PUBLIC NOTICE

The Boston Redevelopment Authority ("BRA"), pursuant to Article 80 of the Boston Zoning Code, hereby gives notice that a Project Notification Form for Large Project Review ("PNF") was filed by SCD 1350 Boylston Street, LLC (the "Proponent") on July 8, 2013 for the 1350 Boylston Street project (the "Proposed Project"), to be constructed on the approximately 0.6 acre site at 1350 Boylston Street in the Fenway neighborhood of Boston.

The Proposed Project is includes approximately 196,500 square feet anticipated to contain approximately 7,050 square feet of ground floor retail, a portion of which may be restaurant space, and approximately 240 rental apartments. Approximately 105 parking spaces will be located in a below-grade garage. The existing building on the site will be demolished.

The Proponent is seeking the issuance of a Scoping Determination by the BRA pursuant to Section 80B-5. 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, 9th Floor, Boston MA 02201 between 9:00 AM and 5:00 PM, Monday through Friday, except legal holidays. Public comments on the PNF, including the comments of public agencies, should be submitted in writing to John Fitzgerald, BRA, at the address stated above within 30 days of this notice.

BOSTON REDEVELOPMENT AUTHORITY
Brian P. Golden, Executive Director/Secretary

1350 BOYLSTON STREET

Expanded Project Notification Form

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

Submitted by:
SCD 1350 Boylston Street, LLC
253 Summer Street, Boston, Massachusetts 02210

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

In Association with:
ADD Inc
Bohler Engineering
Brennan, Dain, Le Ray, Wiest, Torpy & Garner, P.C.
Cosentini Associates
Haley & Aldrich
Nelson\Nygaard Consulting Associates

July 8, 2013

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July 8, 2013

Table of Contents

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

List of Figures

List of Figures (Continued)

List of Figures (Continued)

List of Tables

List of Tables (Continued)

List of Appendices

Chapter 1.0

Introduction / Project Description

1.0 INTRODUCTION / PROJECT DESCRIPTION

1.1 Introduction

SCD 1350 Boylston Street, LLC (the Proponent), proposes to redevelop an approximately 0.6 acre site (the Project site) at 1350 Boylston Street in the Fenway neighborhood of Boston (the Project). The existing site at the southeast corner of Boylston and Kilmarnock streets includes a surface parking lot and a Burger King restaurant. The existing building will be demolished and replaced with an approximately 196,500 square foot (sf) building with ground floor retail and residential units above. Parking will be provided in a below-grade parking garage.

The Project will continue the revitalization of this area of the Fenway neighborhood from surface parking lots and suburban style development to an urban area with a mix of uses. Over the last decade, new buildings have been built in the area, while there are currently several projects under construction or under review by the Boston Redevelopment Authority (BRA). The Project will improve the street scape by creating a consistent street wall closer to the street, while providing a wide sidewalk on Boylston Street which will allow for new street trees, street lighting, and benches. The Project will also result in a number of public benefits, including affordable housing, tax revenue, and an improved urban environment.

This Expanded Project Notification Form (PNF) is being submitted to the BRA to initiate review of the Project under Article 80B, Large Project Review, of the Boston Zoning Code.

1.2 Developer Experience

Skanska USA Commercial Development Inc. is an affiliate of SCD 1350 Boylston Street, LLC and is a business unit of Skanska USA. Skanska USA is one of the largest, most financially sound construction and development companies in the country with expertise in construction, civil infrastructure, public-private partnerships and commercial development in select U.S. markets. Skanska USA Commercial Development Inc. is focused on commercial office and multifamily development in four U.S. markets, including Boston, with more than four million square feet currently under development. All properties developed by Skanska USA Commercial Development Inc. target a minimum of Leadership in Energy and Environmental Design (LEED) Gold, while continuing to strive to incorporate innovative "green" features that push the sustainability of the building. The Proponent's other projects in Boston include Watermark Seaport and Parcel L1 of Seaport Square, as well as 150 Second Street in Cambridge, MA.

1.3 Project Identification

Address/Location:	1350 Boylston Street
Developer:	SCD 1350 Boylston Street, LLC 253 Summer Street Boston, MA 02210 (617) 574-1400 Shawn Hurley Mark McGowan
Architect:	ADD Inc 311 Summer Street Boston, MA 02210 (617) 234-3100 BK Boley Tamara Roy
Legal Counsel:	Brennan, Dain, Le Ray, Wiest, Torpy & Garner, P.C. 129 South Street Boston, MA 02111 (617) 542-4800 Donald Weist
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Geoff Starsiak
Transportation Consultant:	Nelson\Nygaard Consulting Associates 10 High Street, Suite 700 Boston, MA 02210 (617) 521-9404 Ralph DeNisco
Building Engineer:	Cosentini Associates Building 200, 2nd Floor One Kendall Square Cambridge, MA 02139 (617) 494-9090 Randall Duke Robert Leber

Civil Engineer:	Bohler Engineering 352 Turnpike Road Southborough, MA 01772 (508) 480-9900 William Goebel Joshua Swerling
Geotechnical Consultant:	Haley & Aldrich 465 Medford Street, Suite 2200 Boston, MA 02129 (617) 886-7400 Mark Balfe

1.4 Project Description

1.4.1 Area Context

The Project site is located in the Fenway neighborhood of Boston (see Figures 1-1 and 1-2). The area currently consists of a mix of low-rise, mid-rise and high-rise residential towers, medical centers, and low-rise commercial buildings. However, this is a rapidly growing area with multiple projects either under construction or under review by the BRA (see Figure 1-3). Currently under construction is the Fenway Triangle, located at 1325 Boylston Street, which will be an approximately 700,000 sf mixed use redevelopment project, and will consist of residential, office and retail uses. At 1282 Boylston Street, the BRA Board has approved an approximately 348,000 sf mixed-use redevelopment project that will consist of residential, office, and ground floor retail uses, as well as an underground parking garage. The Point, located at the juncture of Boylston Street and Brookline Avenue, is a proposed approximately 320,000 sf, 22-story mixed-use project that will consist of commercial and residential uses. The proposed Project will contribute to the growth of the neighborhood in a manner that is consistent with the Fenway Urban Village Plan. See Section 1.4.3.3 for more details on the Plan.

1.4.2 Project Site

The Project site is an approximately 0.6 acre parcel of land on the south side of Boylston Street at the intersection of Kilmarnock Street. The site currently consists of a one-story Burger King, as well as a surface parking lot that covers a majority of the parcel. As described in Section 1.4.1, the surrounding area consists of a variety of building heights and uses, with several projects in the construction or permitting phases. A survey of the site is included in Appendix A.

1350 BOYLSTON STREET

Figure 1-1

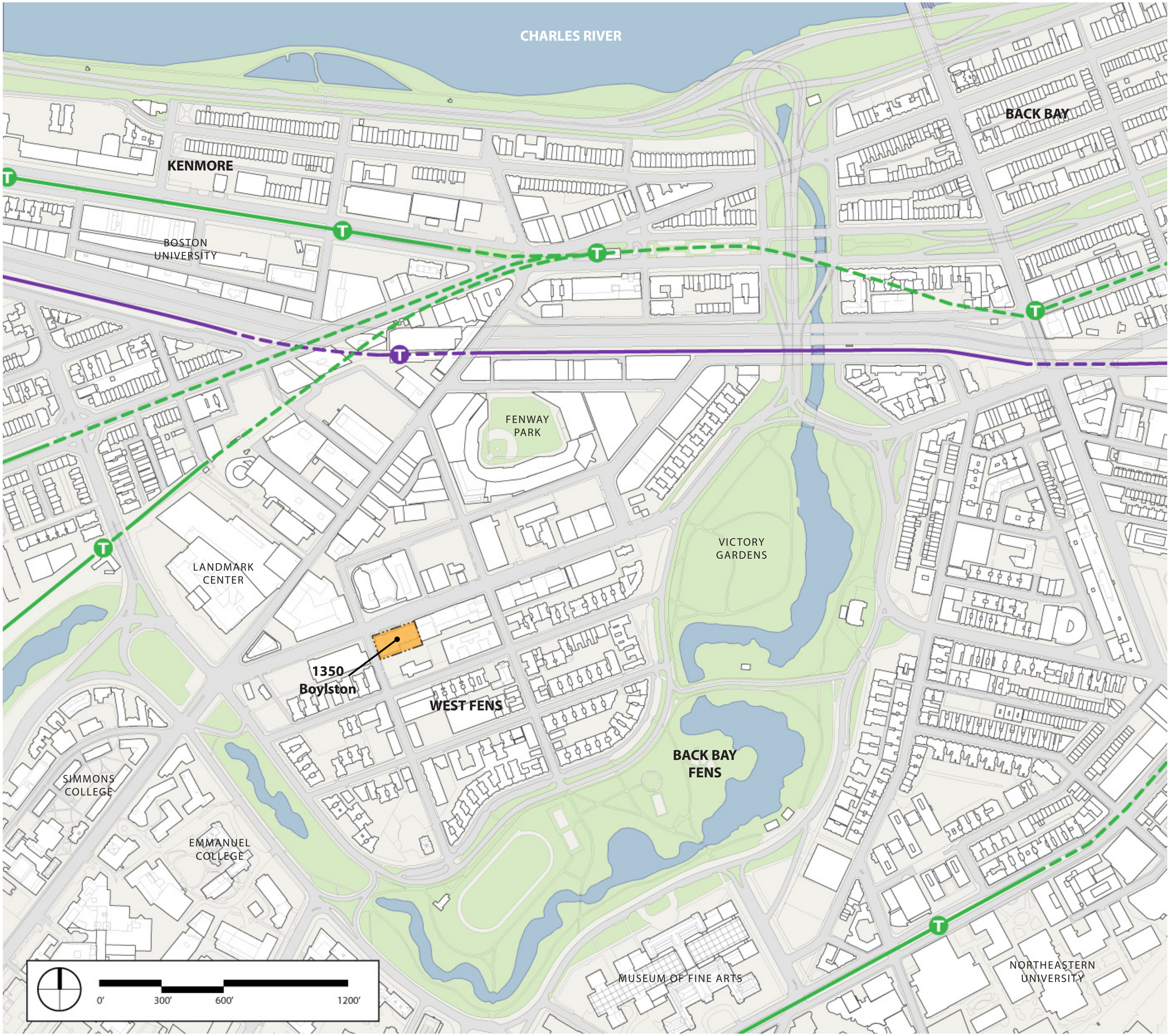
Location Map

Site Area

SKANSKA

EPSILON ASSOCIATES INC.

prepared by: ADD Inc



1350 BOYLSTON STREET

Figure 1-2

Site in Context

Site Area

SKANSKA

EPSILON ASSOCIATES INC.

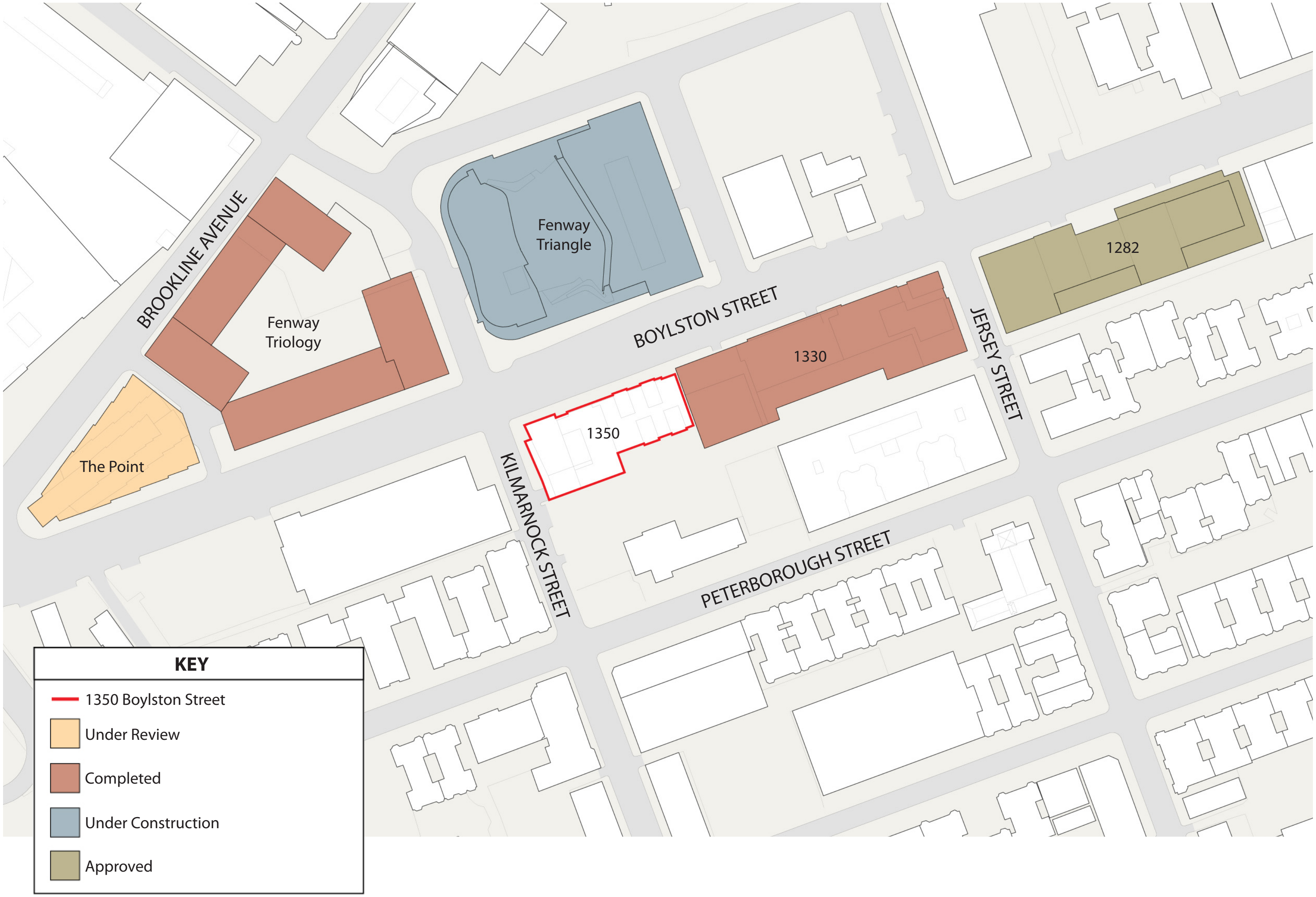
prepared by: ADD Inc

1350 BOYLSTON STREET

Figure 1-3

Development Context

Site Area



SKANSKA

EPSILON ASSOCIATES INC.

prepared by: ADD Inc

1.4.3 Proposed Development

1.4.3.1 Description and Program

The proposed Project includes approximately 196,500 square feet (sf) anticipated to contain approximately 7,050 sf of ground floor retail, a portion of which may be restaurant space, and approximately 240 rental apartments. Approximately 105 parking spaces will be located in a below-grade garage. The building includes a four-story podium spanning the majority of the site, with a consistent street wall along Boylston Street and Kilmarnock Street. At the western half of the site, the building will rise to 18 stories. Table 1-1 provides the Project program.

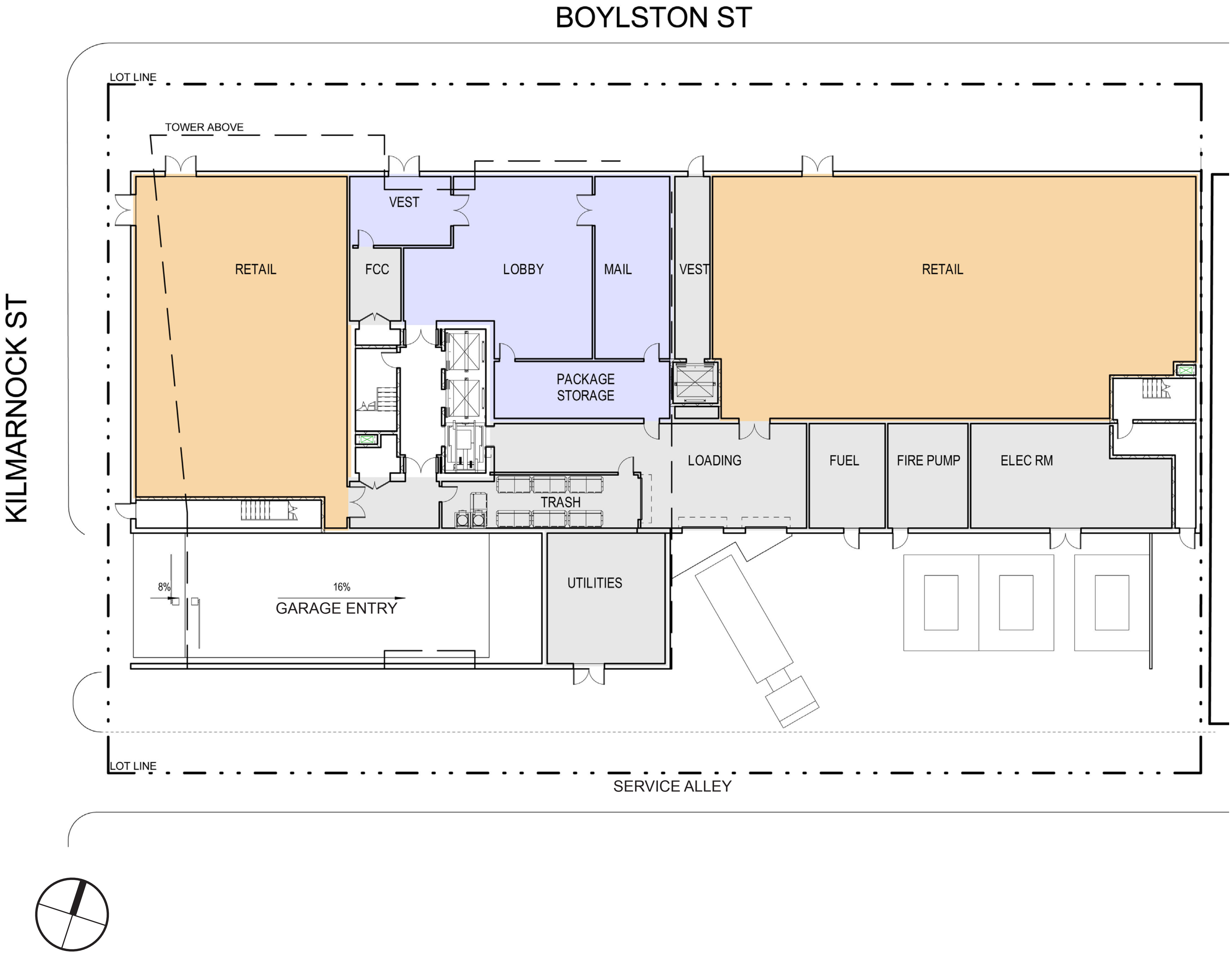
The ground floor will include two retail spaces with openings on Boylston Street. The western retail space will also include an opening at the corner of Kilmarnock Street. Between the two retail spaces on Boylston will be the entrance to the residential lobby. The Boylston Street sidewalk width will be consistent with the new developments in the area. Additional stairway exits will have doorways onto the alley and Kilmarnock Street. The ground floor also includes a number of utility rooms, mail room, trash room, and loading areas. See Figure 1-4 for a first floor site plan.

Levels two through four will include residences ranging from studios to two bedrooms plus den. The fourth floor, on the eastern portion of the site, is anticipated to include four loft style apartments. These apartments will include a second story enclosure that opens onto a private outdoor area for those units. These outdoor areas are anticipated to be landscaped and could include everything from a simple porch to an urban garden. On the western side of the building, a common amenity space for all residents will be located on the fifth floor. This space is set aside for a potential fitness area, common lounge, chef kitchen, and a common roof deck facing Kilmarnock Street. See Figures 1-5 through 1-7 for an amenities plan as well as typical floor plans for the Project.

Table 1-1 Proposed Program

Project Element	Approximate Dimension
Residential	240 units / 189,450 sf
Retail*	2,500 sf
Restaurant*	4,550 sf
Total Square Footage	**196,500 sf**
Parking	105 Spaces

* The types of uses within the retail portion of the Project are yet to be determined. To be conservative, it has been assumed that a portion will be for restaurant space.



1350 BOYLSTON STREET

Figure 1-4
Ground Floor Plan
Building Design

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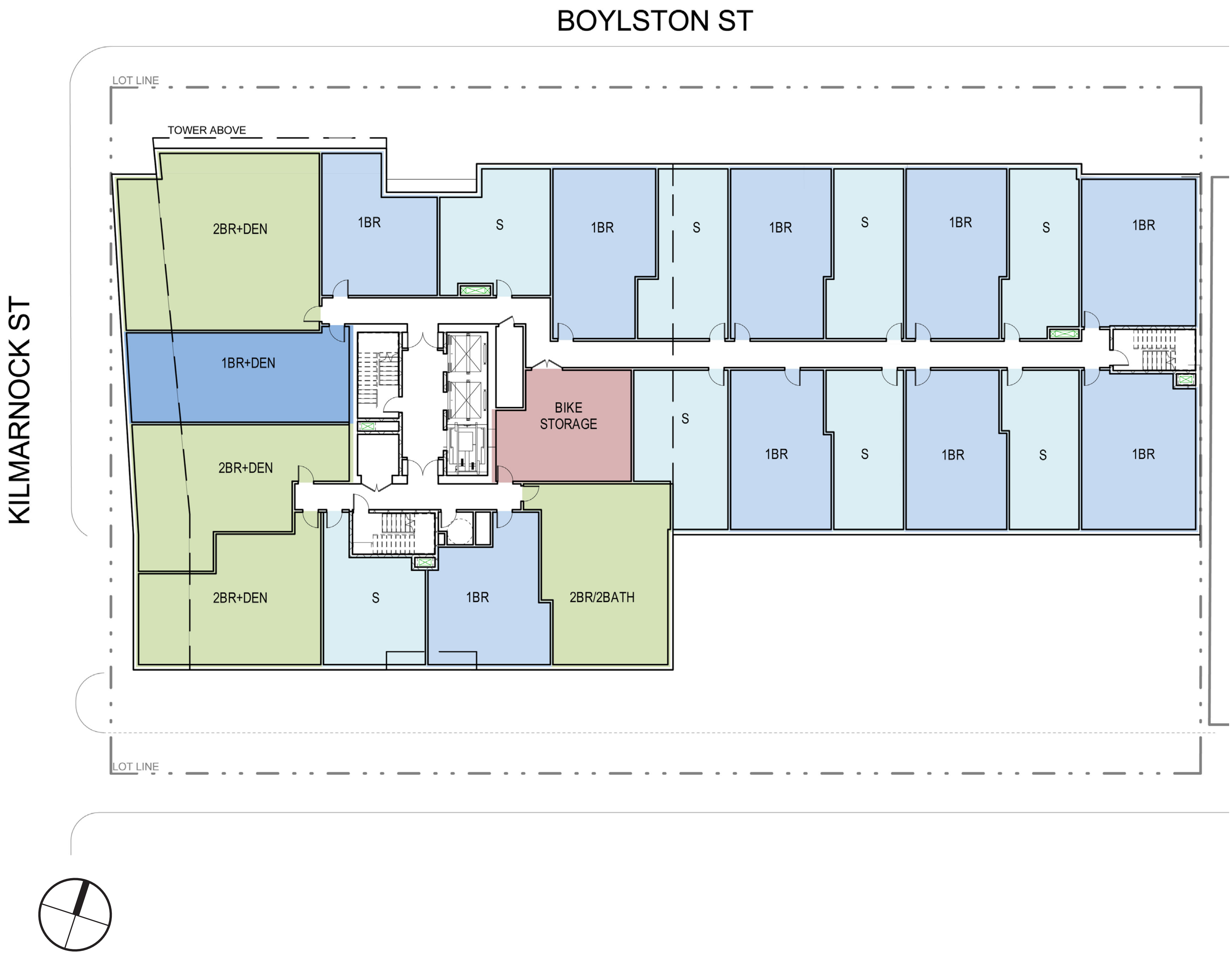
EPSILON ASSOCIATES INC.

prepared by: ADD Inc



1350 BOYLSTON STREET

Figure 1-5
Typical Bar Plan
Building Design

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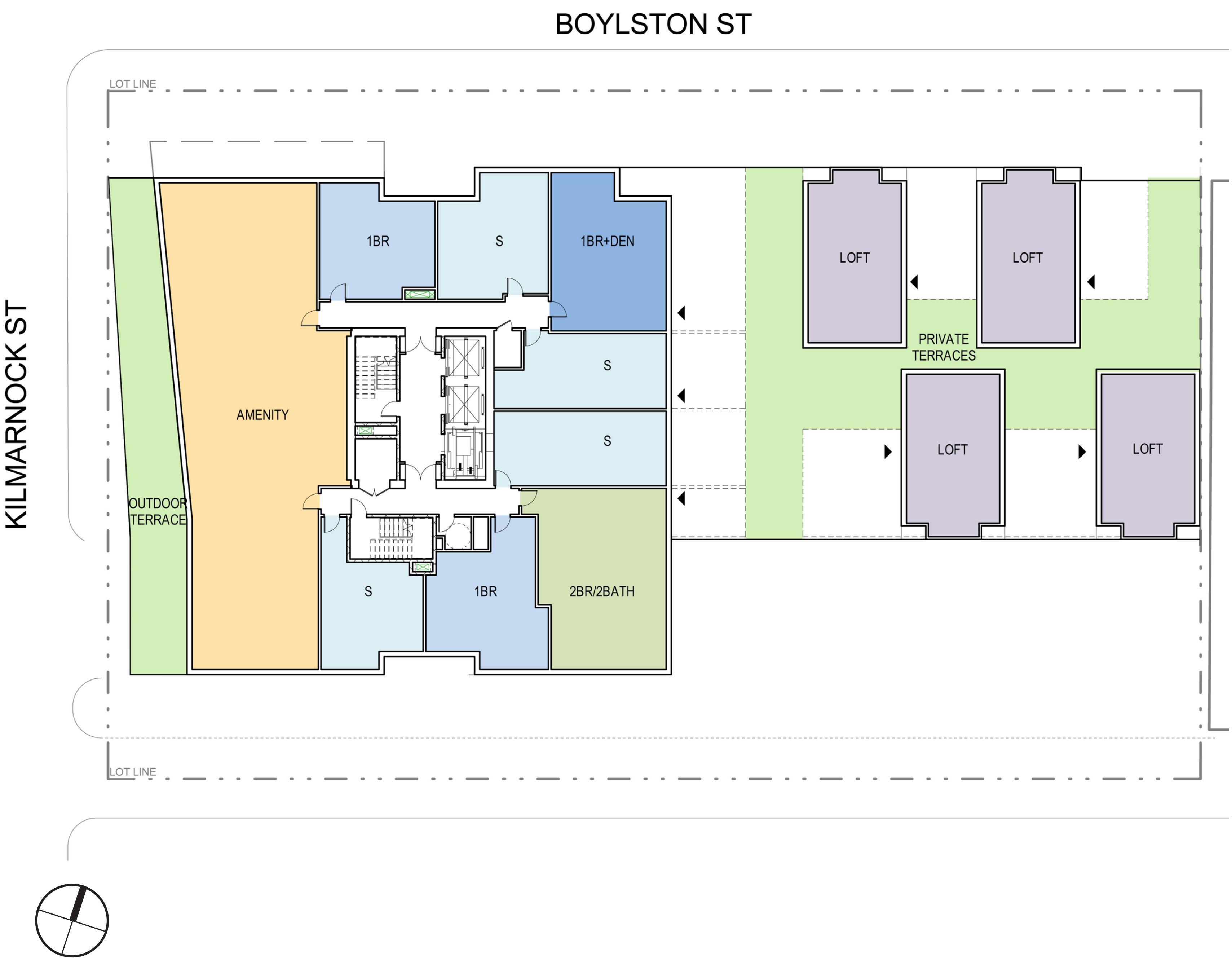
prepared by: ADD Inc

1350 BOYLSTON STREET

Figure 1-6

Amenities Plan

Building Design



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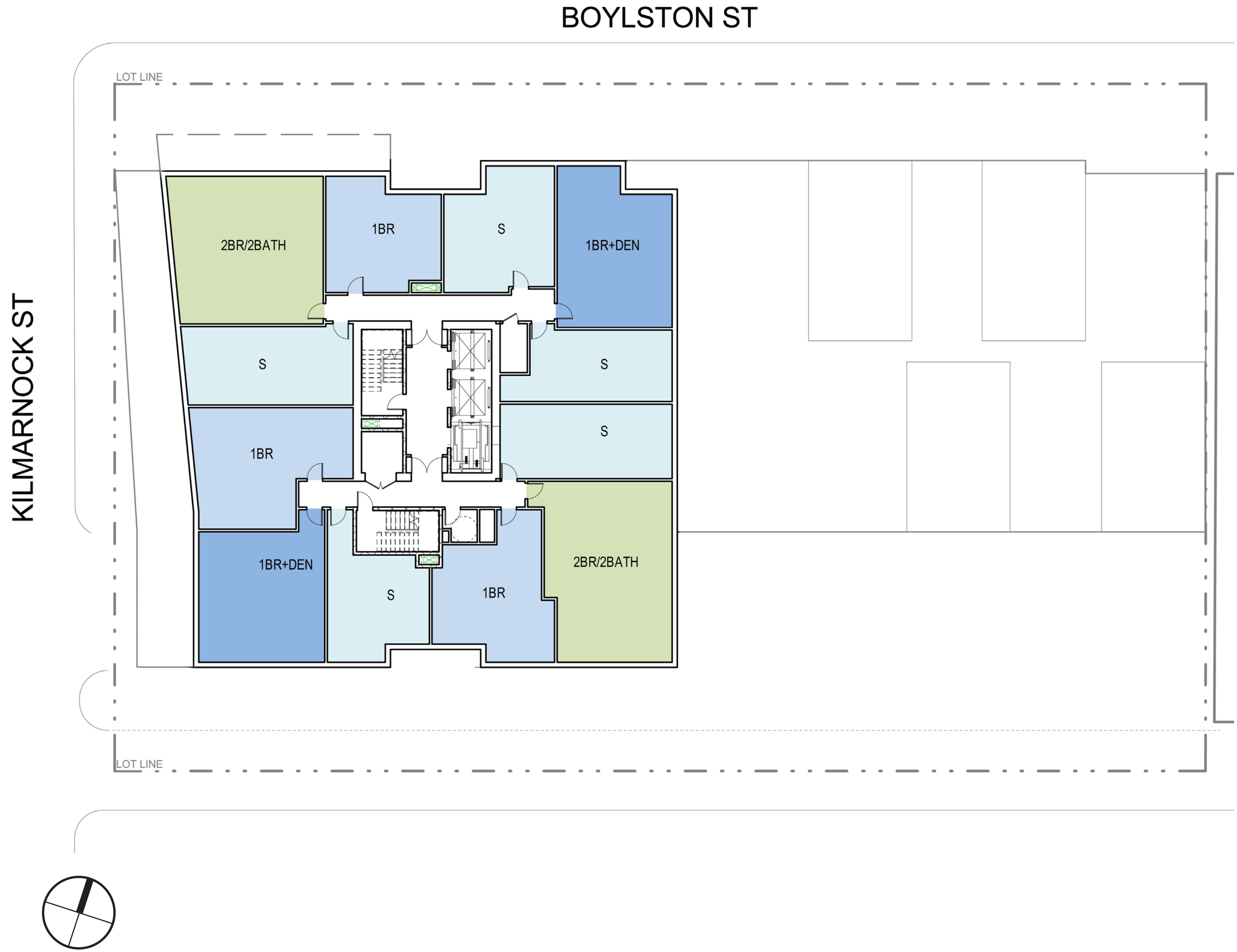


1350 BOYLSTON STREET

Figure 1-7

Typical Tower Plan
Building Design

SKANSKA

EPSILON ASSOCIATES INC.

prepared by: ADD Inc

1.4.3.2 Parking and Access

Access and egress for the below-grade parking garage will be from a new curb cut on Kilmarnock Street, adjacent to the existing alley. Loading, move-ins, and trash pickup will occur in the alley behind the site with access also from Kilmarnock Street. It is anticipated that the truck loading area will be open air, and the building will not be built above it.

