orange Line subway and several bus lines. There is new parking associated with this development; a parking garage will be located on floors two through five for building residents. The Project will maintain the current public parking rights.

<u>Prerequisite 1 Construction Activity Pollution Prevention</u>

The Construction Manager (CM) will compile and submit an Erosion and Sedimentation Control (ESC) Plan for construction activities related to the demolition of existing and the construction of new buildings specific to the Project. The ESC Plan will conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit.

<u>Credit 1 Site Selection</u>

The Project site is located on a previously developed parcel in Boston Proper on the edge of the Theater District, Chinatown and Downtown Crossing.

Credit 2 Development Density and Community Connectivity

The Project site is in downtown Boston; the surrounding community is replete with services including restaurants, shops, theaters, colleges, galleries, and medical offices. In addition, Boston Common and the Public Garden are both a short walk away.

Credit 3 Brownfield Redevelopment

The Project site may be classified as a Brownfield or contaminated site and will be assessed for hazardous materials.

Credit 4.1 Alternative Transportation, Public Transportation Access

The Chinatown MBTA station for Orange Line subway service is located approximately 0.1 miles from the Project site; the MBTA Boylston Street Green Line station is also located 0.1 mile from the Project site. Several MBTA bus routes stop less than 0.25 miles of the Project site.

Credit 4.2 Alternative Transportation, Bicycle Storage and Changing Rooms

Covered bicycle storage will be located within the building footprint within the first six floors of the new building. Some residential units may contain designated storage areas for bicycles. The quantity of bicycle storage areas will be equal to or greater than 15% of the number of residential occupants.

Credit 4.3 Alternative Transportation, Low-Emitting & Fuel-Efficient Vehicles

The new multi-level parking garage located on floors two through five may have designated preferred parking spaces for Low Emitting and Fuel-Efficient Vehicles representing 5% of the total vehicle capacity of the parking structure.

Credit 6.2 Stormwater Design
Quality Control

The Project is located within the Groundwater Conservation Overlay District. Stormwater will be captured from the roofs and channeled to a recharge storage tank where it will be recharged into the groundwater table through a recharge system. The groundwater recharge system will both reduce the amount of stormwater channeling directly to the stormwater system and treat the stormwater being recharged into the groundwater.

Credit 7.1 Heat Island Effect, Non-Roof

This Project places 100% of parking in a parking structure on floors two through five, within the building footprint.

Credit 7.2 Heat Island Effect, Roof

The roofs may be a high-albedo material to help minimize solar heat gain and urban heat island effects.

Water Efficiency

The Project may specify low flow and high efficiency plumbing fixtures to achieve a minimum of 20% water savings above the water use baseline.

Prerequisite 1 Water Use Reduction, 20% Reduction

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

Credit 1.1 Water Efficient Landscaping, Reduce by 50%
Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation

The Project will not have a permanent irrigation system. The roof top and patio planter boxes may have drought tolerant plant materials that may require occasional watering by hand.

Credit 3 Water Use Reduction

Specified fixtures may include high efficiency toilets, low flow lavatory and kitchen faucets and ultra low flow shower heads. The Project is targeting an overall water savings of 30% above the calculated baseline.

Energy and Atmosphere

The building systems will be designed to optimize energy performance and will not use refrigerants that are harmful to the environment. The building is located in Boston and will meet the criteria of the Stretch Code Amendment to the State Energy Code. The owner will engage a Commissioning Agent to confirm the building systems are installed and function as intended and designed.

Prerequisite 1 Fundamental Commissioning of the Building Energy Systems

A third party Commissioning Agent (CxA) will be engaged by the owner for purposes of providing both basic and enhanced commissioning services for the building energy related systems including HVAC & R, lighting and domestic hot water systems. The CxA will verify the building systems are installed, calibrated and perform to the building owners Project requirements.

Prerequisite 2 Minimum Energy Performance

The building performance rating will demonstrate a minimum of a 20% improvement when compared to the baseline building performance when calculated using the rating method in Appendix G of ANSI/ASHREA/IESNA Standard 90.1-2007

Prerequisite 3 Fundamental Refrigerant Management

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

Credit 1 Optimize Energy Performance

The designed building systems will target a performance level which is a minimum of 20% improvement over a baseline building performance rating, (as established in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007). The team will develop a whole building energy model to demonstrate the expected performance rating of the designed building systems.

Credit 3 Enhanced Commissioning

The Commissioning Agent (CxA) may be part of the Project team from early on in the Project process. The CxA's role will include reviewing the owner's Project requirements, creating distributing and implementing a commissioning plan, and performing a design review of the design development and construction documents.

Credit 4 Enhanced Refrigerant Management

Long life high efficiency mechanical equipment may be specified for the HVAC systems and the refrigerants specified for the systems may have low ozone-depletion and global warming potentials.

Materials and Resources

Throughout the construction phase of the Project the contractor will endeavor to divert Construction and Demolition waste from area landfills as possible and to procure materials that have recycled content and/or are extracted, processed and/or manufactured regionally.

Prerequisite 1 Storage and Collection of Recyclables

Storage of collected recyclables will be accommodated in the lower level of the building in the area of the loading dock. There will be a recycling program and adequate storage for collected recyclable materials within the building.

Credits 2.1 and 2.2 Construction Waste Management

Prior to the start of construction, the Construction Manager ("CM") will prepare a Construction Waste Management plan; which will endeavor to divert as much demolition debris and construction waste from area landfills as possible.

Credits 4.1 Recycled Content

The Project specifications may require materials to include pre- and or post-consumer recycled content. During construction, material submittals will include a document indicating the percentage of both pre- and post-consumer recycled content. The CM will track the recycled content for each material with a Project target to achieve 10% recycled-content materials based on overall Project material costs.

Credit 5.1 Regional Materials

The Project specifications may indicate materials to be extracted, harvested, recovered and manufactured within a 500 mile radius of the job site. The Project team has a goal that 10% of the materials specified and used will be regional materials. The CM will track the source location for each material with a Project target to achieve 10% regional materials based on overall Project material costs.

Indoor Environmental Quality

Prerequisite 1 Minimum IAQ Performance

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

Prerequisite 2 Environmental Tobacco Smoke (ETS) Control

The common areas within the building will be non-smoking environments.

Credit 1 Outdoor Air Delivery Monitoring

The Project may incorporate permanent CO_2 sensors and measuring devices to provide feedback on the performance of the HVAC system. Devices will be programmed to generate an alarm when the conditions vary by 10% from a set point. The residential units will have operable windows. The units will be ventilated through a combination of both mechanical and natural ventilation.

Credit 3.1 Construction IAQ Management Plan (during construction)

The CM may develop an Indoor Air Quality Management Plan for the construction and pre-occupancy phases of the Project to meet or exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter3). Absorptive materials stored on site will be protected from moisture damage.

Credit 3.2 Construction IAQ Management Plan (before occupancy)

After the completion of construction and prior to occupancy, either baseline IAQ testing or a full building flush-out will be conducted to demonstrate contaminant maximum concentrations are not exceeded.

Credits 4.1-4.3 Low Emitting Materials

The Project specifications may set VOC limits for adhesive and sealants, paints and coatings, and may also include flooring systems.

Credit 5 Indoor Chemical and Pollutant Source Control

The Project team may design to minimize and control the entry of pollutants into the building and to contain chemical use areas.

Credit 6.1 Controllability of Systems, Lighting

It is the intent of the design to provide individual lighting controls for regularly occupied spaces. The controls may include vacancy/occupancy sensors or day light dimming controls. Multi-occupant user spaces shall have multi-level lighting controls for modifying light levels as necessary for the various uses.

Credit 6.2 Controllability of Systems, Thermal Comfort

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

Credit 7.1 Thermal Comfort Design

The building HVAC design will be in compliance with ASHRAE 55.

Credit 8.1 Daylight and Views, Daylight for 75% of spaces

It is the intent of the design to locate regularly occupied spaces along the perimeter. The residential units will have large windows to provide ample daylight for the occupants.

Innovation & Design Processes

The team has identified several possible ID credits which are listed below, (limited to 5 ID credits total):

Credit 1.1 Exemplary Performance for SSc4.1

The Project site is located within 0.5 miles of existing multiple commuter rail lines and two subway lines (Orange and Green), with a frequency of service of over 200 transit rides per day.

Credit 1.2 Exemplary Performance for SSc7.1

The Project places 100% of parking under cover.

Credit 1.3 Low Mercury lighting

Building Facilities/Maintenance will establish a lighting purchasing plan to limit the levels of mercury containing lamps purchased for the building.

Credit 2 LEED Accredited Professional (required ID credit for LEED certification)

A LEED AP will provide administrative services to oversee the LEED credit documentation process.

Regional Priority Credits

Regional Priority Credits, (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project. RPCs applicable to the Boston area include: SSc3, SSc6.1 SSc7.1, SSc7.2, EAc2 and MRc1.1. The Project anticipates one RPC for SSc7.1-Heat Island Effect, Non-Roof.

Section 4.0

Urban Design

4.0 URBAN DESIGN

4.1 Context and Objectives

The Project sits within several vibrant neighborhoods including the Theatre District, Chinatown, Downtown Crossing, and the Midtown Cultural District that features a variety of uses making for a unique and diverse neighborhood in Boston. This intersection of cultural, educational, historical, and commercial resources makes the project site an ideal location for multi-family residential housing that will add to the overall character and 24/7 energy of the area.

The Project massing is sculpted to appear as a collection of buildings and relates to the surrounding building heights, as shown on Figures 4.1-1 and 4.1-2. The building sits comfortably amid buildings of similar height and use, such as the Archstone Boston Common, Kensington and Millenium buildings. The unique massing is designed to provide maximum space and air between the tower elements of the building and surrounding high rise structures.

The surrounding district also features a wide range of mid to late 20th century structures which create a 5 to 10-story undulating height of eclectic buildings. The immediate context is comprised of a number of notable historical buildings such as the Jacob Wirth Building (a Boston landmark) and H.H. Richardson's Hayden building built in 1875.

The project will have a positive transformative impact on the area by adding vibrant residential activity to Stuart Street and LaGrange Street. The urban design objectives of the Project, which is still in the process of design study and refinement, are:

1. To create a 5 to 6-story street wall along Stuart Street that will align with the scale of the Jacob Wirth building and the collection of small buildings towards the corner of Stuart and Tremont Streets.

2. The major Project massing is 55′ from Stuart Street. The building street frontage has a 10′ set back from Stuart Street at the 50′ height of the adjacent buildings.

3. The 289 foot, 29-story tower ties into the current massing heights of the W Hotel, Archstone Boston Common, and proposed Kensington project creating a mid-rise massing limit between the 500 foot Millennium tower and the 60′-80 foot mid-century buildings in the area.

4. The massing of the tower has been sculpted to appear as a collection of buildings that creates interesting skyline views from the Boston Common and Stuart Street and results in a well-proportioned building. A range of window fenestrations, wall details, and balconies create complimentary patterns that act as scaling elements for the overall composition.

45 Stuart Street Boston, MA

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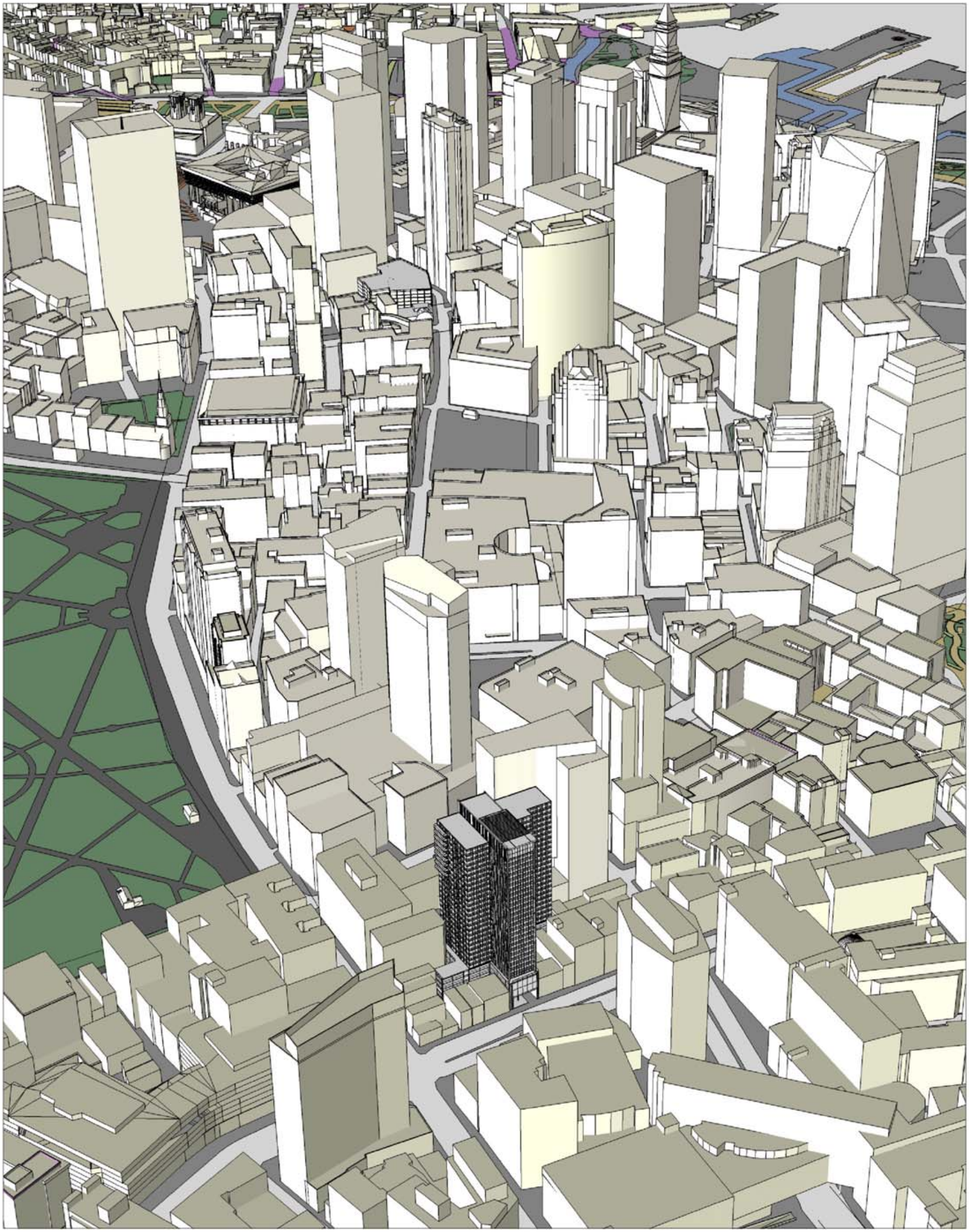
Figure 4.1-1

Aerial Perspective Looking West



45 Stuart Street   Boston, MA

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Figure 4.1-2

Aerial Perspective Looking North

5. The new building will activate Stuart Street with active signage and with an entrance to the building which will create an inviting pedestrian zone through the use of lighting, permeable materials and continuity of paving materials. The focus of the Stuart Street entrance will primarily be on the pedestrian experience while integrating automobile access as a secondary design element.

6. The new building will activate LaGrange Street through a new building entrance as well as design of active lighting and architectural elements to improve the pedestrian experience.

7. To contribute toward the creation of an architecturally interesting and distinctive skyline view from the Boston Common, along the Stuart Street corridor, and from the surrounding long distant urban vantage points.

4.2 Physical Description

The building is organized around an active ground floor that introduces residential lobbies on both Stuart Street and LaGrange Street. The focus of the ground floor design will be to create a vibrant and appealing pedestrian experience. The ground plane along Stuart will express a pedestrian-friendly 'courtyard feeling for residents, visitors, and the casual passerby, while enhancing the streetscape. A full-floor auto pass-through allows for a one-way vehicular entrance from Stuart Street for residential and public drop-off, while valet attendants park both public and residential cars on the upper level garage. The LaGrange Street auto entry and exit creates the primary auto exit on the property and allows for an efficient management of parking operations. The ground floor also includes a two-bay loading zone and back of house and mechanical spaces. A partial basement may also exist for additional mechanical equipment.

The next four levels include above-grade parking with active signage on the Stuart Street building façade from the third level up to the fifth level, with dynamic façade elements on both the Stuart Street and LaGrange street sides as shown in Figures 4.2-1 and 4.2-2.

At the 6th floor the Project massing steps back from Stuart Street and includes residential units as well as amenity spaces for all residents including a fitness club and social space.

Floors 7-29 are all residential floors with 17 units per floor in a stacked configuration for efficiency. Each floor contains a variety of apartment types, from studios and 1-bedrooms to 2-bedroom apartments. The 29th floor is proposed to include a roof deck accessible for residents and the 15' mechanical penthouse behind an architectural screenwall.

A small portion of the floor plate on the ninth floor and above is cantilevered from the building and extends only 16' over the rear of the Jacob Wirth kitchen structure to accommodate the necessary depth for residential floors. The lowest point of the cantilever is set a minimum of 20' above the highest point of the highest chimney of the Jacob Wirth

Building in order to respect the air space of the Jacob Wirth Building and to conform with agreements governing the relationship between the Project site and the adjacent Jacob Wirth Parcel. This cantilevered area of floor plate is approximately 775 sf. ft and extends over less than 10% of the Jacob Wirth Building footprint, creating minimal impact on historic landmark.

4.3 Building Materials

The building will create an iconic image on the skyline, through strategic massing and well thought out proportions, textures, and materials. The design of the building exterior will utilize an architectural vocabulary that features contrasting exterior expressions that will highlight and reinforce the intersecting massing elements that scale the overall building form. The detailing of the North-South tower will feature a strong vertical expression, to contrast with the more horizontal East-West exterior articulation. The architecture of the facades will consist of a variety precast concrete panels with varying metal and glass infill that will create a rich pattern of articulation for the Project and contrast with the architectural vocabulary of the surrounding context.

Figure 4.2-1

Stuart Street Facade

45 Stuart Street   Boston, MA

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Figure 4.2-2

LaGrange Street Facade

Section 5.0

Historic and Archaeological Resources

5.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Project site consists of a surface parking lot with no built structures, located in a dense urban environment; therefore there are no historic resources and little potential for significant archaeological resources on the site. However, immediately adjacent to the Project site is the State and National Register-listed Jacob Wirth building.

5.1 Historic Resources in the vicinity

Jacob Wirth Building, 31-39 Stuart Street

Located immediately adjacent to the Project site is the Jacob Wirth building, 31-39 Stuart Street, a designated Boston landmark and a property individually listed on the National Register of Historic Places. The Jacob Wirth building consists of two, 1844-1845 Greek Revival style, brick rowhouses with bow front window bays. Originally constructed as single family residences, each rowhouse is three and a half stories in height, three bays wide, and topped with a side gable pitched roof featuring two pedimented dormers. A late 19th century, single story, cast iron storefront unites the two rowhouses. The storefront contains two recessed entrance bays at either end separated by two pairs of plate glass windows on either side of a central bay providing access to a common cellar passageway. The entrance doors feature cast iron surrounds consisting of pilasters and simple capitals. The plate glass windows are divided by cylindrical engaged columns with similar capitals. A combined, single story, brick ell is located at the rear.

The rowhouses are a relatively rare surviving residential type representing a stylistic evolution between the earlier Federal style bow fronts found on Beacon Hill and the later 1850s-1860s Italianate style bow fronts found in the South End. Jacob Wirth, an immigrant from Rhenish Prussia (now part of Germany) purchased the rowhouse at 37-39 Eliot Street (now known as Stuart Street), in 1878 and relocated his restaurant from across the street at 60 Eliot to the first floor. Wirth resided on the upper floors of the rowhouse. In 1889, Wirth leased the 31-33 Eliot rowhouse (right side) and constructed the single story, cast iron storefront uniting the two buildings.

Wirth continued to own and operate the restaurant until his death in 1902, at which time it was passed on to his son, Jacob Wirth Jr. The younger Wirth continued to operate the restaurant until his own death in 1965. The traditional German style restaurant has been in continuous operation since its opening in 1868 across the street and its current location since 1878. Much of the interior finishes of the restaurant, including the ornate mahogany bar, oak tables, brass rails, and wainscoting date from the late 19th century when the restaurant was expanded to the rowhouse at 31-33 Stuart Street.

The Jacob Wirth building was designated a Boston landmark in 1977. The landmark designation applies to both the exterior and the interior finishes, ensuring their future preservation. In 1980, the Jacob Wirth's building was listed on the National Register of Historic Places as part of a multiple resource area nomination for the Historic Resources of the Boston Theatre Area.

Numerous other historic resources exist within the Project vicinity. Notable resources include: the National Register listed Dill Building at 11-25 Stuart Street, the Hayden Building, a designated Boston Landmark at 681-683 Washington Street, and the Piano Row Historic District along Boylston and Tremont streets. These historic resources, and others within a quarter-mile radius of the Project site, are listed in Tables 5-1 and 5-2 and identified in Figure 5-1.

Table 5-1 State and National Register-Listed Properties

Historic Resource	Address
1. Jacob Wirth's Building	31-39 Stuart Street
2. Boston Young Men's Christian Union	48 Boylston Street
3. Hayden Building	681-683 Washington Street
4. Liberty Tree Historic District	Essex and Washington Streets
5. Beach-Knapp Historic District	7-15, 17-23, 25-29 Beach Street and 5, 7, 9-23 Knapp Street
6. Dill Building	11-25 Stuart Street
7. Boylston Building (China Trade)	2-22 Boylston Street and 651-657 Washington Street
8. Piano Row	Boylston and Tremont Streets
9. Boston Edison Electric Co.	25-39 Boylston Street
10. Boston Common	Beacon, Park, Tremont, Boylston, and Charles Streets
11. Washington Street Theatre District	511-559 Washington Street
12. West Street Historic District	16-24, 26-30, 148-49 West Street and 150 Tremont Street
13. Temple Place Historic District	11-55, 26-58 Temple Place
14. Commercial Palace Historic District	Bedford, Summer, Devonshire, Franklin, Hawley, and Chauncy Streets
15. Textile District	62-107 Essex Street, 80-122 Kingston Street, 89-117 Chauncy Street, and 11-23 Edinboro Street
16. Metropolitan Theatre (Wang)	252-272 Tremont Street
17. Wilbur Theatre	244-250 Tremont Street
18. Shubert Theatre	263-265 Tremont Street
19. Charles Playhouse	76-78 Warrenton Street
20. Bay Village Historic District	Piedmont, Winchester, Melrose, Fayette, and Tremont Streets

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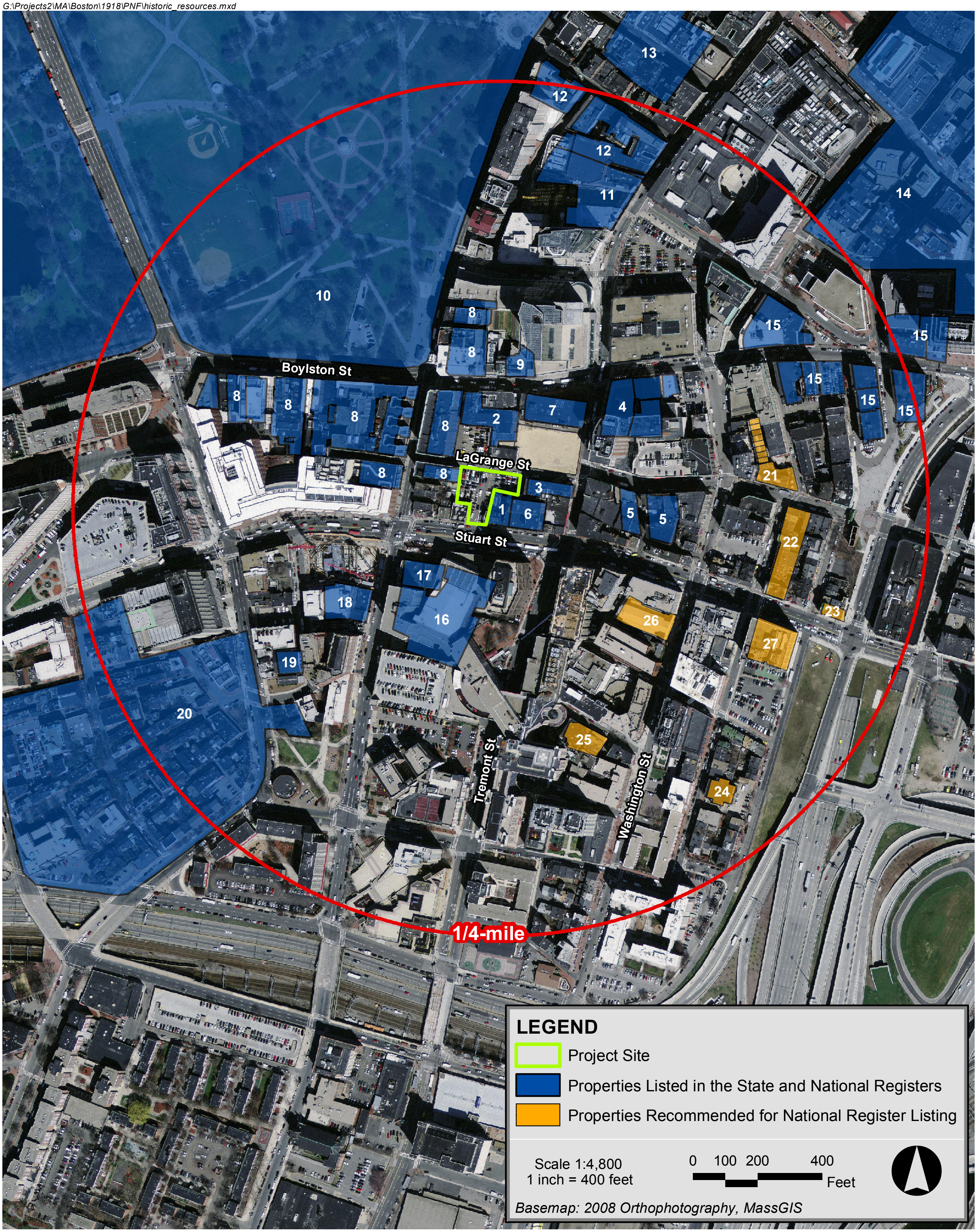


45 Starting Street Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 5-1

Historic Resources

Table 5-2 Properties Recommended for National Register Listing (Continued)

Historic Resource	Address
21. Old Chinatown Historic Area	28-38 Harrison Avenue, 48-58 Beach Street and 4-11 Oxford Place
22. Tyler Street Historic Area	2-22 Tyler Street
23. Chinese Merchants Association Building	20 Hudson Street
24. Quincy Grammar School	88-90 Tyler Street
25. Boston Dispensary	25-37 Bennet Street
26. St. James Church	123 Harrison Avenue
27. Hudson Building	75 Kneeland Street

5.2 Impacts to Historic Resources

Design Impacts

There will be no physical connection to, or charges to the Jacob Wirth building. The design of the Project respects and responds to the urban scale and geometry of the site, the Stuart Street corridor, and the Jacob Wirth building. The Project will replace the existing surface parking lot and create a five to six story street wall along Stuart Street that will align with the scale and detail of the Jacob Wirth building and the collection of small buildings towards the corner of Stuart and Tremont.

The tower will be set back approximately 10 feet back from the street at the height of the adjacent buildings. The massing of the tower will appear as a collection of buildings, broken up with the use of a range of window fenestrations, balconies, and wall details that will create differing patterns.

The massing of the tower will be set back and rise above the adjacent Jacob Wirth building thereby allowing the existing landmark building to be framed by its immediately adjacent structures. Floors nine and above of the tower will be cantilevered over a portion of the rear kitchen wing of the Jacob Wirth building. The cantilever, which will extend 16 feet from the tower, will at its lowest point be a minimum of 20 feet above the top of the tallest chimney of the Jacob Wirth Building in order to respect the air space of the Jacob Wirth Building and to conform with agreements governing the relationship between the project site and the adjacent Jacob Wirth Parcel. This cantilevered area of floor plate is approximately 775 sf and extends over less than 10% of the Jacob Wirth Building footprint, creating minimal impact on the historic landmark.

The proposed ground level residential entrances will align with the set back of the Jacob Wirth's entrances, while a portion of the upper façade will align with the existing streetwall on Stuart Street. The street façade will be articulated to refer to the existing height of the

Jacob Wirth's building and its horizontal articulation. The design intent is to preserve the pedestrian's appreciation of the massing and volume of the original Greek Revival rowhouses and maintain the pedestrian level views of the roof forms.

Shadow Impacts

Because there are no buildings currently on the site, it is inevitable that the Project will result in some new shadows. However, new shadows will mainly be limited to the rooftops of the historic resources in the vicinity. For example, while there will be some new shadows cast on the Jacob Wirth building, Hayden Building and buildings within the Piano Row Multiple Resource Area, these impacts will mainly be confined to the rooftops and not the primary facades of the buildings.

In addition, while during one time period studied (December at 9:00 a.m.), new shadows were cast onto Boston Common, the Project will comply with the Public Commons Shadow Act as described in Section 3.2.6 above.

Due to the close proximity of the Project site to the Jacob Wirth building, the Project proponent will be meeting with the Boston Landmarks Commission ("BLC") staff to review and discuss the proposed Project. As the Project design advances, the Proponent will continue to consult with the BLC staff.

5.3 Archaeological Resources

The Project site consists of a previously developed urban parcel. Due to previous development activities and disturbances, it is unlikely that the site contains significant archaeological resources.

Section 6.0

Infrastructure

6.0 INFRASTRUCTURE

The following sections describe the existing water, sewer, and drainage systems surrounding the site and explain how these systems will service the Project.

6.1 Sewage System

6.1.1 Existing Conditions

Currently, the Boston Water and Sewer Commission (BWSC) has a 20-inch and a 24x30-inch combined sewer in Stuart Street, and a 12-inch that becomes 20x30-inch combined sewer in LaGrange Street. The BWSC lines connect to the Massachusetts Water Resource Authority (MWRA) system and ultimately discharge into the Deer Island Treatment Facility. An analysis was done on the 20-inch sewer in Stuart Street, as this would be the most likely connection point. It was determined that this pipe has the capacity to handle an approximately 6.9 million gallons per day (gpd) flow at full capacity.

6.1.2 Proposed Sewage Generation

The Project's sewage generation rates were estimated using Massachusetts State Environmental Code (Title 5) at 310 CMR 15.203. This reference lists typical generation values for the sources listed in Table 6-1. Other wastewater generation includes the cooling system. As shown in Table 6-1, the Project will have average daily flows of approximately 65,120 gpd of sanitary sewage.

Table 6-1 Sewage Generation

Use	Number	Sewage Generation Rate	Total gpd
Residential	592 bedrooms	110 gpd/bedroom	65,120
Total			65,120

6.1.3 System Connections

The construction of all connections will be performed so as to minimize any effects on adjacent streets and to ensure that adequate facilities are available to service the site and surrounding area during construction. It should be noted that these water flows will be kept separate from all storm drain service connections. All appropriate permits and approvals will be obtained prior to construction.

6.2 Water Supply System

6.2.1 Existing Conditions

A 12-inch diameter low service water main runs within Stuart Street immediately adjacent to the site. There is a 12-inch high service water main within Tremont Street but not adjacent to the Project. There are two fire hydrants adjacent to the Project. One is on Stuart Street and the other is on LaGrange Street. There are no capacity issues expected for serving the Project with water from the city system. A flow test on the low service main within Stuart Street was performed in 2010 and the results are below:

Static	70 psi
Residual	67 psi
Total Flow	2,126 gpm
Flow @ 20 PSI	9,713 gpm

6.2.2 Proposed Water System

The Project's water demand estimates for domestic sources are based on the Project's estimated sewage generation. A conservative factor of 1.1 is applied to the average daily wastewater flows. This factor accounts for consumption and other miscellaneous losses. Therefore, it is estimated that the proposed Project will consume 71,632 gpd of domestic water. The water will be supplied by the BWSC.

6.3 Stormwater System

6.3.1 Existing Conditions

Currently, the site is occupied by a bituminous concrete parking area with a stormwater collection system.

6.3.2 Proposed Stormwater System

The BWSC and the Massachusetts Department of Environmental Protection (MassDEP) are attempting to separate stormwater and wastewater over time to prevent flooding of the system resulting in periodic overflows of combined sewer and stormwater into receiving waters.

The Proponent will work with these two offices to help with the separation of stormwater and wastewater.

As the existing site is a paved parking area, the development of the Project will result in essentially the same amount of impervious surface area. The Project is located within the City of Boston's Groundwater Conservation Overlay District and will be capturing and recharging one-inch of rainfall over new impervious services as required. Thereby, a reduction in the rate and volume of stormwater discharge leaving the site will result.

The water quality of the stormwater discharge will also be improved by replacing stormwater runoff from a bituminous concrete parking lot with clean runoff from a new rooftop. An oil water separator will be installed since an enclosed parking garage will be incorporated into the Project. If the loading dock area pitches down from the back of the sidewalk, this flow will be discharged to the combined sewer system. The drainage system on the site will be separated from the sewer system as required by the City of Boston. All storm drains within the site will have plaques that state: "Don't Dump – Drains to Boston Harbor."

6.4 Water Quality and Stormwater Management

The Project will not affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, hay bales and/or crushed stone, to provide for sediment removal from runoff. 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.

All necessary dewatering, if required, will be conducted in accordance with a MWRA and BWSC discharge permit. Once construction is complete, the Project will be in compliance with all local and state stormwater management policies. See below for additional information.

6.5 MassDEP Stormwater Management Standards

In February of 2008, the MassDEP revised their Stormwater Management Standards to better address water quality and water quantity issues associated with project sites. The revisions promote increased stormwater recharge, treatment of more runoff from polluting land uses, low impact development (LID) techniques, pollution prevention, the removal of illicit discharges, and improved operation and maintenance of stormwater best management practices (BMPs).

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

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

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

Standard #2: Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

Compliance: The proposed design will not increase the impervious area compared to the pre-development condition. Therefore, there will be no detention system needed to mitigate the peak rate of runoff from the site.

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

Compliance: The Project will meet and exceed this standard by complying with the Boston Redevelopment Authority's requirement of recharging one-inch of stormwater over the entire new impervious area.

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

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

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

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

Compliance: The Project will meet or exceed all standards.

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

Compliance: The Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-8). The Project complies with this standard.

Standard #6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00.5 Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of the public water supply.

Compliance: The Project will not discharge untreated stormwater to a sensitive area or any other area.

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

Compliance: The Project will meet or exceed all standards.

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

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

Standard #9: A long term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance: A long term Operations and Maintenance Plan shall be developed and maintained for the Project.

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

Compliance: There will be no illicit discharges associated with the Project.

6.6 Mitigation Measures

The peak rate of runoff will not need to be mitigated for the Project. The impervious area is not getting larger as a result of the Project.

Within the Project's limit of work, there will be mostly roof area. There will be no paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system. Therefore, no measures will need to be taken for water quality.

6.7 Coordination with the Boston Water & Sewer Commission

Proposed connections to the BWSC's water, sanitary sewer, and storm drain 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 a General Service Applicant and a site plan for review and approval prior to construction. The site plan will indicate the existing and proposed water mains, sanitary sewers, storm sewers, telephone, gas, electric, steam, and cable television. The plan will include the disconnections of the existing services as well as the proposed connections.

Section 7.0

Coordination with other Agencies

7.0 COORDINATION WITH OTHER AGENCIES

7.1 Architectural Access Board Requirements

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

7.2 Boston Civic Design Commission

The Project will comply with the applicable provisions of the Boston Zoning Code. The Expanded PNF will be submitted to the Boston Civic Design Commission as part of the Article 80 process.

7.3 Massachusetts Environmental Policy Act (MEPA)

Although the Project will involve a Land Transfer from the BRA, the aspects of the Project within the area subject to the Land Transfer do not exceed any review threshold under the Massachusetts Environmental Policy Act (MEPA). In connection with a prior proposed project on the Project site in which MEPA had jurisdiction (EEA No. 13870), an Environmental Notification Form was filed but MEPA determined that no EIR was required.

7.4 Massachusetts Historical Commission

Because the Project requires state permits, it is subject to reviewed by the Massachusetts Historical Commission (MHC) in accordance with M.G.L., Chapter 9, Sec. 26-27c, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00). An MHC Project Notification Form will be prepared and submitted to the MHC to initiate the Chapter 254 review process.

7.5 Other Permits and Approvals

Section 1.8 of this Expanded PNF provides an anticipated list of agencies from which permits and approvals for the Project will be sought.

Section 8.0

Project Certification

8.0 PROJECT CERTIFICATION

This form has been submitted to the Boston Redevelopment Authority as required by the Boston Zoning Code, Article 80.

Signature of Proponent's Representative

Michael J. Roberts
Avalon Bay Communities, Inc.
51 Sleeper Street, Suite 750
Boston, MA 02210
(617) 654-9503

August 4, 2011
Date:

M B Briggs
Signature of Preparer

Margaret B. Briggs
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754
(978) 897-7100

August 4, 2011
Date:

Appendix A

Transportation

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 1

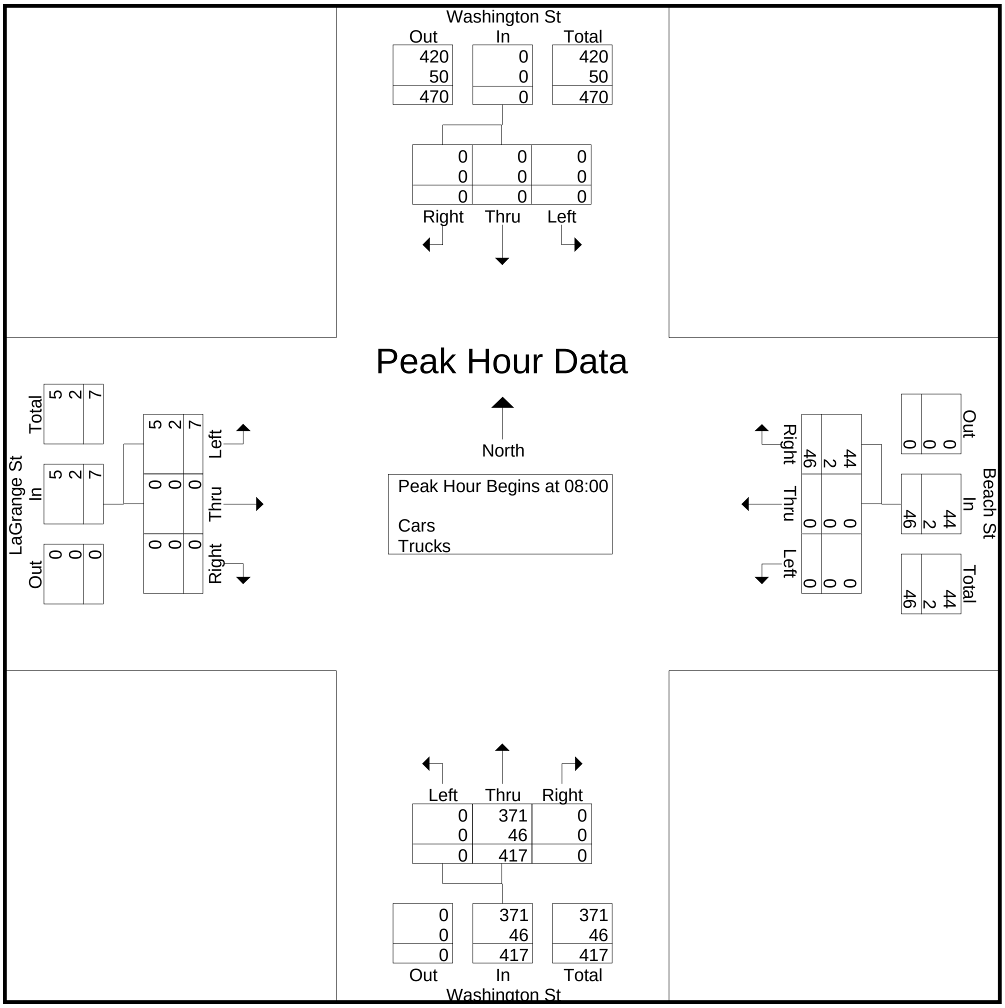
Groups Printed- Cars - Trucks

	Washington St From North			Beach St From East			Washington St From South			LaGrange St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	0	0	0	0	0	7	0	65	0	3	0	0	75
07:15	0	0	0	0	0	8	0	68	0	0	0	0	76
07:30	0	0	0	0	0	10	0	85	0	1	0	0	96
07:45	0	0	0	0	0	8	0	85	0	4	0	0	97
Total	0	0	0	0	0	33	0	303	0	8	0	0	344
08:00	0	0	0	0	0	13	0	87	0	1	0	0	101
08:15	0	0	0	0	0	11	0	105	0	2	0	0	118
08:30	0	0	0	0	0	12	0	110	0	1	0	0	123
08:45	0	0	0	0	0	10	0	115	0	3	0	0	128
Total	0	0	0	0	0	46	0	417	0	7	0	0	470
Grand Total	0	0	0	0	0	79	0	720	0	15	0	0	814
Apprch %	0	0	0	0	0	100	0	100	0	100	0	0	
Total %	0	0	0	0	0	9.7	0	88.5	0	1.8	0	0	
Cars	0	0	0	0	0	76	0	634	0	11	0	0	721
% Cars	0	0	0	0	0	96.2	0	88.1	0	73.3	0	0	88.6
Trucks	0	0	0	0	0	3	0	86	0	4	0	0	93
% Trucks	0	0	0	0	0	3.8	0	11.9	0	26.7	0	0	11.4

	Washington St From North				Beach St From East				Washington St From South				LaGrange St 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	0	0	0	0	0	0	**13**	**13**	0	87	0	87	1	0	0	1	101
08:15	0	0	0	0	0	0	11	11	0	105	0	105	2	0	0	2	118
08:30	0	0	0	0	0	0	12	12	0	110	0	110	1	0	0	1	123
08:45	0	0	0	0	0	0	10	10	0	**115**	0	**115**	**3**	0	0	**3**	**128**
Total Volume	0	0	0	0	0	0	46	46	0	417	0	417	7	0	0	7	470
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.885	.885	.000	.907	.000	.907	.583	.000	.000	.583	.918
Cars	0	0	0	0	0	0	44	44	0	371	0	371	5	0	0	5	420
% Cars	0	0	0	0	0	0	95.7	95.7	0	89.0	0	89.0	71.4	0	0	71.4	89.4
Trucks	0	0	0	0	0	0	2	2	0	46	0	46	2	0	0	2	50
% Trucks	0	0	0	0	0	0	4.3	4.3	0	11.0	0	11.0	28.6	0	0	28.6	10.6

Accurate Counts
978-664-2565

N/S Street : Washington Street	File Name : 61470001
E/W Street: LaGrange St / Beach St	Site Code : 61470001
City/State : Boston, MA	Start Date : 4/14/2011
Weather : Drizzle	Page No : 2



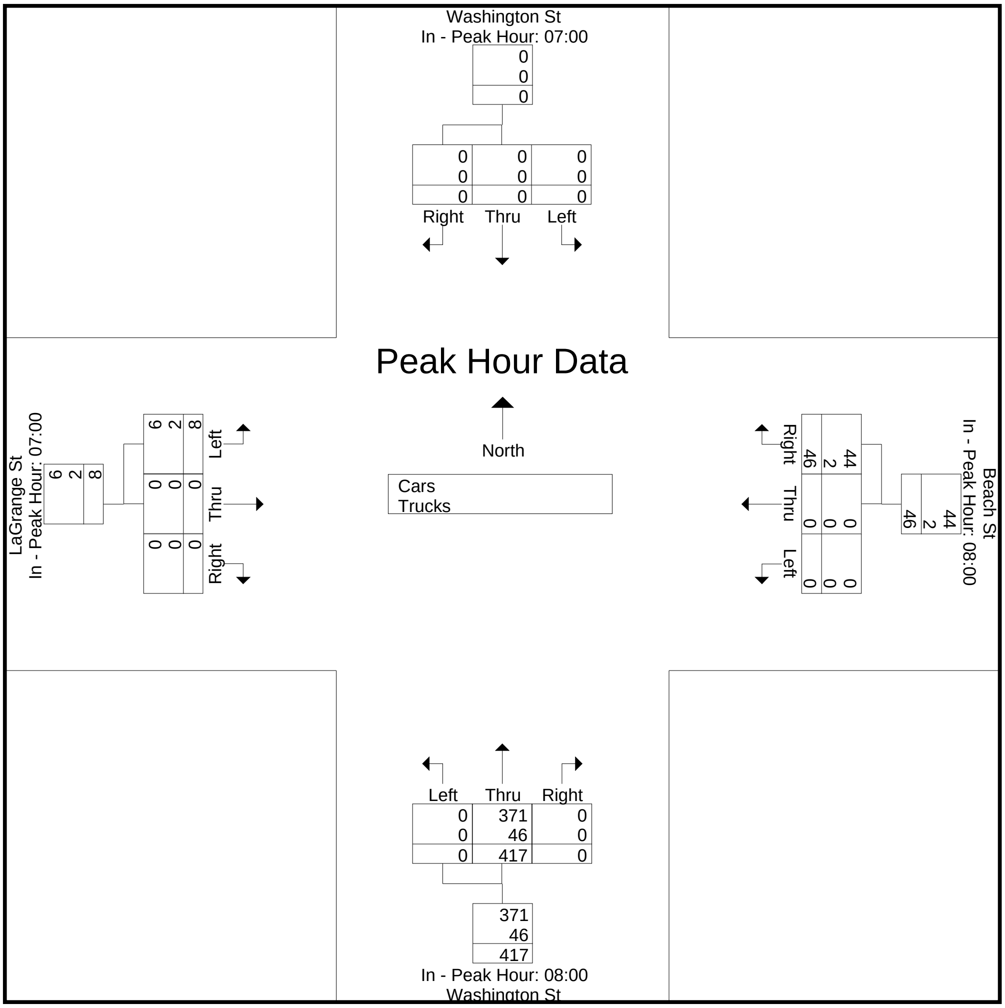
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				08:00				08:00				07:00			
+0 mins.	0	0	0	0	0	0	**13**	**13**	0	87	0	87	3	0	0	3
+15 mins.	0	0	0	0	0	0	11	11	0	105	0	105	0	0	0	0
+30 mins.	0	0	0	0	0	0	12	12	0	110	0	110	1	0	0	1
+45 mins.	0	0	0	0	0	0	10	10	0	**115**	0	**115**	**4**	0	0	**4**
Total Volume	0	0	0	0	0	0	46	46	0	417	0	417	8	0	0	8
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.000	.885	.885	.000	.907	.000	.907	.500	.000	.000	.500
Cars	0	0	0	0	0	0	44	44	0	371	0	371	6	0	0	6
% Cars	0	0	0	0	0	0	95.7	95.7	0	89	0	89	75	0	0	75
Trucks	0	0	0	0	0	0	2	2	0	46	0	46	2	0	0	2
% Trucks	0	0	0	0	0	0	4.3	4.3	0	11	0	11	25	0	0	25

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 3



N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011

Groups Printed- Cars

	Washington St From North			**Beach St From East**			**Washington St From South**			**LaGrange St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	0	0	0	0	0	6	0	56	0	1	0	0	63
07:15	0	0	0	0	0	8	0	56	0	0	0	0	64
07:30	0	0	0	0	0	10	0	74	0	1	0	0	85
07:45	0	0	0	0	0	8	0	77	0	4	0	0	89
Total	0	0	0	0	0	32	0	263	0	6	0	0	301
08:00	0	0	0	0	0	12	0	74	0	0	0	0	86
08:15	0	0	0	0	0	11	0	94	0	2	0	0	107
08:30	0	0	0	0	0	12	0	97	0	1	0	0	110
08:45	0	0	0	0	0	9	0	106	0	2	0	0	117
Total	0	0	0	0	0	44	0	371	0	5	0	0	420
Grand Total	0	0	0	0	0	76	0	634	0	11	0	0	721
Apprch %	0	0	0	0	0	100	0	100	0	100	0	0	
Total %	0	0	0	0	0	10.5	0	87.9	0	1.5	0	0	

	Washington St From North				**Beach St From East**				**Washington St From South**				**LaGrange St 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	0	0	0	0	0	0	**12**	**12**	0	74	0	74	0	0	0	0	86
08:15	0	0	0	0	0	0	11	11	0	94	0	94	**2**	0	0	**2**	107
08:30	0	0	0	0	0	0	12	12	0	97	0	97	1	0	0	1	110
08:45	0	0	0	0	0	0	9	9	0	**106**	0	**106**	2	0	0	2	**117**
Total Volume	0	0	0	0	0	0	44	44	0	371	0	371	5	0	0	5	420
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.917	.917	.000	.875	.000	.875	.625	.000	.000	.625	.897

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
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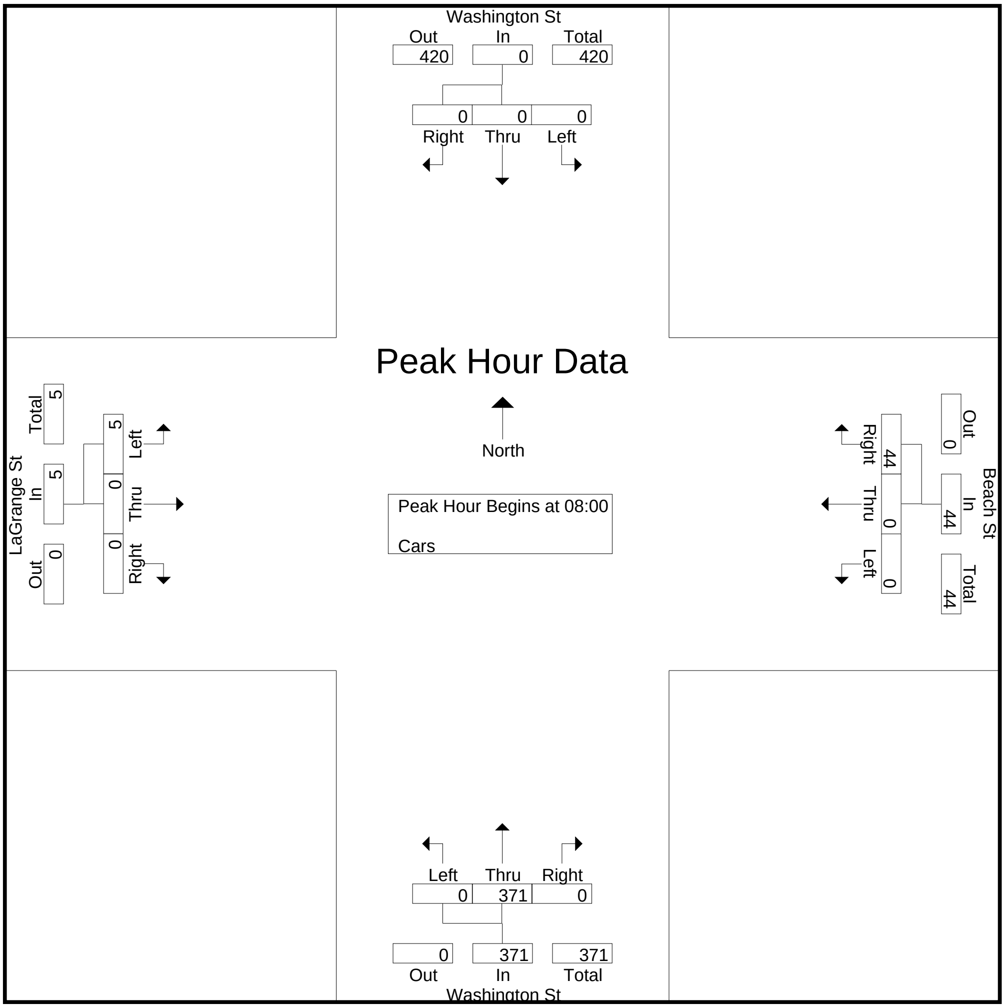

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				08:00				08:00				07:30			
+0 mins.	0	0	0	0	0	0	**12**	**12**	0	74	0	74	1	0	0	1
+15 mins.	0	0	0	0	0	0	11	11	0	94	0	94	**4**	0	0	**4**
+30 mins.	0	0	0	0	0	0	12	12	0	97	0	97	0	0	0	0
+45 mins.	0	0	0	0	0	0	9	9	0	**106**	0	**106**	2	0	0	2
Total Volume	0	0	0	0	0	0	44	44	0	371	0	371	7	0	0	7
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.000	.917	.917	.000	.875	.000	.875	.438	.000	.000	.438

Accurate Counts
978-664-2565

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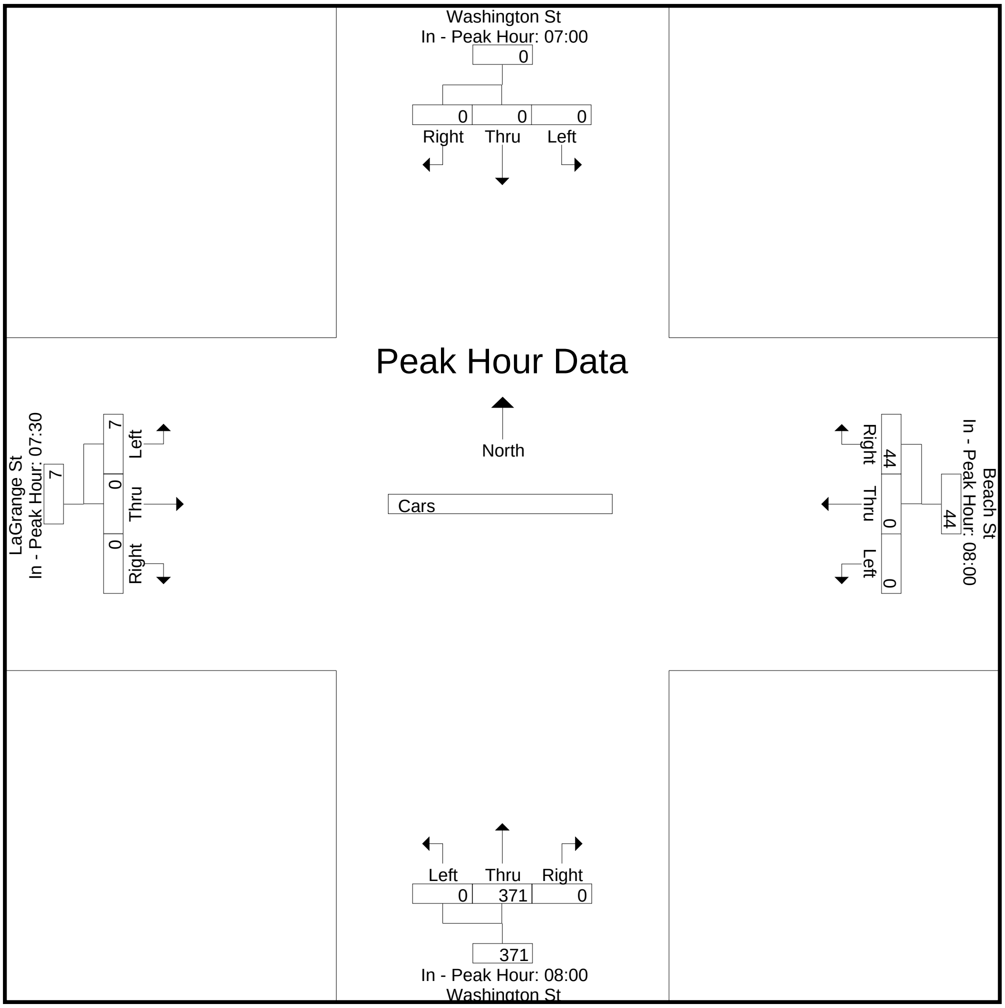

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Page No : 1

Groups Printed- Trucks

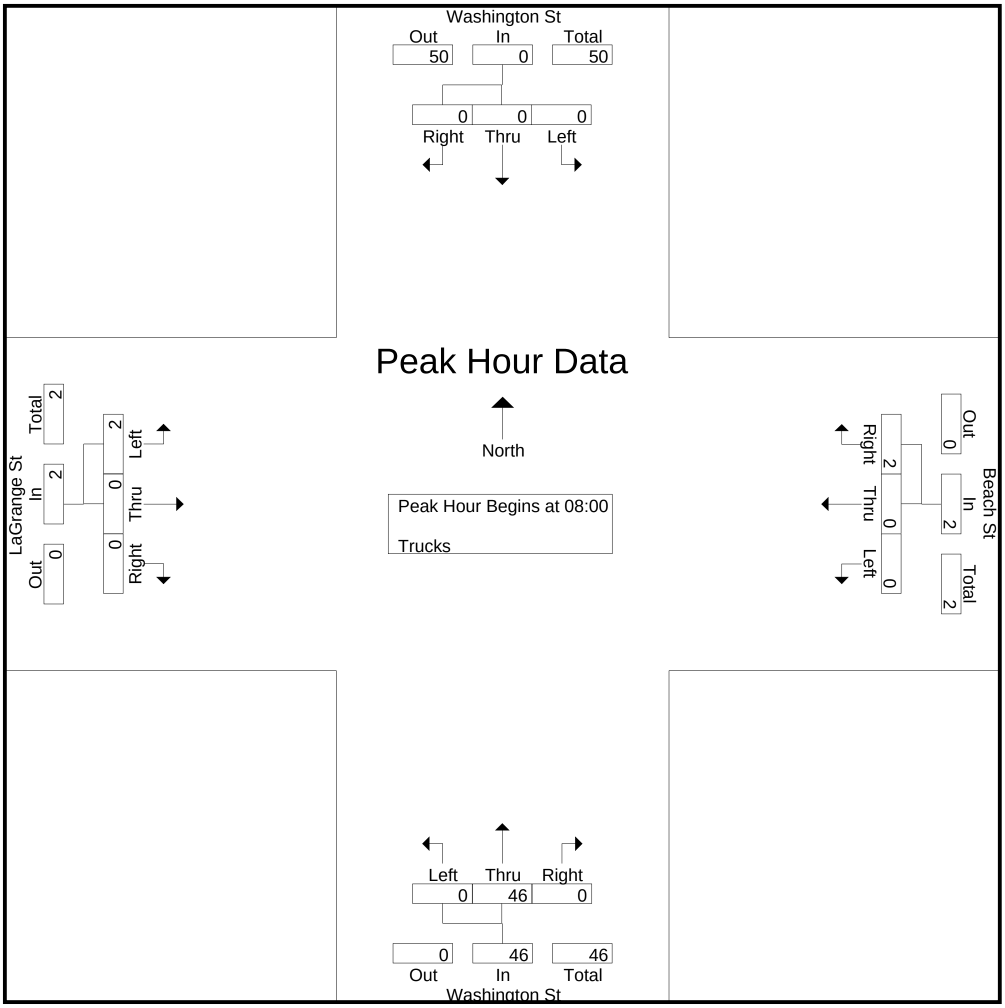
	Washington St From North			Beach St From East			Washington St From South			LaGrange St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	0	0	0	0	0	1	0	9	0	2	0	0	12
07:15	0	0	0	0	0	0	0	12	0	0	0	0	12
07:30	0	0	0	0	0	0	0	11	0	0	0	0	11
07:45	0	0	0	0	0	0	0	8	0	0	0	0	8
Total	0	0	0	0	0	1	0	40	0	2	0	0	43
08:00	0	0	0	0	0	1	0	13	0	1	0	0	15
08:15	0	0	0	0	0	0	0	11	0	0	0	0	11
08:30	0	0	0	0	0	0	0	13	0	0	0	0	13
08:45	0	0	0	0	0	1	0	9	0	1	0	0	11
Total	0	0	0	0	0	2	0	46	0	2	0	0	50
Grand Total	0	0	0	0	0	3	0	86	0	4	0	0	93
Apprch %	0	0	0	0	0	100	0	100	0	100	0	0	
Total %	0	0	0	0	0	3.2	0	92.5	0	4.3	0	0	

	Washington St From North				Beach St From East				Washington St From South				LaGrange St 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	0	0	0	0	0	0	**1**	**1**	0	**13**	0	**13**	**1**	0	0	**1**	**15**
08:15	0	0	0	0	0	0	0	0	0	11	0	11	0	0	0	0	11
08:30	0	0	0	0	0	0	0	0	0	13	0	13	0	0	0	0	13
08:45	0	0	0	0	0	0	1	1	0	9	0	9	1	0	0	1	11
Total Volume	0	0	0	0	0	0	2	2	0	46	0	46	2	0	0	2	50
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.500	.000	.885	.000	.885	.500	.000	.000	.500	.833

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 2



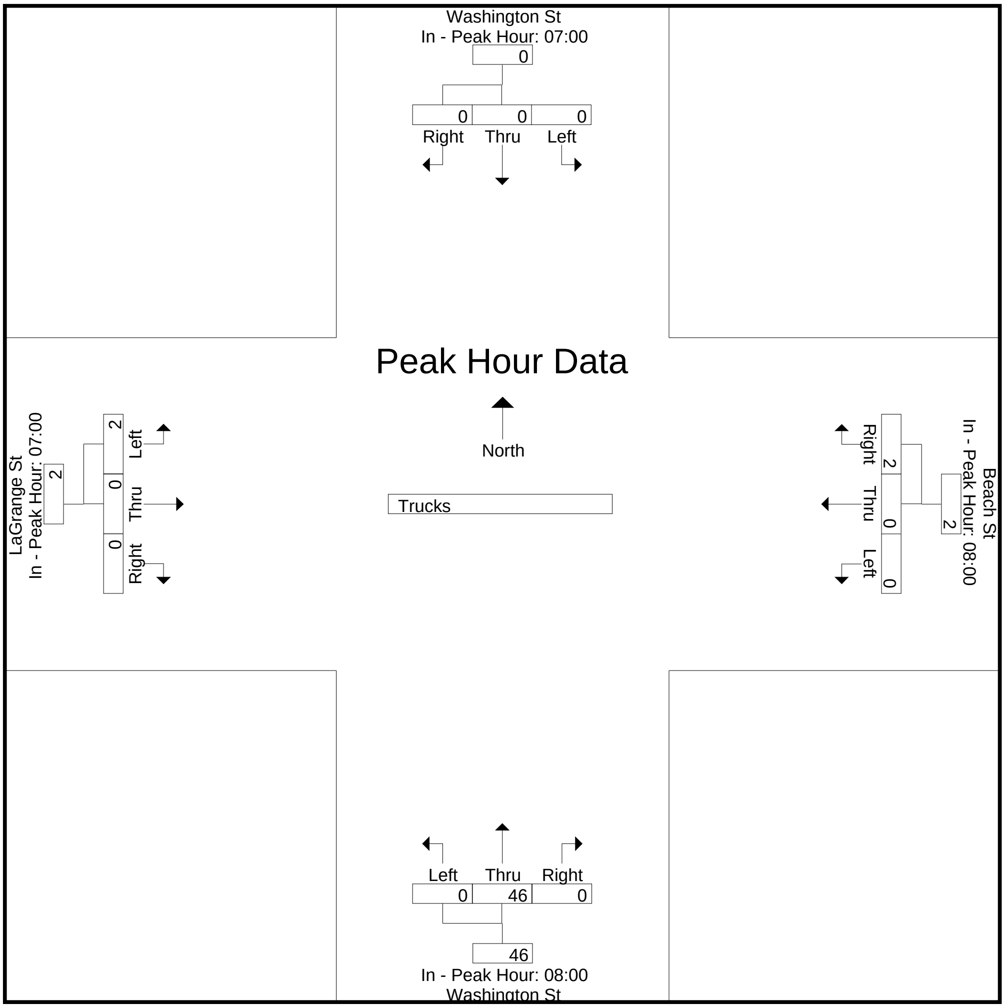
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				08:00				08:00				07:00			
+0 mins.	0	0	0	0	0	0	**1**	**1**	0	**13**	0	**13**	**2**	0	0	**2**
+15 mins.	0	0	0	0	0	0	0	0	0	11	0	11	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	13	0	13	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	1	0	9	0	9	0	0	0	0
Total Volume	0	0	0	0	0	0	2	2	0	46	0	46	2	0	0	2
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.000	.500	.500	.000	.885	.000	.885	.250	.000	.000	.250

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

	Washington St From North				**Beach St From East**				**Washington St From South**				**LaGrange St 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	1	1	0	6	0	0	0	37	0	1	0	2	0	0	0	16	61	3	64
07:15	0	0	0	5	0	0	0	52	0	3	0	2	0	0	0	24	83	3	86
07:30	0	0	0	19	1	0	0	70	0	2	0	13	0	0	0	40	142	3	145
07:45	0	0	0	16	0	0	0	83	0	5	0	12	0	0	0	47	158	5	163
Total	1	1	0	46	1	0	0	242	0	11	0	29	0	0	0	127	444	14	458
08:00	0	0	0	15	0	0	0	87	0	9	1	16	0	0	0	58	176	10	186
08:15	0	0	0	11	0	1	0	89	0	13	0	14	0	0	0	55	169	14	183
08:30	0	0	0	22	0	1	0	75	1	10	0	14	0	0	0	52	163	12	175
08:45	0	0	0	7	0	1	0	89	0	14	1	26	0	0	0	59	181	16	197
Total	0	0	0	55	0	3	0	340	1	46	2	70	0	0	0	224	689	52	741
Grand Total	1	1	0	101	1	3	0	582	1	57	2	99	0	0	0	351	1133	66	1199
Apprch %	50	50	0		25	75	0		1.7	95	3.3		0	0	0				
Total %	1.5	1.5	0		1.5	4.5	0		1.5	86.4	3		0	0	0		94.5	5.5	

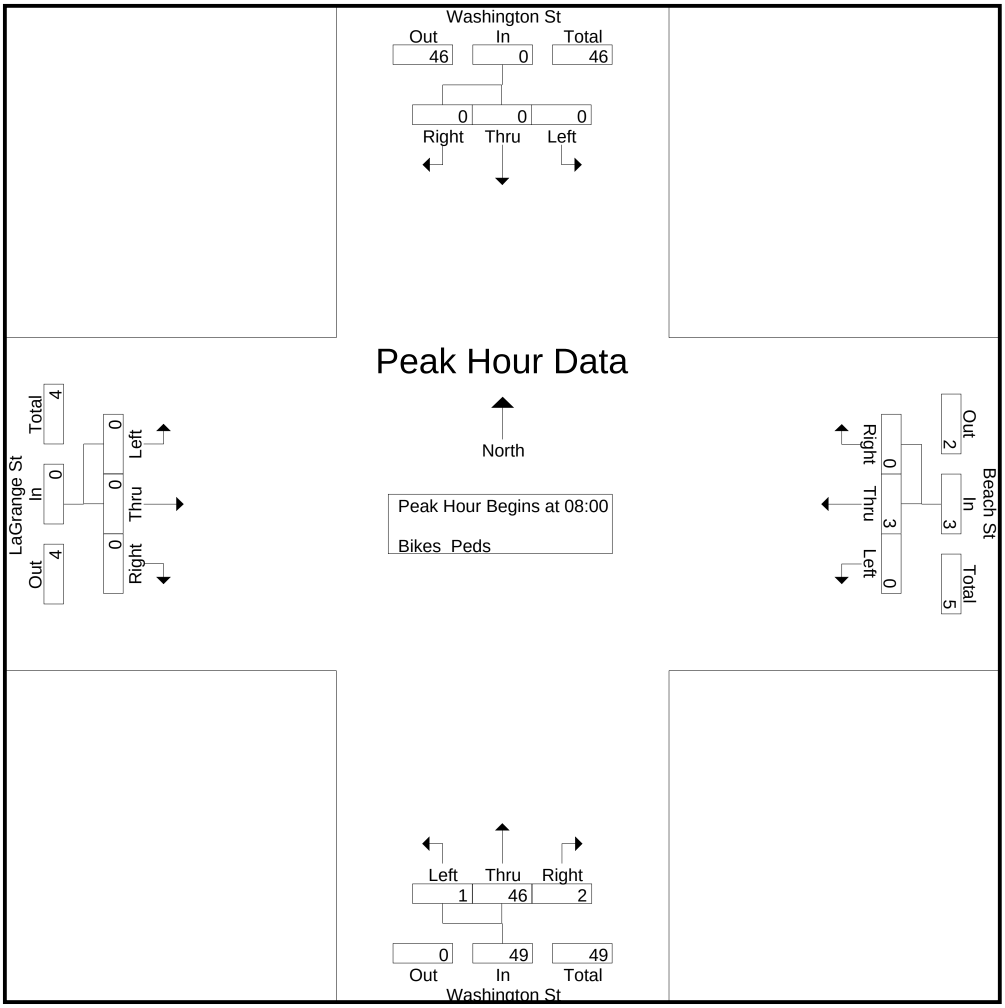
	Washington St From North				**Beach St From East**				**Washington St From South**				**LaGrange St From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	0	0	0	0	0	0	0	0	0	9	**1**	10	0	0	0	0	10
08:15	0	0	0	0	0	**1**	0	**1**	0	13	0	13	0	0	0	0	14
08:30	0	0	0	0	0	1	0	1	**1**	10	0	11	0	0	0	0	12
08:45	0	0	0	0	0	1	0	1	0	**14**	1	**15**	0	0	0	0	**16**
Total Volume	0	0	0	0	0	3	0	3	1	46	2	49	0	0	0	0	52
% App. Total	0	0	0		0	100	0		2	93.9	4.1		0	0	0		
PHF	.000	.000	.000	.000	.000	.750	.000	.750	.250	.821	.500	.817	.000	.000	.000	.000	.813

Accurate Counts

978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 2



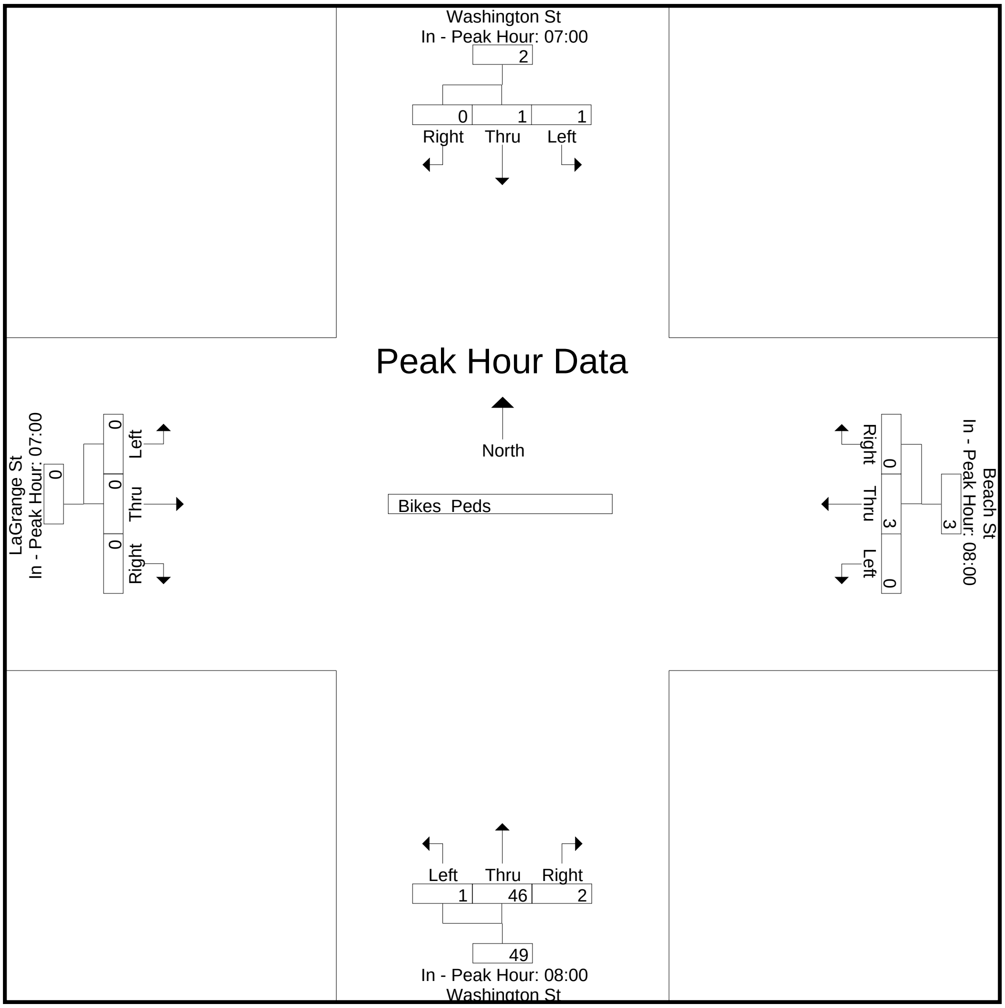
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				08:00				08:00				07:00			
+0 mins.	**1**	**1**	0	**2**	0	0	0	0	0	9	**1**	10	0	0	0	0
+15 mins.	0	0	0	0	0	**1**	0	**1**	0	13	0	13	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	**1**	10	0	11	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	**14**	1	**15**	0	0	0	0
Total Volume	1	1	0	2	0	3	0	3	1	46	2	49	0	0	0	0
% App. Total	50	50	0		0	100	0		2	93.9	4.1		0	0	0	
PHF	.250	.250	.000	.250	.000	.750	.000	.750	.250	.821	.500	.817	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 1