1.4.3.3 Evolution of Design

The Proponent analyzed of number of different options for the site. The earlier plans considered an office building with ground floor retail. After a number of conversations with neighborhood groups and the BRA, it was determined that a residential use would be more appropriate for the site. Through subsequent discussions with the BRA and Fenway community groups, a number of configurations for the building and heights were analyzed. The various alternatives included massing at 115 and 150 feet tall, while others included variations on this scheme. The heights of the alternatives studied rose to 210 feet, and after further discussions the massing was broken up to allow for a shorter podium area that would be at the scale of the existing neighborhood to the south of Boylston Street. Through these discussions and different alternatives, the Project, as described above, has been determined to be the preferred alternative.

1.4.3.4 Consistency with Fenway Urban Village Plan

The Fenway Urban Village Plan is a resident-created vision for the Fenway neighborhood prepared by the Fenway Community Development Corporation. Most recently updated in 2009, the Plan's vision is to transform the area into a smart-growth neighborhood "where people can live, work, shop, and entertain in a single urban area". The Plan includes five components for which the Plan includes a number of goals.

1. A sufficient and varied housing supply
2. Excellent access to public transportation and curbs on vehicular traffic
3. Community-building facilities such as a community center
4. A healthy business community serving local residents and visitors alike, while providing employment opportunities
5. Easy access to open space and a responsible level of impact upon the environment

The proposed Project, which redevelops a parcel that currently consists of a single-story building with a large surface parking lot into an approximately 240 unit residential building with ground floor retail and an underground parking lot, is consistent with this vision. The Project will increase the density of the area and create additional housing options for the area, an essential element of smart-growth development. The Project will include new affordable housing units, in compliance the Mayor's Inclusionary Development Policy. By moving the parking lot underground and activating the ground floor with retail uses, this parcel will become pedestrian friendly, adding to the livelihood of the neighborhood. In addition, the Plan suggests a parking ratio of approximately 0.65 spaces per residential unit; the Project currently proposes a parking ratio of approximately 0.42 spaces per residential unit.

The Project will also make significant contributions towards the Plan's goals of reducing the area's carbon footprint. The Project intends to be LEED certified at the Gold level. The Proponent has a strong conviction that the best new developments integrate the sustainability performance goals at the earliest stage of the project, allowing the whole team to work collaboratively together to achieve great results. See Section 3.12 for further discussion on Sustainable Design.

1.5 Public Benefits

The site at 1350 Boylston Street is currently a Burger King restaurant surrounded by an asphalt parking lot that is a vestige of 1950's planning for the car. Transforming the site into a 240-unit rental apartment building with ground floor retail and underground parking brings the site into the 21st century, where urban living is sought after, and buildings provide active edges for vibrant pedestrian streets.

The Project will include numerous benefits to the neighborhood and the City of Boston, including but not limited to:

- The Project will create approximately 240 new residential units proximate to public transportation and the Fenway area—a rapidly growing neighborhood.
- A portion on the approximately 240 units will be set aside as affordable units.
- Approximately 400 construction jobs and 45 permanent full- and part-time jobs will be created.
- The Project will increase annual property taxes, a substantial increase from the tax levied on the underdeveloped Project site.
- The Project will provide a creative variety of unit designs for individuals, couples, and today's families

The proposed Project will provide a variety of urban design benefits to the surrounding neighborhood, including:

- The Project will be LEED certified at the Gold level, exceeding the requirements of Article 37 of the Boston Zoning Code.

- The Project will activate Boylston and Kilmarnock Streets by removing the surface level parking lot and replacing it with two ground-floor retail stores and a building lobby

- The Project's massing will include a 4-story base to acknowledge the scale of the existing neighborhood south of the site and will allow sun and air to the north side of Boylston Street

- Street trees, benches, lighting, and a permeable paving strip will be installed along Boylston Street in conformance with Boston's 'Complete Streets' guidelines

1.6 City of Boston Zoning

The Project site is governed by Article 66 of the Boston Zoning Code (the "Code"), the Fenway Neighborhood District Article. It is located within the South Boylston Neighborhood Services ("NS") Subdistrict, which is further identified as a so-called "NS-1" subdistrict. The site is additionally located within the Groundwater Conservation Overlay District and the Restricted Parking Overlay District. It is outside of the Restricted Roof Structure District, the Neighborhood Design Overlay District, and the Fenway's Greenbelt Protection Overlay Districts.

As a project "to erect a building or structure having a gross floor area of fifty thousand (50,000) or more square feet," the Project will be subject to the Large Project Review process set out by Code Article 80B. The Project will also comply with the provisions of Code Article 37, Green Buildings.

The Project's principal use, as a multifamily residential apartment building, is allowed as of right within the NS-1 subdistricts, as is the Project's expected mix of ground floor restaurant/retail/service/trade uses. The Project is anticipated to meet the requirements of Article 66's Residential Development Incentive provisions. While the height and massing of the Project will be generally consistent with the predominant scale of the new development that has taken place along Boylston Street pursuant to Article 66, the Project will require zoning relief for building height, street wall height, floor area ratio, certain setbacks, usable open space, and the number and design of its off-street parking spaces.

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 legal actions pending that are adverse to the Project.

1.7.2 History of Tax Arrears on Property

The Proponent is not in tax arrears on any property owned within the City of Boston.

1.7.3 Site Control / Public Easements

The Proponent received a deed for the site which is filed with the Suffolk Registry District of the Land Court. The Proponent is not aware of any encroachments not shown on the site survey, which can be found in Appendix A.

1.8 Anticipated Permits

The Proponent does not expect that the Project will require review by the Massachusetts Environmental Policy Act (MEPA) Office of the Massachusetts Executive Office of Energy and Environmental Affairs. Current plans do not call for the Project to receive any state funding or involve any state land transfers, nor will it exceed any MEPA review thresholds that are conceptually related to a required state permit or approval.

Permits and approvals likely to be required for the Project are listed in Table 1-2.

Table 1-2 List of Anticipated Permits and Approvals

AGENCY	APPROVAL
Local	
Boston Redevelopment Authority	Article 80 Large Project Review
Boston Civic Design Commission	Design Review
Boston Committee on Licenses	Parking Garage License; Flammable Storage License
Boston Water and Sewer Commission	Water and Sewer Connection Permits; Temporary Construction Dewatering Permit; General Service Application; Site Plan Review
Boston Transportation Department	Construction Management Plan; Transportation Access Plan Agreement
Boston Public Improvement Commission/Boston Department of Public Works	Curb Cut Permit; Street/Sidewalk Repair Plan; Permits for street occupancy and opening permit
Boston Fire Department	Approval of Fire Safety Equipment; Fuel Oil Storage Permit
Boston Inspectional Services Department	Building Permit; Flammable Storage Permit; Certificate of Occupancy
Boston Zoning Board of Appeal	Zoning Relief
Boston Parks Department	Construction within 100 feet of a public park

Table 1-2 List of Anticipated Permits and Approvals (Continued)

AGENCY	APPROVAL
State	
Department of Environmental Protection, Division of Water Pollution Control	Self-certification for sewer discharges
Department of Environmental Protection	Notification of Demolition and Construction
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (As required)

1.9 Public Participation

A Letter of Intent was filed with the BRA on March 13, 2013 beginning the Project's formal public review process. The Proponent has met with Fenway community groups and elected officials to date, and looks forward to working with its longtime neighbors and other stakeholders through the course of the Article 80 review process.

1.10 Schedule

The duration of construction for the Project is expected to last approximately 24 months. Construction is anticipated to commence approximately six months following Article 80 approval.

Chapter 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

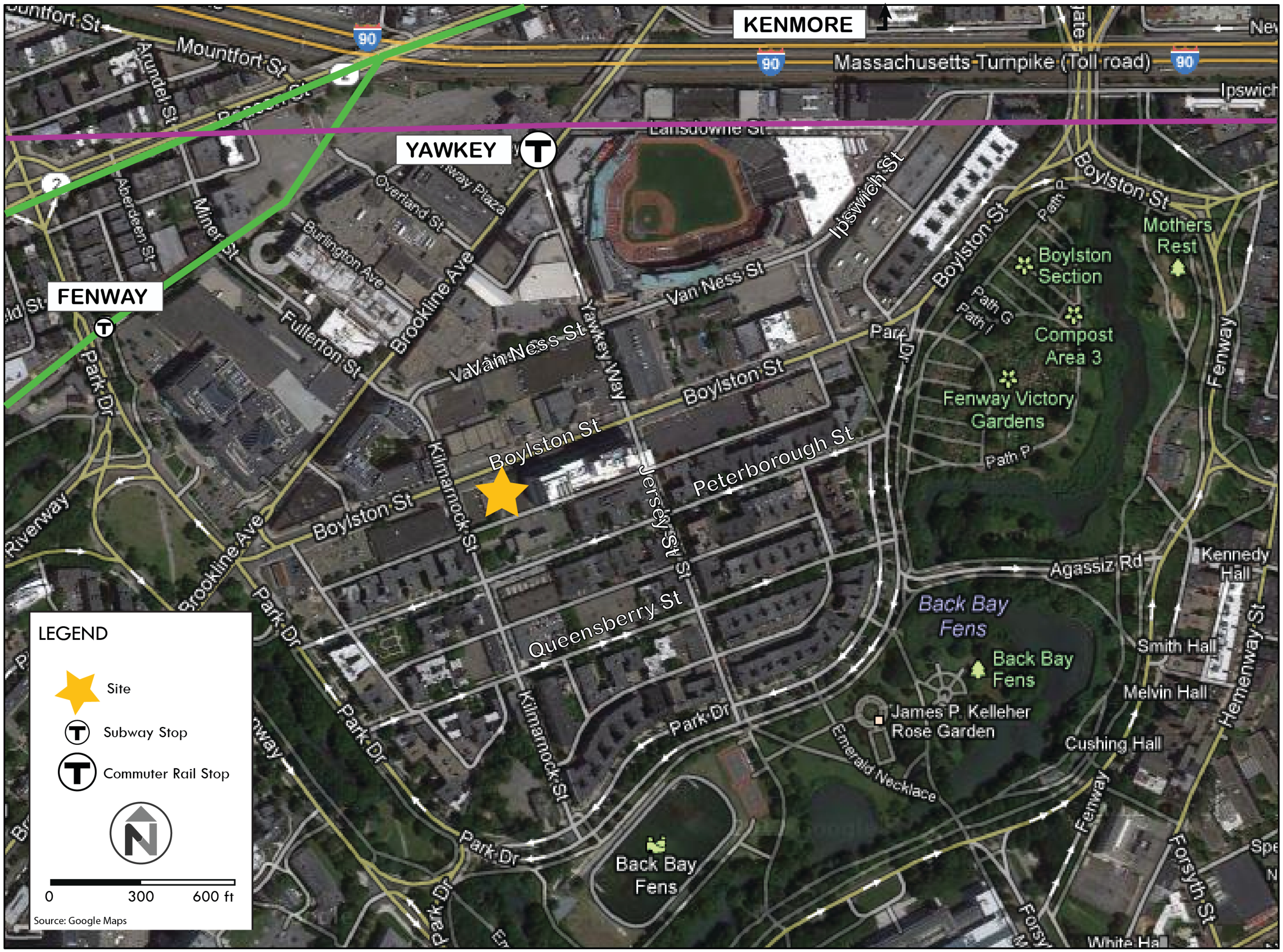
The portion of Boylston Street located in the Fenway area is undergoing significant transformation now and into the foreseeable future. Its proximity to Fenway Park, the Longwood Medical and Academic Area (LMA), and academic institutions makes the area a great place to live, work and play. Figure 2-1 shows the location of the Project site and area immediately around the site, which is on the southeast corner of Boylston and Kilmarnock streets. In addition to the existing extensive sidewalk network, the City of Boston has engaged in a comprehensive "Complete Streets" design process for Boylston Street in this area, which will improve amenities for pedestrians, cyclists, and transit riders.

As a primarily residential project with ground floor retail uses, the Project is consistent with area planning and Boylston Street design guidelines. By removing the existing fast food restaurant, which includes a drive-thru and surface parking, the Project will close driveways on Boylston Street that interrupt the sidewalk today, improve the street wall along the sidewalks, add retail entries and facades, and provide a comparable or reduced level of vehicular traffic. With no increased traffic impact, this analysis looks primarily at the adjacent intersections.

2.1.1 Project Description

The proposed Project includes approximately 196,500 sf anticipated to contain approximately 7,050 sf of ground floor retail, a portion of which may be restaurant space, and approximately 240 rental apartments. All parking will be located in a below-grade garage with approximately 105 spaces. The building includes a four-story podium spanning the majority of the site, with a consistent street wall along Boylston Street and Kilmarnock Street. At the western half of the site, the building will rise to 18 stories. Table 2-1 provides the Project program.

The ground floor will include two retail spaces with openings on Boylston Street. The western retail space will also include an opening at the corner of Kilmarnock Street. The retail spaces will continue Boylston Street's evolving retail street wall. Between the two retail spaces on Boylston Street will be the entrance to the residential lobby. The Boylston Street sidewalk width will be consistent with the new developments in the area. Additional stairway exits will have doorways onto the alley and Kilmarnock Street. The ground floor also includes a number of utility rooms, mail room, trash room, and loading areas. See Figure 1-4 for a first floor site plan.



1350 BOYLSTON STREET

Figure 2-1

Site and Study Area

Transportation

SKANSKA

prepared by:
Nelson\Nygaard
Consulting Associates

Table 2-1 Proposed Program

Project Element	Approximate Dimension
Residential	240 units / 189,450 sf
Retail*	2,500 sf
Restaurant*	4,550 sf
Total Square Footage	**196,500 sf**
Parking	105 Spaces

* The types of uses within the retail portion of the Project are yet to be determined. To be conservative, it has been assumed that a portion will be for restaurant space.

All parking will be provided below-grade in an access-controlled two-level parking structure that includes elevator access to ground and upper floors. Bicycle storage rooms are included in the garage, with easy access via the garage ramp or elevators. The existing loading alleyway at the back of the site off of Kilmarnock Street will be retained, and a new curb cut for the garage ramp adjacent to the alleyway will be added.

The two existing driveways on Boylston Street will be closed, removing the vehicular turning moves from the street and the pedestrian conflict areas on the sidewalk. The restored sidewalk and streetscape on Boylston Street will be developed further in conjunction with the Boylston Street reconstruction project and will include appropriate landscaping and lighting as well as walking, biking, or transit amenities in conformance with the "Complete Streets" design being developed.

2.1.2 Study Area and Methodology

This chapter provides a review and evaluation of the transportation impacts of the proposed Project. The scope of the analysis was coordinated with the Boston Transportation Department (BTD) in advance and follows the Transportation Access Plan Guidelines developed under the Article 80 review process.

As suggested by BTD, more specific analysis is provided for the following intersections adjacent to the site and shown in Figure 2-2.

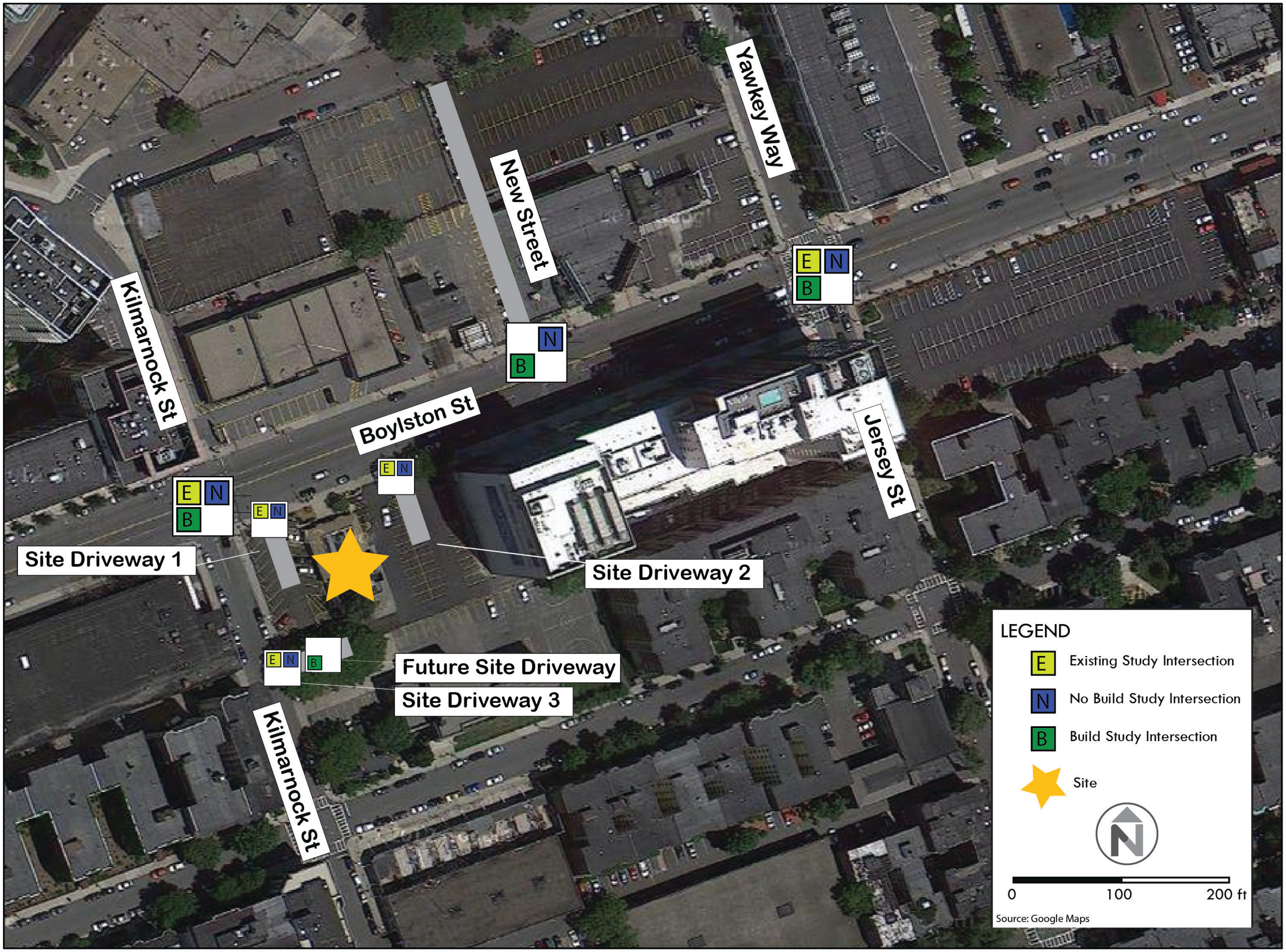
- Boylston Street/Jersey Street/Yawkey Way (in all analysis conditions)
- Boylston Street/Kilmarnock Street (in all analysis conditions)
- Boylston Street/Current Driveways (in Existing and No Build analysis conditions

1350 BOYLSTON STREET

Figure 2-2

Study Area Intersections

Transportation



SKANSKA

prepared by:
Nelson\Nygaard
Consulting Associates

- Boylston Street/New Street (Fenway Triangle Mixed-Use Project) (in No Build and Build analysis conditions)

- Site Driveway/Kilmarnock Street (in Build analysis condition)

The site is well integrated into the surrounding Fenway neighborhood and the City at large. The site is easily accessible via public transportation, with Massachusetts Bay Transportation Authority (MBTA) bus route 55 directly on Boylston and Kilmarnock streets, bus routes 8, 9, 19, 57, 60, and 65 one block away, the D Branch of the Green Line two blocks away, and multiple bus and Green Line services at nearby Kenmore Square. Moreover, the sidewalk network in the area is well-connected.

The multiple connections, growing mixed use of Boylston Street in general, and connections to the surrounding neighborhood combine to minimize the expected vehicular traffic impacts from the proposed development.

2.1.3 Transportation Analysis Summary

Overall, the Project will continue to fulfill City and neighborhood goals of converting Boylston Street from a car dominated street with auto-centric uses into the vital heart of a mixed-use multimodal neighborhood in the following ways:

- Removing two driveways from Boylston Street;

- Removing surface parking and game day event parking from the overburdened Fenway neighborhood;

- Removing a fast food with drive-thru;

- Providing a continual, lively street wall with ground level retail and an attractive residential lobby along a widened sidewalk, achieved through setting the building back from the lot line;

- Supporting the City's plans for the "Complete Streets" reconstruction of Boylston Street;

- Demonstrating minimal change in traffic conditions from the proposed No Build network, and adding a negligible (less than 1%) amount of vehicular traffic to overall peak volumes on Boylston Street;

- Ensuring that all loading and service activity occur on-site;

- Providing ample bicycle parking both on-site and on-street for public use;

- ♦ Pursuing an aggressive transportation demand management program designed to support tenants non-auto travel choices; and

- ♦ Providing “unbundled” on-site parking to meet building demand.

2.2 Existing Condition

2.2.1 Site Layout

The existing site consists of an approximately 28,082 sf parcel fronting on Boylston Street in the Fenway neighborhood of Boston. The site is on the southeast corner of the Boylston Street/Kilmarnock Street intersection with the addresses 1346-1356 Boylston Street. An approximately 3,410 sf Burger King with drive-thru currently occupies the site along with 55 surface parking spaces. The south side of the parcel includes a shared alleyway which provides through access between Kilmarnock Street and Jersey Street.

Three site driveways provide vehicular access to the site. Two are located on Boylston Street: a primarily entry driveway just east of Kilmarnock Street; and a full-access driveway is located about 125 feet east of Kilmarnock Street. Another full access driveway is on Kilmarnock Street, about 125 feet south of Boylston Street. Appendix A includes a survey of the existing site layout with the driveways shown.

2.2.2 Roadway Network

Boylston Street

Boylston Street is a minor arterial that runs generally east-west through the study area, connecting between the Sears Rotary and Charlesgate, ultimately continuing east into downtown Boston. It is a four-lane, two-way roadway between Brookline Avenue to the west and Park Drive to the east, with on-street parking, wide sidewalks, and a growing residential, retail, and restaurant presence. Following City guidelines, newer developments east of the site have expanded the sidewalk slightly as buildings are set further back from the street (a treatment that will be continued by the Project). Boylston Street serves as the main street of the Fenway neighborhood and a through connection between the Back Bay and the LMA.

Boylston Street has an approximately 80-foot public right-of-way, with approximately 62 feet of curb to curb width. The street includes two 12-foot lanes in each direction, and an 8-foot parking lane on both sides. Curbside parking, where available, generally consists of two hour meters. In front of the site, sidewalks are approximately 8 feet wide and abut landscaped areas. Currently, construction across the street from the site at 1282 Boylston Street has closed part of the sidewalk on the northern side of the street.

Kilmarnock Street

Kilmarnock Street is a smaller neighborhood street generally oriented north-south which runs between Park Drive to the south and Boylston Street to the north. Between Peterborough Street, one-block south of the site and Boylston Street, Kilmarnock Street has a public right of way of approximately 50 feet, with an approximately 34-foot of curb to curb width. There are approximately 8-foot sidewalks on each side of the street. Kilmarnock Street has two unmarked travel lanes—one in each direction—that are approximately 10 feet wide, and unmarked on-street parking lanes on each side that are approximately 7 feet wide. At the intersection of Boylston Street, the travel lanes are separated by double yellow lane lines.

The existing alleyway onto the site is the only public access to commercial uses along this section of Kilmarnock Street, although the western side is adjacent to an active loading dock, which is accessed from Boylston Street, for the Shaw's supermarket.

Alleyway

The south side of the site extends to the centerline of a shared alleyway which provides through access between Kilmarnock Street and Jersey Street. To the south, this alley abuts the McKinley Preparatory High School—a Boston Public School property—but there is no access onto the alleyway. The school property is fenced off and is at a lower elevation than the alleyway. The site includes ownership to the midpoint of the alley, with full access rights.

2.2.3 Intersection Conditions

2.2.3.1 Signalized Intersections

Boylston Street/Jersey Street/Yawkey Way

This signalized intersection of Boylston Street includes Yawkey Way on the north side and Jersey Street on the south side of Boylston Street. The Boylston Street eastbound and westbound approaches each have the same configuration, with a shared left/through lane, a shared right/through lane, and a parking lane.

Yawkey Way is one-way northbound, away from the intersection, with one travel lane and parking on both sides. Jersey Street is a two-way street, with one travel lane in either direction, separated by a double yellow lane line near Boylston Street. Near Boylston Street, there is parking on the east side of Jersey Street. The adjacent northbound (approach) lane is an all-purpose lane for right/left turns and through traffic. Further south, the centerline discontinues, and the street has parking on both sides.

There are crosswalks across all approaches and stop bars on the Jersey Street approach and both Boylston Street approaches. The crosswalks include international standard markings in good condition. While there are apex wheelchair ramps at each corner, only the northeast and southwest corners have detectable warning surfaces.

A three-phase signal controls the intersection on a 100 second cycle, with the Boylston Street eastbound and westbound approaches operating concurrently during the first phase. The Jersey Street northbound approach operates during the second phase. The Boylston Street eastbound approach operates during the third phase with a protected left turning movement. The pedestrian movements operate concurrently with the first and second vehicular phases. The traffic signal is interconnected with the others on Boylston Street with direct connection back to BTD's Traffic Management Center. There is not a camera at this location, but the camera is listed as a commitment of the 1330 Boylston Street project in their Transportation Access Plan Agreement.

Boylston Street/Kilmarnock Street

Boylston Street and Kilmarnock Street meet at a four-way signalized intersection just to the west of the site. The Boylston Street eastbound and westbound approaches are two lanes; one is a shared left/through lane and the other a shared right/through lane. Parking lanes exist in both directions. Kilmarnock Street northbound consists of one general purpose travel lane and one receiving lane, while the southbound approach to the intersection has a left turn lane, a through/right turn lane, and one receiving lane. Both Kilmarnock Street and Boylston Street have double yellow centerlines, though the centerline on Kilmarnock Street drops approximately 50 feet past the intersection. Each approach has international standard crosswalks, although the pavement markings are faded and hardly visible. Each crosswalk has an apex wheelchair ramp without detectable warning surfaces.

A two-phase signal controls the intersection, operating on a 100 second cycle. The Boylston Street eastbound and westbound approaches operate together during the first phase. The Kilmarnock Street northbound and southbound approaches operate during the second phase. Pedestrian movements operate concurrently with the vehicular phases. The Boylston/Kilmarnock traffic signal is interconnected with the others on Boylston Street with direct connection back to BTD's Traffic Management Center, and the intersection includes a working camera allowing for real-time monitoring.

Boylston Street/New Street (No-Build, Build)

For the Fenway Triangle Mixed Use project, the developer (Samuels & Associates) is constructing a mixed-use development across several parcels bounded by Boylston Street, Kilmarnock Street, Van Ness Street, and Brookline Avenue. One project will be at 132 Brookline Avenue, while the other will be at 1325 Boylston Street. The project at 1325 Boylston Street includes frontage on Van Ness Street, and the developer will transfer a portion of the parcel to the City to create a new street running north-south between

Boylston and Van Ness streets (hereto referred to as "New Street"). This will create a new intersection on Boylston Street between Kilmarnock Street and Yawkey Way/Jersey Street. New Street will be the primary access point for the development, both for pedestrians and for loading entry (loading exit will be onto Kilmarnock Street). The City of Boston's Boylston Street reconstruction plans include a signal at this intersection which is assumed for the No Build and Build scenarios per coordination with BTD.

2.2.3.2 Unsignalized Intersections

Boylston Street West Driveway (Site Driveway 1)

The western site driveway (Driveway 1) on Boylston Street is located just east of the Kilmarnock Street intersection. This driveway provides vehicular access to the site from east and westbound Boylston Street. The driveway has an opening of approximately 26 feet, with a continuous, but cross-sloped, concrete sidewalk across the apron. While intended as an entry with site parking along this driveway angled in the direction of entering vehicles, no signs or markings prevent egress, which occasionally occurs. Site Driveway 1 is the main access point for the Burger King drive-thru as well.

Boylston Street East Driveway (Site Driveway 2)

Located approximately 125 feet east of the Kilmarnock Street intersection, Site Driveway 2 provides full access to the existing site and site's larger eastern parking field. Site Driveway 2 has an opening of approximately 26 feet, also with a continuous, but cross-sloped, concrete sidewalk across the apron. There are no signs or markings establishing directions or lanes, but this driveway mostly serves as the main egress point for the site.

Kilmarnock Street Driveway (Site Driveway 3)

The third driveway is on Kilmarnock Street approximately 125 feet south of Boylston Street. Site Driveway 3 provides access both to the site's parking lot as well as the alley that runs the length of the block to Jersey Street. This driveway has an opening of approximately 30 feet, also with a continuous, but angled, concrete sidewalk across the apron.

2.2.4 Parking

2.2.4.1 On-street Parking

On-street parking is available in the vicinity of the site along Boylston, Jersey, Peterborough and Kilmarnock streets, as well as several other streets in the area. Metered parking in the area is primarily limited to the main commercial streets in the area, including Brookline Avenue and Yawkey Way. The streets abutting Fenway Park have metered parking, but typically have restrictions on game days. On-street parking along Boylston Street is mostly metered with a two-hour time limit. Other two-hour non-metered spaces are located along Kilmarnock Street and a short section of Peterborough Street. Figure 2-3 shows on-street parking within an approximately quarter mile of the site.

Currently, site Driveway 1 prevents parking on Boylston Street near the intersection of Kilmarnock Street. There is no on-street parking along the block of Kilmarnock Street north of its intersection with Boylston Street. Figure 2-4 shows the curbside regulations immediately adjacent to the site and on the block surrounding it. This area also contains a significant amount of on-street residential parking, limited to residents of the Fenway-Kenmore area. Behind the site on Peterborough Street is McKinley Preparatory High School. Outside of the school on the western end of Peterborough Street, parking is prohibited on school days between 7:00 a.m. and 2:00 p.m.

2.2.4.2 Off-street Parking

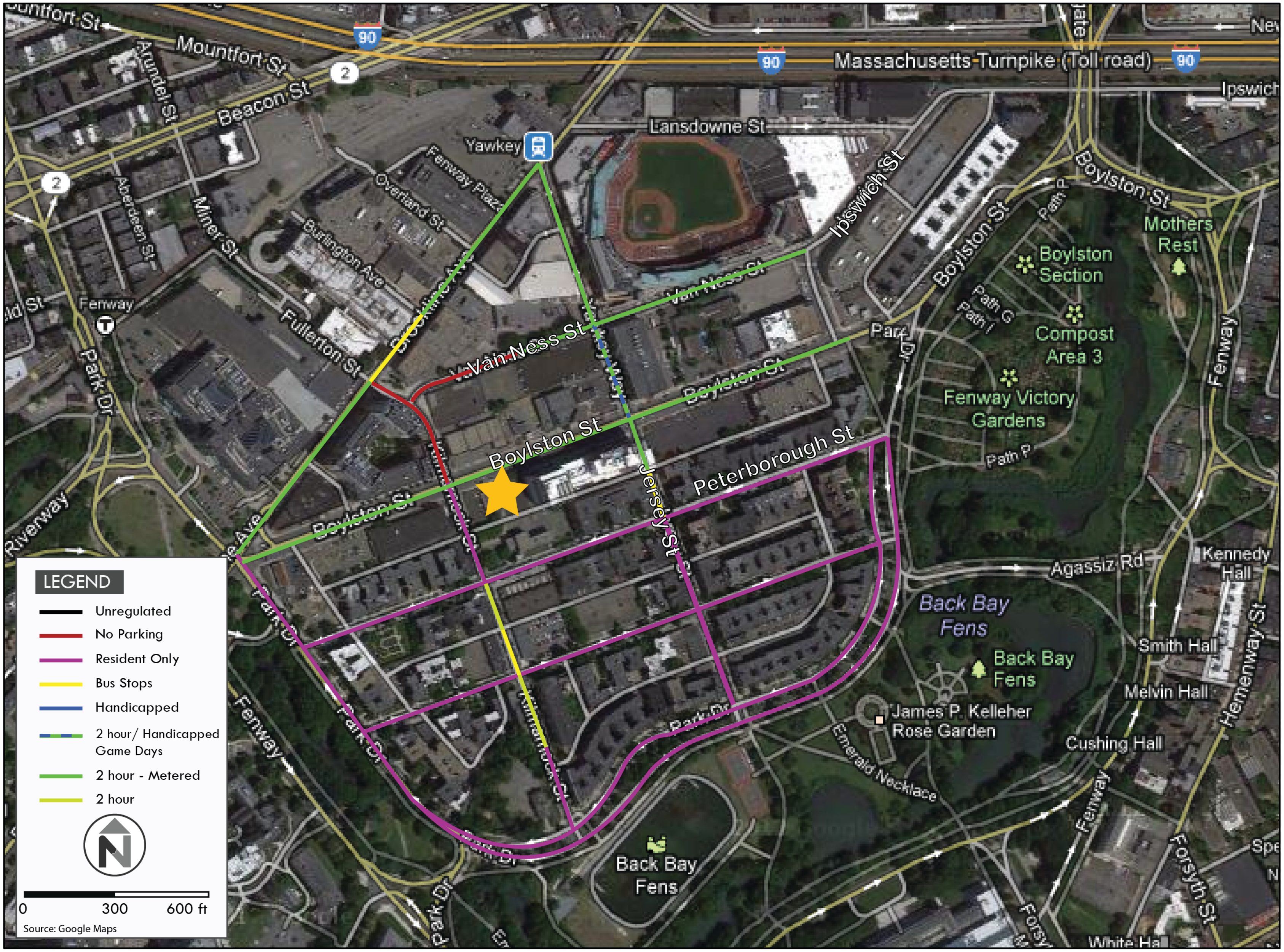
The site today has 55 surface parking spaces. Sixteen spaces are located on the entry driveway from Boylston Street, and the remaining 39 spaces are on the east side of the building along one double-loaded aisle and one single-loaded aisle. Spaces are used for customers of the Burger King, and for use by the general public for a fee. The parking facility is licensed by BTD with a cap of 40 spaces available to the general public. Daily rates are $15, with a higher event rate for Red Sox games, which is typical of the area.

Much of the off-street parking in the nearby area is restricted to specific businesses and restaurants. However, there are several publicly available parking facilities within walking distance of the site, including two surface lots. As with the parking at the site, rates are typically higher for events at Fenway Park, and parking at several facilities, such as the nearby parking at the McKinley Preparatory High School, is only available by the public during events. A summary of available public off-street parking nearby is included in Table 2-2.

Table 2-2 Current Off-Street Publicly Available Parking Facilities

Location	Operator	Capacity	Address
Landmark Center Garage	LAZ Parking	208	401 Park Drive
Fenway Triangle Trilogy Garage	Standard	179	200 Brookline Avenue
MEP Realty Trust Garage		46	65 Kilmarnock Street
Deaconess Garage	EJT	50	60 Kilmarnock Street
1330 Boylston Garage	Standard	179	15 Jersey Street
Standard Parking Lot	Standard	43	1301 Boylston Street
LAZ Parking Lot	LAZ Parking	169	1282 Boylston Street

Source: http://boston.bestparking.com/



1350 BOYLSTON STREET

Figure 2-3

Parking Regulations Overview

Transportation

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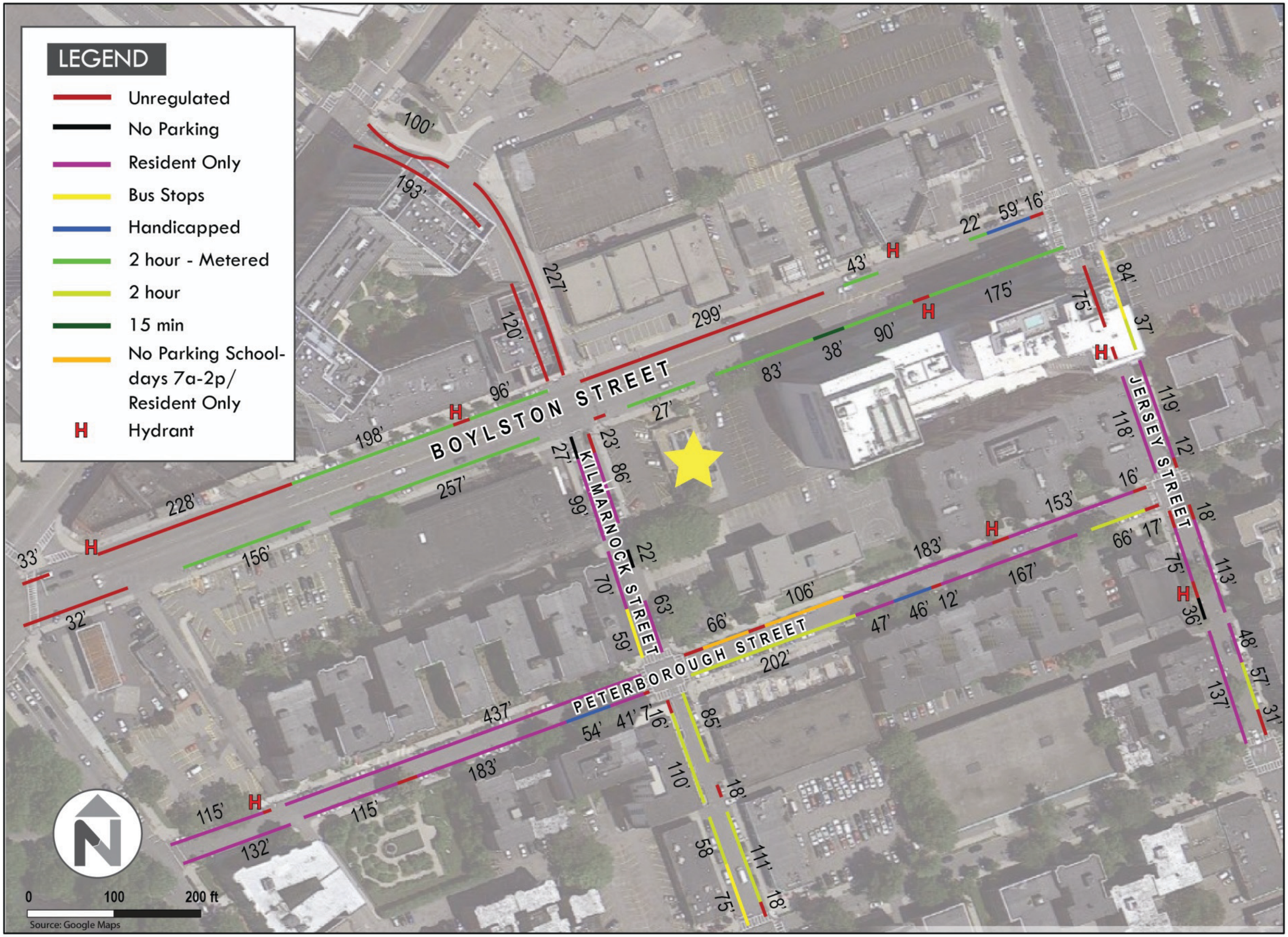

1350 BOYLSTON STREET

Figure 2-4

Parking Regulations Adjacent to Site

Transportation

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2.2.5 Public Transportation in the Study Area

The Project is well served by public transportation with several different modes within short walking distance of the site. The Fenway neighborhood has both good access and high transit use and the mix of uses and combination of services lead many residents to live without a vehicle. Figure 2-5 shows both five minute (approximately 1/4 mile) and 10 minute (approximately 1/2 mile) walk circles centered on the site. Within those circles, there are a number of public transportation options providing service to most of the City and region, as well as direct connections into the larger MBTA transit network. This high level of access to public transit will reduce the number of vehicle trips to and from the site as well as the demand for site parking.

2.2.5.1 MBTA Green Line and Commuter Rail

Within a five-minute walk radius, the site is directly accessible to the MBTA's Fenway Station which provides Green Line D Branch service from Fenway Station to both Riverside Station in Newton and Government Center in downtown Boston. Within a 10-minute walk radius, the study area's largest transportation hub, Kenmore Square, provides direct access to the Green Line B, C, and D branches from Government Center to stations and cities directly west of Boston. In addition, just north of the Project site, the Yawkey Commuter Rail station provides direct Commuter Rail service inbound to South Station and outbound to Framingham and Worcester.

2.2.5.2 MBTA Buses

High frequency MBTA bus service is immediately adjacent to and within the vicinity of the Project site. Bus service is both frequent and varied providing cross-town and other connections to a large part of the City, and a strong complement to the light rail and commuter rail transit options in the study area. MBTA bus route 55 circumnavigates the block containing the Project site with several bus stops within walking distance along Boylston, Kilmarnock, Queensberry, and Jersey streets. The nearest adjacent bus stop is located on Kilmarnock Street approaching Peterborough Street. Within the five-minute walk radius, Brookline Avenue, directly one block away from the Project, is well served by various bus routes that generally run at a frequency of 15 minutes during peak hours. Table 2-3 provides more detailed information on the MBTA bus routes that cross within a five minute walk of the site.

1350 BOYLSTON STREET

Figure 2-5

Public Transportation in Study Area

Transportation

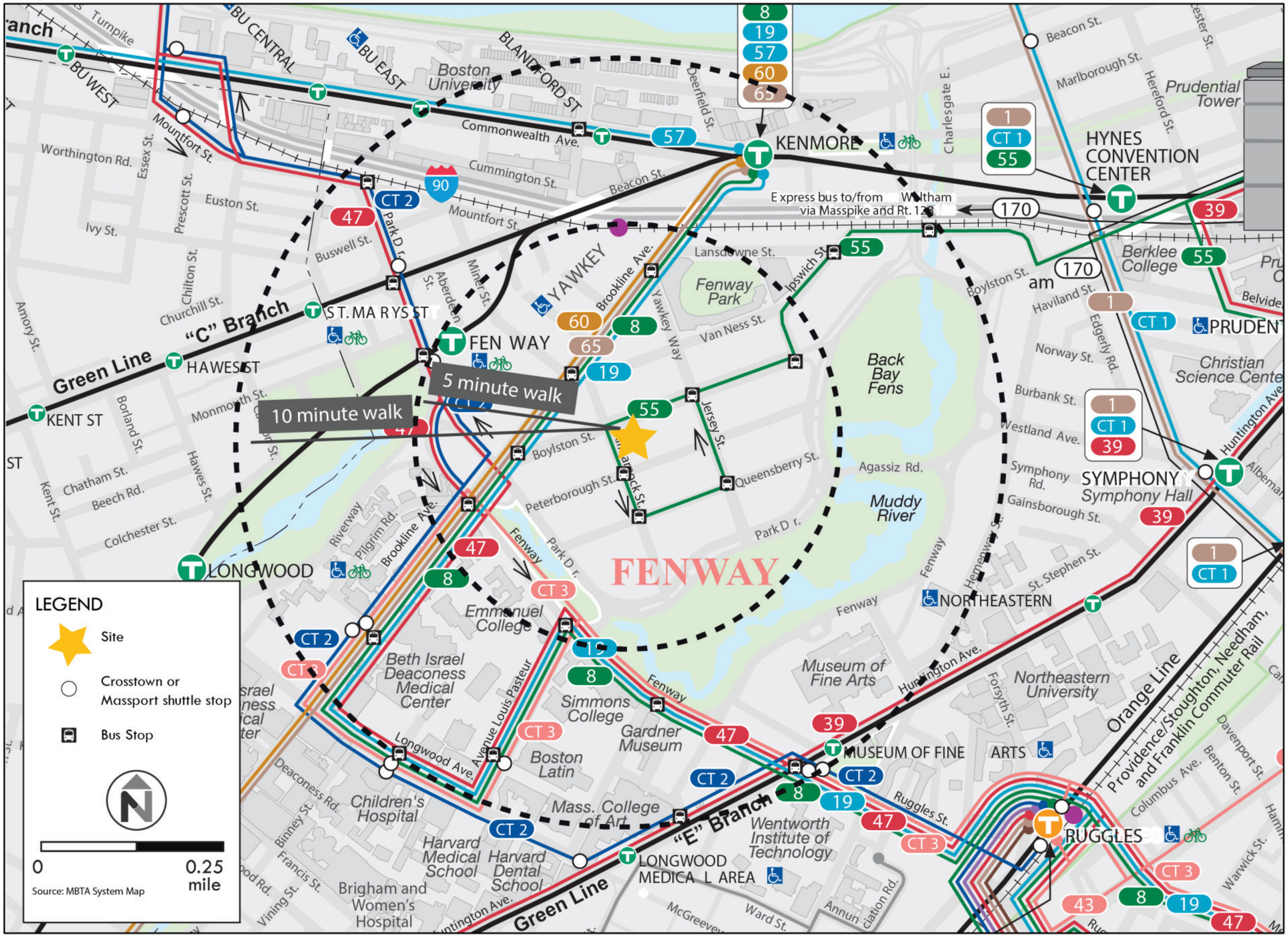

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Table 2-3 MBTA Bus Routes within Five Minute Walk of Site

Bus Route	Origin- Destination	Weekday Peak/Off Peak	Weekend
8	Harbor Point/ UMass- Kenmore Station via B.U. Medical Center and Dudley Station	15 minutes/ 20-25 minutes	40-45 minutes
19	Fields Corner Station- Kenmore or Ruggles Station via Grove Hall and Dudley Station	15-20 minutes/ 25 minutes	25-40 minutes
47	Central Square, Cambridge- Broadway Station via B.U. Medical Center, Dudley Station and LMA	10-15 minutes/ 20-25 minutes	25-40 minutes
55	Jersey and Queensberry- Copley Square or Park and Tremont Streets via Ipswich Street	15 minutes/ 50-60 minutes	30-35 minutes
60	Chestnut Hill- Kenmore Station via Brookline Village and Cypress Street	25 minutes/ 30-35 minutes	40-60 minutes
65	Brighton Center- Kenmore Station via Washington Street, Brookline Village, and Brookline Avenue	25-30 minutes/ 30 minutes	40-60 minutes
CT2	Sullivan Station- Ruggles Station via Kendall/ MIT	20 minutes/ 30 minutes	No Service
CT3	Beth Israel Deaconess Medical Center- Andrew Station via B.U. Medical Center	10 minutes/ 30-60 minutes	No Service

Kenmore Square, Longwood Avenue and Huntington Avenue are also within the expanded 10 minute walk circle from the site and provide access to additional MBTA bus service, including some of the busiest and most frequent routes in the MBTA system, such as bus routes 39 and 57.

2.2.6 Pedestrian Access and Circulation

There is good sidewalk connectivity in the area, as all streets have concrete sidewalks and connect into the surrounding neighborhood. However, the current range of sidewalk conditions can vary widely. In general, where new properties have been developed, the sidewalks are wider and well maintained. Other sidewalks are narrower and show occasional cracking. South of Boylston Street, the sidewalks along Peterborough, Queensberry, Kilmarnock and Jersey streets are in good condition and have street trees that create a pleasant sidewalk environment. North of Boylston Street, the sidewalk network is less continuous. Van Ness Street currently has no sidewalk on the south side due to construction, and the sidewalk on the north side has no street trees or benches. Brookline Avenue has a sidewalk on both sides with street trees on one side.

At the site, there are several curb cuts for large driveways. Crosswalks at the intersection of Kilmarnock Street and Boylston Street are very worn, while those at Boylston Street and Jersey Street/Yawkey Way are in good condition. On Boylston Street west of Kilmarnock Street, a continuous curb cut on the northern side of the street has eroded the sidewalk, which has been repaired with patches of asphalt.

2.2.7 Bicycle Accommodations

There are no on-street bicycle accommodations on the streets immediately adjacent to the site. In general, the narrow streets of the area do not have shoulders or even wide lanes that may be conducive to bicycling. The Fenway Path—a shared-use off-street walking and biking facility—runs along Park Drive in the Fens to the south of the study area. There are bicycle racks on Kilmarnock and Boylston streets. Two well used Hubway bike share stations are within a short walk of the site—one just north of Boylston Street on Yawkey Way and one on Brookline Avenue by the Landmark Center.

2.2.8 Loading and Service Uses

Service activity for most uses in the area, especially on Boylston Street, occurs on site and not on Boylston Street. As new development continues on Boylston Street, this pattern is reinforced, with access to off-street loading facilities located off alleys or side streets. The service uses for the existing Burger King are located behind the building off of the alleyway. There is a screen wall that hides a dumpster and other facilities. Service vehicles can enter or depart from the alleyway off Kilmarnock Street as well as directly via Boylston Street. The neighboring Shaw's Supermarket, opposite the Project site on Kilmarnock Street has a loading/service facility parallel to Kilmarnock Street, with access from Boylston Street.

2.2.9 Traffic Conditions

The Project is in keeping with the City's plans for the Fenway area, and is consistent with other recently permitted projects. As a primarily residential building, with ground level retail and limited parking, the Project is expected to generate predominantly non-auto dependent uses. The Project stands in stark contrast to the existing auto dependent dominated use of the site, which is a fast food restaurant with a drive-thru and excess surface parking offered to the public for a fee. Thus, the transportation analysis scope for the Project was coordinated with BTD, and primarily concentrates on the changes in volumes and turning movements on the intersections directly adjacent to the site, and the associated driveway and access changes.

Moreover, BTD has recently completed several analyses of the Fenway area, and Boylston Street in particular. An Existing Condition network, with recent counts, was completed by BTD for the Fenway area, for planning and intersection analysis. The analysis included herein builds upon that network per BTD's request. Future No Build and Build analyses were completed using the 2020 Build Condition network for the Boylston Street reconstruction. While that Project is approaching the 25% design stage, BTD has requested that future analysis be completed on the basis of the design for that Project which assumes future growth and other area projects.

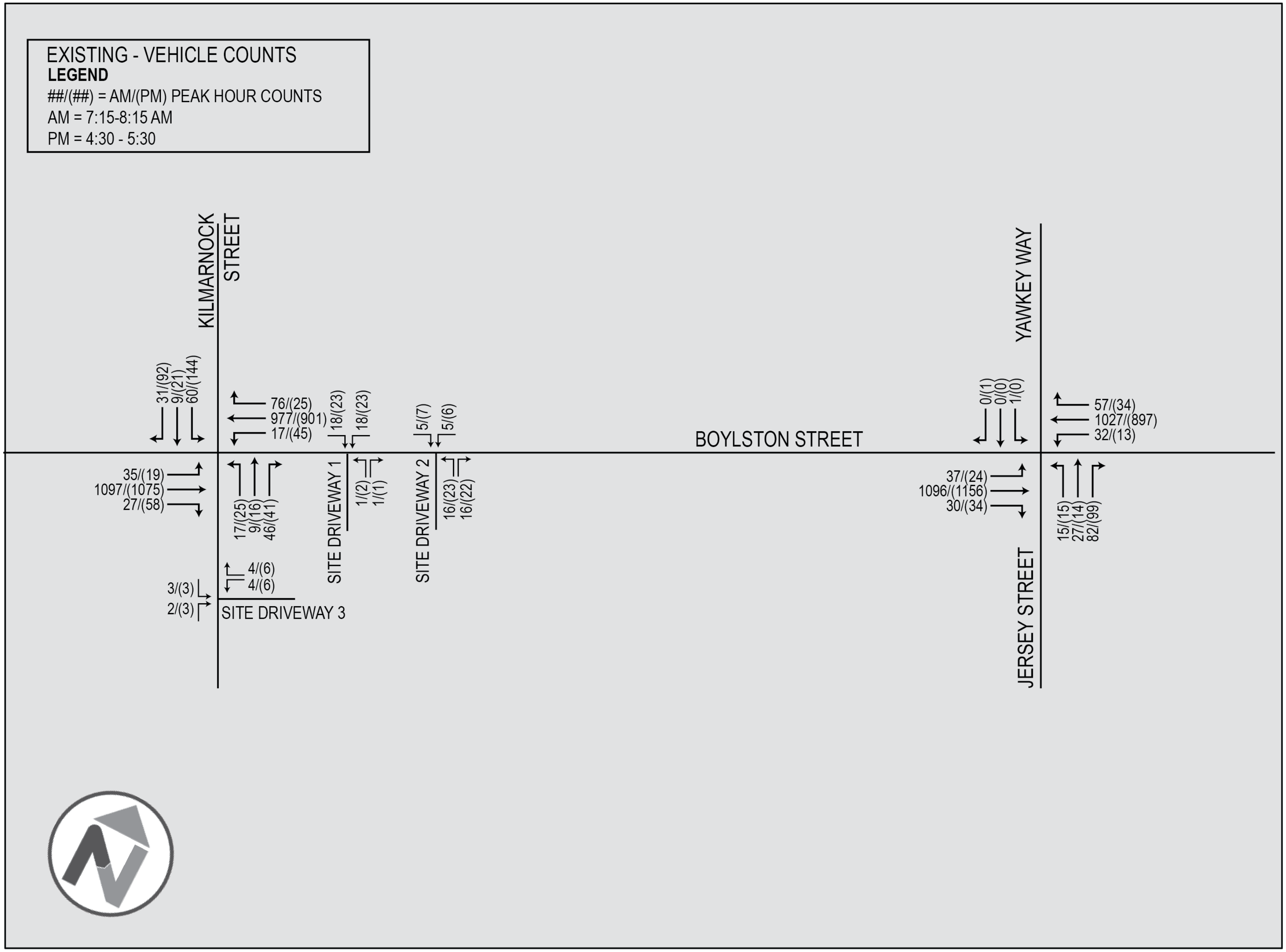
2.2.9.1 Existing Volumes

Vehicles

To establish existing vehicular traffic levels in the area around the Project site, this analysis utilizes the turning movement counts and volumes included in the Existing Condition network described above. The underlying counts for that analysis included heavy vehicles, cars, pedestrians and cyclists. The counts determined that the morning peak hour was between 7:15 and 8:15 a.m., while the evening peak hour fell between 4:30 p.m. and 5:30 p.m.

The three existing site driveways, while active, were not included in the Existing Condition network provided by BTD. Site driveway counts were taken from a memorandum prepared by others for the Project and included in the analysis. The memorandum includes 24 hour entering/exiting counts for the site shown by hour. The memo is included in Appendix B. Overall driveway counts for the peak hour of the adjacent roadways were then added to the network, with site observations and review of traffic patterns used to assign movements by percentage to the driveways.

The predominance of vehicular movements are travelling east-west on Boylston Street, with fewer vehicles utilizing the side streets. Overall, a.m. and p.m. peak volumes are comparable on Boylston Street. Moreover, Boylston Street shows little evidence of peak hour directional changes, with eastbound movement higher in both scenarios. There is little through traffic on Kilmarnock Street, with the majority of vehicles, both northbound and southbound, headed east on Boylston Street. Jersey Street behaves in a similar fashion. Yawkey Way, which is one way northbound, nevertheless shows minor "illegal" activity with cars approaching Boylston Street. Figure 2-6 shows the traffic volumes by intersection for the Existing Condition.