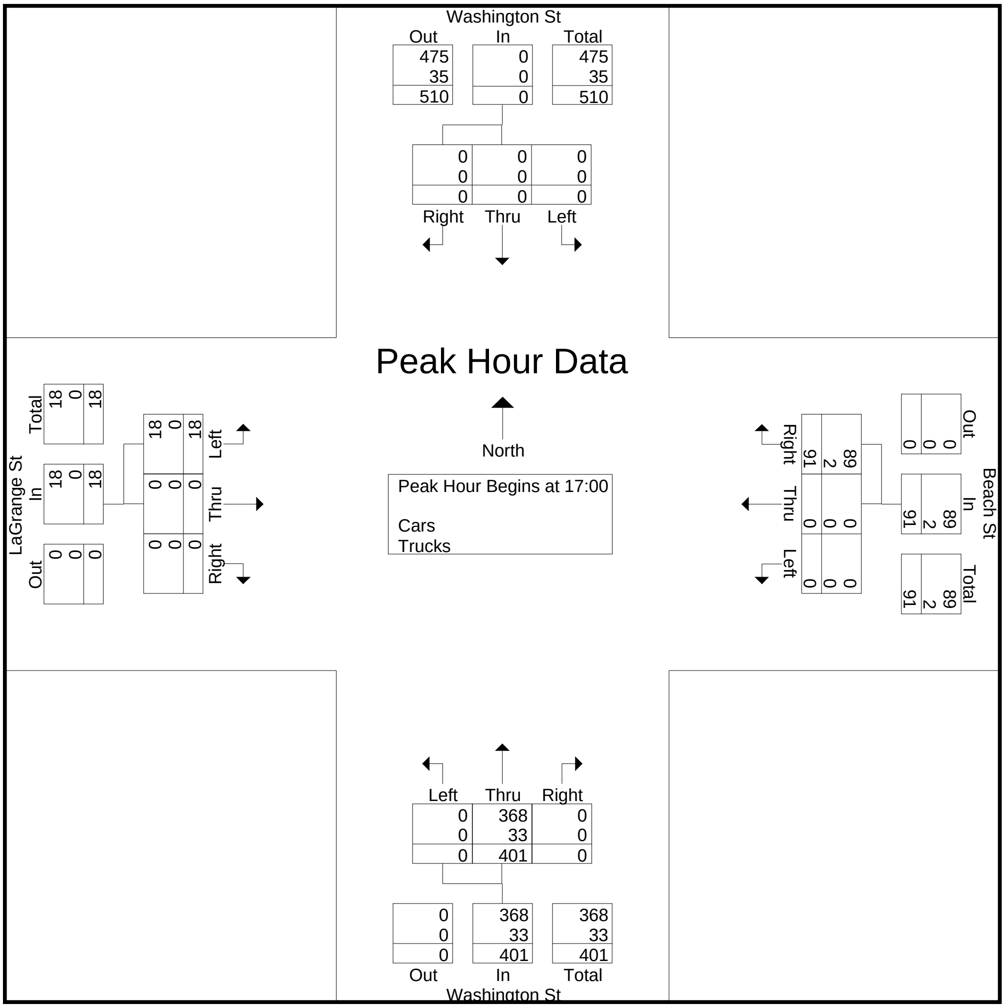
Groups Printed- Cars - Trucks

	Washington St From North			Beach St From East			Washington St From South			LaGrange St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	0	0	0	0	0	21	0	109	0	3	0	0	133
16:15	0	0	0	0	0	9	0	84	0	6	0	0	99
16:30	0	0	0	0	0	19	0	104	0	5	0	0	128
16:45	0	0	0	0	0	16	0	107	0	1	0	0	124
Total	0	0	0	0	0	65	0	404	0	15	0	0	484
17:00	0	0	0	0	0	24	0	92	0	2	0	0	118
17:15	0	0	0	0	0	23	0	94	0	5	0	0	122
17:30	0	0	0	0	0	19	0	110	0	6	0	0	135
17:45	0	0	0	0	0	25	0	105	0	5	0	0	135
Total	0	0	0	0	0	91	0	401	0	18	0	0	510
Grand Total	0	0	0	0	0	156	0	805	0	33	0	0	994
Apprch %	0	0	0	0	0	100	0	100	0	100	0	0	
Total %	0	0	0	0	0	15.7	0	81	0	3.3	0	0	
Cars	0	0	0	0	0	153	0	746	0	33	0	0	932
% Cars	0	0	0	0	0	98.1	0	92.7	0	100	0	0	93.8
Trucks	0	0	0	0	0	3	0	59	0	0	0	0	62
% Trucks	0	0	0	0	0	1.9	0	7.3	0	0	0	0	6.2

	Washington St From North				Beach St From East				Washington St From South				LaGrange St 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 17:00																	
17:00	0	0	0	0	0	0	24	24	0	92	0	92	2	0	0	2	118
17:15	0	0	0	0	0	0	23	23	0	94	0	94	5	0	0	5	122
17:30	0	0	0	0	0	0	19	19	0	**110**	0	**110**	**6**	0	0	**6**	**135**
17:45	0	0	0	0	0	0	**25**	**25**	0	105	0	105	5	0	0	5	135
Total Volume	0	0	0	0	0	0	91	91	0	401	0	401	18	0	0	18	510
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.910	.910	.000	.911	.000	.911	.750	.000	.000	.750	.944
Cars	0	0	0	0	0	0	89	89	0	368	0	368	18	0	0	18	475
% Cars	0	0	0	0	0	0	97.8	97.8	0	91.8	0	91.8	100	0	0	100	93.1
Trucks	0	0	0	0	0	0	2	2	0	33	0	33	0	0	0	0	35
% Trucks	0	0	0	0	0	0	2.2	2.2	0	8.2	0	8.2	0	0	0	0	6.9

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011



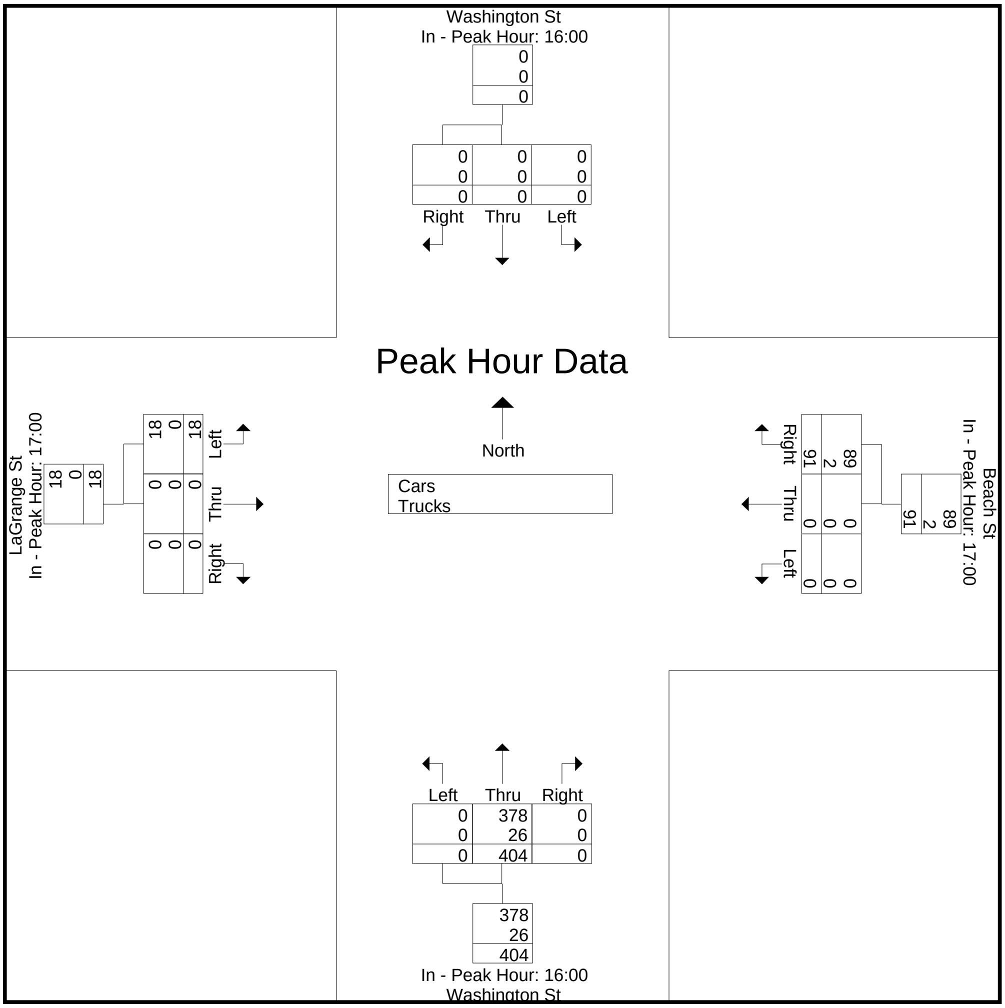
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				17:00				16:00				17:00			
+0 mins.	0	0	0	0	0	0	24	24	0	**109**	0	**109**	2	0	0	2
+15 mins.	0	0	0	0	0	0	23	23	0	84	0	84	5	0	0	5
+30 mins.	0	0	0	0	0	0	19	19	0	104	0	104	**6**	0	0	**6**
+45 mins.	0	0	0	0	0	0	**25**	**25**	0	107	0	107	5	0	0	5
Total Volume	0	0	0	0	0	0	91	91	0	404	0	404	18	0	0	18
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.000	.910	.910	.000	.927	.000	.927	.750	.000	.000	.750
Cars	0	0	0	0	0	0	89	89	0	378	0	378	18	0	0	18
% Cars	0	0	0	0	0	0	97.8	97.8	0	93.6	0	93.6	100	0	0	100
Trucks	0	0	0	0	0	0	2	2	0	26	0	26	0	0	0	0
% Trucks	0	0	0	0	0	0	2.2	2.2	0	6.4	0	6.4	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars

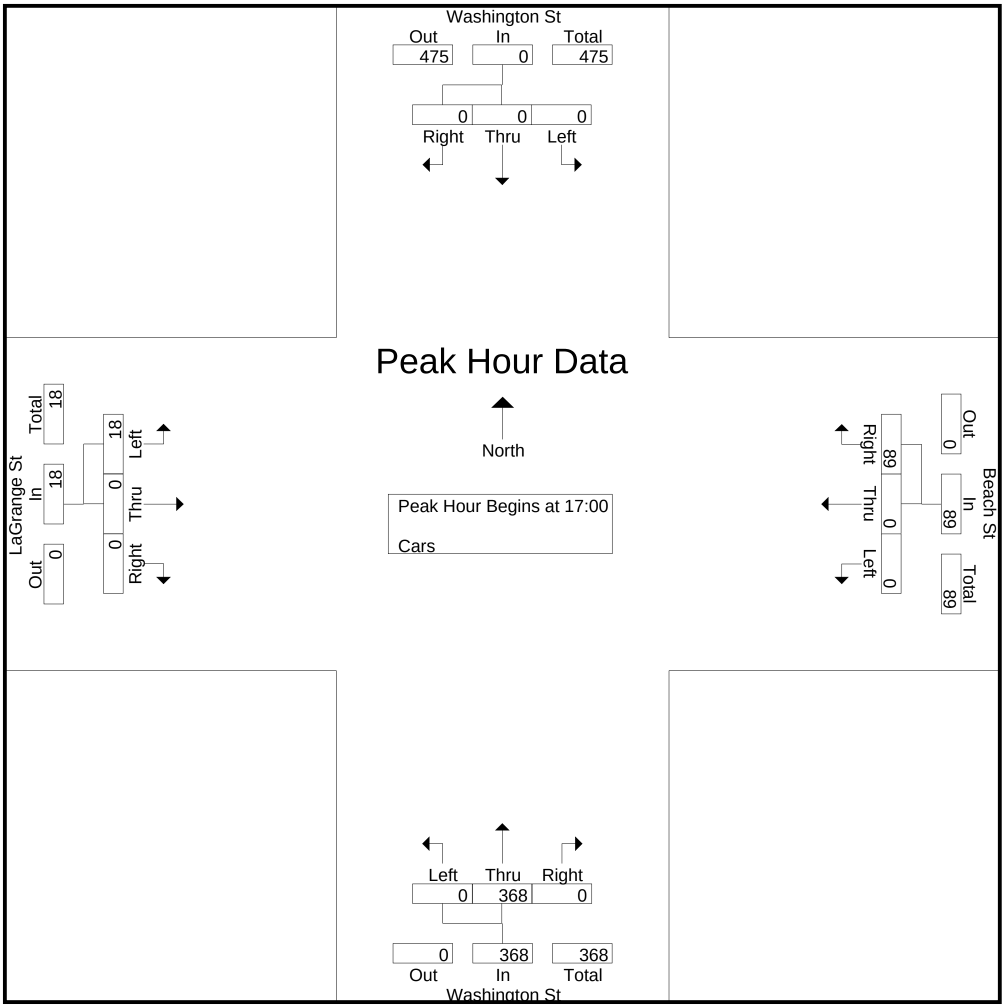
	Washington St From North			**Beach St From East**			**Washington St From South**			**LaGrange St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	0	0	0	0	0	21	0	102	0	3	0	0	126
16:15	0	0	0	0	0	9	0	78	0	6	0	0	93
16:30	0	0	0	0	0	19	0	97	0	5	0	0	121
16:45	0	0	0	0	0	15	0	101	0	1	0	0	117
Total	0	0	0	0	0	64	0	378	0	15	0	0	457
17:00	0	0	0	0	0	24	0	80	0	2	0	0	106
17:15	0	0	0	0	0	23	0	85	0	5	0	0	113
17:30	0	0	0	0	0	18	0	106	0	6	0	0	130
17:45	0	0	0	0	0	24	0	97	0	5	0	0	126
Total	0	0	0	0	0	89	0	368	0	18	0	0	475
Grand Total	0	0	0	0	0	153	0	746	0	33	0	0	932
Apprch %	0	0	0	0	0	100	0	100	0	100	0	0	
Total %	0	0	0	0	0	16.4	0	80	0	3.5	0	0	

	Washington St From North				**Beach St From East**				**Washington St From South**				**LaGrange St 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 17:00																	
17:00	0	0	0	0	0	0	**24**	**24**	0	80	0	80	2	0	0	2	106
17:15	0	0	0	0	0	0	23	23	0	85	0	85	5	0	0	5	113
17:30	0	0	0	0	0	0	18	18	0	**106**	0	**106**	**6**	0	0	**6**	**130**
17:45	0	0	0	0	0	0	24	24	0	97	0	97	5	0	0	5	126
Total Volume	0	0	0	0	0	0	89	89	0	368	0	368	18	0	0	18	475
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.927	.927	.000	.868	.000	.868	.750	.000	.000	.750	.913

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 2



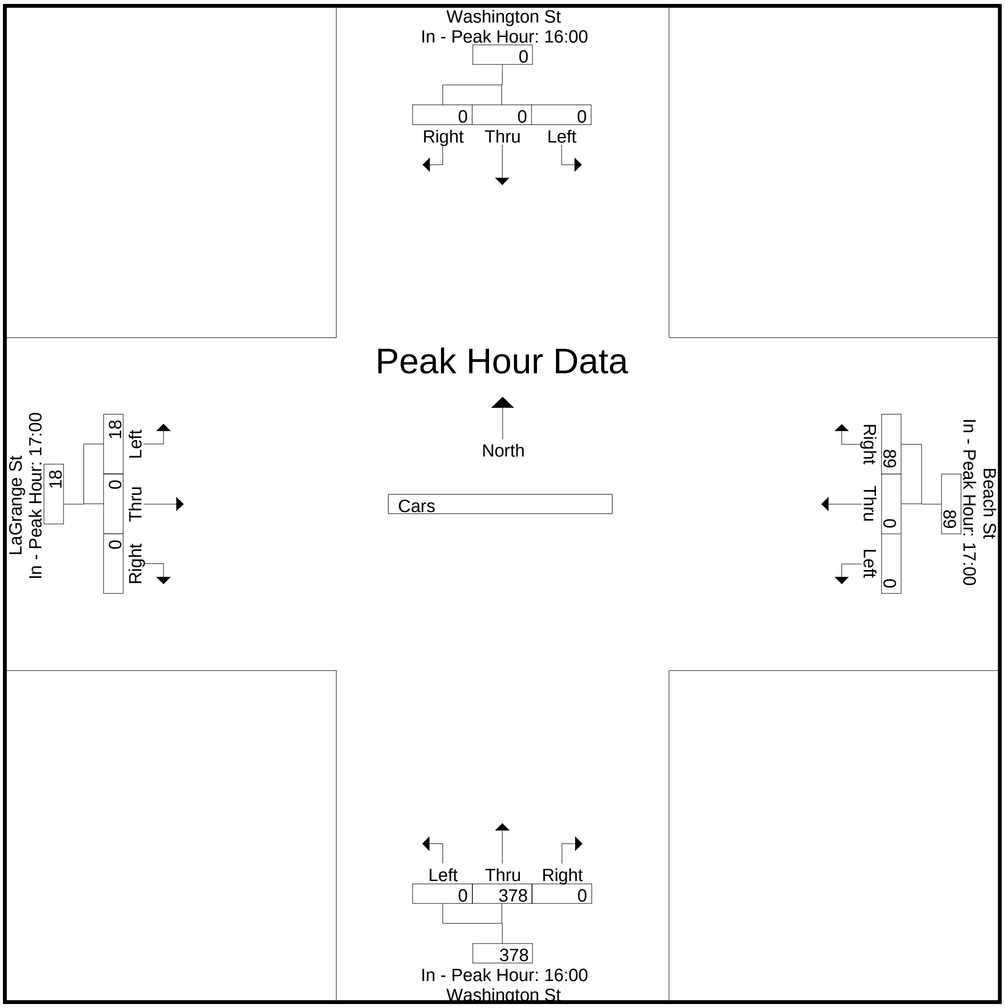
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				17:00				16:00				17:00			
+0 mins.	0	0	0	0	0	0	**24**	**24**	0	**102**	0	**102**	2	0	0	2
+15 mins.	0	0	0	0	0	0	23	23	0	78	0	78	5	0	0	5
+30 mins.	0	0	0	0	0	0	18	18	0	97	0	97	**6**	0	0	**6**
+45 mins.	0	0	0	0	0	0	24	24	0	101	0	101	5	0	0	5
Total Volume	0	0	0	0	0	0	89	89	0	378	0	378	18	0	0	18
% App. Total	0	0	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.000	.927	.927	.000	.926	.000	.926	.750	.000	.000	.750

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 1

Groups Printed- Trucks

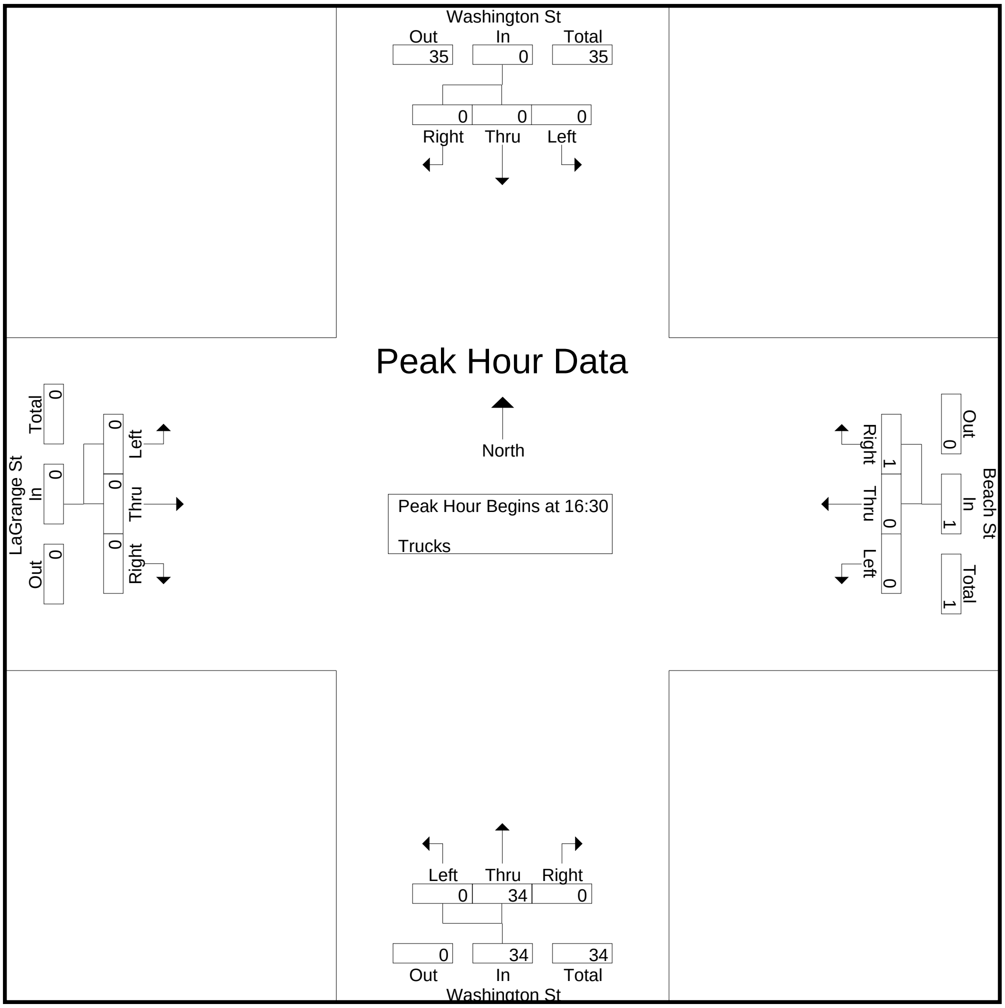
	Washington St From North			Beach St From East			Washington St From South			LaGrange St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	0	0	0	0	0	0	0	7	0	0	0	0	7
16:15	0	0	0	0	0	0	0	6	0	0	0	0	6
16:30	0	0	0	0	0	0	0	7	0	0	0	0	7
16:45	0	0	0	0	0	1	0	6	0	0	0	0	7
Total	0	0	0	0	0	1	0	26	0	0	0	0	27
17:00	0	0	0	0	0	0	0	12	0	0	0	0	12
17:15	0	0	0	0	0	0	0	9	0	0	0	0	9
17:30	0	0	0	0	0	1	0	4	0	0	0	0	5
17:45	0	0	0	0	0	1	0	8	0	0	0	0	9
Total	0	0	0	0	0	2	0	33	0	0	0	0	35
Grand Total	0	0	0	0	0	3	0	59	0	0	0	0	62
Apprch %	0	0	0	0	0	100	0	100	0	0	0	0	
Total %	0	0	0	0	0	4.8	0	95.2	0	0	0	0	

	Washington St From North				Beach St From East				Washington St From South				LaGrange St 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	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	7
16:45	0	0	0	0	0	0	**1**	**1**	0	6	0	6	0	0	0	0	7
17:00	0	0	0	0	0	0	0	0	0	**12**	0	**12**	0	0	0	0	**12**
17:15	0	0	0	0	0	0	0	0	0	9	0	9	0	0	0	0	9
Total Volume	0	0	0	0	0	0	1	1	0	34	0	34	0	0	0	0	35
% App. Total	0	0	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.708	.000	.708	.000	.000	.000	.000	.729

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 2



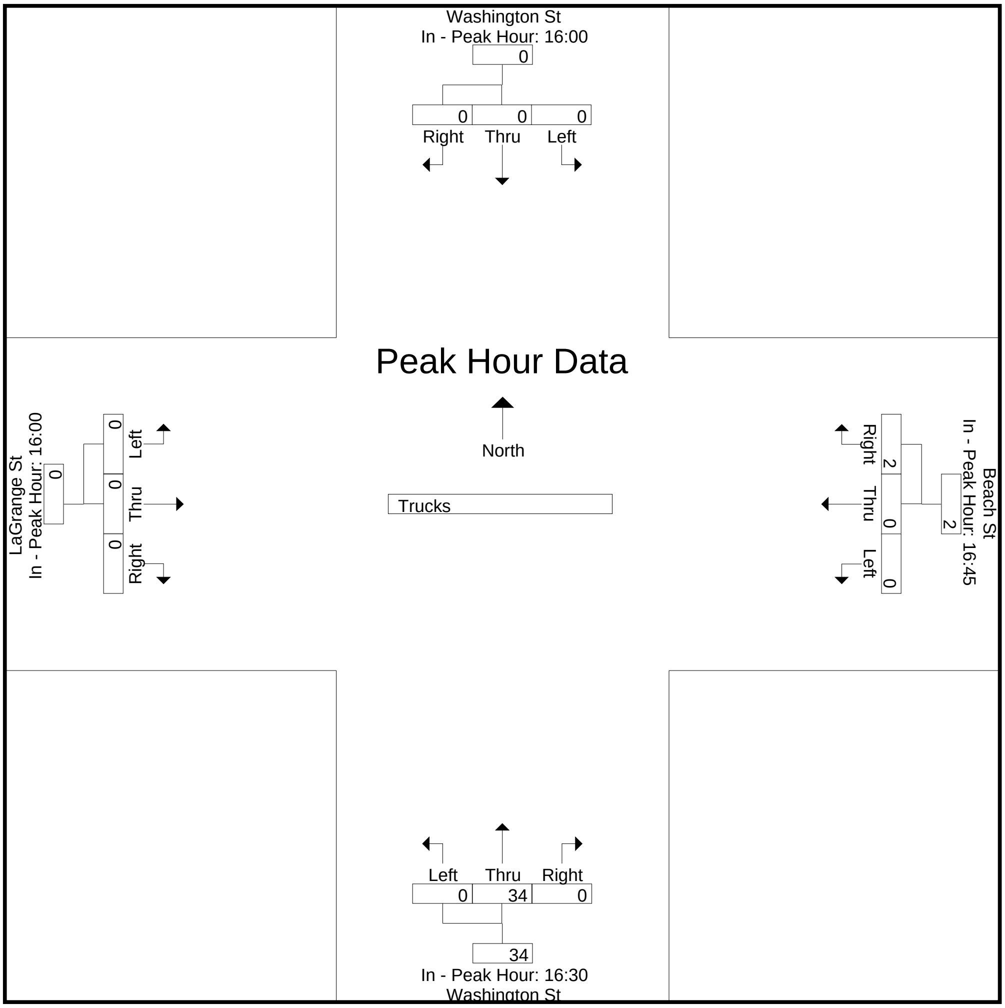
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:45				16:30				16:00			
+0 mins.	0	0	0	0	0	0	**1**	**1**	0	7	0	7	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**12**	0	**12**	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	1	0	9	0	9	0	0	0	0
Total Volume	0	0	0	0	0	0	2	2	0	34	0	34	0	0	0	0
% App. Total	0	0	0		0	0	100		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.500	.500	.000	.708	.000	.708	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 1

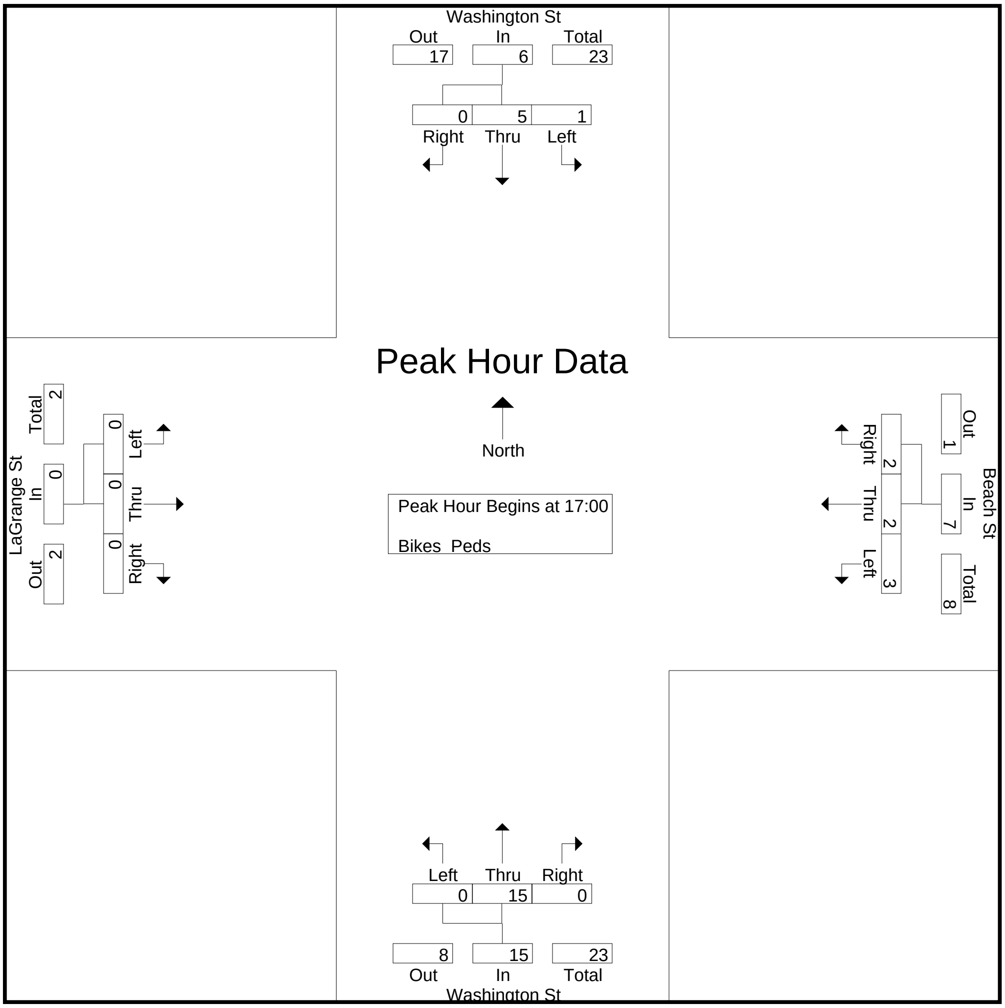
Groups Printed- Bikes Peds

	Washington St From North				**Beach St From East**				**Washington St From South**				**LaGrange St 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	1	0	36	0	1	0	132	0	5	1	16	0	0	0	54	238	8	246
16:15	0	3	0	40	0	0	0	140	0	5	0	27	0	0	0	85	292	8	300
16:30	0	0	0	24	0	0	1	157	0	4	2	31	0	0	0	76	288	7	295
16:45	0	0	0	26	0	0	0	121	0	4	0	32	0	0	0	101	280	4	284
Total	0	4	0	126	0	1	1	550	0	18	3	106	0	0	0	316	1098	27	1125
17:00	1	2	0	21	0	0	0	183	0	2	0	29	0	0	0	76	309	5	314
17:15	0	0	0	55	0	0	1	132	0	5	0	34	0	0	0	80	301	6	307
17:30	0	3	0	46	3	1	0	151	0	2	0	26	0	0	0	71	294	9	303
17:45	0	0	0	28	0	1	1	145	0	6	0	29	0	0	0	68	270	8	278
Total	1	5	0	150	3	2	2	611	0	15	0	118	0	0	0	295	1174	28	1202
Grand Total	1	9	0	276	3	3	3	1161	0	33	3	224	0	0	0	611	2272	55	2327
Apprch %	10	90	0		33.3	33.3	33.3		0	91.7	8.3		0	0	0				
Total %	1.8	16.4	0		5.5	5.5	5.5		0	60	5.5		0	0	0		97.6	2.4	

	Washington St From North				**Beach St From East**				**Washington St From South**				**LaGrange St 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 17:00																	
17:00	**1**	2	0	**3**	0	0	0	0	0	2	0	2	0	0	0	0	5
17:15	0	0	0	0	0	0	**1**	1	0	5	0	5	0	0	0	0	6
17:30	0	**3**	0	3	**3**	**1**	0	**4**	0	2	0	2	0	0	0	0	**9**
17:45	0	0	0	0	0	1	1	2	0	**6**	0	**6**	0	0	0	0	8
Total Volume	1	5	0	6	3	2	2	7	0	15	0	15	0	0	0	0	28
% App. Total	16.7	83.3	0		42.9	28.6	28.6		0	100	0		0	0	0		
PHF	.250	.417	.000	.500	.250	.500	.500	.438	.000	.625	.000	.625	.000	.000	.000	.000	.778

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011
Page No : 2

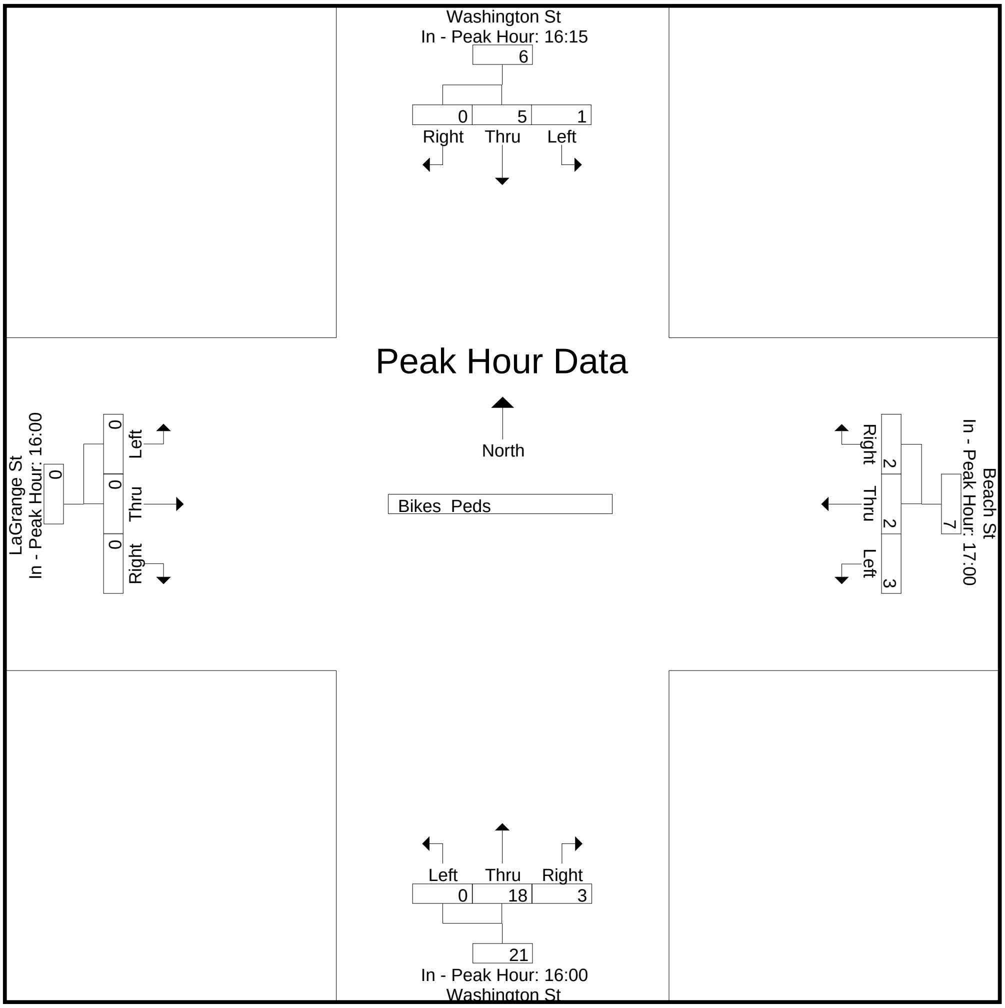


Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:15				17:00				16:00				16:00			
+0 mins.	0	**3**	0	**3**	0	0	0	0	0	**5**	1	**6**	0	0	0	0
+15 mins.	0	0	0	0	0	0	**1**	1	0	5	0	5	0	0	0	0
+30 mins.	0	0	0	0	**3**	**1**	0	**4**	0	4	**2**	6	0	0	0	0
+45 mins.	**1**	2	0	3	0	1	1	2	0	4	0	4	0	0	0	0
Total Volume	1	5	0	6	3	2	2	7	0	18	3	21	0	0	0	0
% App. Total	16.7	83.3	0		42.9	28.6	28.6		0	85.7	14.3		0	0	0	
PHF	.250	.417	.000	.500	.250	.500	.500	.438	.000	.900	.375	.875	.000	.000	.000	.000

N/S Street : Washington Street
E/W Street: LaGrange St / Beach St
City/State : Boston, MA
Weather : Clear

File Name : 61470001
Site Code : 61470001
Start Date : 4/14/2011



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars - Trucks

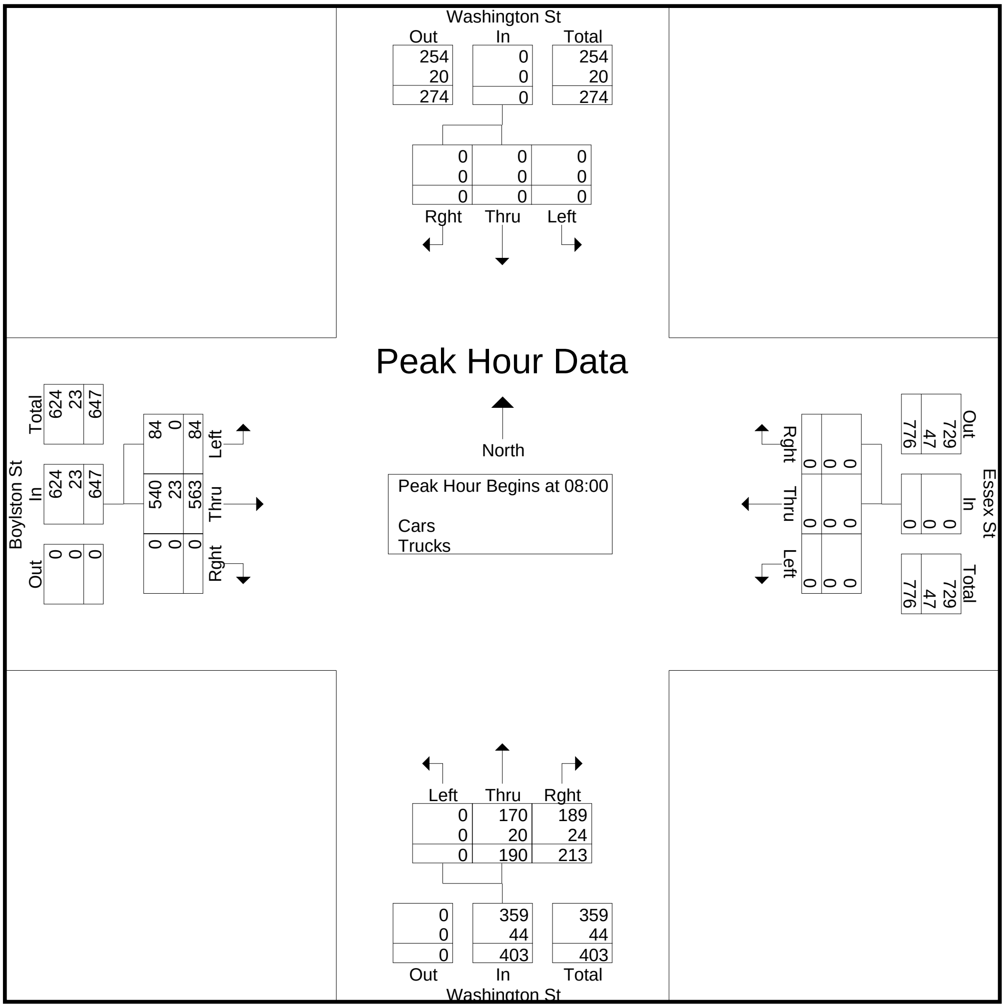
	Washington St From North			Essex St From East			Washington St From South			Boylston St From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
07:00	0	0	0	0	0	0	0	30	40	10	76	0	156
07:15	0	0	0	0	0	0	0	34	39	11	71	0	155
07:30	0	0	0	0	0	0	0	37	52	14	128	0	231
07:45	0	0	0	0	0	0	0	32	40	11	128	0	211
Total	0	0	0	0	0	0	0	133	171	46	403	0	753
08:00	0	0	0	0	0	0	0	42	49	22	127	0	240
08:15	0	0	0	0	0	0	0	45	54	20	136	0	255
08:30	0	0	0	0	0	0	0	52	52	20	151	0	275
08:45	0	0	0	0	0	0	0	51	58	22	149	0	280
Total	0	0	0	0	0	0	0	190	213	84	563	0	1050
Grand Total	0	0	0	0	0	0	0	323	384	130	966	0	1803
Apprch %	0	0	0	0	0	0	0	45.7	54.3	11.9	88.1	0	
Total %	0	0	0	0	0	0	0	17.9	21.3	7.2	53.6	0	
Cars	0	0	0	0	0	0	0	285	338	128	924	0	1675
% Cars	0	0	0	0	0	0	0	88.2	88	98.5	95.7	0	92.9
Trucks	0	0	0	0	0	0	0	38	46	2	42	0	128
% Trucks	0	0	0	0	0	0	0	11.8	12	1.5	4.3	0	7.1

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	0	0	0	0	0	0	0	0	42	49	91	**22**	127	0	149	240
08:15	0	0	0	0	0	0	0	0	0	45	54	99	20	136	0	156	255
08:30	0	0	0	0	0	0	0	0	0	**52**	52	104	20	**151**	0	**171**	275
08:45	0	0	0	0	0	0	0	0	0	51	**58**	**109**	22	149	0	171	**280**
Total Volume	0	0	0	0	0	0	0	0	0	190	213	403	84	563	0	647	1050
% App. Total	0	0	0		0	0	0		0	47.1	52.9		13	87	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.913	.918	.924	.955	.932	.000	.946	.938
Cars	0	0	0	0	0	0	0	0	0	170	189	359	84	540	0	624	983
% Cars	0	0	0	0	0	0	0	0	0	89.5	88.7	89.1	100	95.9	0	96.4	93.6
Trucks	0	0	0	0	0	0	0	0	0	20	24	44	0	23	0	23	67
% Trucks	0	0	0	0	0	0	0	0	0	10.5	11.3	10.9	0	4.1	0	3.6	6.4

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 2



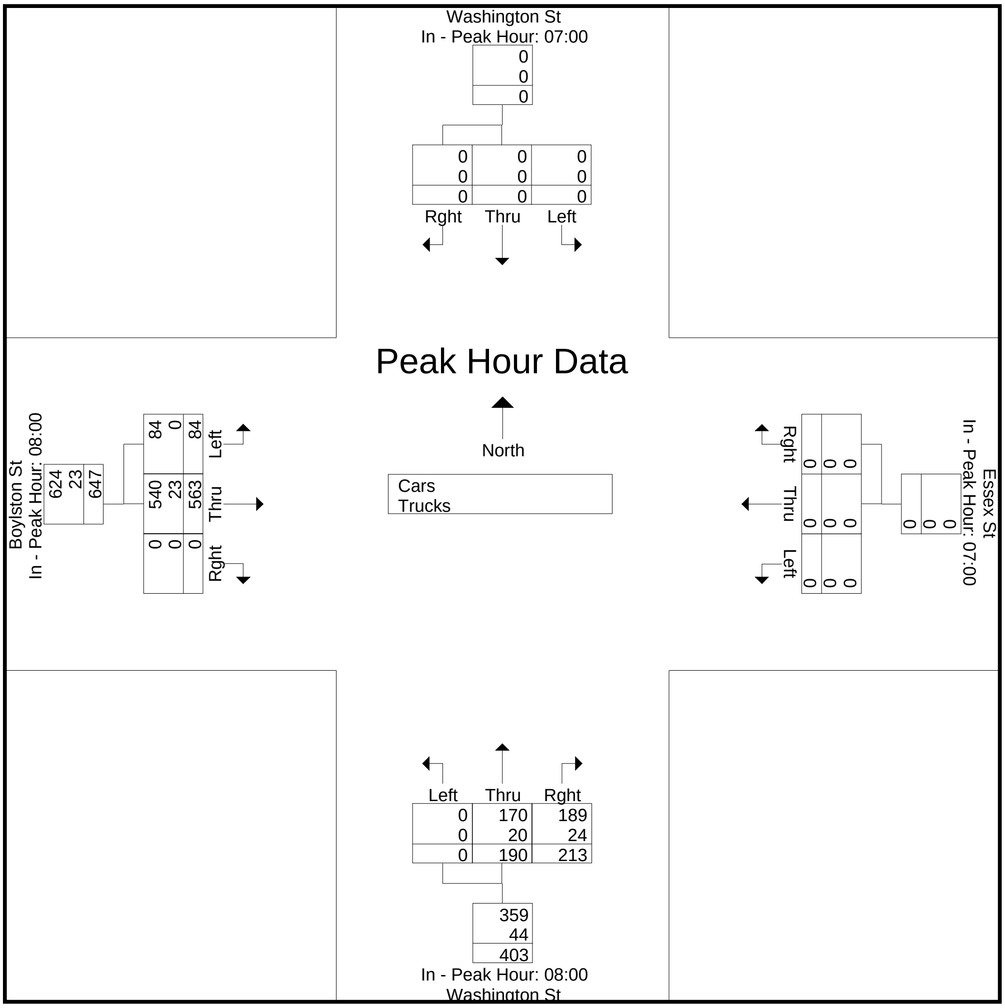
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				07:00				08:00				08:00			
+0 mins.	0	0	0	0	0	0	0	0	0	42	49	91	**22**	127	0	149
+15 mins.	0	0	0	0	0	0	0	0	0	45	54	99	20	136	0	156
+30 mins.	0	0	0	0	0	0	0	0	0	**52**	52	104	20	**151**	0	**171**
+45 mins.	0	0	0	0	0	0	0	0	0	51	**58**	**109**	22	149	0	171
Total Volume	0	0	0	0	0	0	0	0	0	190	213	403	84	563	0	647
% App. Total	0	0	0		0	0	0		0	47.1	52.9		13	87	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.913	.918	.924	.955	.932	.000	.946
Cars	0	0	0	0	0	0	0	0	0	170	189	359	84	540	0	624
% Cars	0	0	0	0	0	0	0	0	0	89.5	88.7	89.1	100	95.9	0	96.4
Trucks	0	0	0	0	0	0	0	0	0	20	24	44	0	23	0	23
% Trucks	0	0	0	0	0	0	0	0	0	10.5	11.3	10.9	0	4.1	0	3.6

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

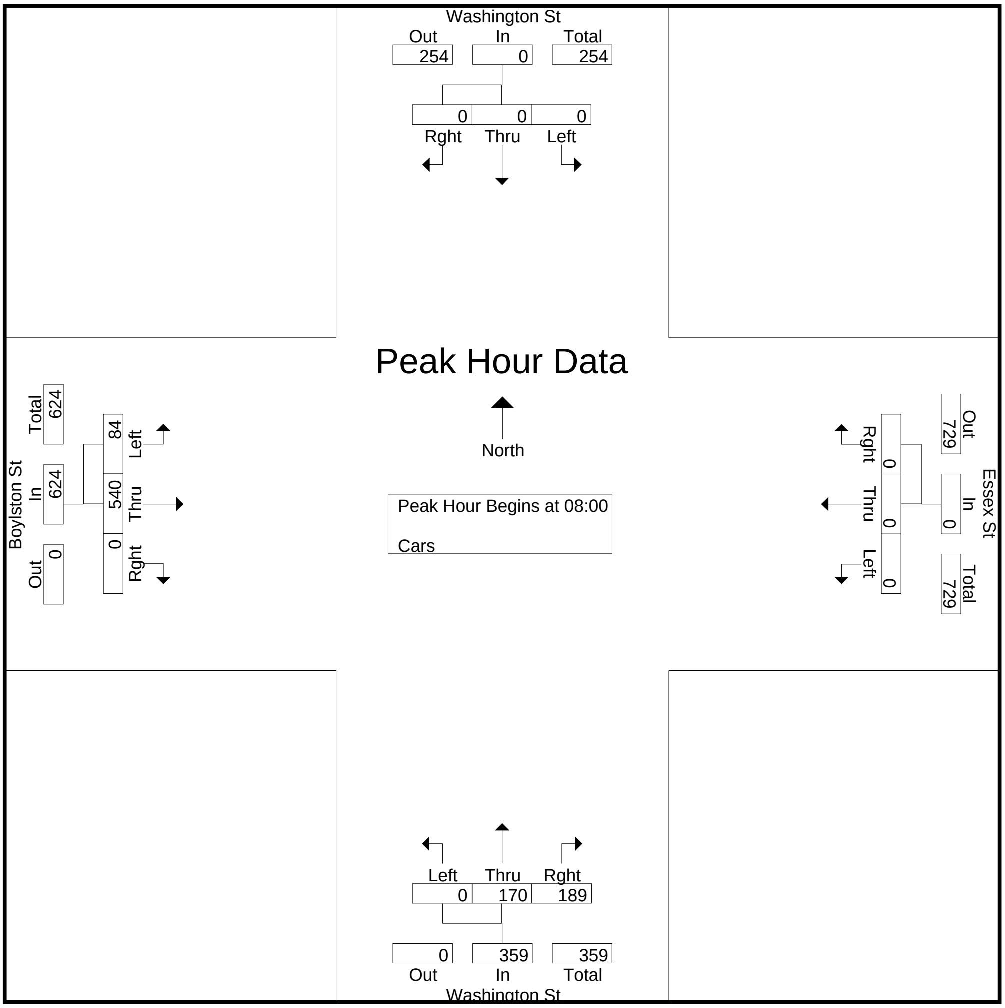
Groups Printed- Cars

	Washington St From North			Essex St From East			Washington St From South			Boylston St From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
07:00	0	0	0	0	0	0	0	26	32	9	72	0	139
07:15	0	0	0	0	0	0	0	27	35	11	66	0	139
07:30	0	0	0	0	0	0	0	35	47	13	124	0	219
07:45	0	0	0	0	0	0	0	27	35	11	122	0	195
Total	0	0	0	0	0	0	0	115	149	44	384	0	692
08:00	0	0	0	0	0	0	0	34	45	22	124	0	225
08:15	0	0	0	0	0	0	0	43	45	20	127	0	235
08:30	0	0	0	0	0	0	0	47	46	20	147	0	260
08:45	0	0	0	0	0	0	0	46	53	22	142	0	263
Total	0	0	0	0	0	0	0	170	189	84	540	0	983
Grand Total	0	0	0	0	0	0	0	285	338	128	924	0	1675
Apprch %	0	0	0	0	0	0	0	45.7	54.3	12.2	87.8	0	
Total %	0	0	0	0	0	0	0	17	20.2	7.6	55.2	0	

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	0	0	0	0	0	0	0	0	34	45	79	**22**	124	0	146	225
08:15	0	0	0	0	0	0	0	0	0	43	45	88	20	127	0	147	235
08:30	0	0	0	0	0	0	0	0	0	**47**	46	93	20	**147**	0	**167**	260
08:45	0	0	0	0	0	0	0	0	0	46	**53**	**99**	22	142	0	164	**263**
Total Volume	0	0	0	0	0	0	0	0	0	170	189	359	84	540	0	624	983
% App. Total	0	0	0		0	0	0		0	47.4	52.6		13.5	86.5	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.904	.892	.907	.955	.918	.000	.934	.934

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011



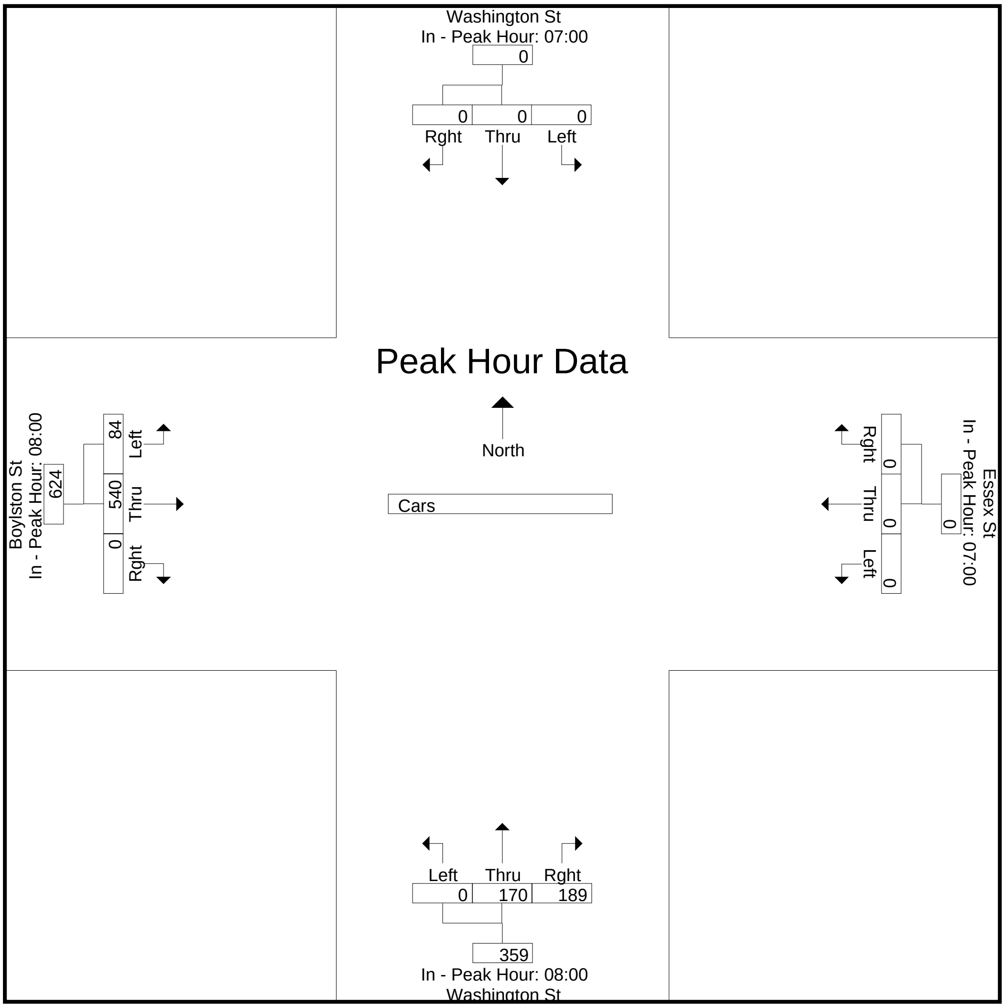
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				07:00				08:00				08:00			
+0 mins.	0	0	0	0	0	0	0	0	0	34	45	79	**22**	124	0	146
+15 mins.	0	0	0	0	0	0	0	0	0	43	45	88	20	127	0	147
+30 mins.	0	0	0	0	0	0	0	0	0	**47**	46	93	20	**147**	0	**167**
+45 mins.	0	0	0	0	0	0	0	0	0	46	**53**	**99**	22	142	0	164
Total Volume	0	0	0	0	0	0	0	0	0	170	189	359	84	540	0	624
% App. Total	0	0	0		0	0	0		0	47.4	52.6		13.5	86.5	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.904	.892	.907	.955	.918	.000	.934

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011

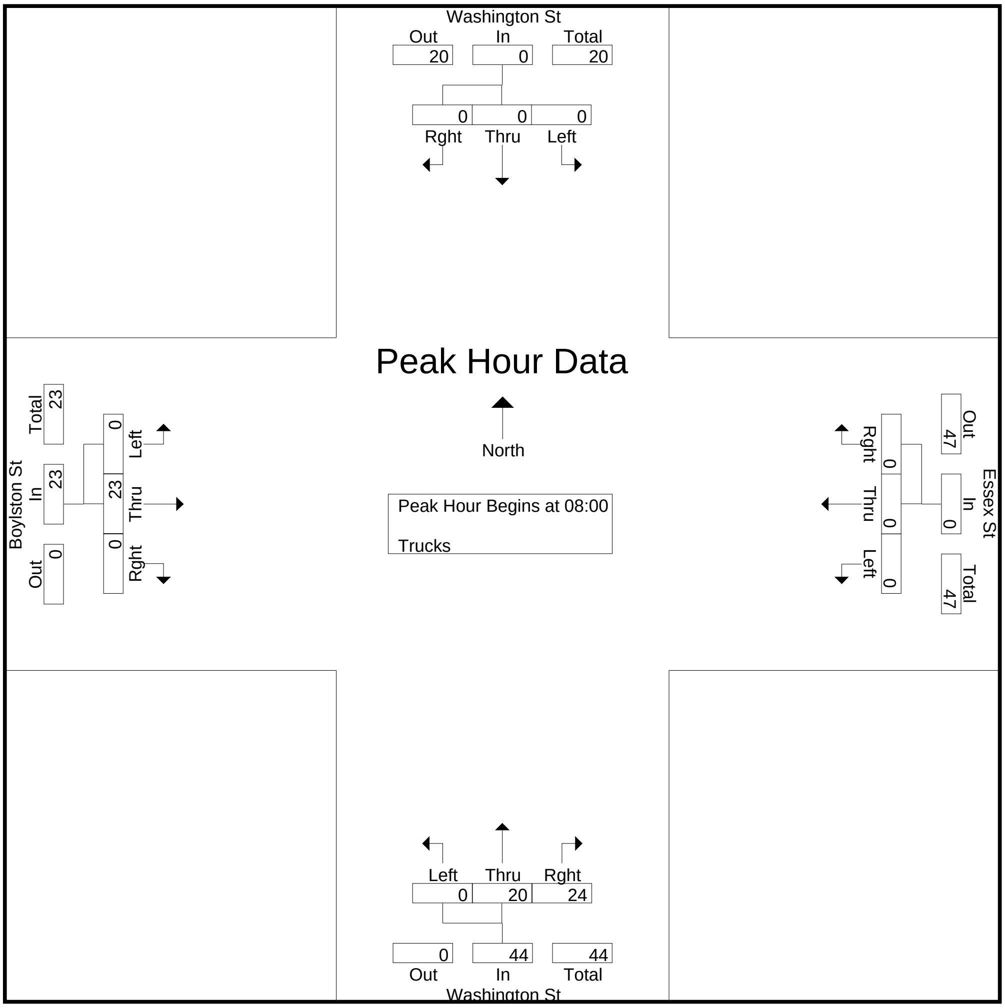
Groups Printed- Trucks

	Washington St From North			Essex St From East			Washington St From South			Boylston St From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
07:00	0	0	0	0	0	0	0	4	8	1	4	0	17
07:15	0	0	0	0	0	0	0	7	4	0	5	0	16
07:30	0	0	0	0	0	0	0	2	5	1	4	0	12
07:45	0	0	0	0	0	0	0	5	5	0	6	0	16
Total	0	0	0	0	0	0	0	18	22	2	19	0	61
08:00	0	0	0	0	0	0	0	8	4	0	3	0	15
08:15	0	0	0	0	0	0	0	2	9	0	9	0	20
08:30	0	0	0	0	0	0	0	5	6	0	4	0	15
08:45	0	0	0	0	0	0	0	5	5	0	7	0	17
Total	0	0	0	0	0	0	0	20	24	0	23	0	67
Grand Total	0	0	0	0	0	0	0	38	46	2	42	0	128
Apprch %	0	0	0	0	0	0	0	45.2	54.8	4.5	95.5	0	
Total %	0	0	0	0	0	0	0	29.7	35.9	1.6	32.8	0	

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	0	0	0	0	0	0	0	0	**8**	4	**12**	0	3	0	3	15
08:15	0	0	0	0	0	0	0	0	0	2	**9**	11	0	**9**	0	**9**	**20**
08:30	0	0	0	0	0	0	0	0	0	5	6	11	0	4	0	4	15
08:45	0	0	0	0	0	0	0	0	0	5	5	10	0	7	0	7	17
Total Volume	0	0	0	0	0	0	0	0	0	20	24	44	0	23	0	23	67
% App. Total	0	0	0		0	0	0		0	45.5	54.5		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.625	.667	.917	.000	.639	.000	.639	.838

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 2

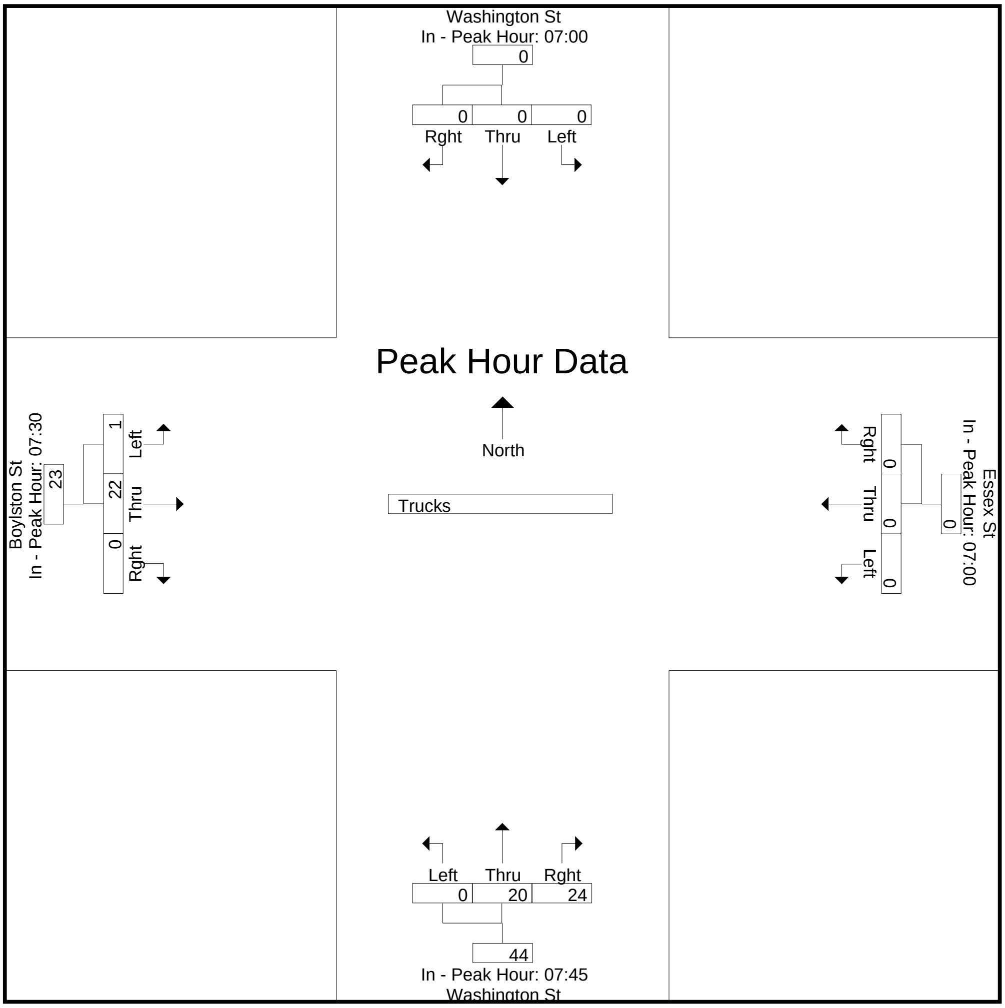


Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				07:00				07:45				07:30			
+0 mins.	0	0	0	0	0	0	0	0	0	5	5	10	**1**	4	0	5
+15 mins.	0	0	0	0	0	0	0	0	0	**8**	4	**12**	0	6	0	6
+30 mins.	0	0	0	0	0	0	0	0	0	2	**9**	11	0	3	0	3
+45 mins.	0	0	0	0	0	0	0	0	0	5	6	11	0	**9**	0	**9**
Total Volume	0	0	0	0	0	0	0	0	0	20	24	44	1	22	0	23
% App. Total	0	0	0		0	0	0		0	45.5	54.5		4.3	95.7	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.625	.667	.917	.250	.611	.000	.639

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

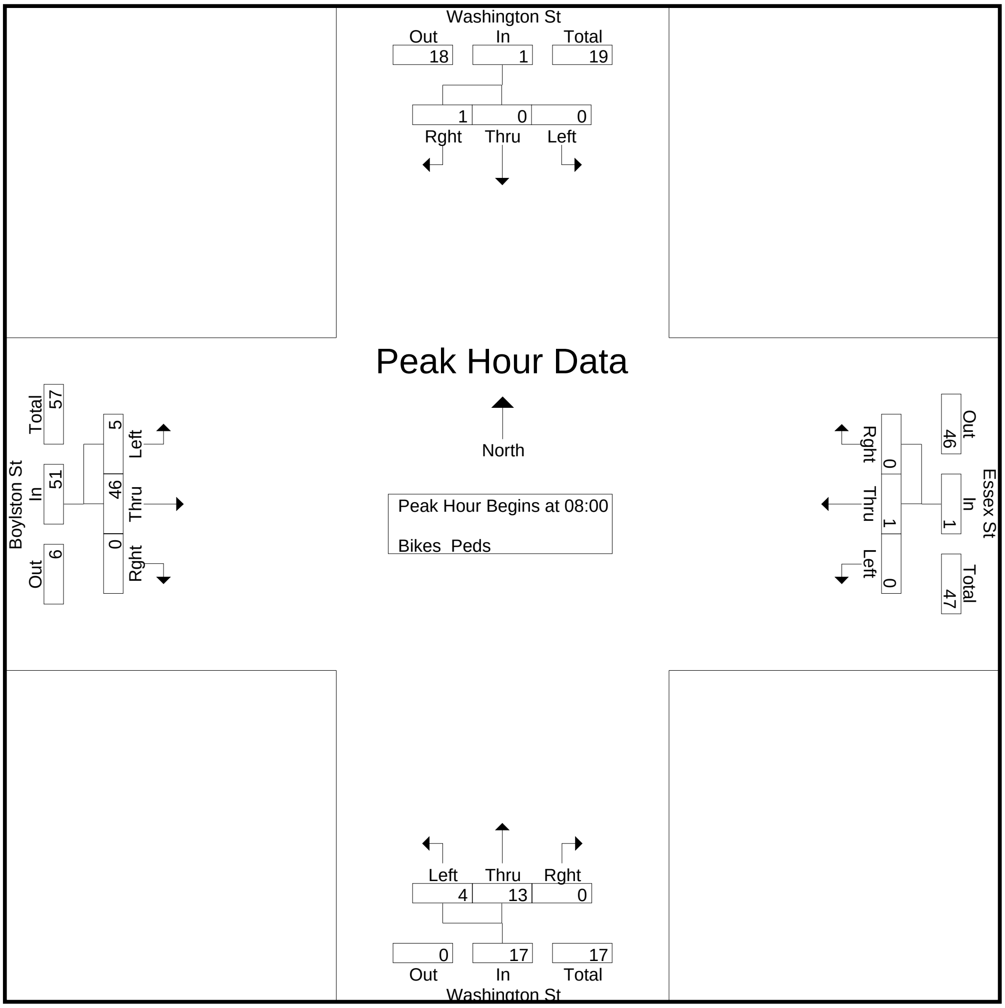
	Washington St From North				Essex St From East				Washington St From South				Boylston St From West						
Start Time	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	52	1	1	0	32	0	1	0	41	0	3	1	17	142	7	149
07:15	0	0	0	55	0	1	0	34	1	0	1	62	0	6	0	23	174	9	183
07:30	0	0	0	74	0	0	0	30	0	0	1	57	1	12	0	46	207	14	221
07:45	0	0	0	83	0	0	0	48	0	1	1	82	1	7	0	59	272	10	282
Total	0	0	0	264	1	2	0	144	1	2	3	242	2	28	1	145	795	40	835
08:00	0	0	1	112	0	0	0	34	1	3	0	95	1	6	0	57	298	12	310
08:15	0	0	0	79	0	0	0	34	2	2	0	96	1	10	0	49	258	15	273
08:30	0	0	0	100	0	0	0	30	0	3	0	98	2	15	0	64	292	20	312
08:45	0	0	0	112	0	1	0	23	1	5	0	132	1	15	0	66	333	23	356
Total	0	0	1	403	0	1	0	121	4	13	0	421	5	46	0	236	1181	70	1251
Grand Total	0	0	1	667	1	3	0	265	5	15	3	663	7	74	1	381	1976	110	2086
Apprch %	0	0	100		25	75	0		21.7	65.2	13		8.5	90.2	1.2				
Total %	0	0	0.9		0.9	2.7	0		4.5	13.6	2.7		6.4	67.3	0.9		94.7	5.3	

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	0	**1**	**1**	0	0	0	0	1	3	0	4	1	6	0	7	12
08:15	0	0	0	0	0	0	0	0	**2**	2	0	4	1	10	0	11	15
08:30	0	0	0	0	0	0	0	0	0	3	0	3	**2**	**15**	0	**17**	20
08:45	0	0	0	0	0	**1**	0	**1**	1	**5**	0	**6**	1	15	0	16	**23**
Total Volume	0	0	1	1	0	1	0	1	4	13	0	17	5	46	0	51	70
% App. Total	0	0	100		0	100	0		23.5	76.5	0		9.8	90.2	0		
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.500	.650	.000	.708	.625	.767	.000	.750	.761

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 2



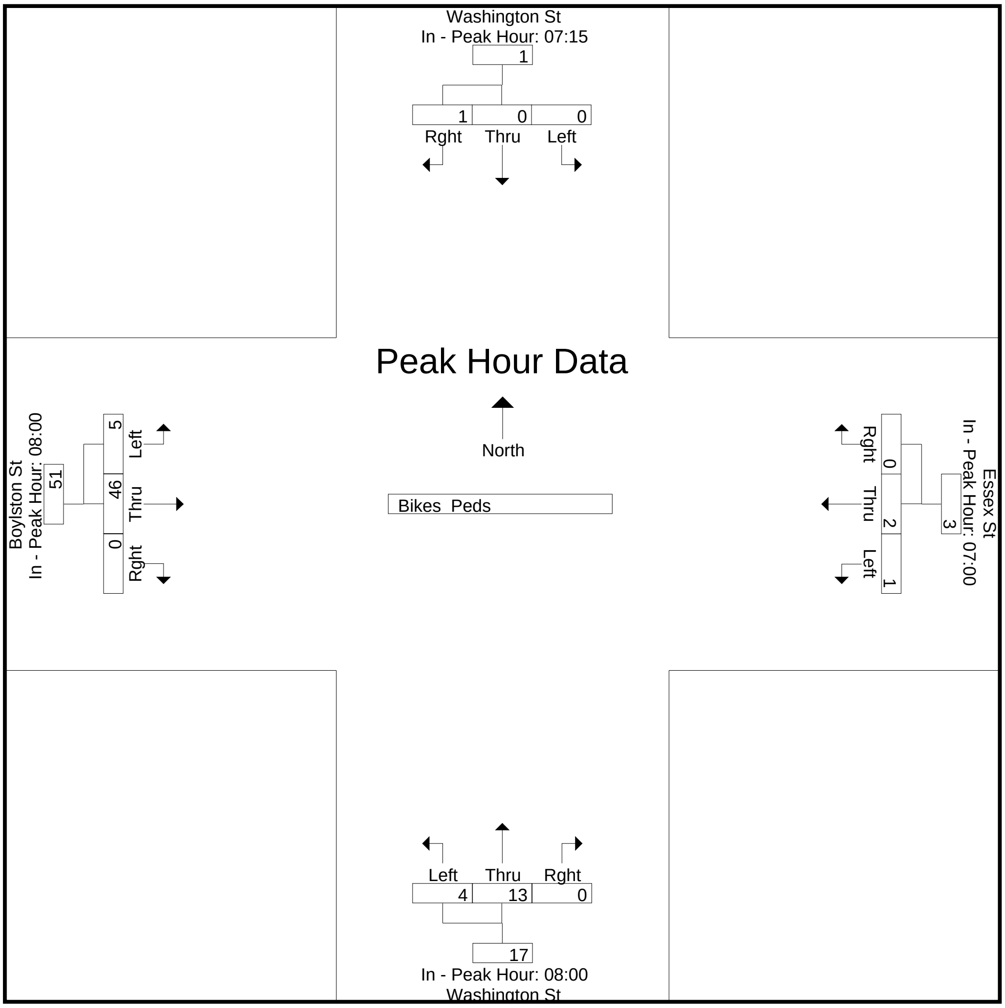
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15				07:00				08:00				08:00			
+0 mins.	0	0	0	0	**1**	**1**	0	**2**	1	3	0	4	1	6	0	7
+15 mins.	0	0	0	0	0	1	0	1	**2**	2	0	4	1	10	0	11
+30 mins.	0	0	0	0	0	0	0	0	0	3	0	3	**2**	**15**	0	**17**
+45 mins.	0	0	**1**	**1**	0	0	0	0	1	**5**	0	**6**	1	15	0	16
Total Volume	0	0	1	1	1	2	0	3	4	13	0	17	5	46	0	51
% App. Total	0	0	100		33.3	66.7	0		23.5	76.5	0		9.8	90.2	0	
PHF	.000	.000	.250	.250	.250	.500	.000	.375	.500	.650	.000	.708	.625	.767	.000	.750