1350 BOYLSTON STREET

Figure 2-6

Existing Vehicle Volumes

Transportation

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Bicycles

Peak hour bicycle volumes for Boylston Street were extracted from the same source described above. Volumes are lower than may be expected given the level of overall bicycle activity in the neighborhood, and the generally younger population of the Fenway area. However as noted earlier, Boylston Street has no specific on-street bicycle facilities, while the parallel side streets (Peterborough, etc.) have considerably less vehicular traffic. Additionally, the nearby Fenway Path provides a regional bicycle connection and is heavily used. Figure 2-7 shows bicycle volumes by intersection for the a.m. and p.m. peak hours in the Existing Condition.

Pedestrians

Even though the area immediately adjacent to the site has not experienced the levels of development occurring on the rest of Boylston Street, pedestrian volumes are relatively high on this section. Peak hour pedestrian volumes for Boylston Street were extracted from the same source as the other measures. In almost all cases, p.m. peak hour pedestrian volumes are higher than a.m. volumes, with roughly comparable volumes either crossing or travelling along Boylston Street. Figure 2-8 shows pedestrian volumes by intersection for the a.m. and p.m. peak hours in the Existing Condition.

2.2.9.2 Existing Traffic Capacity

As described above, the Existing Condition analysis integrates the City's Existing Condition network for the Fenway area, with the added movements at the current site driveways. The additional links and turning movements were compiled into the City of Boston's Synchro traffic model for these nearby intersections in order to evaluate their existing capacity, delay, and queuing. Utilizing the model's Highway Capacity Manual (HCM) methodology, the delay in seconds for each intersection approach was calculated, along with corresponding level of service (LOS), volume to capacity ratio (V/C), and the 50th and 95th percentile queue lengths. Results are displayed in Table 2-4.

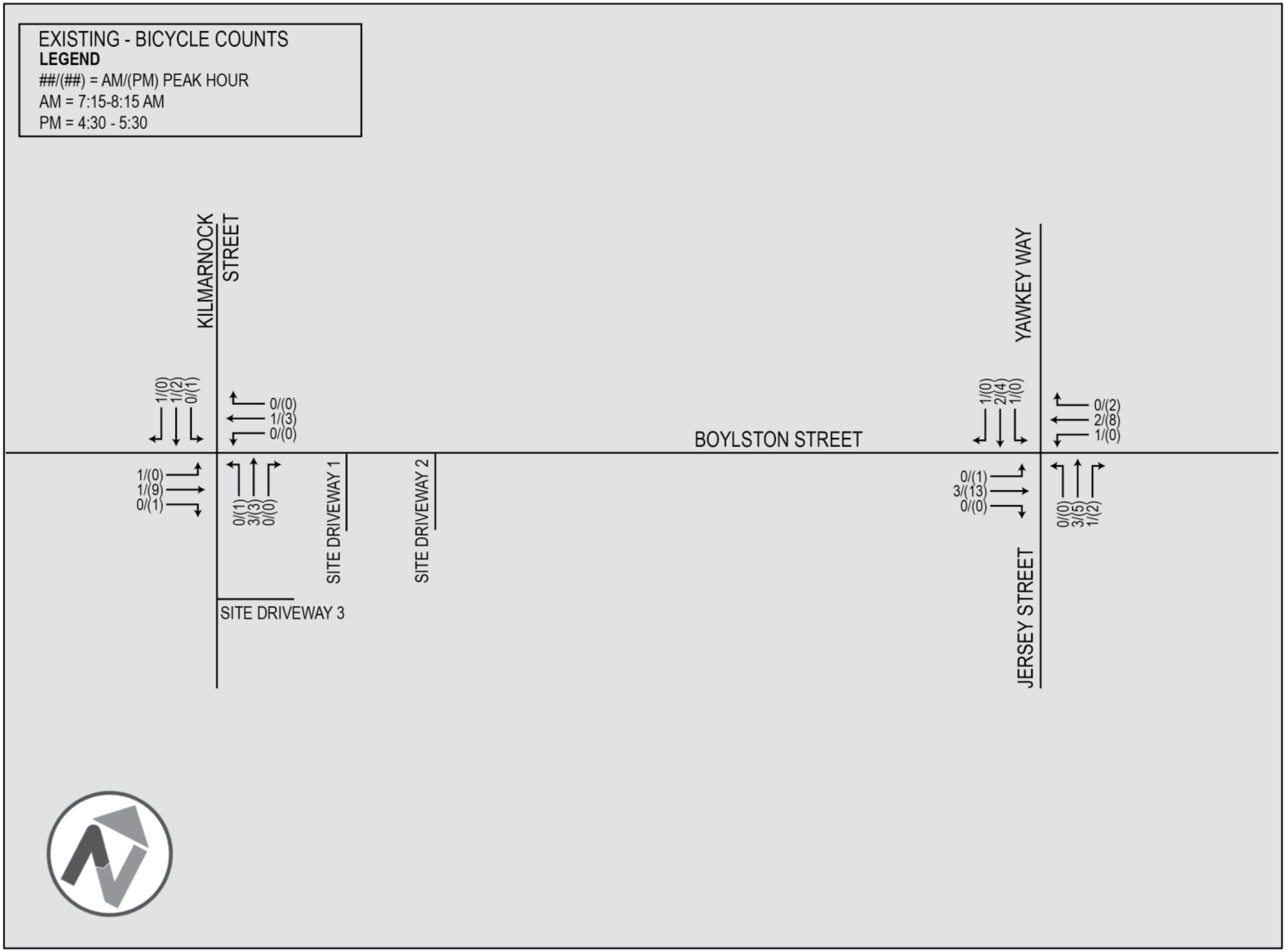
Traffic operations at the Boylston Street intersection operate at LOS C or better in both a.m. and p.m. peak conditions. Adding the site driveways into the network shows that the westbound left turns into the site operate at LOS B, but do introduce additional friction into the Boylston Street traffic streams. Access to these driveways typically benefits from the gaps created in the traffic stream by the adjacent Boylston Street signals at Kilmarnock and Jersey streets. The unsignalized site driveway intersections show the longest delays and worst LOS for exiting traffic. While the queues are minimal due to the relatively low volumes, the delay can contribute to driver frustration and potential aggressive or unsafe maneuvers.

1350 BOYLSTON STREET

Figure 2-7

Existing Bicycle Volumes

Transportation



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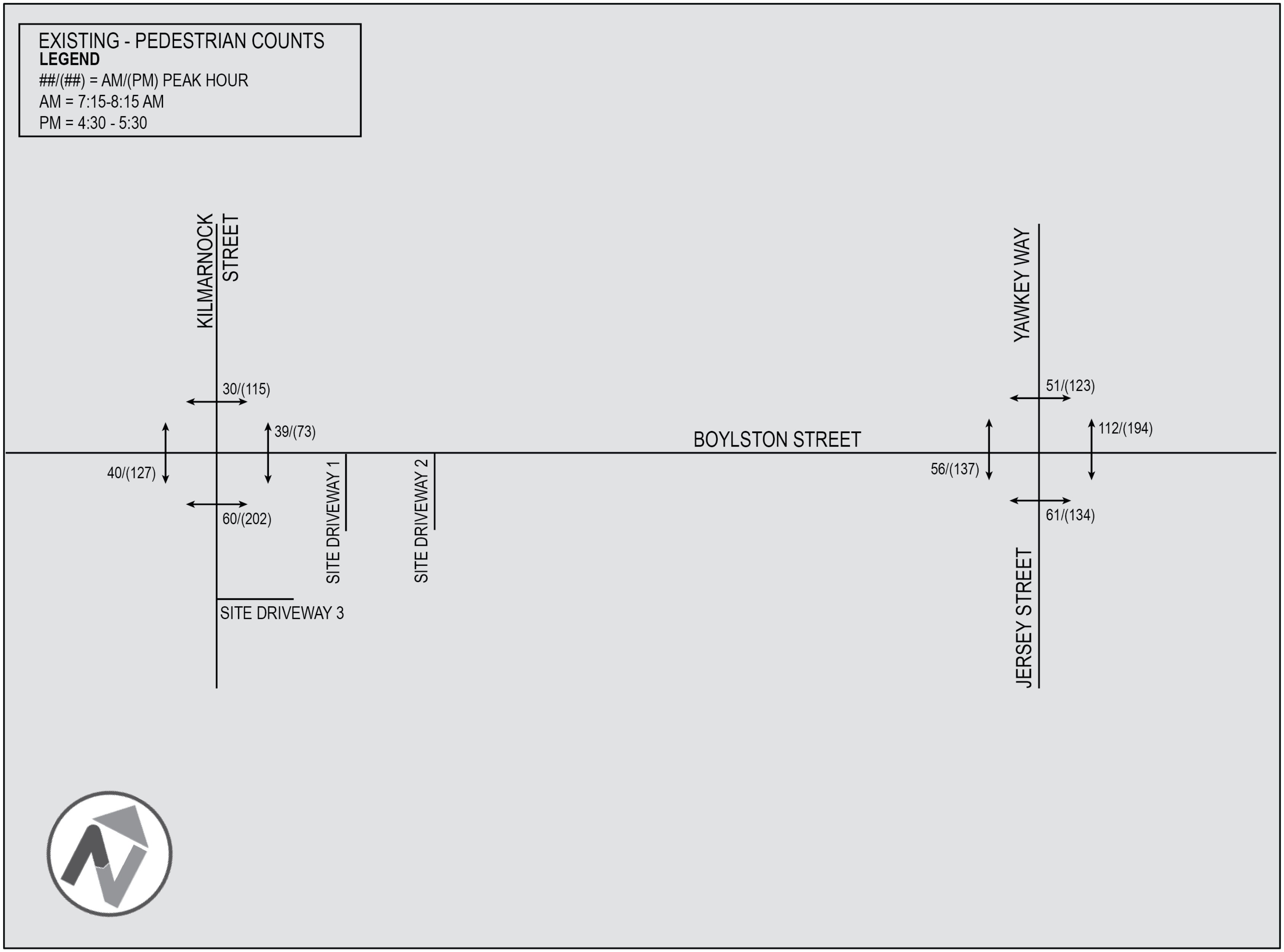

1350 BOYLSTON STREET

Figure 2-8

Existing Pedestrian Counts

Transportation

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Table 2-4 Existing Traffic Capacity

Signalized Intersection	Movement	AM Peak Hour					PM Peak Hour				
		LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th	LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th
Boylston Street / Jersey Street / Yawkey Way	EB LTR	A	8.6	0.74	90	156	C	25.8	0.97	124	576*
	WB LTR	B	16.4	0.72	212	366	B	14.8	0.65	177	287
	NB LTR	D	41.3	0.57	81	116	D	54.7	0.71	86	119
	Intersection	**B**	**14.1**	**0.68**			**C**	**23.1**	**0.78**		
Boylston Street / Kilmarnock Street	EB LTR	A	7.7	0.58	115	276	B	16	0.81	205	410*
	WB LTR	A	2.6	0.49	31	64	A	5	0.53	60	88
	NB LTR	C	34	0.32	40	71	D	39.9	0.42	48	80
	SB L	D	38.7	0.44	47	61	E	62.5	0.78	84	140
	SB TR	C	31.5	0.22	30	43	D	40.7	0.47	61	104
	Intersection	**A**	**7.9**	**0.41**			**B**	**16.4**	**0.60**		
Boylston Street / New Street	EB L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	EB T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	WB TR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	SB LR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Intersection	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unsignalized Intersection	**Movement**	**AM Peak Hour**					**PM Peak Hour**				
		LOS	**Delay**	**V/C**	**Queue (ft) 50th**	**Queue (ft) 95th**	**LOS**	**Delay**	**V/C**	**Queue (ft) 50th**	**Queue (ft) 95th**
Boylston Street / Site Driveway 1 (50 ft East)	WB T	A	0.5	0	N/A	N/A	A	0.6	0	N/A	N/A
	WB L	B	11.84	0.04	< 1	< 1	B	12.3	0.05	< 1	< 1
	NB LR	E	40.3	0.02	< 1	< 1	**F**	**51.8**	0.04	< 1	< 1
Boylston Street / Site Driveway 2 (150 ft East)	WB T	A	0.1	0	< 1	< 1	A	0.2	0	< 1	< 1
	WB L	B	11.6	0.01	< 1	< 1	B	11.9	0.01	< 1	< 1
	NB LR	E	48.3	0.29	< 1	1	**F**	**58.1**	0.42	< 1	2
Kilmarnock Street / Site Driveway 3	SB T	A	0	0	< 1	< 1	A	0	0	< 1	< 1
	SB L	A	7.36	0	< 1	< 1	A	7.4	0	< 1	< 1
	WB LR	A	8.9	0.01	< 1	< 1	A	9.2	0.02	< 1	< 1
**Queue exceeds capacity*											
m - Volume is metered by upstream signal											

2.2.9.3 Existing Trip Generation

A portion of the existing traffic and delay near the site will be eliminated with the closure of the current Burger King and parking lot. In order to calculate the net effect of replacing the current use with the proposed Project, an estimate of the trip generation of the existing uses was developed, and aggregate driveway counts were conducted to validate the estimates.

To estimate the trip generation of the existing Burger King, the 8th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual was utilized. For a fast food restaurant with drive-thru (land use code 934), the Manual calculates roughly 1,700 daily vehicle trips, with 170 in the morning peak hour and 115 in the evening peak hour (see Table 2-5). Utilizing the average vehicle occupancy in Boston from the most recent American Community Survey, the total number of person trips in those vehicle estimates was also calculated and shown in Table 2-5.

In order to validate the trip estimates, vehicle counts were conducted in 2011 on all three site driveways over a 24 hour period. As shown, the site produces slightly fewer daily trips than ITE estimates, slightly fewer a.m. peak hour trips, and about the same amount of p.m. peak hour trips. In order to utilize a conservative approach for estimating the impacts of the proposed Project, the lower observed counts were used in the future Build analysis to maximize the potential peak hour impact of the redevelopment.

Table 2-5 Existing Site Trip Generation

ITE Class	Fast Food Restaurant with Drive Through Window (934) trips per 1000 SF GLA					Observed Vehicle Trips, Existing Burger King (2011)		
Time	ITE	Vehicle Trips	Person Trips	Entering	Exiting	Entering	Exiting	Vehicle Trips
Weekday	496.1	1692	1861	930	930	925	911	1836
Saturday	722	2462	2708	1354	1354			
AM Peak Hour*	49.35	168	185	94	91	51	42	93
PM Peak Hour*	33.84	115	127	66	61	65	60	125

*Peak hour of Adjacent Street Traffic

2.3 Evaluation of Long-term Impacts

2.3.1 Future No Build Condition

In order to establish a baseline against which to compare Project impacts when the mixed-use development is complete and occupied, a future year No Build analysis has been completed that builds off of the Existing Condition analysis and the Projects impacts in the future. Working in coordination with and at the request of BTD, the future No Build analysis uses the plans and networks developed as part of the Boylston Street "Complete Streets" reconstruction. Traffic impacts have been evaluated at the following signalized intersections:

- Boylston Street/Jersey Street/Yawkey Way
- Boylston Street/Kilmarnock Street
- Boylston Street/Current Driveways
- Boylston Street/New Street (by others)
- Kilmarnock Street/Site Driveway - Alleyway

The Boylston Street plans use a forecast network for the year 2020, and include a background growth rate of 0.5% annual growth along with added assumptions of traffic growth from area developments. Additionally, the future No Build analysis considers the operational effect of the planned multi-modal infrastructure improvements (signal upgrades, bicycle lanes, roadway connections, transit changes, etc.) as part of the Boylston Street Complete Street project, as described below.

2.3.1.1 Boylston Street Reconstruction Plans

The City of Boston is working to improve Boylston Street in the study area to make this minor arterial more "Complete" and reflective of its growing multi-modal nature, which continues to see a growth in walking, biking, and transit use. A number of features are planned for installation by 2020, including:

- Expanded "Neckdowns" or curb extensions at all intersections to reduce pedestrian crossing distances;
- Five-foot dedicated bicycle lanes in both directions;
- Bike boxes that enable safer left turns by bicyclists in both directions at Jersey Street/Yawkey Way, as well as at Kilmarnock Street;
- Bike boxes for those travelling eastbound at New Street and Ipswich Street;

- Sidewalk repairs west of Kilmarnock Street; and
- A new intersection with New Street, located midway between Kilmarnock Street to the west and Yawkey Way/Jersey Street to the east. This street would be an additional connection between Van Ness and Boylston streets that is planned to eventually connect across Brookline Avenue to Beacon Street.

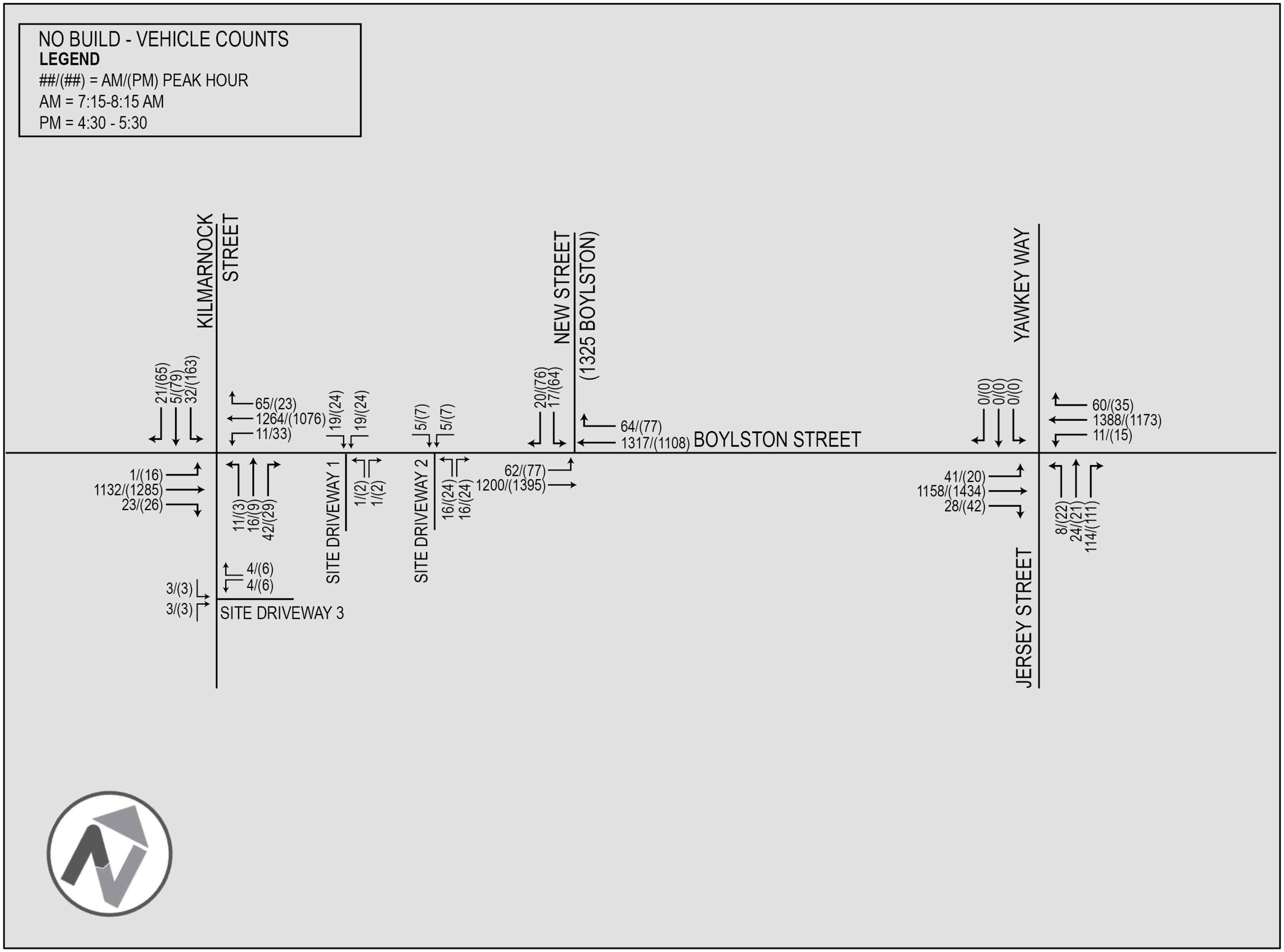
These improvements will make the area more reachable by all modes, thus increasing accessibility to the site and other nearby destinations without the use of a car. These improvements are particularly valuable for the mix of uses proposed to replace the existing Burger King. While a fast food restaurant with drive-thru is an attractor of vehicle traffic from beyond the immediate area, a residential building with more locally-serving retail to the growing mix of residential and retail sites in the area will naturally encourage shorter trips. With the Boylston Street Complete Streets improvements in place, these shorter retail trips will be predominantly by foot, bike, and bus, helping to greatly reduce vehicle trips to the site as well as parking demand.

2.3.1.2 Future No Build Traffic Volumes

As with the Existing Condition network, the site driveways were added to the future No Build Condition network. For consistency, a 0.5% annual growth rate was added to the site driveways for the 2020 forecast year. Figure 2-9 shows the No Build vehicle traffic volumes for the 2020 forecast year.

2.3.1.3 Future No Build Traffic Operations

The future No Build vehicle volumes were again entered into the City's Synchro model for the study area intersections, and the corresponding LOS, delay, volume to capacity ratio, and queues are summarized in Table 2-6. The No Build Condition network also includes the proposed signalized intersection of Boylston Street/New Street which is located between the Jersey and Kilmarnock streets intersections. The New Street intersection operates at an LOS B or better in the p.m., largely due to the metering associated with the adjacent traffic signals with which it is coordinated. With the added volumes in the No Build scenario, the Boylston Street site driveways from the Project site show significant increase in delays with all exiting movements operating at LOS F, and the westbound lefts all showing added delay in all scenarios moving from LOS B to LOS C or D in both peaks at each driveway.



1350 BOYLSTON STREET

Figure 2-9

Future No Build Traffic Volumes

Transportation

SKANSKA

prepared by:
Nelson\Nygaard Consulting Associates

Table 2-6 Future No Build Traffic Operations

Signalized Intersection	Movement	AM Peak Hour					PM Peak Hour				
		LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th	LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th
Boylston Street / Jersey Street / Yawkey Way	EB LTR	A	7.5	0.55	87	372	**F**	**126**	**1.23**	**344***	**779***
	WB LTR	B	15.4	0.76	261	494	B	16.6	0.57	246	370
	NB LTR	C	28.5	0.62	46	98	D	44.9	0.7	77	133
	Intersection	**B**	**12.7**	**0.64**			**E**	**75.3**	**0.83**		
Boylston Street / Kilmarnock Street	EB LTR	B	10.6	0.71	97	382	**F**	**205**	**1.4**	**592***	**751***
	WB LTR	A	2.1	0.62	1	4	D	40.5	0.99	237	551*
	NB LTR	B	18.7	0.34	16	48	B	14.8	0.16	6	33
	SB L	C	33.8	0.22	19	41	E	56.3	0.78	95	159
	SB TR	B	14.8	0.14	3	23	C	28.2	0.51	56	110
	Intersection	**A**	**6.8**	**0.41**			**F**	**133.8**	**0.77**		
Boylston Street / New Street	EB L	A	5.9	0.29	5	22m	A	3.7	0.31	9	9m
	EB T	A	3.9	0.46	62	196	B	14.9	0.56	103	89m
	WB TR	A	0.5	0.53	0	0	B	10.2	0.48	91	265
	SB LR	C	27.9	0.28	10	40	C	32.8	0.62	46	101
	Intersection	**A**	**2.6**	**0.39**			**B**	**13.5**	**0.49**		
Unsignalized Intersection	**Movement**	**AM Peak Hour**					**PM Peak Hour**				
		LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th	LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th
Boylston Street / Site Driveway 1 (50 ft East)	WB T	A	3.6	0	<1	<1	A	5.7	0	<1	<1
	WB L	C	19.1	0.08	<1	<1	D	25.9	0.13	<1	<1
	NB LR	**F**	**58.1**	0.03	<1	<1	**F**	**87.3**	0.09	<1	<1
Boylston Street / Site Driveway 2 (150 ft East)	WB T	A	0.8	0	<1	<1	A	1.6	0	<1	<1
	WB L	C	17.97	0.02	<1	<1	C	23.42	0.04	<1	<1
	NB LR	**F**	**54.7**	0.33	1	1	**F**	**124.9**	0.7	2	3
Kilmarnock Street / Site Driveway 3	SB T	A	0	0	<1	<1	A	0	0	<1	<1
	SB L	A	7.36	0	<1	<1	A	7.3	0	<1	<1
	WB LR	A	8.9	0.01	<1	<1	A	9.1	0.02	<1	<1

**Queue exceeds capacity*

m - Volume is metered by upstream signal

2.3.2 Build Condition

2.3.2.1 Site Access and Circulation

The proposed site conditions contrast markedly with existing conditions with relation to public right-of-way layout, vehicular access and circulation, curbside regulations, and pedestrian, bicycle and transit amenities. The current site is oriented to drive-thru fast food operations and event parking, leaving little amenity for walking, biking or transit use. On-street parking is impacted by two driveways on Boylston Street that also interrupt the walking environment and leave little waiting room before or after crossing Kilmarnock Street.

The proposed Project will entirely eliminate both driveways on Boylston Street and create a pedestrian, bicycle, and transit friendly environment compatible with the "Complete Streets" plan for Boylston Street, which includes wide sidewalks, bike racks, street trees, curb extensions, and more on-street parking to buffer the sidewalk from traffic. All vehicular access will be off of Kilmarnock Street at the current alleyway. The new garage ramp will access Kilmarnock Street immediately adjacent to the alleyway, minimizing the total distance needed to cross alley and driveway, while requiring only the removal of one on-street space on Kilmarnock Street. The reconstructed alleyway/driveway curb cut will cross the sidewalk at the elevation of the sidewalk, which prioritizes the pedestrian and promotes safer and slower vehicle operations.

2.3.2.2 Trip Generation

The following analysis uses ITE Trip Generation, 8th edition to determine trip generation rates for the proposed Project. Three ITE land use categories were used for the Project, and their corresponding trip rates are listed in Table 2-7.

Table 2-7 Trip Generation

ITE Class	Apartment (220)	Shopping Center (820)	High Turnover (Sit-Down) Restaurant (932)
	Trips per occupied dwelling:	Trips per 1,000 SF GLA:	Trips per 1,000 SF GFA:
Weekday	6.65	42.94	127.15
Saturday	6.39	49.97	158.37
AM Peak Hour*	0.51	1	11.52
PM Peak Hour*	0.62	3.73	11.15
*Peak hour of Adjacent Street Traffic			

As compared to the standard development used in ITE analyses, the study area has a very low driving rate. Thus, the following analysis uses BTD Area 4 mode split credits to accurately divide person trips amongst the modes of driving, bicycling and walking. The analysis also uses the 2010 average vehicle occupancy for Boston per the 2010 American Community Survey (1.1 vehicle occupancy) to convert vehicle trips to person trips. Finally, the site itself will have multiple uses and thus generate a certain rate of internal capture. To remain conservative, this analysis does not include internally captured trips, which would reduce vehicular trips to and from the site slightly from the numbers in Table 2-8.

For the Build analysis, the Boylston Street driveways and associated turning movements were removed from the network. The trips generated by the current Burger King and drive-thru were also removed from the network. However, to be conservative, the analysis recognizes that some trips associated with the current drive-thru are "pass-by" trips, meaning that they would otherwise already be on Boylston Street. Thus, the Build Condition assumes that 50% of the trips accessing the Boylston Street site driveways in the No Build scenario would remain on Boylston Street.

2.3.3 Trip Distribution and Assignment

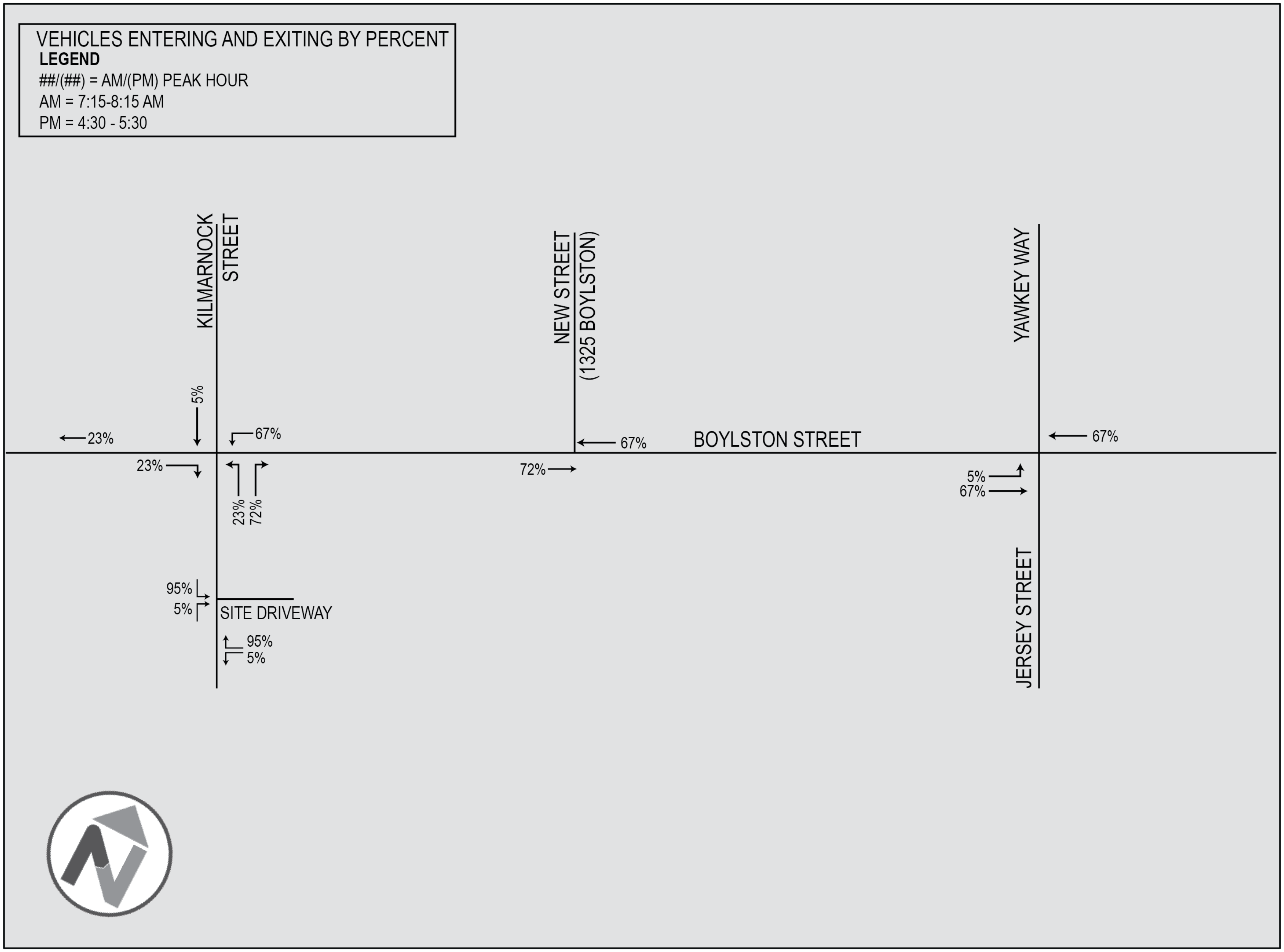
A Trip Distribution was developed—characterizing the overall split of person trips by mode and then assigning the vehicle trips to the network. As shown in Table 2-8, the majority of site trips for all uses and time periods are pedestrian trips (including bicycle trips as the BTD mode share data assumes both categories). A significant number of trips are transit trips, which also within the Study Area evaluated are essentially pedestrian trips as people would walk to access the nearest transit location.

To determine auto trips, person trips by automobile were re-calculated into vehicle trips using the same vehicle occupancy rate used to derive overall person trips. These auto trips were then assigned to the network using the directional distribution shown in Figure 2-10, which was derived from BTD's mode share guidelines which show vehicle trip percentages between the Fenway neighborhood and the rest of the Boston region. All site generated trips associated with the Project are assumed to use the site driveway on Kilmarnock Street, with the majority of trips directed towards Boylston Street (and away from the residential neighborhood). Most of these are travelling east (when exiting) or west (when entering) on Boylston Street connecting to the Charlesgate overpass. Figure 2-11 shows the net vehicle change by intersection movement in the a.m. and p.m. peak periods. Figure 2-11 includes the reduction in vehicle trips from the removal of the existing use, the reassignment of trips to the site driveway and the added vehicle trips generated by the Project. In general, in either peak period, the net vehicle trips form the site are less than 1% of overall Boylston Street volumes.

Table 2-8 Build Trip Generation and Mode Split

		Entering				Exiting				Total
		Apartment +	Shopping	+ Restaurant	ENTERING[1] TOTAL TRIPS	Apartment +	Shopping	+ Restaurant	EXITING TOTAL TRIPS	=TOTAL TRIPS
Daily avg mode shares										
	Auto	211	17	84	284	211	17	84	284	568
	Transit	167	10	47	223	167	10	47	223	446
	Walk	500	33	160	693	500	33	160	693	1387
AM peak mode shares										
	Auto	5	0	7	11	23	0	7	27	38
	Transit	6	0	5	11	16	0	3	20	31
	Walk	16	1	16	32	69	1	15	85	118
PM peak mode shares										
	Auto	22	1	8	29	11	1	5	16	45
	Transit	16	1	4	21	13	1	4	18	38
	Walk	68	3	18	90	34	3	12	49	138
Saturday Mode Shares										
	Auto	202	21	109	302	228	20	105	321	623
	Transit	160	11	58	229	194	11	58	263	493
	Walk	481	38	196	714	422	38	196	655	1369

[1] Note that Auto trips show the number of vehicle trips, derived by converting person trips to vehicle trips utilizing the average vehicle occupancy in Boston from the most recent American Community Survey.



1350 BOYLSTON STREET

Figure 2-10

Directional Distribution

Transportation

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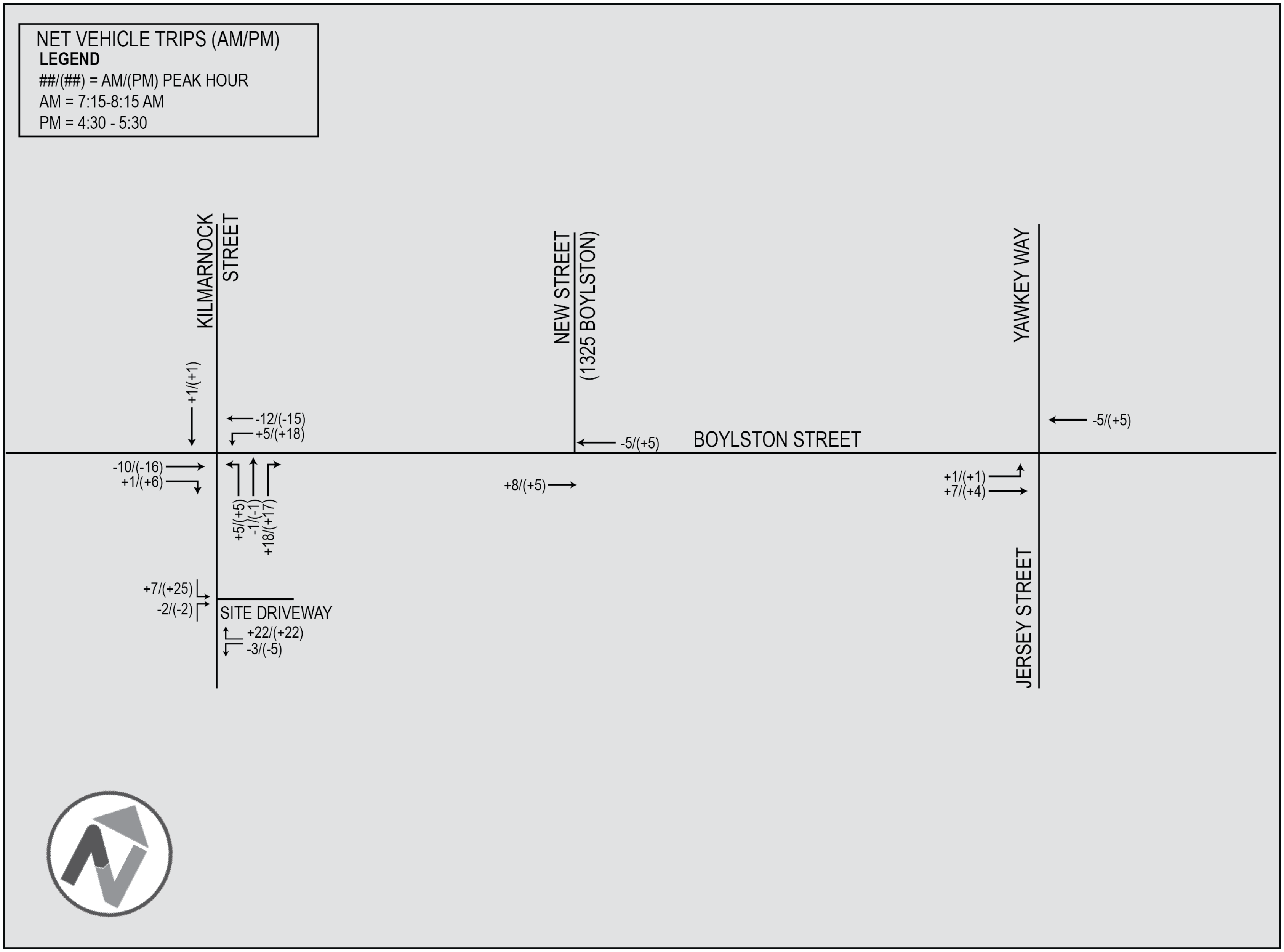
prepared by:
Nelson\Nygaard Consulting Associates



1350 BOYLSTON STREET

Figure 2-11

Net Vehicle Change

Transportation

SKANSKA

prepared by:
Nelson\Nygaard
Consulting Associates

2.3.3.1 Future Build Traffic Volumes

Using the 2020 No Build as basis, the 2020 Build Conditions network incorporates the proposed site plan and resulting traffic volumes into a new network for the a.m. and p.m. peak periods. By removing the existing Boylston Street site driveways, and making combined adjustments as described above, Figure 2-12 shows the resulting traffic volumes for the 2020 Build Condition. All Project trips are assumed to be using the site driveway on Kilmarnock Street. Given the relatively high volumes of vehicular traffic on Boylston Street, and low volumes generated by the Project, the Project adds no more than eight vehicles in one direction on Boylston Street in any scenario, or less than 1% of overall volume.

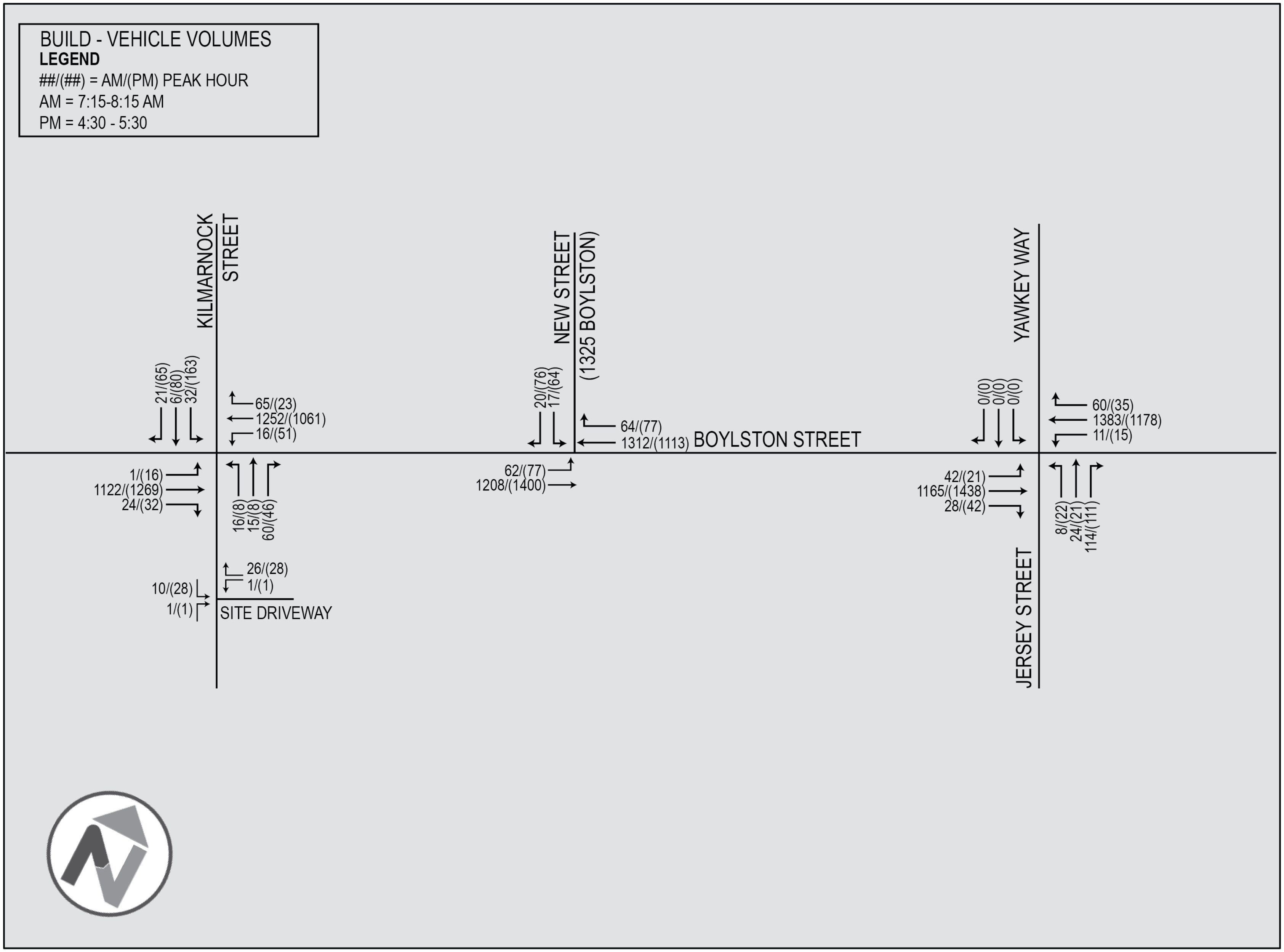
2.3.3.2 Future Build Capacity Analysis

The 2020 Build Condition Network was completed, and includes the removal of both Boylston Street site driveways. Using the City's Synchro model with the proposed Boylston Street reconstruction assumptions, the study area intersections, and the corresponding LOS, delay, volume to capacity ratio, and queues are summarized in Table 2-9. As with the No Build Condition, the Build Condition also includes the proposed signalized intersection of Boylston Street/New Street which is located between the Jersey and Kilmarnock streets intersections. The overall LOS at the New Street intersection is LOS B in the p.m., largely due to the metering associated with the adjacent traffic signals with which it is coordinated.

With the Boylston Street site driveways removed, operations on Boylston Street are improved, as the friction caused by westbound lefts (LOS C or D) is removed from the network. Moreover, the existing moves from the Boylston Street site driveways, which operated at LOS F in the No Build Condition, are also removed, with all existing site traffic leaving via Kilmarnock Street. The proposed Kilmarnock Street driveway operates at LOS A.

The northbound Kilmarnock Street approach shows a slight change from the No Build Condition (LOS B) to Build Condition (LOS C) in the a.m. peak, but with only a slight (1.6 second) increase in delay. All other intersections are essentially unchanged between the No Build and Build conditions.

With the added volumes in the No Build Condition, the Boylston Street site driveways from the Project site show significant increase in delays with all exiting moves operating at LOS F, and the westbound lefts all showing added delay in all scenarios moving from LOS B to LOS C or D in both peaks at each driveway.



1350 BOYLSTON STREET

Figure 2-12

Future Build Vehicle Volumes

Transportation

SKANSKA

prepared by:
Nelson\Nygaard Consulting Associates

Table 2-9 Future Build Capacity Analysis

Signalized Intersection	Movement	AM Peak Hour					PM Peak Hour				
		LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th	LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th
Boylston Street / Jersey Street / Yawkey Way	EB LTR	A	7.6	0.55	87	374	**F**	**128**	**1.23**	**351***	**783***
	WB LTR	B	15.3	0.76	258	491	B	16.6	0.57	247	372
	NB LTR	C	28.7	0.62	47	99	D	43.3	0.7	77	133
	Intersection	**B**	**12.6**	**0.64**			**E**	**76.2**	**0.83**		
Boylston Street / Kilmarnock Street	EB LTR	B	10.4	0.71	95	374	**F**	**208.3**	**1.4**	**592***	**751***
	WB LTR	A	2	0.62	1	1	E	55.8	1.00	237	551*
	NB LTR	C	20.3	0.37	19	52	B	13.8	0.23	6	33
	SB L	C	34.1	0.23	19	41	E	61.2	0.81	95	159
	SB TR	B	15.5	0.15	4	25	C	27.5	0.49	56	110
	Intersection	**A**	**6.7**	**0.42**			**F**	**124.9**	**0.79**		
Boylston Street / New Street	EB L	A	5.8	0.28	5	22m	A	3.8	0.31	9	9m
	EB T	A	3.9	0.46	62	197	B	16.8	0.56	103	90m
	WB TR	A	0.5	0.53	0	0	B	10.3	0.48	92	267
	SB LR	C	27.9	0.28	10	40	C	34.6	0.62	46	101
	Intersection	**A**	**2.6**	**0.39**			**B**	**14.6**	**0.49**		
Unsignalized Intersection	**Movement**	**AM Peak Hour**					**PM Peak Hour**				
		LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th	LOS	Delay	V/C	Queue (ft) 50th	Queue (ft) 95th
Boylston Street / Site Driveway 1 (50 ft East)	WB T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	WB L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	NB LR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boylston Street / Site Driveway 2 (150 ft East)	WB T	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	WB L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	NB LR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kilmarnock Street / Site Driveway 3	SB T	A	0	0	<1	<1	A	0	0	<1	<1
	SB L	A	7.37	0.01	<1	<1	A	7.3	0	<1	<1
	WB LR	A	8.8	0.03	<1	<1	A	9.1	0.02	<1	<1

**Queue exceeds capacity*

m - Volume is metered by upstream signal

2.3.3.3 Parking Supply and Demand

The Project is mostly residential and will include approximately 240 units available for rent. The expected market for these units is in keeping with the current demographics in the Fenway neighborhood which attracts a younger population that often strives to live car free for both personal cost and environmental sustainability reasons. Access to nearby jobs, amenities, public transportation and bicycle and pedestrian facilities are reasons many choose to live in the Fenway.

The Project will remove the existing 55 surface parking spaces on the site and will include two levels of underground parking with driveway access off of Kilmarnock Street. The two levels will support approximately 105 parking spaces which will be primarily for use by the residential tenants. Most of the units are studio and one bedroom, and a portion of them will be affordable units.

BTD's off-street parking guidelines seek a maximum parking ratio of 0.75 spaces per residential unit or 1,000 sf of non-residential development. The Project is proposing an aggressive transportation demand management program, which also includes the "unbundling" of parking from residential rents, leading to a lower demand for the provision of parking. With unbundling, parking spaces will be leased separately to building tenants at a monthly rate. The Project will provide spaces, per City policy, for a car-sharing vehicle and an electric vehicle charging station. These will be located in an easily accessible place within the parking garage and will be heavily marketed to building tenants in an effort to reduce car ownership. At this stage, it also anticipated that one space will be reserved for each of the commercial retail spaces incorporated in the Project. The approximately 105 parking spaces are anticipated to be provided as shown in Table 2-10.

Table 2-10 Parking Ratios

Use	Dimension	# of Spaces	Effective Parking Ratio
Proposed			
Retail	7,050 sf	2	0.28 spaces/ksf
Car Sharing		1	
Electric Vehicle		1	
Residential	240 units	101	0.42 spaces/unit
TOTAL		105	
Existing			
Fast Food with Drive Thru	*3,410 sf*	*55*	*16.13 spaces/ksf*
Net Change		50 spaces	

The garage will be accessed off Kilmarnock Street. All access control equipment will be provided on-site, and will be designed to ensure that all queuing occurs off the right-of-way. Appropriate safety controls will be installed at the driveway entrance to ensure pedestrian safety. Electronic access controls will likely be used, and several direct entries from the parking facility into the Project will be provided as shown in the Site Plan. The building will also be staffed on a 24-hour basis with management staff having the ability to manage the garage facility on an ongoing basis. Parking spaces that are not leased by building tenants may be made available to area residents/tenants at competitive lease rates as well. The Project will further post signs and enforce idling laws in the garage, at the loading facility and in the alley adjacent to the Project.

2.3.3.4 Service and Loading

A designated loading dock is provided at the rear of the site and will be accessed via the alleyway that spans the block between Kilmarnock and Jersey streets. All loading will be provided on-site through this facility, minimizing impacts on Boylston Street and the surrounding neighborhood. Access to the loading facility will be provided through the building lobby for the residential and retail uses. A trash room is located inside the building adjacent to the loading area, and will serve the entire building. Trash pickup will also occur through the loading facility. The loading dock provided is designed to accommodate WB-50 type vehicles, and the space will be sufficient for the vehicle to enter and exit the site using the alley for maneuvering space.

2.3.3.5 Bicycle Accommodations

Bicycling is a growing mode of transportation in Boston in general, and in the Fenway neighborhood in particular. With Hubway, Boston's shared bicycle parking program, a growing network of on-street bicycle facilities, and the Project's proximity to easily bikable jobs in the LMA, Back Bay, Downtown and Cambridge, bicycling will be an important component of tenants mobility needs. The proposed Boylston Street reconstruction plans include five-foot dedicated bicycle lanes in both directions for the length of Boylston Street in the Fenway neighborhood as well.

The Project is committed to providing storage and other accommodations for bicyclists to the level of demand. Secure, protected bicycle spaces will be provided in several locations within the parking garage in areas easily accessible to the garage ramps and building elevators. Spaces will be in access controlled rooms and designed to accommodate the parking requirements and tenant demand. Elevators are being designed to allow for bicycles, and hooks or other in-unit storage devices can be provided upon request in individual apartments. The Project is committed to meeting the City of Boston's Bicycle Parking Requirements, shown in Table 2-11, which are intended to encourage bicycling, promote physical exercise, and reduce energy use and emissions in keeping with overall City bicycling goals.

On-street bicycle spaces, whether on Boylston Street, Kilmarnock Street or in the Alley, will also be made available. With the wide sidewalks consistent with other developments in the area, there will be ample space to provide for bicycle parking, a Hubway station, or some combination thereof. The Boylston Street plan further includes an extended open space which adds sidewalk space and provides even greater ability to incorporate bicycling facilities as needed. The Project will work closely with the City and the Boylston Street reconstruction team to incorporate appropriately designed and located bicycle racks and storage on the street in a manner consistent with the overall design of the street.

Table 2-11 City of Boston Bicycle Parking Requirements

	BTD Requirement	Estimated Bicycle Parking Required
Apartments	1 secure/covered space per unit 1 outdoor/covered or outdoor/ open space per 5 units	240 secure/covered 48 outdoor
Retail	0.3 secure/covered spaces per ksf (min. 2 spaces) for employees 1 outdoor/covered or outdoor/ open space per 5,000 sq ft (min. 2 spaces) for patrons	3 secure/covered 2 outdoor
TOTAL		**243 secure/covered** **50 outdoor** **293 Total**

2.4 Transportation Mitigation Measures

The Project will continue to fulfill City and neighborhood goals of converting Boylston Street from a car dominated street with auto-centric uses into the vital heart of a mixed-use multimodal neighborhood. The Project will add to this evolving district by continuing the street wall, widening the pedestrian space on the sidewalks and removing driveways. The Project's residential and retail space are being developed in an urban walkable format that takes advantage of superior transit access, improved walking amenities, and growing bicycling popularity to continue to anchor this burgeoning district. The proposed Project will entirely eliminate both driveways on Boylston Street and create a pedestrian, bicycle, and transit friendly environment compatible with the "Complete Streets" plan for Boylston Street. Specific site improvements will include:

- Closing of the two site driveways on Boylston Street;
- Continuing the street wall with retail entries and the residential lobby;

- Providing a new, wide sidewalk on Boylston Street consistent with other developments in the area, greatly expanding the pedestrian space;

- Providing unified access off of Kilmarnock Street for the underground garage;

- Providing for off-street loading and trash service at a designated loading facility; and

- Working with the City to locate publicly available bicycle parking spaces on-street.

The Project is supportive of the City of Boston's efforts to reconstruct Boylston Street and will align its streetscape and sidewalk plan with that effort. The overall City of Boston plan for Boylston Street calls for a number of features to be implemented by the City by 2020, including:

- Expanded "Neckdowns" or curb extensions at all intersections to reduce pedestrian crossing distances, including one at the Kilmarnock Street intersection fronting the site;

- Wide sidewalks, including the area created by the building setback, with pedestrian amenities;

- Five-foot dedicated bicycle lanes in both directions;

- Bike boxes that enable safer left turns by bicyclists in both directions at Jersey Street/Yawkey Way, as well as at Kilmarnock Street;

- Bike boxes for those travelling eastbound at New Street and Ipswich Street;

- Sidewalk repairs west of Kilmarnock Street;

- A new intersection with "New Street," located midway between Kilmarnock Street to the west and Yawkey Way/Jersey Street to the east. This street would be an additional connection between Van Ness and Boylston streets that is planned to eventually connect across Brookline Avenue to Beacon Street;

- New environmentally sustainable landscaping; and

- New streetlighting.

Travel Demand Management (TDM) comprises a variety of strategies designed to reduce single-occupancy vehicle (SOV) travel and encourage "alternate modes" of transportation (public transit, walking, bicycling). As a primarily residential Project with apartment units targeted towards a younger, urban demographic, the Project intends to attract residents and tenants who rely primarily on non-auto travel for work, errands, and recreation. Nevertheless, the implementation of TDM programs is critical to helping ensure that residents, visitors and customers can meet their mobility needs using the variety of transportation options available in the Fenway neighborhood. The Project intends to adopt the following measures and programs to benefit their residents, and the Fenway neighborhood, while reducing vehicular traffic and potential environmental impacts.

Programmatic

- Provide information on travel alternatives onsite and with lease information;
- Designate an on-site transportation coordinator;
- Encourage the use of non-auto modes for residents, employees and visitors;
- Work with area developments on transportation issues including investigating joining the Transportation Management Association (TMA); and
- Post signs and enforce idling laws at loading facility and in alley.

Parking

- "Unbundle" the cost of parking spaces from residential lease rates to reduce parking demand;
- Provide for a car-sharing space within the garage;
- Provide space for an electric vehicle charging station in the garage;
- Encourage tenants to carpool/vanpool; and
- Potential to offer unleased parking to area residents/tenants at a monthly rate.

Public Transportation

- Provide a free monthly MBTA pass for the first month for each new lease; and
- Work with the MBTA to enroll tenants and employees in monthly pass programs.

Pedestrian/Bicycle

- Provide free on-site bicycle parking for residents, employees and visitors;
- Provide an attractive sidewalk along the Boylston Street frontage to continue the dynamic growth on Boylston Street; and
- Work with the City of Boston to determine demand for and locate a Hubway station nearby as appropriate.

2.5 Conclusions

Overall, the Project will continue to fulfill City and neighborhood goals of converting Boylston Street from a car dominated street with auto-centric uses into the vital heart of a mixed-use multimodal neighborhood in the following ways:

- Removing two driveways from Boylston Street;
- Removing surface parking, and game day event parking from the overburdened Fenway neighborhood;
- Removing a fast food with drive-thru;
- Providing a continual, lively street wall with ground level retail and an attractive residential lobby along a widened sidewalk, achieved through setting the building back from the lot line;
- Supporting the City's plans for the "Complete Streets" reconstruction of Boylston Street;
- Demonstrating minimal change in traffic conditions from the proposed No Build Condition, and adding a negligible (less than 1%) amount of vehicular traffic to overall peak volumes on Boylston Street;
- Ensuring that all loading and service activity occur onsite;
- Providing ample bicycle parking both on-site and on-street for public use;
- Pursuing an aggressive transportation demand management program designed to support tenants non-auto travel choices; and
- Providing "unbundled" on-site parking to meet building demand.

Chapter 3.0

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW COMPONENT

3.1 Wind

3.1.1 Introduction

Rowan Williams Davies & Irwin Inc. (RWDI) conducted a pedestrian wind study for the proposed Project. The purpose of the study was to assess the wind environment around the development in terms of pedestrian comfort and safety. This objective was achieved through a detailed quantitative assessment involving wind tunnel testing of a 1:300 scale model of the proposed Project.

The model was constructed based on information provided by the Proponent. The criteria recommended by the BRA were used in this study.

The results of the wind tunnel simulations show that with the other proposed projects in the vicinity of the Project constructed, the Project will have minimal impact on the surrounding pedestrian level wind conditions.

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 and a 3D model of the proposed development and surroundings provided by the design team. The following conditions were simulated:

- No Build Condition: includes the current site and all existing surrounding buildings;
- Build Condition: includes the proposed development and all existing surroundings; and,
- Full Build Condition: includes the proposed development, all existing, proposed and future surroundings.

As shown in Figures 3.1-1 to 3.1-3, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1,200 foot radius of the Project site. The mean speed profile and turbulence of the natural wind approaching the modeled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 74 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full scale height of five feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. The results were then combined with long term meteorological data, recorded during the years 1981 to 2011 at Boston's Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year.

Figures 3.1-4 to 3.1-6 present "wind roses" summarizing the annual and seasonal wind climates in the Boston area, based on the data from Logan Airport. The wind roses, in Figures 3.1-4 and 3.1-5, are based on all observed wind readings for the given season. The left-hand side wind rose in Figure 3.1-4, for example, summarize the spring (March, April, and May) wind data. In general, the prevailing winds are from the west-northwest, northwest, west and southwest. In the case of strong winds, however, the most common wind direction is northwest and west.

On an annual basis (Figure 3.1-6) the most common wind directions are those between southwest and northwest. These are also the dominant directions for strong winds. Winds from the east and east-southeast are also relatively common.