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Drizzle

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

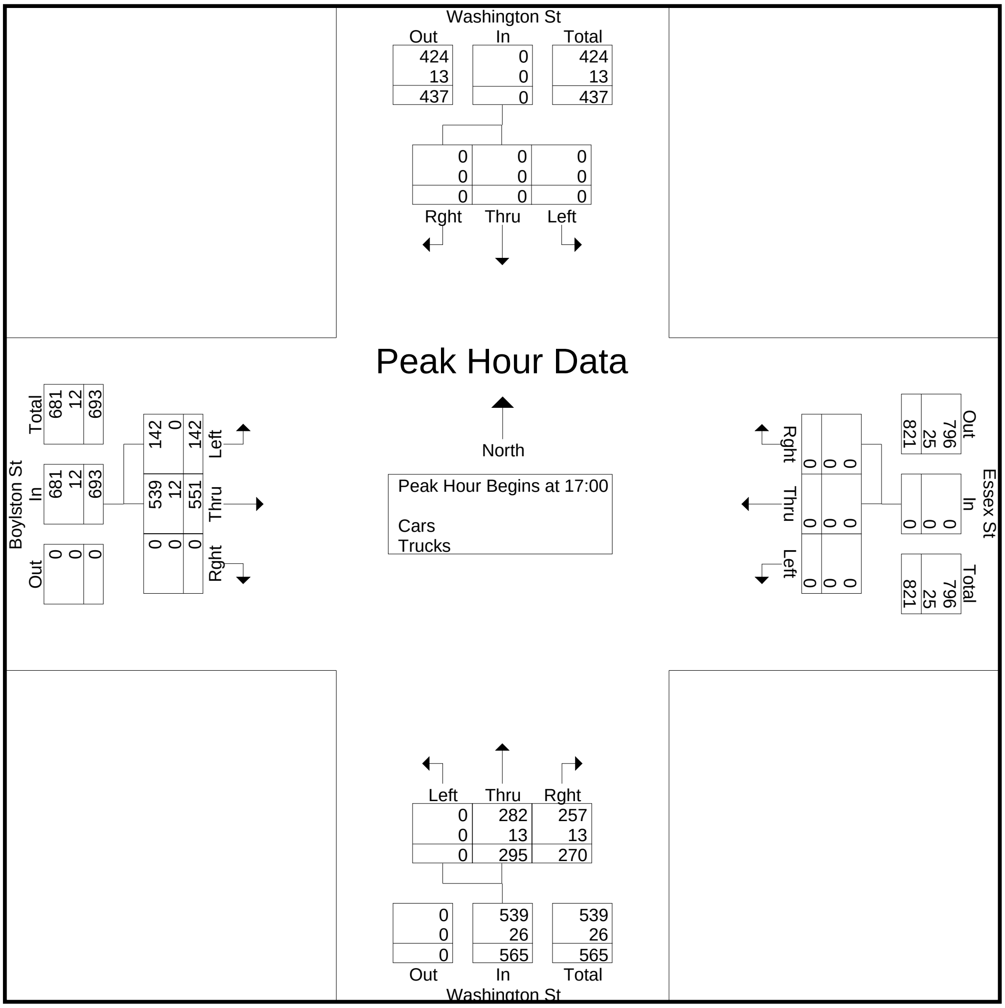
Groups Printed- Cars - Trucks

	Washington St From North			Essex St From East			Washington St From South			Boylston St From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
16:00	0	0	0	0	0	0	0	65	60	29	131	0	285
16:15	0	0	0	0	0	0	0	44	63	36	157	0	300
16:30	0	0	0	0	0	0	0	58	62	22	117	0	259
16:45	0	0	0	0	0	0	0	57	56	37	144	0	294
Total	0	0	0	0	0	0	0	224	241	124	549	0	1138
17:00	0	0	0	0	0	0	0	60	52	28	126	0	266
17:15	0	0	0	0	0	0	0	61	59	50	147	0	317
17:30	0	0	0	0	0	0	0	86	69	39	134	0	328
17:45	0	0	0	0	0	0	0	88	90	25	144	0	347
Total	0	0	0	0	0	0	0	295	270	142	551	0	1258
Grand Total	0	0	0	0	0	0	0	519	511	266	1100	0	2396
Apprch %	0	0	0	0	0	0	0	50.4	49.6	19.5	80.5	0	
Total %	0	0	0	0	0	0	0	21.7	21.3	11.1	45.9	0	
Cars	0	0	0	0	0	0	0	496	485	265	1073	0	2319
% Cars	0	0	0	0	0	0	0	95.6	94.9	99.6	97.5	0	96.8
Trucks	0	0	0	0	0	0	0	23	26	1	27	0	77
% Trucks	0	0	0	0	0	0	0	4.4	5.1	0.4	2.5	0	3.2

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	0	0	0	0	0	0	0	0	60	52	112	28	126	0	154	266
17:15	0	0	0	0	0	0	0	0	0	61	59	120	**50**	**147**	0	**197**	317
17:30	0	0	0	0	0	0	0	0	0	86	69	155	39	134	0	173	328
17:45	0	0	0	0	0	0	0	0	0	**88**	**90**	**178**	25	144	0	169	**347**
Total Volume	0	0	0	0	0	0	0	0	0	295	270	565	142	551	0	693	1258
% App. Total	0	0	0		0	0	0		0	52.2	47.8		20.5	79.5	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.838	.750	.794	.710	.937	.000	.879	.906
Cars	0	0	0	0	0	0	0	0	0	282	257	539	142	539	0	681	1220
% Cars	0	0	0	0	0	0	0	0	0	95.6	95.2	95.4	100	97.8	0	98.3	97.0
Trucks	0	0	0	0	0	0	0	0	0	13	13	26	0	12	0	12	38
% Trucks	0	0	0	0	0	0	0	0	0	4.4	4.8	4.6	0	2.2	0	1.7	3.0

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011



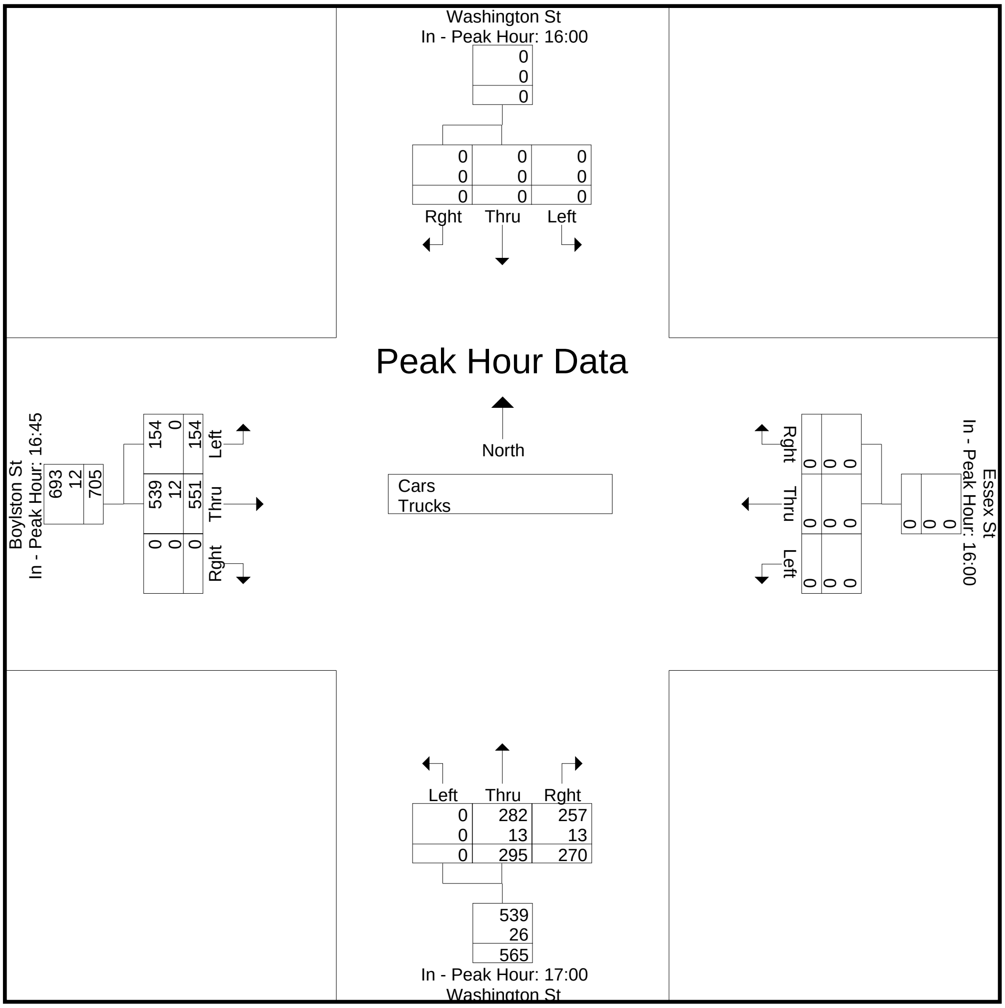
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:00				17:00				16:45			
+0 mins.	0	0	0	0	0	0	0	0	0	60	52	112	37	144	0	181
+15 mins.	0	0	0	0	0	0	0	0	0	61	59	120	28	126	0	154
+30 mins.	0	0	0	0	0	0	0	0	0	86	69	155	**50**	**147**	0	**197**
+45 mins.	0	0	0	0	0	0	0	0	0	**88**	**90**	**178**	39	134	0	173
Total Volume	0	0	0	0	0	0	0	0	0	295	270	565	154	551	0	705
% App. Total	0	0	0		0	0	0		0	52.2	47.8		21.8	78.2	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.838	.750	.794	.770	.937	.000	.895
Cars	0	0	0	0	0	0	0	0	0	282	257	539	154	539	0	693
% Cars	0	0	0	0	0	0	0	0	0	95.6	95.2	95.4	100	97.8	0	98.3
Trucks	0	0	0	0	0	0	0	0	0	13	13	26	0	12	0	12
% Trucks	0	0	0	0	0	0	0	0	0	4.4	4.8	4.6	0	2.2	0	1.7

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

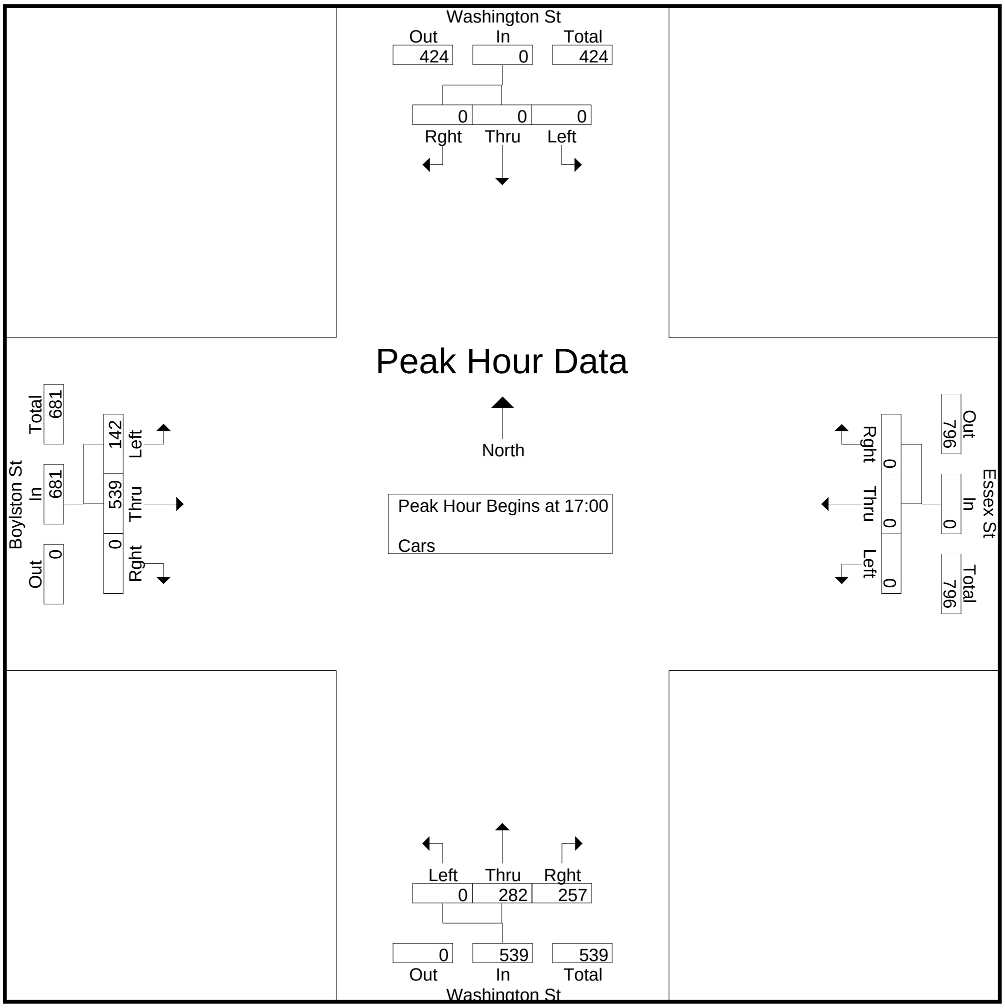
Groups Printed- Cars

	Washington St From North			Essex St From East			Washington St From South			Boylston St From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
16:00	0	0	0	0	0	0	0	62	57	29	125	0	273
16:15	0	0	0	0	0	0	0	42	60	35	152	0	289
16:30	0	0	0	0	0	0	0	55	59	22	115	0	251
16:45	0	0	0	0	0	0	0	55	52	37	142	0	286
Total	0	0	0	0	0	0	0	214	228	123	534	0	1099
17:00	0	0	0	0	0	0	0	54	49	28	123	0	254
17:15	0	0	0	0	0	0	0	59	55	50	144	0	308
17:30	0	0	0	0	0	0	0	84	67	39	130	0	320
17:45	0	0	0	0	0	0	0	85	86	25	142	0	338
Total	0	0	0	0	0	0	0	282	257	142	539	0	1220
Grand Total	0	0	0	0	0	0	0	496	485	265	1073	0	2319
Apprch %	0	0	0	0	0	0	0	50.6	49.4	19.8	80.2	0	
Total %	0	0	0	0	0	0	0	21.4	20.9	11.4	46.3	0	

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	0	0	0	0	0	0	0	0	54	49	103	28	123	0	151	254
17:15	0	0	0	0	0	0	0	0	0	59	55	114	**50**	**144**	0	**194**	308
17:30	0	0	0	0	0	0	0	0	0	84	67	151	39	130	0	169	320
17:45	0	0	0	0	0	0	0	0	0	**85**	**86**	**171**	25	142	0	167	**338**
Total Volume	0	0	0	0	0	0	0	0	0	282	257	539	142	539	0	681	1220
% App. Total	0	0	0		0	0	0		0	52.3	47.7		20.9	79.1	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.829	.747	.788	.710	.936	.000	.878	.902

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011



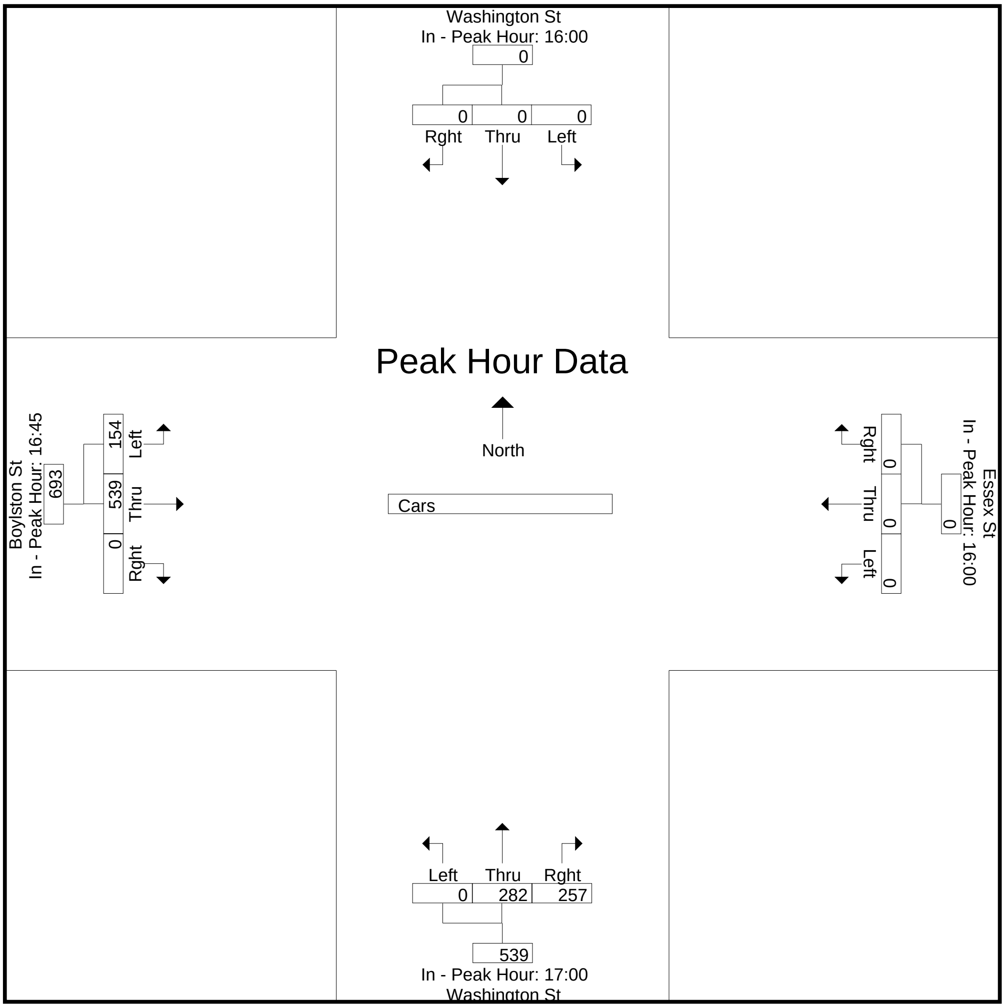
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:00				17:00				16:45			
+0 mins.	0	0	0	0	0	0	0	0	0	54	49	103	37	142	0	179
+15 mins.	0	0	0	0	0	0	0	0	0	59	55	114	28	123	0	151
+30 mins.	0	0	0	0	0	0	0	0	0	84	67	151	**50**	**144**	0	**194**
+45 mins.	0	0	0	0	0	0	0	0	0	**85**	**86**	**171**	39	130	0	169
Total Volume	0	0	0	0	0	0	0	0	0	282	257	539	154	539	0	693
% App. Total	0	0	0		0	0	0		0	52.3	47.7		22.2	77.8	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.829	.747	.788	.770	.936	.000	.893

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

Groups Printed- Trucks

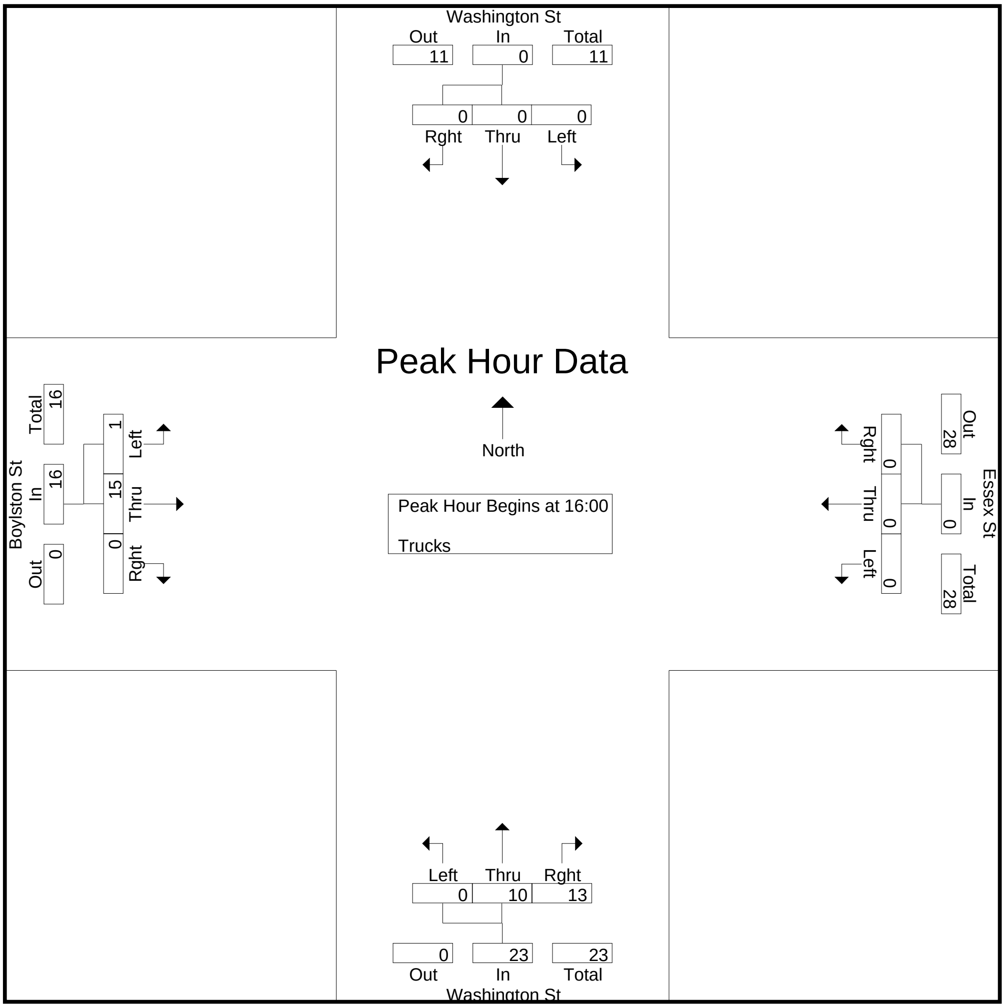
	Washington St From North			Essex St From East			Washington St From South			Boylston St From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
16:00	0	0	0	0	0	0	0	3	3	0	6	0	12
16:15	0	0	0	0	0	0	0	2	3	1	5	0	11
16:30	0	0	0	0	0	0	0	3	3	0	2	0	8
16:45	0	0	0	0	0	0	0	2	4	0	2	0	8
Total	0	0	0	0	0	0	0	10	13	1	15	0	39
17:00	0	0	0	0	0	0	0	6	3	0	3	0	12
17:15	0	0	0	0	0	0	0	2	4	0	3	0	9
17:30	0	0	0	0	0	0	0	2	2	0	4	0	8
17:45	0	0	0	0	0	0	0	3	4	0	2	0	9
Total	0	0	0	0	0	0	0	13	13	0	12	0	38
Grand Total	0	0	0	0	0	0	0	23	26	1	27	0	77
Apprch %	0	0	0	0	0	0	0	46.9	53.1	3.6	96.4	0	
Total %	0	0	0	0	0	0	0	29.9	33.8	1.3	35.1	0	

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	0	0	0	0	0	0	0	0	**3**	3	**6**	0	**6**	0	**6**	**12**
16:15	0	0	0	0	0	0	0	0	0	2	3	5	**1**	5	0	6	11
16:30	0	0	0	0	0	0	0	0	0	3	3	6	0	2	0	2	8
16:45	0	0	0	0	0	0	0	0	0	2	**4**	6	0	2	0	2	8
Total Volume	0	0	0	0	0	0	0	0	0	10	13	23	1	15	0	16	39
% App. Total	0	0	0		0	0	0		0	43.5	56.5		6.2	93.8	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.833	.813	.958	.250	.625	.000	.667	.813

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 2



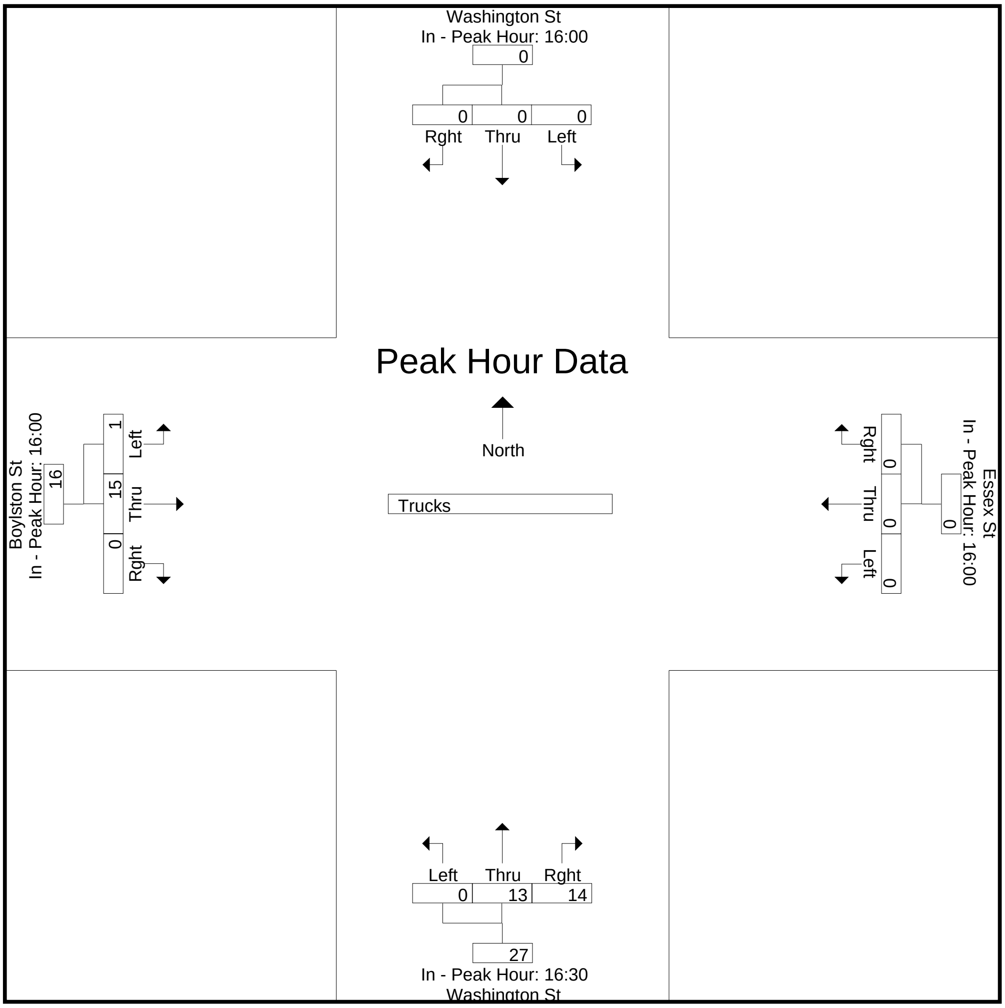
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:00				16:30				16:00			
+0 mins.	0	0	0	0	0	0	0	0	0	3	3	6	0	**6**	0	**6**
+15 mins.	0	0	0	0	0	0	0	0	0	2	**4**	6	**1**	5	0	6
+30 mins.	0	0	0	0	0	0	0	0	0	**6**	3	**9**	0	2	0	2
+45 mins.	0	0	0	0	0	0	0	0	0	2	4	6	0	2	0	2
Total Volume	0	0	0	0	0	0	0	0	0	13	14	27	1	15	0	16
% App. Total	0	0	0		0	0	0		0	48.1	51.9		6.2	93.8	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.542	.875	.750	.250	.625	.000	.667

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

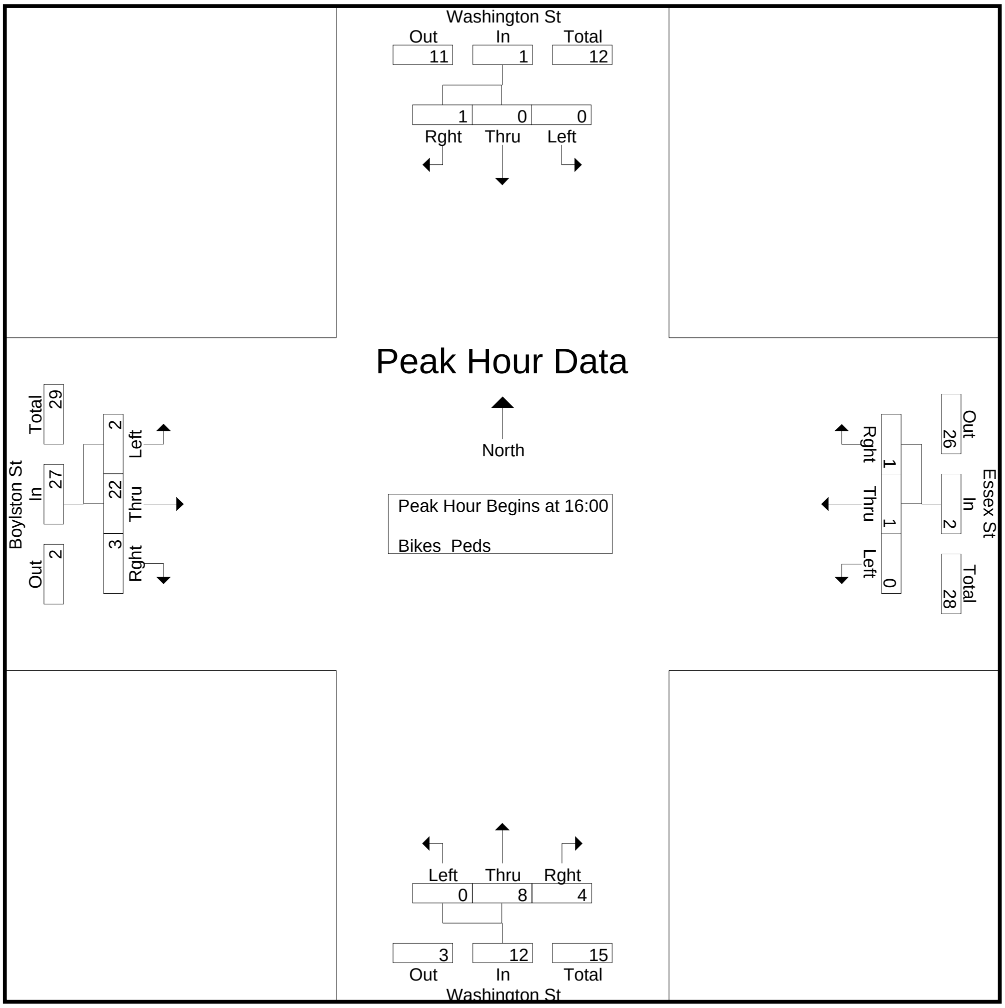
	Washington St From North				Essex St From East				Washington St From South				Boylston St From West						
Start Time	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	0	0	0	92	0	0	0	54	0	4	1	114	1	2	0	86	346	8	354
16:15	0	0	0	98	0	1	0	65	0	1	2	112	0	6	3	85	360	13	373
16:30	0	0	1	115	0	0	1	45	0	1	1	113	0	5	0	60	333	9	342
16:45	0	0	0	89	0	0	0	51	0	2	0	134	1	9	0	79	353	12	365
Total	0	0	1	394	0	1	1	215	0	8	4	473	2	22	3	310	1392	42	1434
17:00	0	0	0	125	0	0	0	59	0	1	0	139	0	5	1	48	371	7	378
17:15	0	0	0	107	0	1	0	44	0	0	0	169	1	3	0	102	422	5	427
17:30	0	0	0	103	1	0	0	44	0	2	0	114	3	7	1	103	364	14	378
17:45	0	0	0	114	0	0	0	51	1	2	0	109	0	2	0	62	336	5	341
Total	0	0	0	449	1	1	0	198	1	5	0	531	4	17	2	315	1493	31	1524
Grand Total	0	0	1	843	1	2	1	413	1	13	4	1004	6	39	5	625	2885	73	2958
Apprch %	0	0	100		25	50	25		5.6	72.2	22.2		12	78	10				
Total %	0	0	1.4		1.4	2.7	1.4		1.4	17.8	5.5		8.2	53.4	6.8		97.5	2.5	

	Washington St From North				Essex St From East				Washington St From South				Boylston St From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	0	0	0	0	0	0	0	0	0	**4**	1	**5**	**1**	2	0	3	8
16:15	0	0	0	0	0	**1**	0	**1**	0	1	**2**	3	0	6	**3**	9	**13**
16:30	0	0	**1**	**1**	0	0	**1**	1	0	1	1	2	0	5	0	5	9
16:45	0	0	0	0	0	0	0	0	0	2	0	2	1	**9**	0	**10**	12
Total Volume	0	0	1	1	0	1	1	2	0	8	4	12	2	22	3	27	42
% App. Total	0	0	100		0	50	50		0	66.7	33.3		7.4	81.5	11.1		
PHF	.000	.000	.250	.250	.000	.250	.250	.500	.000	.500	.500	.600	.500	.611	.250	.675	.808

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 2



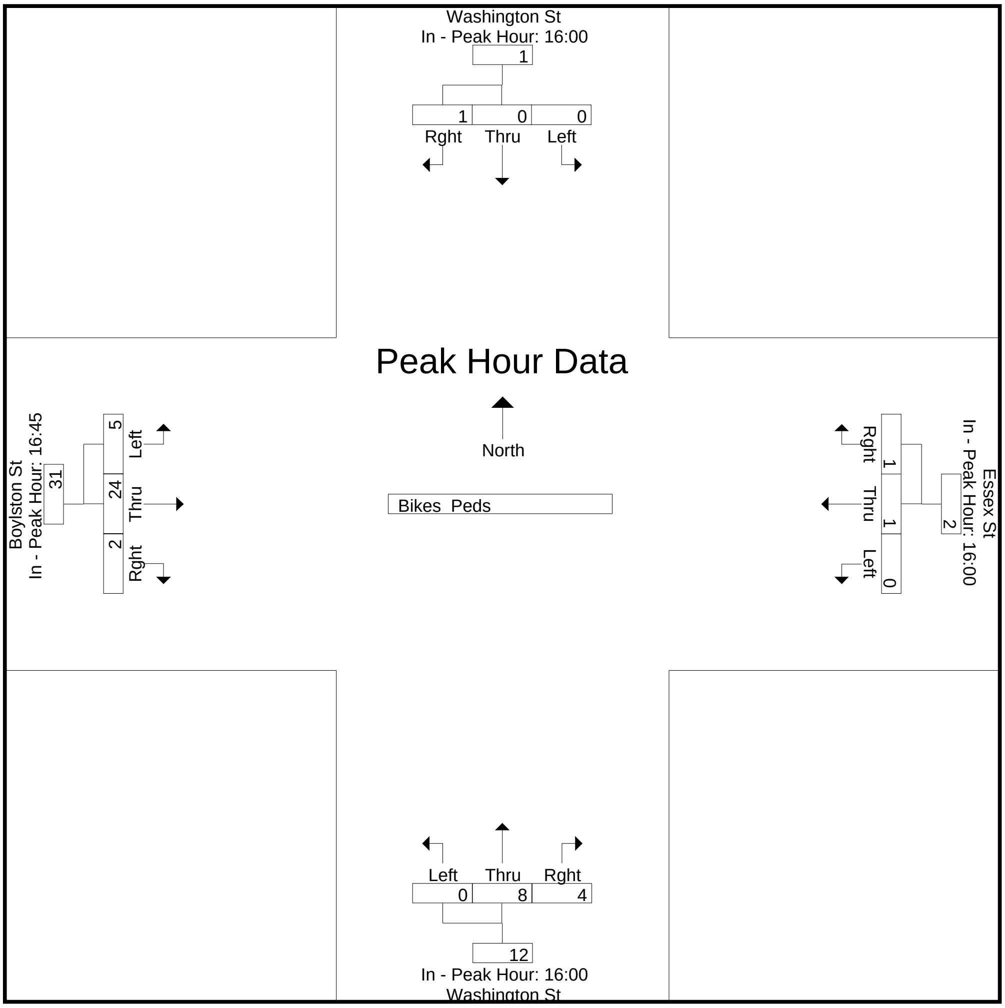
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:00				16:00				16:45			
+0 mins.	0	0	0	0	0	0	0	0	0	**4**	1	**5**	1	**9**	0	10
+15 mins.	0	0	0	0	0	**1**	0	**1**	0	1	**2**	3	0	5	**1**	6
+30 mins.	0	0	**1**	**1**	0	0	**1**	1	0	1	1	2	1	3	0	4
+45 mins.	0	0	0	0	0	0	0	0	0	2	0	2	**3**	7	1	**11**
Total Volume	0	0	1	1	0	1	1	2	0	8	4	12	5	24	2	31
% App. Total	0	0	100		0	50	50		0	66.7	33.3		16.1	77.4	6.5	
PHF	.000	.000	.250	.250	.000	.250	.250	.500	.000	.500	.500	.600	.417	.667	.500	.705

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street: Boylston St / Essex St
City/State : Boston, MA
Weather : Clear

File Name : 61470002
Site Code : 61470002
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars - Trucks

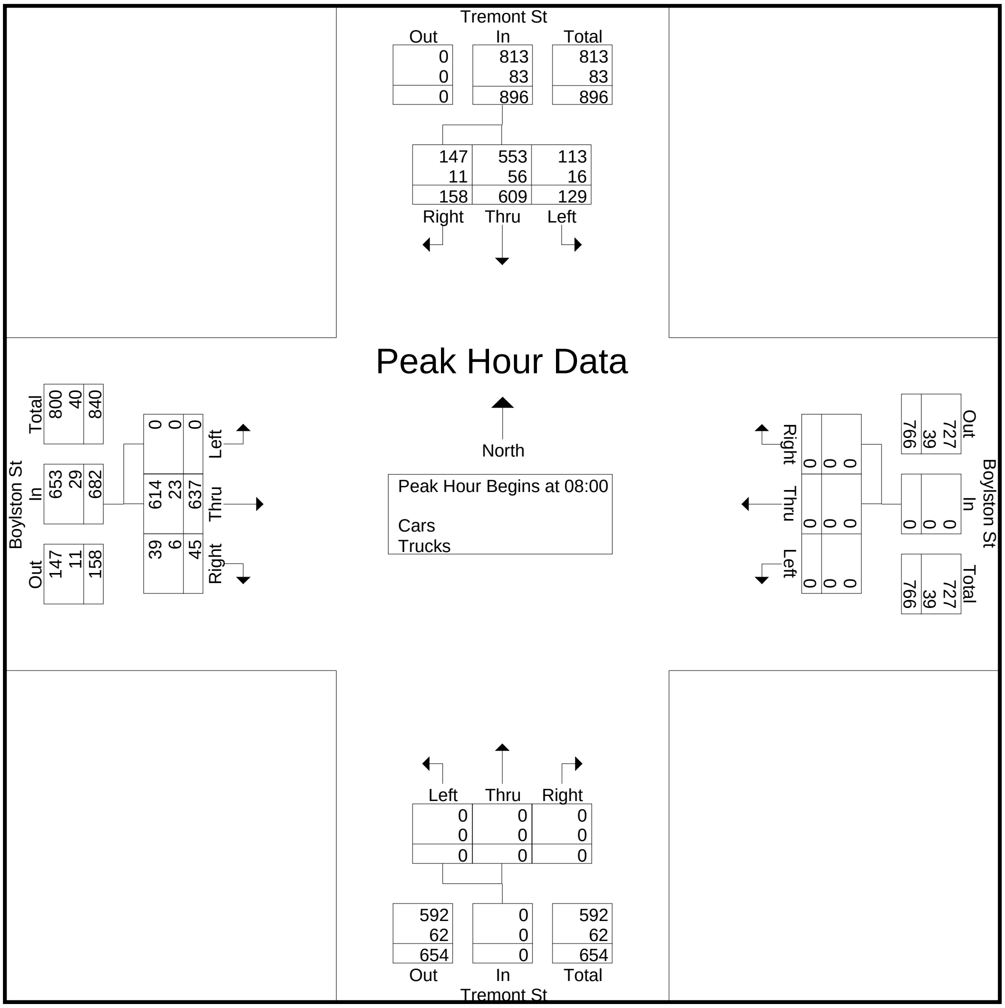
	Tremont St From North			**Boylston St From East**			**Tremont St From South**			**Boylston St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	28	88	22	0	0	0	0	0	0	0	69	13	220
07:15	23	84	27	0	0	0	0	0	0	0	82	16	232
07:30	32	126	28	0	0	0	0	0	0	0	110	18	314
07:45	24	157	38	0	0	0	0	0	0	0	163	16	398
Total	107	455	115	0	0	0	0	0	0	0	424	63	1164
08:00	23	167	32	0	0	0	0	0	0	0	146	10	378
08:15	38	142	39	0	0	0	0	0	0	0	136	18	373
08:30	39	160	49	0	0	0	0	0	0	0	168	8	424
08:45	29	140	38	0	0	0	0	0	0	0	187	9	403
Total	129	609	158	0	0	0	0	0	0	0	637	45	1578
Grand Total	236	1064	273	0	0	0	0	0	0	0	1061	108	2742
Apprch %	15	67.6	17.4	0	0	0	0	0	0	0	90.8	9.2	
Total %	8.6	38.8	10	0	0	0	0	0	0	0	38.7	3.9	
Cars	209	963	255	0	0	0	0	0	0	0	1019	98	2544
% Cars	88.6	90.5	93.4	0	0	0	0	0	0	0	96	90.7	92.8
Trucks	27	101	18	0	0	0	0	0	0	0	42	10	198
% Trucks	11.4	9.5	6.6	0	0	0	0	0	0	0	4	9.3	7.2

	Tremont St From North				**Boylston St From East**				**Tremont St From South**				**Boylston St 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	23	**167**	32	222	0	0	0	0	0	0	0	0	0	146	10	156	378
08:15	38	142	39	219	0	0	0	0	0	0	0	0	0	136	**18**	154	373
08:30	**39**	160	**49**	**248**	0	0	0	0	0	0	0	0	0	168	8	176	**424**
08:45	29	140	38	207	0	0	0	0	0	0	0	0	0	**187**	9	**196**	403
Total Volume	129	609	158	896	0	0	0	0	0	0	0	0	0	637	45	682	1578
% App. Total	14.4	68	17.6		0	0	0		0	0	0		0	93.4	6.6		
PHF	.827	.912	.806	.903	.000	.000	.000	.000	.000	.000	.000	.000	.000	.852	.625	.870	.930
Cars	113	553	147	813	0	0	0	0	0	0	0	0	0	614	39	653	1466
% Cars	87.6	90.8	93.0	90.7	0	0	0	0	0	0	0	0	0	96.4	86.7	95.7	92.9
Trucks	16	56	11	83	0	0	0	0	0	0	0	0	0	23	6	29	112
% Trucks	12.4	9.2	7.0	9.3	0	0	0	0	0	0	0	0	0	3.6	13.3	4.3	7.1

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



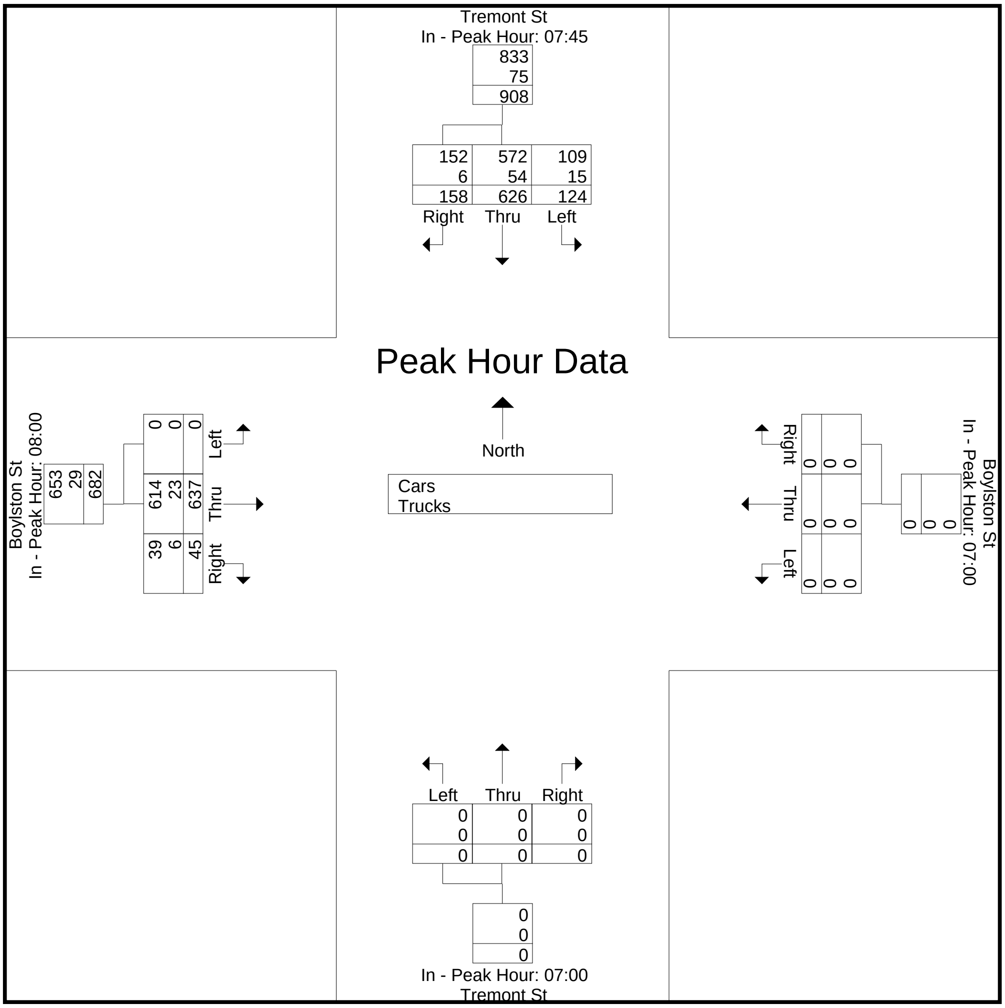
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45				07:00				07:00				08:00			
+0 mins.	24	157	38	219	0	0	0	0	0	0	0	0	0	146	10	156
+15 mins.	23	**167**	32	222	0	0	0	0	0	0	0	0	0	136	**18**	154
+30 mins.	38	142	39	219	0	0	0	0	0	0	0	0	0	168	8	176
+45 mins.	**39**	160	**49**	**248**	0	0	0	0	0	0	0	0	0	**187**	9	**196**
Total Volume	124	626	158	908	0	0	0	0	0	0	0	0	0	637	45	682
% App. Total	13.7	68.9	17.4		0	0	0		0	0	0		0	93.4	6.6	
PHF	.795	.937	.806	.915	.000	.000	.000	.000	.000	.000	.000	.000	.000	.852	.625	.870
Cars	109	572	152	833	0	0	0	0	0	0	0	0	0	614	39	653
% Cars	87.9	91.4	96.2	91.7	0	0	0	0	0	0	0	0	0	96.4	86.7	95.7
Trucks	15	54	6	75	0	0	0	0	0	0	0	0	0	23	6	29
% Trucks	12.1	8.6	3.8	8.3	0	0	0	0	0	0	0	0	0	3.6	13.3	4.3

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars

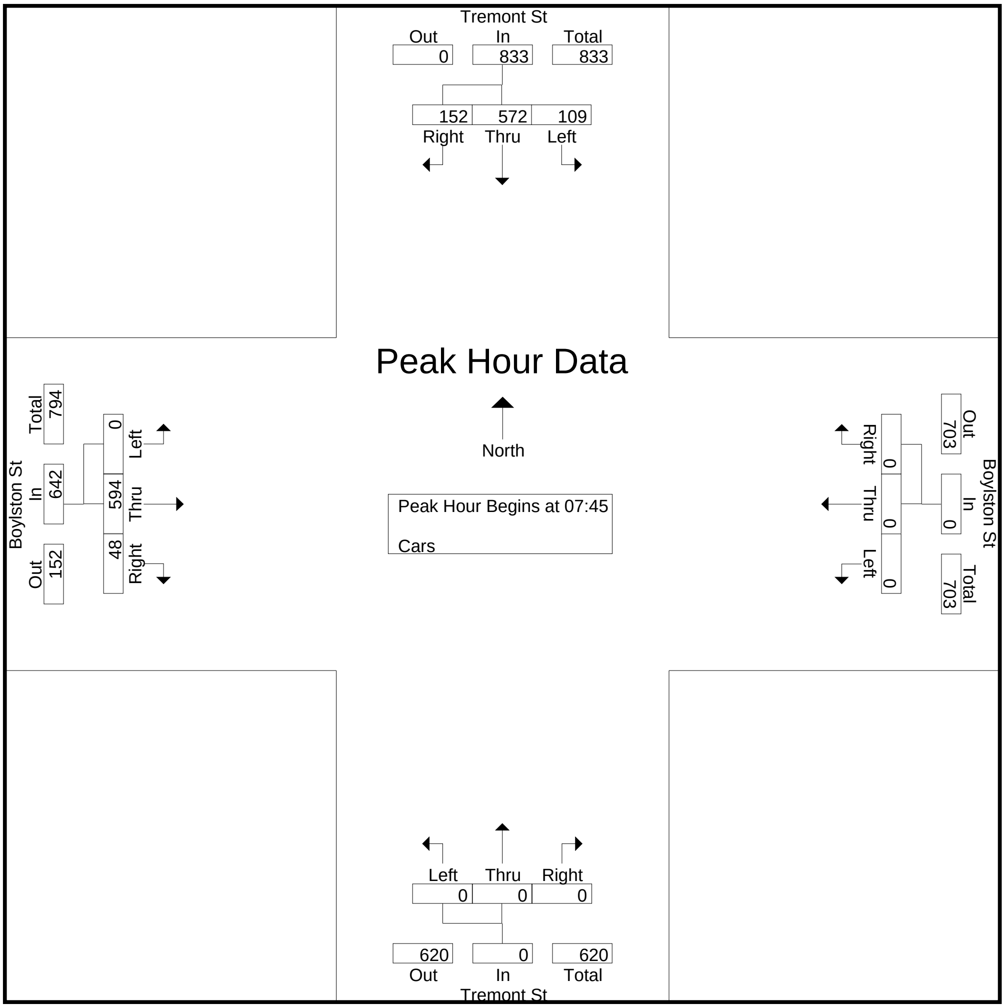
	Tremont St From North			Boylston St From East			Tremont St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	26	77	22	0	0	0	0	0	0	0	63	11	199
07:15	19	77	21	0	0	0	0	0	0	0	76	16	209
07:30	30	111	28	0	0	0	0	0	0	0	106	16	291
07:45	21	145	37	0	0	0	0	0	0	0	160	16	379
Total	96	410	108	0	0	0	0	0	0	0	405	59	1078
08:00	20	149	30	0	0	0	0	0	0	0	142	8	349
08:15	34	138	37	0	0	0	0	0	0	0	130	18	357
08:30	34	140	48	0	0	0	0	0	0	0	162	6	390
08:45	25	126	32	0	0	0	0	0	0	0	180	7	370
Total	113	553	147	0	0	0	0	0	0	0	614	39	1466
Grand Total	209	963	255	0	0	0	0	0	0	0	1019	98	2544
Apprch %	14.6	67.5	17.9	0	0	0	0	0	0	0	91.2	8.8	
Total %	8.2	37.9	10	0	0	0	0	0	0	0	40.1	3.9	

	Tremont St From North				Boylston St From East				Tremont St From South				Boylston St 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 07:45																	
07:45	21	145	37	203	0	0	0	0	0	0	0	0	0	160	16	**176**	379
08:00	20	**149**	30	199	0	0	0	0	0	0	0	0	0	142	8	150	349
08:15	**34**	138	37	209	0	0	0	0	0	0	0	0	0	130	**18**	148	357
08:30	34	140	**48**	**222**	0	0	0	0	0	0	0	0	0	**162**	6	168	**390**
Total Volume	109	572	152	833	0	0	0	0	0	0	0	0	0	594	48	642	1475
% App. Total	13.1	68.7	18.2		0	0	0		0	0	0		0	92.5	7.5		
PHF	.801	.960	.792	.938	.000	.000	.000	.000	.000	.000	.000	.000	.000	.917	.667	.912	.946

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



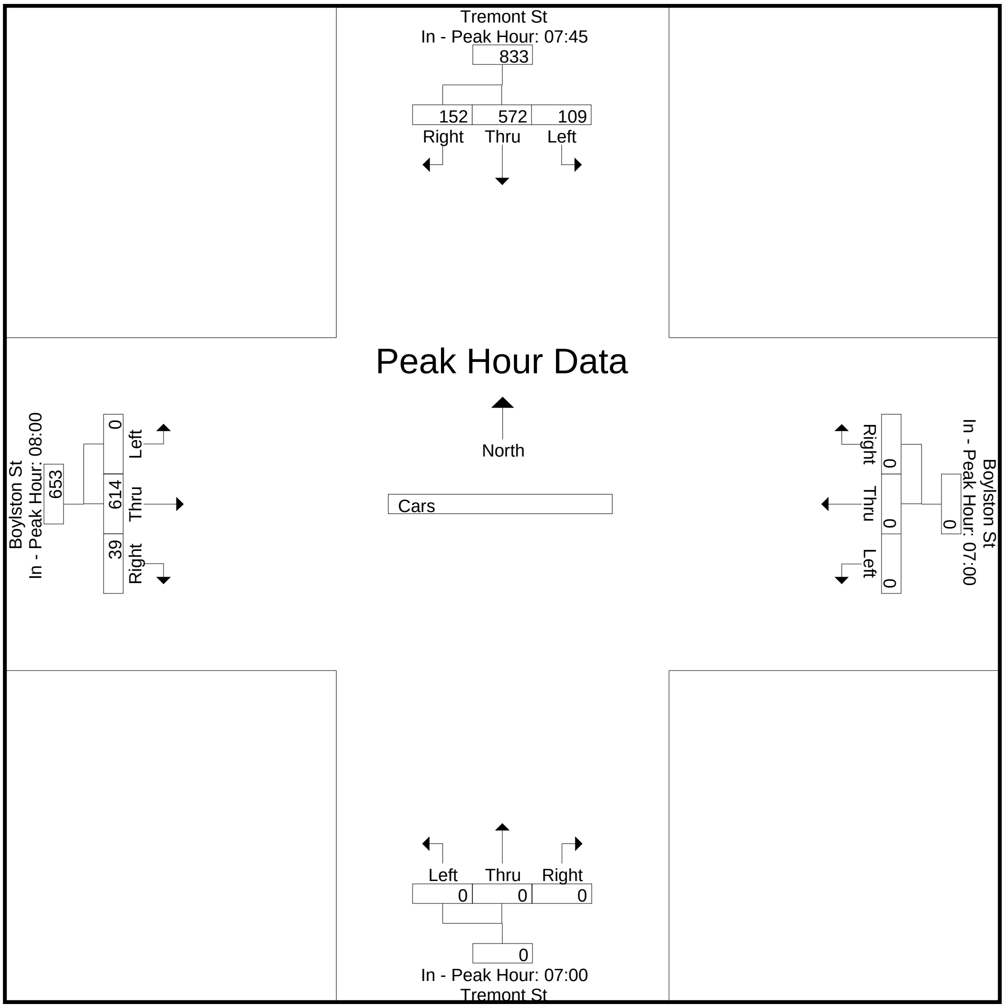
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45				07:00				07:00				08:00			
+0 mins.	21	145	37	203	0	0	0	0	0	0	0	0	0	142	8	150
+15 mins.	20	**149**	30	199	0	0	0	0	0	0	0	0	0	130	**18**	148
+30 mins.	**34**	138	37	209	0	0	0	0	0	0	0	0	0	162	6	168
+45 mins.	34	140	**48**	**222**	0	0	0	0	0	0	0	0	0	**180**	7	**187**
Total Volume	109	572	152	833	0	0	0	0	0	0	0	0	0	614	39	653
% App. Total	13.1	68.7	18.2		0	0	0		0	0	0		0	94	6	
PHF	.801	.960	.792	.938	.000	.000	.000	.000	.000	.000	.000	.000	.000	.853	.542	.873

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

Groups Printed- Trucks

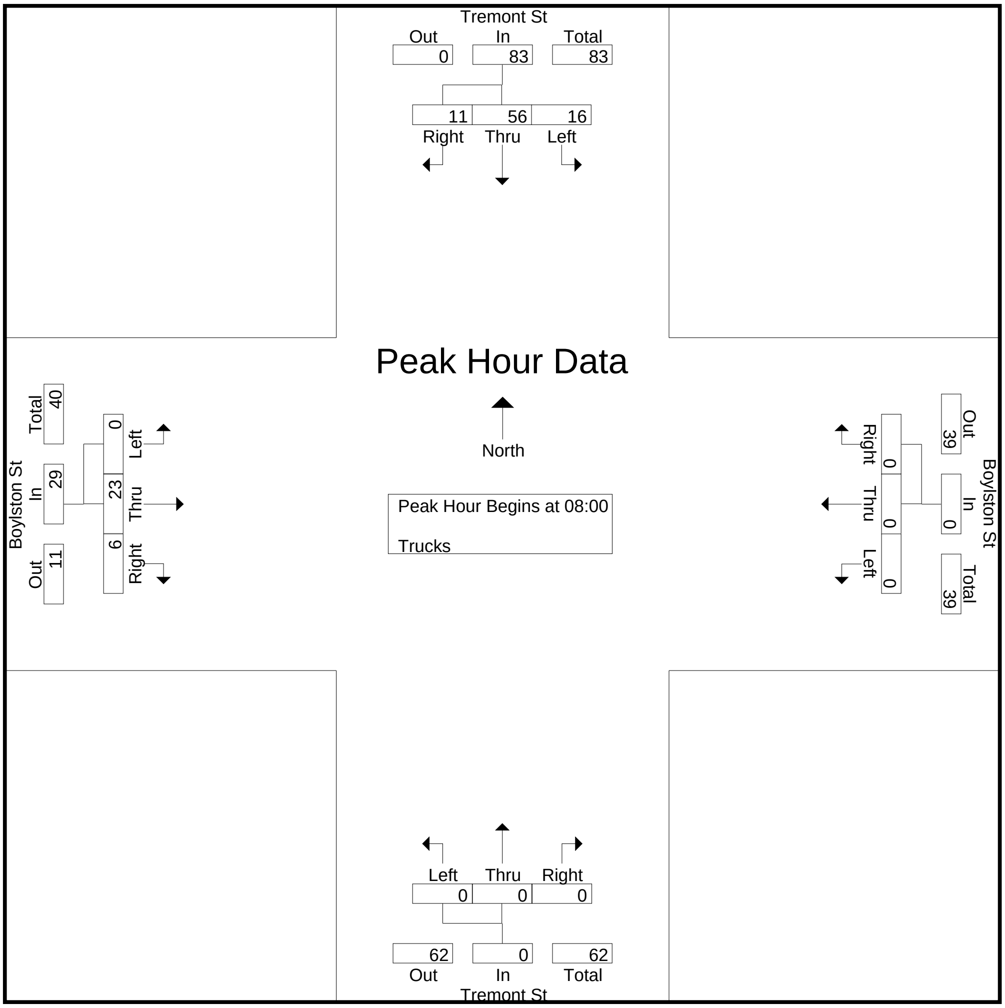
	Tremont St From North			**Boylston St From East**			**Tremont St From South**			**Boylston St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	2	11	0	0	0	0	0	0	0	0	6	2	21
07:15	4	7	6	0	0	0	0	0	0	0	6	0	23
07:30	2	15	0	0	0	0	0	0	0	0	4	2	23
07:45	3	12	1	0	0	0	0	0	0	0	3	0	19
Total	11	45	7	0	0	0	0	0	0	0	19	4	86
08:00	3	18	2	0	0	0	0	0	0	0	4	2	29
08:15	4	4	2	0	0	0	0	0	0	0	6	0	16
08:30	5	20	1	0	0	0	0	0	0	0	6	2	34
08:45	4	14	6	0	0	0	0	0	0	0	7	2	33
Total	16	56	11	0	0	0	0	0	0	0	23	6	112
Grand Total	27	101	18	0	0	0	0	0	0	0	42	10	198
Apprch %	18.5	69.2	12.3	0	0	0	0	0	0	0	80.8	19.2	
Total %	13.6	51	9.1	0	0	0	0	0	0	0	21.2	5.1	

	Tremont St From North				**Boylston St From East**				**Tremont St From South**				**Boylston St 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	3	18	2	23	0	0	0	0	0	0	0	0	0	4	**2**	6	29
08:15	4	4	2	10	0	0	0	0	0	0	0	0	0	6	0	6	16
08:30	**5**	**20**	1	**26**	0	0	0	0	0	0	0	0	0	6	2	8	**34**
08:45	4	14	**6**	24	0	0	0	0	0	0	0	0	0	**7**	2	**9**	33
Total Volume	16	56	11	83	0	0	0	0	0	0	0	0	0	23	6	29	112
% App. Total	19.3	67.5	13.3		0	0	0		0	0	0		0	79.3	20.7		
PHF	.800	.700	.458	.798	.000	.000	.000	.000	.000	.000	.000	.000	.000	.821	.750	.806	.824

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

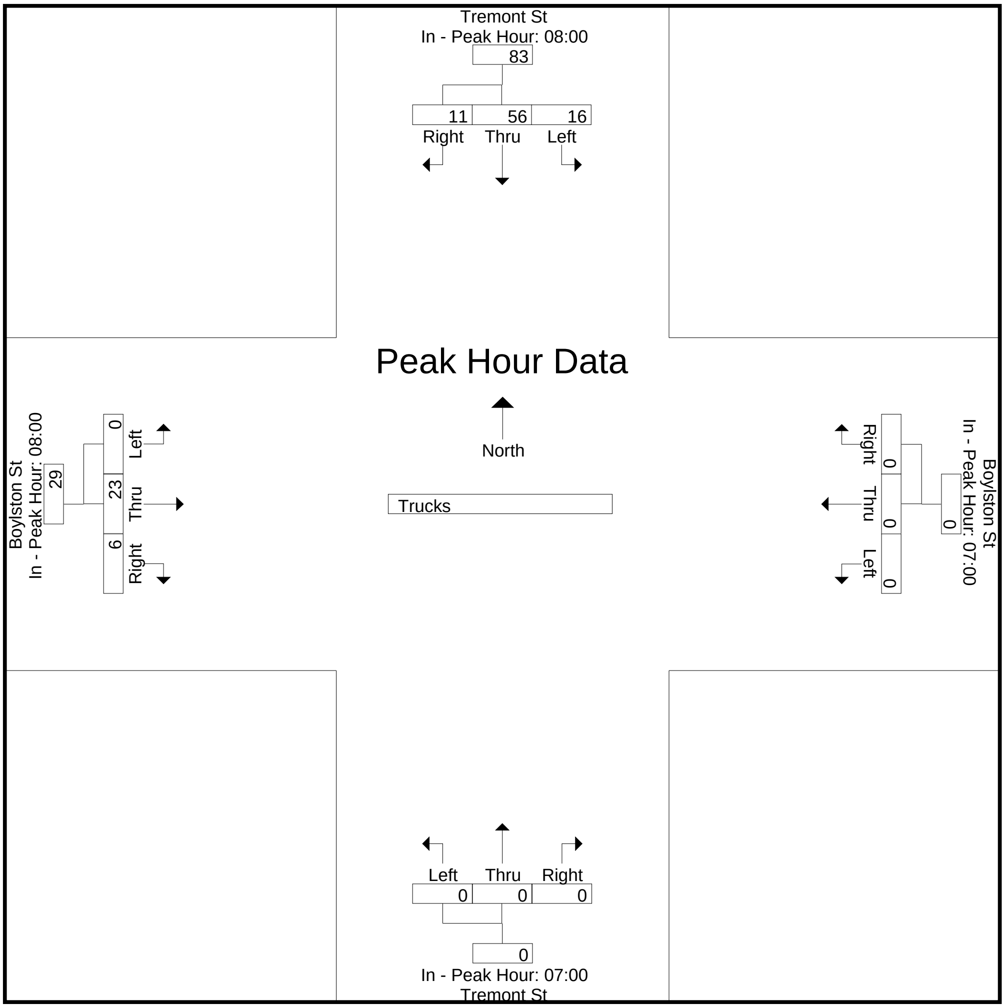
	08:00				07:00				07:00				08:00			
+0 mins.	3	18	2	23	0	0	0	0	0	0	0	0	0	4	**2**	6
+15 mins.	4	4	2	10	0	0	0	0	0	0	0	0	0	6	0	6
+30 mins.	**5**	**20**	1	**26**	0	0	0	0	0	0	0	0	0	6	2	8
+45 mins.	4	14	**6**	24	0	0	0	0	0	0	0	0	0	**7**	2	**9**
Total Volume	16	56	11	83	0	0	0	0	0	0	0	0	0	23	6	29
% App. Total	19.3	67.5	13.3		0	0	0		0	0	0		0	79.3	20.7	
PHF	.800	.700	.458	.798	.000	.000	.000	.000	.000	.000	.000	.000	.000	.821	.750	.806

Accurate Counts

978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

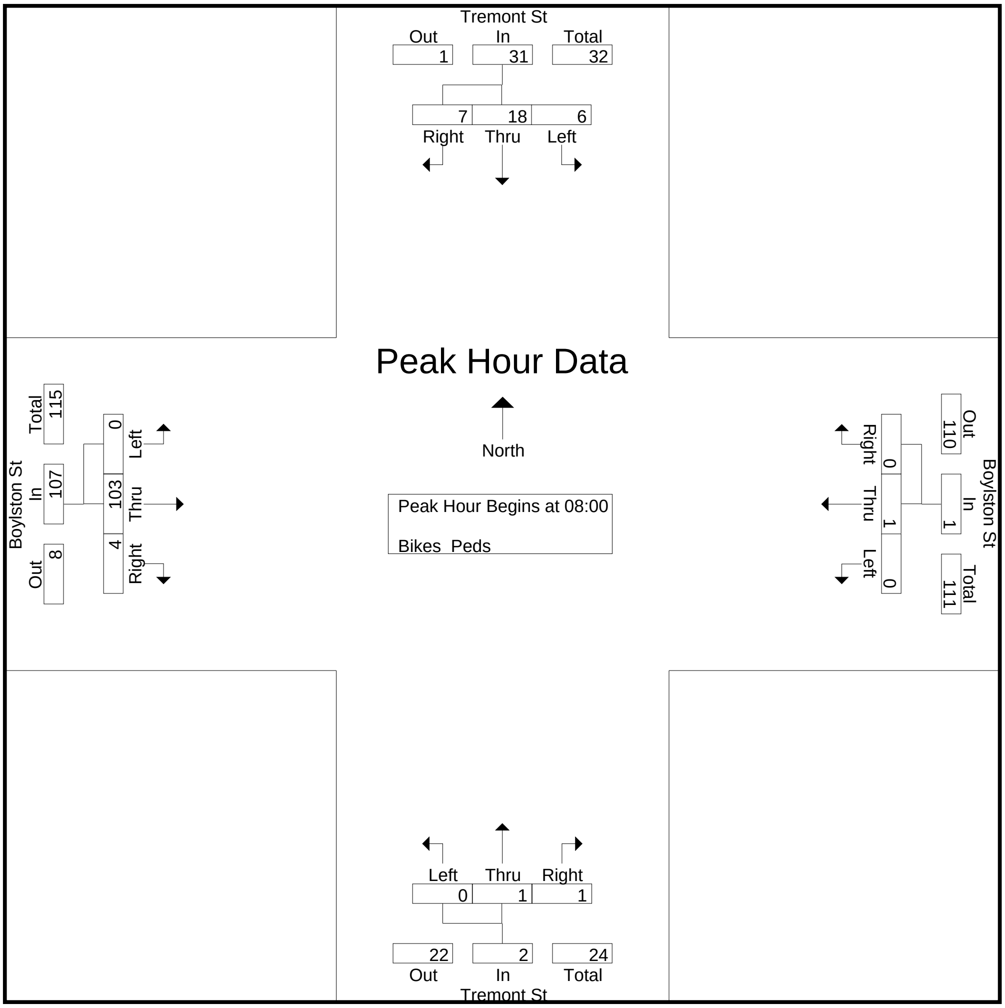
	Tremont St From North				**Boylston St From East**				**Tremont St From South**				**Boylston St From West**						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	1	0	0	36	0	1	0	28	0	0	0	9	1	4	2	72	145	9	154
07:15	0	1	0	37	0	0	0	51	0	0	0	16	0	8	2	57	161	11	172
07:30	0	1	0	52	0	0	0	47	0	0	0	22	0	6	0	81	202	7	209
07:45	3	6	0	88	0	0	7	114	0	0	0	73	0	8	2	129	404	26	430
Total	4	8	0	213	0	1	7	240	0	0	0	120	1	26	6	339	912	53	965
08:00	2	6	1	63	0	0	0	123	0	0	0	58	0	26	4	139	383	39	422
08:15	2	2	0	113	0	0	0	142	0	0	0	75	0	22	0	171	501	26	527
08:30	2	7	5	122	0	1	0	127	0	1	0	61	0	30	0	124	434	46	480
08:45	0	3	1	182	0	0	0	159	0	0	1	75	0	25	0	232	648	30	678
Total	6	18	7	480	0	1	0	551	0	1	1	269	0	103	4	666	1966	141	2107
Grand Total	10	26	7	693	0	2	7	791	0	1	1	389	1	129	10	1005	2878	194	3072
Apprch %	23.3	60.5	16.3		0	22.2	77.8		0	50	50		0.7	92.1	7.1				
Total %	5.2	13.4	3.6		0	1	3.6		0	0.5	0.5		0.5	66.5	5.2		93.7	6.3	

	Tremont St From North				**Boylston St From East**				**Tremont St From South**				**Boylston St 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	**2**	6	1	9	0	0	0	0	0	0	0	0	0	26	**4**	**30**	39
08:15	2	2	0	4	0	0	0	0	0	0	0	0	0	22	0	22	26
08:30	2	**7**	**5**	**14**	0	**1**	0	**1**	0	**1**	0	**1**	0	**30**	0	30	**46**
08:45	0	3	1	4	0	0	0	0	0	0	**1**	1	0	25	0	25	30
Total Volume	6	18	7	31	0	1	0	1	0	1	1	2	0	103	4	107	141
% App. Total	19.4	58.1	22.6		0	100	0		0	50	50		0	96.3	3.7		
PHF	.750	.643	.350	.554	.000	.250	.000	.250	.000	.250	.250	.500	.000	.858	.250	.892	.766

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



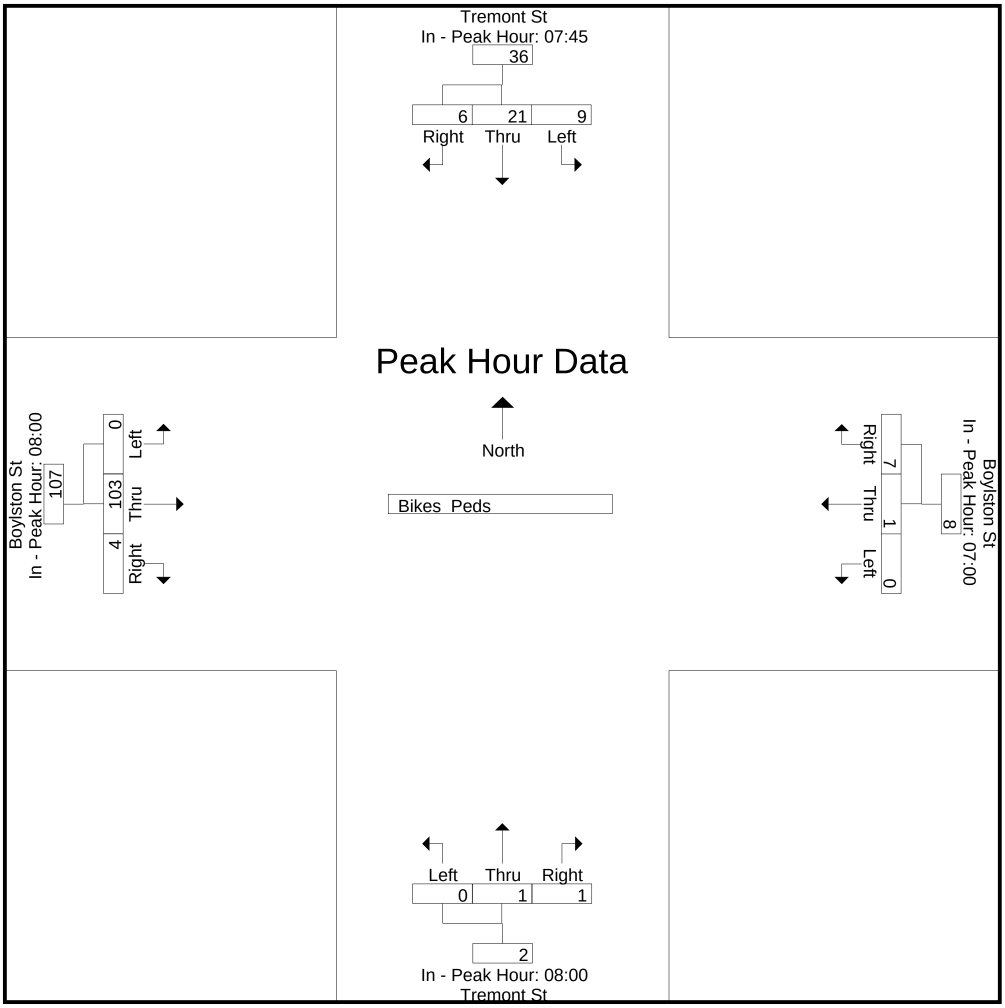
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45				07:00				08:00				08:00			
+0 mins.	**3**	6	0	9	0	**1**	0	1	0	0	0	0	0	26	**4**	**30**
+15 mins.	2	6	1	9	0	0	0	0	0	0	0	0	0	22	0	22
+30 mins.	2	2	0	4	0	0	0	0	0	**1**	0	**1**	0	**30**	0	30
+45 mins.	2	**7**	**5**	**14**	0	0	**7**	**7**	0	0	**1**	1	0	25	0	25
Total Volume	9	21	6	36	0	1	7	8	0	1	1	2	0	103	4	107
% App. Total	25	58.3	16.7		0	12.5	87.5		0	50	50		0	96.3	3.7	
PHF	.750	.750	.300	.643	.000	.250	.250	.286	.000	.250	.250	.500	.000	.858	.250	.892