This study involved state of the art measurement and analysis techniques to predict wind conditions in the vicinity of the Project. 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 one-hour mean wind speed exceeded one percent of the time (i.e., the 99-percentile mean wind speed). They are as follows:

BRA Mean Wind 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.

3.1.5 Test Results

Table 1 in Appendix C presents the mean and effective gust wind speeds for each season as well as annually. Figures 3.1-7 to 3.1-12 graphically depict the wind conditions at each wind measurement location based on the annual winds. Typically the summer and fall

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

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 No Build Condition

A wind comfort categorization of walking is considered appropriate for sidewalks. Lower wind speeds conducive to standing are preferred at building entrances. As shown in Figure 3.1-7, most locations were suitable for walking or better, annually. Five off-site locations were however found to experience mean wind speeds that would be uncomfortable on an annual basis: on Boylston Street (Locations 11, 15 and 23); at the intersection of Van Ness and Kilmarnock streets (Location 38); and at the intersection of Peterborough and Jersey streets (Location 66). The annual effective gust criterion is predicted to be met at all locations (see Figure 3.1-10).

3.1.5.2 Build Condition

Grade Level On-site (Locations 1 through 10)

Wind speeds at most locations are predicted to be comfortable for walking or better on an annual basis. Winds at the north entrances to the proposed building are predicted to be comfortable for sitting, which is ideal (Location 9 in Figure 3.1-8). Winds at the southwest residential entrance are seen to be conducive to walking (Location 5 in Figure 3.1-8), while those at the northwest retail entrance were uncomfortable (Location 7 in Figure 3.1-8). Winds at Location 7 marginally exceeded the effective gust criterion, by 1 mph, on an annual basis (Figure 3.1-11).

Additional measures may be studied as the design progresses for Location 7 to possibly improve the wind conditions in this location. Note that in the Full Build Condition, Location 7 is suitable for walking and the gust wind criterion is not exceeded.

Grade Level Off-site (Locations 11 through 66)

Wind conditions at most off-site locations are predicted to be comfortable for walking or better, which is appropriate for sidewalks. Improvements in wind comfort conditions are predicted to the east of the Project site with the addition of the proposed building. Winds that were categorized as uncomfortable to the northeast of the Project site in the No Build Condition (Location 11) improved to being comfortable for sitting. A new uncomfortable location is predicted at the intersection of Boylston and Kilmarnock streets (Location 22 in Figure 3.1-8 and Table 1 in Appendix C), as mean wind speeds (21 mph) were found to be slightly higher than the criterion for walking (19 mph). Overall, wind comfort conditions at most locations around the proposed site either improved or remained unchanged with the addition of the new building.

All off-site locations are predicted to meet the annual effective gust criterion as shown in Figure 3.1-11.

Podium Level (Locations 67 through 74)

A comfort categorization of sitting or standing is desired at terraces that will be frequented by building occupants for passive activities. Mean wind speeds at the west terrace and along the east border of the tower (Locations 67 through 69 in Figure 3.1-8) are predicted to be conducive to walking on an annual basis, with wind speeds at the northwest corner of the east terrace (Location 70) being uncomfortable on an annual basis. These areas are affected by the predominant northwesterly winds that are intercepted by the tall tower and downwashed on to the podium level terraces. Winds at the remaining podium area are predicted to be comfortable for sitting or standing on an annual basis.

All locations are expected to meet the annual effective gust criterion (Figure 3.1-11). Wind conditions on the podium will continue to be analyzed as the design progresses to provide suitable conditions for these outdoor areas.

3.1.5.3 Full Build Condition

Grade Level On-site (Locations 1 through 10)

In the Full Build Condition, wind activity on an annual basis at all but one location on-site is predicted to be comfortable for sitting or standing, which is ideal (see Figure 3.1-9). Mean wind speeds near the northwest retail entrances (Location 7) are seen to be conducive to walking on an annual basis; this condition may be studied further as the design progresses to possibly improve the wind conditions at this location. The annual effective gust criterion is predicted to be met at all locations in the Full Build condition.

Grade Level Off-site (Locations 11 through 66)

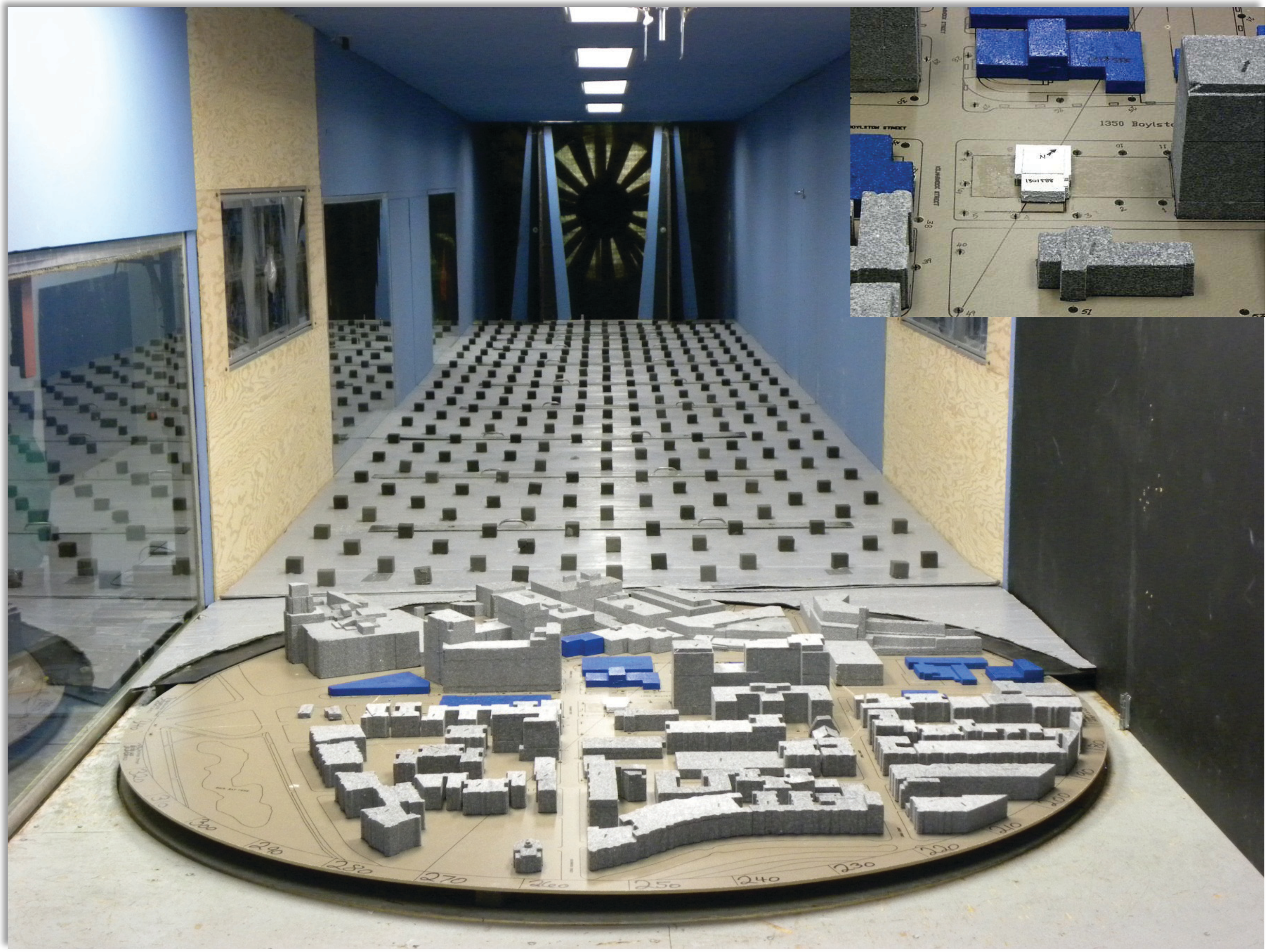
With the addition of the future developments, mean wind speeds on an annual basis at most locations around the Project site are predicted to be comfortable for walking or better with a majority of them comfortable for sitting (see Figure 3.1-9). Marginally uncomfortable winds are predicted at the intersection of Brookline Avenue and Kilmarnock Street (Location 37 in Figure 3.1-9), which is not likely to be the result of the placement of the proposed Project. The north corner of the intersection of Van Ness and Kilmarnock streets is predicted to remain uncomfortable for walking (Location 38). The placement of the future developments mitigated the uncomfortable wind conditions at the intersection of Boylston and Kilmarnock streets predicted for Build Condition (Locations 22 and 23 in Figures 3.1-8 and 3.1-9). The gust criterion is predicted to be exceeded at one location, but not likely due to the proposed Project (see Figure 3.1-12).

Podium Level (Locations 67 through 74)

Mean wind speeds, on an annual basis at all but one location on the podium terraces are predicted to be comfortable for sitting or standing. Wind activity at the northwest corner of the east terrace (Location 70 in Figure 3.1-9) is predicted to be conducive to walking. Wind conditions on the podium will continue to be analyzed as the design progresses to provide suitable conditions for these outdoor areas.

3.1.6 Conclusion

With the Project and the construction of other proposed projects in the vicinity, the pedestrian level wind conditions at the locations studied are predicted to be suitable for walking or better at all but three locations. In the Full Build Condition, three locations are predicted to be Uncomfortable, one that is Uncomfortable in the No Build Condition, and two that will be Uncomfortable but not likely due to the proposed Project. In the Full Build Condition, the gust criterion is predicted to be exceeded at one location; again, not likely due to the proposed Project.



1350 BOYLSTON STREET

Figure 3.1-1

No Build

Wind Tunnel Study

SKANSKA

prepared by: RWDI

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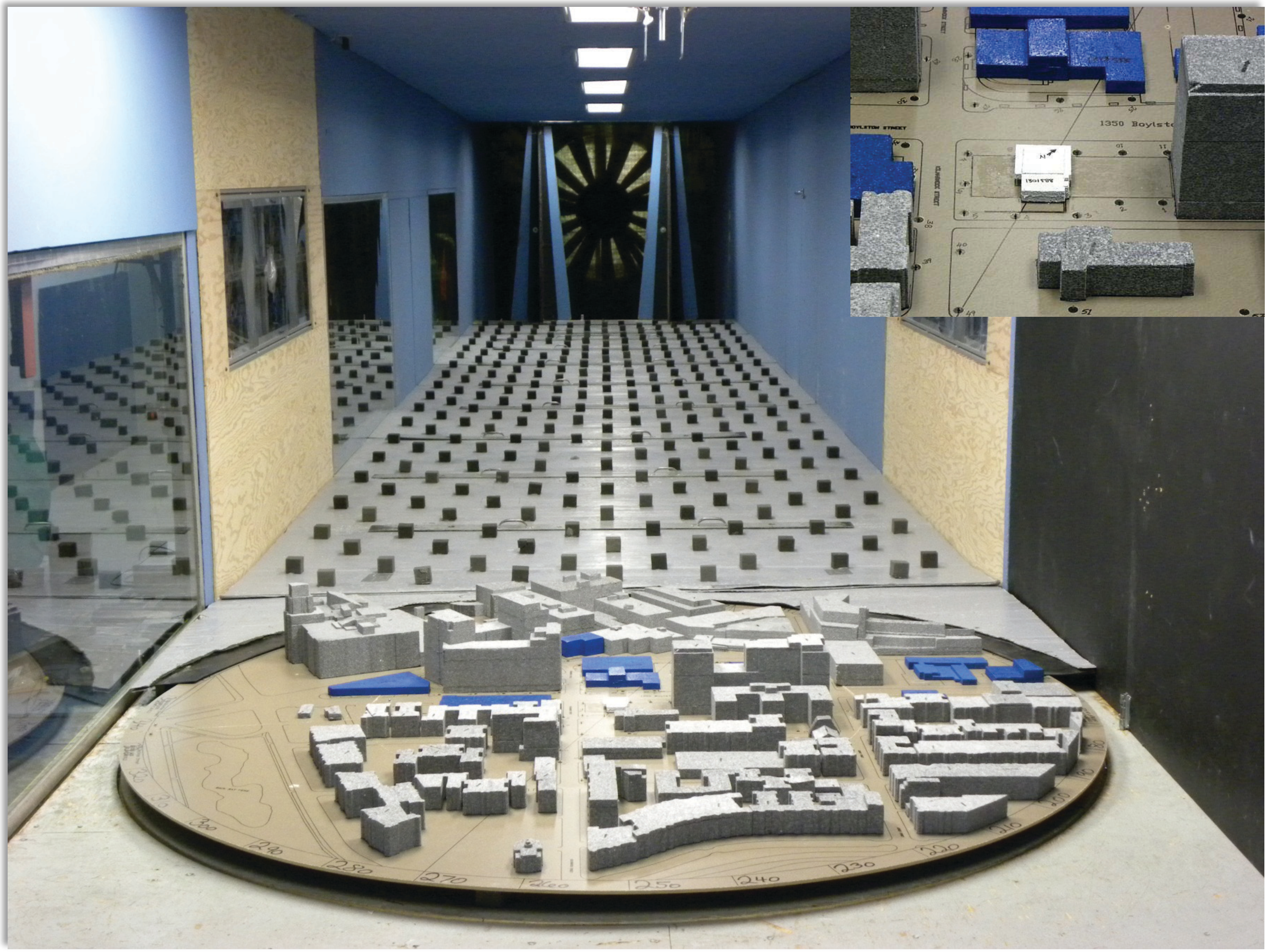

Figure 3.1-2

Build
Wind Tunnel Study

SKANSKA

prepared by: RWDI

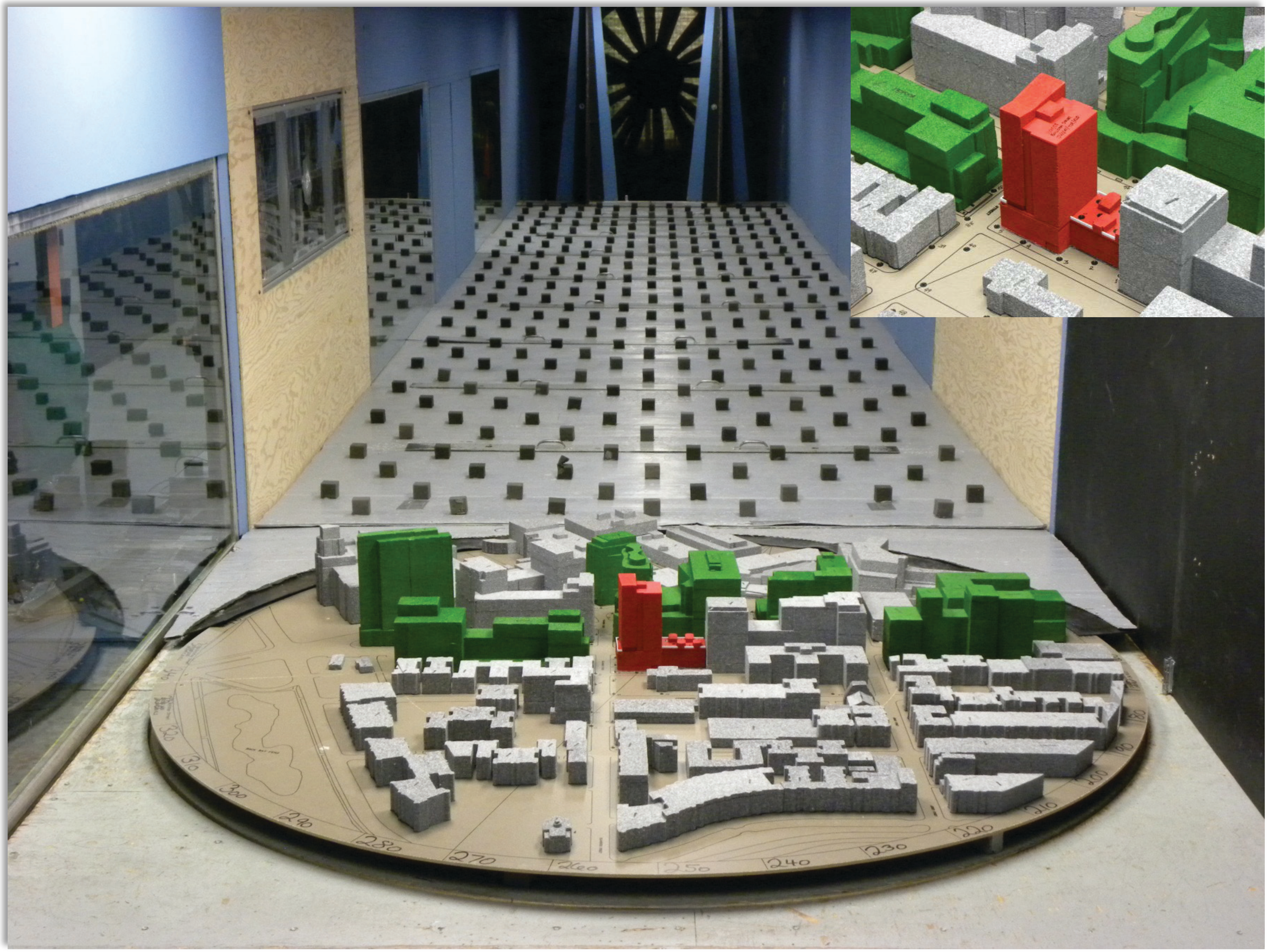

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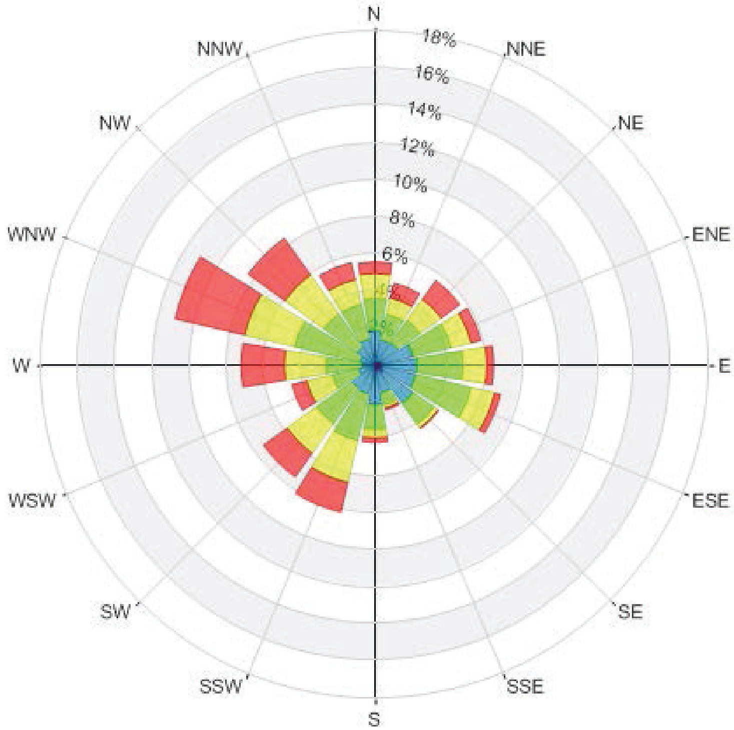
Figure 3.1-3

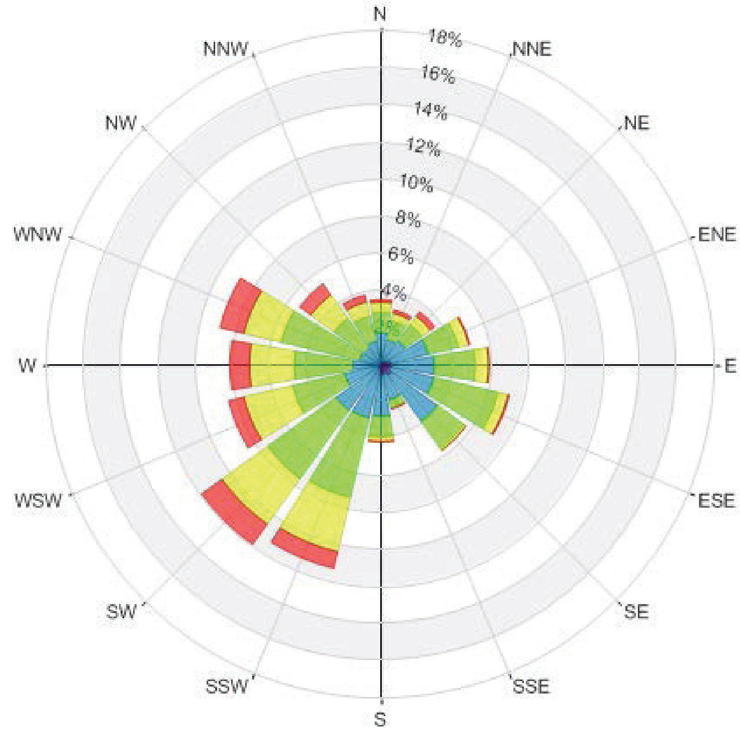
Full Build
Wind Tunnel Study

SKANSKA

prepared by: RWDI



Spring
(March - May)



Summer
(June - August)

Wind Speed (mph)	Probability (%) Spring	Summer
Calm	1.7	1.8
1-5	3.5	4.6
6-10	22.5	30.3
11-15	31.5	36.4
16-20	23.0	19.5
>20	17.8	7.4

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Figure 3.1-4

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1981-2011)

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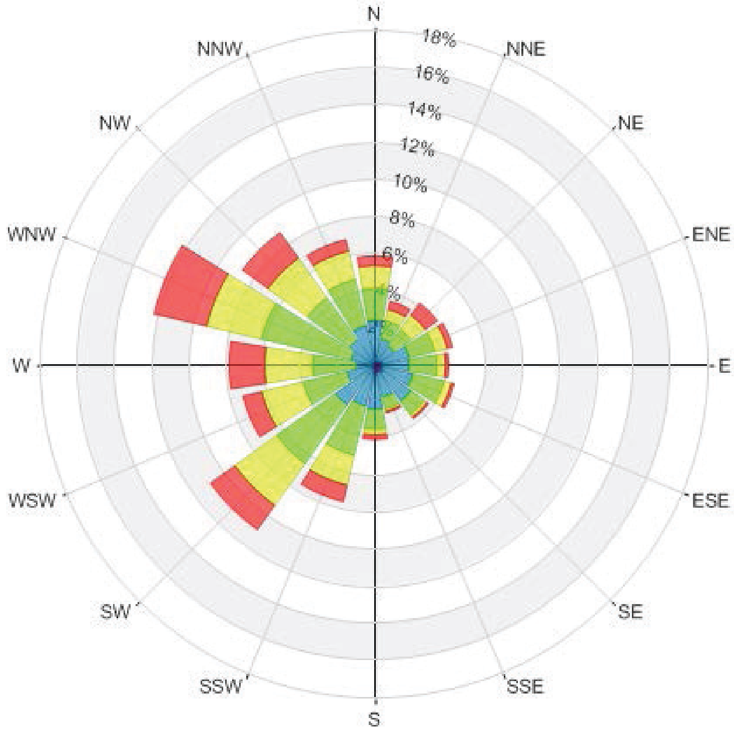
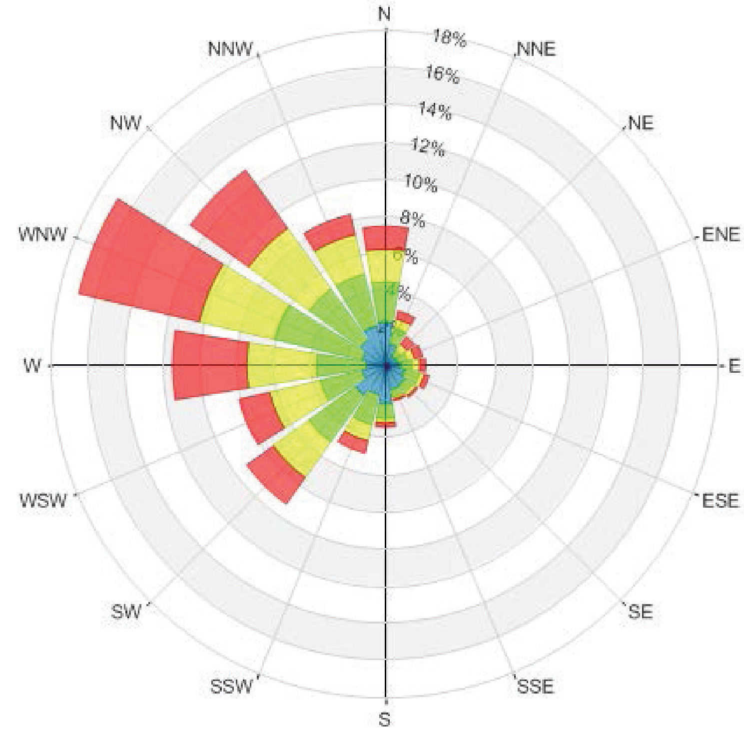


Fall
(September - November)



Winter
(December - February)

Wind Speed (mph)	Probability (%) Fall	Winter
Calm	1.9	1.5
1-5	4.1	3.0
6-10	26.3	19.8
11-15	32.7	27.7
16-20	21.4	24.6
>20	13.5	23.4

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Figure 3.1-5

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1981-2011)

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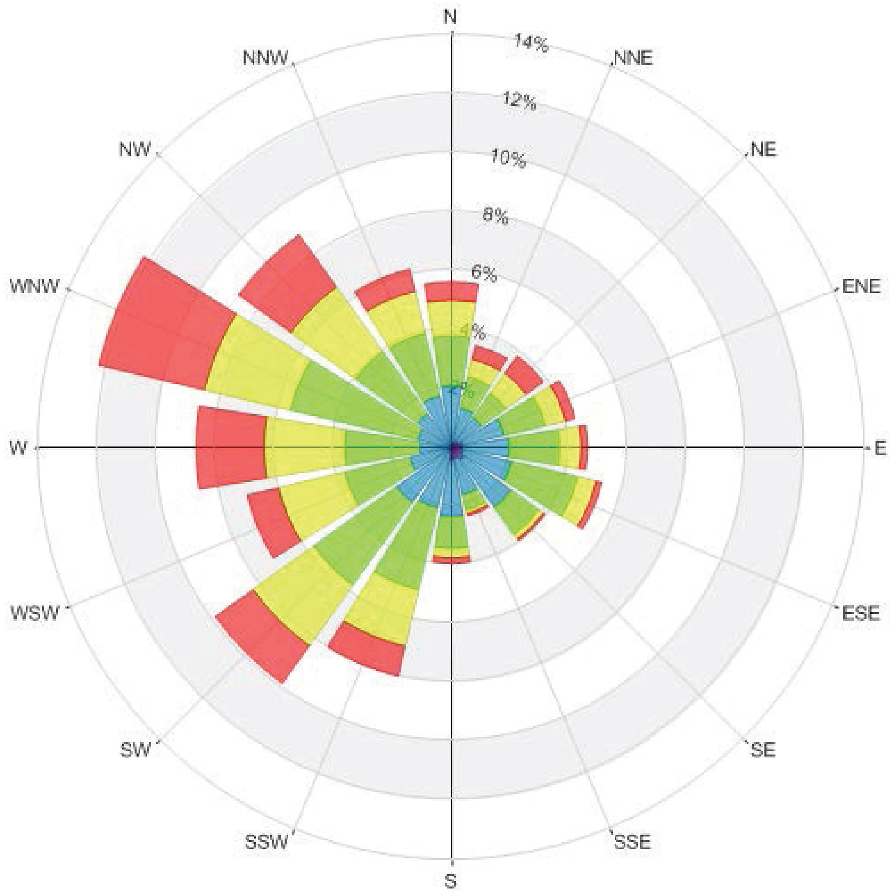

Annual Winds

	Wind Speed (mph)	Probability (%)
	Calm	1.7
	1-5	3.8
	6-10	24.7
	11-15	32.1
	16-20	22.1
	>20	15.5

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Figure 3.1-6

Directional Distribution (%) of Winds (Blowing From) Boston Logan International Airport (1981-2011)

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prepared by: RDWI

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Figure 3.1-7
Pedestrian Wind Conditions
Mean Speed - No Build
Annual (January to December, 1:00 to 24:00)

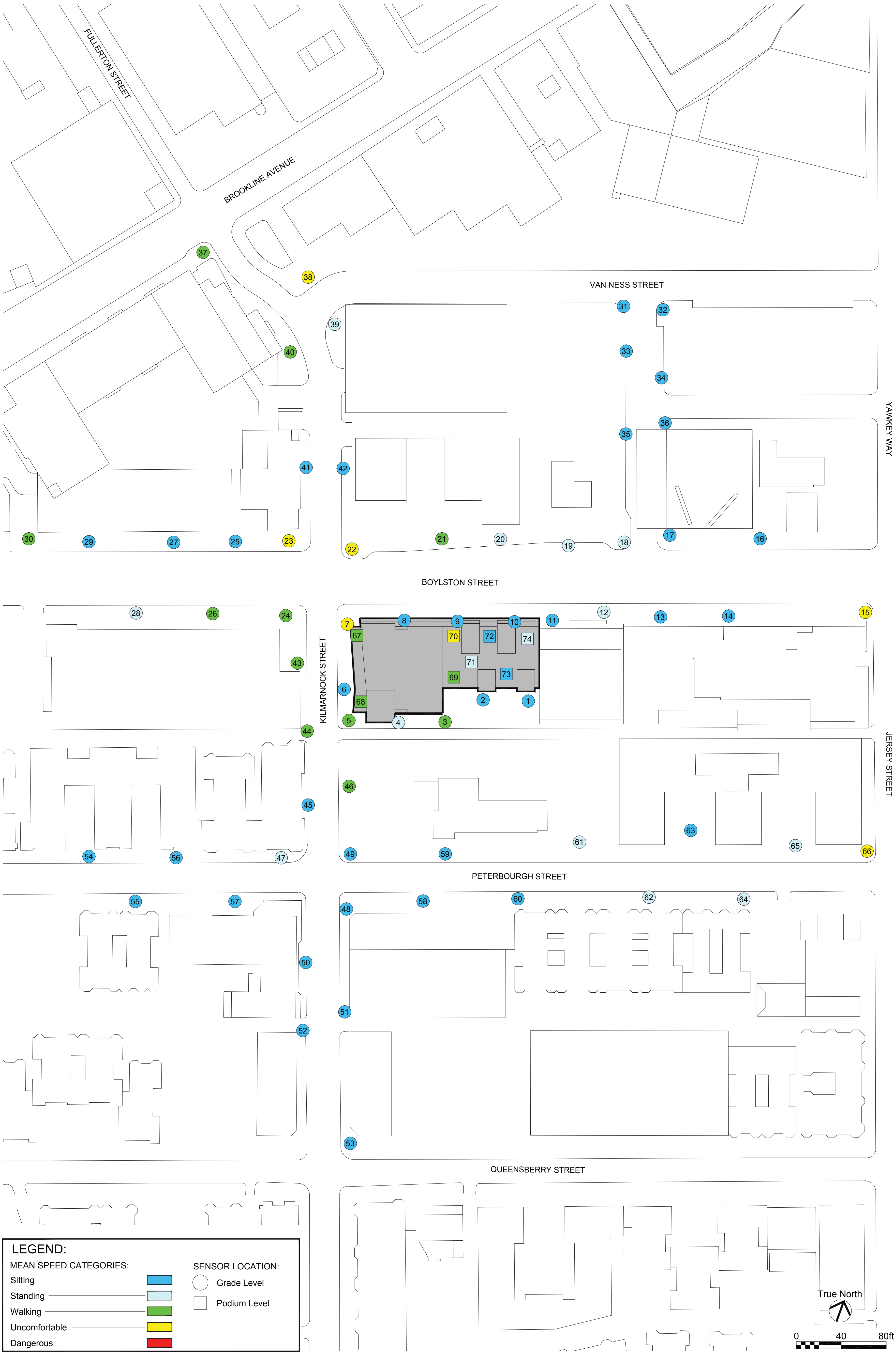

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Figure 3.1-8
Pedestrian Wind Conditions
Mean Speed - Build
Annual (January to December, 1:00 to 24:00)

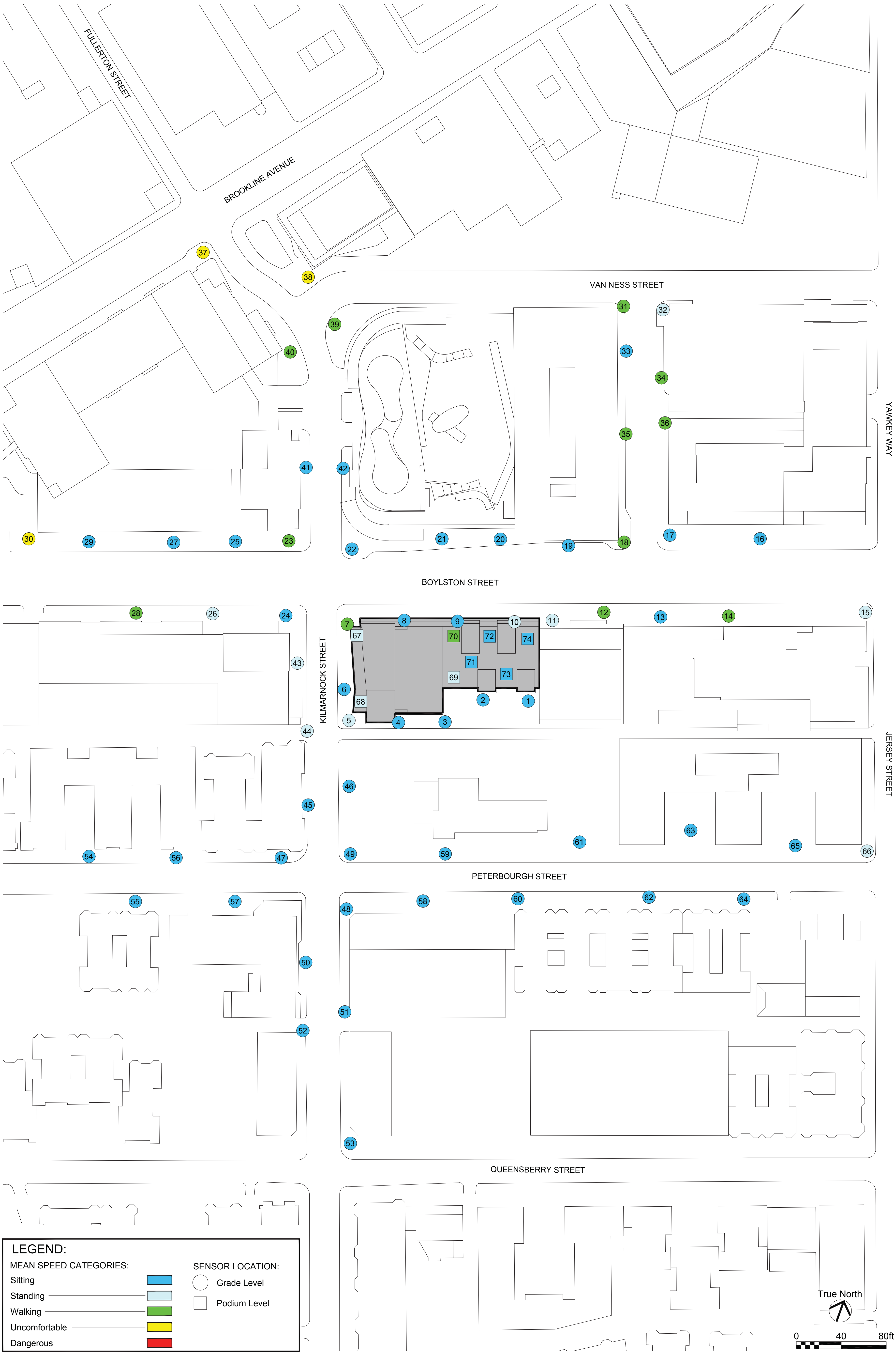

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Figure 3.1-9
Pedestrian Wind Conditions
Mean Speed - Full Build
Annual (January to December, 1:00 to 24:00)

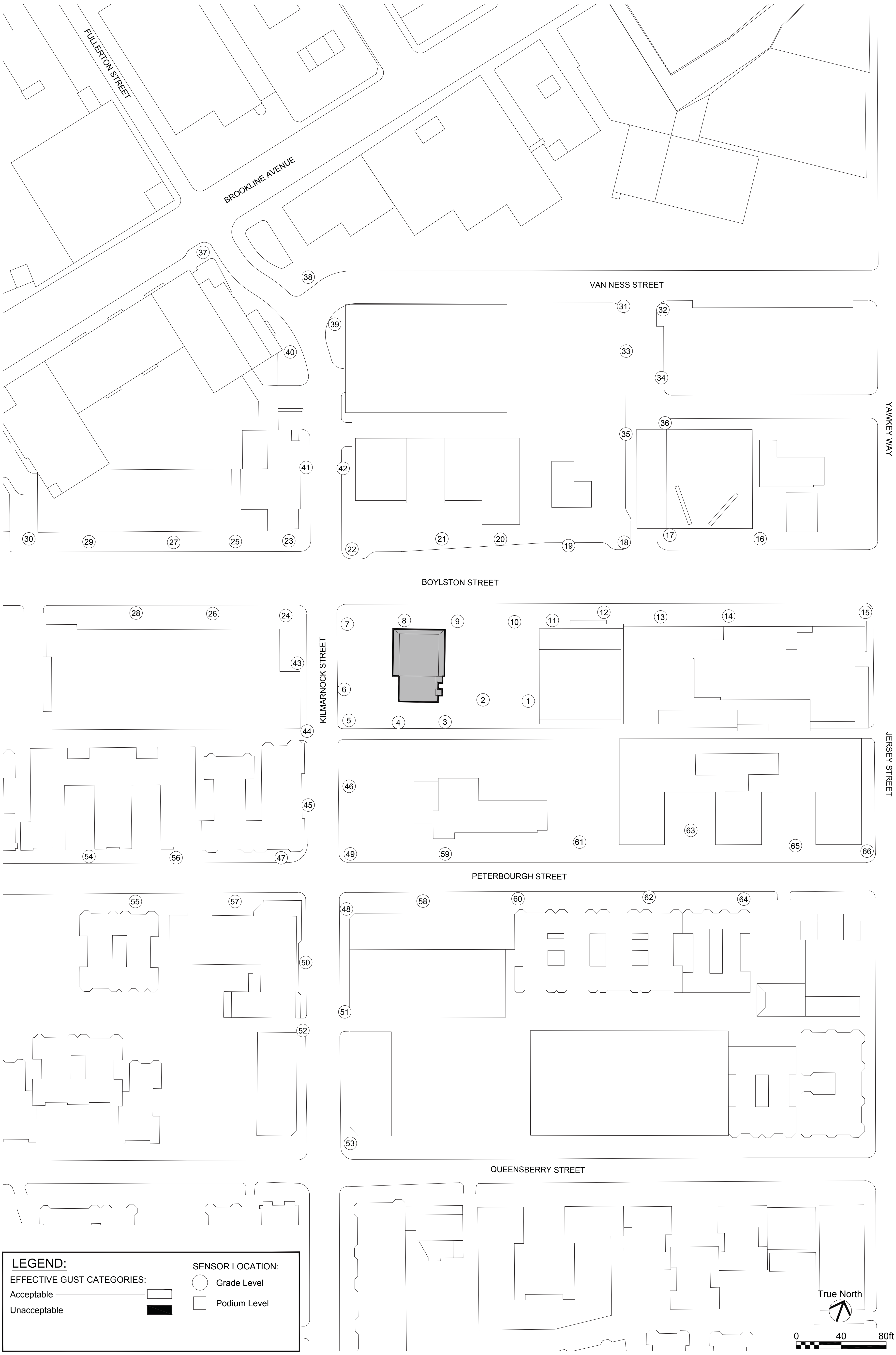

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Figure 3.1-10
Pedestrian Wind Conditions
Mean Speed - No Build
Annual (January to December, 1:00 to 24:00)

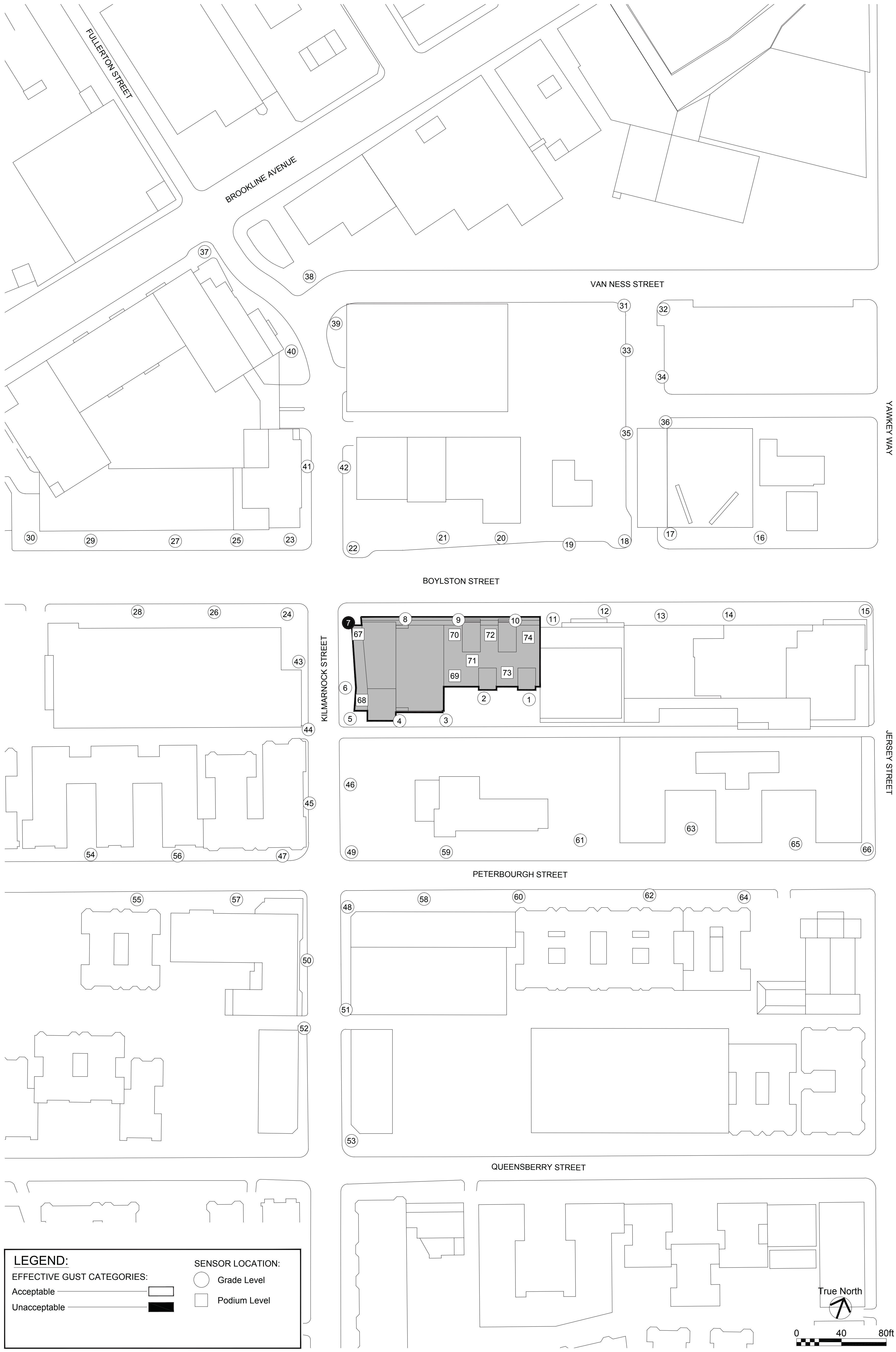

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Figure 3.1-11
Pedestrian Wind Conditions
Mean Speed - Build
Annual (January to December, 1:00 to 24:00)

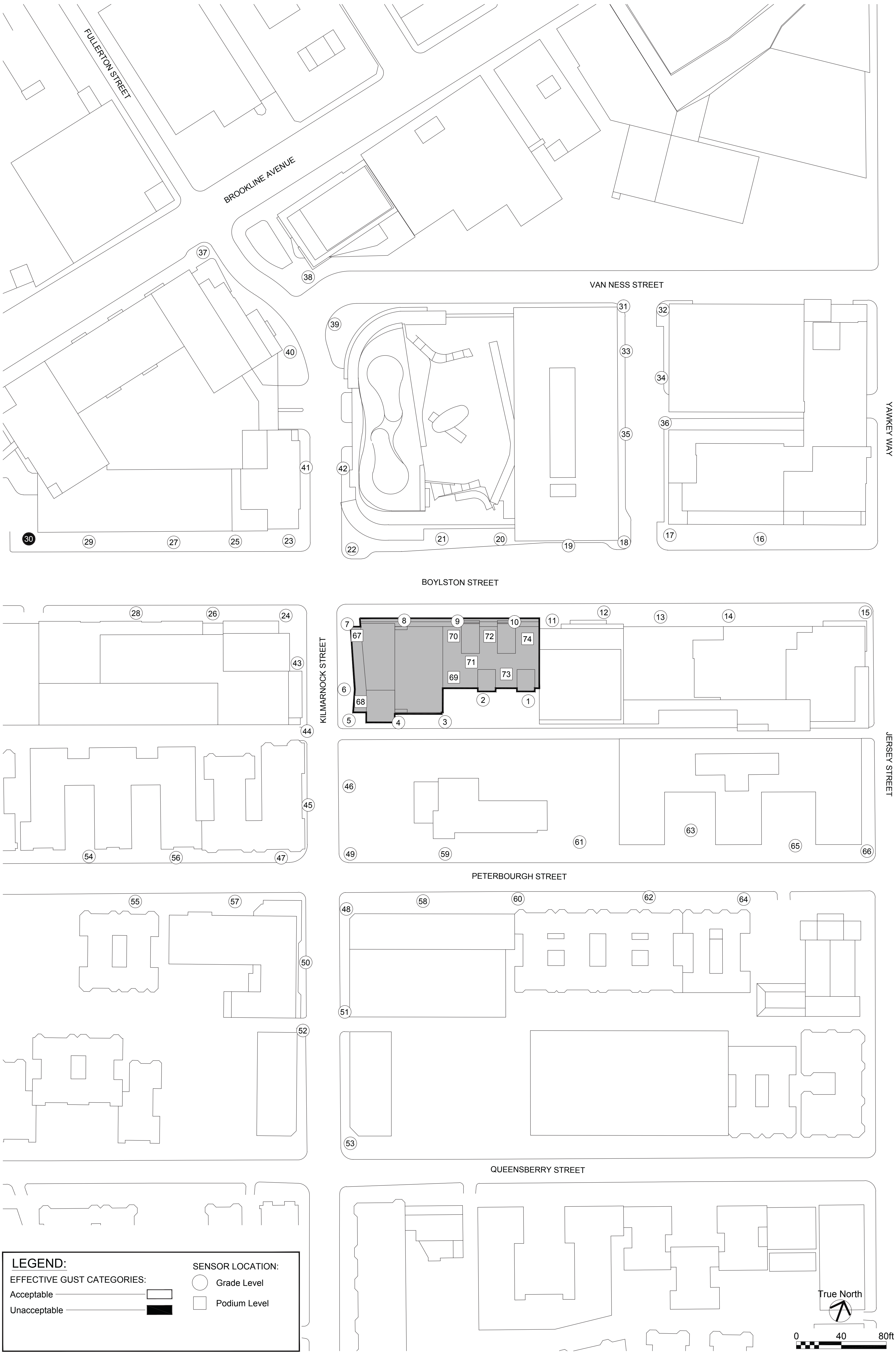

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Figure 3.1-12
Pedestrian Wind Conditions
Mean Speed - Full Build
Annual (January to December, 1:00 to 24:00)

3.2 Shadow

3.2.1 Introduction and Methodology

As is typically required by the BRA, a shadow impact analysis was conducted to investigate shadow impacts from the Project during three time periods (9:00 a.m., 12:00 noon, and 3:00 p.m.) during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and the winter solstice (December 21). Due to the change in legislation regarding Daylight Saving Time, the shadow impacts from the vernal equinox (March 21) and the autumnal equinox would be virtually the same. In addition, shadow studies were conducted for the 6:00 p.m. time period during the summer solstice and autumnal equinox.

The shadow analysis presents net new shadow from the buildings, as well as the existing shadow, and illustrates the incremental impact of the Project. The analysis focuses on public open spaces, major pedestrian areas, bus and subway stops, and the sidewalks adjacent to and in the vicinity of the Project site. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 3.2-1 to 3.2-14 at the end of this section.

The analysis shows that the Project's impacts will generally be limited to the surrounding streets and sidewalks. No new shadows will be cast onto nearby bus stops or open spaces.

3.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow from the Project will be cast to the northwest onto a portion of Boylston Street and its northern and southern sidewalks, and a portion of Kilmarnock Street and its eastern and western sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 12:00 p.m., new shadow will be cast to the north onto a portion of Boylston Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of Boylston Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

3.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow from the Project will be cast to the northwest onto a portion of Boylston Street and its northern and southern sidewalks, and a portion of Kilmarnock Street and its eastern and western sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 12:00 p.m., new shadow will be cast to the north and will be limited to a portion of Boylston Street and its southern sidewalk. No new shadow will be cast onto nearby bus stops or open spaces.

At 3:00 p.m., new shadow will be cast to the east. New shadow will be limited to the Project site and small portions of Boylston Street's southern sidewalk. No new shadow will be cast onto nearby bus stops or open spaces.

At 6:00 p.m., new shadow will be cast to the southeast onto a small portion of Peterborough Street and its northern and southern sidewalks, as well as the McKinley Preparatory High School parking lot and basketball court. No new shadow will be cast onto bus stops or other open spaces.

3.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, new shadow from the Project will be cast to the northwest onto a portion of Boylston Street and its northern and southern sidewalks, and a portion of Kilmarnock Street and its eastern and western sidewalks. No new shadow will be cast onto nearby bus stops or open space.

At 12:00 p.m., new shadow will be cast to the north onto a portion of Boylston Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of Boylston Street, its southern sidewalk, and a minor portion of its northern sidewalk. No new shadow will be cast onto nearby bus stops or open space.

At 6:00 p.m., most of the area is under existing shadow. New shadow will be cast to the southeast onto a small portion of the Back Bay Fens. No new shadow will be cast onto other nearby bus stops or open spaces.

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 in urban areas to elongate and be cast onto large portions of the surrounding area.

At 9:00 a.m., new shadow will be cast to the northwest onto a portion of Boylston Street and its northern and southern sidewalks, a portion of Kilmarnock Street and its eastern and western sidewalks, and a small portion of Brookline Avenue and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or open space.

At 12:00 p.m., new shadow will be cast to the northeast onto a portion of Boylston Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or open spaces.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of Boylston Street and its northern and southern sidewalks, and a portion of Van Ness Street and its northern sidewalk. No new shadow will be cast onto nearby bus stops or open space.

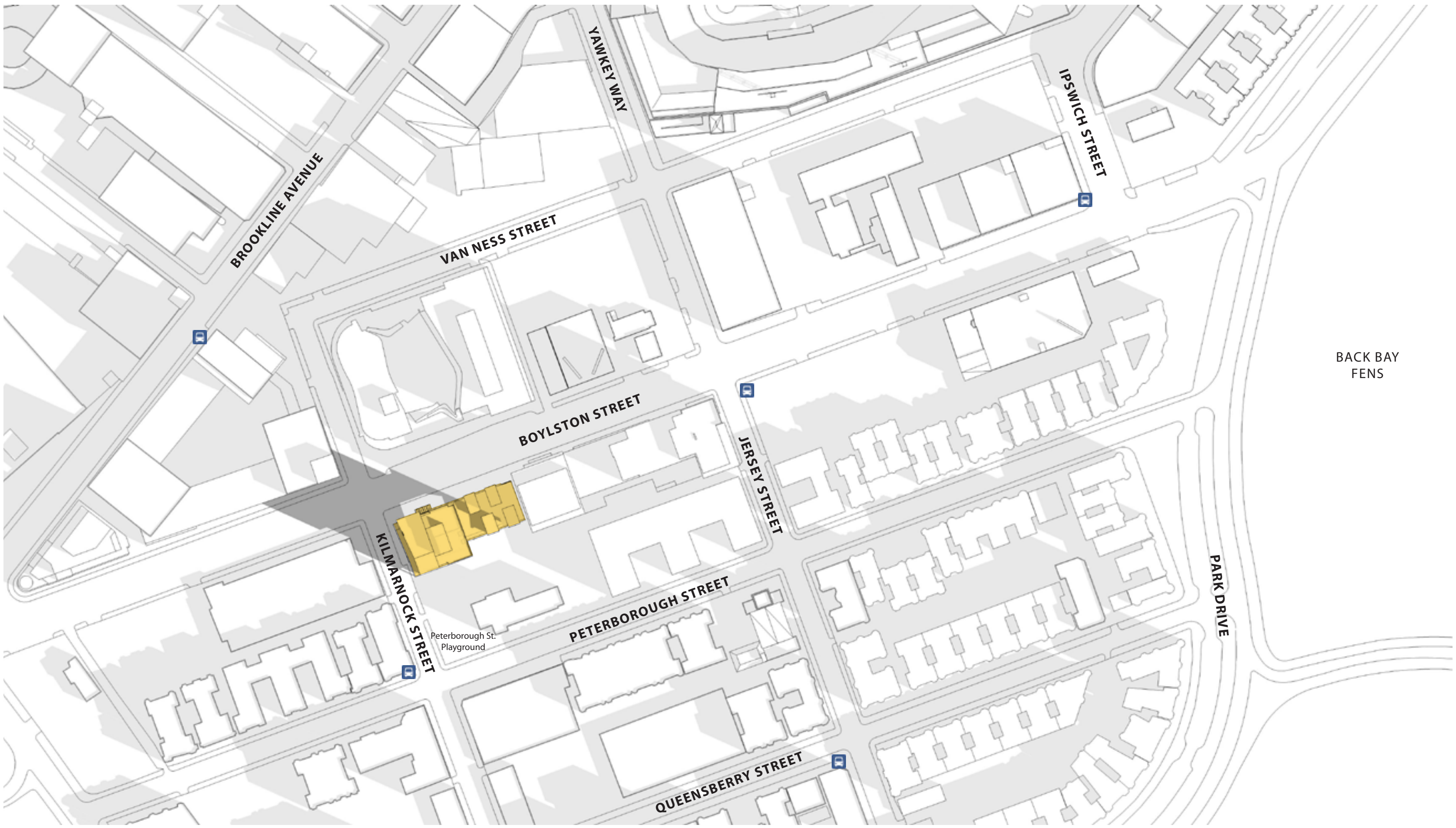
3.2.6 Conclusions

The shadow impact analysis looked at net new shadow created by the Project during fourteen time periods. New shadow will generally be limited to the immediately surrounding streets and sidewalks. During 12 of the 14 time periods studied, no new shadow will be cast onto nearby open spaces. During one of the fourteen time periods, September at 6:00 p.m., a small new shadow will be cast onto the Back Bay Fens. During one time period, June 21 at 6:00 p.m., new shadow will be cast onto the McKinley Preparatory High School basketball court. No new shadow will be cast onto nearby bus stops during the time periods studied.