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Drizzle

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

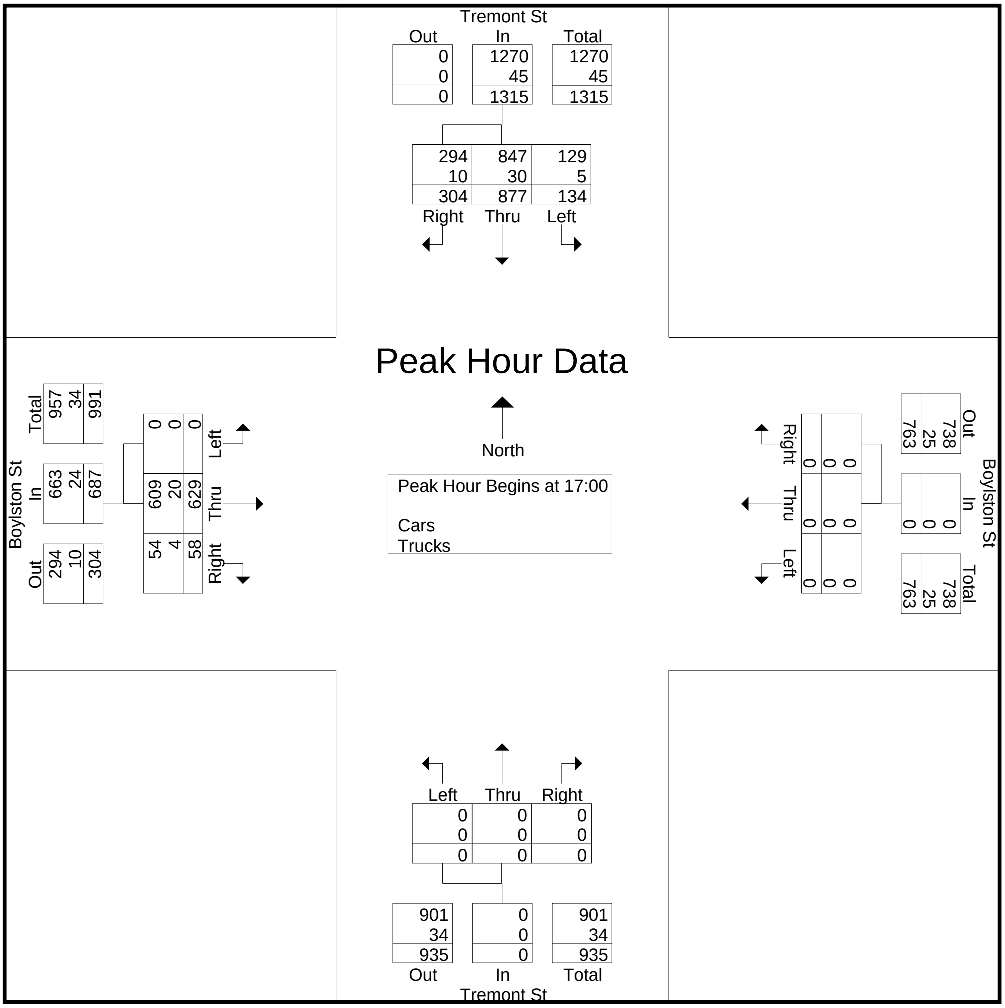
Groups Printed- Cars - Trucks

	Tremont St From North			Boylston St From East			Tremont St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	25	174	54	0	0	0	0	0	0	0	128	9	390
16:15	43	220	61	0	0	0	0	0	0	0	112	8	444
16:30	38	193	64	0	0	0	0	0	0	0	144	12	451
16:45	41	205	67	0	0	0	0	0	0	0	162	7	482
Total	147	792	246	0	0	0	0	0	0	0	546	36	1767
17:00	33	201	64	0	0	0	0	0	0	0	131	19	448
17:15	28	222	87	0	0	0	0	0	0	0	174	16	527
17:30	40	244	74	0	0	0	0	0	0	0	175	10	543
17:45	33	210	79	0	0	0	0	0	0	0	149	13	484
Total	134	877	304	0	0	0	0	0	0	0	629	58	2002
Grand Total	281	1669	550	0	0	0	0	0	0	0	1175	94	3769
Apprch %	11.2	66.8	22	0	0	0	0	0	0	0	92.6	7.4	
Total %	7.5	44.3	14.6	0	0	0	0	0	0	0	31.2	2.5	
Cars	267	1610	521	0	0	0	0	0	0	0	1134	89	3621
% Cars	95	96.5	94.7	0	0	0	0	0	0	0	96.5	94.7	96.1
Trucks	14	59	29	0	0	0	0	0	0	0	41	5	148
% Trucks	5	3.5	5.3	0	0	0	0	0	0	0	3.5	5.3	3.9

	Tremont St From North				Boylston St From East				Tremont St From South				Boylston St 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 17:00																	
17:00	33	201	64	298	0	0	0	0	0	0	0	0	0	131	**19**	150	448
17:15	28	222	**87**	337	0	0	0	0	0	0	0	0	0	174	16	**190**	527
17:30	**40**	**244**	74	**358**	0	0	0	0	0	0	0	0	0	**175**	10	185	**543**
17:45	33	210	79	322	0	0	0	0	0	0	0	0	0	149	13	162	484
Total Volume	134	877	304	1315	0	0	0	0	0	0	0	0	0	629	58	687	2002
% App. Total	10.2	66.7	23.1		0	0	0		0	0	0		0	91.6	8.4		
PHF	.838	.899	.874	.918	.000	.000	.000	.000	.000	.000	.000	.000	.000	.899	.763	.904	.922
Cars	129	847	294	1270	0	0	0	0	0	0	0	0	0	609	54	663	1933
% Cars	96.3	96.6	96.7	96.6	0	0	0	0	0	0	0	0	0	96.8	93.1	96.5	96.6
Trucks	5	30	10	45	0	0	0	0	0	0	0	0	0	20	4	24	69
% Trucks	3.7	3.4	3.3	3.4	0	0	0	0	0	0	0	0	0	3.2	6.9	3.5	3.4

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



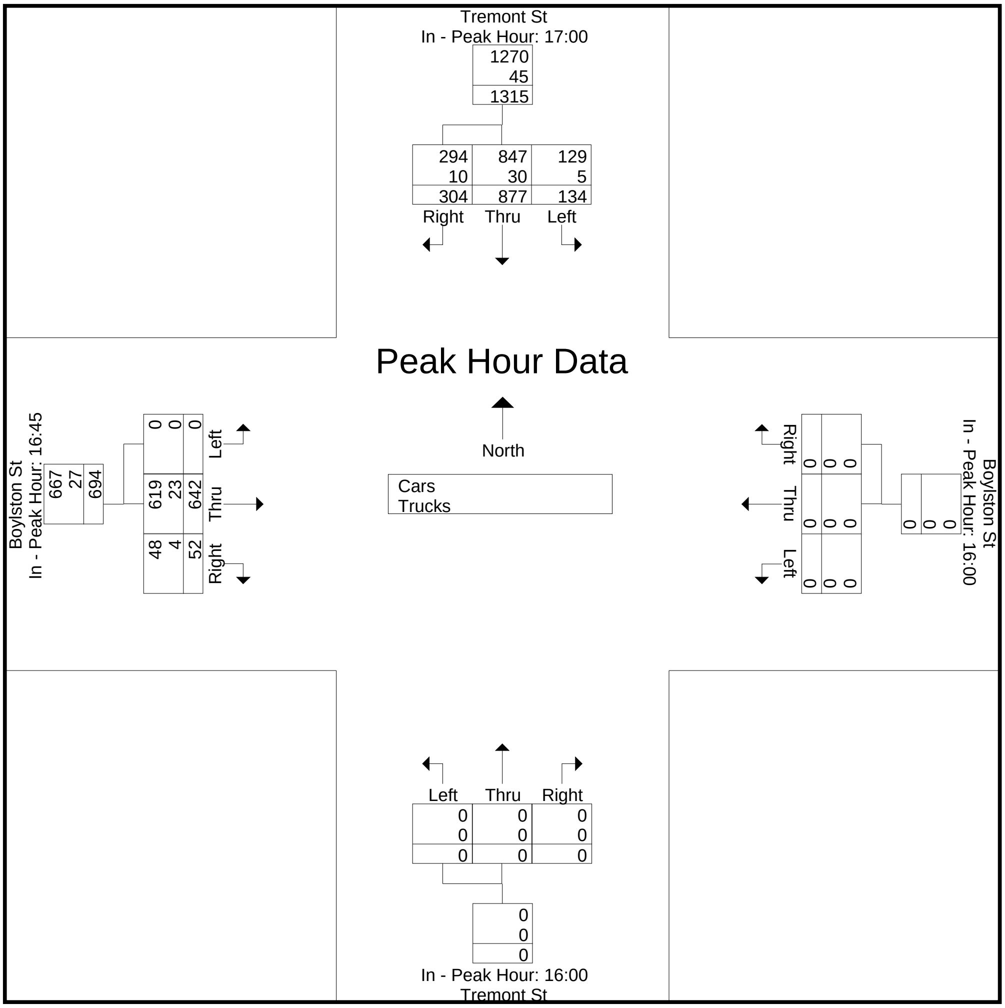
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:00				16:00				16:45			
+0 mins.	33	201	64	298	0	0	0	0	0	0	0	0	0	162	7	169
+15 mins.	28	222	**87**	337	0	0	0	0	0	0	0	0	0	131	**19**	150
+30 mins.	**40**	**244**	74	**358**	0	0	0	0	0	0	0	0	0	174	16	**190**
+45 mins.	33	210	79	322	0	0	0	0	0	0	0	0	0	**175**	10	185
Total Volume	134	877	304	1315	0	0	0	0	0	0	0	0	0	642	52	694
% App. Total	10.2	66.7	23.1		0	0	0		0	0	0		0	92.5	7.5	
PHF	.838	.899	.874	.918	.000	.000	.000	.000	.000	.000	.000	.000	.000	.917	.684	.913
Cars	129	847	294	1270	0	0	0	0	0	0	0	0	0	619	48	667
% Cars	96.3	96.6	96.7	96.6	0	0	0	0	0	0	0	0	0	96.4	92.3	96.1
Trucks	5	30	10	45	0	0	0	0	0	0	0	0	0	23	4	27
% Trucks	3.7	3.4	3.3	3.4	0	0	0	0	0	0	0	0	0	3.6	7.7	3.9

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

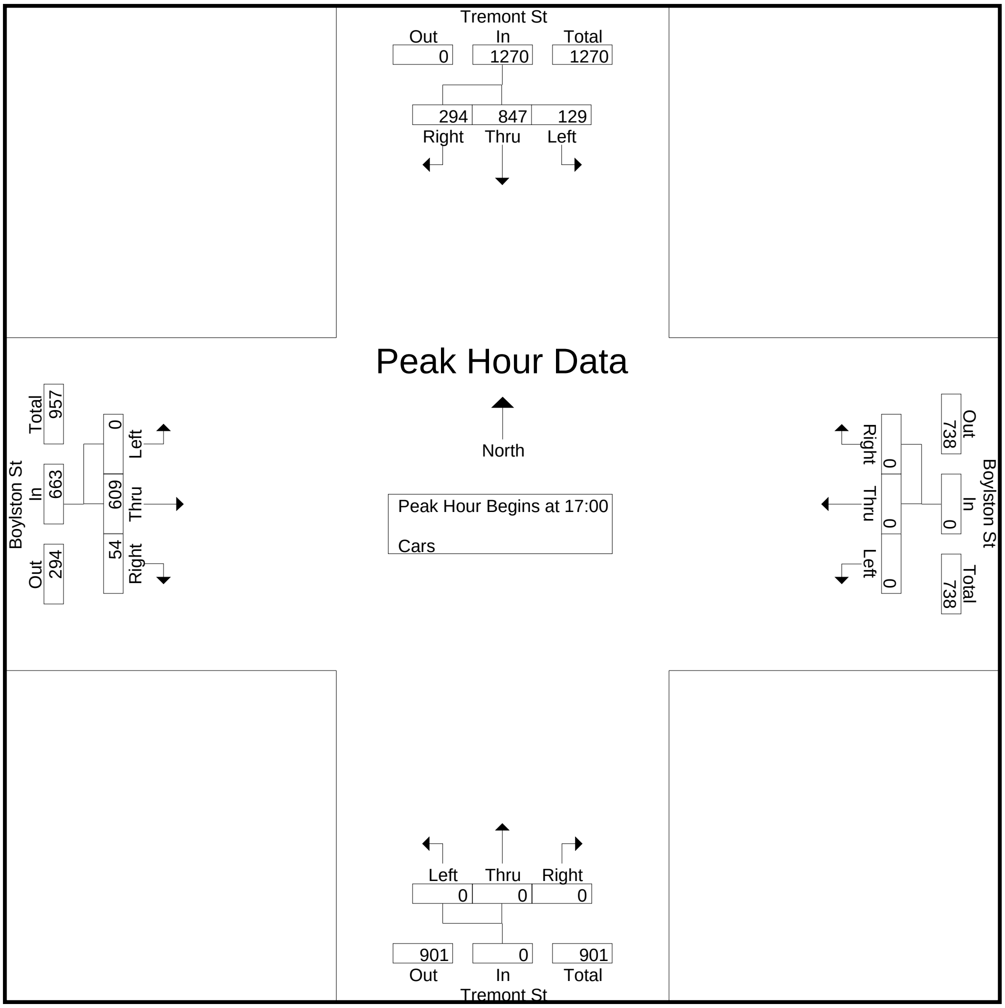
Groups Printed- Cars

	Tremont St From North			**Boylston St From East**			**Tremont St From South**			**Boylston St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	23	166	50	0	0	0	0	0	0	0	118	8	365
16:15	40	211	55	0	0	0	0	0	0	0	109	8	423
16:30	36	189	60	0	0	0	0	0	0	0	141	12	438
16:45	39	197	62	0	0	0	0	0	0	0	157	7	462
Total	138	763	227	0	0	0	0	0	0	0	525	35	1688
17:00	33	194	61	0	0	0	0	0	0	0	125	17	430
17:15	25	212	85	0	0	0	0	0	0	0	166	15	503
17:30	39	239	70	0	0	0	0	0	0	0	171	9	528
17:45	32	202	78	0	0	0	0	0	0	0	147	13	472
Total	129	847	294	0	0	0	0	0	0	0	609	54	1933
Grand Total	267	1610	521	0	0	0	0	0	0	0	1134	89	3621
Apprch %	11.1	67.1	21.7	0	0	0	0	0	0	0	92.7	7.3	
Total %	7.4	44.5	14.4	0	0	0	0	0	0	0	31.3	2.5	

	Tremont St From North				**Boylston St From East**				**Tremont St From South**				**Boylston St 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 17:00																	
17:00	33	194	61	288	0	0	0	0	0	0	0	0	0	125	**17**	142	430
17:15	25	212	**85**	322	0	0	0	0	0	0	0	0	0	166	15	**181**	503
17:30	**39**	**239**	70	**348**	0	0	0	0	0	0	0	0	0	**171**	9	180	**528**
17:45	32	202	78	312	0	0	0	0	0	0	0	0	0	147	13	160	472
Total Volume	129	847	294	1270	0	0	0	0	0	0	0	0	0	609	54	663	1933
% App. Total	10.2	66.7	23.1		0	0	0		0	0	0		0	91.9	8.1		
PHF	.827	.886	.865	.912	.000	.000	.000	.000	.000	.000	.000	.000	.000	.890	.794	.916	.915

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011

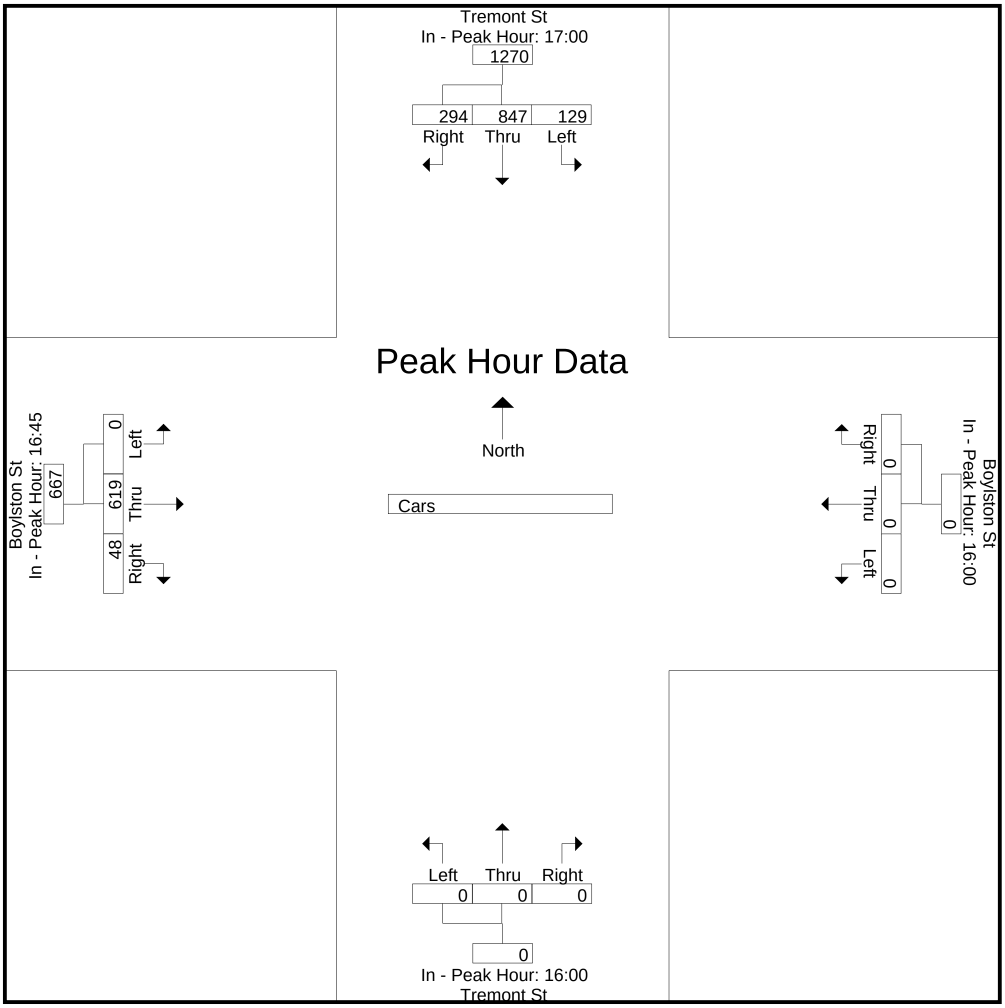


Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:00				16:00				16:45			
+0 mins.	33	194	61	288	0	0	0	0	0	0	0	0	0	157	7	164
+15 mins.	25	212	**85**	322	0	0	0	0	0	0	0	0	0	125	**17**	142
+30 mins.	**39**	**239**	70	**348**	0	0	0	0	0	0	0	0	0	166	15	**181**
+45 mins.	32	202	78	312	0	0	0	0	0	0	0	0	0	**171**	9	180
Total Volume	129	847	294	1270	0	0	0	0	0	0	0	0	0	619	48	667
% App. Total	10.2	66.7	23.1		0	0	0		0	0	0		0	92.8	7.2	
PHF	.827	.886	.865	.912	.000	.000	.000	.000	.000	.000	.000	.000	.000	.905	.706	.921

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

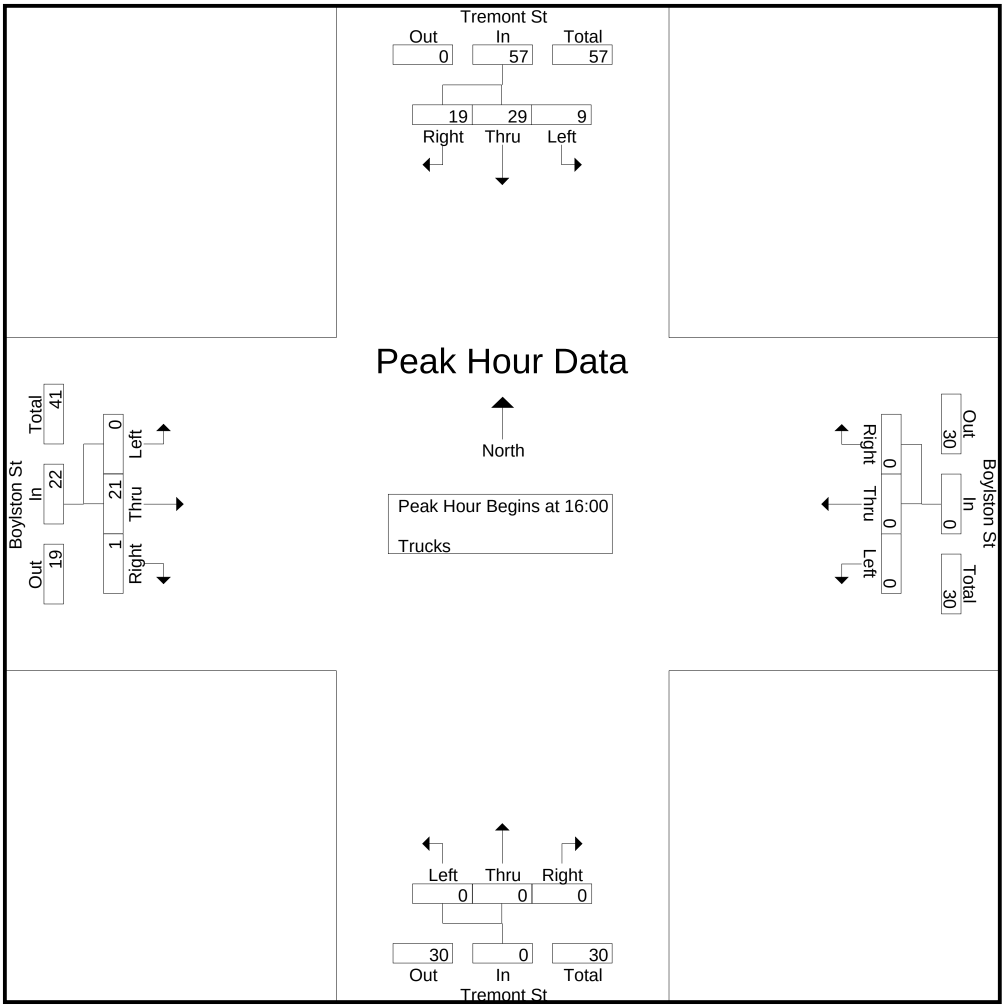
Groups Printed- Trucks

	Tremont St From North			**Boylston St From East**			**Tremont St From South**			**Boylston St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	2	8	4	0	0	0	0	0	0	0	10	1	25
16:15	3	9	6	0	0	0	0	0	0	0	3	0	21
16:30	2	4	4	0	0	0	0	0	0	0	3	0	13
16:45	2	8	5	0	0	0	0	0	0	0	5	0	20
Total	9	29	19	0	0	0	0	0	0	0	21	1	79
17:00	0	7	3	0	0	0	0	0	0	0	6	2	18
17:15	3	10	2	0	0	0	0	0	0	0	8	1	24
17:30	1	5	4	0	0	0	0	0	0	0	4	1	15
17:45	1	8	1	0	0	0	0	0	0	0	2	0	12
Total	5	30	10	0	0	0	0	0	0	0	20	4	69
Grand Total	14	59	29	0	0	0	0	0	0	0	41	5	148
Apprch %	13.7	57.8	28.4	0	0	0	0	0	0	0	89.1	10.9	
Total %	9.5	39.9	19.6	0	0	0	0	0	0	0	27.7	3.4	

	Tremont St From North				**Boylston St From East**				**Tremont St From South**				**Boylston St 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 16:00																	
16:00	2	8	4	14	0	0	0	0	0	0	0	0	0	**10**	**1**	**11**	**25**
16:15	**3**	**9**	**6**	**18**	0	0	0	0	0	0	0	0	0	3	0	3	21
16:30	2	4	4	10	0	0	0	0	0	0	0	0	0	3	0	3	13
16:45	2	8	5	15	0	0	0	0	0	0	0	0	0	5	0	5	20
Total Volume	9	29	19	57	0	0	0	0	0	0	0	0	0	21	1	22	79
% App. Total	15.8	50.9	33.3		0	0	0		0	0	0		0	95.5	4.5		
PHF	.750	.806	.792	.792	.000	.000	.000	.000	.000	.000	.000	.000	.000	.525	.250	.500	.790

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



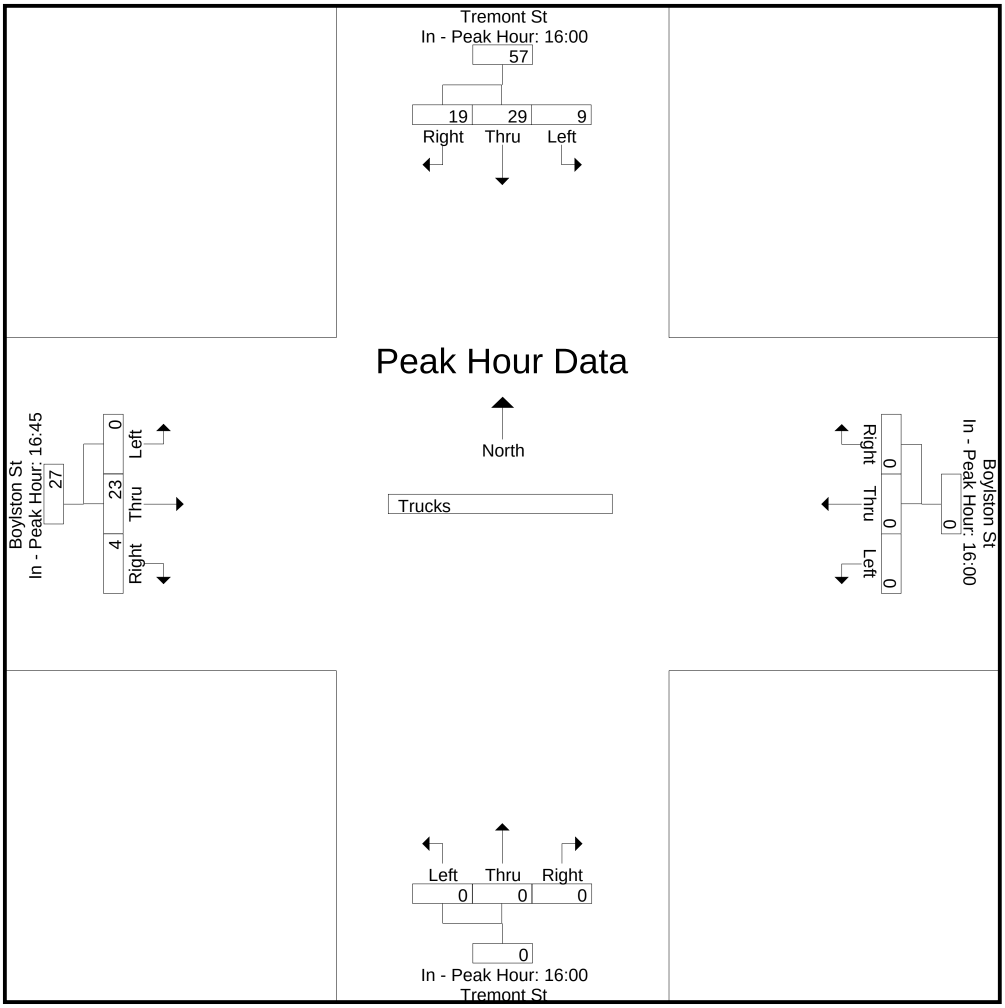
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:00				16:00				16:45			
+0 mins.	2	8	4	14	0	0	0	0	0	0	0	0	0	5	0	5
+15 mins.	**3**	**9**	**6**	**18**	0	0	0	0	0	0	0	0	0	6	**2**	8
+30 mins.	2	4	4	10	0	0	0	0	0	0	0	0	0	**8**	1	**9**
+45 mins.	2	8	5	15	0	0	0	0	0	0	0	0	0	4	1	5
Total Volume	9	29	19	57	0	0	0	0	0	0	0	0	0	23	4	27
% App. Total	15.8	50.9	33.3		0	0	0		0	0	0		0	85.2	14.8	
PHF	.750	.806	.792	.792	.000	.000	.000	.000	.000	.000	.000	.000	.000	.719	.500	.750

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

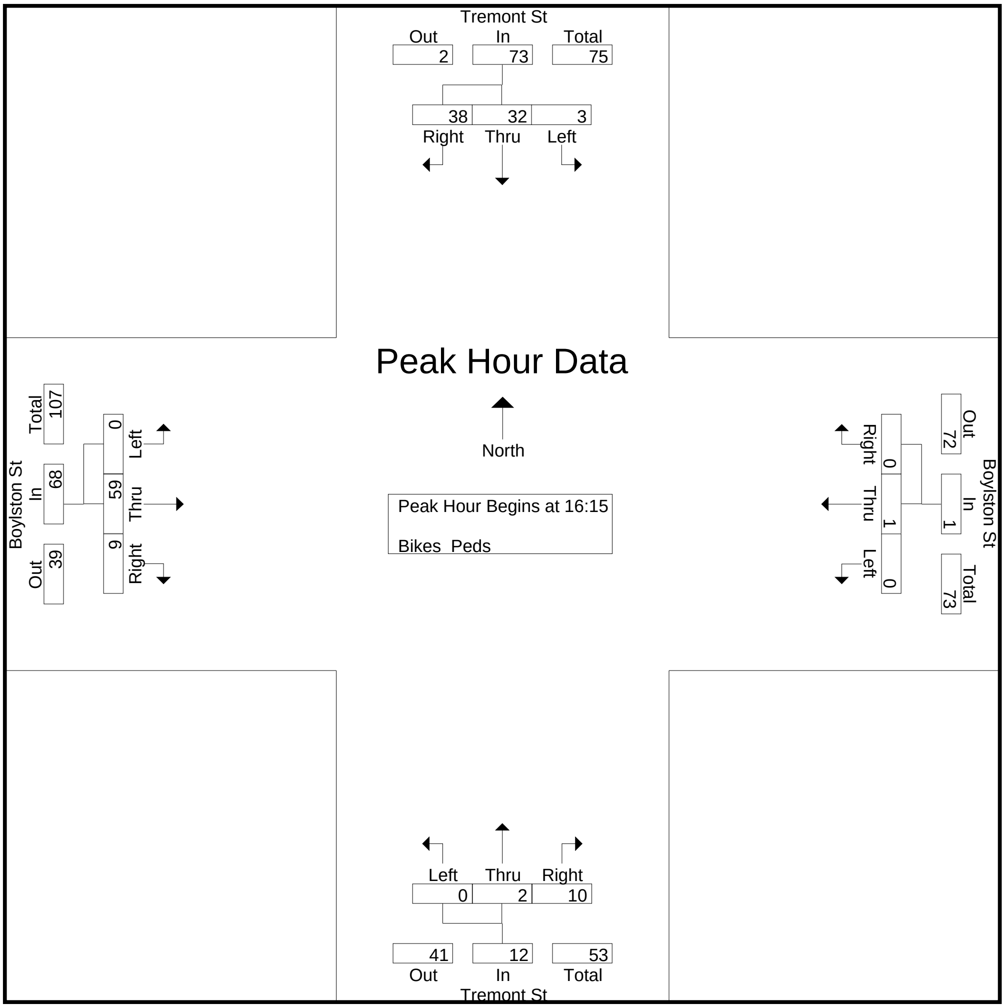
	Tremont St From North				Boylston St From East				Tremont St From South				Boylston St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	0	8	2	141	0	0	0	197	0	0	0	119	0	17	1	254	711	28	739
16:15	1	7	7	149	0	1	0	201	0	2	10	128	0	11	0	286	764	39	803
16:30	0	2	13	246	0	0	0	186	0	0	0	125	0	14	4	298	855	33	888
16:45	2	9	13	193	0	0	0	196	0	0	0	116	0	24	4	285	790	52	842
Total	3	26	35	729	0	1	0	780	0	2	10	488	0	66	9	1123	3120	152	3272
17:00	0	14	5	158	0	0	0	187	0	0	0	101	0	10	1	282	728	30	758
17:15	0	3	9	163	0	0	0	234	0	0	0	122	0	20	0	236	755	32	787
17:30	0	5	7	141	0	0	0	230	1	1	1	137	1	15	0	263	771	31	802
17:45	0	7	7	156	0	1	0	235	1	0	0	157	0	7	0	276	824	23	847
Total	0	29	28	618	0	1	0	886	2	1	1	517	1	52	1	1057	3078	116	3194
Grand Total	3	55	63	1347	0	2	0	1666	2	3	11	1005	1	118	10	2180	6198	268	6466
Apprch %	2.5	45.5	52.1		0	100	0		12.5	18.8	68.8		0.8	91.5	7.8				
Total %	1.1	20.5	23.5		0	0.7	0		0.7	1.1	4.1		0.4	44	3.7		95.9	4.1	

	Tremont St From North				Boylston St From East				Tremont St From South				Boylston St 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	1	7	7	15	0	**1**	0	**1**	0	**2**	**10**	**12**	0	11	0	11	39
16:30	0	2	**13**	15	0	0	0	0	0	0	0	0	0	14	**4**	18	33
16:45	**2**	9	13	**24**	0	0	0	0	0	0	0	0	0	**24**	4	**28**	**52**
17:00	0	**14**	5	19	0	0	0	0	0	0	0	0	0	10	1	11	30
Total Volume	3	32	38	73	0	1	0	1	0	2	10	12	0	59	9	68	154
% App. Total	4.1	43.8	52.1		0	100	0		0	16.7	83.3		0	86.8	13.2		
PHF	.375	.571	.731	.760	.000	.250	.000	.250	.000	.250	.250	.250	.000	.615	.563	.607	.740

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 2



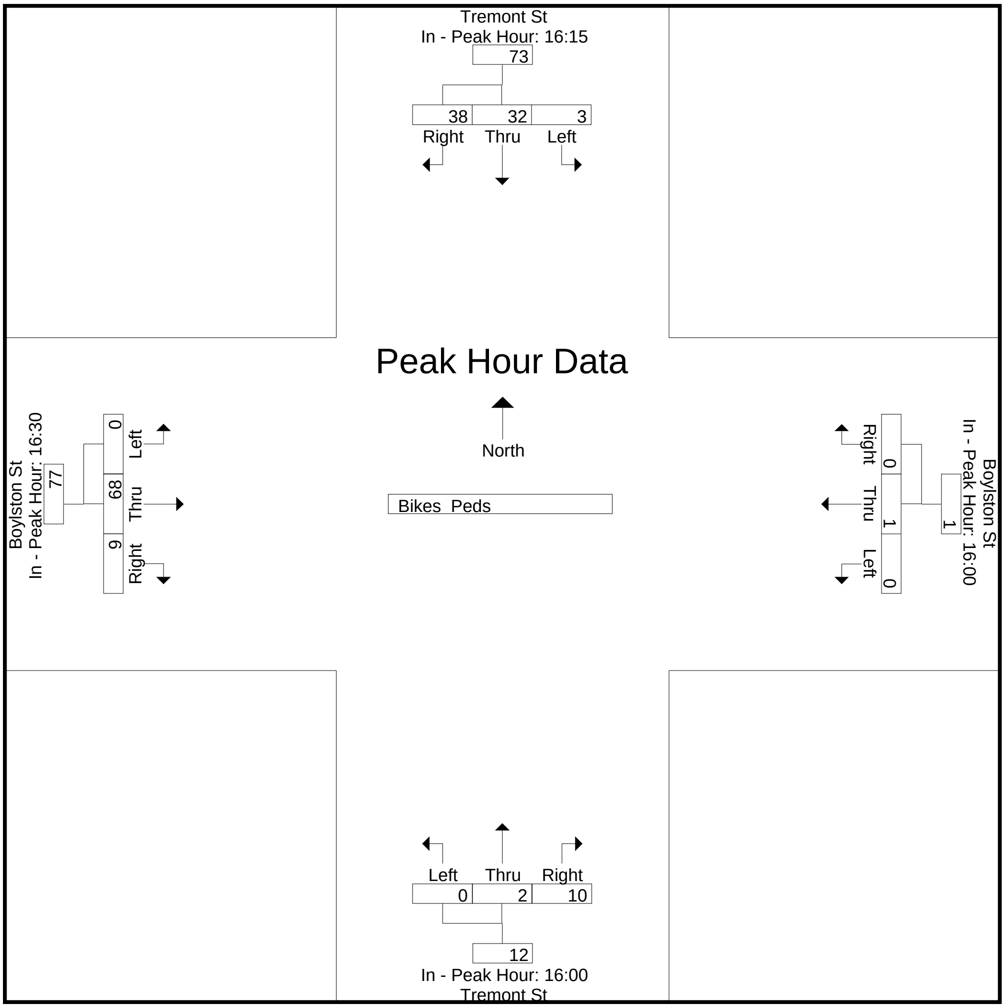
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:15				16:00				16:00				16:30			
+0 mins.	1	7	7	15	0	0	0	0	0	0	0	0	0	14	**4**	18
+15 mins.	0	2	**13**	15	0	**1**	0	**1**	0	**2**	**10**	**12**	0	**24**	4	**28**
+30 mins.	**2**	9	13	**24**	0	0	0	0	0	0	0	0	0	10	1	11
+45 mins.	0	**14**	5	19	0	0	0	0	0	0	0	0	0	20	0	20
Total Volume	3	32	38	73	0	1	0	1	0	2	10	12	0	68	9	77
% App. Total	4.1	43.8	52.1		0	100	0		0	16.7	83.3		0	88.3	11.7	
PHF	.375	.571	.731	.760	.000	.250	.000	.250	.000	.250	.250	.250	.000	.708	.563	.688

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 61470003
Site Code : 61470003
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars - Trucks

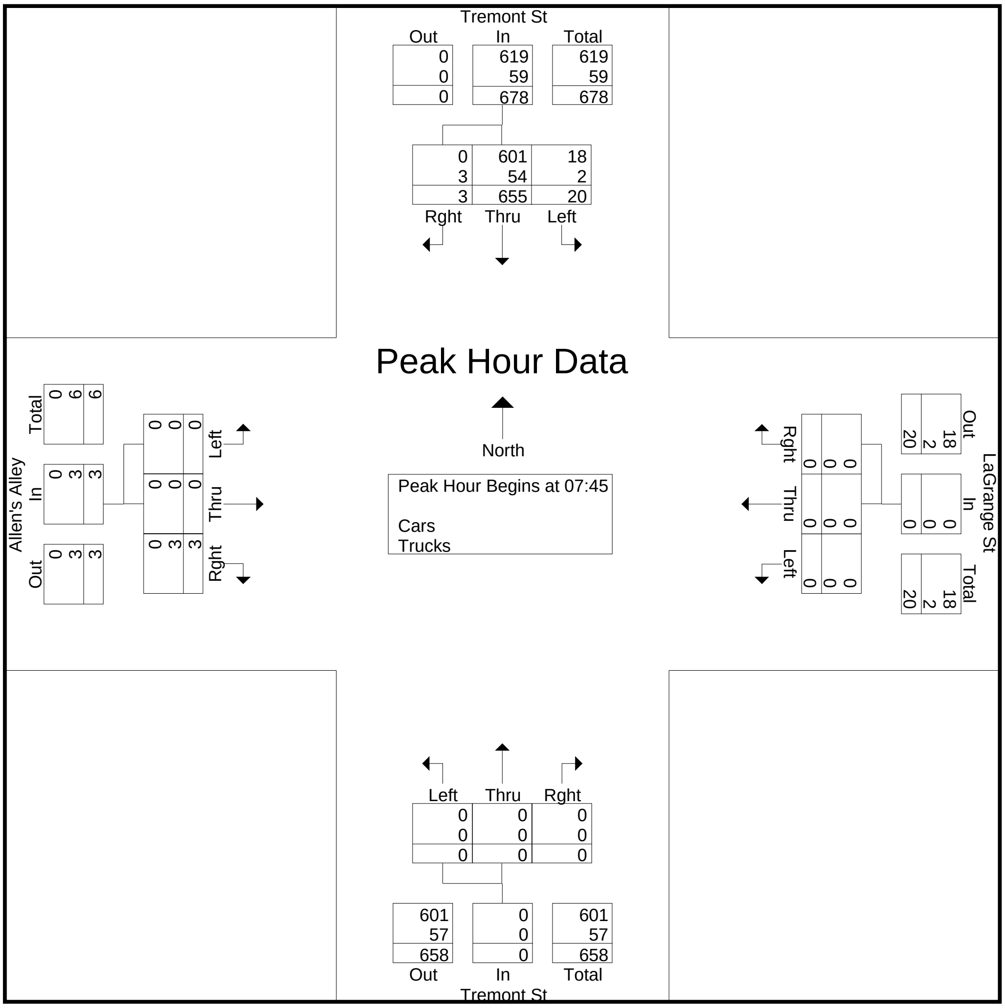
	Tremont St From North			LaGrange St From East			Tremont St From South			Allen's Alley From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
07:00	4	104	0	0	0	0	0	0	0	0	1	0	109
07:15	1	103	0	0	0	0	0	0	0	0	0	0	104
07:30	3	134	1	0	0	0	0	0	0	0	0	1	139
07:45	4	165	1	0	0	0	0	0	0	0	0	0	170
Total	12	506	2	0	0	0	0	0	0	0	1	1	522
08:00	6	164	1	0	0	0	0	0	0	0	0	1	172
08:15	4	161	0	0	0	0	0	0	0	0	0	1	166
08:30	6	165	1	0	0	0	0	0	0	0	0	1	173
08:45	11	142	1	0	0	0	0	0	0	0	0	0	154
Total	27	632	3	0	0	0	0	0	0	0	0	3	665
Grand Total	39	1138	5	0	0	0	0	0	0	0	1	4	1187
Apprch %	3.3	96.3	0.4	0	0	0	0	0	0	0	20	80	
Total %	3.3	95.9	0.4	0	0	0	0	0	0	0	0.1	0.3	
Cars	37	1034	0	0	0	0	0	0	0	0	0	0	1071
% Cars	94.9	90.9	0	0	0	0	0	0	0	0	0	0	90.2
Trucks	2	104	5	0	0	0	0	0	0	0	1	4	116
% Trucks	5.1	9.1	100	0	0	0	0	0	0	0	100	100	9.8

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	4	**165**	**1**	170	0	0	0	0	0	0	0	0	0	0	0	0	170
08:00	**6**	164	1	171	0	0	0	0	0	0	0	0	0	0	**1**	**1**	172
08:15	4	161	0	165	0	0	0	0	0	0	0	0	0	0	1	1	166
08:30	6	165	1	**172**	0	0	0	0	0	0	0	0	0	0	1	1	**173**
Total Volume	20	655	3	678	0	0	0	0	0	0	0	0	0	0	3	3	681
% App. Total	2.9	96.6	0.4		0	0	0		0	0	0		0	0	100		
PHF	.833	.992	.750	.985	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.984
Cars	18	601	0	619	0	0	0	0	0	0	0	0	0	0	0	0	619
% Cars	90.0	91.8	0	91.3	0	0	0	0	0	0	0	0	0	0	0	0	90.9
Trucks	2	54	3	59	0	0	0	0	0	0	0	0	0	0	3	3	62
% Trucks	10.0	8.2	100	8.7	0	0	0	0	0	0	0	0	0	0	100	100	9.1

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011



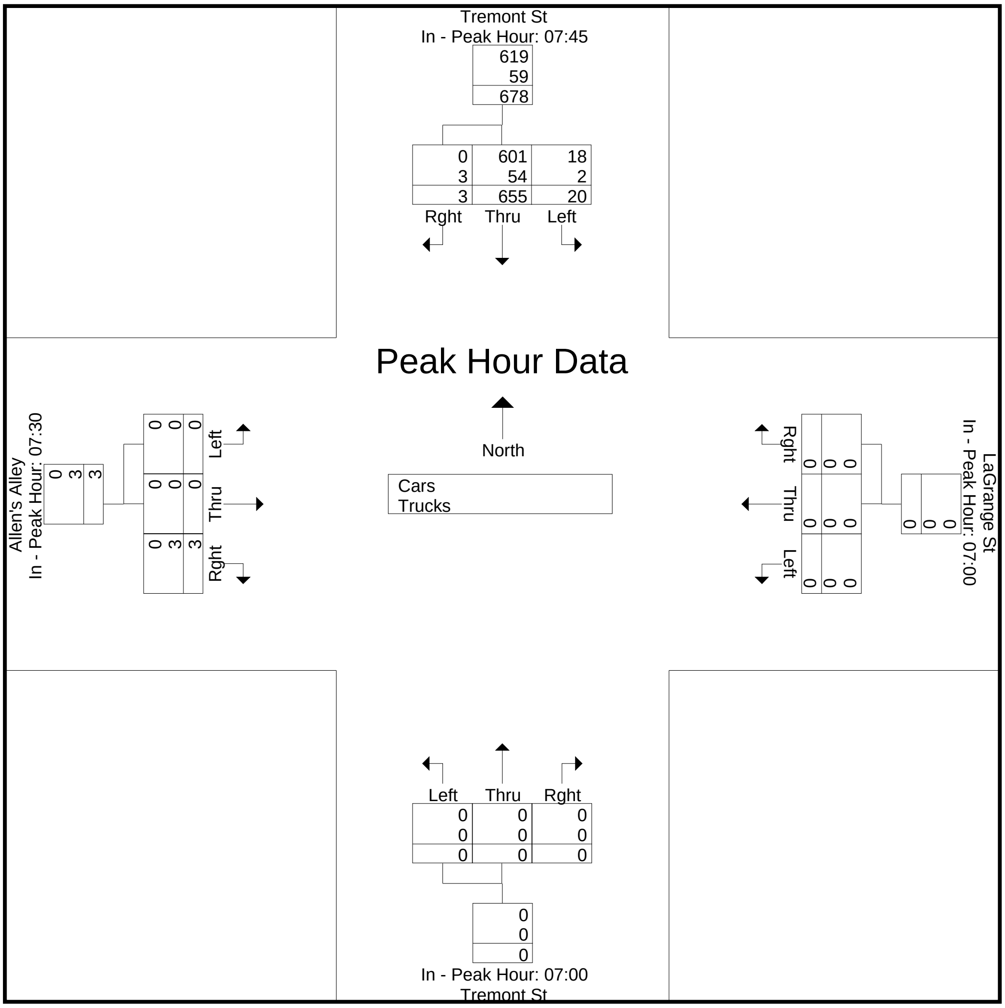
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45				07:00				07:00				07:30			
+0 mins.	4	**165**	**1**	170	0	0	0	0	0	0	0	0	0	0	**1**	**1**
+15 mins.	**6**	164	1	171	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	4	161	0	165	0	0	0	0	0	0	0	0	0	0	1	1
+45 mins.	6	165	1	**172**	0	0	0	0	0	0	0	0	0	0	1	1
Total Volume	20	655	3	678	0	0	0	0	0	0	0	0	0	0	3	3
% App. Total	2.9	96.6	0.4		0	0	0		0	0	0		0	0	100	
PHF	.833	.992	.750	.985	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750
Cars	18	601	0	619	0	0	0	0	0	0	0	0	0	0	0	0
% Cars	90	91.8	0	91.3	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	2	54	3	59	0	0	0	0	0	0	0	0	0	0	3	3
% Trucks	10	8.2	100	8.7	0	0	0	0	0	0	0	0	0	0	100	100

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars

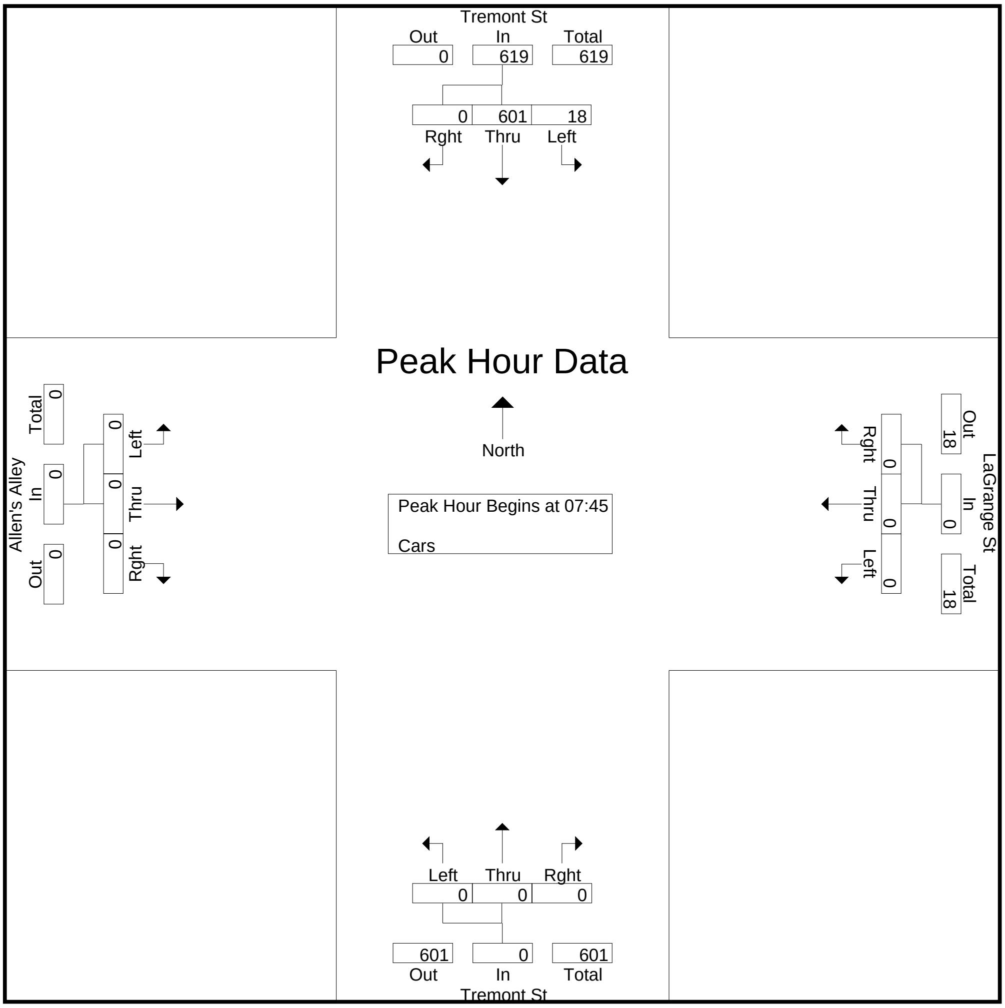
	Tremont St From North			LaGrange St From East			Tremont St From South			Allen's Alley From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
07:00	4	91	0	0	0	0	0	0	0	0	0	0	95
07:15	1	96	0	0	0	0	0	0	0	0	0	0	97
07:30	3	118	0	0	0	0	0	0	0	0	0	0	121
07:45	4	155	0	0	0	0	0	0	0	0	0	0	159
Total	12	460	0	0	0	0	0	0	0	0	0	0	472
08:00	5	150	0	0	0	0	0	0	0	0	0	0	155
08:15	4	154	0	0	0	0	0	0	0	0	0	0	158
08:30	5	142	0	0	0	0	0	0	0	0	0	0	147
08:45	11	128	0	0	0	0	0	0	0	0	0	0	139
Total	25	574	0	0	0	0	0	0	0	0	0	0	599
Grand Total	37	1034	0	0	0	0	0	0	0	0	0	0	1071
Apprch %	3.5	96.5	0	0	0	0	0	0	0	0	0	0	
Total %	3.5	96.5	0	0	0	0	0	0	0	0	0	0	

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	4	**155**	0	**159**	0	0	0	0	0	0	0	0	0	0	0	0	**159**
08:00	**5**	150	0	155	0	0	0	0	0	0	0	0	0	0	0	0	155
08:15	4	154	0	158	0	0	0	0	0	0	0	0	0	0	0	0	158
08:30	5	142	0	147	0	0	0	0	0	0	0	0	0	0	0	0	147
Total Volume	18	601	0	619	0	0	0	0	0	0	0	0	0	0	0	0	619
% App. Total	2.9	97.1	0		0	0	0		0	0	0		0	0	0		
PHF	.900	.969	.000	.973	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.973

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 2



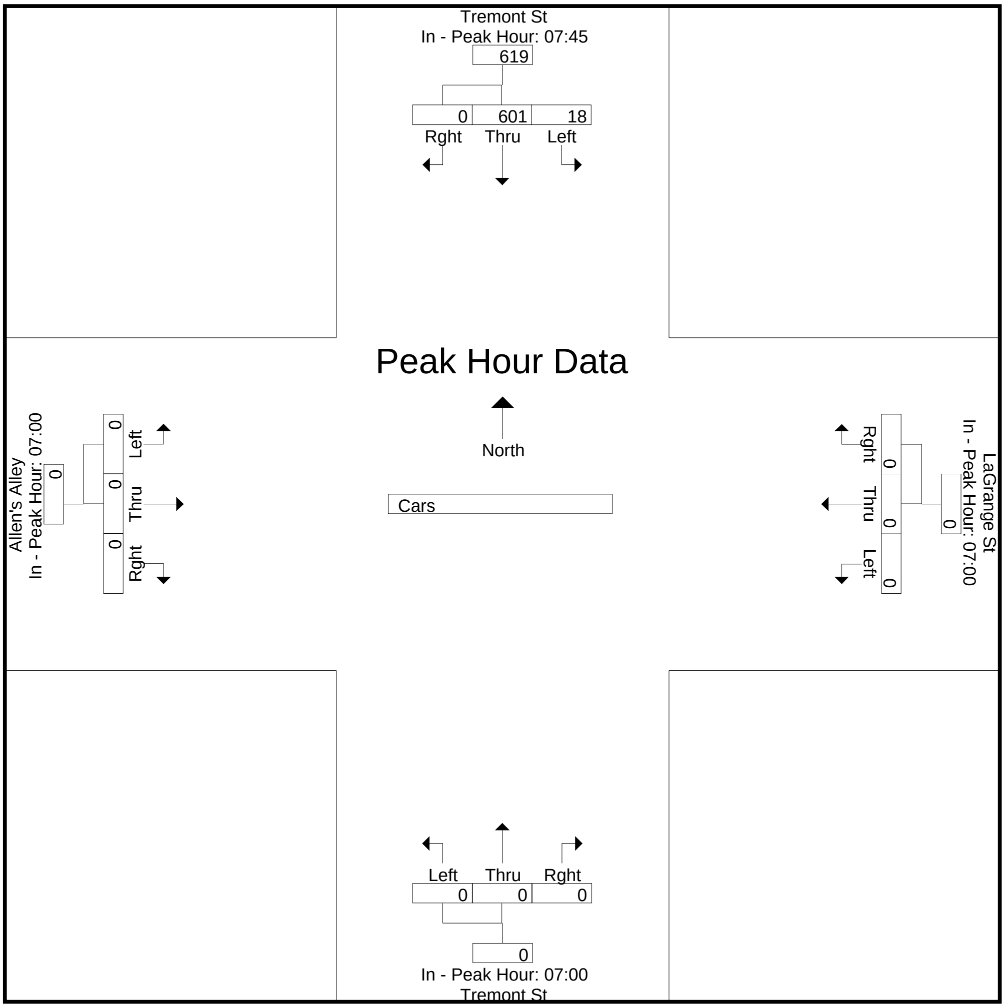
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45				07:00				07:00				07:00			
+0 mins.	4	**155**	0	**159**	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	**5**	150	0	155	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	4	154	0	158	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	5	142	0	147	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	18	601	0	619	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	2.9	97.1	0		0	0	0		0	0	0		0	0	0	
PHF	.900	.969	.000	.973	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

Groups Printed- Trucks

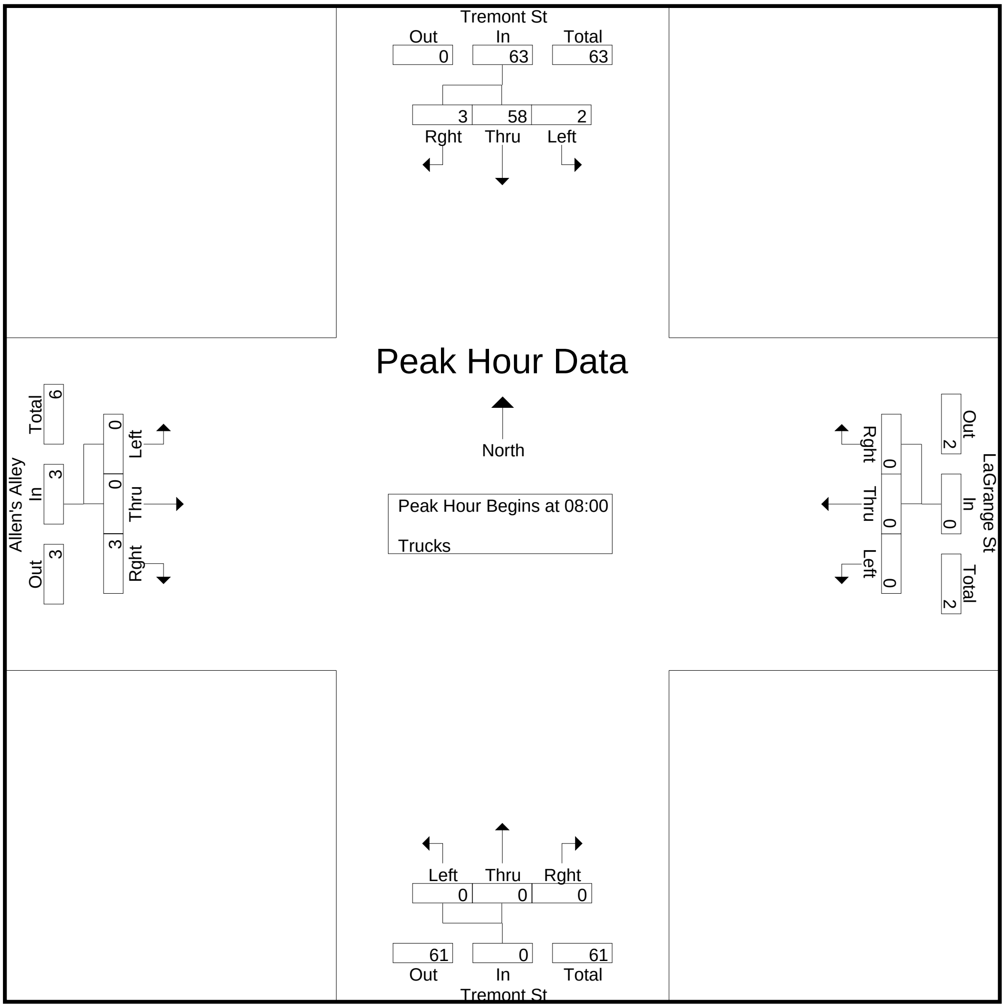
	Tremont St From North			LaGrange St From East			Tremont St From South			Allen's Alley From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
07:00	0	13	0	0	0	0	0	0	0	0	1	0	14
07:15	0	7	0	0	0	0	0	0	0	0	0	0	7
07:30	0	16	1	0	0	0	0	0	0	0	0	1	18
07:45	0	10	1	0	0	0	0	0	0	0	0	0	11
Total	0	46	2	0	0	0	0	0	0	0	1	1	50
08:00	1	14	1	0	0	0	0	0	0	0	0	1	17
08:15	0	7	0	0	0	0	0	0	0	0	0	1	8
08:30	1	23	1	0	0	0	0	0	0	0	0	1	26
08:45	0	14	1	0	0	0	0	0	0	0	0	0	15
Total	2	58	3	0	0	0	0	0	0	0	0	3	66
Grand Total	2	104	5	0	0	0	0	0	0	0	1	4	116
Apprch %	1.8	93.7	4.5	0	0	0	0	0	0	0	20	80	
Total %	1.7	89.7	4.3	0	0	0	0	0	0	0	0.9	3.4	

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	**1**	14	**1**	16	0	0	0	0	0	0	0	0	0	0	**1**	**1**	17
08:15	0	7	0	7	0	0	0	0	0	0	0	0	0	0	1	1	8
08:30	1	**23**	1	**25**	0	0	0	0	0	0	0	0	0	0	1	1	**26**
08:45	0	14	1	15	0	0	0	0	0	0	0	0	0	0	0	0	15
Total Volume	2	58	3	63	0	0	0	0	0	0	0	0	0	0	3	3	66
% App. Total	3.2	92.1	4.8		0	0	0		0	0	0		0	0	100		
PHF	.500	.630	.750	.630	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750	.635

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 2



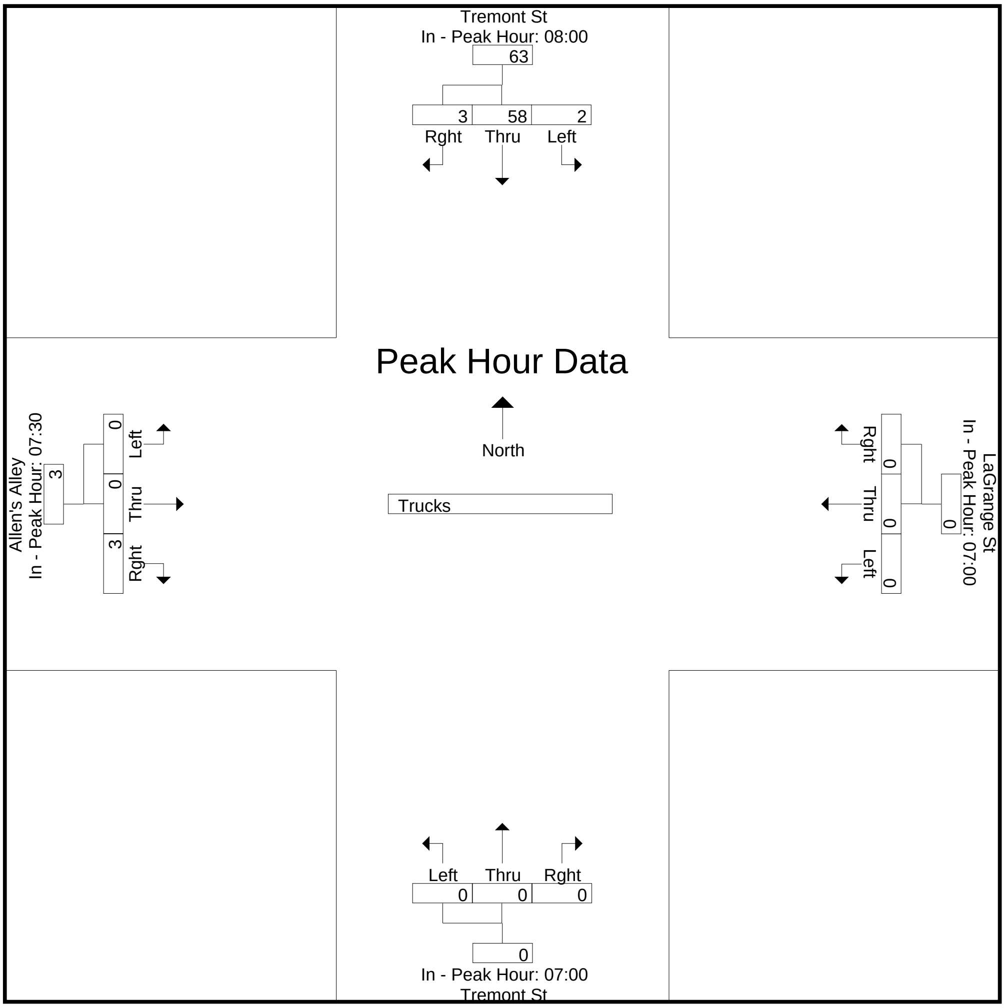
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00				07:00				07:00				07:30			
+0 mins.	**1**	14	**1**	16	0	0	0	0	0	0	0	0	0	0	**1**	**1**
+15 mins.	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	**23**	1	**25**	0	0	0	0	0	0	0	0	0	0	1	1
+45 mins.	0	14	1	15	0	0	0	0	0	0	0	0	0	0	1	1
Total Volume	2	58	3	63	0	0	0	0	0	0	0	0	0	0	3	3
% App. Total	3.2	92.1	4.8		0	0	0		0	0	0		0	0	100	
PHF	.500	.630	.750	.630	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.750

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

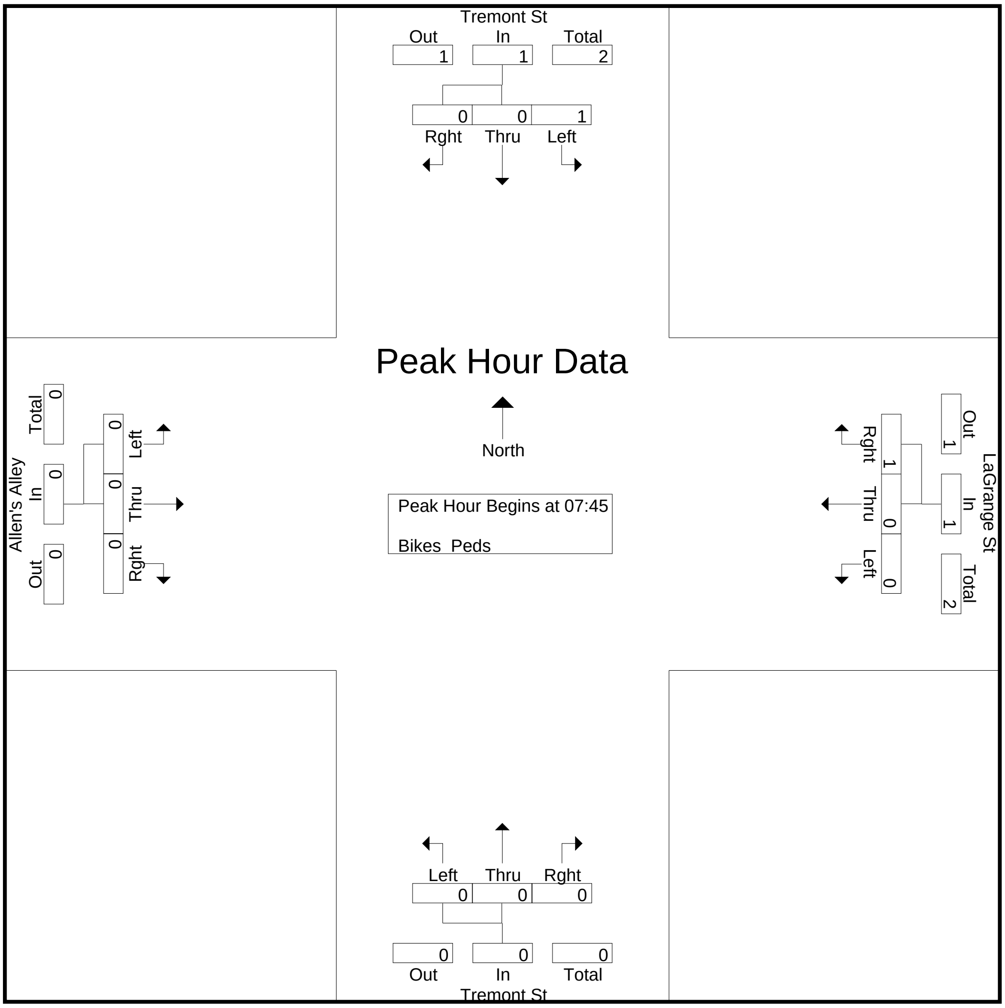
	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West						
Start Time	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	6	1	0	0	26	0	0	0	12	0	0	0	22	66	1	67
07:15	0	0	0	2	0	0	0	29	0	0	0	11	0	0	0	24	66	0	66
07:30	0	0	0	4	0	0	0	43	0	0	0	13	0	0	0	22	82	0	82
07:45	0	0	0	12	0	0	0	86	0	0	0	8	0	0	0	20	126	0	126
Total	0	0	0	24	1	0	0	184	0	0	0	44	0	0	0	88	340	1	341
08:00	1	0	0	11	0	0	0	98	0	0	0	12	0	0	0	37	158	1	159
08:15	0	0	0	6	0	0	0	104	0	0	0	8	0	0	0	46	164	0	164
08:30	0	0	0	8	0	0	1	80	0	0	0	11	0	0	0	27	126	1	127
08:45	0	0	0	9	0	0	0	117	0	0	0	13	0	0	0	35	174	0	174
Total	1	0	0	34	0	0	1	399	0	0	0	44	0	0	0	145	622	2	624
Grand Total	1	0	0	58	1	0	1	583	0	0	0	88	0	0	0	233	962	3	965
Apprch %	100	0	0		50	0	50		0	0	0		0	0	0				
Total %	33.3	0	0		33.3	0	33.3		0	0	0		0	0	0		99.7	0.3	

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45																	
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
% App. Total	100	0	0		0	0	100		0	0	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 2



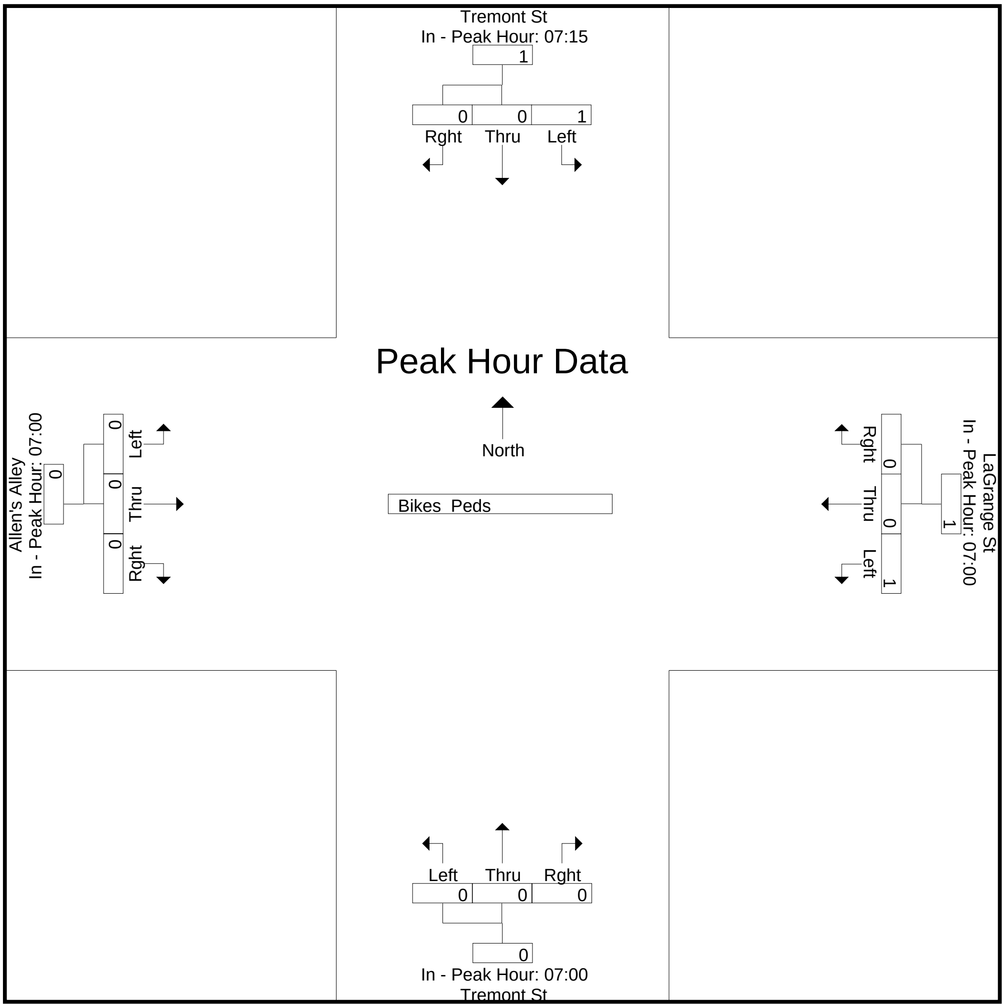
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15				07:00				07:00				07:00			
+0 mins.	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0
% App. Total	100	0	0		100	0	0		0	0	0		0	0	0	
PHF	.250	.000	.000	.250	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Drizzle

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011

Groups Printed- Cars - Trucks

	Tremont St From North			LaGrange St From East			Tremont St From South			Allen's Alley From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
16:00	2	184	1	0	0	0	0	0	0	0	0	1	188
16:15	4	220	0	0	0	0	0	0	0	0	0	0	224
16:30	5	196	0	0	0	0	0	0	0	0	0	1	202
16:45	7	207	1	0	0	0	0	0	0	0	0	0	215
Total	18	807	2	0	0	0	0	0	0	0	0	2	829
17:00	1	217	0	0	0	0	0	0	0	0	0	0	218
17:15	4	240	1	0	0	0	0	0	0	0	0	0	245
17:30	6	246	0	0	0	0	0	0	0	0	0	3	255
17:45	5	226	0	0	0	0	0	0	0	0	0	0	231
Total	16	929	1	0	0	0	0	0	0	0	0	3	949
Grand Total	34	1736	3	0	0	0	0	0	0	0	0	5	1778
Apprch %	1.9	97.9	0.2	0	0	0	0	0	0	0	0	100	
Total %	1.9	97.6	0.2	0	0	0	0	0	0	0	0	0.3	
Cars	34	1670	3	0	0	0	0	0	0	0	0	5	1712
% Cars	100	96.2	100	0	0	0	0	0	0	0	0	100	96.3
Trucks	0	66	0	0	0	0	0	0	0	0	0	0	66
% Trucks	0	3.8	0	0	0	0	0	0	0	0	0	0	3.7

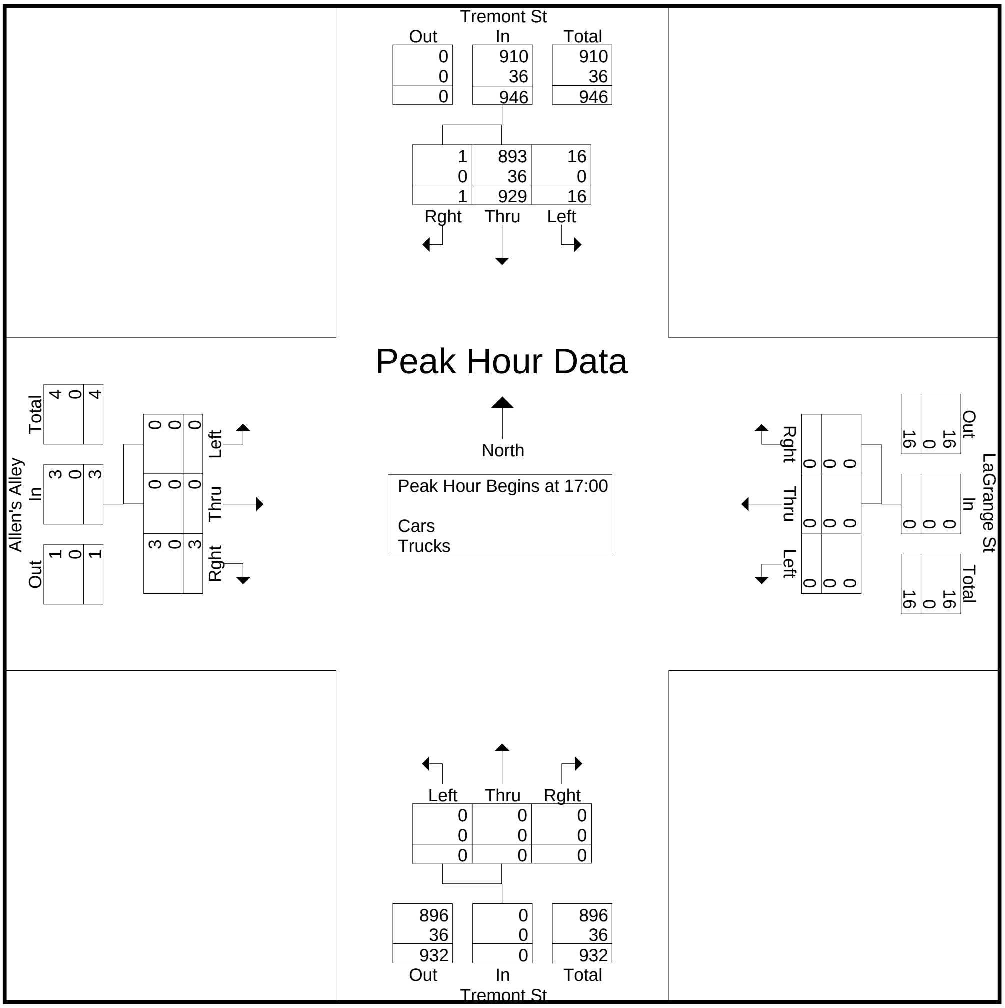
	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	1	217	0	218	0	0	0	0	0	0	0	0	0	0	0	0	218
17:15	4	240	**1**	245	0	0	0	0	0	0	0	0	0	0	0	0	245
17:30	**6**	**246**	0	**252**	0	0	0	0	0	0	0	0	0	0	**3**	**3**	**255**
17:45	5	226	0	231	0	0	0	0	0	0	0	0	0	0	0	0	231
Total Volume	16	929	1	946	0	0	0	0	0	0	0	0	0	0	3	3	949
% App. Total	1.7	98.2	0.1		0	0	0		0	0	0		0	0	100		
PHF	.667	.944	.250	.938	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.930
Cars	16	893	1	910	0	0	0	0	0	0	0	0	0	0	3	3	913
% Cars	100	96.1	100	96.2	0	0	0	0	0	0	0	0	0	0	100	100	96.2
Trucks	0	36	0	36	0	0	0	0	0	0	0	0	0	0	0	0	36
% Trucks	0	3.9	0	3.8	0	0	0	0	0	0	0	0	0	0	0	0	3.8

Accurate Counts

978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1

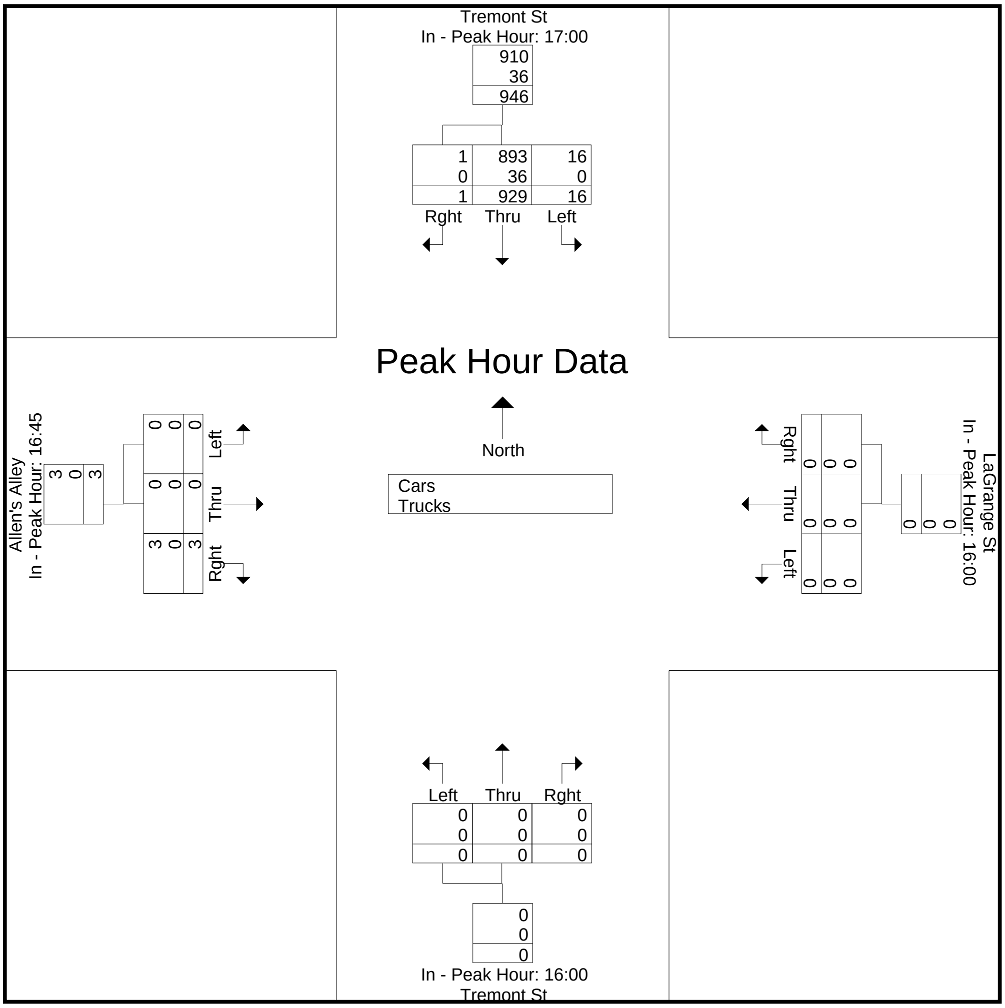
Peak Hour for Each Approach Begins at:

	17:00				16:00				16:00				16:45			
+0 mins.	1	217	0	218	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	4	240	**1**	245	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	**6**	**246**	0	**252**	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	5	226	0	231	0	0	0	0	0	0	0	0	0	0	**3**	**3**
Total Volume	16	929	1	946	0	0	0	0	0	0	0	0	0	0	3	3
% App. Total	1.7	98.2	0.1		0	0	0		0	0	0		0	0	100	
PHF	.667	.944	.250	.938	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250
Cars	16	893	1	910	0	0	0	0	0	0	0	0	0	0	3	3
% Cars	100	96.1	100	96.2	0	0	0	0	0	0	0	0	0	0	100	100
Trucks	0	36	0	36	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	3.9	0	3.8	0	0	0	0	0	0	0	0	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars

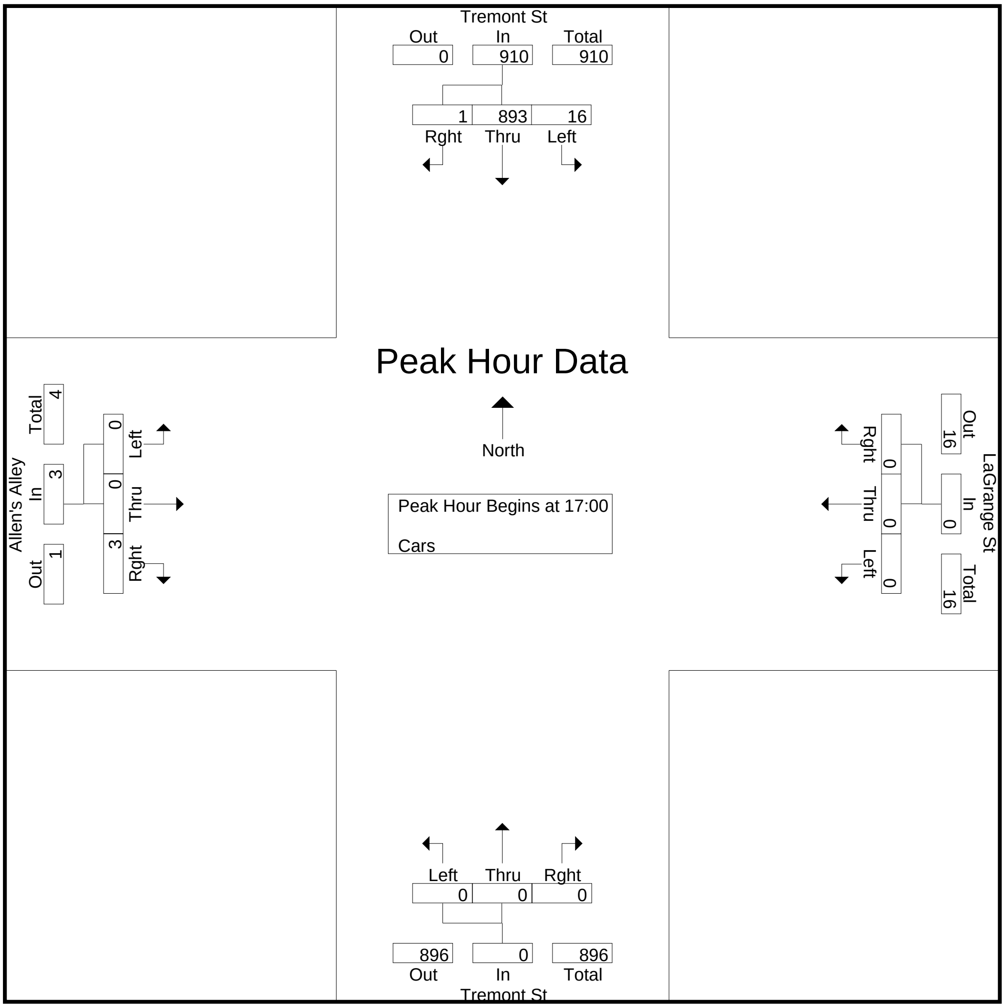
	Tremont St From North			LaGrange St From East			Tremont St From South			Allen's Alley From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
16:00	2	175	1	0	0	0	0	0	0	0	0	1	179
16:15	4	211	0	0	0	0	0	0	0	0	0	0	215
16:30	5	192	0	0	0	0	0	0	0	0	0	1	198
16:45	7	199	1	0	0	0	0	0	0	0	0	0	207
Total	18	777	2	0	0	0	0	0	0	0	0	2	799
17:00	1	206	0	0	0	0	0	0	0	0	0	0	207
17:15	4	229	1	0	0	0	0	0	0	0	0	0	234
17:30	6	240	0	0	0	0	0	0	0	0	0	3	249
17:45	5	218	0	0	0	0	0	0	0	0	0	0	223
Total	16	893	1	0	0	0	0	0	0	0	0	3	913
Grand Total	34	1670	3	0	0	0	0	0	0	0	0	5	1712
Apprch %	2	97.8	0.2	0	0	0	0	0	0	0	0	100	
Total %	2	97.5	0.2	0	0	0	0	0	0	0	0	0.3	

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	1	206	0	207	0	0	0	0	0	0	0	0	0	0	0	0	207
17:15	4	229	**1**	234	0	0	0	0	0	0	0	0	0	0	0	0	234
17:30	**6**	**240**	0	**246**	0	0	0	0	0	0	0	0	0	0	**3**	**3**	**249**
17:45	5	218	0	223	0	0	0	0	0	0	0	0	0	0	0	0	223
Total Volume	16	893	1	910	0	0	0	0	0	0	0	0	0	0	3	3	913
% App. Total	1.8	98.1	0.1		0	0	0		0	0	0		0	0	100		
PHF	.667	.930	.250	.925	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.917

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011

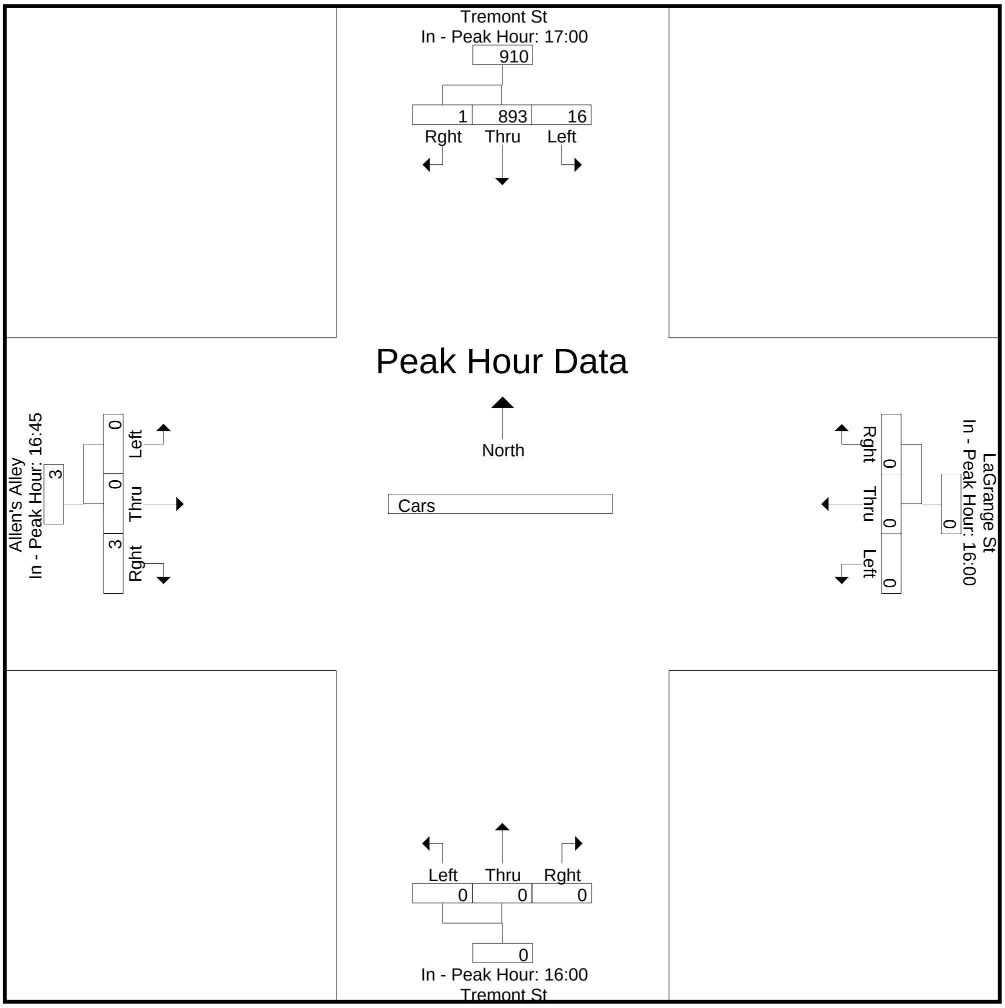


Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:00				16:00				16:45			
+0 mins.	1	206	0	207	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	4	229	**1**	234	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	**6**	**240**	0	**246**	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	5	218	0	223	0	0	0	0	0	0	0	0	0	0	**3**	**3**
Total Volume	16	893	1	910	0	0	0	0	0	0	0	0	0	0	3	3
% App. Total	1.8	98.1	0.1		0	0	0		0	0	0		0	0	100	
PHF	.667	.930	.250	.925	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

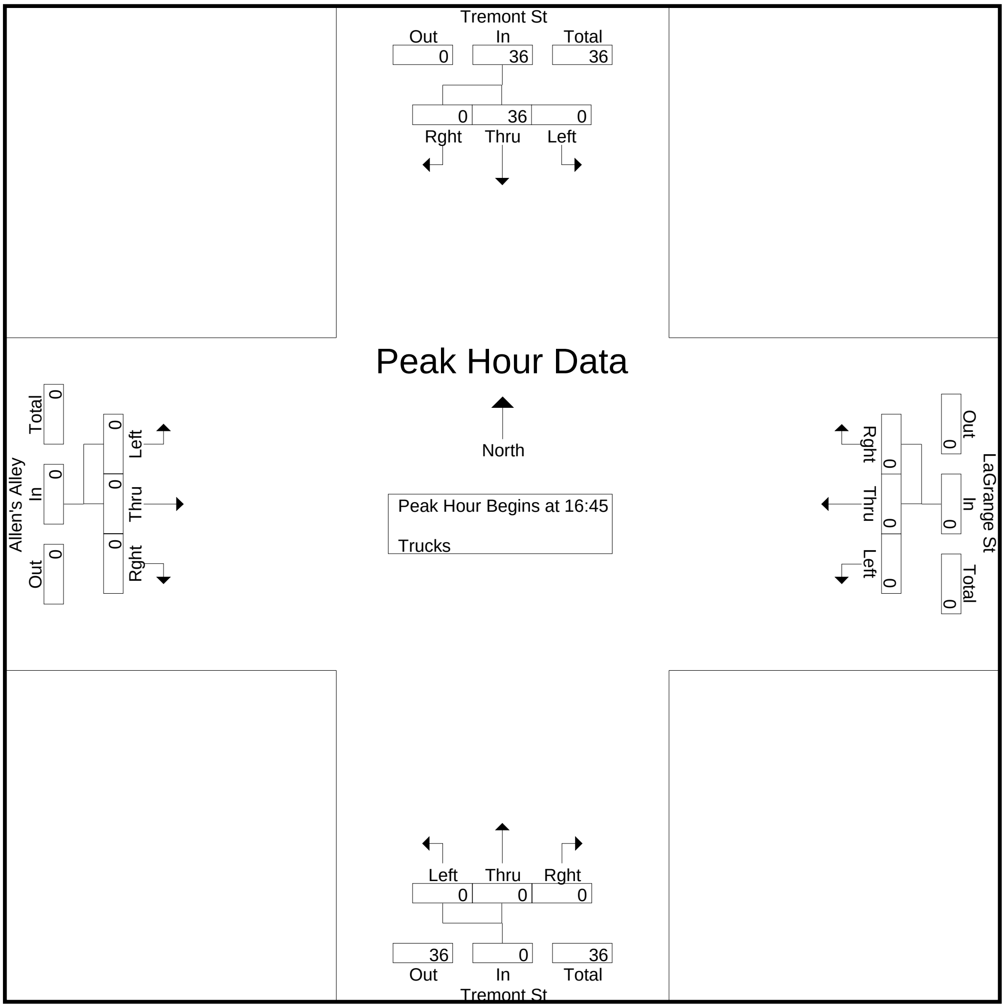
Groups Printed- Trucks

	Tremont St From North			LaGrange St From East			Tremont St From South			Allen's Alley From West			
Start Time	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Left	Thru	Rght	Int. Total
16:00	0	9	0	0	0	0	0	0	0	0	0	0	9
16:15	0	9	0	0	0	0	0	0	0	0	0	0	9
16:30	0	4	0	0	0	0	0	0	0	0	0	0	4
16:45	0	8	0	0	0	0	0	0	0	0	0	0	8
Total	0	30	0	0	0	0	0	0	0	0	0	0	30
17:00	0	11	0	0	0	0	0	0	0	0	0	0	11
17:15	0	11	0	0	0	0	0	0	0	0	0	0	11
17:30	0	6	0	0	0	0	0	0	0	0	0	0	6
17:45	0	8	0	0	0	0	0	0	0	0	0	0	8
Total	0	36	0	0	0	0	0	0	0	0	0	0	36
Grand Total	0	66	0	0	0	0	0	0	0	0	0	0	66
Apprch %	0	100	0	0	0	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	0	0	0	0	

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
17:00	0	**11**	0	**11**	0	0	0	0	0	0	0	0	0	0	0	0	**11**
17:15	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	11
17:30	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Volume	0	36	0	36	0	0	0	0	0	0	0	0	0	0	0	0	36
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.818	.000	.818	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.818

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 2



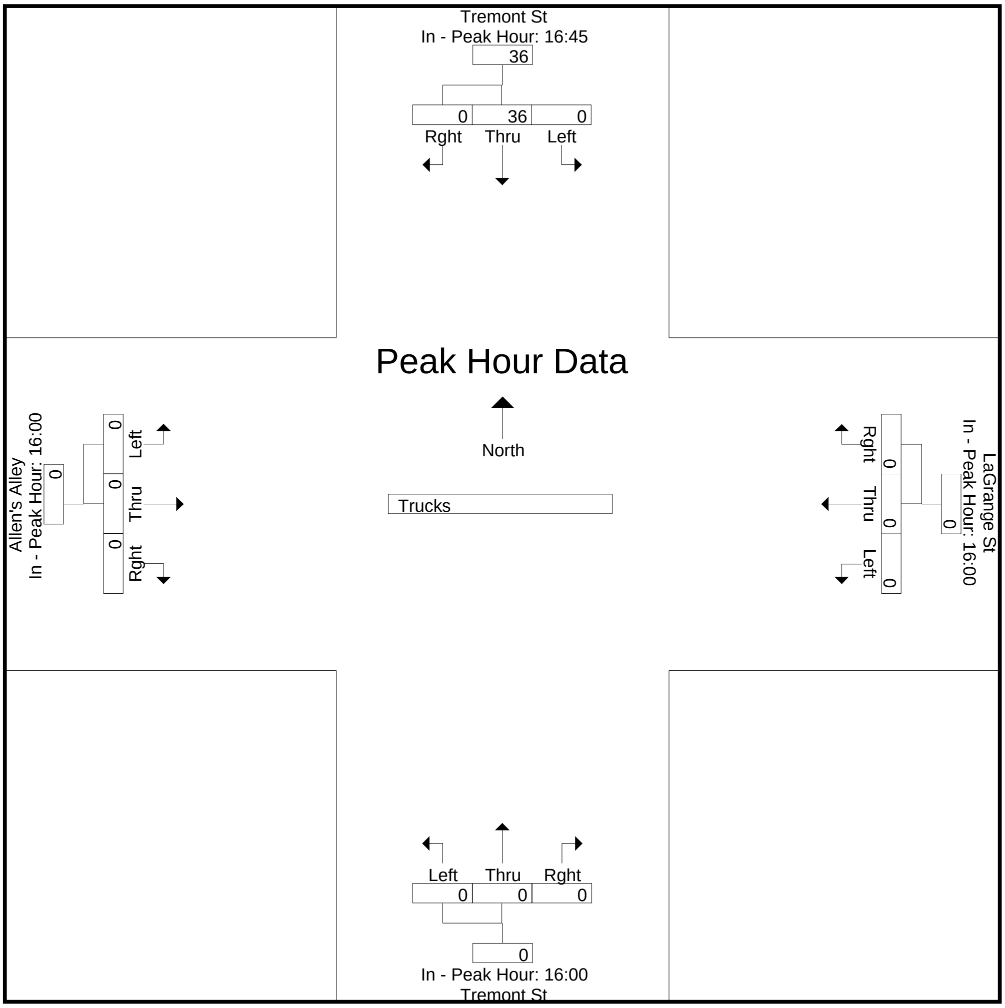
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:45				16:00				16:00				16:00			
+0 mins.	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	**11**	0	**11**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	36	0	36	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.818	.000	.818	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 1

Groups Printed- Bikes Peds

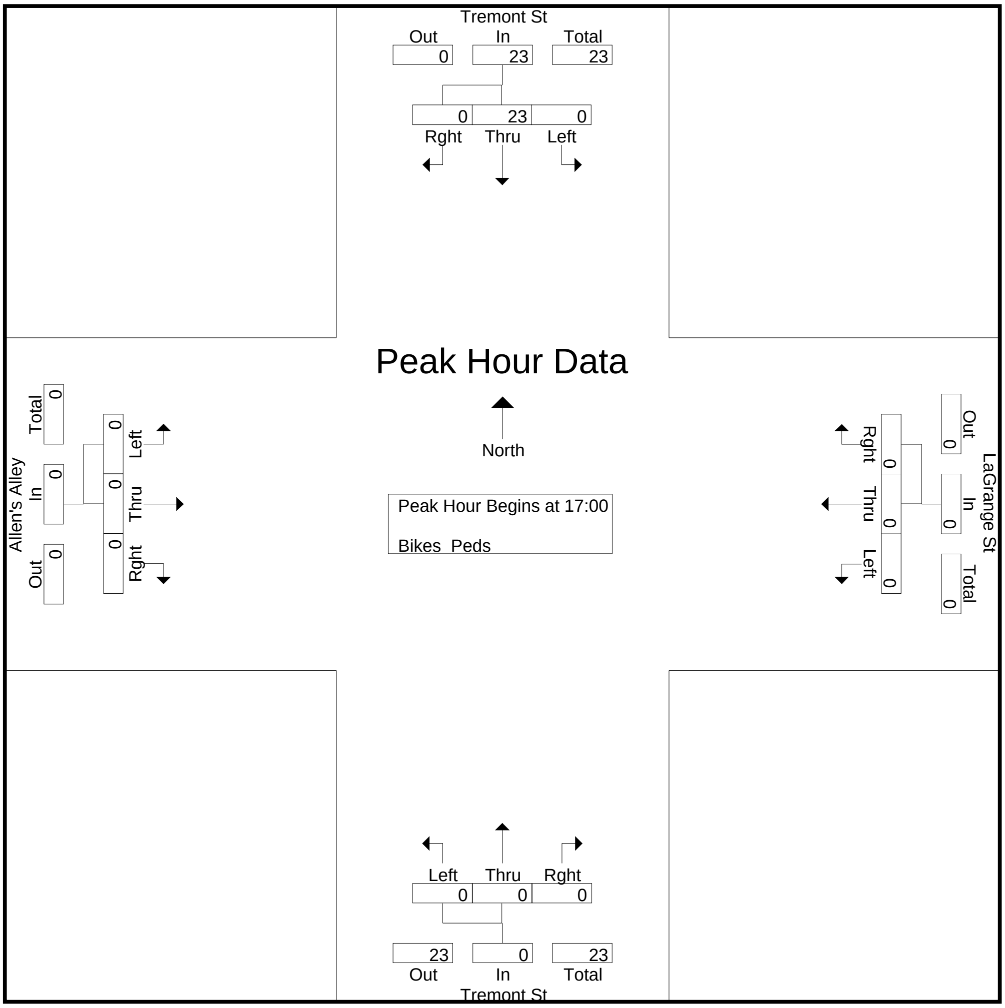
	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West						
Start Time	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Left	Thru	Rght	Peds	Exclu. Total	Inclu. Total	Int. Total
16:00	0	7	0	18	0	0	0	93	0	0	0	21	0	0	0	24	156	7	163
16:15	0	5	0	26	0	0	0	94	0	0	0	13	0	0	0	38	171	5	176
16:30	0	2	0	10	0	0	0	91	0	0	0	13	0	0	0	54	168	2	170
16:45	0	5	0	17	0	0	0	135	0	0	0	15	0	0	0	53	220	5	225
Total	0	19	0	71	0	0	0	413	0	0	0	62	0	0	0	169	715	19	734
17:00	0	7	0	21	0	0	0	75	0	0	0	20	0	0	0	33	149	7	156
17:15	0	4	0	25	0	0	0	81	0	0	0	23	0	0	0	34	163	4	167
17:30	0	4	0	19	0	0	0	70	0	0	0	17	0	0	0	18	124	4	128
17:45	0	8	0	30	0	0	0	96	0	0	0	17	0	0	0	28	171	8	179
Total	0	23	0	95	0	0	0	322	0	0	0	77	0	0	0	113	607	23	630
Grand Total	0	42	0	166	0	0	0	735	0	0	0	139	0	0	0	282	1322	42	1364
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0				
Total %	0	100	0		0	0	0		0	0	0		0	0	0		96.9	3.1	

	Tremont St From North				LaGrange St From East				Tremont St From South				Allen's Alley From West				
Start Time	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	App. Total	Left	Thru	Rght	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	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
17:15	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
17:30	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
17:45	0	**8**	0	**8**	0	0	0	0	0	0	0	0	0	0	0	0	**8**
Total Volume	0	23	0	23	0	0	0	0	0	0	0	0	0	0	0	0	23
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.719	.000	.719	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.719

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 2



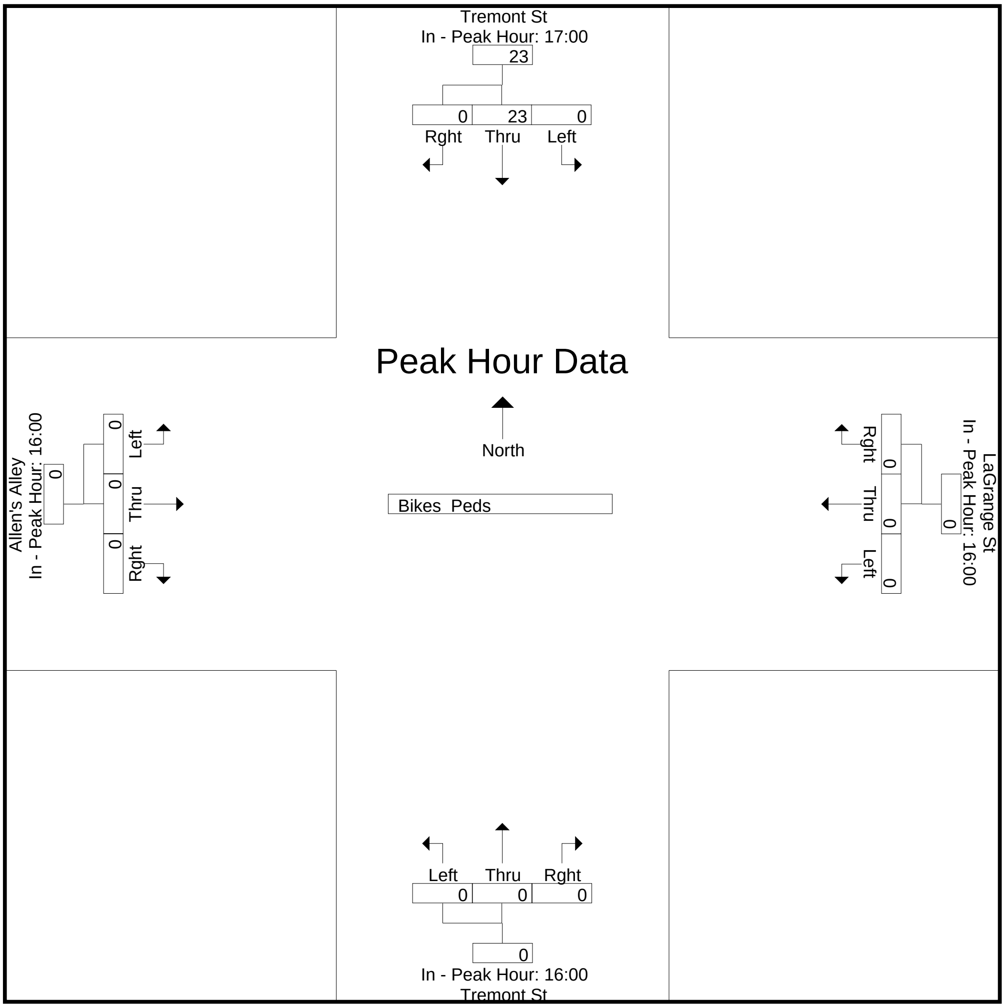
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:00				16:00				16:00			
+0 mins.	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	**8**	0	**8**	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	23	0	23	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.719	.000	.719	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Tremont Street
E/W Street: LaGrange St / Allen's Alley
City/State : Boston, MA
Weather : Clear

File Name : 61470004
Site Code : 61470004
Start Date : 4/14/2011
Page No : 3



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: Tremont Street
E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Tremont Street From North			Stuart Street From East			Tremont Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	34	45	20	0	115	37	0	0	0	20	61	0	332
07:15 AM	30	49	22	0	102	19	0	0	0	31	60	0	313
07:30 AM	36	63	26	0	102	33	0	0	0	17	57	0	334
07:45 AM	44	71	31	0	102	24	0	0	0	28	87	0	387
Total	144	228	99	0	421	113	0	0	0	96	265	0	1366
08:00 AM	38	71	16	0	108	41	0	0	0	30	66	0	370
08:15 AM	46	66	29	0	112	26	0	0	0	27	85	0	391
08:30 AM	54	82	29	0	110	31	0	0	0	38	81	0	425
08:45 AM	60	89	37	0	111	32	0	0	0	25	110	0	464
Total	198	308	111	0	441	130	0	0	0	120	342	0	1650
09:00 AM	42	80	32	0	111	35	0	0	0	32	87	0	419
09:15 AM	37	96	43	0	117	33	0	0	0	29	82	0	437
09:30 AM	45	73	36	0	97	35	0	0	0	23	92	0	401
09:45 AM	44	84	29	0	96	41	0	0	0	20	80	0	394
Total	168	333	140	0	421	144	0	0	0	104	341	0	1651
10:00 AM	36	67	24	0	100	38	0	0	0	21	91	0	377
10:15 AM	43	76	25	0	106	32	0	0	0	18	95	0	395
10:30 AM	41	80	32	0	91	35	0	0	0	23	85	0	387
10:45 AM	50	87	36	0	109	32	0	0	0	25	90	0	429
Total	170	310	117	0	406	137	0	0	0	87	361	0	1588
11:00 AM	54	86	43	0	88	34	0	0	0	27	83	0	415
11:15 AM	45	86	35	0	79	19	0	0	0	17	106	0	387
11:30 AM	46	72	28	0	123	26	0	0	0	20	105	0	420
11:45 AM	42	95	43	0	110	21	0	0	0	21	92	0	424
Total	187	339	149	0	400	100	0	0	0	85	386	0	1646
12:00 PM	26	79	38	0	119	35	0	0	0	18	113	0	428
12:15 PM	40	92	29	0	104	40	0	0	0	30	111	0	446
12:30 PM	37	73	36	0	97	52	0	0	0	27	102	0	424
12:45 PM	39	93	38	0	96	38	0	0	0	34	93	0	431
Total	142	337	141	0	416	165	0	0	0	109	419	0	1729
01:00 PM	32	75	31	0	108	36	0	0	0	26	99	0	407
01:15 PM	27	58	33	0	103	32	0	0	0	28	88	0	369
01:30 PM	26	67	29	0	97	29	0	0	0	31	98	0	377
01:45 PM	43	87	34	0	112	28	0	0	0	31	100	0	435
Total	128	287	127	0	420	125	0	0	0	116	385	0	1588
02:00 PM	35	95	38	0	108	25	0	0	0	27	102	0	430
02:15 PM	42	93	42	0	120	29	0	0	0	20	90	0	436
02:30 PM	44	109	48	0	93	26	0	0	0	24	91	0	435
02:45 PM	48	127	51	0	112	38	0	0	0	21	98	0	495
Total	169	424	179	0	433	118	0	0	0	92	381	0	1796
03:00 PM	41	114	47	0	89	47	0	0	0	19	100	0	457
03:15 PM	41	97	41	0	115	36	0	0	0	25	131	0	486
03:30 PM	43	82	42	0	123	34	0	0	0	23	126	0	473
03:45 PM	54	126	45	0	121	25	0	0	0	26	105	0	502
Total	179	419	175	0	448	142	0	0	0	93	462	0	1918
04:00 PM	43	123	53	0	101	35	0	0	0	24	100	0	479
04:15 PM	45	119	56	0	138	34	0	0	0	21	119	0	532
04:30 PM	37	125	56	0	116	22	0	0	0	25	111	0	492
04:45 PM	40	111	57	0	137	30	0	0	0	23	128	0	526
Total	165	478	222	0	492	121	0	0	0	93	458	0	2029

N/S: Tremont Street
E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Cars - Heavy Vehicles

	Tremont Street From North			Stuart Street From East			Tremont Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
05:00 PM	41	139	64	0	146	28	0	0	0	19	126	0	563
05:15 PM	54	145	62	0	152	21	0	0	0	15	125	0	574
05:30 PM	59	149	46	0	143	23	0	0	0	20	110	0	550
05:45 PM	40	114	41	0	151	16	0	0	0	25	99	0	486
Total	194	547	213	0	592	88	0	0	0	79	460	0	2173
Grand Total	1844	4010	1673	0	4890	1383	0	0	0	1074	4260	0	19134
Apprch %	24.5	53.3	22.2	0	78	22	0	0	0	20.1	79.9	0	
Total %	9.6	21	8.7	0	25.6	7.2	0	0	0	5.6	22.3	0	
Cars	1633	3775	1446	0	4639	1339	0	0	0	1022	3936	0	17790
% Cars	88.6	94.1	86.4	0	94.9	96.8	0	0	0	95.2	92.4	0	93
Heavy Vehicles	211	235	227	0	251	44	0	0	0	52	324	0	1344
% Heavy Vehicles	11.4	5.9	13.6	0	5.1	3.2	0	0	0	4.8	7.6	0	7

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart 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 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:30 AM																	
08:30 AM	54	82	29	165	0	110	31	141	0	0	0	0	**38**	81	0	119	425
08:45 AM	**60**	89	37	**186**	0	111	32	143	0	0	0	0	25	**110**	0	**135**	**464**
09:00 AM	42	80	32	154	0	111	**35**	146	0	0	0	0	32	87	0	119	419
09:15 AM	37	**96**	**43**	176	0	**117**	33	**150**	0	0	0	0	29	82	0	111	437
Total Volume	193	347	141	681	0	449	131	580	0	0	0	0	124	360	0	484	1745
% App. Total	28.3	51	20.7		0	77.4	22.6		0	0	0		25.6	74.4	0		
PHF	.804	.904	.820	.915	.000	.959	.936	.967	.000	.000	.000	.000	.816	.818	.000	.896	.940
Cars	172	325	112	609	0	414	128	542	0	0	0	0	118	331	0	449	1600
% Cars	89.1	93.7	79.4	89.4	0	92.2	97.7	93.4	0	0	0	0	95.2	91.9	0	92.8	91.7
Heavy Vehicles	21	22	29	72	0	35	3	38	0	0	0	0	6	29	0	35	145
% Heavy Vehicles	10.9	6.3	20.6	10.6	0	7.8	2.3	6.6	0	0	0	0	4.8	8.1	0	7.2	8.3
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	26	79	**38**	143	0	**119**	35	**154**	0	0	0	0	18	**113**	0	131	428
12:15 PM	**40**	92	29	161	0	104	40	144	0	0	0	0	30	111	0	**141**	**446**
12:30 PM	37	73	36	146	0	97	**52**	149	0	0	0	0	27	102	0	129	424
12:45 PM	39	**93**	38	**170**	0	96	38	134	0	0	0	0	**34**	93	0	127	431
Total Volume	142	337	141	620	0	416	165	581	0	0	0	0	109	419	0	528	1729
% App. Total	22.9	54.4	22.7		0	71.6	28.4		0	0	0		20.6	79.4	0		
PHF	.888	.906	.928	.912	.000	.874	.793	.943	.000	.000	.000	.000	.801	.927	.000	.936	.969
Cars	131	317	123	571	0	395	160	555	0	0	0	0	100	389	0	489	1615
% Cars	92.3	94.1	87.2	92.1	0	95.0	97.0	95.5	0	0	0	0	91.7	92.8	0	92.6	93.4
Heavy Vehicles	11	20	18	49	0	21	5	26	0	0	0	0	9	30	0	39	114
% Heavy Vehicles	7.7	5.9	12.8	7.9	0	5.0	3.0	4.5	0	0	0	0	8.3	7.2	0	7.4	6.6
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	40	111	57	208	0	137	**30**	167	0	0	0	0	**23**	**128**	0	**151**	526
05:00 PM	41	139	**64**	244	0	146	28	**174**	0	0	0	0	19	126	0	145	563
05:15 PM	54	145	62	**261**	0	**152**	21	173	0	0	0	0	15	125	0	140	**574**
05:30 PM	**59**	**149**	46	254	0	143	23	166	0	0	0	0	20	110	0	130	550
Total Volume	194	544	229	967	0	578	102	680	0	0	0	0	77	489	0	566	2213
% App. Total	20.1	56.3	23.7		0	85	15		0	0	0		13.6	86.4	0		
PHF	.822	.913	.895	.926	.000	.951	.850	.977	.000	.000	.000	.000	.837	.955	.000	.937	.964
Cars	185	534	208	927	0	565	100	665	0	0	0	0	75	464	0	539	2131
% Cars	95.4	98.2	90.8	95.9	0	97.8	98.0	97.8	0	0	0	0	97.4	94.9	0	95.2	96.3
Heavy Vehicles	9	10	21	40	0	13	2	15	0	0	0	0	2	25	0	27	82
% Heavy Vehicles	4.6	1.8	9.2	4.1	0	2.2	2.0	2.2	0	0	0	0	2.6	5.1	0	4.8	3.7

N/S: Tremont Street
E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

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File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Cars

	Tremont Street From North			Stuart Street From East			Tremont Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	28	42	15	0	108	36	0	0	0	19	55	0	303
07:15 AM	25	45	13	0	86	19	0	0	0	30	54	0	272
07:30 AM	31	57	22	0	95	32	0	0	0	16	55	0	308
07:45 AM	39	67	24	0	92	23	0	0	0	27	82	0	354
Total	123	211	74	0	381	110	0	0	0	92	246	0	1237
08:00 AM	31	66	13	0	103	40	0	0	0	29	58	0	340
08:15 AM	37	56	21	0	102	24	0	0	0	26	75	0	341
08:30 AM	50	76	21	0	99	29	0	0	0	35	77	0	387
08:45 AM	57	82	29	0	104	32	0	0	0	25	102	0	431
Total	175	280	84	0	408	125	0	0	0	115	312	0	1499
09:00 AM	38	78	26	0	100	34	0	0	0	31	81	0	388
09:15 AM	27	89	36	0	111	33	0	0	0	27	71	0	394
09:30 AM	35	64	29	0	85	34	0	0	0	19	76	0	342
09:45 AM	34	76	26	0	92	39	0	0	0	19	70	0	356
Total	134	307	117	0	388	140	0	0	0	96	298	0	1480
10:00 AM	27	62	20	0	96	35	0	0	0	20	75	0	335
10:15 AM	31	69	22	0	93	31	0	0	0	17	89	0	352
10:30 AM	37	76	28	0	84	35	0	0	0	22	76	0	358
10:45 AM	41	83	31	0	101	28	0	0	0	25	82	0	391
Total	136	290	101	0	374	129	0	0	0	84	322	0	1436
11:00 AM	45	77	35	0	83	32	0	0	0	26	72	0	370
11:15 AM	42	80	30	0	73	17	0	0	0	17	99	0	358
11:30 AM	45	64	25	0	116	25	0	0	0	18	93	0	386
11:45 AM	35	84	38	0	105	21	0	0	0	21	82	0	386
Total	167	305	128	0	377	95	0	0	0	82	346	0	1500
12:00 PM	22	75	33	0	109	33	0	0	0	18	105	0	395
12:15 PM	39	86	26	0	102	39	0	0	0	29	102	0	423
12:30 PM	36	68	32	0	92	50	0	0	0	27	93	0	398
12:45 PM	34	88	32	0	92	38	0	0	0	26	89	0	399
Total	131	317	123	0	395	160	0	0	0	100	389	0	1615
01:00 PM	29	72	28	0	101	35	0	0	0	24	94	0	383
01:15 PM	25	54	31	0	97	31	0	0	0	25	79	0	342
01:30 PM	24	63	25	0	92	29	0	0	0	29	91	0	353
01:45 PM	36	81	28	0	109	27	0	0	0	27	95	0	403
Total	114	270	112	0	399	122	0	0	0	105	359	0	1481
02:00 PM	33	84	31	0	105	24	0	0	0	27	96	0	400
02:15 PM	40	87	36	0	115	29	0	0	0	20	81	0	408
02:30 PM	38	107	43	0	90	25	0	0	0	24	87	0	414
02:45 PM	42	120	44	0	109	38	0	0	0	20	90	0	463
Total	153	398	154	0	419	116	0	0	0	91	354	0	1685
03:00 PM	37	112	41	0	87	45	0	0	0	19	96	0	437
03:15 PM	38	94	37	0	112	36	0	0	0	24	126	0	467
03:30 PM	42	79	39	0	119	33	0	0	0	22	118	0	452
03:45 PM	49	120	38	0	116	23	0	0	0	26	99	0	471
Total	166	405	155	0	434	137	0	0	0	91	439	0	1827
04:00 PM	39	117	49	0	99	35	0	0	0	24	93	0	456
04:15 PM	41	114	53	0	136	33	0	0	0	21	114	0	512
04:30 PM	32	119	52	0	113	22	0	0	0	25	103	0	466
04:45 PM	37	108	48	0	132	29	0	0	0	23	123	0	500
Total	149	458	202	0	480	119	0	0	0	93	433	0	1934

PRECISION
DATA
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N/S: Tremont Street
E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Cars

	Tremont Street From North			Stuart Street From East			Tremont Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
05:00 PM	39	136	59	0	144	28	0	0	0	18	115	0	539
05:15 PM	50	144	58	0	149	21	0	0	0	14	122	0	558
05:30 PM	59	146	43	0	140	22	0	0	0	20	104	0	534
05:45 PM	37	108	36	0	151	15	0	0	0	21	97	0	465
Total	185	534	196	0	584	86	0	0	0	73	438	0	2096
Grand Total	1633	3775	1446	0	4639	1339	0	0	0	1022	3936	0	17790
Apprch %	23.8	55.1	21.1	0	77.6	22.4	0	0	0	20.6	79.4	0	
Total %	9.2	21.2	8.1	0	26.1	7.5	0	0	0	5.7	22.1	0	

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart 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 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:30 AM																	
08:30 AM	50	76	21	147	0	99	29	128	0	0	0	0	**35**	77	0	112	387
08:45 AM	**57**	82	29	**168**	0	104	32	136	0	0	0	0	25	**102**	0	**127**	**431**
09:00 AM	38	78	26	142	0	100	**34**	134	0	0	0	0	31	81	0	112	388
09:15 AM	27	**89**	**36**	152	0	**111**	33	**144**	0	0	0	0	27	71	0	98	394
Total Volume	172	325	112	609	0	414	128	542	0	0	0	0	118	331	0	449	1600
% App. Total	28.2	53.4	18.4		0	76.4	23.6		0	0	0		26.3	73.7	0		
PHF	.754	.913	.778	.906	.000	.932	.941	.941	.000	.000	.000	.000	.843	.811	.000	.884	.928
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	22	75	**33**	130	0	**109**	33	**142**	0	0	0	0	18	**105**	0	123	395
12:15 PM	**39**	86	26	151	0	102	39	141	0	0	0	0	**29**	102	0	**131**	**423**
12:30 PM	36	68	32	136	0	92	**50**	142	0	0	0	0	27	93	0	120	398
12:45 PM	34	**88**	32	**154**	0	92	38	130	0	0	0	0	26	89	0	115	399
Total Volume	131	317	123	571	0	395	160	555	0	0	0	0	100	389	0	489	1615
% App. Total	22.9	55.5	21.5		0	71.2	28.8		0	0	0		20.4	79.6	0		
PHF	.840	.901	.932	.927	.000	.906	.800	.977	.000	.000	.000	.000	.862	.926	.000	.933	.954
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	37	108	48	193	0	132	**29**	161	0	0	0	0	**23**	**123**	0	**146**	500
05:00 PM	39	136	**59**	234	0	144	28	**172**	0	0	0	0	18	115	0	133	539
05:15 PM	50	144	58	**252**	0	**149**	21	170	0	0	0	0	14	122	0	136	**558**
05:30 PM	**59**	**146**	43	248	0	140	22	162	0	0	0	0	20	104	0	124	534
Total Volume	185	534	208	927	0	565	100	665	0	0	0	0	75	464	0	539	2131
% App. Total	20	57.6	22.4		0	85	15		0	0	0		13.9	86.1	0		
PHF	.784	.914	.881	.920	.000	.948	.862	.967	.000	.000	.000	.000	.815	.943	.000	.923	.955

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N/S: Tremont Street
E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009
Page No : 1

Groups Printed- Heavy Vehicles

	Tremont Street From North			Stuart Street From East			Tremont Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	6	3	5	0	7	1	0	0	0	1	6	0	29
07:15 AM	5	4	9	0	16	0	0	0	0	1	6	0	41
07:30 AM	5	6	4	0	7	1	0	0	0	1	2	0	26
07:45 AM	5	4	7	0	10	1	0	0	0	1	5	0	33
Total	21	17	25	0	40	3	0	0	0	4	19	0	129
08:00 AM	7	5	3	0	5	1	0	0	0	1	8	0	30
08:15 AM	9	10	8	0	10	2	0	0	0	1	10	0	50
08:30 AM	4	6	8	0	11	2	0	0	0	3	4	0	38
08:45 AM	3	7	8	0	7	0	0	0	0	0	8	0	33
Total	23	28	27	0	33	5	0	0	0	5	30	0	151
09:00 AM	4	2	6	0	11	1	0	0	0	1	6	0	31
09:15 AM	10	7	7	0	6	0	0	0	0	2	11	0	43
09:30 AM	10	9	7	0	12	1	0	0	0	4	16	0	59
09:45 AM	10	8	3	0	4	2	0	0	0	1	10	0	38
Total	34	26	23	0	33	4	0	0	0	8	43	0	171
10:00 AM	9	5	4	0	4	3	0	0	0	1	16	0	42
10:15 AM	12	7	3	0	13	1	0	0	0	1	6	0	43
10:30 AM	4	4	4	0	7	0	0	0	0	1	9	0	29
10:45 AM	9	4	5	0	8	4	0	0	0	0	8	0	38
Total	34	20	16	0	32	8	0	0	0	3	39	0	152
11:00 AM	9	9	8	0	5	2	0	0	0	1	11	0	45
11:15 AM	3	6	5	0	6	2	0	0	0	0	7	0	29
11:30 AM	1	8	3	0	7	1	0	0	0	2	12	0	34
11:45 AM	7	11	5	0	5	0	0	0	0	0	10	0	38
Total	20	34	21	0	23	5	0	0	0	3	40	0	146
12:00 PM	4	4	5	0	10	2	0	0	0	0	8	0	33
12:15 PM	1	6	3	0	2	1	0	0	0	1	9	0	23
12:30 PM	1	5	4	0	5	2	0	0	0	0	9	0	26
12:45 PM	5	5	6	0	4	0	0	0	0	8	4	0	32
Total	11	20	18	0	21	5	0	0	0	9	30	0	114
01:00 PM	3	3	3	0	7	1	0	0	0	2	5	0	24
01:15 PM	2	4	2	0	6	1	0	0	0	3	9	0	27
01:30 PM	2	4	4	0	5	0	0	0	0	2	7	0	24
01:45 PM	7	6	6	0	3	1	0	0	0	4	5	0	32
Total	14	17	15	0	21	3	0	0	0	11	26	0	107
02:00 PM	2	11	7	0	3	1	0	0	0	0	6	0	30
02:15 PM	2	6	6	0	5	0	0	0	0	0	9	0	28
02:30 PM	6	2	5	0	3	1	0	0	0	0	4	0	21
02:45 PM	6	7	7	0	3	0	0	0	0	1	8	0	32
Total	16	26	25	0	14	2	0	0	0	1	27	0	111
03:00 PM	4	2	6	0	2	2	0	0	0	0	4	0	20
03:15 PM	3	3	4	0	3	0	0	0	0	1	5	0	19
03:30 PM	1	3	3	0	4	1	0	0	0	1	8	0	21
03:45 PM	5	6	7	0	5	2	0	0	0	0	6	0	31
Total	13	14	20	0	14	5	0	0	0	2	23	0	91
04:00 PM	4	6	4	0	2	0	0	0	0	0	7	0	23
04:15 PM	4	5	3	0	2	1	0	0	0	0	5	0	20
04:30 PM	5	6	4	0	3	0	0	0	0	0	8	0	26
04:45 PM	3	3	9	0	5	1	0	0	0	0	5	0	26
Total	16	20	20	0	12	2	0	0	0	0	25	0	95

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E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009
Page No : 2

Groups Printed- Heavy Vehicles

	Tremont Street From North			Stuart Street From East			Tremont Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
05:00 PM	2	3	5	0	2	0	0	0	0	1	11	0	24
05:15 PM	4	1	4	0	3	0	0	0	0	1	3	0	16
05:30 PM	0	3	3	0	3	1	0	0	0	0	6	0	16
05:45 PM	3	6	5	0	0	1	0	0	0	4	2	0	21
Total	9	13	17	0	8	2	0	0	0	6	22	0	77
Grand Total	211	235	227	0	251	44	0	0	0	52	324	0	1344
Apprch %	31.4	34.9	33.7	0	85.1	14.9	0	0	0	13.8	86.2	0	
Total %	15.7	17.5	16.9	0	18.7	3.3	0	0	0	3.9	24.1	0	

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart 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 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 09:00 AM																	
09:00 AM	4	2	6	12	0	11	1	12	0	0	0	0	1	6	0	7	31
09:15 AM	10	7	7	24	0	6	0	6	0	0	0	0	2	11	0	13	43
09:30 AM	10	9	7	26	0	12	1	13	0	0	0	0	4	16	0	20	59
09:45 AM	10	8	3	21	0	4	2	6	0	0	0	0	1	10	0	11	38
Total Volume	34	26	23	83	0	33	4	37	0	0	0	0	8	43	0	51	171
% App. Total	41	31.3	27.7		0	89.2	10.8		0	0	0		15.7	84.3	0		
PHF	.850	.722	.821	.798	.000	.688	.500	.712	.000	.000	.000	.000	.500	.672	.000	.638	.725
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 10:15 AM																	
10:15 AM	12	7	3	22	0	13	1	14	0	0	0	0	1	6	0	7	43
10:30 AM	4	4	4	12	0	7	0	7	0	0	0	0	1	9	0	10	29
10:45 AM	9	4	5	18	0	8	4	12	0	0	0	0	0	8	0	8	38
11:00 AM	9	9	8	26	0	5	2	7	0	0	0	0	1	11	0	12	45
Total Volume	34	24	20	78	0	33	7	40	0	0	0	0	3	34	0	37	155
% App. Total	43.6	30.8	25.6		0	82.5	17.5		0	0	0		8.1	91.9	0		
PHF	.708	.667	.625	.750	.000	.635	.438	.714	.000	.000	.000	.000	.750	.773	.000	.771	.861
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	2	11	7	20	0	3	1	4	0	0	0	0	0	6	0	6	30
02:15 PM	2	6	6	14	0	5	0	5	0	0	0	0	0	9	0	9	28
02:30 PM	6	2	5	13	0	3	1	4	0	0	0	0	0	4	0	4	21
02:45 PM	6	7	7	20	0	3	0	3	0	0	0	0	1	8	0	9	32
Total Volume	16	26	25	67	0	14	2	16	0	0	0	0	1	27	0	28	111
% App. Total	23.9	38.8	37.3		0	87.5	12.5		0	0	0		3.6	96.4	0		
PHF	.667	.591	.893	.838	.000	.700	.500	.800	.000	.000	.000	.000	.250	.750	.000	.778	.867

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Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009
Page No : 1

Groups Printed- Peds and Bicycles

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	1	5	0	1	0	28	0	0	0	18	0	2	0	32	88
07:15 AM	0	1	1	1	0	0	0	26	0	0	0	20	0	3	0	46	98
07:30 AM	0	1	2	6	0	0	0	34	0	0	0	26	1	3	0	49	122
07:45 AM	0	2	0	10	0	0	0	63	0	2	1	19	0	4	0	39	140
Total	0	5	4	22	0	1	0	151	0	2	1	83	1	12	0	166	448
08:00 AM	0	3	0	5	0	1	0	54	0	0	0	14	0	4	0	40	121
08:15 AM	1	0	1	2	0	3	1	64	0	0	0	21	0	8	0	64	165
08:30 AM	1	4	1	2	0	0	1	49	0	0	0	25	0	2	0	62	147
08:45 AM	1	6	2	11	0	1	0	67	0	0	0	15	0	4	0	59	166
Total	3	13	4	20	0	5	2	234	0	0	0	75	0	18	0	225	599
09:00 AM	0	1	0	11	0	3	0	60	0	0	0	18	1	2	0	56	152
09:15 AM	0	1	3	6	0	1	0	59	0	0	0	10	0	6	0	54	140
09:30 AM	2	2	3	2	0	0	0	68	0	0	0	29	0	2	0	47	155
09:45 AM	0	1	2	2	0	1	1	46	0	1	0	19	1	3	0	35	112
Total	2	5	8	21	0	5	1	233	0	1	0	76	2	13	0	192	559
10:00 AM	0	2	0	7	0	1	0	49	0	0	0	12	1	4	0	48	124
10:15 AM	2	2	1	4	0	0	0	47	0	0	0	5	1	1	0	56	119
10:30 AM	1	1	0	4	0	3	0	59	0	2	0	11	0	0	1	69	151
10:45 AM	0	0	3	5	0	2	0	69	0	0	0	33	1	2	0	37	152
Total	3	5	4	20	0	6	0	224	0	2	0	61	3	7	1	210	546
11:00 AM	1	0	1	5	0	4	0	54	0	0	0	10	0	2	0	25	102
11:15 AM	0	1	1	4	0	4	0	102	0	0	0	17	1	4	0	45	179
11:30 AM	0	4	0	11	0	3	0	62	0	0	0	22	0	2	0	21	125
11:45 AM	0	3	0	4	0	1	0	100	0	1	0	22	0	4	0	65	200
Total	1	8	2	24	0	12	0	318	0	1	0	71	1	12	0	156	606
12:00 PM	2	1	1	7	0	4	0	95	0	0	1	53	1	1	0	69	235
12:15 PM	1	0	0	16	0	1	0	122	0	0	0	28	0	3	1	76	248
12:30 PM	0	1	0	22	0	1	0	99	0	0	0	31	0	3	0	49	206
12:45 PM	0	4	0	14	0	0	1	122	0	1	0	26	1	1	0	68	238
Total	3	6	1	59	0	6	1	438	0	1	1	138	2	8	1	262	927
01:00 PM	0	0	0	10	0	1	0	89	0	0	0	22	0	1	0	52	175
01:15 PM	2	0	0	12	0	3	0	78	0	0	0	15	0	1	0	43	154
01:30 PM	0	0	0	4	0	0	0	75	0	0	0	3	0	2	0	42	126
01:45 PM	1	1	0	5	0	1	0	65	0	0	0	7	0	1	0	33	114
Total	3	1	0	31	0	5	0	307	0	0	0	47	0	5	0	170	569
02:00 PM	0	2	0	4	0	0	0	76	0	0	0	14	0	3	0	41	140
02:15 PM	0	1	0	4	0	0	0	61	0	0	0	26	0	4	0	43	139
02:30 PM	1	0	0	4	0	0	0	72	0	0	0	9	0	1	0	62	149
02:45 PM	1	0	0	8	0	1	1	72	0	0	0	12	0	2	0	64	161
Total	2	3	0	20	0	1	1	281	0	0	0	61	0	10	0	210	589
03:00 PM	0	3	0	4	0	4	0	56	0	0	0	33	0	2	0	68	170
03:15 PM	1	0	1	6	0	4	0	48	0	0	0	32	0	4	0	71	167
03:30 PM	0	1	2	5	0	1	0	44	1	0	0	28	1	0	0	58	141
03:45 PM	0	2	0	6	0	3	0	61	0	0	0	27	0	1	0	70	170
Total	1	6	3	21	0	12	0	209	1	0	0	120	1	7	0	267	648
04:00 PM	1	0	0	5	0	1	0	69	0	0	0	14	1	1	0	52	144
04:15 PM	0	1	0	10	0	5	0	51	0	0	0	31	0	5	0	70	173
04:30 PM	0	2	0	6	0	4	0	60	0	0	0	25	0	3	0	71	171
04:45 PM	4	4	0	1	0	3	0	64	0	0	0	24	0	3	0	63	166
Total	5	7	0	22	0	13	0	244	0	0	0	94	1	12	0	256	654

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E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009
Page No : 2

Groups Printed- Peds and Bicycles

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
05:00 PM	3	0	0	19	0	2	0	98	0	0	0	14	0	2	0	81	219
05:15 PM	1	0	0	10	0	6	1	64	0	0	0	34	1	4	0	93	214
05:30 PM	2	2	0	1	0	4	0	77	0	0	0	42	0	0	0	117	245
05:45 PM	1	2	0	6	0	6	1	48	0	0	0	24	0	1	0	79	168
Total	7	4	0	36	0	18	2	287	0	0	0	114	1	7	0	370	846
Grand Total	30	63	26	296	0	84	7	2926	1	7	2	940	12	111	2	2484	6991
Apprch %	7.2	15.2	6.3	71.3	0	2.8	0.2	97	0.1	0.7	0.2	98.9	0.5	4.3	0.1	95.2	
Total %	0.4	0.9	0.4	4.2	0	1.2	0.1	41.9	0	0.1	0	13.4	0.2	1.6	0	35.5	

	Tremont Street From North					Stuart Street From East					Tremont Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	**1**	**0**	**1**	**2**	**4**	**0**	**3**	**1**	**64**	**68**	0	0	0	21	21	0	**8**	0	**64**	**72**	165
08:30 AM	1	4	1	2	8	0	0	1	49	50	0	0	0	**25**	**25**	0	2	0	62	64	147
08:45 AM	1	**6**	**2**	**11**	**20**	0	1	0	**67**	68	0	0	0	15	15	0	4	0	59	63	**166**
09:00 AM	0	1	0	11	12	0	3	0	60	63	0	0	0	18	18	**1**					
Total Volume	3	11	4	26	44	0	7	2	240	249	0	0	0	79	79	1	16	0	241	258	630
% App. Total	6.8	25	9.1	59.1		0	2.8	0.8	96.4		0	0	0	100		0.4	6.2	0	93.4		
PHF	.750	.458	.500	.591	.550	.000	.583	.500	.896	.915	.000	.000	.000	.790	.790	.250	.500	.000	.941	.896	.949
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	**2**	**1**	**1**	**7**	**11**	**0**	**4**	**0**	**95**	**99**	**0**	**0**	**1**	**53**	**54**	**1**	**1**	**0**	**69**	**71**	**235**
12:15 PM	**1**	**0**	**0**	**16**	**17**	**0**	**1**	**0**	**122**	**123**	0	0	0	28	28	0	**3**	**1**	**76**	**80**	**248**
12:30 PM	0	1	0	**22**	**23**	0	1	0	99	100	0	0	0	31	31	0	3	0	49	52	206
12:45 PM	0	**4**	0	14	18	0	0	**1**				**1**									
Total Volume	3	6	1	59	69	0	6	1	438	445	0	1	1	138	140	2	8	1	262	273	927
% App. Total	4.3	8.7	1.4	85.5		0	1.3	0.2	98.4		0	0.7	0.7	98.6		0.7	2.9	0.4	96		
PHF	.375	.375	.250	.670	.750	.000	.375	.250	.898	.904	.000	.250	.250	.651	.648	.500	.667	.250	.862	.853	.934
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**3**	**0**	**0**	**19**	**22**	0	2	0	**98**	**100**	0	0	0	14	14	0	2	0	81	83	219
05:15 PM	1	0	0	10	11	0	**6**	**1**								**1**	**4**	0	93	98	214
05:30 PM	2	**2**	0	1	5	0	4	0	77	81	0	0	0	**42**	**42**	0	0	0	**117**	**117**	**245**
05:45 PM	1	2	0	6	9	0	6	1	48	55	0	0	0	24	24	0	1	0	79	80	168
Total Volume	7	4	0	36	47	0	18	2	287	307	0	0	0	114	114	1	7	0	370	378	846
% App. Total	14.9	8.5	0	76.6		0	5.9	0.7	93.5		0	0	0	100		0.3	1.9	0	97.9		
PHF	.583	.500	.000	.474	.534	.000	.750	.500	.732	.768	.000	.000	.000	.679	.679	.250	.438	.000	.791	.808	.863

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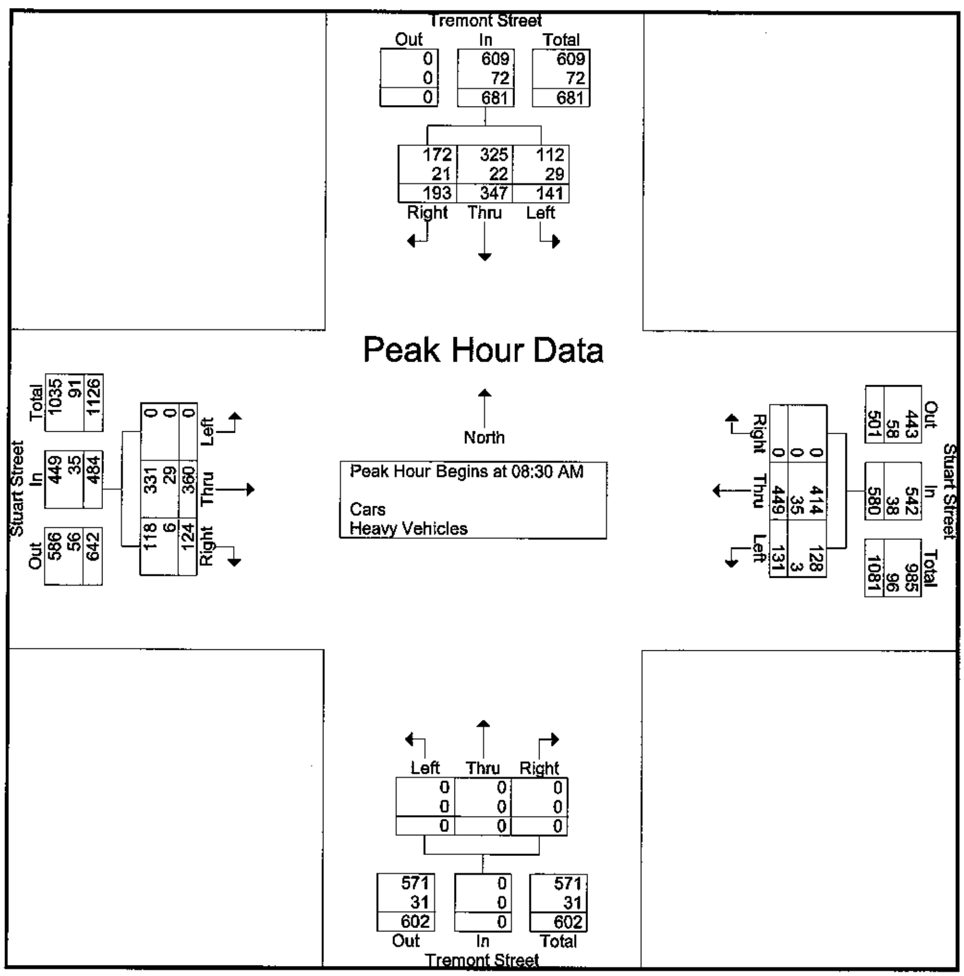
	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:30 AM																	
08:30 AM	54	82	29	165	0	110	31	141	0	0	0	0	**38**	81	0	119	425
08:45 AM	**60**	89	37	**186**	0	111	32	143	0	0	0	0	25	**110**	0	**135**	**464**
09:00 AM	42	80	32	154	0	111	**35**	146	0	0	0	0	32	87	0	119	419
09:15 AM	37	**96**	**43**	176	0	**117**	33	**150**	0	0	0	0	29	82	0	111	437
Total Volume	193	347	141	681	0	449	131	580	0	0	0	0	124	360	0	484	1745
% App. Total	28.3	51	20.7		0	77.4	22.6		0	0	0		25.6	74.4	0		
PHF	.804	.904	.820	.915	.000	.959	.936	.967	.000	.000	.000	.000	.816	.818	.000	.896	.940
Cars	172	325	112	609	0	414	128	542	0	0	0	0	118	331	0	449	1600
% Cars	89.1	93.7	79.4	89.4	0	92.2	97.7	93.4	0	0	0	0	95.2	91.9	0	92.8	91.7
Heavy Vehicles	21	22	29	72	0	35	3	38	0	0	0	0	6	29	0	35	145
% Heavy Vehicles	10.9	6.3	20.6	10.6	0	7.8	2.3	6.6	0	0	0	0	4.8	8.1	0	7.2	8.3



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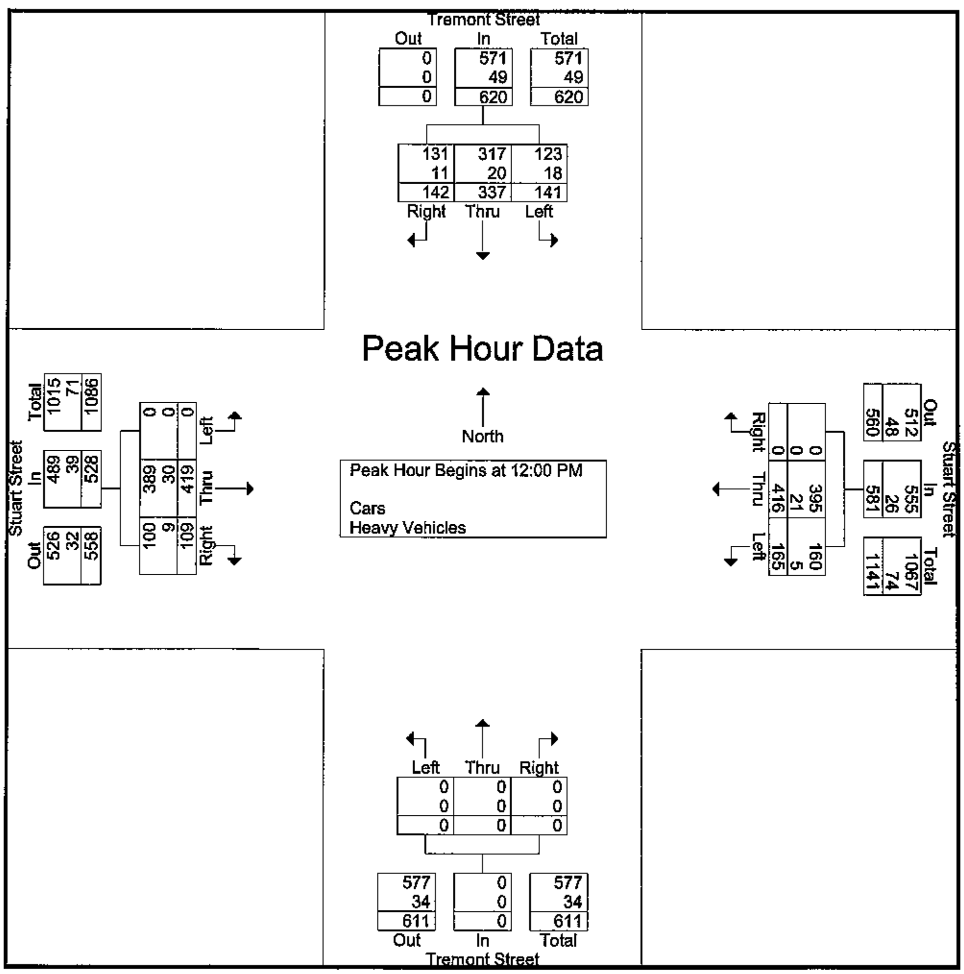
Page No : 2

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart 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 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	26	79	**38**	143	0	**119**	35	**154**	0	0	0	0	18	**113**	0	131	428
12:15 PM	**40**	92	29	161	0	104	40	144	0	0	0	0	30	111	0	**141**	**446**
12:30 PM	37	73	36	146	0	97	**52**	149	0	0	0	0	27	102	0	129	424
12:45 PM	39	**93**	38	**170**	0	96	38	134	0	0	0	0	**34**	93	0	127	431
Total Volume	142	337	141	620	0	416	165	581	0	0	0	0	109	419	0	528	1729
% App. Total	22.9	54.4	22.7		0	71.6	28.4		0	0	0		20.6	79.4	0		
PHF	.888	.906	.928	.912	.000	.874	.793	.943	.000	.000	.000	.000	.801	.927	.000	.936	.969
Cars	131	317	123	571	0	395	160	555	0	0	0	0	100	389	0	489	1615
% Cars	92.3	94.1	87.2	92.1	0	95.0	97.0	95.5	0	0	0	0	91.7	92.8	0	92.6	93.4
Heavy Vehicles	11	20	18	49	0	21	5	26	0	0	0	0	9	30	0	39	114
% Heavy Vehicles	7.7	5.9	12.8	7.9	0	5.0	3.0	4.5	0	0	0	0	8.3	7.2	0	7.4	6.6



PRECISION DATA INDUSTRIES, LLC

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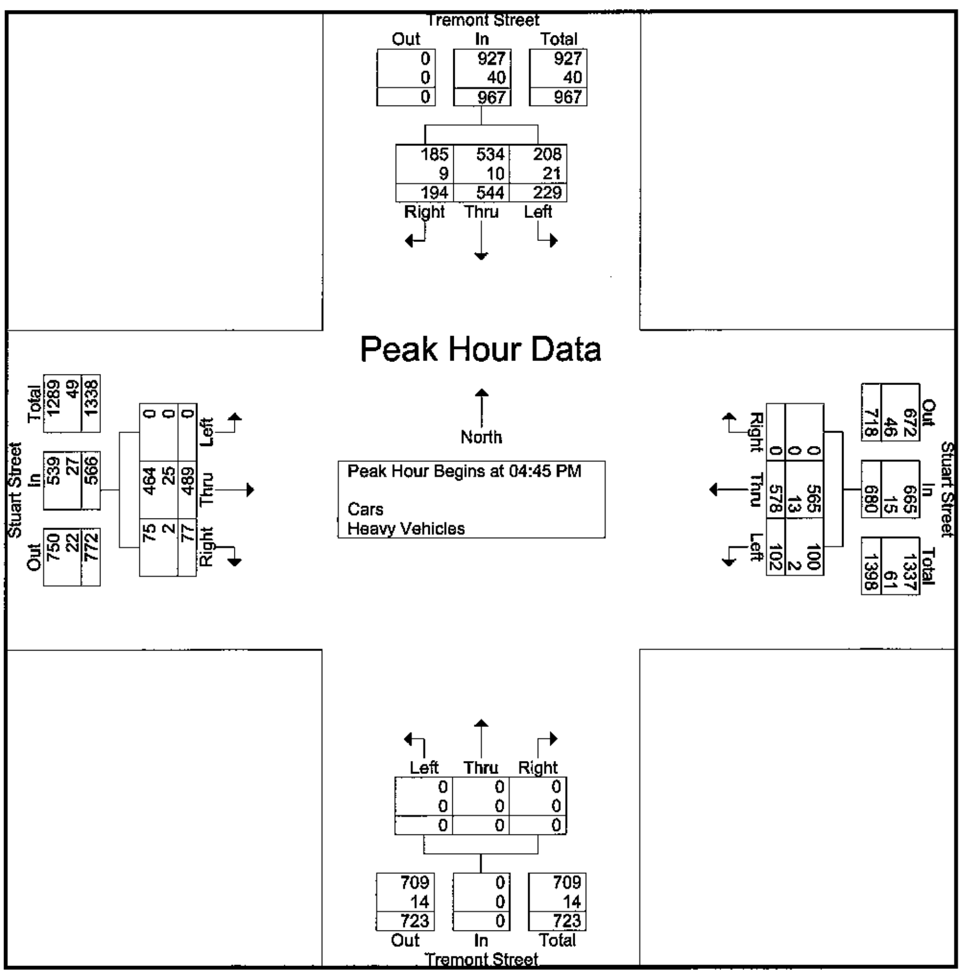
N/S: Tremont Street
E/W: Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 C
Site Code : TBA
Start Date : 7/29/2009

	Tremont Street From North				Stuart Street From East				Tremont Street From South				Stuart 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 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**40**	111	57	208	0	137	**30**	167	0	0	0	0	**23**	**128**	0	**151**	526
05:00 PM	41	139	**64**	244	0	146	28	**174**	0	0	0	0	19	126	0	145	563
05:15 PM	54	145	62	**261**	0	**152**	21	173	0	0	0	0	15	125	0	140	**574**
05:30 PM	**59**	**149**	46	254	0	143	23	166	0	0	0	0	20	110	0	130	550
Total Volume	194	544	229	967	0	578	102	680	0	0	0	0	77	489	0	566	2213
% App. Total	20.1	56.3	23.7		0	85	15		0	0	0		13.6	86.4	0		
PHF	.822	.913	.895	.926	.000	.951	.850	.977	.000	.000	.000	.000	.837	.955	.000	.937	.964
Cars	185	534	208	927	0	565	100	665	0	0	0	0	75	464	0	539	2131
% Cars	95.4	98.2	90.8	95.9	0	97.8	98.0	97.8	0	0	0	0	97.4	94.9	0	95.2	96.3
Heavy Vehicles	9	10	21	40	0	13	2	15	0	0	0	0	2	25	0	27	82
% Heavy Vehicles	4.6	1.8	9.2	4.1	0	2.2	2.0	2.2	0	0	0	0	2.6	5.1	0	4.8	3.7



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N/S: Washington Street
E/W: Kneeland Street / Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	25	132	37	0	17	25	14	0	12	55	11	0	328
07:15 AM	0	0	0	28	123	38	0	14	36	7	0	8	60	13	1	328
07:30 AM	0	0	0	25	125	22	0	23	37	7	0	9	62	12	1	323
07:45 AM	0	0	0	25	115	28	0	22	26	10	0	14	87	9	0	336
Total	0	0	0	103	495	125	0	76	124	38	0	43	264	45	2	1315
08:00 AM	0	0	0	46	134	38	0	16	39	12	0	13	66	13	0	377
08:15 AM	0	0	0	33	144	34	0	21	32	11	0	14	81	20	2	392
08:30 AM	0	0	0	34	131	45	1	27	40	9	1	18	72	20	1	399
08:45 AM	0	0	0	38	143	32	1	24	42	13	1	20	94	18	1	427
Total	0	0	0	151	552	149	2	88	153	45	2	65	313	71	4	1595
09:00 AM	0	0	0	48	146	32	1	29	45	17	0	20	84	16	0	438
09:15 AM	0	0	0	39	141	36	1	32	60	11	0	38	84	10	2	454
09:30 AM	0	0	0	42	106	47	1	33	44	21	0	22	86	18	0	420
09:45 AM	0	0	0	37	137	41	0	33	41	12	1	17	75	17	1	412
Total	0	0	0	166	530	156	3	127	190	61	1	97	329	61	3	1724
10:00 AM	0	0	0	31	127	42	0	52	58	16	1	17	80	18	1	443
10:15 AM	1	0	0	43	115	36	0	28	39	13	2	12	95	12	2	398
10:30 AM	0	0	0	46	126	37	0	52	46	10	0	13	90	11	2	433
10:45 AM	0	0	0	38	143	28	0	31	38	12	0	10	104	11	1	416
Total	1	0	0	158	511	143	0	163	181	51	3	52	369	52	6	1690
11:00 AM	0	0	0	42	104	33	2	35	42	13	0	16	94	13	2	396
11:15 AM	0	0	0	30	100	34	1	39	41	15	0	16	112	18	1	407
11:30 AM	0	0	0	30	102	30	0	28	37	16	0	14	102	15	5	379
11:45 AM	0	0	0	31	141	35	0	26	44	15	2	19	101	24	0	438
Total	0	0	0	133	447	132	3	128	164	59	2	65	409	70	8	1620
12:00 PM	0	0	0	35	128	24	1	23	40	9	0	16	100	17	0	393
12:15 PM	0	0	0	46	128	30	1	25	56	24	0	21	98	31	0	460
12:30 PM	1	0	0	36	112	32	2	23	43	18	1	25	99	20	0	412
12:45 PM	0	0	0	31	121	39	1	35	48	28	1	25	87	17	1	434
Total	1	0	0	148	489	125	5	106	187	79	2	87	384	85	1	1699
01:00 PM	0	0	0	26	138	36	2	25	22	16	1	19	118	20	0	423
01:15 PM	0	0	0	27	116	29	0	27	16	18	2	16	97	21	0	369
01:30 PM	0	0	0	24	117	41	0	27	25	6	0	12	101	31	0	384
01:45 PM	0	0	0	35	126	34	0	31	23	13	0	20	96	26	0	404
Total	0	0	0	112	497	140	2	110	86	53	3	67	412	98	0	1580
02:00 PM	0	0	0	20	109	25	1	35	35	13	0	23	96	23	0	380
02:15 PM	0	0	0	29	119	23	0	45	47	17	2	13	112	10	3	420
02:30 PM	0	0	0	33	115	30	2	42	43	10	1	17	108	21	0	422
02:45 PM	0	0	0	16	127	36	0	58	50	17	0	19	100	20	1	444
Total	0	0	0	98	470	114	3	180	175	57	3	72	416	74	4	1666
03:00 PM	0	0	0	17	109	25	0	44	44	23	1	7	130	18	2	420
03:15 PM	0	0	0	28	97	27	1	51	29	17	1	20	123	21	0	415
03:30 PM	0	0	0	22	114	27	0	67	44	22	0	17	129	8	1	451
03:45 PM	0	0	0	29	118	24	0	49	38	13	3	25	103	21	0	423
Total	0	0	0	96	438	103	1	211	155	75	5	69	485	68	3	1709
04:00 PM	0	0	0	25	122	28	1	52	40	13	2	16	105	19	2	425
04:15 PM	0	0	0	30	154	23	2	59	43	16	0	17	139	23	2	508
04:30 PM	0	0	0	20	127	18	0	67	47	15	0	21	121	15	2	453
04:45 PM	0	0	0	30	155	22	0	51	58	12	0	13	150	18	2	511
Total	0	0	0	105	558	91	3	229	188	56	2	67	515	75	8	1897

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City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
05:00 PM	0	0	0	30	141	23	1	34	43	23	0	19	156	20	3	493
05:15 PM	0	0	0	30	157	15	1	29	44	15	0	18	155	24	1	489
05:30 PM	0	0	0	22	168	20	0	40	42	10	1	15	131	21	4	474
05:45 PM	0	0	0	26	152	40	1	35	48	8	0	15	121	16	1	463
Total	0	0	0	108	618	98	3	138	177	56	1	67	563	81	9	1919
Grand Total	2	0	0	1378	5605	1376	25	1556	1780	630	24	751	4459	780	48	18414
Apprch %	100	0	0	16.4	66.9	16.4	0.3	39	44.6	15.8	0.6	12.4	73.8	12.9	0.8	
Total %	0	0	0	7.5	30.4	7.5	0.1	8.5	9.7	3.4	0.1	4.1	24.2	4.2	0.3	
Cars	2	0	0	1318	5361	1342	24	1489	1563	604	24	606	4076	739	47	17195
% Cars	100	0	0	95.6	95.6	97.5	96	95.7	87.8	95.9	100	80.7	91.4	94.7	97.9	93.4
Heavy Vehicles	0	0	0	60	244	34	1	67	217	26	0	145	383	41	1	1219
% Heavy Vehicles	0	0	0	4.4	4.4	2.5	4	4.3	12.2	4.1	0	19.3	8.6	5.3	2.1	6.6

	Washington Street From North				Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 08:45 AM																				
08:45 AM	0	0	0	0	38	143	32	**1**	214	24	42	13	**1**	80	20	**94**	**18**	1	133	427
09:00 AM	0	0	0	0	**48**	**146**	32	1	**227**	29	45	17	0	91	20	84	16	0	120	438
09:15 AM	0	0	0	0	39	141	36	1	217	32	**60**	11	0	**103**	**38**	84	10	**2**	**134**	**454**
09:30 AM	0	0	0	0	42	106	**47**	1	196	**33**	44	**21**	0	98	22	86	18	0	126	420
Total Volume	0	0	0	0	167	536	147	4	854	118	191	62	1	372	100	348	62	3	513	1739
% App. Total	0	0	0		19.6	62.8	17.2	0.5		31.7	51.3	16.7	0.3		19.5	67.8	12.1	0.6		
PHF	.000	.000	.000	.000	.870	.918	.782	1.000	.941	.894	.796	.738	.250	.903	.658	.926	.861	.375	.957	.958
Cars	0	0	0	0	157	498	142	4	801	108	169	60	1	338	80	307	55	3	445	1584
% Cars	0	0	0	0	94.0	92.9	96.6	100	93.8	91.5	88.5	96.8	100	90.9	80.0	88.2	88.7	100	86.7	91.1
Heavy Vehicles	0	0	0	0	10	38	5	0	53	10	22	2	0	34	20	41	7	0	68	155
% Heavy Vehicles	0	0	0	0	6.0	7.1	3.4	0	6.2	8.5	11.5	3.2	0	9.1	20.0	11.8	11.3	0	13.3	8.9
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 12:15 PM																				
12:15 PM	0	0	0	0	**46**	128	30	**1**	**205**	25	**56**	24	0	105	21	98	**31**	0	150	**460**
12:30 PM	**1**	0	0	**1**	36	112	32	**2**	182	23	43	18	**1**	85	**25**	99	20	0	144	412
12:45 PM	0	0	0	0	31	121	**39**	1	192	**35**	48	**28**	1	**112**	25	87	17	**1**	130	434
01:00 PM	0	0	0	0	26	**138**	36	2	202	25	22	16	1	64	19	**118**	20	0	**157**	423
Total Volume	1	0	0	1	139	499	137	6	781	108	169	86	3	366	90	402	88	1	581	1729
% App. Total	100	0	0		17.8	63.9	17.5	0.8		29.5	46.2	23.5	0.8		15.5	69.2	15.1	0.2		
PHF	.250	.000	.000	.250	.755	.904	.878	.750	.952	.771	.754	.768	.750	.817	.900	.852	.710	.250	.925	.940
Cars	1	0	0	1	137	484	132	6	759	106	157	83	3	349	79	373	84	1	537	1646
% Cars	100	0	0	100	98.6	97.0	96.4	100	97.2	98.1	92.9	96.5	100	95.4	87.8	92.8	95.5	100	92.4	95.2
Heavy Vehicles	0	0	0	0	2	15	5	0	22	2	12	3	0	17	11	29	4	0	44	83
% Heavy Vehicles	0	0	0	0	1.4	3.0	3.6	0	2.8	1.9	7.1	3.5	0	4.6	12.2	7.2	4.5	0	7.6	4.8
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 04:45 PM																				
04:45 PM	0	0	0	0	**30**	155	22	0	207	**51**	**58**	12	0	**121**	13	150	18	2	183	**511**
05:00 PM	0	0	0	0	30	141	**23**	**1**	195	34	43	**23**	0	100	**19**	**156**	20	3	**198**	493
05:15 PM	0	0	0	0	30	157	15	1	203	29	44	15	0	88	18	155	**24**	1	198	489
05:30 PM	0	0	0	0	22	**168**	20	0	**210**	40	42	10	**1**	93	15	131	21	**4**	171	474
Total Volume	0	0	0	0	112	621	80	2	815	154	187	60	1	402	65	592	83	10	750	1967
% App. Total	0	0	0		13.7	76.2	9.8	0.2		38.3	46.5	14.9	0.2		8.7	78.9	11.1	1.3		
PHF	.000	.000	.000	.000	.933	.924	.870	.500	.970	.755	.806	.652	.250	.831	.855	.949	.865	.625	.947	.962
Cars	0	0	0	0	107	609	78	2	796	151	162	58	1	372	49	565	78	9	701	1869
% Cars	0	0	0	0	95.5	98.1	97.5	100	97.7	98.1	86.6	96.7	100	92.5	75.4	95.4	94.0	90.0	93.5	95.0
Heavy Vehicles	0	0	0	0	5	12	2	0	19	3	25	2	0	30	16	27	5	1	49	98
% Heavy Vehicles	0	0	0	0	4.5	1.9	2.5	0	2.3	1.9	13.4	3.3	0	7.5	24.6	4.6	6.0	10.0	6.5	5.0

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File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Cars

	Washington Street From North			Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	22	125	36	0	16	20	14	0	9	48	10	0	300
07:15 AM	0	0	0	26	111	38	0	11	28	6	0	5	49	13	1	288
07:30 AM	0	0	0	20	119	21	0	19	28	5	0	7	61	11	1	292
07:45 AM	0	0	0	24	108	28	0	19	21	10	0	10	82	9	0	311
Total	0	0	0	92	463	123	0	65	97	35	0	31	240	43	2	1191
08:00 AM	0	0	0	44	128	36	0	14	39	12	0	10	59	11	0	353
08:15 AM	0	0	0	30	134	34	0	17	31	10	0	10	70	19	2	357
08:30 AM	0	0	0	33	124	45	1	27	39	8	1	15	65	18	1	377
08:45 AM	0	0	0	37	135	31	1	23	40	12	1	16	85	17	1	399
Total	0	0	0	144	521	146	2	81	149	42	2	51	279	65	4	1486
09:00 AM	0	0	0	45	134	32	1	25	39	17	0	16	77	16	0	402
09:15 AM	0	0	0	35	133	35	1	28	51	11	0	31	72	8	2	407
09:30 AM	0	0	0	40	96	44	1	32	39	20	0	17	73	14	0	376
09:45 AM	0	0	0	36	131	41	0	30	33	10	1	15	62	17	1	377
Total	0	0	0	156	494	152	3	115	162	58	1	79	284	55	3	1562
10:00 AM	0	0	0	29	120	40	0	48	51	15	1	13	61	18	1	397
10:15 AM	1	0	0	40	102	36	0	27	34	13	2	9	86	11	2	363
10:30 AM	0	0	0	45	118	36	0	47	40	10	0	10	84	10	2	402
10:45 AM	0	0	0	38	132	27	0	28	32	12	0	7	96	9	1	382
Total	1	0	0	152	472	139	0	150	157	50	3	39	327	48	6	1544
11:00 AM	0	0	0	41	99	33	2	33	36	13	0	12	82	13	2	366
11:15 AM	0	0	0	29	93	31	1	36	38	15	0	13	101	16	1	374
11:30 AM	0	0	0	30	101	28	0	27	34	16	0	12	90	15	5	358
11:45 AM	0	0	0	29	135	35	0	24	38	15	2	15	91	24	0	408
Total	0	0	0	129	428	127	3	120	146	59	2	52	364	68	8	1506
12:00 PM	0	0	0	34	122	24	1	21	34	8	0	14	92	15	0	365
12:15 PM	0	0	0	45	125	28	1	25	52	24	0	17	91	30	0	438
12:30 PM	1	0	0	36	106	31	2	22	39	18	1	23	90	18	0	387
12:45 PM	0	0	0	30	119	39	1	35	44	27	1	22	79	17	1	415
Total	1	0	0	145	472	122	5	103	169	77	2	76	352	80	1	1605
01:00 PM	0	0	0	26	134	34	2	24	22	14	1	17	113	19	0	406
01:15 PM	0	0	0	26	116	27	0	26	14	18	2	12	91	20	0	352
01:30 PM	0	0	0	24	114	39	0	27	24	6	0	10	91	31	0	366
01:45 PM	0	0	0	34	125	33	0	31	22	13	0	16	87	25	0	386
Total	0	0	0	110	489	133	2	108	82	51	3	55	382	95	0	1510
02:00 PM	0	0	0	20	104	25	1	35	28	12	0	20	87	22	0	354
02:15 PM	0	0	0	28	115	23	0	42	42	16	2	11	101	9	3	392
02:30 PM	0	0	0	33	109	30	2	40	34	10	1	12	100	20	0	391
02:45 PM	0	0	0	15	124	35	0	57	45	16	0	17	87	17	1	414
Total	0	0	0	96	452	113	3	174	149	54	3	60	375	68	4	1551
03:00 PM	0	0	0	16	105	25	0	43	42	22	1	5	124	17	2	402
03:15 PM	0	0	0	27	95	27	1	51	23	17	1	17	116	21	0	396
03:30 PM	0	0	0	22	108	26	0	67	39	21	0	14	120	8	1	426
03:45 PM	0	0	0	27	111	24	0	48	32	13	3	22	93	21	0	394
Total	0	0	0	92	419	102	1	209	136	73	5	58	453	67	3	1618
04:00 PM	0	0	0	23	119	27	1	52	36	12	2	13	94	19	2	400
04:15 PM	0	0	0	29	150	22	1	59	37	14	0	15	130	22	2	481
04:30 PM	0	0	0	19	122	18	0	67	39	13	0	16	112	15	2	423
04:45 PM	0	0	0	30	150	21	0	48	51	12	0	9	140	18	2	481
Total	0	0	0	101	541	88	2	226	163	51	2	53	476	74	8	1785

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City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009
Page No : 2

Groups Printed- Cars

	Washington Street From North			Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
05:00 PM	0	0	0	29	140	23	1	34	38	22	0	15	147	19	2	470
05:15 PM	0	0	0	27	154	14	1	29	37	15	0	13	151	23	1	465
05:30 PM	0	0	0	21	165	20	0	40	36	9	1	12	127	18	4	453
05:45 PM	0	0	0	24	151	40	1	35	42	8	0	12	119	16	1	449
Total	0	0	0	101	610	97	3	138	153	54	1	52	544	76	8	1837
Grand Total	2	0	0	1318	5361	1342	24	1489	1563	604	24	606	4076	739	47	17195
Apprch %	100	0	0	16.4	66.6	16.7	0.3	40.5	42.5	16.4	0.7	11.1	74.5	13.5	0.9	
Total %	0	0	0	7.7	31.2	7.8	0.1	8.7	9.1	3.5	0.1	3.5	23.7	4.3	0.3	

	Washington Street From North				Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 08:30 AM																				
08:30 AM	0	0	0	0	33	124	**45**	1	203	27	39	8	**1**	75	15	65	**18**	1	99	377
08:45 AM	0	0	0	0	37	**135**	31	1	204	23	40	12	**1**	76	16	**85**	17	1	**119**	399
09:00 AM	0	0	0	0	**45**	134	32	1	**212**	25	39	**17**	0	81	16	77	16	0	109	402
09:15 AM	0	0	0	0	35	133	35	1	204	**28**	**51**	11	0	**90**	**31**	72	8	**2**	113	**407**
Total Volume	0	0	0	0	150	526	143	4	823	103	169	48	2	322	78	299	59	4	440	1585
% App. Total	0	0	0		18.2	63.9	17.4	0.5		32	52.5	14.9	0.6		17.7	68	13.4	0.9		
PHF	.000	.000	.000	.000	.833	.974	.794	1.000	.971	.920	.828	.706	.500	.894	.629	.879	.819	.500	.924	.974
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 12:15 PM																				
12:15 PM	0	0	0	0	**45**	125	28	1	**199**	25	**52**	24	0	101	17	91	**30**	0	138	**438**
12:30 PM	**1**	0	0	**1**	36	106	31	**2**	175	22	39	18	**1**	80	**23**	90	18	0	131	387
12:45 PM	0	0	0	0	30	119	**39**	1	189	**35**	44	**27**	1	**107**	22	79	17	**1**	119	415
01:00 PM	0	0	0	0	26	**134**	34	2	196	24	22	14	1	61	17	**113**	19	0	**149**	406
Total Volume	1	0	0	1	137	484	132	6	759	106	157	83	3	349	79	373	84	1	537	1646
% App. Total	100	0	0		18.1	63.8	17.4	0.8		30.4	45	23.8	0.9		14.7	69.5	15.6	0.2		
PHF	.250	.000	.000	.250	.761	.903	.846	.750	.954	.757	.755	.769	.750	.815	.859	.825	.700	.250	.901	.939
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 04:45 PM																				
04:45 PM	0	0	0	0	**30**	150	21	0	201	**48**	**51**	12	0	**111**	9	140	18	2	169	**481**
05:00 PM	0	0	0	0	29	140	**23**	**1**	193	34	38	**22**	0	94	**15**	147	19	2	183	470
05:15 PM	0	0	0	0	27	154	14	1	196	29	37	15	0	81	13	**151**	**23**	1	**188**	465
05:30 PM	0	0	0	0	21	**165**	20	0	**206**	40	36	9	**1**	86	12	127	18	**4**	161	453
Total Volume	0	0	0	0	107	609	78	2	796	151	162	58	1	372	49	565	78	9	701	1869
% App. Total	0	0	0		13.4	76.5	9.8	0.3		40.6	43.5	15.6	0.3		7	80.6	11.1	1.3		
PHF	.000	.000	.000	.000	.892	.923	.848	.500	.966	.786	.794	.659	.250	.838	.817	.935	.848	.563	.932	.971

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City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	3	7	1	0	1	5	0	0	3	7	1	0	28
07:15 AM	0	0	0	2	12	0	0	3	8	1	0	3	11	0	0	40
07:30 AM	0	0	0	5	6	1	0	4	9	2	0	2	1	1	0	31
07:45 AM	0	0	0	1	7	0	0	3	5	0	0	4	5	0	0	25
Total	0	0	0	11	32	2	0	11	27	3	0	12	24	2	0	124
08:00 AM	0	0	0	2	6	2	0	2	0	0	0	3	7	2	0	24
08:15 AM	0	0	0	3	10	0	0	4	1	1	0	4	11	1	0	35
08:30 AM	0	0	0	1	7	0	0	0	1	1	0	3	7	2	0	22
08:45 AM	0	0	0	1	8	1	0	1	2	1	0	4	9	1	0	28
Total	0	0	0	7	31	3	0	7	4	3	0	14	34	6	0	109
09:00 AM	0	0	0	3	12	0	0	4	6	0	0	4	7	0	0	36
09:15 AM	0	0	0	4	8	1	0	4	9	0	0	7	12	2	0	47
09:30 AM	0	0	0	2	10	3	0	1	5	1	0	5	13	4	0	44
09:45 AM	0	0	0	1	6	0	0	3	8	2	0	2	13	0	0	35
Total	0	0	0	10	36	4	0	12	28	3	0	18	45	6	0	162
10:00 AM	0	0	0	2	7	2	0	4	7	1	0	4	19	0	0	46
10:15 AM	0	0	0	3	13	0	0	1	5	0	0	3	9	1	0	35
10:30 AM	0	0	0	1	8	1	0	5	6	0	0	3	6	1	0	31
10:45 AM	0	0	0	0	11	1	0	3	6	0	0	3	8	2	0	34
Total	0	0	0	6	39	4	0	13	24	1	0	13	42	4	0	146
11:00 AM	0	0	0	1	5	0	0	2	6	0	0	4	12	0	0	30
11:15 AM	0	0	0	1	7	3	0	3	3	0	0	3	11	2	0	33
11:30 AM	0	0	0	0	1	2	0	1	3	0	0	2	12	0	0	21
11:45 AM	0	0	0	2	6	0	0	2	6	0	0	4	10	0	0	30
Total	0	0	0	4	19	5	0	8	18	0	0	13	45	2	0	114
12:00 PM	0	0	0	1	6	0	0	2	6	1	0	2	8	2	0	28
12:15 PM	0	0	0	1	3	2	0	0	4	0	0	4	7	1	0	22
12:30 PM	0	0	0	0	6	1	0	1	4	0	0	2	9	2	0	25
12:45 PM	0	0	0	1	2	0	0	0	4	1	0	3	8	0	0	19
Total	0	0	0	3	17	3	0	3	18	2	0	11	32	5	0	94
01:00 PM	0	0	0	0	4	2	0	1	0	2	0	2	5	1	0	17
01:15 PM	0	0	0	1	0	2	0	1	2	0	0	4	6	1	0	17
01:30 PM	0	0	0	0	3	2	0	0	1	0	0	2	10	0	0	18
01:45 PM	0	0	0	1	1	1	0	0	1	0	0	4	9	1	0	18
Total	0	0	0	2	8	7	0	2	4	2	0	12	30	3	0	70
02:00 PM	0	0	0	0	5	0	0	0	7	1	0	3	9	1	0	26
02:15 PM	0	0	0	1	4	0	0	3	5	1	0	2	11	1	0	28
02:30 PM	0	0	0	0	6	0	0	2	9	0	0	5	8	1	0	31
02:45 PM	0	0	0	1	3	1	0	1	5	1	0	2	13	3	0	30
Total	0	0	0	2	18	1	0	6	26	3	0	12	41	6	0	115
03:00 PM	0	0	0	1	4	0	0	1	2	1	0	2	6	1	0	18
03:15 PM	0	0	0	1	2	0	0	0	6	0	0	3	7	0	0	19
03:30 PM	0	0	0	0	6	1	0	0	5	1	0	3	9	0	0	25
03:45 PM	0	0	0	2	7	0	0	1	6	0	0	3	10	0	0	29
Total	0	0	0	4	19	1	0	2	19	2	0	11	32	1	0	91
04:00 PM	0	0	0	2	3	1	0	0	4	1	0	3	11	0	0	25
04:15 PM	0	0	0	1	4	1	1	0	6	2	0	2	9	1	0	27
04:30 PM	0	0	0	1	5	0	0	0	8	2	0	5	9	0	0	30
04:45 PM	0	0	0	0	5	1	0	3	7	0	0	4	10	0	0	30
Total	0	0	0	4	17	3	1	3	25	5	0	14	39	1	0	112

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City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Heavy Vehicles

	Washington Street From North			Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
05:00 PM	0	0	0	1	1	0	0	0	5	1	0	4	9	1	1	23
05:15 PM	0	0	0	3	3	1	0	0	7	0	0	5	4	1	0	24
05:30 PM	0	0	0	1	3	0	0	0	6	1	0	3	4	3	0	21
05:45 PM	0	0	0	2	1	0	0	0	6	0	0	3	2	0	0	14
Total	0	0	0	7	8	1	0	0	24	2	0	15	19	5	1	82
Grand Total	0	0	0	60	244	34	1	67	217	26	0	145	383	41	1	1219
Apprch %	0	0	0	17.7	72	10	0.3	21.6	70	8.4	0	25.4	67.2	7.2	0.2	
Total %	0	0	0	4.9	20	2.8	0.1	5.5	17.8	2.1	0	11.9	31.4	3.4	0.1	

	Washington Street From North				Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 09:00 AM																				
09:00 AM	0	0	0	0	3	**12**	0	0	**15**	**4**	6	0	0	10	4	7	0	0	11	36
09:15 AM	0	0	0	0	**4**	8	1	0	13	4	**9**	0	0	**13**	**7**	12	2	0	21	**47**
09:30 AM	0	0	0	0	2	10	**3**	0	15	1	5	1	0	7	5	**13**	**4**	0	**22**	44
09:45 AM	0	0	0	0	1	6	0	0	7	3	8	**2**	0	13	2	13	0	0	15	35
Total Volume	0	0	0	0	10	36	4	0	50	12	28	3	0	43	18	45	6	0	69	162
% App. Total	0	0	0		20	72	8	0		27.9	65.1	7	0		26.1	65.2	8.7	0		
PHF	.000	.000	.000	.000	.625	.750	.333	.000	.833	.750	.778	.375	.000	.827	.643	.865	.375	.000	.784	.862
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 10:00 AM																				
10:00 AM	0	0	0	0	2	7	**2**	0	11	4	**7**	**1**	0	**12**	**4**	**19**	0	0	**23**	**46**
10:15 AM	0	0	0	0	**3**	**13**	0	0	**16**	1	5	0	0	6	3	9	1	0	13	35
10:30 AM	0	0	0	0	1	8	1	0	10	**5**	6	0	0	11	3	6	1	0	10	31
10:45 AM	0	0	0	0	0	11	1	0	12	3	6	0	0	9	3	8	**2**	0	13	34
Total Volume	0	0	0	0	6	39	4	0	49	13	24	1	0	38	13	42	4	0	59	146
% App. Total	0	0	0		12.2	79.6	8.2	0		34.2	63.2	2.6	0		22	71.2	6.8	0		
PHF	.000	.000	.000	.000	.500	.750	.500	.000	.766	.650	.857	.250	.000	.792	.813	.553	.500	.000	.641	.793
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 02:00 PM																				
02:00 PM	0	0	0	0	0	5	0	0	5	0	7	**1**	0	8	3	9	1	0	13	26
02:15 PM	0	0	0	0	**1**	4	0	0	5	**3**	5	1	0	9	2	11	1	0	14	28
02:30 PM	0	0	0	0	0	**6**	0	0	**6**	2	**9**	0	0	**11**	**5**	8	1	0	14	**31**
02:45 PM	0	0	0	0	1	3	**1**	0	5	1	5	1	0	7	2	**13**	**3**	0	**18**	30
Total Volume	0	0	0	0	2	18	1	0	21	6	26	3	0	35	12	41	6	0	59	115
% App. Total	0	0	0		9.5	85.7	4.8	0		17.1	74.3	8.6	0		20.3	69.5	10.2	0		
PHF	.000	.000	.000	.000	.500	.750	.250	.000	.875	.500	.722	.750	.000	.795	.600	.788	.500	.000	.819	.927

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File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North				Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	32	1	2	0	27	0	3	0	11	0	2	1	35	114
07:15 AM	0	0	0	29	1	5	0	39	1	1	0	29	0	2	1	32	140
07:30 AM	0	0	0	40	0	2	1	31	1	6	0	26	0	1	1	43	152
07:45 AM	0	0	0	50	0	3	0	41	1	0	0	36	1	6	0	58	196
Total	0	0	0	151	2	12	1	138	3	10	0	102	1	11	3	168	602
08:00 AM	0	0	0	31	0	3	0	38	0	6	0	66	0	4	0	22	170
08:15 AM	0	1	0	50	0	4	0	36	0	4	0	54	0	4	2	27	182
08:30 AM	0	0	0	45	0	2	0	39	0	5	0	64	0	2	1	32	190
08:45 AM	0	0	0	52	0	2	0	40	0	6	0	73	0	4	0	59	236
Total	0	1	0	178	0	11	0	153	0	21	0	257	0	14	3	140	778
09:00 AM	0	0	0	44	0	1	0	91	0	6	0	89	0	2	2	49	284
09:15 AM	0	0	0	43	0	1	0	89	0	2	0	94	0	8	3	67	307
09:30 AM	0	0	0	66	0	0	0	77	0	1	0	88	1	3	0	79	315
09:45 AM	0	0	0	55	1	2	0	221	0	1	0	172	0	5	1	68	526
Total	0	0	0	208	1	4	0	478	0	10	0	443	1	18	6	263	1432
10:00 AM	0	0	0	74	0	1	0	103	0	0	1	79	2	4	0	83	347
10:15 AM	0	0	0	78	0	1	0	82	0	0	1	79	0	2	0	69	312
10:30 AM	0	0	0	55	0	2	0	140	0	2	0	102	0	1	0	88	390
10:45 AM	0	0	0	84	0	1	0	90	0	1	0	122	1	5	0	63	367
Total	0	0	0	291	0	5	0	415	0	3	2	382	3	12	0	303	1416
11:00 AM	0	1	0	57	0	4	1	133	0	1	0	78	0	2	2	102	381
11:15 AM	0	1	0	89	1	4	1	116	0	2	0	104	0	4	0	105	427
11:30 AM	0	0	1	109	1	1	0	124	1	2	0	92	0	1	0	142	474
11:45 AM	0	0	0	294	0	2	1	114	0	1	0	101	1	2	1	182	699
Total	0	2	1	549	2	11	3	487	1	6	0	375	1	9	3	531	1981
12:00 PM	0	0	0	127	0	0	0	129	0	0	0	140	0	1	0	160	557
12:15 PM	0	0	0	122	0	0	1	159	0	0	0	167	0	1	0	105	555
12:30 PM	0	0	0	130	0	0	0	96	0	0	1	118	0	2	0	180	527
12:45 PM	0	0	0	166	0	0	0	112	0	0	0	122	1	0	0	168	569
Total	0	0	0	545	0	0	1	496	0	0	1	547	1	4	0	613	2208
01:00 PM	0	0	0	155	0	0	0	132	0	0	0	108	0	1	0	133	529
01:15 PM	0	0	0	146	0	2	0	148	0	0	0	116	0	2	0	169	583
01:30 PM	0	0	0	141	0	1	0	144	0	0	0	94	0	1	0	145	526
01:45 PM	0	0	0	139	0	1	0	162	0	0	0	129	0	0	0	113	544
Total	0	0	0	581	0	4	0	586	0	0	0	447	0	4	0	560	2182
02:00 PM	0	0	0	146	0	2	2	111	0	2	0	59	0	2	0	125	449
02:15 PM	0	0	0	95	0	1	0	74	0	0	0	60	0	4	2	122	358
02:30 PM	0	2	0	116	0	0	2	108	0	1	0	77	0	3	1	113	423
02:45 PM	0	0	0	121	0	5	2	181	0	5	0	78	0	2	0	87	481
Total	0	2	0	478	0	8	6	474	0	8	0	274	0	11	3	447	1711
03:00 PM	0	0	0	57	0	2	0	70	0	3	1	86	0	4	0	96	319
03:15 PM	0	0	0	71	0	1	0	49	0	5	0	66	0	4	0	146	342
03:30 PM	0	0	0	78	0	1	0	76	0	2	1	68	2	1	0	110	339
03:45 PM	0	0	0	71	1	1	2	70	0	0	1	92	0	2	0	117	357
Total	0	0	0	277	1	5	2	265	0	10	3	312	2	11	0	469	1357
04:00 PM	0	0	0	128	0	1	0	122	0	1	0	93	0	3	0	99	447
04:15 PM	0	0	0	79	0	2	0	94	0	3	0	84	0	2	0	89	353
04:30 PM	0	0	0	100	0	3	0	84	0	1	0	85	1	4	0	89	367
04:45 PM	0	0	0	105	0	1	0	114	0	0	0	88	1	2	0	101	412
Total	0	0	0	412	0	7	0	414	0	5	0	350	2	11	0	378	1579

N/S: Washington Street
E/W: Kneeland Street / Stuart Street
City, State: Boston, MA
Client: HSH/J. SanClemente

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File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

Groups Printed- Peds and Bicycles

	Washington Street From North				Kneeland Street From East				Washington Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
05:00 PM	0	0	0	113	0	8	2	84	0	0	2	76	3	3	0	118	409
05:15 PM	0	0	0	132	1	7	1	82	0	1	1	61	1	1	0	105	393
05:30 PM	0	0	0	87	0	3	2	62	0	0	2	72	0	0	0	99	327
05:45 PM	0	0	0	82	0	6	0	59	0	0	2	69	0	2	0	79	299
Total	0	0	0	414	1	24	5	287	0	1	7	278	4	6	0	401	1428
Grand Total	0	5	1	4084	7	91	18	4193	4	74	13	3767	15	111	18	4273	16674
Apprch %	0	0.1	0	99.9	0.2	2.1	0.4	97.3	0.1	1.9	0.3	97.6	0.3	2.5	0.4	96.7	
Total %	0	0	0	24.5	0	0.5	0.1	25.1	0	0.4	0.1	22.6	0.1	0.7	0.1	25.6	

	Washington Street From North					Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	0	0	0	44	44	0	1	0	91	92	0	6	0	89	95	0	2	2	49	53	284
09:15 AM	0	0	0	43	43	0	1	0	89	90	0	2	0	94	96	0	8	3	67	78	307
09:30 AM	0	0	0	66	66	0	0	0	77	77	0	1	0	88	89	1	3	0	79	83	315
09:45 AM	0	0	0	55	55	1	2		221	224	0	1	0	172	173	0	5	1	68	74	526
Total Volume	0	0	0	208	208	1	4	0	478	483	0	10	0	443	453	1	18	6	263	288	1432
% App. Total	0	0	0	100		0.2	0.8	0	99		0	2.2	0	97.8		0.3	6.2	2.1	91.3		
PHF	.000	.000	.000	.788	.788	.250	.500	.000	.541	.539	.000	.417	.000	.644	.655	.250	.563	.500	.832	.867	.681
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	0	0	0	294	294	0	2	1	114	117	0	1	0	101	102	1	2	1	182	186	699
12:00 PM	0	0	0	127	127	0	0	0	129	129	0	0	0	140	140	0	1	0	160	161	557
12:15 PM	0	0	0	122	122	0	0	1	159	160	0	0	0	167	167	0	1	0	105	106	555
12:30 PM	0	0	0	130	130	0	0	0	96	96	0	0	1	118	119	0	2	0	180	182	527
Total Volume	0	0	0	673	673	0	2	2	498	502	0	1	1	526	528	1	6	1	627	635	2338
% App. Total	0	0	0	100		0	0.4	0.4	99.2		0	0.2	0.2	99.6		0.2	0.9	0.2	98.7		
PHF	.000	.000	.000	.572	.572	.000	.250	.500	.783	.784	.000	.250	.250	.787	.790	.250	.750	.250	.861	.853	.836
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:00 PM																					
02:00 PM	0	0	0	146	146	0	2	2	111	115	0	2	0	59	61	0	2	0	125	127	449
02:15 PM	0	0	0	95	95	0	1	0	74	75	0	0	0	60	60	0	4	2	122	128	358
02:30 PM	0	2	0	116	118	0	0	2	108	110	0	1	0	77	78	0	3	1	113	117	423
02:45 PM	0	0	0	121	121	0	5		181	188	0	5		78	83	0	2	0	87	89	481
Total Volume	0	2	0	478	480	0	8	6	474	488	0	8	0	274	282	0	11	3	447	461	1711
% App. Total	0	0.4	0	99.6		0	1.6	1.2	97.1		0	2.8	0	97.2		0	2.4	0.7	97		
PHF	.000	.250	.000	.818	.822	.000	.400	.750	.655	.649	.000	.400	.000	.878	.849	.000	.688	.375	.894	.900	.889

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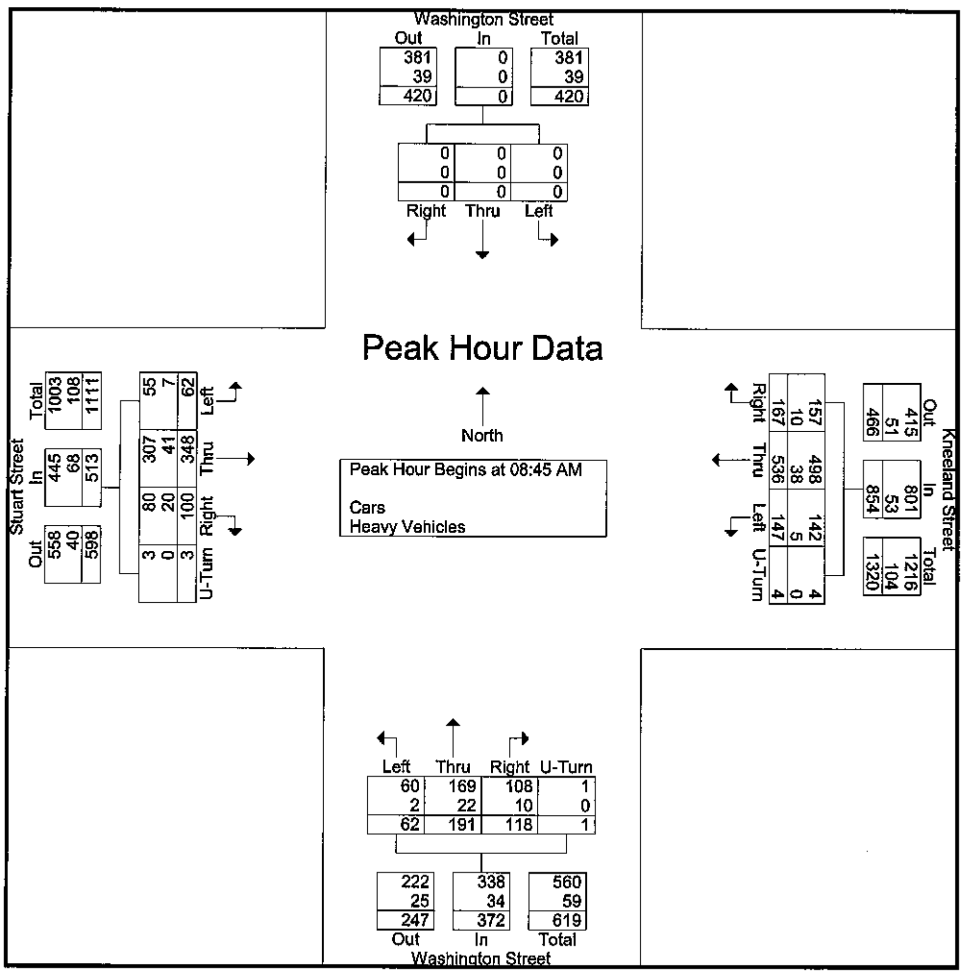
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

	Washington Street From North				Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 08:45 AM																				
08:45 AM	0	0	0	0	38	143	32	**1**	214	24	42	13	**1**	80	20	**94**	**18**	1	133	427
09:00 AM	0	0	0	0	**48**	**146**	32	1	**227**	29	45	17	0	91	20	84	16	0	120	438
09:15 AM	0	0	0	0	39	141	36	1	217	32	**60**	11	0	**103**	**38**	84	10	**2**	**134**	**454**
09:30 AM	0	0	0	0	42	106	**47**	1	196	**33**	44	**21**	0	98	22	86	18	0	126	420
Total Volume	0	0	0	0	167	536	147	4	854	118	191	62	1	372	100	348	62	3	513	1739
% App. Total	0	0	0		19.6	62.8	17.2	0.5		31.7	51.3	16.7	0.3		19.5	67.8	12.1	0.6		
PHF	.000	.000	.000	.000	.870	.918	.782	1.000	.941	.894	.796	.738	.250	.903	.658	.926	.861	.375	.957	.958
Cars	0	0	0	0	157	498	142	4	801	108	169	60	1	338	80	307	55	3	445	1584
% Cars	0	0	0	0	94.0	92.9	96.6	100	93.8	91.5	88.5	96.8	100	90.9	80.0	88.2	88.7	100	86.7	91.1
Heavy Vehicles	0	0	0	0	10	38	5	0	53	10	22	2	0	34	20	41	7	0	68	155
% Heavy Vehicles	0	0	0	0	6.0	7.1	3.4	0	6.2	8.5	11.5	3.2	0	9.1	20.0	11.8	11.3	0	13.3	8.9



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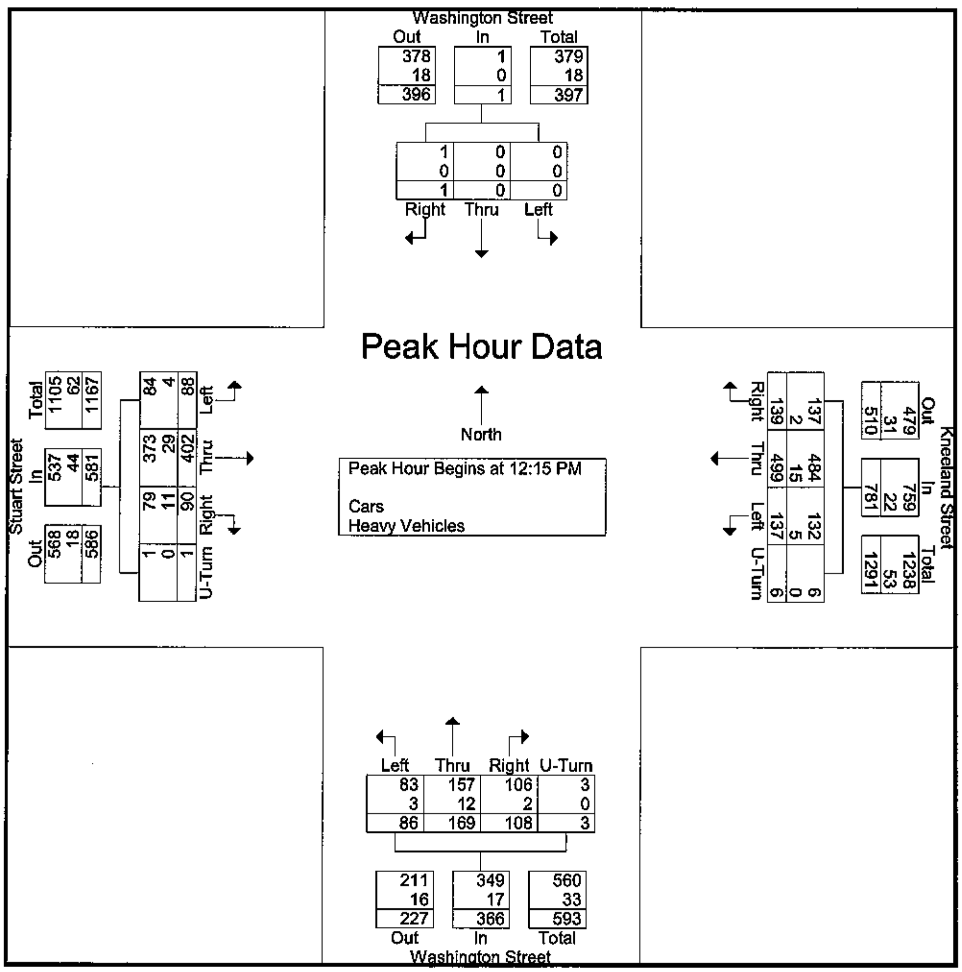
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

	Washington Street From North				Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 12:15 PM																				
12:15 PM	0	0	0	0	**46**	128	30	1	**205**	25	**56**	24	0	105	21	98	**31**	0	150	**460**
12:30 PM	**1**	0	0	**1**	36	112	32	**2**	182	23	43	18	**1**	85	**25**	99	20	0	144	412
12:45 PM	0	0	0	0	31	121	**39**	1	192	**35**	48	**28**	1	**112**	25	87	17	**1**	130	434
01:00 PM	0	0	0	0	26	**138**	36	2	202	25	22	16	1	64	19	**118**	20	0	**157**	423
Total Volume	1	0	0	1	139	499	137	6	781	108	169	86	3	366	90	402	88	1	581	1729
% App. Total	100	0	0		17.8	63.9	17.5	0.8		29.5	46.2	23.5	0.8		15.5	69.2	15.1	0.2		
PHF	.250	.000	.000	.250	.755	.904	.878	.750	.952	.771	.754	.768	.750	.817	.900	.852	.710	.250	.925	.940
Cars	1	0	0	1	137	484	132	6	759	106	157	83	3	349	79	373	84	1	537	1646
% Cars	100	0	0	100	98.6	97.0	96.4	100	97.2	98.1	92.9	96.5	100	95.4	87.8	92.8	95.5	100	92.4	95.2
Heavy Vehicles	0	0	0	0	2	15	5	0	22	2	12	3	0	17	11	29	4	0	44	83
% Heavy Vehicles	0	0	0	0	1.4	3.0	3.6	0	2.8	1.9	7.1	3.5	0	4.6	12.2	7.2	4.5	0	7.6	4.8



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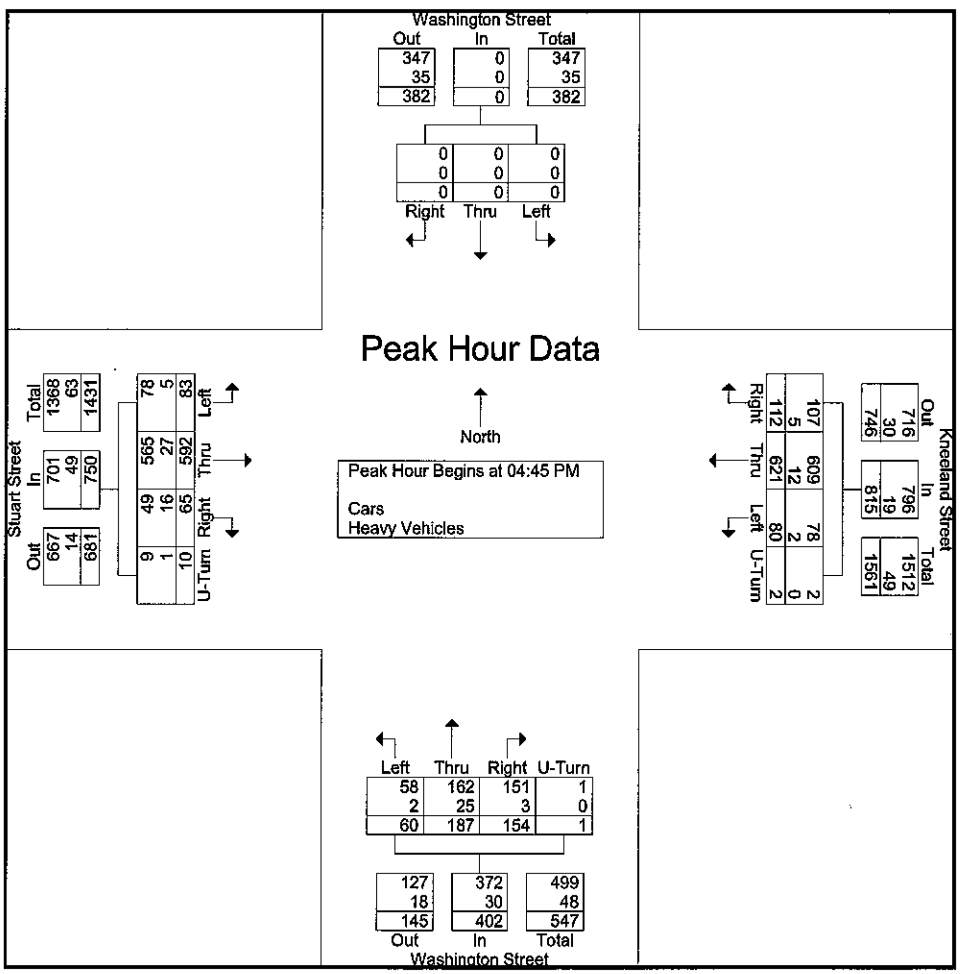
City, State: Boston, MA
Client: HSH/J. SanClemente

File Name : 91950 D
Site Code : TBA
Start Date : 7/29/2009

	Washington Street From North				Kneeland Street From East					Washington Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 04:45 PM																				
04:45 PM	0	0	0	0	**30**	155	22	0	207	**51**	**58**	12	0	**121**	13	150	18	2	183	**511**
05:00 PM	0	0	0	0	30	141	**23**	**1**	195	34	43	**23**	0	100	**19**	**156**	20	3	**198**	493
05:15 PM	0	0	0	0	30	157	15	1	203	29	44	15	0	88	18	155	**24**	1	198	489
05:30 PM	0	0	0	0	22	**168**	20	0	**210**	40	42	10	**1**	93	15	131	21	**4**	171	474
Total Volume	0	0	0	0	112	621	80	2	815	154	187	60	1	402	65	592	83	10	750	1967
% App. Total	0	0	0		13.7	76.2	9.8	0.2		38.3	46.5	14.9	0.2		8.7	78.9	11.1	1.3		
PHF	.000	.000	.000	.000	.933	.924	.870	.500	.970	.755	.806	.652	.250	.831	.855	.949	.865	.625	.947	.962
Cars	0	0	0	0	107	609	78	2	796	151	162	58	1	372	49	565	78	9	701	1869
% Cars	0	0	0	0	95.5	98.1	97.5	100	97.7	98.1	86.6	96.7	100	92.5	75.4	95.4	94.0	90.0	93.5	95.0
Heavy Vehicles	0	0	0	0	5	12	2	0	19	3	25	2	0	30	16	27	5	1	49	98
% Heavy Vehicles	0	0	0	0	4.5	1.9	2.5	0	2.3	1.9	13.4	3.3	0	7.5	24.6	4.6	6.0	10.0	6.5	5.0



Lane Group	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
Lane Width (ft)	12	11	13	9	12	12	12	12	12	10	10	12
Storage Length (ft)	0		80	125		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.936	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	2737	1444	1406	2885	0	0	0	0	1223	3698	0
Flt Permitted				0.342						0.950		
Satd. Flow (perm)	0	2737	1444	506	2885	0	0	0	0	1223	3698	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136								175	
Headway Factor	1.14	1.27	1.10	1.30	1.22	1.14	1.14	1.14	1.14	1.25	1.25	1.14
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		535			502			920			242	
Travel Time (s)		12.2			11.4			25.1			6.6	
Volume (vph)	0	375	128	130	471	0	0	0	0	115	308	221
Peak Hour Factor	0.92	0.79	0.78	0.79	0.98	0.92	0.92	0.92	0.92	0.75	0.87	0.83
Heavy Vehicles (%)	0%	9%	4%	4%	7%	0%	0%	0%	0%	24%	9%	12%
Parking (#/hr)	0	0			0	0						
Adj. Flow (vph)	0	475	164	165	481	0	0	0	0	153	354	266
Lane Group Flow (vph)	0	475	164	165	481	0	0	0	0	153	620	0
Turn Type			Perm	D.P+P						Split		
Protected Phases		1		6	1 6					5	5	
Permitted Phases			1	1								
Detector Phases		1	1	6	1 6					5	5	
Minimum Initial (s)		1.0	1.0	4.0						8.0	8.0	
Minimum Split (s)		24.0	24.0	11.0						15.0	15.0	
Total Split (s)	0.0	31.0	31.0	18.0	49.0	0.0	0.0	0.0	0.0	26.0	26.0	0.0
Total Split (%)	0.0%	31.0%	31.0%	18.0%	49.0%	0.0%	0.0%	0.0%	0.0%	26.0%	26.0%	0.0%
Maximum Green (s)		25.0	25.0	14.0						20.0	20.0	
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0	
All-Red Time (s)		3.0	3.0	1.0						3.0	3.0	
Lead/Lag		Lead	Lead	Lag						Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		34.5	34.5	44.4	48.4					18.6	18.6	
Actuated g/C Ratio		0.34	0.34	0.44	0.48					0.19	0.19	
v/c Ratio		0.50	0.28	0.53	0.34					0.67	0.75	
Control Delay		19.6	2.9	19.8	13.2					52.4	33.0	

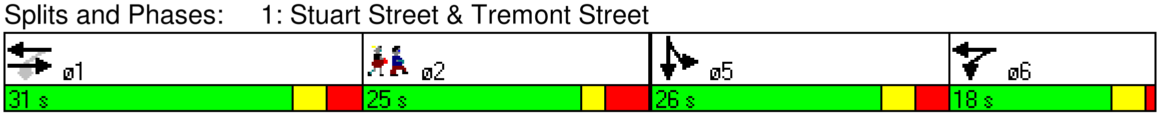
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		19.6	2.9	19.8	13.2					52.4	33.0	
LOS		B	A	B	B					D	C	
Approach Delay		15.3			14.8						36.8	
Approach LOS		B			B						D	
Queue Length 50th (ft)		73	4	33	50					91	98	
Queue Length 95th (ft)		171	m9	m61	92					124	129	
Internal Link Dist (ft)		455			422			840			162	
Turn Bay Length (ft)			80	125								
Base Capacity (vph)		944	587	367	1373					269	950	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.50	0.28	0.45	0.35					0.57	0.65	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 62 (62%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 23.2 Intersection LOS: C
Intersection Capacity Utilization 41.6% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Stuart Street & Tremont Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50								50	50	
Trailing Detector (ft)		0								0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Frt		0.990									0.974	
Flt Protected											0.993	
Satd. Flow (prot)	0	2666	0	0	0	0	0	0	0	0	4998	0
Flt Permitted											0.993	
Satd. Flow (perm)	0	2666	0	0	0	0	0	0	0	0	4998	0
Right Turn on Red			No			Yes			Yes	No		No
Satd. Flow (RTOR)												
Headway Factor	1.19	1.32	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.19	1.19	1.19
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		719			550			237			390	
Travel Time (s)		19.6			15.0			6.5			10.6	
Volume (vph)	0	637	45	0	0	0	0	0	0	129	609	158
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Heavy Vehicles (%)	2%	8%	6%	2%	2%	2%	2%	2%	2%	8%	11%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	4
Parking (#/hr)		10	20									
Adj. Flow (vph)	0	650	46	0	0	0	0	0	0	133	628	163
Lane Group Flow (vph)	0	696	0	0	0	0	0	0	0	0	924	0
Turn Type										Perm		
Protected Phases		3									1	
Permitted Phases										1		
Detector Phases		3								1	1	
Minimum Initial (s)		6.0								13.0	13.0	
Minimum Split (s)		23.0								19.0	19.0	
Total Split (s)	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0
Total Split (%)	0.0%	41.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	0.0%
Maximum Green (s)		29.0								21.0	21.0	
Yellow Time (s)		3.0								3.0	3.0	
All-Red Time (s)		1.0								1.0	1.0	
Lead/Lag										Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0								2.0	2.0	
Recall Mode		Max								C-Max	C-Max	
Walk Time (s)		7.0										
Flash Dont Walk (s)		11.0										
Pedestrian Calls (#/hr)		194										
Act Effct Green (s)		29.0									21.0	
Actuated g/C Ratio		0.36									0.26	
v/c Ratio		0.72									0.70	
Control Delay		8.2									12.8	
Queue Delay		0.0									0.0	

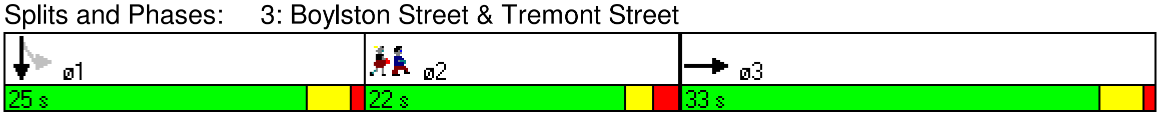
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	28%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		8.2									12.8	
LOS		A									B	
Approach Delay		8.2									12.8	
Approach LOS		A									B	
Queue Length 50th (ft)		22									27	
Queue Length 95th (ft)		37									33	
Internal Link Dist (ft)		639			470			157			310	
Turn Bay Length (ft)												
Base Capacity (vph)		966									1312	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.72									0.70	

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 34 (43%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 42.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Boylston Street & Tremont Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	9	11	12	12	10	12	12	10	12	12	12	12
Storage Length (ft)	200		0	0		80	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50				
Trailing Detector (ft)	0	0		0	0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.975				0.850		0.954				
Flt Protected	0.950				0.988			0.991				
Satd. Flow (prot)	1294	2633	0	0	2852	1358	0	2710	0	0	0	0
Flt Permitted	0.359				0.613			0.991				
Satd. Flow (perm)	489	2633	0	0	1770	1358	0	2710	0	0	0	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		23										
Headway Factor	1.30	1.19	1.14	1.14	1.25	1.14	1.14	1.25	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		502			435			519			240	
Travel Time (s)		13.7			11.9			14.2			6.5	
Volume (vph)	79	346	69	151	552	151	47	153	92	0	0	0
Peak Hour Factor	0.87	0.76	0.77	0.82	0.94	0.92	0.68	0.84	0.83	0.92	0.92	0.92
Heavy Vehicles (%)	13%	13%	33%	2%	6%	7%	8%	3%	9%	0%	0%	0%
Parking (#/hr)			0									
Adj. Flow (vph)	91	455	90	184	587	164	69	182	111	0	0	0
Lane Group Flow (vph)	91	545	0	0	771	164	0	362	0	0	0	0
Turn Type	Perm			pm+pt		Prot	Split					
Protected Phases		6		5	5 6	5 6	1	1				
Permitted Phases	6			5 6								
Detector Phases	6	6		5	5 6	5 6	1	1				
Minimum Initial (s)	10.0	10.0		6.0			10.0	10.0				
Minimum Split (s)	14.0	14.0		10.0			22.0	22.0				
Total Split (s)	34.0	34.0	0.0	21.0	55.0	55.0	23.0	23.0	0.0	0.0	0.0	0.0
Total Split (%)	34.0%	34.0%	0.0%	21.0%	55.0%	55.0%	23.0%	23.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0		17.0			19.0	19.0				
Yellow Time (s)	3.0	3.0		3.0			3.0	3.0				
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0				
Lead/Lag	Lag	Lag		Lead			Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0				
Recall Mode	Max	Max		Max			C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	30.0	30.0			47.0	51.0		19.0				
Actuated g/C Ratio	0.30	0.30			0.47	0.51		0.19				
v/c Ratio	0.62	0.68			0.76	0.24		0.70				
Control Delay	28.8	14.7			23.1	14.8		46.2				

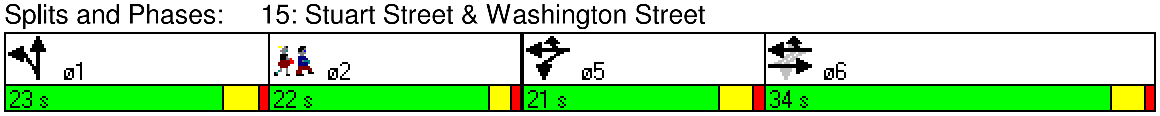
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	28.8	14.7			23.1	14.8		46.2				
LOS	C	B			C	B		D				
Approach Delay		16.8			21.7			46.2				
Approach LOS		B			C			D				
Queue Length 50th (ft)	18	50			166	56		114				
Queue Length 95th (ft)	m#35	54			221	97		152				
Internal Link Dist (ft)		422			355			439			160	
Turn Bay Length (ft)	200					80						
Base Capacity (vph)	147	806			1016	693		515				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.62	0.68			0.76	0.24		0.70				

Intersection Summary	
Area Type: CBD	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 2 (2%), Referenced to phase 1:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 24.6	Intersection LOS: C
Intersection Capacity Utilization 54.4%	ICU Level of Service A
Analysis Period (min) 15	

\# 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: 15: Stuart Street & Washington Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

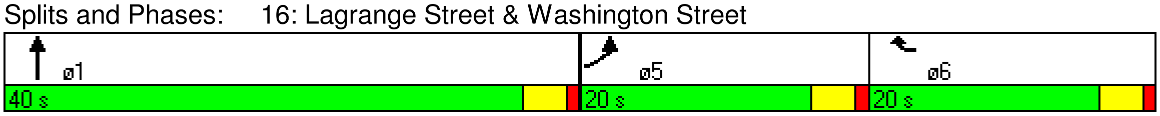
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50					50		50				
Trailing Detector (ft)	0					0		0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor						0.56						
Frt						0.850						
Flt Protected	0.950											
Satd. Flow (prot)	1624	0	0	0	0	2152	0	2954	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	1624	0	0	0	0	1211	0	2954	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	442					903						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.30	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		343			445			240			275	
Travel Time (s)		9.4			12.1			6.5			7.5	
Volume (vph)	7	0	0	0	0	46	0	417	0	0	0	0
Confl. Peds. (#/hr)						149						
Peak Hour Factor	0.55	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	2%	2%	7%	2%	10%	2%	2%	2%	2%
Parking (#/hr)						20						
Adj. Flow (vph)	13	0	0	0	0	54	0	453	0	0	0	0
Lane Group Flow (vph)	13	0	0	0	0	54	0	453	0	0	0	0
Turn Type	custom					custom						
Protected Phases	5					6		1				
Permitted Phases	5					6						
Detector Phases	5					6		1				
Minimum Initial (s)	12.0					6.0		6.0				
Minimum Split (s)	16.0					18.0		25.0				
Total Split (s)	20.0	0.0	0.0	0.0	0.0	20.0	0.0	40.0	0.0	0.0	0.0	0.0
Total Split (%)	25.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	16.0					16.0		36.0				
Yellow Time (s)	3.0					3.0		3.0				
All-Red Time (s)	1.0					1.0		1.0				
Lead/Lag	Lead					Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0					3.0		3.0				
Recall Mode	Min					Max		C-Max				
Walk Time (s)	4.0					7.0		17.0				
Flash Dont Walk (s)	1.0					7.0		4.0				
Pedestrian Calls (#/hr)	243					75		243				
Act Effct Green (s)	12.0					16.0		40.0				
Actuated g/C Ratio	0.15					0.20		0.50				
v/c Ratio	0.02					0.05		0.31				
Control Delay	0.0					0.1		12.5				
Queue Delay	0.0					0.0		1.2				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	0.0					0.1		13.7				
LOS	A					A		B				
Approach Delay								13.7				
Approach LOS								B				
Queue Length 50th (ft)	0					0		66				
Queue Length 95th (ft)	m0					0		97				
Internal Link Dist (ft)		263			365			160			195	
Turn Bay Length (ft)												
Base Capacity (vph)	678					1153		1477				
Starvation Cap Reductn	0					0		774				
Spillback Cap Reductn	0					0		0				
Storage Cap Reductn	0					0		0				
Reduced v/c Ratio	0.02					0.05		0.64				

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 48 (60%), Referenced to phase 1:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 12.0 Intersection LOS: B
Intersection Capacity Utilization 39.0% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Lagrange Street & Washington Street



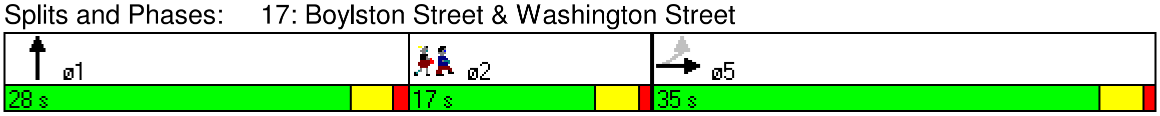
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50						50				
Trailing Detector (ft)	0	0						0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.921				
Flt Protected		0.994										
Satd. Flow (prot)	0	3017	0	0	0	0	0	2682	0	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	3017	0	0	0	0	0	2682	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24						227				
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		550			365			275			368	
Travel Time (s)		15.0			10.0			7.5			10.0	
Volume (vph)	84	563	0	0	0	0	0	190	213	0	0	0
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	14%	6%	2%	2%	2%	2%	2%	10%	13%	2%	2%	2%
Adj. Flow (vph)	89	599	0	0	0	0	0	202	227	0	0	0
Lane Group Flow (vph)	0	688	0	0	0	0	0	429	0	0	0	0
Turn Type	Perm											
Protected Phases		5						1				
Permitted Phases	5											
Detector Phases	5	5						1				
Minimum Initial (s)	6.0	6.0						6.0				
Minimum Split (s)	15.0	15.0						25.0				
Total Split (s)	35.0	35.0	0.0	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	43.8%	43.8%	0.0%	0.0%	0.0%	0.0%	0.0%	35.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	31.0	31.0						24.0				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lead/Lag								Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	None	None						C-Max				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	4.0	4.0						11.0				
Pedestrian Calls (#/hr)	127	127						146				
Act Effct Green (s)		29.0						26.0				
Actuated g/C Ratio		0.36						0.32				
v/c Ratio		0.62						0.42				
Control Delay		9.0						3.1				
Queue Delay		0.0						0.2				
Total Delay		9.0						3.3				
LOS		A						A				
Approach Delay		9.0						3.3				

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	21%
Maximum Green (s)	13.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	45
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A						A				
Queue Length 50th (ft)		31						7				
Queue Length 95th (ft)		41						15				
Internal Link Dist (ft)		470			285			195			288	
Turn Bay Length (ft)												
Base Capacity (vph)		1184						1026				
Starvation Cap Reductn		0						137				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.58						0.48				

Intersection Summary	
Area Type: CBD	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 52 (65%), Referenced to phase 1:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 40.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 17: Boylston Street & Washington Street



Lane Group	ø2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	20	655
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	22	712
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			242			237
pX, platoon unblocked						
vC, conflicting volume	221	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	221	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	737	1084			1622	

Direction, Lane #	SB 1	SB 2	SB 3	SB 4
Volume Total	123	203	203	203
Volume Left	22	0	0	0
Volume Right	0	0	0	0
cSH	1622	1700	1700	1700
Volume to Capacity	0.01	0.12	0.12	0.12
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	1.4	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.2			
Approach LOS				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	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
Lane Width (ft)	12	11	13	9	12	12	12	12	12	10	10	12
Storage Length (ft)	0		80	125		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.957	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	2842	1458	1433	3026	0	0	0	0	1391	4054	0
Flt Permitted				0.264						0.950		
Satd. Flow (perm)	0	2842	1458	398	3026	0	0	0	0	1391	4054	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72								97	
Headway Factor	1.14	1.27	1.10	1.30	1.22	1.14	1.14	1.14	1.14	1.25	1.25	1.14
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		535			502			920			242	
Travel Time (s)		12.2			11.4			25.1			6.6	
Volume (vph)	0	562	89	109	620	0	0	0	0	229	544	194
Peak Hour Factor	0.92	0.96	0.84	0.85	0.95	0.92	0.92	0.92	0.92	0.89	0.91	0.82
Heavy Vehicles (%)	0%	5%	3%	2%	2%	0%	0%	0%	0%	9%	2%	5%
Parking (#/hr)	0	0			0	0						
Adj. Flow (vph)	0	585	106	128	653	0	0	0	0	257	598	237
Lane Group Flow (vph)	0	585	106	128	653	0	0	0	0	257	835	0
Turn Type			Perm	D.P+P						Split		
Protected Phases		1		6	1 6					5	5	
Permitted Phases			1	1								
Detector Phases		1	1	6	1 6					5	5	
Minimum Initial (s)		1.0	1.0	4.0						8.0	8.0	
Minimum Split (s)		24.0	24.0	11.0						15.0	15.0	
Total Split (s)	0.0	32.0	32.0	13.0	45.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0
Total Split (%)	0.0%	32.0%	32.0%	13.0%	45.0%	0.0%	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%
Maximum Green (s)		26.0	26.0	9.0						24.0	24.0	
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0	
All-Red Time (s)		3.0	3.0	1.0						3.0	3.0	
Lead/Lag		Lead	Lead	Lag						Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		30.3	30.3	39.2	43.2					23.8	23.8	
Actuated g/C Ratio		0.30	0.30	0.39	0.43					0.24	0.24	
v/c Ratio		0.68	0.22	0.52	0.50					0.77	0.80	
Control Delay		24.3	3.9	22.7	15.6					27.4	14.7	

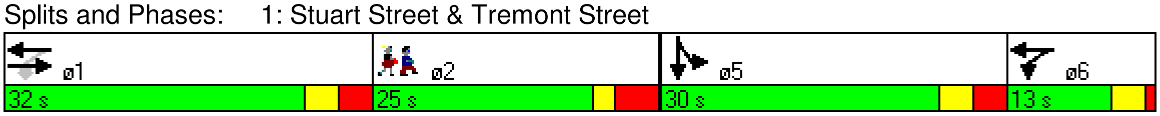
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		24.3	3.9	22.7	15.6					27.4	14.7	
LOS		C	A	C	B					C	B	
Approach Delay		21.1			16.8						17.7	
Approach LOS		C			B						B	
Queue Length 50th (ft)		185	4	27	71					103	92	
Queue Length 95th (ft)		248	m9	m39	m105					m#195	m112	
Internal Link Dist (ft)		455			422			840			162	
Turn Bay Length (ft)			80	125								
Base Capacity (vph)		861	492	249	1286					362	1126	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.68	0.22	0.51	0.51					0.71	0.74	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 72 (72%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 18.4 Intersection LOS: B
Intersection Capacity Utilization 50.5% ICU Level of Service A
Analysis Period (min) 15
\# 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: Stuart Street & Tremont Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50								50	50	
Trailing Detector (ft)		0								0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Frt		0.987									0.965	
Flt Protected											0.995	
Satd. Flow (prot)	0	2729	0	0	0	0	0	0	0	0	5205	0
Flt Permitted											0.995	
Satd. Flow (perm)	0	2729	0	0	0	0	0	0	0	0	5205	0
Right Turn on Red			No			Yes			Yes	No		No
Satd. Flow (RTOR)												
Headway Factor	1.19	1.32	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.19	1.19	1.19
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		719			550			237			390	
Travel Time (s)		19.6			15.0			6.5			10.6	
Volume (vph)	0	629	58	0	0	0	0	0	0	134	877	304
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	5%	6%	2%	2%	2%	2%	2%	2%	4%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	4
Parking (#/hr)		10	20									
Adj. Flow (vph)	0	676	62	0	0	0	0	0	0	140	914	317
Lane Group Flow (vph)	0	738	0	0	0	0	0	0	0	0	1371	0
Turn Type										Perm		
Protected Phases		3									1	
Permitted Phases										1		
Detector Phases		3								1	1	
Minimum Initial (s)		6.0								13.0	13.0	
Minimum Split (s)		23.0								19.0	19.0	
Total Split (s)	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	0.0
Total Split (%)	0.0%	33.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)		29.0								41.0	41.0	
Yellow Time (s)		3.0								3.0	3.0	
All-Red Time (s)		1.0								1.0	1.0	
Lead/Lag										Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0								2.0	2.0	
Recall Mode		Max								C-Max	C-Max	
Walk Time (s)		7.0										
Flash Dont Walk (s)		11.0										
Pedestrian Calls (#/hr)		252										
Act Effct Green (s)		29.0									41.0	
Actuated g/C Ratio		0.29									0.41	
v/c Ratio		0.93									0.64	
Control Delay		31.0									16.0	
Queue Delay		0.0									0.1	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		31.0									16.1	
LOS		C									B	
Approach Delay		31.0									16.1	
Approach LOS		C									B	
Queue Length 50th (ft)		240									227	
Queue Length 95th (ft)		#360									270	
Internal Link Dist (ft)		639			470			157			310	
Turn Bay Length (ft)												
Base Capacity (vph)		791									2134	
Starvation Cap Reductn		0									104	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.93									0.68	

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

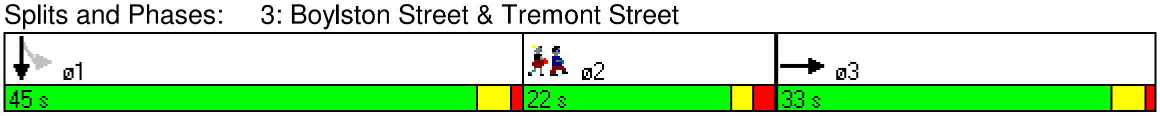
Intersection Signal Delay: 21.4 Intersection LOS: C

Intersection Capacity Utilization 50.1% ICU Level of Service A

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Boylston Street & Tremont Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lane Group	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
Lane Width (ft)	9	11	12	12	10	12	12	10	12	12	12	12
Storage Length (ft)	200		0	0		80	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50				
Trailing Detector (ft)	0	0		0	0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.984				0.850		0.942				
Flt Protected	0.950				0.994			0.991				
Satd. Flow (prot)	1379	2884	0	0	2952	1398	0	2646	0	0	0	0
Flt Permitted	0.344				0.620			0.991				
Satd. Flow (perm)	499	2884	0	0	1841	1398	0	2646	0	0	0	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		13										
Headway Factor	1.30	1.19	1.14	1.14	1.25	1.14	1.14	1.25	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		502			435			507			240	
Travel Time (s)		13.7			11.9			13.8			6.5	
Volume (vph)	98	624	69	87	659	119	61	187	154	0	0	0
Peak Hour Factor	0.86	0.95	0.86	0.87	0.92	0.93	0.65	0.81	0.75	0.92	0.92	0.92
Heavy Vehicles (%)	6%	5%	25%	3%	2%	4%	3%	13%	2%	2%	2%	2%
Adj. Flow (vph)	114	657	80	100	716	128	94	231	205	0	0	0
Lane Group Flow (vph)	114	737	0	0	816	128	0	530	0	0	0	0
Turn Type	Perm			D.P+P		Prot	Split					
Protected Phases		4		3	3 4	3 4	1	1				
Permitted Phases	4			4								
Detector Phases	4	4		3	3 4	3 4	1	1				
Minimum Initial (s)	9.0	9.0		5.0			10.0	10.0				
Minimum Split (s)	14.0	14.0		10.0			22.0	22.0				
Total Split (s)	32.0	32.0	0.0	18.0	50.0	50.0	28.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	32.0%	32.0%	0.0%	18.0%	50.0%	50.0%	28.0%	28.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	28.0	28.0		14.0			24.0	24.0				
Yellow Time (s)	3.0	3.0		3.0			3.0	3.0				
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0				
Lead/Lag	Lag	Lag		Lead			Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0				
Recall Mode	Max	Max		Max			C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	28.0	28.0			42.0	46.0		24.0				
Actuated g/C Ratio	0.28	0.28			0.42	0.46		0.24				
v/c Ratio	0.81	0.90			0.88	0.20		0.83				
Control Delay	53.0	31.0			34.9	17.1		45.7				
Queue Delay	0.0	0.0			0.0	0.0		1.7				

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	53.0	31.0			34.9	17.1		47.4				
LOS	D	C			C	B		D				
Approach Delay		34.0			32.5			47.4				
Approach LOS		C			C			D				
Queue Length 50th (ft)	30	100			197	47		170				
Queue Length 95th (ft)	m#116	#205			#289	85		204				
Internal Link Dist (ft)		422			355			427			160	
Turn Bay Length (ft)	200					80						
Base Capacity (vph)	140	817			929	643		635				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		31				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.81	0.90			0.88	0.20		0.88				

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 1:NBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 36.4 Intersection LOS: D

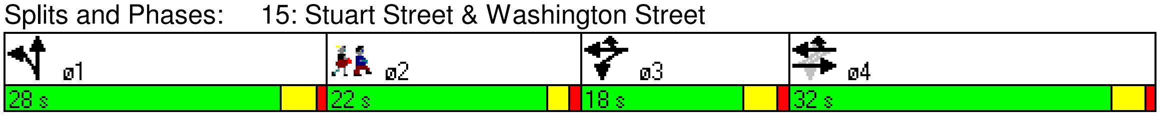
Intersection Capacity Utilization 67.9% ICU Level of Service C

Analysis Period (min) 15

\# 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: 15: Stuart Street & Washington Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

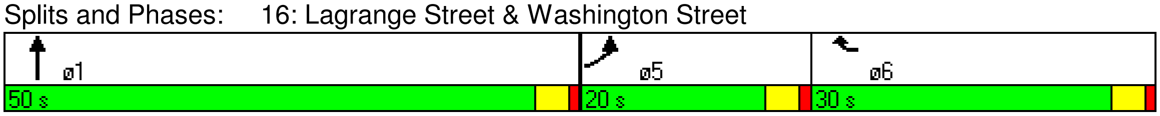
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50					50		50				
Trailing Detector (ft)	0					0		0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor						0.49						
Frt						0.850						
Flt Protected	0.950											
Satd. Flow (prot)	1624	0	0	0	0	2235	0	2981	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	1624	0	0	0	0	1091	0	2981	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	451					856						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.30	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		275			445			240			275	
Travel Time (s)		7.5			12.1			6.5			7.5	
Volume (vph)	18	0	0	0	0	91	0	401	0	0	0	0
Confl. Peds. (#/hr)						143						
Peak Hour Factor	0.88	0.92	0.92	0.92	0.92	0.89	0.92	0.95	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	2%	2%	3%	2%	9%	2%	2%	2%	2%
Parking (#/hr)						20						
Adj. Flow (vph)	20	0	0	0	0	102	0	422	0	0	0	0
Lane Group Flow (vph)	20	0	0	0	0	102	0	422	0	0	0	0
Turn Type	custom					custom						
Protected Phases	5					6		1				
Permitted Phases	5					6						
Detector Phases	5					6		1				
Minimum Initial (s)	12.0					6.0		6.0				
Minimum Split (s)	16.0					18.0		25.0				
Total Split (s)	20.0	0.0	0.0	0.0	0.0	30.0	0.0	50.0	0.0	0.0	0.0	0.0
Total Split (%)	20.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	16.0					26.0		46.0				
Yellow Time (s)	3.0					3.0		3.0				
All-Red Time (s)	1.0					1.0		1.0				
Lead/Lag	Lead					Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0					3.0		3.0				
Recall Mode	None					Max		C-Max				
Walk Time (s)	4.0					7.0		17.0				
Flash Dont Walk (s)	1.0					7.0		4.0				
Pedestrian Calls (#/hr)	327					72		327				
Act Effct Green (s)	12.0					26.0		50.0				
Actuated g/C Ratio	0.12					0.26		0.50				
v/c Ratio	0.03					0.08		0.28				
Control Delay	0.1					0.1		14.6				
Queue Delay	0.0					0.0		4.9				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	0.1					0.1		19.5				
LOS	A					A		B				
Approach Delay								19.5				
Approach LOS								B				
Queue Length 50th (ft)	0					0		80				
Queue Length 95th (ft)	m0					0		m120				
Internal Link Dist (ft)		195			365			160			195	
Turn Bay Length (ft)												
Base Capacity (vph)	639					1215		1491				
Starvation Cap Reductn	0					0		985				
Spillback Cap Reductn	11					21		73				
Storage Cap Reductn	0					0		0				
Reduced v/c Ratio	0.03					0.09		0.83				

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 23 (23%), Referenced to phase 1:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.28
Intersection Signal Delay: 15.2 Intersection LOS: B
Intersection Capacity Utilization 38.8% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Lagrange Street & Washington Street



Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50						50				
Trailing Detector (ft)	0	0						0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.928				
Flt Protected		0.990										
Satd. Flow (prot)	0	3087	0	0	0	0	0	2844	0	0	0	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	3087	0	0	0	0	0	2844	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38						256				
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		550			365			275			368	
Travel Time (s)		15.0			10.0			7.5			10.0	
Volume (vph)	142	551	0	0	0	0	0	295	270	0	0	0
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.92	0.92	0.92
Heavy Vehicles (%)	1%	5%	2%	2%	2%	2%	2%	6%	6%	2%	2%	2%
Adj. Flow (vph)	148	574	0	0	0	0	0	339	310	0	0	0
Lane Group Flow (vph)	0	722	0	0	0	0	0	649	0	0	0	0
Turn Type	Perm											
Protected Phases		5						1				
Permitted Phases	5											
Detector Phases	5	5						1				
Minimum Initial (s)	6.0	6.0						6.0				
Minimum Split (s)	15.0	15.0						25.0				
Total Split (s)	44.0	44.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.0
Total Split (%)	44.0%	44.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	40.0	40.0						35.0				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lead/Lag								Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	None	None						C-Max				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	4.0	4.0						11.0				
Pedestrian Calls (#/hr)	203	203						161				
Act Effct Green (s)		35.8						39.2				
Actuated g/C Ratio		0.36						0.39				
v/c Ratio		0.64						0.51				
Control Delay		8.6						7.2				
Queue Delay		0.0						0.2				
Total Delay		8.6						7.5				
LOS		A						A				
Approach Delay		8.6						7.5				

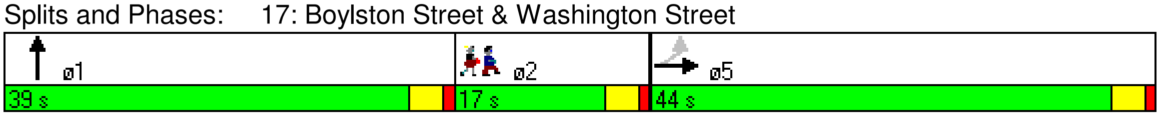
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	17%
Maximum Green (s)	13.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	45
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A						A				
Queue Length 50th (ft)		32						135				
Queue Length 95th (ft)		m38						15				
Internal Link Dist (ft)		470			285			195			288	
Turn Bay Length (ft)												
Base Capacity (vph)		1258						1270				
Starvation Cap Reductn		0						158				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.57						0.58				

Intersection Summary	
Area Type: CBD	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 31 (31%), Referenced to phase 1:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 46.9%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 17: Boylston Street & Washington Street



Lane Group	ø2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	16	929
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	17	1010
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			242			237
pX, platoon unblocked						
vC, conflicting volume	287	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	287	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	672	1084			1622	

Direction, Lane #	SB 1	SB 2	SB 3	SB 4
Volume Total	162	289	289	289
Volume Left	17	0	0	0
Volume Right	0	0	0	0
cSH	1622	1700	1700	1700
Volume to Capacity	0.01	0.17	0.17	0.17
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	0.9	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.1			
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	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
Lane Width (ft)	12	11	13	9	12	12	12	12	12	10	10	12
Storage Length (ft)	0		80	125		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.935	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	2737	1444	1406	2885	0	0	0	0	1223	3693	0
Flt Permitted				0.286						0.950		
Satd. Flow (perm)	0	2737	1444	423	2885	0	0	0	0	1223	3693	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			122								178	
Headway Factor	1.14	1.27	1.10	1.30	1.22	1.14	1.14	1.14	1.14	1.25	1.25	1.14
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		535			502			920			242	
Travel Time (s)		12.2			11.4			25.1			6.6	
Volume (vph)	0	430	132	144	504	0	0	0	0	119	319	233
Peak Hour Factor	0.92	0.79	0.78	0.79	0.98	0.92	0.92	0.92	0.92	0.75	0.87	0.83
Heavy Vehicles (%)	0%	9%	4%	4%	7%	0%	0%	0%	0%	24%	9%	12%
Parking (#/hr)	0	0			0	0						
Adj. Flow (vph)	0	544	169	182	514	0	0	0	0	159	367	281
Lane Group Flow (vph)	0	544	169	182	514	0	0	0	0	159	648	0
Turn Type			Perm	D.P+P						Split		
Protected Phases		1		6	1 6					5	5	
Permitted Phases			1	1								
Detector Phases		1	1	6	1 6					5	5	
Minimum Initial (s)		1.0	1.0	4.0						8.0	8.0	
Minimum Split (s)		24.0	24.0	11.0						15.0	15.0	
Total Split (s)	0.0	31.0	31.0	18.0	49.0	0.0	0.0	0.0	0.0	26.0	26.0	0.0
Total Split (%)	0.0%	31.0%	31.0%	18.0%	49.0%	0.0%	0.0%	0.0%	0.0%	26.0%	26.0%	0.0%
Maximum Green (s)		25.0	25.0	14.0						20.0	20.0	
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0	
All-Red Time (s)		3.0	3.0	1.0						3.0	3.0	
Lead/Lag		Lead	Lead	Lag						Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		33.4	33.4	44.0	48.0					19.0	19.0	
Actuated g/C Ratio		0.33	0.33	0.44	0.48					0.19	0.19	
v/c Ratio		0.59	0.30	0.63	0.37					0.68	0.77	
Control Delay		23.2	4.4	27.4	14.2					52.6	33.8	

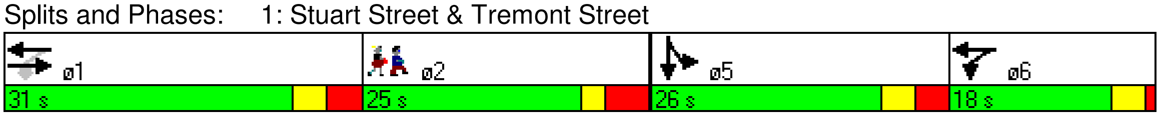
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		23.2	4.4	27.4	14.2					52.6	33.8	
LOS		C	A	C	B					D	C	
Approach Delay		18.8			17.7						37.5	
Approach LOS		B			B						D	
Queue Length 50th (ft)		91	5	38	56					94	103	
Queue Length 95th (ft)		198	m11	m73	m92					128	136	
Internal Link Dist (ft)		455			422			840			162	
Turn Bay Length (ft)			80	125								
Base Capacity (vph)		915	564	336	1372					269	951	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.59	0.30	0.54	0.37					0.59	0.68	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 62 (62%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 25.2 Intersection LOS: C
Intersection Capacity Utilization 44.7% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Stuart Street & Tremont Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50								50	50	
Trailing Detector (ft)		0								0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Frt		0.990									0.972	
Flt Protected											0.993	
Satd. Flow (prot)	0	2666	0	0	0	0	0	0	0	0	4988	0
Flt Permitted											0.993	
Satd. Flow (perm)	0	2666	0	0	0	0	0	0	0	0	4988	0
Right Turn on Red			No			Yes			Yes	No		No
Satd. Flow (RTOR)												
Headway Factor	1.19	1.32	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.19	1.19	1.19
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		719			550			237			390	
Travel Time (s)		19.6			15.0			6.5			10.6	
Volume (vph)	0	669	50	0	0	0	0	0	0	133	634	173
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Heavy Vehicles (%)	2%	8%	6%	2%	2%	2%	2%	2%	2%	8%	11%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	4
Parking (#/hr)		10	20									
Adj. Flow (vph)	0	683	51	0	0	0	0	0	0	137	654	178
Lane Group Flow (vph)	0	734	0	0	0	0	0	0	0	0	969	0
Turn Type										Perm		
Protected Phases		3									1	
Permitted Phases										1		
Detector Phases		3								1	1	
Minimum Initial (s)		6.0								13.0	13.0	
Minimum Split (s)		23.0								19.0	19.0	
Total Split (s)	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0
Total Split (%)	0.0%	41.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	0.0%
Maximum Green (s)		29.0								21.0	21.0	
Yellow Time (s)		3.0								3.0	3.0	
All-Red Time (s)		1.0								1.0	1.0	
Lead/Lag										Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0								2.0	2.0	
Recall Mode		Max								C-Max	C-Max	
Walk Time (s)		7.0										
Flash Dont Walk (s)		11.0										
Pedestrian Calls (#/hr)		194										
Act Effct Green (s)		29.0									21.0	
Actuated g/C Ratio		0.36									0.26	
v/c Ratio		0.76									0.74	
Control Delay		9.9									13.6	
Queue Delay		0.0									0.0	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	28%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		9.9									13.6	
LOS		A									B	
Approach Delay		9.9									13.6	
Approach LOS		A									B	
Queue Length 50th (ft)		24									29	
Queue Length 95th (ft)		41									35	
Internal Link Dist (ft)		639			470			157			310	
Turn Bay Length (ft)												
Base Capacity (vph)		966									1309	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.76									0.74	

Intersection Summary

Area Type: CBD

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 34 (43%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

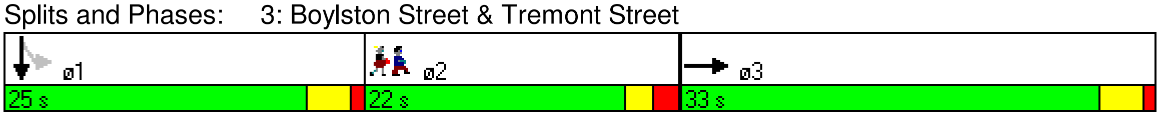
Maximum v/c Ratio: 0.76

Intersection Signal Delay: 12.0 Intersection LOS: B

Intersection Capacity Utilization 44.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Boylston Street & Tremont Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	9	11	12	12	10	12	12	10	12	12	12	12
Storage Length (ft)	200		0	0		80	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50				
Trailing Detector (ft)	0	0		0	0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.978				0.850		0.955				
Flt Protected	0.950				0.988			0.991				
Satd. Flow (prot)	1294	2648	0	0	2852	1358	0	2714	0	0	0	0
Flt Permitted	0.338				0.581			0.991				
Satd. Flow (perm)	460	2648	0	0	1677	1358	0	2714	0	0	0	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		20										
Headway Factor	1.30	1.19	1.14	1.14	1.25	1.14	1.14	1.25	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		502			435			430			240	
Travel Time (s)		13.7			11.9			11.7			6.5	
Volume (vph)	84	399	71	164	597	165	48	162	95	0	0	0
Peak Hour Factor	0.87	0.76	0.77	0.82	0.94	0.92	0.68	0.84	0.83	0.92	0.92	0.92
Heavy Vehicles (%)	13%	13%	33%	2%	6%	7%	8%	3%	9%	0%	0%	0%
Parking (#/hr)			0									
Adj. Flow (vph)	97	525	92	200	635	179	71	193	114	0	0	0
Lane Group Flow (vph)	97	617	0	0	835	179	0	378	0	0	0	0
Turn Type	Perm			D.P+P		Prot	Split					
Protected Phases		4		3	3 4	3 4	1	1				
Permitted Phases	4			4								
Detector Phases	4	4		3	3 4	3 4	1	1				
Minimum Initial (s)	10.0	10.0		6.0			10.0	10.0				
Minimum Split (s)	14.0	14.0		10.0			22.0	22.0				
Total Split (s)	34.0	34.0	0.0	21.0	55.0	55.0	23.0	23.0	0.0	0.0	0.0	0.0
Total Split (%)	34.0%	34.0%	0.0%	21.0%	55.0%	55.0%	23.0%	23.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0		17.0			19.0	19.0				
Yellow Time (s)	3.0	3.0		3.0			3.0	3.0				
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0				
Lead/Lag	Lag	Lag		Lead			Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0				
Recall Mode	Max	Max		Max			C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	30.0	30.0			47.0	51.0		19.0				
Actuated g/C Ratio	0.30	0.30			0.47	0.51		0.19				
v/c Ratio	0.70	0.76			0.85	0.26		0.73				
Control Delay	37.5	18.1			28.1	15.1		44.1				

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0			0.0	0.0		0.8				
Total Delay	37.5	18.1			28.1	15.1		44.9				
LOS	D	B			C	B		D				
Approach Delay		20.7			25.8			44.9				
Approach LOS		C			C			D				
Queue Length 50th (ft)	18	54			185	62		123				
Queue Length 95th (ft)	m#111	79			#255	106		164				
Internal Link Dist (ft)		422			355			350			160	
Turn Bay Length (ft)	200					80						
Base Capacity (vph)	138	808			988	693		516				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	4		25				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.70	0.76			0.85	0.26		0.77				

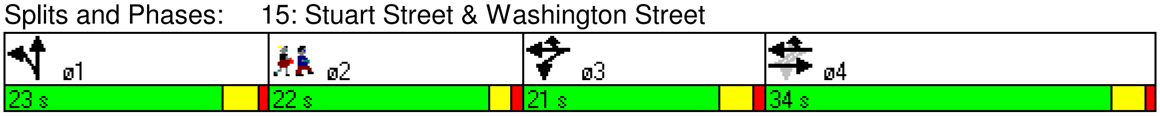
Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 2 (2%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.5 Intersection LOS: C
Intersection Capacity Utilization 58.3% ICU Level of Service B
Analysis Period (min) 15

\# 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: 15: Stuart Street & Washington Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50					50	50	50				
Trailing Detector (ft)	0					0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850						
Flt Protected	0.950											
Satd. Flow (prot)	1624	0	0	0	0	2152	0	2955	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	1624	0	0	0	0	2152	0	2955	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						1015						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.30	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		282			445			240			275	
Travel Time (s)		7.7			12.1			6.5			7.5	
Volume (vph)	48	0	0	0	0	47	4	442	0	0	0	0
Confl. Peds. (#/hr)						149						
Peak Hour Factor	0.55	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	2%	2%	7%	2%	10%	2%	2%	2%	2%
Parking (#/hr)						20						
Adj. Flow (vph)	87	0	0	0	0	55	4	480	0	0	0	0
Lane Group Flow (vph)	87	0	0	0	0	55	0	484	0	0	0	0
Turn Type	Prot					custom	Split					
Protected Phases	7					8	2	2				
Permitted Phases												
Detector Phases	7					8	2	2				
Minimum Initial (s)	4.0					4.0	4.0	4.0				
Minimum Split (s)	8.0					8.0	20.0	20.0				
Total Split (s)	18.0	0.0	0.0	0.0	0.0	12.0	26.0	26.0	0.0	0.0	0.0	0.0
Total Split (%)	22.5%	0.0%	0.0%	0.0%	0.0%	15.0%	32.5%	32.5%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0					8.0	22.0	22.0				
Yellow Time (s)	3.0					3.0	3.0	3.0				
All-Red Time (s)	1.0					1.0	1.0	1.0				
Lead/Lag	Lag					Lead						
Lead-Lag Optimize?	Yes					Yes						
Vehicle Extension (s)	3.0					3.0	3.0	3.0				
Recall Mode	Max					Max	C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	14.0					8.0		34.0				
Actuated g/C Ratio	0.18					0.10		0.42				
v/c Ratio	0.31					0.05		0.39				
Control Delay	31.6					0.1		19.4				
Queue Delay	0.0					0.0		0.4				

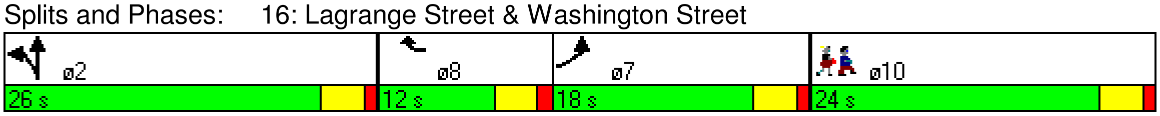
Lane Group	ø10
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	31.6					0.1		19.8				
LOS	C					A		B				
Approach Delay								19.8				
Approach LOS								B				
Queue Length 50th (ft)	41					0		101				
Queue Length 95th (ft)	50					0		147				
Internal Link Dist (ft)		202			365			160			195	
Turn Bay Length (ft)												
Base Capacity (vph)	284					1129		1256				
Starvation Cap Reductn	0					0		343				
Spillback Cap Reductn	0					0		0				
Storage Cap Reductn	0					0		0				
Reduced v/c Ratio	0.31					0.05		0.53				

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 48 (60%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 19.7 — Intersection LOS: B
Intersection Capacity Utilization 40.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 16: Lagrange Street & Washington Street



Lane Group	ø10
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50						50				
Trailing Detector (ft)	0	0						0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.916				
Flt Protected		0.994										
Satd. Flow (prot)	0	3017	0	0	0	0	0	2665	0	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	3017	0	0	0	0	0	2665	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24						280				
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		550			365			275			368	
Travel Time (s)		15.0			10.0			7.5			10.0	
Volume (vph)	88	592	0	0	0	0	0	205	263	0	0	0
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	14%	6%	2%	2%	2%	2%	2%	10%	13%	2%	2%	2%
Adj. Flow (vph)	94	630	0	0	0	0	0	218	280	0	0	0
Lane Group Flow (vph)	0	724	0	0	0	0	0	498	0	0	0	0
Turn Type	Perm											
Protected Phases		5						1				
Permitted Phases	5											
Detector Phases	5	5						1				
Minimum Initial (s)	6.0	6.0						6.0				
Minimum Split (s)	15.0	15.0						25.0				
Total Split (s)	35.0	35.0	0.0	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	43.8%	43.8%	0.0%	0.0%	0.0%	0.0%	0.0%	35.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	31.0	31.0						24.0				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lead/Lag								Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	None	None						C-Max				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	4.0	4.0						11.0				
Pedestrian Calls (#/hr)	127	127						146				
Act Effct Green (s)		28.8						26.2				
Actuated g/C Ratio		0.36						0.33				
v/c Ratio		0.66						0.47				
Control Delay		9.4						4.7				
Queue Delay		0.0						0.2				
Total Delay		9.4						4.9				
LOS		A						A				
Approach Delay		9.4						4.9				

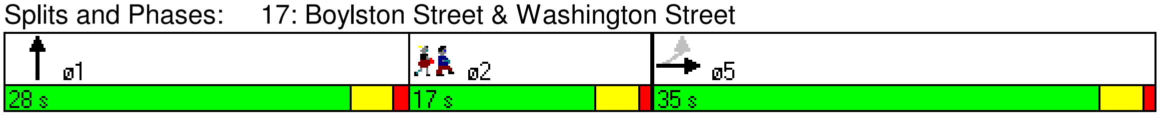
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	21%
Maximum Green (s)	13.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	45
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A						A				
Queue Length 50th (ft)		38						1				
Queue Length 95th (ft)		41						5				
Internal Link Dist (ft)		470			285			195			288	
Turn Bay Length (ft)												
Base Capacity (vph)		1184						1062				
Starvation Cap Reductn		0						116				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.61						0.53				

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 52 (65%), Referenced to phase 1:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 7.6 — Intersection LOS: A
Intersection Capacity Utilization 43.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 17: Boylston Street & Washington Street



Lane Group	ø2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	25	682
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	27	741
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			242			237
pX, platoon unblocked						
vC, conflicting volume	240	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	240	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			98	
cM capacity (veh/h)	715	1084			1622	

Direction, Lane #	SB 1	SB 2	SB 3	SB 4
Volume Total	133	212	212	212
Volume Left	27	0	0	0
Volume Right	0	0	0	0
cSH	1622	1700	1700	1700
Volume to Capacity	0.02	0.12	0.12	0.12
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	1.6	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.3			
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	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
Lane Width (ft)	12	11	13	9	12	12	12	12	12	10	10	12
Storage Length (ft)	0		80	125		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.957	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	2842	1458	1433	3026	0	0	0	0	1391	4054	0
Flt Permitted				0.220						0.950		
Satd. Flow (perm)	0	2842	1458	332	3026	0	0	0	0	1391	4054	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			81								98	
Headway Factor	1.14	1.27	1.10	1.30	1.22	1.14	1.14	1.14	1.14	1.25	1.25	1.14
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		535			502			920			242	
Travel Time (s)		12.2			11.4			25.1			6.6	
Volume (vph)	0	621	110	117	654	0	0	0	0	237	564	206
Peak Hour Factor	0.92	0.96	0.84	0.85	0.95	0.92	0.92	0.92	0.92	0.89	0.91	0.82
Heavy Vehicles (%)	0%	5%	3%	2%	2%	0%	0%	0%	0%	9%	2%	5%
Parking (#/hr)	0	0			0	0						
Adj. Flow (vph)	0	647	131	138	688	0	0	0	0	266	620	251
Lane Group Flow (vph)	0	647	131	138	688	0	0	0	0	266	871	0
Turn Type			Perm	D.P+P						Split		
Protected Phases		1		6	1 6					5	5	
Permitted Phases			1	1								
Detector Phases		1	1	6	1 6					5	5	
Minimum Initial (s)		1.0	1.0	4.0						8.0	8.0	
Minimum Split (s)		24.0	24.0	11.0						15.0	15.0	
Total Split (s)	0.0	32.0	32.0	13.0	45.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0
Total Split (%)	0.0%	32.0%	32.0%	13.0%	45.0%	0.0%	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%
Maximum Green (s)		26.0	26.0	9.0						24.0	24.0	
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0	
All-Red Time (s)		3.0	3.0	1.0						3.0	3.0	
Lead/Lag		Lead	Lead	Lag						Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		29.9	29.9	38.8	42.8					24.2	24.2	
Actuated g/C Ratio		0.30	0.30	0.39	0.43					0.24	0.24	
v/c Ratio		0.76	0.27	0.61	0.53					0.79	0.82	
Control Delay		28.9	5.1	28.9	16.4					28.1	15.5	

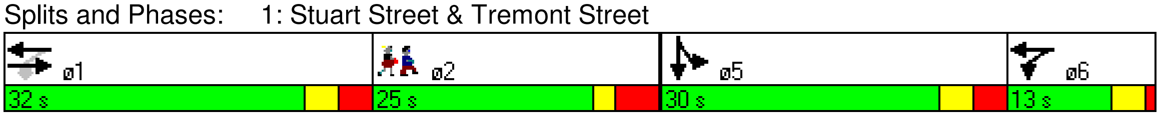
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		28.9	5.1	28.9	16.4					28.1	15.5	
LOS		C	A	C	B					C	B	
Approach Delay		24.9			18.5						18.4	
Approach LOS		C			B						B	
Queue Length 50th (ft)		208	5	34	89					106	101	
Queue Length 95th (ft)		#283	m14	m38	m98					m#206	m119	
Internal Link Dist (ft)		455			422			840			162	
Turn Bay Length (ft)			80	125								
Base Capacity (vph)		849	493	228	1274					362	1127	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.76	0.27	0.61	0.54					0.73	0.77	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 72 (72%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 20.3 Intersection LOS: C
Intersection Capacity Utilization 53.5% ICU Level of Service A
Analysis Period (min) 15
\# 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: Stuart Street & Tremont Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50								50	50	
Trailing Detector (ft)		0								0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Frt		0.984									0.964	
Flt Protected											0.995	
Satd. Flow (prot)	0	2720	0	0	0	0	0	0	0	0	5200	0
Flt Permitted											0.995	
Satd. Flow (perm)	0	2720	0	0	0	0	0	0	0	0	5200	0
Right Turn on Red			No			Yes			Yes	No		No
Satd. Flow (RTOR)												
Headway Factor	1.19	1.32	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.19	1.19	1.19
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		719			550			237			390	
Travel Time (s)		19.6			15.0			6.5			10.6	
Volume (vph)	0	684	81	0	0	0	0	0	0	141	914	328
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	5%	6%	2%	2%	2%	2%	2%	2%	4%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	4
Parking (#/hr)		10	20									
Adj. Flow (vph)	0	735	87	0	0	0	0	0	0	147	952	342
Lane Group Flow (vph)	0	822	0	0	0	0	0	0	0	0	1441	0
Turn Type										Perm		
Protected Phases		3									1	
Permitted Phases										1		
Detector Phases		3								1	1	
Minimum Initial (s)		6.0								13.0	13.0	
Minimum Split (s)		23.0								19.0	19.0	
Total Split (s)	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	0.0
Total Split (%)	0.0%	33.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)		29.0								41.0	41.0	
Yellow Time (s)		3.0								3.0	3.0	
All-Red Time (s)		1.0								1.0	1.0	
Lead/Lag										Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0								2.0	2.0	
Recall Mode		Max								C-Max	C-Max	
Walk Time (s)		7.0										
Flash Dont Walk (s)		11.0										
Pedestrian Calls (#/hr)		252										
Act Effct Green (s)		29.0									41.0	
Actuated g/C Ratio		0.29									0.41	
v/c Ratio		1.04									0.68	
Control Delay		59.7									16.8	
Queue Delay		0.0									0.1	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		59.7									16.9	
LOS		E									B	
Approach Delay		59.7									16.9	
Approach LOS		E									B	
Queue Length 50th (ft)		~300									242	
Queue Length 95th (ft)		#426									286	
Internal Link Dist (ft)		639			470			157			310	
Turn Bay Length (ft)												
Base Capacity (vph)		789									2132	
Starvation Cap Reductn		0									89	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		1.04									0.71	

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 32.5 Intersection LOS: C

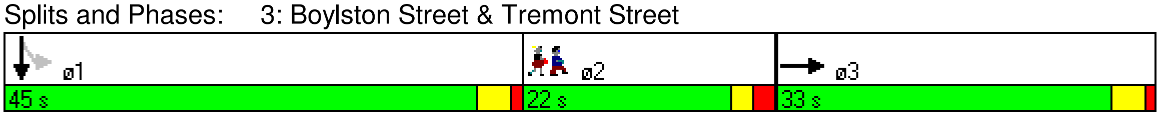
Intersection Capacity Utilization 53.7% ICU Level of Service A

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Boylston Street & Tremont Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lane Group	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
Lane Width (ft)	9	11	12	12	10	12	12	10	12	12	12	12
Storage Length (ft)	200		0	0		80	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50				
Trailing Detector (ft)	0	0		0	0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.984				0.850		0.943				
Flt Protected	0.950				0.994			0.991				
Satd. Flow (prot)	1379	2886	0	0	2952	1398	0	2646	0	0	0	0
Flt Permitted	0.326				0.580			0.991				
Satd. Flow (perm)	473	2886	0	0	1722	1398	0	2646	0	0	0	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		12										
Headway Factor	1.30	1.19	1.14	1.14	1.25	1.14	1.14	1.25	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		502			435			519			240	
Travel Time (s)		13.7			11.9			14.2			6.5	
Volume (vph)	109	679	71	93	701	148	63	203	160	0	0	0
Peak Hour Factor	0.86	0.95	0.86	0.87	0.92	0.93	0.65	0.81	0.75	0.92	0.92	0.92
Heavy Vehicles (%)	6%	5%	25%	3%	2%	4%	3%	13%	2%	2%	2%	2%
Adj. Flow (vph)	127	715	83	107	762	159	97	251	213	0	0	0
Lane Group Flow (vph)	127	798	0	0	869	159	0	561	0	0	0	0
Turn Type	Perm			D.P+P		Prot	Split					
Protected Phases		4		3	3 4	3 4	1	1				
Permitted Phases	4			4								
Detector Phases	4	4		3	3 4	3 4	1	1				
Minimum Initial (s)	9.0	9.0		5.0			10.0	10.0				
Minimum Split (s)	14.0	14.0		10.0			22.0	22.0				
Total Split (s)	32.0	32.0	0.0	18.0	50.0	50.0	28.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	32.0%	32.0%	0.0%	18.0%	50.0%	50.0%	28.0%	28.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	28.0	28.0		14.0			24.0	24.0				
Yellow Time (s)	3.0	3.0		3.0			3.0	3.0				
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0				
Lead/Lag	Lag	Lag		Lead			Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0				
Recall Mode	Max	Max		Max			C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	28.0	28.0			42.0	46.0		24.0				
Actuated g/C Ratio	0.28	0.28			0.42	0.46		0.24				
v/c Ratio	0.96	0.98			0.97	0.25		0.88				
Control Delay	80.9	42.7			49.0	17.8		41.0				
Queue Delay	0.0	0.0			0.0	0.0		1.4				

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	80.9	42.7			49.0	17.8		42.4				
LOS	F	D			D	B		D				
Approach Delay		48.0			44.2			42.4				
Approach LOS		D			D			D				
Queue Length 50th (ft)	39	123			216	60		168				
Queue Length 95th (ft)	m#127	#372			#358	104		#189				
Internal Link Dist (ft)		422			355			439			160	
Turn Bay Length (ft)	200					80						
Base Capacity (vph)	132	817			895	643		635				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		16				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.96	0.98			0.97	0.25		0.91				

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 1:NBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 45.2 Intersection LOS: D

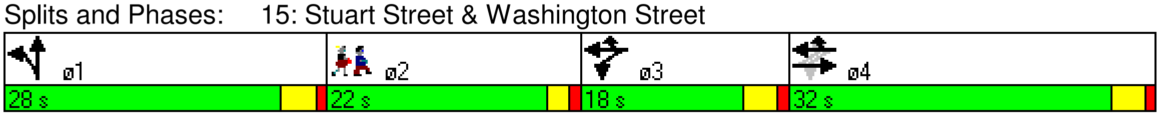
Intersection Capacity Utilization 71.9% ICU Level of Service C

Analysis Period (min) 15

\# 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: 15: Stuart Street & Washington Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

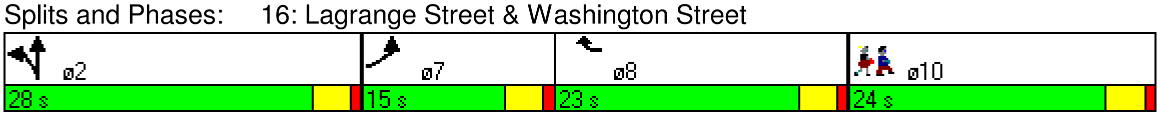
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50					50	50	50				
Trailing Detector (ft)	0					0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850						
Flt Protected	0.950							0.998				
Satd. Flow (prot)	1624	0	0	0	0	2235	0	2983	0	0	0	0
Flt Permitted	0.950							0.998				
Satd. Flow (perm)	1624	0	0	0	0	2235	0	2983	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						1024						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.30	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		267			445			240			275	
Travel Time (s)		7.3			12.1			6.5			7.5	
Volume (vph)	39	0	0	0	0	93	19	441	0	0	0	0
Confl. Peds. (#/hr)						143						
Peak Hour Factor	0.88	0.92	0.92	0.92	0.92	0.89	0.92	0.95	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	2%	2%	3%	2%	9%	2%	2%	2%	2%
Parking (#/hr)						20						
Adj. Flow (vph)	44	0	0	0	0	104	21	464	0	0	0	0
Lane Group Flow (vph)	44	0	0	0	0	104	0	485	0	0	0	0
Turn Type	custom					custom	Split					
Protected Phases	7					8	2	2				
Permitted Phases	7											
Detector Phases	7					8	2	2				
Minimum Initial (s)	3.0					4.0	4.0	4.0				
Minimum Split (s)	7.0					19.0	25.0	25.0				
Total Split (s)	15.0	0.0	0.0	0.0	0.0	23.0	28.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	16.7%	0.0%	0.0%	0.0%	0.0%	25.6%	31.1%	31.1%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	11.0					19.0	24.0	24.0				
Yellow Time (s)	3.0					3.0	3.0	3.0				
All-Red Time (s)	1.0					1.0	1.0	1.0				
Lead/Lag	Lead					Lag						
Lead-Lag Optimize?	Yes					Yes						
Vehicle Extension (s)	2.0					3.0	3.0	3.0				
Recall Mode	None					None	C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	6.8					5.5		59.9				
Actuated g/C Ratio	0.08					0.06		0.67				
v/c Ratio	0.35					0.09		0.24				
Control Delay	46.7					0.2		10.7				
Queue Delay	0.2					0.0		0.2				

Lane Group	ø10
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	27%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	46.8					0.2		10.9				
LOS	D					A		B				
Approach Delay								10.9				
Approach LOS								B				
Queue Length 50th (ft)	24					0		81				
Queue Length 95th (ft)	54					0		123				
Internal Link Dist (ft)		187			365			160			195	
Turn Bay Length (ft)												
Base Capacity (vph)	198					1280		1986				
Starvation Cap Reductn	0					0		820				
Spillback Cap Reductn	16					65		68				
Storage Cap Reductn	0					0		0				
Reduced v/c Ratio	0.24					0.09		0.42				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 40.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 16: Lagrange Street & Washington Street



Lane Group	ø10
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50						50				
Trailing Detector (ft)	0	0						0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.927				
Flt Protected		0.990										
Satd. Flow (prot)	0	3087	0	0	0	0	0	2841	0	0	0	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	3087	0	0	0	0	0	2841	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38						264				
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		550			365			275			368	
Travel Time (s)		15.0			10.0			7.5			10.0	
Volume (vph)	155	606	0	0	0	0	0	323	307	0	0	0
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.92	0.92	0.92
Heavy Vehicles (%)	1%	5%	2%	2%	2%	2%	2%	6%	6%	2%	2%	2%
Adj. Flow (vph)	161	631	0	0	0	0	0	371	353	0	0	0
Lane Group Flow (vph)	0	792	0	0	0	0	0	724	0	0	0	0
Turn Type	Perm											
Protected Phases		5						1				
Permitted Phases	5											
Detector Phases	5	5						1				
Minimum Initial (s)	6.0	6.0						6.0				
Minimum Split (s)	15.0	15.0						25.0				
Total Split (s)	44.0	44.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.0
Total Split (%)	44.0%	44.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	40.0	40.0						35.0				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lead/Lag								Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	None	None						C-Max				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	4.0	4.0						11.0				
Pedestrian Calls (#/hr)	203	203						161				
Act Effct Green (s)		38.6						36.4				
Actuated g/C Ratio		0.39						0.36				
v/c Ratio		0.65						0.60				
Control Delay		7.2						18.5				
Queue Delay		0.0						2.8				
Total Delay		7.2						21.4				
LOS		A						C				
Approach Delay		7.2						21.4				

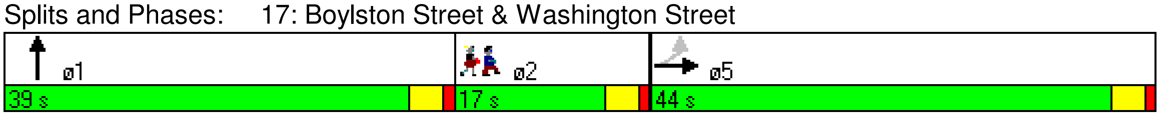
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	17%
Maximum Green (s)	13.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	45
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A						C				
Queue Length 50th (ft)		35						125				
Queue Length 95th (ft)		m37						176				
Internal Link Dist (ft)		470			285			195			288	
Turn Bay Length (ft)												
Base Capacity (vph)		1258						1203				
Starvation Cap Reductn		0						354				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.63						0.85				

Intersection Summary	
Area Type: CBD	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 31 (31%), Referenced to phase 1:NBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 17: Boylston Street & Washington Street



Lane Group	ø2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	38	967
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	41	1051
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			242			237
pX, platoon unblocked						
vC, conflicting volume	345	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	609	1084			1622	

Direction, Lane #	SB 1	SB 2	SB 3	SB 4
Volume Total	191	300	300	300
Volume Left	41	0	0	0
Volume Right	0	0	0	0
cSH	1622	1700	1700	1700
Volume to Capacity	0.03	0.18	0.18	0.18
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	1.7	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.3			
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	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
Lane Width (ft)	12	11	13	9	12	12	12	12	12	10	10	12
Storage Length (ft)	0		80	125		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.935	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	2737	1444	1406	2885	0	0	0	0	1223	3693	0
Flt Permitted				0.286						0.950		
Satd. Flow (perm)	0	2737	1444	423	2885	0	0	0	0	1223	3693	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			122								178	
Headway Factor	1.14	1.27	1.10	1.30	1.22	1.14	1.14	1.14	1.14	1.25	1.25	1.14
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		535			203			920			242	
Travel Time (s)		12.2			4.6			25.1			6.6	
Volume (vph)	0	430	132	145	511	0	0	0	0	119	319	233
Peak Hour Factor	0.92	0.79	0.78	0.79	0.98	0.92	0.92	0.92	0.92	0.75	0.87	0.83
Heavy Vehicles (%)	0%	9%	4%	4%	7%	0%	0%	0%	0%	24%	9%	12%
Parking (#/hr)	0	0			0	0						
Adj. Flow (vph)	0	544	169	184	521	0	0	0	0	159	367	281
Lane Group Flow (vph)	0	544	169	184	521	0	0	0	0	159	648	0
Turn Type			Perm	D.P+P						Split		
Protected Phases		1		6	1 6					5	5	
Permitted Phases			1	1								
Detector Phases		1	1	6	1 6					5	5	
Minimum Initial (s)		1.0	1.0	4.0						8.0	8.0	
Minimum Split (s)		24.0	24.0	11.0						15.0	15.0	
Total Split (s)	0.0	31.0	31.0	18.0	49.0	0.0	0.0	0.0	0.0	26.0	26.0	0.0
Total Split (%)	0.0%	31.0%	31.0%	18.0%	49.0%	0.0%	0.0%	0.0%	0.0%	26.0%	26.0%	0.0%
Maximum Green (s)		25.0	25.0	14.0						20.0	20.0	
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0	
All-Red Time (s)		3.0	3.0	1.0						3.0	3.0	
Lead/Lag		Lead	Lead	Lag						Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		33.3	33.3	44.0	48.0					19.0	19.0	
Actuated g/C Ratio		0.33	0.33	0.44	0.48					0.19	0.19	
v/c Ratio		0.60	0.30	0.63	0.38					0.68	0.77	
Control Delay		23.4	4.4	27.6	14.4					52.6	33.8	

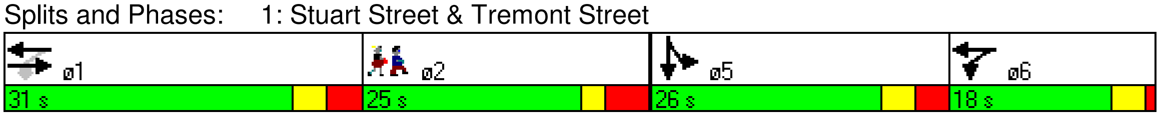
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		23.4	4.4	27.6	14.4					52.6	33.8	
LOS		C	A	C	B					D	C	
Approach Delay		18.9			17.9						37.5	
Approach LOS		B			B						D	
Queue Length 50th (ft)		91	5	40	60					94	103	
Queue Length 95th (ft)		198	m11	m74	m94					128	136	
Internal Link Dist (ft)		455			123			840			162	
Turn Bay Length (ft)			80	125								
Base Capacity (vph)		911	562	335	1369					269	951	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.60	0.30	0.55	0.38					0.59	0.68	

Intersection Summary	
Area Type: CBD	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 62 (62%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 44.8%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 1: Stuart Street & Tremont Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50								50	50	
Trailing Detector (ft)		0								0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Frt		0.986									0.972	
Flt Protected											0.993	
Satd. Flow (prot)	0	2657	0	0	0	0	0	0	0	0	4988	0
Flt Permitted											0.993	
Satd. Flow (perm)	0	2657	0	0	0	0	0	0	0	0	4988	0
Right Turn on Red			No			Yes			Yes	No		No
Satd. Flow (RTOR)												
Headway Factor	1.19	1.32	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.19	1.19	1.19
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		719			550			237			390	
Travel Time (s)		19.6			15.0			6.5			10.6	
Volume (vph)	0	661	66	0	0	0	0	0	0	131	638	177
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97
Heavy Vehicles (%)	2%	8%	6%	2%	2%	2%	2%	2%	2%	8%	11%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	4
Parking (#/hr)		10	20									
Adj. Flow (vph)	0	674	67	0	0	0	0	0	0	135	658	182
Lane Group Flow (vph)	0	741	0	0	0	0	0	0	0	0	975	0
Turn Type										Perm		
Protected Phases		3									1	
Permitted Phases										1		
Detector Phases		3								1	1	
Minimum Initial (s)		6.0								13.0	13.0	
Minimum Split (s)		23.0								19.0	19.0	
Total Split (s)	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0
Total Split (%)	0.0%	41.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	31.3%	31.3%	0.0%
Maximum Green (s)		29.0								21.0	21.0	
Yellow Time (s)		3.0								3.0	3.0	
All-Red Time (s)		1.0								1.0	1.0	
Lead/Lag										Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0								2.0	2.0	
Recall Mode		Max								C-Max	C-Max	
Walk Time (s)		7.0										
Flash Dont Walk (s)		11.0										
Pedestrian Calls (#/hr)		194										
Act Effct Green (s)		29.0									21.0	
Actuated g/C Ratio		0.36									0.26	
v/c Ratio		0.77									0.74	
Control Delay		10.4									13.7	
Queue Delay		0.0									0.0	

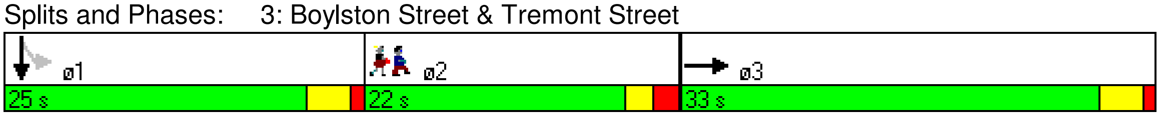
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	28%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		10.4									13.7	
LOS		B									B	
Approach Delay		10.4									13.7	
Approach LOS		B									B	
Queue Length 50th (ft)		24									29	
Queue Length 95th (ft)		44									35	
Internal Link Dist (ft)		639			470			157			310	
Turn Bay Length (ft)												
Base Capacity (vph)		963									1309	
Starvation Cap Reductn		0									0	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.77									0.74	

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 34 (43%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 12.3 Intersection LOS: B
Intersection Capacity Utilization 45.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Boylston Street & Tremont Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	9	11	12	12	10	12	12	10	12	12	12	12
Storage Length (ft)	200		0	0		80	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50				
Trailing Detector (ft)	0	0		0	0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.978				0.850		0.955				
Flt Protected	0.950				0.988			0.991				
Satd. Flow (prot)	1294	2648	0	0	2852	1358	0	2714	0	0	0	0
Flt Permitted	0.335				0.582			0.991				
Satd. Flow (perm)	456	2648	0	0	1680	1358	0	2714	0	0	0	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		20										
Headway Factor	1.30	1.19	1.14	1.14	1.25	1.14	1.14	1.25	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		299			435			519			240	
Travel Time (s)		8.2			11.9			14.2			6.5	
Volume (vph)	84	399	71	164	604	165	49	162	95	0	0	0
Peak Hour Factor	0.87	0.76	0.77	0.82	0.94	0.92	0.68	0.84	0.83	0.92	0.92	0.92
Heavy Vehicles (%)	13%	13%	33%	2%	6%	7%	8%	3%	9%	0%	0%	0%
Parking (#/hr)			0									
Adj. Flow (vph)	97	525	92	200	643	179	72	193	114	0	0	0
Lane Group Flow (vph)	97	617	0	0	843	179	0	379	0	0	0	0
Turn Type	Perm			D.P+P		Prot	Split					
Protected Phases		4		3	3 4	3 4	1	1				
Permitted Phases	4			4								
Detector Phases	4	4		3	3 4	3 4	1	1				
Minimum Initial (s)	10.0	10.0		6.0			10.0	10.0				
Minimum Split (s)	14.0	14.0		10.0			22.0	22.0				
Total Split (s)	34.0	34.0	0.0	21.0	55.0	55.0	23.0	23.0	0.0	0.0	0.0	0.0
Total Split (%)	34.0%	34.0%	0.0%	21.0%	55.0%	55.0%	23.0%	23.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	30.0	30.0		17.0			19.0	19.0				
Yellow Time (s)	3.0	3.0		3.0			3.0	3.0				
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0				
Lead/Lag	Lag	Lag		Lead			Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0				
Recall Mode	Max	Max		Max			C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	30.0	30.0			47.0	51.0		19.0				
Actuated g/C Ratio	0.30	0.30			0.47	0.51		0.19				
v/c Ratio	0.71	0.76			0.85	0.26		0.73				
Control Delay	42.5	21.2			28.7	15.1		42.0				

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0			0.0	0.0		0.8				
Total Delay	42.5	21.2			28.7	15.1		42.8				
LOS	D	C			C	B		D				
Approach Delay		24.1			26.3			42.8				
Approach LOS		C			C			D				
Queue Length 50th (ft)	22	69			188	62		120				
Queue Length 95th (ft)	m#115	92			#262	106		159				
Internal Link Dist (ft)		219			355			439			160	
Turn Bay Length (ft)	200					80						
Base Capacity (vph)	137	808			989	693		516				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	4		25				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.71	0.76			0.85	0.26		0.77				

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 2 (2%), Referenced to phase 1:NBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 28.5 Intersection LOS: C

Intersection Capacity Utilization 58.6% ICU Level of Service B

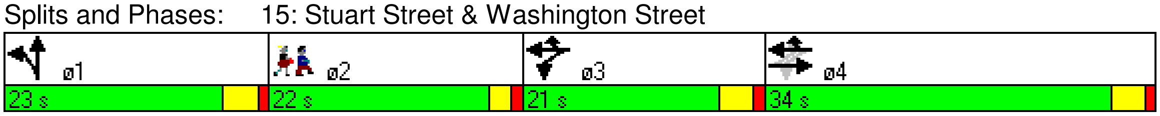
Analysis Period (min) 15

\# 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: 15: Stuart Street & Washington Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50					50	50	50				
Trailing Detector (ft)	0					0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850						
Flt Protected	0.950											
Satd. Flow (prot)	1624	0	0	0	0	2152	0	2955	0	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	1624	0	0	0	0	2152	0	2955	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						910						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.30	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		301			445			240			275	
Travel Time (s)		8.2			12.1			6.5			7.5	
Volume (vph)	87	0	0	0	0	47	4	442	0	0	0	0
Confl. Peds. (#/hr)						149						
Peak Hour Factor	0.55	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	2%	2%	7%	2%	10%	2%	2%	2%	2%
Parking (#/hr)						20						
Adj. Flow (vph)	158	0	0	0	0	55	4	480	0	0	0	0
Lane Group Flow (vph)	158	0	0	0	0	55	0	484	0	0	0	0
Turn Type	Prot					custom	Split					
Protected Phases	7					8	2	2				
Permitted Phases												
Detector Phases	7					8	2	2				
Minimum Initial (s)	4.0					4.0	4.0	4.0				
Minimum Split (s)	8.0					8.0	20.0	20.0				
Total Split (s)	18.0	0.0	0.0	0.0	0.0	12.0	26.0	26.0	0.0	0.0	0.0	0.0
Total Split (%)	22.5%	0.0%	0.0%	0.0%	0.0%	15.0%	32.5%	32.5%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0					8.0	22.0	22.0				
Yellow Time (s)	3.0					3.0	3.0	3.0				
All-Red Time (s)	1.0					1.0	1.0	1.0				
Lead/Lag	Lag					Lead						
Lead-Lag Optimize?	Yes					Yes						
Vehicle Extension (s)	3.0					3.0	3.0	3.0				
Recall Mode	Max					Max	C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	14.0					8.0		34.0				
Actuated g/C Ratio	0.18					0.10		0.42				
v/c Ratio	0.56					0.05		0.39				
Control Delay	38.3					0.1		19.4				
Queue Delay	0.0					0.0		0.4				

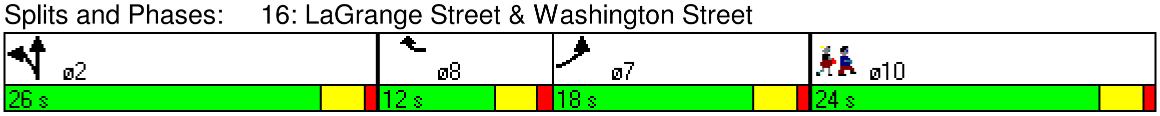
Lane Group	ø10
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	30%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	38.3					0.1		19.8				
LOS	D					A		B				
Approach Delay								19.8				
Approach LOS								B				
Queue Length 50th (ft)	75					0		101				
Queue Length 95th (ft)	78					0		147				
Internal Link Dist (ft)		221			365			160			195	
Turn Bay Length (ft)												
Base Capacity (vph)	284					1034		1256				
Starvation Cap Reductn	0					0		343				
Spillback Cap Reductn	0					0		0				
Storage Cap Reductn	0					0		0				
Reduced v/c Ratio	0.56					0.05		0.53				

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 48 (60%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 22.4 Intersection LOS: C
Intersection Capacity Utilization 42.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 16: LaGrange Street & Washington Street



Lane Group	ø10
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50						50				
Trailing Detector (ft)	0	0						0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.912				
Flt Protected		0.993										
Satd. Flow (prot)	0	3014	0	0	0	0	0	2651	0	0	0	0
Flt Permitted		0.993										
Satd. Flow (perm)	0	3014	0	0	0	0	0	2651	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24						317				
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		550			365			275			368	
Travel Time (s)		15.0			10.0			7.5			10.0	
Volume (vph)	88	583	0	0	0	0	0	209	298	0	0	0
Peak Hour Factor	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	14%	6%	2%	2%	2%	2%	2%	10%	13%	2%	2%	2%
Adj. Flow (vph)	94	620	0	0	0	0	0	222	317	0	0	0
Lane Group Flow (vph)	0	714	0	0	0	0	0	539	0	0	0	0
Turn Type	Perm											
Protected Phases		5						1				
Permitted Phases	5											
Detector Phases	5	5						1				
Minimum Initial (s)	6.0	6.0						6.0				
Minimum Split (s)	15.0	15.0						25.0				
Total Split (s)	35.0	35.0	0.0	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	43.8%	43.8%	0.0%	0.0%	0.0%	0.0%	0.0%	35.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	31.0	31.0						24.0				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lead/Lag								Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	None	None						C-Max				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	4.0	4.0						11.0				
Pedestrian Calls (#/hr)	127	127						146				
Act Effct Green (s)		28.2						26.8				
Actuated g/C Ratio		0.35						0.34				
v/c Ratio		0.66						0.49				
Control Delay		9.7						6.8				
Queue Delay		0.0						0.2				
Total Delay		9.7						7.1				
LOS		A						A				
Approach Delay		9.7						7.1				

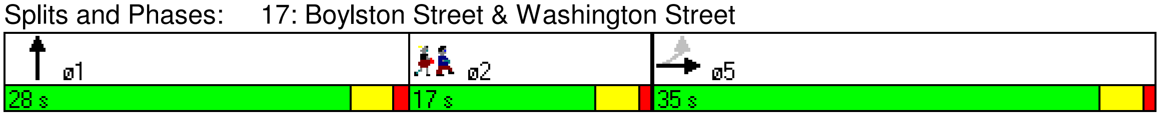
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	21%
Maximum Green (s)	13.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	45
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A						A				
Queue Length 50th (ft)		42						7				
Queue Length 95th (ft)		40						26				
Internal Link Dist (ft)		470			285			195			288	
Turn Bay Length (ft)												
Base Capacity (vph)		1183						1100				
Starvation Cap Reductn		0						141				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.60						0.56				

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 52 (65%), Referenced to phase 1:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 8.6 Intersection LOS: A
Intersection Capacity Utilization 44.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 17: Boylston Street & Washington Street



Lane Group	ø2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	44	682
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	48	741
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			242			237
pX, platoon unblocked						
vC, conflicting volume	281	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	666	1084			1622	

Direction, Lane #	SB 1	SB 2	SB 3	SB 4
Volume Total	154	212	212	212
Volume Left	48	0	0	0
Volume Right	0	0	0	0
cSH	1622	1700	1700	1700
Volume to Capacity	0.03	0.12	0.12	0.12
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	2.4	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.5			
Approach LOS				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	15.1%	ICU Level of Service	A
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)	25	19	0	0	0	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	21	0	0	0	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				301		
pX, platoon unblocked						
vC, conflicting volume			48		38	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			48		38	38
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		100	96
cM capacity (veh/h)			1559		975	1035

Direction, Lane #	EB 1	NB 1
Volume Total	48	42
Volume Left	0	0
Volume Right	21	42
cSH	1700	1035
Volume to Capacity	0.03	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	8.6
Lane LOS		A
Approach Delay (s)	0.0	8.6
Approach LOS		A

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	13.3%	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	549	658	16	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	597	715	17	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		203	299			
pX, platoon unblocked	0.84				0.91	0.84
vC, conflicting volume	733				1022	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	497				507	63
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	896				448	834

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	298	298	477	256
Volume Left	0	0	0	0
Volume Right	0	0	0	17
cSH	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.28	0.15
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	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
Lane Width (ft)	12	11	13	9	12	12	12	12	12	10	10	12
Storage Length (ft)	0		80	125		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	
Trailing Detector (ft)		0	0	0	0					0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.957	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	2842	1458	1433	3026	0	0	0	0	1391	4054	0
Flt Permitted				0.220						0.950		
Satd. Flow (perm)	0	2842	1458	332	3026	0	0	0	0	1391	4054	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			81								98	
Headway Factor	1.14	1.27	1.10	1.30	1.22	1.14	1.14	1.14	1.14	1.25	1.25	1.14
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		535			234			920			242	
Travel Time (s)		12.2			5.3			25.1			6.6	
Volume (vph)	0	621	110	117	650	0	0	0	0	237	564	206
Peak Hour Factor	0.92	0.96	0.84	0.85	0.95	0.92	0.92	0.92	0.92	0.89	0.91	0.82
Heavy Vehicles (%)	0%	5%	3%	2%	2%	0%	0%	0%	0%	9%	2%	5%
Parking (#/hr)	0	0			0	0						
Adj. Flow (vph)	0	647	131	138	684	0	0	0	0	266	620	251
Lane Group Flow (vph)	0	647	131	138	684	0	0	0	0	266	871	0
Turn Type			Perm	D.P+P						Split		
Protected Phases		1		6	1 6					5	5	
Permitted Phases			1	1								
Detector Phases		1	1	6	1 6					5	5	
Minimum Initial (s)		1.0	1.0	4.0						8.0	8.0	
Minimum Split (s)		24.0	24.0	11.0						15.0	15.0	
Total Split (s)	0.0	32.0	32.0	13.0	45.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0
Total Split (%)	0.0%	32.0%	32.0%	13.0%	45.0%	0.0%	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%
Maximum Green (s)		26.0	26.0	9.0						24.0	24.0	
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0	
All-Red Time (s)		3.0	3.0	1.0						3.0	3.0	
Lead/Lag		Lead	Lead	Lag						Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0	
Recall Mode		C-Max	C-Max	None						None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		29.9	29.9	38.8	42.8					24.2	24.2	
Actuated g/C Ratio		0.30	0.30	0.39	0.43					0.24	0.24	
v/c Ratio		0.76	0.27	0.61	0.53					0.79	0.82	
Control Delay		28.9	5.1	28.5	16.8					28.4	15.9	

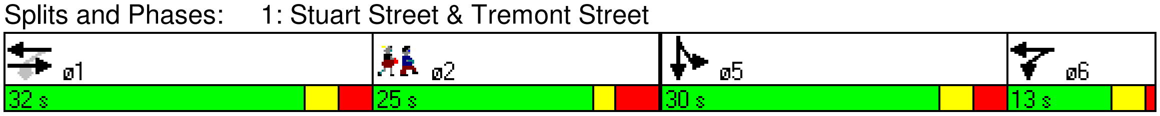
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		28.9	5.1	28.5	16.8					28.4	15.9	
LOS		C	A	C	B					C	B	
Approach Delay		24.9			18.7						18.8	
Approach LOS		C			B						B	
Queue Length 50th (ft)		208	5	36	94					109	105	
Queue Length 95th (ft)		#283	m14	m37	m95					m#198	m123	
Internal Link Dist (ft)		455			154			840			162	
Turn Bay Length (ft)			80	125								
Base Capacity (vph)		850	493	228	1274					362	1127	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.76	0.27	0.61	0.54					0.73	0.77	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 72 (72%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 20.5 Intersection LOS: C
Intersection Capacity Utilization 53.5% ICU Level of Service A
Analysis Period (min) 15
\# 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: Stuart Street & Tremont Street



Lane Group	ø2
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50								50	50	
Trailing Detector (ft)		0								0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	0.86
Frt		0.980									0.964	
Flt Protected											0.995	
Satd. Flow (prot)	0	2708	0	0	0	0	0	0	0	0	5199	0
Flt Permitted											0.995	
Satd. Flow (perm)	0	2708	0	0	0	0	0	0	0	0	5199	0
Right Turn on Red			No			Yes			Yes	No		No
Satd. Flow (RTOR)												
Headway Factor	1.19	1.32	1.19	1.14	1.14	1.14	1.14	1.14	1.14	1.19	1.19	1.19
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		719			550			237			390	
Travel Time (s)		19.6			15.0			6.5			10.6	
Volume (vph)	0	679	103	0	0	0	0	0	0	140	919	333
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96
Heavy Vehicles (%)	0%	5%	6%	2%	2%	2%	2%	2%	2%	4%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	4
Parking (#/hr)		10	20									
Adj. Flow (vph)	0	730	111	0	0	0	0	0	0	146	957	347
Lane Group Flow (vph)	0	841	0	0	0	0	0	0	0	0	1450	0
Turn Type										Perm		
Protected Phases		3									1	
Permitted Phases										1		
Detector Phases		3								1	1	
Minimum Initial (s)		6.0								13.0	13.0	
Minimum Split (s)		23.0								19.0	19.0	
Total Split (s)	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	0.0
Total Split (%)	0.0%	33.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)		29.0								41.0	41.0	
Yellow Time (s)		3.0								3.0	3.0	
All-Red Time (s)		1.0								1.0	1.0	
Lead/Lag										Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0								2.0	2.0	
Recall Mode		Max								C-Max	C-Max	
Walk Time (s)		7.0										
Flash Dont Walk (s)		11.0										
Pedestrian Calls (#/hr)		252										
Act Effct Green (s)		29.0									41.0	
Actuated g/C Ratio		0.29									0.41	
v/c Ratio		1.07									0.68	
Control Delay		70.0									16.9	
Queue Delay		0.0									0.1	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	18.0
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		70.0									17.0	
LOS		E									B	
Approach Delay		70.0									17.0	
Approach LOS		E									B	
Queue Length 50th (ft)		~315									243	
Queue Length 95th (ft)		#440									289	
Internal Link Dist (ft)		639			470			157			310	
Turn Bay Length (ft)												
Base Capacity (vph)		785									2132	
Starvation Cap Reductn		0									87	
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		1.07									0.71	

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 8 (8%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 36.5 Intersection LOS: D

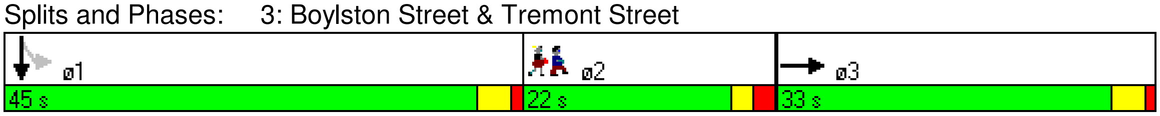
Intersection Capacity Utilization 54.5% ICU Level of Service A

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Boylston Street & Tremont Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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
Lane Width (ft)	9	11	12	12	10	12	12	10	12	12	12	12
Storage Length (ft)	200		0	0		80	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50				
Trailing Detector (ft)	0	0		0	0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.984				0.850		0.944				
Flt Protected	0.950				0.994			0.991				
Satd. Flow (prot)	1379	2886	0	0	2952	1398	0	2650	0	0	0	0
Flt Permitted	0.318				0.579			0.991				
Satd. Flow (perm)	462	2886	0	0	1719	1398	0	2650	0	0	0	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		12										
Headway Factor	1.30	1.19	1.14	1.14	1.25	1.14	1.14	1.25	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		268			435			519			240	
Travel Time (s)		7.3			11.9			14.2			6.5	
Volume (vph)	109	679	71	94	723	148	66	203	160	0	0	0
Peak Hour Factor	0.86	0.95	0.86	0.87	0.92	0.93	0.65	0.81	0.75	0.92	0.92	0.92
Heavy Vehicles (%)	6%	5%	25%	3%	2%	4%	3%	13%	2%	2%	2%	2%
Adj. Flow (vph)	127	715	83	108	786	159	102	251	213	0	0	0
Lane Group Flow (vph)	127	798	0	0	894	159	0	566	0	0	0	0
Turn Type	Perm			D.P+P		Prot	Split					
Protected Phases		4		3	3 4	3 4	1	1				
Permitted Phases	4			4								
Detector Phases	4	4		3	3 4	3 4	1	1				
Minimum Initial (s)	9.0	9.0		5.0			10.0	10.0				
Minimum Split (s)	14.0	14.0		10.0			22.0	22.0				
Total Split (s)	32.0	32.0	0.0	18.0	50.0	50.0	28.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	32.0%	32.0%	0.0%	18.0%	50.0%	50.0%	28.0%	28.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	28.0	28.0		14.0			24.0	24.0				
Yellow Time (s)	3.0	3.0		3.0			3.0	3.0				
All-Red Time (s)	1.0	1.0		1.0			1.0	1.0				
Lead/Lag	Lag	Lag		Lead			Lead	Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0			2.0	2.0				
Recall Mode	Max	Max		Max			C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	28.0	28.0			42.0	46.0		24.0				
Actuated g/C Ratio	0.28	0.28			0.42	0.46		0.24				
v/c Ratio	0.98	0.98			1.00	0.25		0.89				
Control Delay	87.8	43.0			55.6	17.8		50.7				
Queue Delay	0.0	0.0			0.0	0.0		1.8				

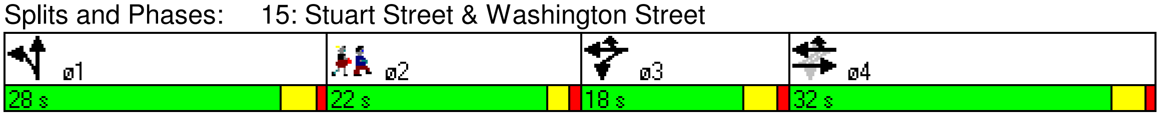
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	10.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	22%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	10.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	87.8	43.0			55.6	17.8		52.5				
LOS	F	D			E	B		D				
Approach Delay		49.2			49.9			52.5				
Approach LOS		D			D			D				
Queue Length 50th (ft)	39	124			224	60		200				
Queue Length 95th (ft)	m#130	#371			#384	104		#238				
Internal Link Dist (ft)		188			355			439			160	
Turn Bay Length (ft)	200					80						
Base Capacity (vph)	129	817			895	643		636				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		18				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.98	0.98			1.00	0.25		0.92				

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 8 (8%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 50.2 Intersection LOS: D
Intersection Capacity Utilization 72.7% ICU Level of Service C
Analysis Period (min) 15
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: 15: Stuart Street & Washington Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50					50	50	50				
Trailing Detector (ft)	0					0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.850						
Flt Protected	0.950							0.998				
Satd. Flow (prot)	1624	0	0	0	0	2235	0	2983	0	0	0	0
Flt Permitted	0.950							0.998				
Satd. Flow (perm)	1624	0	0	0	0	2235	0	2983	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						908						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.30	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		276			445			240			275	
Travel Time (s)		7.5			12.1			6.5			7.5	
Volume (vph)	92	0	0	0	0	93	19	441	0	0	0	0
Confl. Peds. (#/hr)						143						
Peak Hour Factor	0.88	0.92	0.92	0.92	0.92	0.89	0.92	0.95	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	2%	2%	3%	2%	9%	2%	2%	2%	2%
Parking (#/hr)						20						
Adj. Flow (vph)	105	0	0	0	0	104	21	464	0	0	0	0
Lane Group Flow (vph)	105	0	0	0	0	104	0	485	0	0	0	0
Turn Type	custom					custom	Split					
Protected Phases	7					8	2	2				
Permitted Phases	7											
Detector Phases	7					8	2	2				
Minimum Initial (s)	3.0					4.0	4.0	4.0				
Minimum Split (s)	7.0					19.0	25.0	25.0				
Total Split (s)	15.0	0.0	0.0	0.0	0.0	23.0	28.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	16.7%	0.0%	0.0%	0.0%	0.0%	25.6%	31.1%	31.1%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	11.0					19.0	24.0	24.0				
Yellow Time (s)	3.0					3.0	3.0	3.0				
All-Red Time (s)	1.0					1.0	1.0	1.0				
Lead/Lag	Lead					Lag						
Lead-Lag Optimize?	Yes					Yes						
Vehicle Extension (s)	2.0					3.0	3.0	3.0				
Recall Mode	None					None	C-Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	9.1					5.5		55.9				
Actuated g/C Ratio	0.10					0.06		0.62				
v/c Ratio	0.64					0.11		0.26				
Control Delay	56.1					0.2		12.4				
Queue Delay	2.6					0.0		0.3				

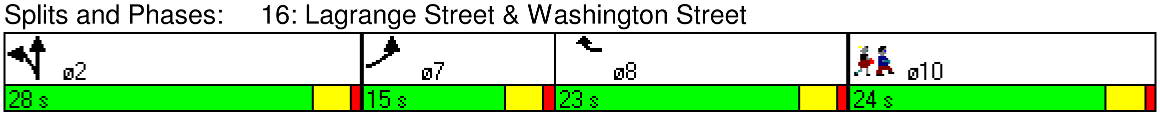
Lane Group	ø10
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Parking (#/hr)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	27%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	50
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	58.7					0.2		12.6				
LOS	E					A		B				
Approach Delay								12.6				
Approach LOS								B				
Queue Length 50th (ft)	58					0		87				
Queue Length 95th (ft)	107					0		127				
Internal Link Dist (ft)		196			365			160			195	
Turn Bay Length (ft)												
Base Capacity (vph)	198					1188		1854				
Starvation Cap Reductn	0					0		748				
Spillback Cap Reductn	34					50		61				
Storage Cap Reductn	0					0		0				
Reduced v/c Ratio	0.64					0.09		0.44				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 17.7 Intersection LOS: B
Intersection Capacity Utilization 43.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 16: Lagrange Street & Washington Street



Lane Group	ø10
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	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	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50						50				
Trailing Detector (ft)	0	0						0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.922				
Flt Protected		0.990										
Satd. Flow (prot)	0	3087	0	0	0	0	0	2826	0	0	0	0
Flt Permitted		0.990										
Satd. Flow (perm)	0	3087	0	0	0	0	0	2826	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38						301				
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		550			365			275			368	
Travel Time (s)		15.0			10.0			7.5			10.0	
Volume (vph)	155	600	0	0	0	0	0	328	355	0	0	0
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.92	0.92	0.92
Heavy Vehicles (%)	1%	5%	2%	2%	2%	2%	2%	6%	6%	2%	2%	2%
Adj. Flow (vph)	161	625	0	0	0	0	0	377	408	0	0	0
Lane Group Flow (vph)	0	786	0	0	0	0	0	785	0	0	0	0
Turn Type	Perm											
Protected Phases		5						1				
Permitted Phases	5											
Detector Phases	5	5						1				
Minimum Initial (s)	6.0	6.0						6.0				
Minimum Split (s)	15.0	15.0						25.0				
Total Split (s)	44.0	44.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0	0.0
Total Split (%)	44.0%	44.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	40.0	40.0						35.0				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lead/Lag								Lead				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	None	None						C-Max				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	4.0	4.0						11.0				
Pedestrian Calls (#/hr)	203	203						161				
Act Effct Green (s)		38.4						36.6				
Actuated g/C Ratio		0.38						0.37				
v/c Ratio		0.65						0.64				
Control Delay		6.7						18.6				
Queue Delay		0.0						3.6				
Total Delay		6.7						22.2				
LOS		A						C				
Approach Delay		6.7						22.2				

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	6.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	17%
Maximum Green (s)	13.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	6.0
Pedestrian Calls (#/hr)	45
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A						C				
Queue Length 50th (ft)		35						135				
Queue Length 95th (ft)		m35						190				
Internal Link Dist (ft)		470			285			195			288	
Turn Bay Length (ft)												
Base Capacity (vph)		1258						1224				
Starvation Cap Reductn		0						338				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.62						0.89				

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 31 (31%), Referenced to phase 1:NBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

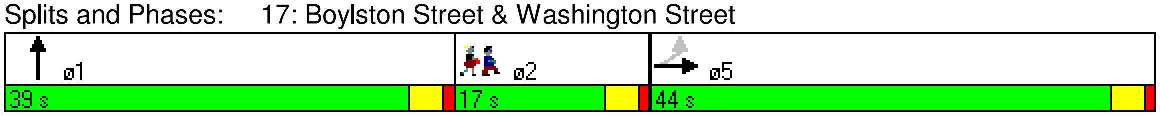
Intersection Signal Delay: 14.5 Intersection LOS: B

Intersection Capacity Utilization 52.8% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 17: Boylston Street & Washington Street



Lane Group	ø2
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	65	967
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	71	1051
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			242			237
pX, platoon unblocked						
vC, conflicting volume	404	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			96	
cM capacity (veh/h)	549	1084			1622	

Direction, Lane #	SB 1	SB 2	SB 3	SB 4
Volume Total	221	300	300	300
Volume Left	71	0	0	0
Volume Right	0	0	0	0
cSH	1622	1700	1700	1700
Volume to Capacity	0.04	0.18	0.18	0.18
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	2.6	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.5			
Approach LOS				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	20.0%	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)	0	858	780	20	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	933	848	22	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		234	268			
pX, platoon unblocked	0.78				0.87	0.78
vC, conflicting volume	870				1325	435
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	546				580	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	792				388	843

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	466	466	565	304
Volume Left	0	0	0	0
Volume Right	0	0	0	22
cSH	1700	1700	1700	1700
Volume to Capacity	0.27	0.27	0.33	0.18
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
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)	38	27	0	0	0	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	29	0	0	0	58
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				276		
pX, platoon unblocked						
vC, conflicting volume			71		56	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			71		56	56
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		100	94
cM capacity (veh/h)			1530		952	1011

Direction, Lane #	EB 1	NB 1
Volume Total	71	58
Volume Left	0	0
Volume Right	29	58
cSH	1700	1011
Volume to Capacity	0.04	0.06
Queue Length 95th (ft)	0	5
Control Delay (s)	0.0	8.8
Lane LOS		A
Approach Delay (s)	0.0	8.8
Approach LOS		A

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	13.6%	ICU Level of Service	A
Analysis Period (min)	15		

31-45 Stuart Street

Detailed Trip Generation Estimation -- APARTMENT

Howard/Stein-Hudson Associates

April 25, 2011

Component	Size	Category	Directional Split	Trip Rates (Trips/ksf or unit)	Unadjusted Vehicle Trips	Capture Rate	Less capture trips	Assumed national vehicle occupancy rate[1]	**Converted to Person trips**	Transit Share[2]	**Transit Trips**	Walk/Bike/ Other Share[2]	**Walk/ Bike/ Other Trips**	Vehicle Share[2]	Vehicle Person Trips	Assumed local vehicle occupancy rate[3]	**Total Adjusted Vehicle Trips**
Daily																	
Residential - Apartments [4]	404	Total		6.37	2572		2572	1.2	**3,086**	30%	**926**	39%	**1,204**	31%	957	1.2	**797**
	Units	In	0.5	3.18	1286		1286	1.2	**1,543**	30%	**463**	39%	**602**	31%	478	1.2	**399**
		Out	0.5	3.18	1286		1286	1.2	**1543**	30%	**463**	39%	**602**	31%	478	1.2	**399**
AM Peak Hour																	
Residential - Apartments [4]	404	Total		0.50	202		202	1.2	**242**		**22**		**154**		66	1.2	**55**
	Units	In	0.2	0.10	40		40	1.2	**48**	17%	**8**	38%	**18**	45%	22	1.2	**18**
		Out	0.8	0.40	161		161	1.2	**194**	7%	**14**	70%	**136**	23%	45	1.2	**37**
PM Peak Hour																	
Residential - Apartments [4]	404	Total		0.59	240		240	1.2	**288**		**30**		**169**		88	1.2	**74**
	Units	In	0.65	0.39	156		156	1.2	**187**	7%	**13**	70%	**131**	23%	43	1.2	**36**
		Out	0.35	0.21	84		84	1.2	**101**	17%	**17**	38%	**38**	45%	45	1.2	**38**

Notes:

1. 2001 National vehicle occupancy rates - 1.2: Home to work; 1.6
2. Mode shares based on BTD Data for Area 3.
3. Local vehicle occupancy rates based on 2000 Census data and 2001 National VOR.
4. ITE Trip Generation Equation, 8th Edition, LUC 220 (Apartment) - Equation.

Appendix B

Wind Study Table

CONSULTING ENGINEERS
& SCIENTISTS

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
1	A	Spring	14	-	Standing	21	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	14	-	Standing	20	-	Acceptable
	B	Spring	13	-	Standing	18	-13%	Acceptable
		Summer	9	-	Sitting	13	-12%	Acceptable
		Fall	12	-	Sitting	17	-10%	Acceptable
		Winter	15	-	Standing	20	-12%	Acceptable
		Annual	13	-	Standing	18	-	Acceptable
2	A	Spring	9	-	Sitting	13	-	Acceptable
		Summer	7	-	Sitting	10	-	Acceptable
		Fall	8	-	Sitting	13	-	Acceptable
		Winter	9	-	Sitting	14	-	Acceptable
		Annual	8	-	Sitting	13	-	Acceptable
	B	Spring	5	-43%	Sitting	8	-37%	Acceptable
		Summer	4	-42%	Sitting	6	-39%	Acceptable
		Fall	4	-49%	Sitting	8	-37%	Acceptable
		Winter	5	-43%	Sitting	9	-35%	Acceptable
		Annual	5	-37%	Sitting	8	-37%	Acceptable
3	A	Spring	9	-	Sitting	14	-	Acceptable
		Summer	7	-	Sitting	11	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	10	-	Sitting	15	-	Acceptable
		Annual	9	-	Sitting	14	-	Acceptable
	B	Spring	8	-10%	Sitting	13	-	Acceptable
		Summer	6	-13%	Sitting	10	-	Acceptable
		Fall	7	-21%	Sitting	12	-13%	Acceptable
		Winter	8	-19%	Sitting	14	-	Acceptable
		Annual	8	-10%	Sitting	12	-13%	Acceptable
4	A	Spring	11	-	Sitting	15	-	Acceptable
		Summer	8	-	Sitting	11	-	Acceptable
		Fall	10	-	Sitting	14	-	Acceptable
		Winter	12	-	Sitting	17	-	Acceptable
		Annual	11	-	Sitting	15	-	Acceptable
	B	Spring	10	-	Sitting	15	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	10	-16%	Sitting	16	-	Acceptable
		Annual	10	-	Sitting	14	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
5	A	Spring	8	-	Sitting	13	-	Acceptable
		Summer	7	-	Sitting	11	-	Acceptable
		Fall	8	-	Sitting	13	-	Acceptable
		Winter	9	-	Sitting	14	-	Acceptable
		Annual	8	-	Sitting	13	-	Acceptable
	B	Spring	6	-24%	Sitting	10	-22%	Acceptable
		Summer	5	-28%	Sitting	7	-35%	Acceptable
		Fall	6	-24%	Sitting	9	-30%	Acceptable
		Winter	7	-21%	Sitting	11	-20%	Acceptable
		Annual	6	-24%	Sitting	10	-22%	Acceptable
6	A	Spring	14	-	Standing	20	-	Acceptable
		Summer	10	-	Sitting	14	-	Acceptable
		Fall	13	-	Standing	18	-	Acceptable
		Winter	14	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	11	-20%	Sitting	17	-14%	Acceptable
		Summer	8	-19%	Sitting	12	-13%	Acceptable
		Fall	10	-22%	Sitting	15	-16%	Acceptable
		Winter	11	-20%	Sitting	17	-14%	Acceptable
		Annual	10	-22%	Sitting	16	-15%	Acceptable
7	A	Spring	11	-	Sitting	17	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	18	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	10	-	Sitting	16	-	Acceptable
		Summer	7	-12%	Sitting	11	-14%	Acceptable
		Fall	9	-17%	Sitting	14	-12%	Acceptable
		Winter	9	-24%	Sitting	15	-16%	Acceptable
		Annual	9	-17%	Sitting	14	-17%	Acceptable
8	A	Spring	14	-	Standing	20	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	14	-	Standing	20	-	Acceptable
	B	Spring	16	+14%	Walking	21	-	Acceptable
		Summer	12	-	Sitting	15	-	Acceptable
		Fall	15	+15%	Standing	20	-	Acceptable
		Winter	18	+20%	Walking	23	-	Acceptable
		Annual	16	+14%	Walking	21	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
9	A	Spring	13	-	Standing	20	-	Acceptable
		Summer	9	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	12	-	Sitting	19	-	Acceptable
	B	Spring	22	+69%	Uncomfortable	28	+40%	Acceptable
		Summer	16	+78%	Walking	20	+33%	Acceptable
		Fall	20	+67%	Uncomfortable	25	+39%	Acceptable
		Winter	24	+85%	Uncomfortable	30	+50%	Acceptable
		Annual	22	+83%	Uncomfortable	27	+42%	Acceptable
10	A	Spring	10	-	Sitting	16	-	Acceptable
		Summer	7	-	Sitting	12	-	Acceptable
		Fall	9	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	17	-	Acceptable
		Annual	10	-	Sitting	16	-	Acceptable
	B	Spring	17	+70%	Walking	22	+38%	Acceptable
		Summer	12	+71%	Sitting	16	+33%	Acceptable
		Fall	15	+67%	Standing	20	+33%	Acceptable
		Winter	18	+64%	Walking	23	+35%	Acceptable
		Annual	16	+60%	Walking	21	+31%	Acceptable
11	A	Spring	10	-	Sitting	15	-	Acceptable
		Summer	7	-	Sitting	12	-	Acceptable
		Fall	9	-	Sitting	15	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	9	-	Sitting	15	-	Acceptable
	B	Spring	8	-19%	Sitting	11	-26%	Acceptable
		Summer	6	-13%	Sitting	8	-32%	Acceptable
		Fall	7	-21%	Sitting	10	-32%	Acceptable
		Winter	8	-19%	Sitting	11	-30%	Acceptable
		Annual	7	-21%	Sitting	11	-26%	Acceptable
12	A	Spring	6	-	Sitting	10	-	Acceptable
		Summer	4	-	Sitting	7	-	Acceptable
		Fall	5	-	Sitting	9	-	Acceptable
		Winter	6	-	Sitting	10	-	Acceptable
		Annual	6	-	Sitting	9	-	Acceptable
	B	Spring	7	+17%	Sitting	11	+10%	Acceptable
		Summer	5	+25%	Sitting	8	+14%	Acceptable
		Fall	6	+20%	Sitting	10	+11%	Acceptable
		Winter	7	+17%	Sitting	11	+10%	Acceptable
		Annual	6	-	Sitting	10	+11%	Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
13	A	Spring	12	-	Sitting	18	-	Acceptable
		Summer	10	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	18	-	Acceptable
		Annual	12	-	Sitting	17	-	Acceptable
	B	Spring	14	+17%	Standing	19	-	Acceptable
		Summer	11	+10%	Sitting	16	+14%	Acceptable
		Fall	13	+18%	Standing	18	-	Acceptable
		Winter	15	+25%	Standing	20	+11%	Acceptable
		Annual	14	+17%	Standing	19	+12%	Acceptable
14	A	Spring	14	-	Standing	21	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	14	-	Standing	20	-	Acceptable
	B	Spring	13	-	Standing	20	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	14	-	Standing	21	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
15	A	Spring	13	-	Standing	20	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	12	-	Sitting	19	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	13	-	Standing	20	-	Acceptable
		Summer	10	-	Sitting	14	-12%	Acceptable
		Fall	13	-	Standing	18	-	Acceptable
		Winter	14	-	Standing	21	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
16	A	Spring	11	-	Sitting	16	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	16	-	Acceptable
		Annual	10	-	Sitting	15	-	Acceptable
	B	Spring	12	-	Sitting	17	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	11	+10%	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	18	+13%	Acceptable
		Annual	11	+10%	Sitting	17	+13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
17	A	Spring	14	-	Standing	20	-	Acceptable
		Summer	10	-	Sitting	14	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	14	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	12	-13%	Sitting	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-14%	Sitting	17	-10%	Acceptable
		Winter	12	-13%	Sitting	19	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
18	A	Spring	10	-	Sitting	16	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	9	-	Sitting	15	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	10	-	Sitting	15	-	Acceptable
	B	Spring	12	+20%	Sitting	17	-	Acceptable
		Summer	10	+11%	Sitting	14	-	Acceptable
		Fall	11	+22%	Sitting	16	-	Acceptable
		Winter	12	+20%	Sitting	18	+13%	Acceptable
		Annual	11	+10%	Sitting	16	-	Acceptable
19	A	Spring	12	-	Sitting	19	-	Acceptable
		Summer	10	-	Sitting	16	-	Acceptable
		Fall	11	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
	B	Spring	18	+50%	Walking	24	+26%	Acceptable
		Summer	13	+30%	Standing	17	-	Acceptable
		Fall	17	+55%	Walking	23	+28%	Acceptable
		Winter	20	+54%	Uncomfortable	26	+30%	Acceptable
		Annual	18	+50%	Walking	24	+33%	Acceptable
20	A	Spring	14	-	Standing	19	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	13	-	Standing	18	-	Acceptable
		Winter	15	-	Standing	21	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	21	+50%	Uncomfortable	28	+47%	Acceptable
		Summer	15	+36%	Standing	20	+33%	Acceptable
		Fall	19	+46%	Walking	26	+44%	Acceptable
		Winter	23	+52%	Uncomfortable	30	+43%	Acceptable
		Annual	21	+62%	Uncomfortable	28	+47%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
21	A	Spring	17	-	Walking	23	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	16	-	Walking	22	-	Acceptable
		Winter	18	-	Walking	25	-	Acceptable
		Annual	16	-	Walking	22	-	Acceptable
	B	Spring	21	+24%	Uncomfortable	28	+22%	Acceptable
		Summer	15	+15%	Standing	20	+11%	Acceptable
		Fall	19	+19%	Walking	26	+18%	Acceptable
		Winter	23	+28%	Uncomfortable	31	+24%	Acceptable
		Annual	21	+31%	Uncomfortable	28	+27%	Acceptable
22	A	Spring	18	-	Walking	24	-	Acceptable
		Summer	14	-	Standing	19	-	Acceptable
		Fall	17	-	Walking	22	-	Acceptable
		Winter	19	-	Walking	25	-	Acceptable
		Annual	17	-	Walking	23	-	Acceptable
	B	Spring	17	-	Walking	26	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	16	-	Walking	24	-	Acceptable
		Winter	19	-	Walking	28	+12%	Acceptable
		Annual	17	-	Walking	25	-	Acceptable
23	A	Spring	14	-	Standing	21	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	18	+29%	Walking	24	+14%	Acceptable
		Summer	13	+18%	Standing	18	+13%	Acceptable
		Fall	16	+23%	Walking	23	+21%	Acceptable
		Winter	19	+27%	Walking	27	+23%	Acceptable
		Annual	18	+38%	Walking	24	+20%	Acceptable
24	A	Spring	20	-	Uncomfortable	27	-	Acceptable
		Summer	14	-	Standing	19	-	Acceptable
		Fall	18	-	Walking	24	-	Acceptable
		Winter	21	-	Uncomfortable	29	-	Acceptable
		Annual	19	-	Walking	26	-	Acceptable
	B	Spring	19	-	Walking	26	-	Acceptable
		Summer	14	-	Standing	19	-	Acceptable
		Fall	17	-	Walking	24	-	Acceptable
		Winter	20	-	Uncomfortable	28	-	Acceptable
		Annual	18	-	Walking	25	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
25	A	Spring	17	-	Walking	25	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	16	-	Walking	23	-	Acceptable
		Winter	19	-	Walking	27	-	Acceptable
		Annual	17	-	Walking	24	-	Acceptable
	B	Spring	18	-	Walking	26	-	Acceptable
		Summer	13	-	Standing	19	-	Acceptable
		Fall	17	-	Walking	24	-	Acceptable
		Winter	20	-	Uncomfortable	29	-	Acceptable
		Annual	18	-	Walking	26	-	Acceptable
26	A	Spring	13	-	Standing	20	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	12	-	Sitting	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	13	-	Standing	21	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	12	-	Sitting	19	-	Acceptable
		Winter	14	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
27	A	Spring	18	-	Walking	26	-	Acceptable
		Summer	13	-	Standing	19	-	Acceptable
		Fall	16	-	Walking	23	-	Acceptable
		Winter	21	-	Uncomfortable	29	-	Acceptable
		Annual	18	-	Walking	26	-	Acceptable
	B	Spring	20	+11%	Uncomfortable	28	-	Acceptable
		Summer	14	-	Standing	20	-	Acceptable
		Fall	18	+13%	Walking	25	-	Acceptable
		Winter	22	-	Uncomfortable	30	-	Acceptable
		Annual	19	-	Walking	27	-	Acceptable
28	A	Spring	11	-	Sitting	18	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	12	-	Sitting	19	-	Acceptable
		Summer	9	+13%	Sitting	13	-	Acceptable
		Fall	11	+10%	Sitting	17	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
29	A	Spring	11	-	Sitting	17	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	10	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	12	-	Sitting	17	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	11	+10%	Sitting	16	-	Acceptable
		Winter	13	-	Standing	19	-	Acceptable
		Annual	12	-	Sitting	17	-	Acceptable
30	A	Spring	8	-	Sitting	14	-	Acceptable
		Summer	6	-	Sitting	10	-	Acceptable
		Fall	8	-	Sitting	13	-	Acceptable
		Winter	9	-	Sitting	15	-	Acceptable
		Annual	8	-	Sitting	14	-	Acceptable
	B	Spring	9	+13%	Sitting	15	-	Acceptable
		Summer	7	+17%	Sitting	11	+10%	Acceptable
		Fall	8	-	Sitting	13	-	Acceptable
		Winter	10	+11%	Sitting	16	-	Acceptable
		Annual	9	+13%	Sitting	14	-	Acceptable
31	A	Spring	9	-	Sitting	14	-	Acceptable
		Summer	7	-	Sitting	10	-	Acceptable
		Fall	8	-	Sitting	13	-	Acceptable
		Winter	10	-	Sitting	15	-	Acceptable
		Annual	9	-	Sitting	13	-	Acceptable
	B	Spring	8	-10%	Sitting	13	-	Acceptable
		Summer	6	-13%	Sitting	10	-	Acceptable
		Fall	8	-	Sitting	12	-	Acceptable
		Winter	9	-	Sitting	14	-	Acceptable
		Annual	8	-10%	Sitting	13	-	Acceptable
32	A	Spring	10	-	Sitting	16	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	17	-	Acceptable
		Annual	10	-	Sitting	16	-	Acceptable
	B	Spring	10	-	Sitting	15	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	9	-	Sitting	15	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
33	A	Spring	13	-	Standing	19	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	15	-	Standing	21	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	11	-14%	Sitting	17	-10%	Acceptable
		Summer	8	-10%	Sitting	12	-	Acceptable
		Fall	10	-16%	Sitting	16	-10%	Acceptable
		Winter	12	-19%	Sitting	18	-13%	Acceptable
		Annual	11	-14%	Sitting	17	-10%	Acceptable
34	A	Spring	12	-	Sitting	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	21	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
	B	Spring	10	-16%	Sitting	16	-15%	Acceptable
		Summer	8	-10%	Sitting	12	-13%	Acceptable
		Fall	9	-17%	Sitting	15	-16%	Acceptable
		Winter	10	-22%	Sitting	16	-23%	Acceptable
		Annual	9	-24%	Sitting	15	-16%	Acceptable
35	A	Spring	15	-	Standing	21	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	13	-12%	Standing	20	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	14	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	18	-	Acceptable
36	A	Spring	17	-	Walking	22	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	16	-	Walking	21	-	Acceptable
		Winter	19	-	Walking	25	-	Acceptable
		Annual	17	-	Walking	22	-	Acceptable
	B	Spring	14	-17%	Standing	20	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	13	-18%	Standing	19	-	Acceptable
		Winter	16	-15%	Walking	22	-11%	Acceptable
		Annual	14	-17%	Standing	20	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B – Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
37	A	Spring	14	-	Standing	20	-	Acceptable
		Summer	10	-	Sitting	14	-	Acceptable
		Fall	13	-	Standing	18	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	14	-	Standing	20	-	Acceptable
	B	Spring	13	-	Standing	20	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	12	-	Sitting	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
38	A	Spring	16	-	Walking	22	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	24	-	Acceptable
		Annual	15	-	Standing	22	-	Acceptable
	B	Spring	16	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	18	-	Walking	24	-	Acceptable
		Annual	16	-	Walking	22	-	Acceptable
39	A	Spring	13	-	Standing	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	12	-	Sitting	19	-	Acceptable
	B	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	19	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
40	A	Spring	18	-	Walking	25	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	17	-	Walking	23	-	Acceptable
		Winter	20	-	Uncomfortable	27	-	Acceptable
		Annual	18	-	Walking	25	-	Acceptable
	B	Spring	12	-32%	Sitting	18	-27%	Acceptable
		Summer	10	-22%	Sitting	15	-16%	Acceptable
		Fall	11	-34%	Sitting	17	-25%	Acceptable
		Winter	13	-34%	Standing	20	-25%	Acceptable
		Annual	12	-32%	Sitting	18	-27%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
41	A	Spring	16	-	Walking	21	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	15	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	23	-	Acceptable
		Annual	16	-	Walking	21	-	Acceptable
	B	Spring	14	-12%	Standing	20	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	13	-12%	Standing	18	-	Acceptable
		Winter	16	-	Walking	22	-	Acceptable
		Annual	14	-12%	Standing	20	-	Acceptable
42	A	Spring	16		Walking	21	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	21	-	Acceptable
	B	Spring	14	-12%	Standing	20	-	Acceptable
		Summer	10	-	Sitting	14	-	Acceptable
		Fall	13	-	Standing	18	-	Acceptable
		Winter	16	-	Walking	22	-	Acceptable
		Annual	14	-	Standing	19	-	Acceptable
43	A	Spring	16	-	Walking	22	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	24	-	Acceptable
		Annual	15	-	Standing	22	-	Acceptable
	B	Spring	20	+25%	Uncomfortable	26	+18%	Acceptable
		Summer	14	+27%	Standing	18	+13%	Acceptable
		Fall	18	+29%	Walking	23	+15%	Acceptable
		Winter	21	+24%	Uncomfortable	28	+17%	Acceptable
		Annual	19	+27%	Walking	25	+14%	Acceptable
44	A	Spring	14	-	Standing	21	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	14	-	Standing	21	-	Acceptable
	B	Spring	17	+21%	Walking	23	+10%	Acceptable
		Summer	12	+20%	Sitting	17	+13%	Acceptable
		Fall	16	+23%	Walking	22	+16%	Acceptable
		Winter	19	+19%	Walking	25	-	Acceptable
		Annual	17	+21%	Walking	23	+10%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
45	A	Spring	15	-	Standing	22	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	24	-	Acceptable
		Annual	15	-	Standing	22	-	Acceptable
	B	Spring	18	+20%	Walking	24	-	Acceptable
		Summer	13	+18%	Standing	17	-	Acceptable
		Fall	17	+21%	Walking	22	+10%	Acceptable
		Winter	19	+12%	Walking	26	-	Acceptable
		Annual	18	+20%	Walking	23	-	Acceptable
46	A	Spring	14	-	Standing	23	-	Acceptable
		Summer	10	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	21	-	Acceptable
		Winter	16	-	Walking	26	-	Acceptable
		Annual	14	-	Standing	23	-	Acceptable
	B	Spring	14	-	Standing	22	-	Acceptable
		Summer	11	+10%	Sitting	16	-	Acceptable
		Fall	13	-	Standing	21	-	Acceptable
		Winter	15	-	Standing	24	-	Acceptable
		Annual	14	-	Standing	22	-	Acceptable
47	A	Spring	16	-	Walking	23	-	Acceptable
		Summer	13	-	Standing	19	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	17	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	22	-	Acceptable
	B	Spring	16	-	Walking	23	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	17	-	Walking	24	-	Acceptable
		Annual	16	-	Walking	22	-	Acceptable
48	A	Spring	17	-	Walking	27	-	Acceptable
		Summer	13	-	Standing	20	-	Acceptable
		Fall	16	-	Walking	25	-	Acceptable
		Winter	18	-	Walking	29	-	Acceptable
		Annual	17	-	Walking	26	-	Acceptable
	B	Spring	17	-	Walking	26	-	Acceptable
		Summer	13	-	Standing	19	-	Acceptable
		Fall	16	-	Walking	24	-	Acceptable
		Winter	18	-	Walking	28	-	Acceptable
		Annual	17	-	Walking	25	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B – Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
49	A	Spring	22	-	Uncomfortable	29	-	Acceptable
		Summer	16	-	Walking	22	-	Acceptable
		Fall	20	-	Uncomfortable	27	-	Acceptable
		Winter	23	-	Uncomfortable	32	-	Unacceptable
		Annual	21	-	Uncomfortable	29	-	Acceptable
	B	Spring	22	-	Uncomfortable	29	-	Acceptable
		Summer	16	-	Walking	22	-	Acceptable
		Fall	20	-	Uncomfortable	27	-	Acceptable
		Winter	23	-	Uncomfortable	31	-	Acceptable
		Annual	21	-	Uncomfortable	28	-	Acceptable
50	A	Spring	23	-	Uncomfortable	31	-	Acceptable
		Summer	17	-	Walking	23	-	Acceptable
		Fall	21	-	Uncomfortable	29	-	Acceptable
		Winter	25	-	Uncomfortable	33	-	Unacceptable
		Annual	22	-	Uncomfortable	30	-	Acceptable
	B	Spring	24	-	Uncomfortable	32	-	Unacceptable
		Summer	17	-	Walking	23	-	Acceptable
		Fall	22	-	Uncomfortable	29	-	Acceptable
		Winter	26	-	Uncomfortable	34	-	Unacceptable
		Annual	23	-	Uncomfortable	31	-	Acceptable
51	A	Spring	15	-	Standing	23	-	Acceptable
		Summer	12	-	Sitting	19	-	Acceptable
		Fall	14	-	Standing	21	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	14	-	Standing	22	-	Acceptable
	B	Spring	16	-	Walking	23	-	Acceptable
		Summer	13	-	Standing	20	-	Acceptable
		Fall	15	-	Standing	22	-	Acceptable
		Winter	16	-	Walking	24	-	Acceptable
		Annual	15	-	Standing	23	-	Acceptable
52	A	Spring	14	-	Standing	20	-	Acceptable
		Summer	12	-	Sitting	18	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	13	-	Standing	20	-	Acceptable
		Summer	12	-	Sitting	18	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
53	A	Spring	15	-	Standing	22	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	14	-	Standing	21	-	Acceptable
	B	Spring	15	-	Standing	22	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	21	-	Acceptable
54	A	Spring	17	-	Walking	24	-	Acceptable
		Summer	15	-	Standing	21	-	Acceptable
		Fall	16	-	Walking	22	-	Acceptable
		Winter	17	-	Walking	24	-	Acceptable
		Annual	16	-	Walking	23	-	Acceptable
	B	Spring	16	-	Walking	23	-	Acceptable
		Summer	14	-	Standing	20	-	Acceptable
		Fall	15	-	Standing	22	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	22	-	Acceptable
55	A	Spring	25	-	Uncomfortable	33	-	Unacceptable
		Summer	18	-	Walking	24	-	Acceptable
		Fall	23	-	Uncomfortable	30	-	Acceptable
		Winter	28	-	Dangerous	36	-	Unacceptable
		Annual	25	-	Uncomfortable	33	-	Unacceptable
	B	Spring	26	-	Uncomfortable	34	-	Unacceptable
		Summer	19	-	Walking	24	-	Acceptable
		Fall	23	-	Uncomfortable	31	-	Acceptable
		Winter	28	-	Dangerous	37	-	Unacceptable
		Annual	25	-	Uncomfortable	33	-	Unacceptable
56	A	Spring	25	-	Uncomfortable	33	-	Unacceptable
		Summer	18	-	Walking	24	-	Acceptable
		Fall	23	-	Uncomfortable	30	-	Acceptable
		Winter	27	-	Uncomfortable	36	-	Unacceptable
		Annual	24	-	Uncomfortable	32	-	Unacceptable
	B	Spring	27	-	Uncomfortable	35	-	Unacceptable
		Summer	19	-	Walking	25	-	Acceptable
		Fall	24	-	Uncomfortable	31	-	Acceptable
		Winter	29	-	Dangerous	38	-	Unacceptable
		Annual	26	-	Uncomfortable	34	-	Unacceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
57	A	Spring	13	-	Standing	20	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	11	-	Sitting	18	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
	B	Spring	16	+23%	Walking	23	+15%	Acceptable
		Summer	12	-	Sitting	18	-	Acceptable
		Fall	14	+27%	Standing	21	+17%	Acceptable
		Winter	16	+33%	Walking	24	+26%	Acceptable
		Annual	15	+25%	Standing	22	+22%	Acceptable
58	A	Spring	16	-	Walking	25	-	Acceptable
		Summer	12	-	Sitting	18	-	Acceptable
		Fall	15	-	Standing	23	-	Acceptable
		Winter	18	-	Walking	28	-	Acceptable
		Annual	16	-	Walking	25	-	Acceptable
	B	Spring	15	-	Standing	23	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	21	-	Acceptable
		Winter	16	-10%	Walking	25	-10%	Acceptable
		Annual	14	-12%	Standing	22	-11%	Acceptable
59	A	Spring	13	-	Standing	19	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	19	-	Acceptable
		Annual	13	-	Standing	18	-	Acceptable
	B	Spring	13	-	Standing	18	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	18	-	Acceptable
		Annual	12	-	Sitting	17	-	Acceptable
60	A	Spring	23	-	Uncomfortable	31	-	Acceptable
		Summer	17	-	Walking	23	-	Acceptable
		Fall	21	-	Uncomfortable	28	-	Acceptable
		Winter	25	-	Uncomfortable	34	-	Unacceptable
		Annual	23	-	Uncomfortable	31	-	Acceptable
	B	Spring	21	-	Uncomfortable	29	-	Acceptable
		Summer	15	-11%	Standing	21	-	Acceptable
		Fall	19	-	Walking	26	-	Acceptable
		Winter	23	-	Uncomfortable	31	-	Acceptable
		Annual	20	-12%	Uncomfortable	28	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

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Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
61	A	Spring	13	-	Standing	21	-	Acceptable
		Summer	10	-	Sitting	16	-	Acceptable
		Fall	12	-	Sitting	20	-	Acceptable
		Winter	14	-	Standing	23	-	Acceptable
		Annual	13	-	Standing	21	-	Acceptable
	B	Spring	13	-	Standing	21	-	Acceptable
		Summer	10	-	Sitting	16	-	Acceptable
		Fall	12	-	Sitting	20	-	Acceptable
		Winter	14	-	Standing	23	-	Acceptable
		Annual	13	-	Standing	21	-	Acceptable
62	A	Spring	17	-	Walking	25	-	Acceptable
		Summer	13	-	Standing	19	-	Acceptable
		Fall	16	-	Walking	23	-	Acceptable
		Winter	19	-	Walking	27	-	Acceptable
		Annual	17	-	Walking	25	-	Acceptable
	B	Spring	17	-	Walking	24	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	15	-	Standing	22	-	Acceptable
		Winter	18	-	Walking	26	-	Acceptable
		Annual	16	-	Walking	24	-	Acceptable
63	A	Spring	23	-	Uncomfortable	30	-	Acceptable
		Summer	17	-	Walking	22	-	Acceptable
		Fall	21	-	Uncomfortable	27	-	Acceptable
		Winter	26	-	Uncomfortable	32	-	Unacceptable
		Annual	23	-	Uncomfortable	29	-	Acceptable
	B	Spring	22	-	Uncomfortable	29	-	Acceptable
		Summer	16	-	Walking	21	-	Acceptable
		Fall	20	-	Uncomfortable	26	-	Acceptable
		Winter	24	-	Uncomfortable	31	-	Acceptable
		Annual	21	-	Uncomfortable	28	-	Acceptable
64	A	Spring	24	-	Uncomfortable	31	-	Acceptable
		Summer	17	-	Walking	22	-	Acceptable
		Fall	22	-	Uncomfortable	28	-	Acceptable
		Winter	26	-	Uncomfortable	33	-	Unacceptable
		Annual	24	-	Uncomfortable	30	-	Acceptable
	B	Spring	23	-	Uncomfortable	29	-	Acceptable
		Summer	16	-	Walking	21	-	Acceptable
		Fall	20	-	Uncomfortable	27	-	Acceptable
		Winter	24	-	Uncomfortable	32	-	Unacceptable
		Annual	22	-	Uncomfortable	29	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
65	A	Spring	13	-	Standing	19	-	Acceptable
		Summer	10	-	Sitting	14	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	14	-	Standing	20	-	Acceptable
		Annual	13	-	Standing	19	-	Acceptable
	B	Spring	13	-	Standing	18	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	12	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
66	A	Spring	11	-	Sitting	19	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	20	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
	B	Spring	11	-	Sitting	18	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	20	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
67	A	Spring	24	-	Uncomfortable	31	-	Acceptable
		Summer	18	-	Walking	23	-	Acceptable
		Fall	22	-	Uncomfortable	29	-	Acceptable
		Winter	27	-	Uncomfortable	34	-	Unacceptable
		Annual	24	-	Uncomfortable	31	-	Acceptable
	B	Spring	24	-	Uncomfortable	31	-	Acceptable
		Summer	17	-	Walking	22	-	Acceptable
		Fall	22	-	Uncomfortable	28	-	Acceptable
		Winter	26	-	Uncomfortable	33	-	Unacceptable
		Annual	23	-	Uncomfortable	30	-	Acceptable
68	A	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	18	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	19	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
69	A	Spring	18	-	Walking	25	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	17	-	Walking	23	-	Acceptable
		Winter	20	-	Uncomfortable	27	-	Acceptable
		Annual	18	-	Walking	25	-	Acceptable
	B	Spring	18	-	Walking	24	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	17	-	Walking	22	-	Acceptable
		Winter	20	-	Uncomfortable	27	-	Acceptable
		Annual	18	-	Walking	24	-	Acceptable
70	A	Spring	15	-	Standing	21	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	14	-	Standing	19	-	Acceptable
		Winter	16	-	Walking	22	-	Acceptable
		Annual	15	-	Standing	20	-	Acceptable
	B	Spring	16	-	Walking	21	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	15	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	23	-	Acceptable
		Annual	16	-	Walking	21	-	Acceptable
71	A	Spring	16	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	17	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	18	-	Walking	24	-	Acceptable
		Annual	16	-	Walking	22	-	Acceptable
	B	Spring	17	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	16	-	Walking	21	-	Acceptable
		Winter	18	-	Walking	25	-	Acceptable
		Annual	17	-	Walking	22	-	Acceptable
72	A	Spring	11	-	Sitting	16	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	17	-	Acceptable
		Annual	10	-	Sitting	16	-	Acceptable
	B	Spring	11	-	Sitting	16	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	17	-	Acceptable
		Annual	10	-	Sitting	15	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
73	A	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	19	-	Acceptable
		Annual	12	-	Sitting	17	-	Acceptable
74	A	Spring	9	-	Sitting	16	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	9	-	Sitting	15	-	Acceptable
	B	Spring	10	+11%	Sitting	15	-	Acceptable
		Summer	8	-	Sitting	12	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	9	-	Sitting	15	-	Acceptable
75	A	Spring	13	-	Standing	21	-	Acceptable
		Summer	9	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	19	-	Acceptable
		Winter	14	-	Standing	23	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	12	-	Sitting	18	-13%	Acceptable
		Summer	9	-	Sitting	13	-12%	Acceptable
		Fall	11	-	Sitting	17	-10%	Acceptable
		Winter	13	-	Standing	20	-12%	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
76	A	Spring	13	-	Standing	22	-	Acceptable
		Summer	10	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	21	-	Acceptable
		Winter	15	-	Standing	24	-	Acceptable
		Annual	13	-	Standing	22	-	Acceptable
	B	Spring	12	-	Sitting	20	-	Acceptable
		Summer	9	-	Sitting	14	-12%	Acceptable
		Fall	11	-14%	Sitting	18	-13%	Acceptable
		Winter	13	-12%	Standing	22	-	Acceptable
		Annual	12	-	Sitting	19	-13%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

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Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
77	A	Spring	15	-	Standing	23	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	22	-	Acceptable
		Winter	16	-	Walking	26	-	Acceptable
		Annual	15	-	Standing	23	-	Acceptable
	B	Spring	14	-	Standing	22	-	Acceptable
		Summer	10	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	21	-	Acceptable
		Winter	16	-	Walking	25	-	Acceptable
		Annual	14	-	Standing	22	-	Acceptable
78	A	Spring	16	-	Walking	24	-	Acceptable
		Summer	12	-	Sitting	17	-	Acceptable
		Fall	15	-	Standing	22	-	Acceptable
		Winter	18	-	Walking	26	-	Acceptable
		Annual	16	-	Walking	23	-	Acceptable
	B	Spring	16	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	17	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	18	-	Walking	26	-	Acceptable
		Annual	16	-	Walking	23	-	Acceptable
79	A	Spring	11	-	Sitting	16	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	17	-	Acceptable
		Annual	10	-	Sitting	16	-	Acceptable
	B	Spring	11	-	Sitting	17	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	11	-	Sitting	18	-	Acceptable
		Annual	10	-	Sitting	16	-	Acceptable
80	A	Spring	20	-	Uncomfortable	29	-	Acceptable
		Summer	15	-	Standing	22	-	Acceptable
		Fall	18	-	Walking	27	-	Acceptable
		Winter	22	-	Uncomfortable	32	-	Unacceptable
		Annual	20	-	Uncomfortable	29	-	Acceptable
	B	Spring	20	-	Uncomfortable	29	-	Acceptable
		Summer	15	-	Standing	21	-	Acceptable
		Fall	18	-	Walking	26	-	Acceptable
		Winter	22	-	Uncomfortable	32	-	Unacceptable
		Annual	20	-	Uncomfortable	29	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B – Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
81	A	Spring	12	-	Sitting	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	21	-	Acceptable
		Annual	12	-	Sitting	19	-	Acceptable
	B	Spring	11	-	Sitting	18	-	Acceptable
		Summer	8	-10%	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	20	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
82	A	Spring	12	-	Sitting	18	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	20	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
	B	Spring	11	-	Sitting	18	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
83	A	Spring	14	-	Standing	21	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	13	-	Standing	20	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	14	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
84	A	Spring	11	-	Sitting	17	-	Acceptable
		Summer	8	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	18	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	+13%	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	20	+11%	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
85	A	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
86	A	Spring	17	-	Walking	25	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	16	-	Walking	22	-	Acceptable
		Winter	19	-	Walking	27	-	Acceptable
		Annual	17	-	Walking	24	-	Acceptable
	B	Spring	16	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	17	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	17	-10%	Walking	25	-	Acceptable
		Annual	15	-11%	Standing	22	-	Acceptable
87	A	Spring	18	-	Walking	25	-	Acceptable
		Summer	13	-	Standing	18	-	Acceptable
		Fall	16	-	Walking	23	-	Acceptable
		Winter	19	-	Walking	27	-	Acceptable
		Annual	17	-	Walking	25	-	Acceptable
	B	Spring	16	-10%	Walking	24	-	Acceptable
		Summer	12	-	Sitting	18	-	Acceptable
		Fall	15	-	Standing	22	-	Acceptable
		Winter	18	-	Walking	26	-	Acceptable
		Annual	16	-	Walking	23	-	Acceptable
88	A	Spring	16	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	21	-	Acceptable
		Winter	17	-	Walking	25	-	Acceptable
		Annual	16	-	Walking	22	-	Acceptable
	B	Spring	16	-	Walking	22	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	21	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B – Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
89	A	Spring	16	-	Walking	23	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	21	-	Acceptable
		Winter	17	-	Walking	25	-	Acceptable
		Annual	15	-	Standing	23	-	Acceptable
	B	Spring	14	-12%	Standing	21	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-11%	Standing	23	-	Acceptable
		Annual	14	-	Standing	21	-	Acceptable
90	A	Spring	15	-	Standing	23	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	13	-	Standing	20	-	Acceptable
		Winter	16	-	Walking	25	-	Acceptable
		Annual	14	-	Standing	22	-	Acceptable
	B	Spring	20	+33%	Uncomfortable	28	+22%	Acceptable
		Summer	14	+27%	Standing	20	+18%	Acceptable
		Fall	18	+38%	Walking	26	+30%	Acceptable
		Winter	22	+38%	Uncomfortable	31	+24%	Acceptable
		Annual	19	+36%	Walking	28	+27%	Acceptable
91	A	Spring	12	-	Sitting	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	18	-	Acceptable
		Winter	13	-	Standing	21	-	Acceptable
		Annual	12	-	Sitting	19	-	Acceptable
	B	Spring	11	-	Sitting	17	-10%	Acceptable
		Summer	8	-10%	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	16	-10%	Acceptable
		Winter	12	-	Sitting	18	-13%	Acceptable
		Annual	11	-	Sitting	17	-10%	Acceptable
92	A	Spring	13	-	Standing	20	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	12	-	Sitting	18	-	Acceptable
		Winter	14	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	15	+15%	Standing	23	+15%	Acceptable
		Summer	11	+10%	Sitting	17	+13%	Acceptable
		Fall	14	+17%	Standing	21	+17%	Acceptable
		Winter	16	+14%	Walking	25	+14%	Acceptable
		Annual	15	+15%	Standing	22	+10%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B – Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
93	A	Spring	12	-	Sitting	18	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	20	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
	B	Spring	11	-	Sitting	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	20	-	Acceptable
		Annual	11	-	Sitting	18	-	Acceptable
94	A	Spring	15	-	Standing	21	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	20	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	21	-	Acceptable
	B	Spring	13	-12%	Standing	21	-	Acceptable
		Summer	11	-	Sitting	16	-	Acceptable
		Fall	13	-	Standing	19	-	Acceptable
		Winter	15	-	Standing	23	-	Acceptable
		Annual	13	-12%	Standing	21	-	Acceptable
95	A	Spring	16	-	Walking	23	-	Acceptable
		Summer	12	-	Sitting	16	-	Acceptable
		Fall	15	-	Standing	21	-	Acceptable
		Winter	16	-	Walking	23	-	Acceptable
		Annual	15	-	Standing	22	-	Acceptable
	B	Spring	15	-	Standing	20	-12%	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	14	-	Standing	18	-13%	Acceptable
		Winter	15	-	Standing	20	-12%	Acceptable
		Annual	14	-	Standing	19	-13%	Acceptable
96	A	Spring	15	-	Standing	22	-	Acceptable
		Summer	11	-	Sitting	15	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	17	-	Walking	24	-	Acceptable
		Annual	15	-	Standing	21	-	Acceptable
	B	Spring	9	-39%	Sitting	15	-31%	Acceptable
		Summer	7	-35%	Sitting	11	-26%	Acceptable
		Fall	9	-35%	Sitting	14	-29%	Acceptable
		Winter	10	-40%	Sitting	16	-32%	Acceptable
		Annual	9	-39%	Sitting	15	-28%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B – Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
97	A	Spring	12	-	Sitting	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	12	-	Sitting	19	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
	B	Spring	13	-	Standing	19	-	Acceptable
		Summer	9	-	Sitting	14	-	Acceptable
		Fall	11	-	Sitting	17	-	Acceptable
		Winter	13	-	Standing	20	-	Acceptable
		Annual	12	-	Sitting	18	-	Acceptable
98	A	Spring	11	-	Sitting	17	-	Acceptable
		Summer	9	-	Sitting	13	-	Acceptable
		Fall	10	-	Sitting	15	-	Acceptable
		Winter	12	-	Sitting	17	-	Acceptable
		Annual	11	-	Sitting	16	-	Acceptable
	B	Spring	12	-	Sitting	18	-	Acceptable
		Summer	10	+11%	Sitting	14	-	Acceptable
		Fall	11	+10%	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	19	+12%	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
99	A	Spring	8	-	Sitting	13	-	Acceptable
		Summer	7	-	Sitting	10	-	Acceptable
		Fall	8	-	Sitting	12	-	Acceptable
		Winter	8	-	Sitting	14	-	Acceptable
		Annual	8	-	Sitting	12	-	Acceptable
	B	Spring	11	+38%	Sitting	16	+23%	Acceptable
		Summer	8	+14%	Sitting	13	+30%	Acceptable
		Fall	10	+25%	Sitting	15	+25%	Acceptable
		Winter	11	+38%	Sitting	18	+29%	Acceptable
		Annual	10	+25%	Sitting	16	+33%	Acceptable
100	A	Spring	10	-	Sitting	15	-	Acceptable
		Summer	8	-	Sitting	11	-	Acceptable
		Fall	10	-	Sitting	14	-	Acceptable
		Winter	11	-	Sitting	16	-	Acceptable
		Annual	10	-	Sitting	15	-	Acceptable
	B	Spring	10	-	Sitting	15	-	Acceptable
		Summer	7	-12%	Sitting	11	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	11	-	Sitting	16	-	Acceptable
		Annual	10	-	Sitting	15	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
101	A	Spring	15	-	Standing	23	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	13	-	Standing	21	-	Acceptable
		Winter	15	-	Standing	24	-	Acceptable
		Annual	14	-	Standing	22	-	Acceptable
	B	Spring	13	-12%	Standing	21	-	Acceptable
		Summer	9	-17%	Sitting	15	-11%	Acceptable
		Fall	12	-	Sitting	19	-	Acceptable
		Winter	14	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
102	A	Spring	12	-	Sitting	17	-	Acceptable
		Summer	10	-	Sitting	13	-	Acceptable
		Fall	11	-	Sitting	16	-	Acceptable
		Winter	12	-	Sitting	18	-	Acceptable
		Annual	11	-	Sitting	17	-	Acceptable
	B	Spring	10	-16%	Sitting	15	-11%	Acceptable
		Summer	8	-19%	Sitting	12	-	Acceptable
		Fall	9	-17%	Sitting	14	-12%	Acceptable
		Winter	10	-16%	Sitting	16	-10%	Acceptable
		Annual	9	-17%	Sitting	14	-17%	Acceptable
103	A	Spring	10	-	Sitting	15	-	Acceptable
		Summer	8	-	Sitting	11	-	Acceptable
		Fall	9	-	Sitting	14	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	9	-	Sitting	15	-	Acceptable
	B	Spring	11	+10%	Sitting	17	+13%	Acceptable
		Summer	8	-	Sitting	13	+18%	Acceptable
		Fall	10	+11%	Sitting	16	+14%	Acceptable
		Winter	12	+20%	Sitting	18	+13%	Acceptable
		Annual	11	+22%	Sitting	16	-	Acceptable
104	A	Spring	8	-	Sitting	12	-	Acceptable
		Summer	6	-	Sitting	9	-	Acceptable
		Fall	7	-	Sitting	12	-	Acceptable
		Winter	8	-	Sitting	13	-	Acceptable
		Annual	7	-	Sitting	12	-	Acceptable
	B	Spring	8	-	Sitting	12	-	Acceptable
		Summer	6	-	Sitting	9	-	Acceptable
		Fall	7	-	Sitting	11	-	Acceptable
		Winter	8	-	Sitting	13	-	Acceptable
		Annual	7	-	Sitting	12	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A - No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 2: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
105	A	Spring	14	-	Standing	21	-	Acceptable
		Summer	10	-	Sitting	15	-	Acceptable
		Fall	13	-	Standing	20	-	Acceptable
		Winter	14	-	Standing	22	-	Acceptable
		Annual	13	-	Standing	20	-	Acceptable
	B	Spring	15	-	Standing	22	-	Acceptable
		Summer	11	+10%	Sitting	16	-	Acceptable
		Fall	14	-	Standing	20	-	Acceptable
		Winter	16	+14%	Walking	23	-	Acceptable
		Annual	14	-	Standing	21	-	Acceptable
106	A	Spring	9	-	Sitting	15	-	Acceptable
		Summer	7	-	Sitting	12	-	Acceptable
		Fall	8	-	Sitting	14	-	Acceptable
		Winter	10	-	Sitting	16	-	Acceptable
		Annual	9	-	Sitting	14	-	Acceptable
	B	Spring	15	+67%	Standing	23	+52%	Acceptable
		Summer	12	+71%	Sitting	17	+42%	Acceptable
		Fall	14	+75%	Standing	21	+50%	Acceptable
		Winter	16	+60%	Walking	24	+50%	Acceptable
		Annual	15	+67%	Standing	22	+57%	Acceptable
107	A	Spring	8	-	Sitting	12	-	Acceptable
		Summer	6	-	Sitting	9	-	Acceptable
		Fall	7	-	Sitting	11	-	Acceptable
		Winter	8	-	Sitting	12	-	Acceptable
		Annual	7	-	Sitting	11	-	Acceptable
	B	Spring	13	+63%	Standing	19	+58%	Acceptable
		Summer	9	+50%	Sitting	14	+56%	Acceptable
		Fall	12	+71%	Sitting	17	+55%	Acceptable
		Winter	13	+63%	Standing	20	+67%	Acceptable
		Annual	12	+71%	Sitting	18	+64%	Acceptable
108	A	Spring	DATA NOT AVAILABLE					
		Summer	DATA NOT AVAILABLE					
		Fall	DATA NOT AVAILABLE					
		Winter	DATA NOT AVAILABLE					
		Annual	DATA NOT AVAILABLE					
	B	Spring	15	-	Standing	23	-	Acceptable
		Summer	11	-	Sitting	17	-	Acceptable
		Fall	14	-	Standing	21	-	Acceptable
		Winter	17	-	Walking	26	-	Acceptable
		Annual	15	-	Standing	23	-	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B – Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Appendix C

Air Quality

AIR QUALITY APPENDIX

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale and stationary source air quality analyses.

Motor Vehicle Emissions

The EPA MOBILE6.2 computer program generated motor vehicle emissions used in the garage stationary source analysis along with the mobile source CAL3QHC modeling and mesoscale analysis. The model input parameters were provided by MassDEP. Emission rates were derived for 2011 and 2016 for speed limits of 2.5, 10, 15, and 30 mph for use in the microscale analyses. The 10 mph rate was used to estimate parking garage emissions.

CAL3QHC

For the intersections studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOBILE6.2. The intersection's queue links and free flow links were input to the model along with sensitive receptors at all locations nearby each intersection. The meteorological assumptions input into the model were a 1.0 meter per second wind speed, Pasquill-Gifford Class D stability combined with a mixing height of 1000 meters. For each direction, the full range of wind directions at 10 degree intervals was examined. In addition, a surface roughness (z_0) of 321 cm was used. Idle emission rates for queue links were based on 2.5 mph emission rates derived in MOBILE6.2 and converted from grams per mile to grams per hour. Emission rates for speeds of 10, 15, and 30 mph were used for free flow links and turn movements.

Stationary Source Emissions

Emissions for the heating combustion units were calculated using the latest DEP emission limits for boilers based on the Boiler Environmental Results Program (ERP). Emissions for the emergency generators and cooling towers were obtained from vendor information for a similar size unit. The resulting hourly emission rate in pounds per hour were converted to grams per second and input to the AERMOD model. For the NAAQS analysis, a similar approach was conducted for CO, SO_2, NOx, PM-10, and PM-2.5. The emergency generator emissions were calculated based on a g/bhp-hr emission factor provided by vendor information for typical size units.

All assumptions and data used in the stationary source emissions and stack parameter calculations are provided herein.

AERMOD

The EPA AERMOD model was used to calculate air quality impacts due to the installation of heating combustion boilers, emergency generators, parking garage vents, loading dock vents and cooling towers. For non-combustion sources, ambient temperature releases were assumed; otherwise temperatures from the exhaust gas were used. Urban dispersion coefficients were used. Building downwash was accounted for in the modeling based on the building heights and projected widths of the buildings. The maximum modeled impacts from the garage vents and the stack sources were conservatively added to monitored background values for comparison to the NAAQS.

Boiler, Cooling Tower, Emergency Generator, and Loading Dock Exhaust Vent Emissions Calculations

45 Stuart St - Calculation ofStationary Source Emissions

Heating Boilers

				Notes
Source Name		DWH1-2	HB1-4	
Make		PVI	AERCO	
Model		200LX300A-PVIF	BMK3.0	from Mech report
Qty.		2	4	from Mech report
Boiler Heat Input	MMBTU/hr (ea.):	2.000	3.000	from Mech report
Boiler Emission Rates	lb/MMBTU	g/s (ea.)	g/s (ea.)	
NOx	0.035	0.00882	0.01323	ERP limits
CO	0.080	0.02016	0.03024	ERP limits
VOC	0.030	0.00756	0.01134	ERP limits
PM-2.5	0.010	0.00252	0.00378	ERP limits Assume PM10=PM2.5
PM-10	0.010	0.00252	0.00378	ERP limits Assume PM10=PM2.5
SO2	0.0006	0.00015	0.00022	AP42 Table 1.4-2 (assuming 1040 Btu/scf)
CO2	115.385	29.07628	43.61442	AP42 Table 1.4-2 (assuming 1040 Btu/scf)
Gas Exit Temp (°F)	°F	170	170	Assumed
Exhaust air (CFM)	CFM	990.96	1486.44	Mfg data
Gas Exit Velocity (fps)	fps	47.27	70.90	calculated, 40 fps minimum
Roof Height	feet	299	299	from site plans
Stack height	feet above roofline	10	10	ERP minimum
Stack height	feet	309	309	calculated
Stack Diameter	feet	0.667	0.667	Mfg data

Cooling Towers

				Notes
Designation		CT1	CT2	
Make		BAC	BAC	from Mech report
Model		3552C	3552C	from Mech report
Cooling Tower Rate	tons	527	527	Mfg data
Tower Overall Dimensions	feet	12.75x21.5x12.25	12.75x21.5x12.25	Mfg data
CT Stack Height (above roofline)	feet	10.75	10.75	Mfg data
Primary Building Height (ft)	feet	299.00	299.00	from Rawn & Assoc. site plan
CT Stack Height (ft)	feet	310	310	calculated
Number of cells (per tower)	#	1	1	from Mech report
Cooling Tower Specs				
Cooling Tower Exhaust Flow	CFM	136170	136170	Mfg data
Cooling Tower Cell Exhaust Flow	CFM	136170	136170	per cell
Cooling Tower Cell Exhaust Flow	kg/s	71.6	71.6	calculated
Cooling Tower Exhaust Temp	°F	78	78	assumed
Cooling Tower Cell Diameter	feet	11.25	11.25	assumed based on overall dimensions
Cooling Tower Stack Velocity	fps	22.83	22.83	calculated
Cooling Tower Drift				
Drift Rate	% of circ water	0.001	0.001	assumed
Circulating Water Rate	gpm	1,581	1,581	assumed 3gpm/ton cooling
Circulating Water Rate	gph	94,860	94,860	calculated
TDS+TSS concentration in drift	mg/L	1,500	1,500	assumed
PM emission rate in drift (per cell)	lb/hr	0.012	0.012	calculated
PM emission rate in drift (per cell)	g/s	0.00150	0.00150	calculated

Emergency Generator

			Notes
Electrical output	kilowatts	800	from Mech report
Make		CAT	from Mech report
model		C27 Standby	from Mech report
Engine Horsepower	BHP	1214.00	Mfg data
Engine power	kilowatts	905.28	calculated
Fuel consumption @full load	gph	57.22	Mfg data
Heat Input	MMBTU/hr:	7.83914	calculated

Pollutant	Emission factor unit	Emission factor	Short Term g/s	Long Term (300 hr/yr) g/s	
NOx	g/BHP-h	5.26	0.0607	0.0607	"Nominal" EF from mfg data (uses intermittent factor)
CO	g/BHP-h	0.23	0.0776	0.0027	"Nominal" EF from mfg data
VOC	g/BHP-h	0.03	0.0101	0.0003	"Nominal" EF from mfg data
PM10	g/BHP-h	0.024	0.0081	0.0003	"Nominal" EF from mfg data
PM2.5	g/BHP-h	0.024	0.0081	0.0003	"Nominal" EF from mfg data
SO2	lb/MMBTU	0.001515	0.0015	0.00005	emission factor from EPA AP-42 (Table 3.4-1)
HAPs	lb/MMBTU	0.00149	0.0015	0.00005	emission factor from EPA AP-42 (Table 3.4-3&4)
CO2	lb/hr	1251.3	157.6603	5.39933	"Nominal" EF from mfg data

Stack Exhaust Flow	ACFM	6,046	Mfg data
Stack Exhaust Temperature	F	955.04	Mfg data
Stack Diameter	in	10	assumed
Stack Velocity	fps	184.7	calculated
Roof Height	feet	299.0	from site plans
Stack height	feet above roofline	10	ERP minimum
Stack height	feet	309.0	calculated

Loading Dock Exhaust Vent

	2013 M6.2 Emission factors (g/hr/veh)	Hourly Idle Time (min/veh)	# Vehicles	Emission Rate (g/s)	Notes
Composite VOC :	4.561	5	2	0.000211	calculated
Composite CO :	42.009	5	2	0.001945	calculated
Composite NOX :	11.184	5	2	0.000518	calculated
Composite CO2 :	2953.598	5	2	0.136741	calculated
Total PM2.5:	0.168	5	2	0.000008	calculated
Total PM10:	0.168	5	2	0.000008	calculated
SO2:	0.036	5	2	0.000002	calculated

assumption: Loading dock is capable of handling 2 trucks at a time. Assume dock is used from 7am-4pm consistently with 2 trucks idling maximum of 5 minutes per hour (MGL Chapter 90, Section 16A).

Vent Parameters		Vent 1	
Stack Exhaust Flow	ACFM	1000	from Mech Fig 2.9
Stack Exhaust Temperature	F	70	assumed
outlet area	sq ft	3	from V. Yamarkovitch, 5/6/11
effective diameter	ft	1.95	calculated
Stack Velocity	fps	5.6	calculated
Stack height	feet above grade	20	assumed

summer 2013 2.5 mph

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2983	0.4117	0.162		0.0369	0.0001	0.0015	0.0857	0.0038	1
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.5	18.4	7.3	50	16.2
Composite Emission	Factors (g/ mi):									
Composite VOC :	2.334	1.774	1.982	1.833	2.66	0.443	0.394	0.963	12.06	1.975
Composite CO :	12.52	10.9	11.8	11.16	27.56	4.148	1.357	4.12	106.63	11.911
Composite NOX :	0.613	0.525	0.756	0.59	0.688	0.698	0.355	6.699	1.12	1.126
Composite CO2 :	368	479.1	624.1	520	895.1	313.1	553.5	1400.1	177.4	562.7
Total PM2.5:	0.0113	0.0113	0.0113	0.0113	0.0259	0.0961	0.0285	0.0917	0.0207	0.0188
Total PM10:	0.0113	0.0113	0.0113	0.0113	0.0259	0.0961	0.0285	0.0917	0.0207	0.0188
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.013	0.0033	0.0092

Winter 2013 2.5 mph

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3031	0.4092	0.1608		0.0365	0.0002	0.0015	0.0851	0.0037	1
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.5	18.4	7.3	50	16.2
Composite Emission	Factors (g/ mi):									
Composite VOC :	2.357	1.765	2.057	1.848	2.984	0.434	0.409	0.983	11.37	2.003
Composite CO :	20.16	18.69	20	19.06	33.76	4.093	1.379	4.404	89.82	18.92
Composite NOX :	0.52	0.57	0.854	0.65	0.782	0.692	0.378	7.251	1.48	1.18
Composite CO2 :	368	479	624	519.9	895.2	313.1	553.5	1401.2	177.4	561.34
Total PM2.5:	0.0113	0.0113	0.0113	0.0113	0.0271	0.0961	0.0297	0.0974	0.0207	0.0193
Total PM10:	0.0113	0.0113	0.0113	0.0113	0.0271	0.0961	0.0297	0.0974	0.0207	0.0193
SO2:	0.0066	0.0087	0.0115	0.0095	0.0164	0.0029	0.0052	0.0131	0.0033	0.0092

Composite CO:	368	479	313.1	177.4	430.4197152

Summer Loading Dock vehicles :	HDGV	HDDV	SUM
actual fraction	0.0369	0.0857	0.1226
garage fraction	0.3010	0.6990	1
			Composite EF
Composite VOC :	2.66	0.963	1.667
Composite CO :	27.56	4.12	13.892
Composite NOX :	0.688	6.699	4.151
Composite CO2 :	895.1	1400.1	1181.439
Total PM2.5:	0.0259	0.0917	0.064
Total PM10:	0.0259	0.0917	0.064
SO2:	0.0163	0.013	0.014

Winter Loading Dock vehicles :	HDGV	HDDV	SUM
actual fraction	0.0365	0.0851	0.1216
garage fraction	0.3002	0.6998	1
			Composite EF
Composite VOC :	2.984	0.983	1.824
Composite CO :	33.76	4.404	16.804
Composite NOX :	0.782	7.251	4.474
Composite CO2 :	895.2	1401.2	1179.428
Total PM2.5:	0.0271	0.0974	0.067
Total PM10:	0.0271	0.0974	0.067
SO2:	0.0164	0.0131	0.014

45 Stuart Street
Calculation of Microscale Modeling Emission Rates
Summary of MOBILE6.2 Output

Carbon Monoxide Only

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

Summer	**2011**	**2016**	**Units**
Idle	34.023	28.053	g/hr
2.5 mph	13.609	11.221	g/mile
10 mph	6.078	5.073	g/mile
15 mph	5.153	4.286	g/mile
30 mph	4.243	3.480	g/mile

Winter	**2011**	**2016**	**Units**
Idle	53.380	44.380	g/hr
2.5 mph	21.352	17.752	g/mile
10 mph	11.410	9.677	g/mile
15 mph	10.231	8.711	g/mile
30 mph	9.096	7.786	g/mile

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

Appendix D

LEED Checklist

LEED for New Construction and Major Renovation 2009
Project Scorecard

Project Name: 45 Stuart Street
Project Address: 45 Stuart Street
Last Updated: 06.02.2011

LEED Rating: Certified

Phase	Yes	?	No		Sustainable Sites	26
	16	5	5			
C	Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
D	1			Credit 1	**Site Selection**	1
D	5			Credit 2	**Development Density & Community Connectivity**	5
D		1		Credit 3	**Brownfield Redevelopment***** RP	1
D	6			Credit 4.1	**Alternative Transportation,** Public Transportation Access	6
D	1			Credit 4.2	**Alternative Transportation,** Bicycle Storage & Changing Rooms	1
D		3		Credit 4.3	**Alternative Transportation,** Low-Emitting & Fuel-Efficient Vehicles	3
D			2	Credit 4.4	**Alternative Transportation,** Parking Capacity	2
C			1	Credit 5.1	**Site Development,** Protect or Restore Habitat	1
D			1	Credit 5.2	**Site Development,** Maximize Open Space	1
D	1			Credit 6.1	**Stormwater Design,** Quantity Control *** RP	1
D	1			Credit 6.2	**Stormwater Design,** Quality Control	1
C	1			Credit 7.1	**Heat Island Effect,** Non-Roof*** RP	1
D		1		Credit 7.2	**Heat Island Effect,** Roof*** RP	1
D			1	Credit 8	**Light Pollution Reduction**	1

Phase	Yes	?	No		Water Efficiency	10
	0	6	4			
D	Y			Prereq 1	**Water Use Reduction, 20%** Reduction	Required
D		2		Credit 1.1	**Water Efficient Landscaping,** Reduce by 50%	2
D		2		Credit 1.2	**Water Efficient Landscaping,** No Potable Use or No Irrigation	2
D			2	Credit 2	**Innovative Wastewater Technologies**	2
D		2	2	Credit 3	**Water Use Reduction**	2 to 4
					30% Reduction	2
					35% Reduction	3
					40% Reduction	4

Phase	Yes	?	No		Energy & Atmosphere	35
	8	12	15			
C	Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
D	Y			Prereq 2	**Minimum Energy Performance**	Required
D	Y			Prereq 3	**Fundamental Refrigerant Management**	Required
D	5	5	9	Credit 1	**Optimize Energy Performance**	1 to 19
					12% New Buildings or 8% Existing Building Renovations	1
					14% New Buildings or 10% Existing Building Renovations	2
					16% New Buildings or 12% Existing Building Renovations	3
					18% New Buildings or 14% Existing Building Renovations	4
				x	20% New Buildings or 16% Existing Building Renovations	5
					22% New Buildings or 18% Existing Building Renovations	6
					24% New Buildings or 20% Existing Building Renovations	7
					26% New Buildings or 22% Existing Building Renovations	8
					28% New Buildings or 24% Existing Building Renovations	9
					30% New Buildings or 26% Existing Building Renovations	10
					32% New Buildings or 28% Existing Building Renovations	11
					34% New Buildings or 30% Existing Building Renovations	12
					36% New Buildings or 32% Existing Building Renovations	13
					38% New Buildings or 34% Existing Building Renovations	14
					40% New Buildings or 36% Existing Building Renovations	15
					48% New Buildings or 44% Existing Building Renovations	19
D		1	6	Credit 2	**On-Site Renewable Energy**	1 to 7
					1% Renewable Energy*** RP	1
					13% Renewable Energy	7
C		2		Credit 3	**Enhanced Commissioning**	2
D	2			Credit 4	**Enhanced Refrigerant Management**	2
C	1	2		Credit 5	**Measurement & Verification**	3
C		2		Credit 6	**Green Power**	2

	Yes	?	No			
	4	4	6		**Materials & Resources**	14
D	Y			Prereq 1	**Storage & Collection of Recyclables**	Required
C			3	Credit 1	**Building Reuse**	1 to 3
				Credit 1.1	Maintain 55% of Existing Walls, Floors & Roof	1
					Maintain 75% of Existing Walls, Floors & Roof *** RP	2
					Maintain 95% of Existing Walls, Floors & Roof	3
C			1	Credit 1.2	**Building Reuse:** Maintain 50% of Interior Non-Structural Elements	1
C	1			Credit 2.1	**Construction Waste Management,** Divert 50% from Disposal	1-2
C	1			Credit 2.2	**Construction Waste Management,** Divert 75% from Disposal	1
C			1	Credit 3.1	**Materials Reuse, 5%**	1
C			1	Credit 3.2	**Materials Reuse,10%**	1
C	1			Credit 4.1	**Recycled Content, 10%** (post-consumer + ½ pre-consumer)	1
C		1		Credit 4.2	**Recycled Content, 20%** (post-consumer + ½ pre-consumer)	1
C	1			Credit 5.1	**Regional Materials, 10%** Extracted, Processed & Manufactured Regionally	1
C		1		Credit 5.2	**Regional Materials, 20%** Extracted, Processed & Manufactured Regionally	1
C		1		Credit 6	**Rapidly Renewable Materials**	1
C		1		Credit 7	**Certified Wood**	1

	Yes	?	No			
	10	4	1		**Indoor Environmental Quality**	15
	Y			Prereq 1	**Minimum IAQ Performance**	Required
	Y			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
D	1			Credit 1	**Outdoor Air Delivery Monitoring**	1
D		1		Credit 2	**Increased Ventilation**	1
C	1			Credit 3.1	**Construction IAQ Management Plan,** During Construction	1
C	1			Credit 3.2	**Construction IAQ Management Plan,** Before Occupancy	1
C	1			Credit 4.1	**Low-Emitting Materials,** Adhesives & Sealants	1
C	1			Credit 4.2	**Low-Emitting Materials,** Paints & Coatings	1
C	1			Credit 4.3	**Low-Emitting Materials,** Flooring Systems	1
C		1		Credit 4.4	**Low-Emitting Materials,** Composite Wood & Agrifiber Products	1
D	1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
D	1			Credit 6.1	**Controllability of Systems,** Lighting	1
D	1			Credit 6.2	**Controllability of Systems,** Thermal Comfort	1
D	1			Credit 7.1	**Thermal Comfort,** Design	1
D			1	Credit 7.2	**Thermal Comfort,** Verification	1
D		1		Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
D		1		Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

	Yes	?	No			
	3	3	0		**Innovation & Design Process**	6
D	1			Credit 1.1	**Innovation in Design - EP for SSc4.1**	
D	1			Credit 1.2	**Innovation in Design - EP for SSc7.1**	
D		1		Credit 1.3	**Innovation in Design -tbd**	
C		1		Credit 1.4	**Innovation in Design - tbd**	
C		1		Credit 1.5	**Innovation in Design -tbd**	
C	1			Credit 2	**LEED® Accredited Professional**	

Yes	?	No			
2	3	0		**Regional Priority Credits**	4
				City, State: Boston MA 02116 *SSc3, SSc6.1, SSc7.1 SSc7.2, EAc2 (1%), MRc1.1 (75%)*	
	1		Credit 1.1	**Regional Priority for SSc3 Brownfield Redevelopment**	
	1		Credit 1.2	**Regional Priority SSc6.1 Stormwater Quantity**	
1			Credit 1.3	**Regional Priority SSc7.1 Heat Island Effect non-roof**	
1	1		Credit 1.4	**Regional Priority SSc7.2 Heat Island Effect roof**	

Yes	?	No		
43	37	31	**Project Totals (Certification Estimates)**	110

Certified: 40-49 points, **Silver:** 50-59 points, **Gold:** 60-79 points, **Platinum:** 80+ points