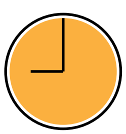
1350 BOYLSTON STREET

Figure 3.2-1

Shadow Studies 3/21 - 9am



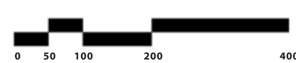
March 21st



9AM

EXISTING SHADOW

NEW SHADOW



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prepared by: ADD Inc

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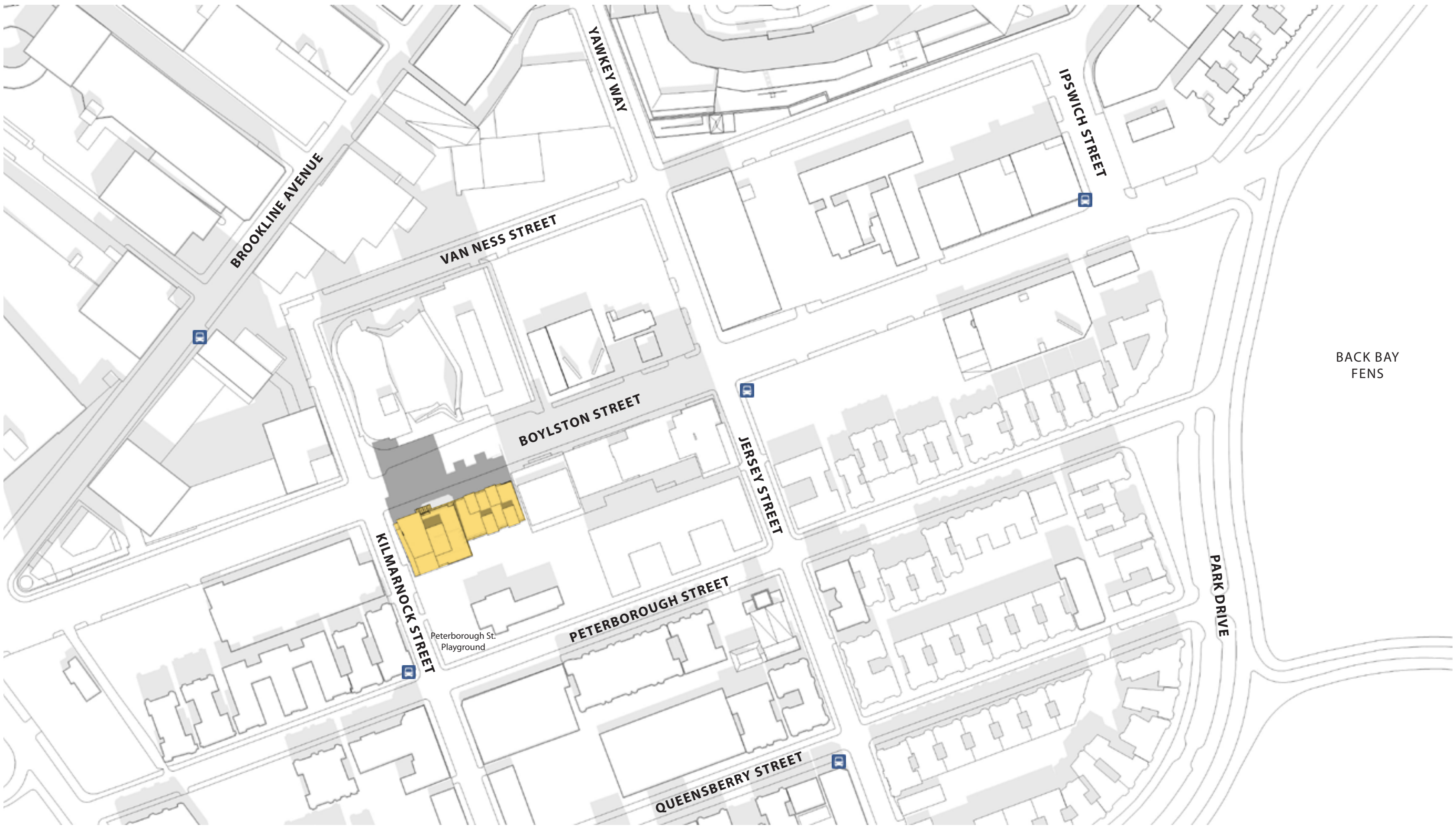
Figure 3.2-2

Shadow Studies 3/21 - 12pm



March 21st

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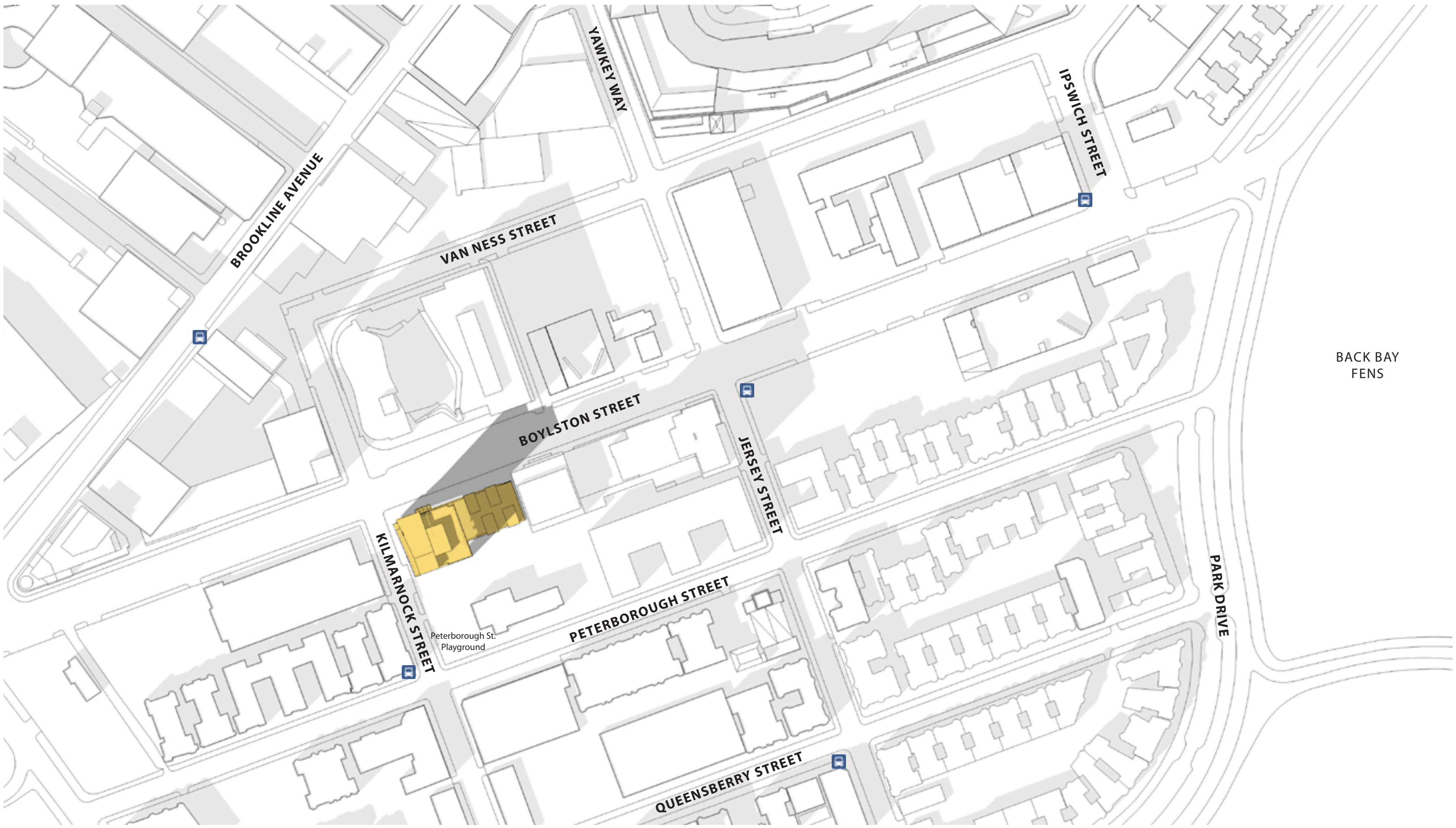
Figure 3.2-3

Shadow Studies 3/21 - 3pm



March 21st

3PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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EPSILON ASSOCIATES INC.

prepared by: ADD Inc

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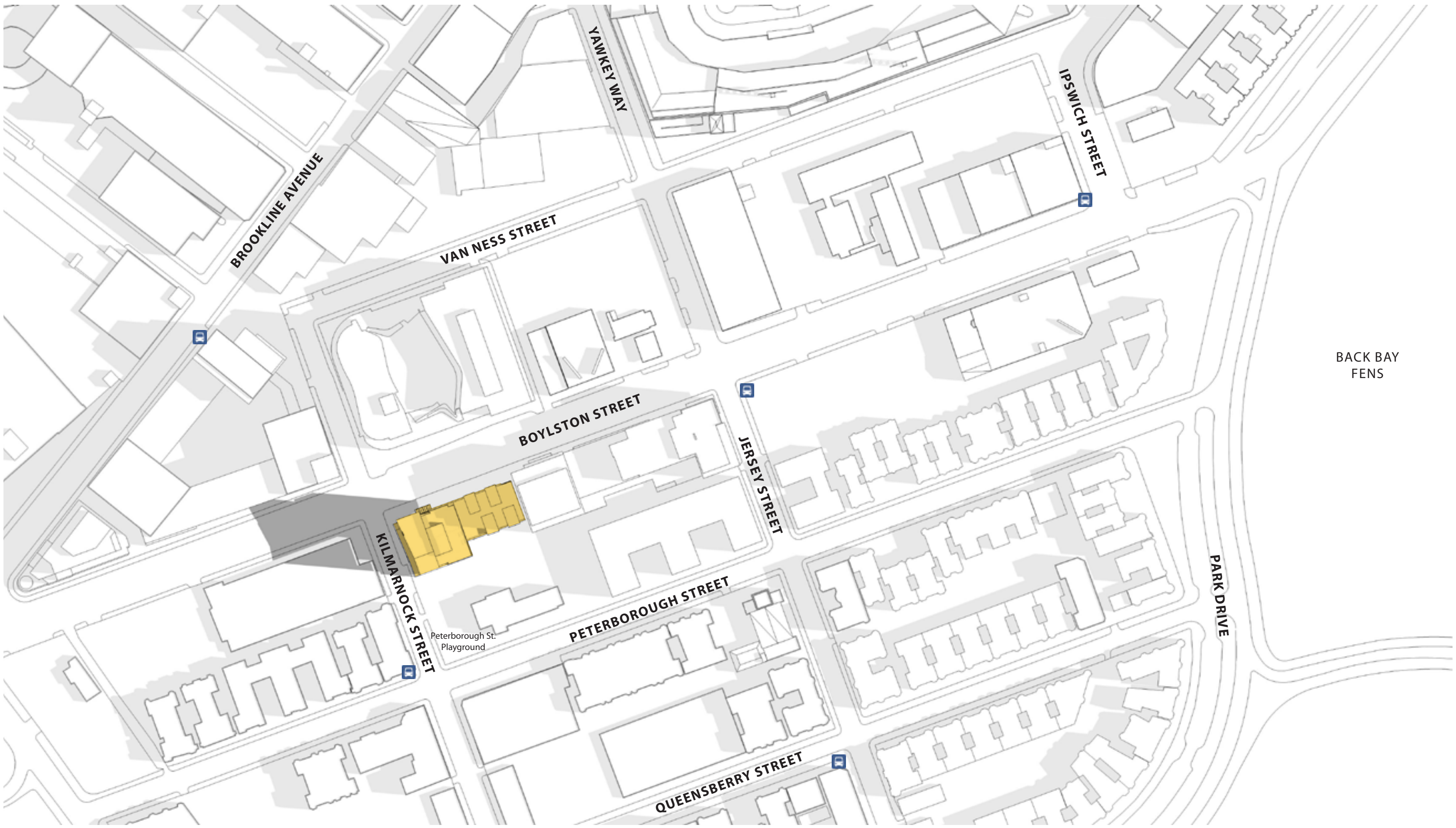
Figure 3.2-4

Shadow Studies 6/21 - 9am



June 21st

9AM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

SKANSKA

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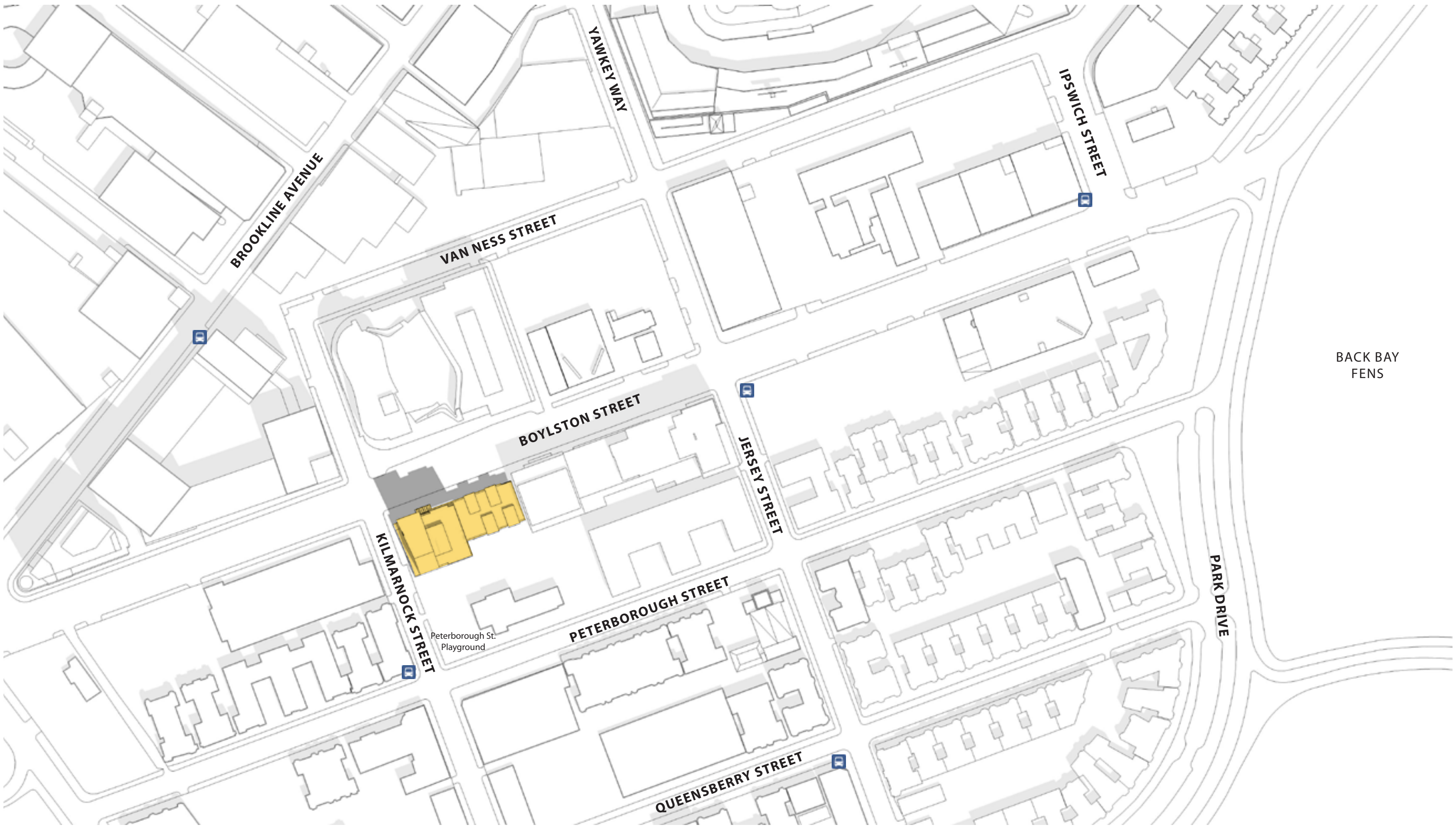
Figure 3.2-5

Shadow Studies
6/21 - 12pm



June 21st

12PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

SKANSKA

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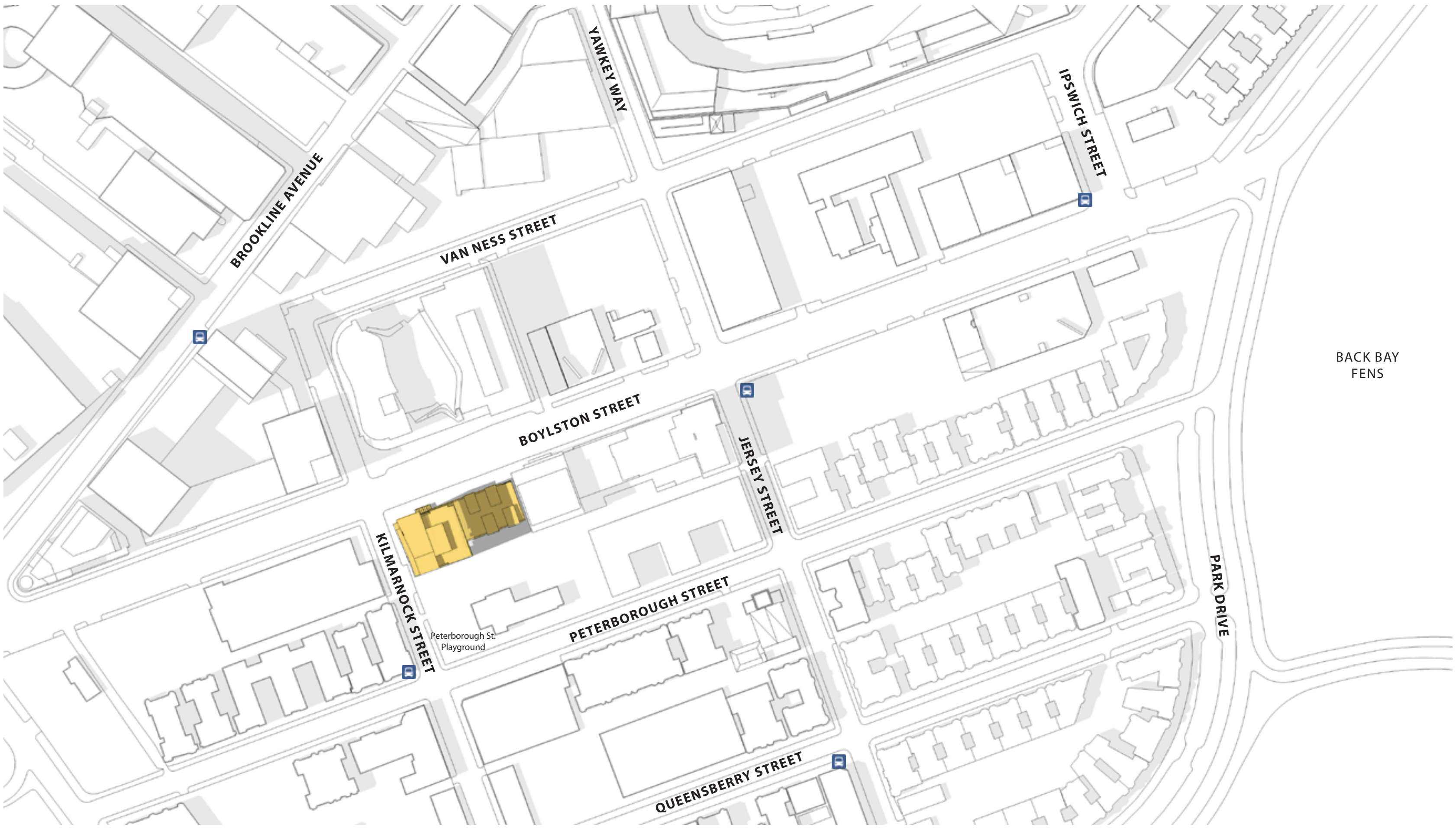
1350 BOYLSTON STREET

Figure 3.2-6

Shadow Studies 6/21 - 3pm



June 21st

3PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

SKANSKA

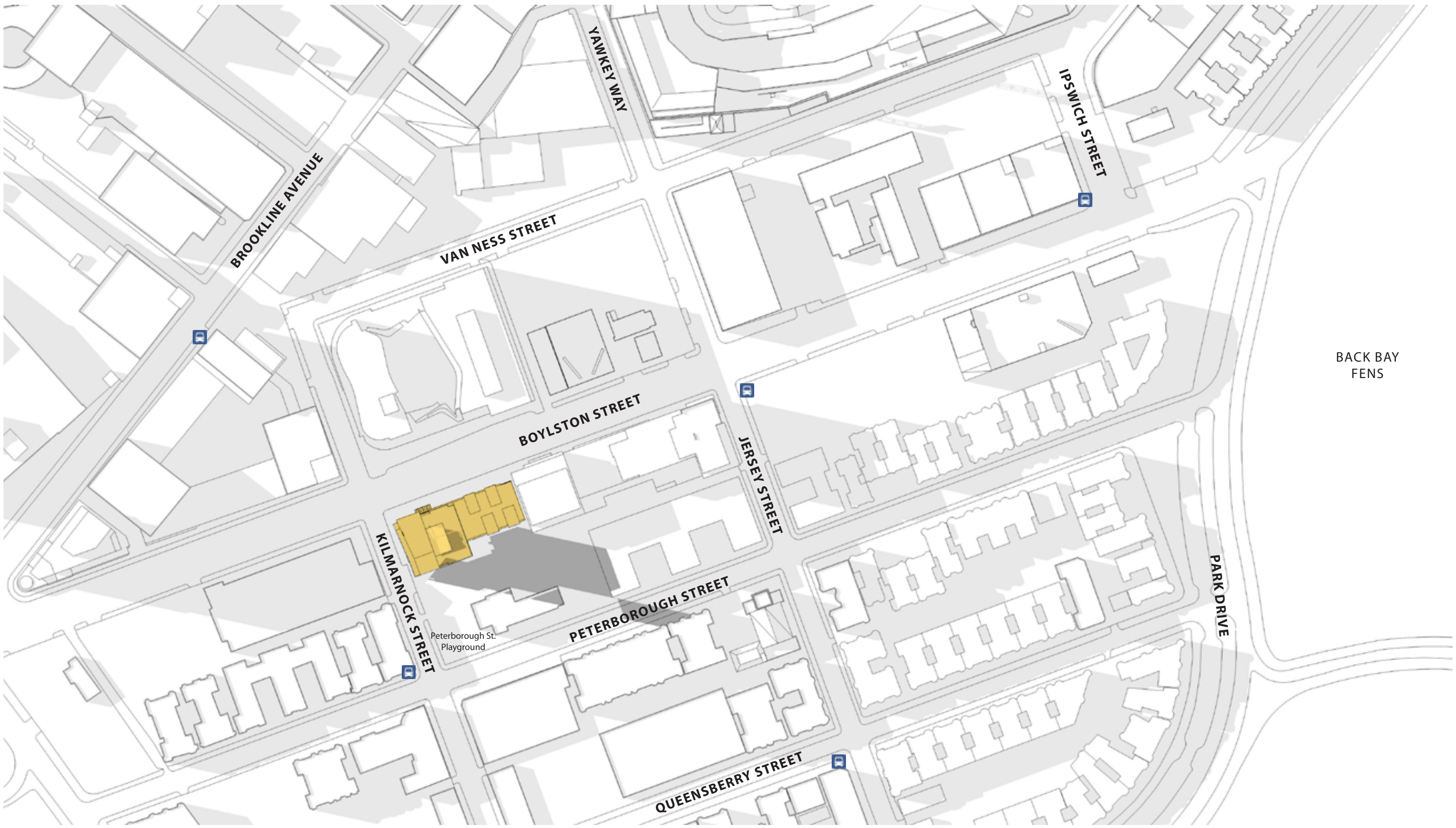
EPSILON ASSOCIATES INC.

prepared by: ADD Inc

1350 BOYLSTON STREET

Figure 3.2-7

Shadow Studies 6/21 - 6pm



June 21st

6PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

SKANSKA

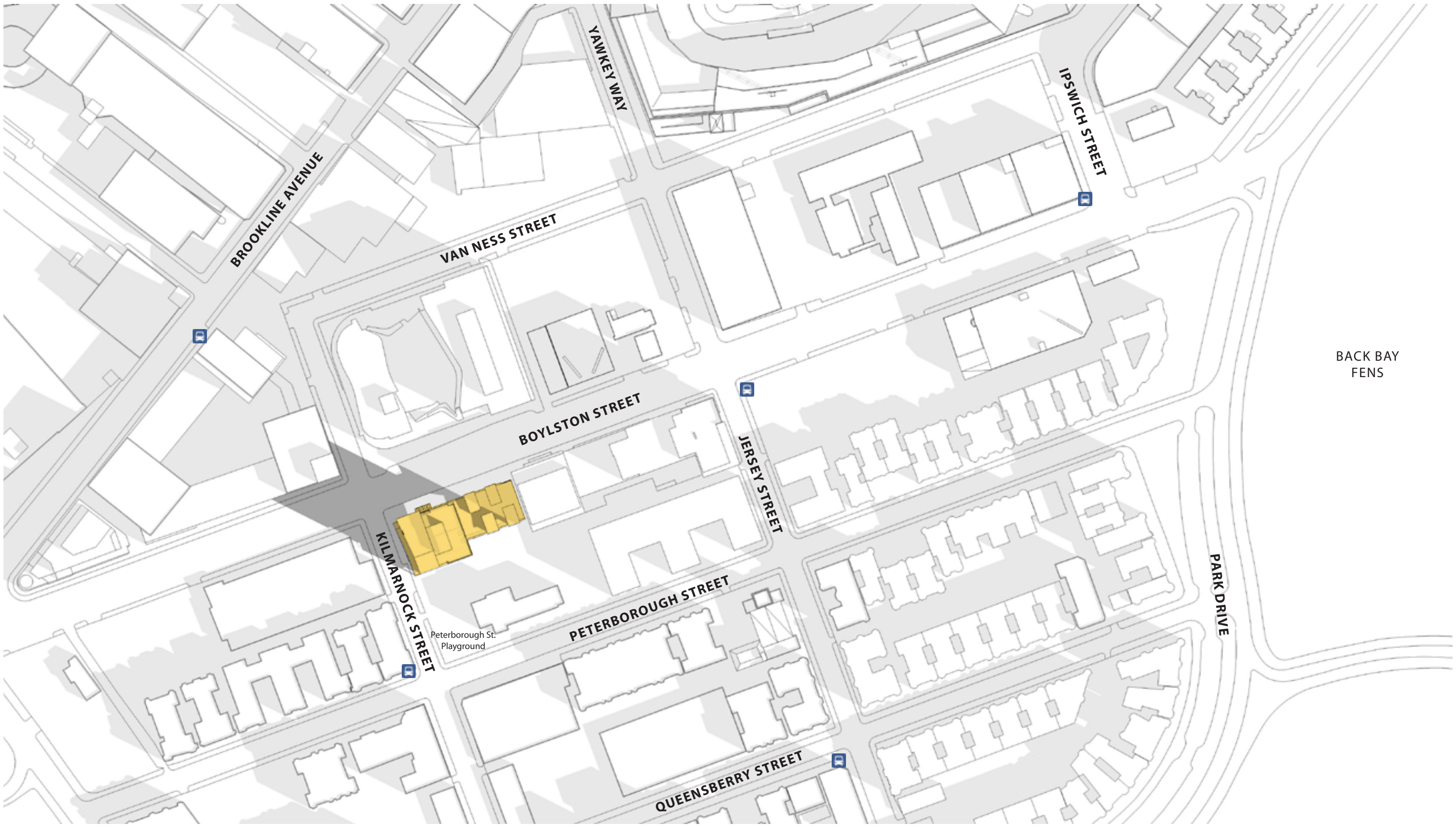
EPSILON ASSOCIATES INC.

prepared by: ADD Inc

1350 BOYLSTON STREET

Figure 3.2-8

Shadow Studies 9/21 - 9am



September 21st

9AM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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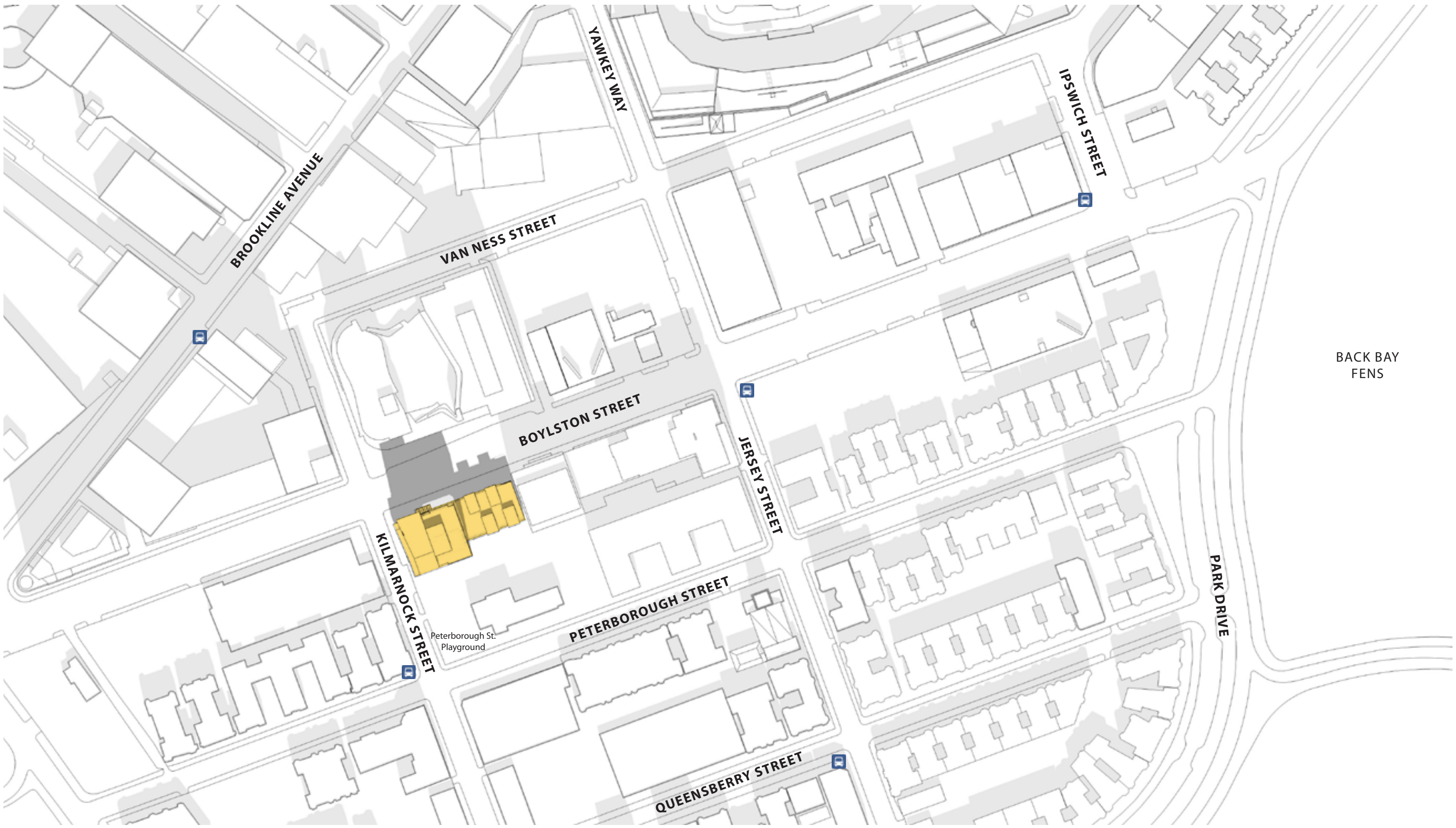
Figure 3.2-9

Shadow Studies 9/21 - 12pm



September 21st

12PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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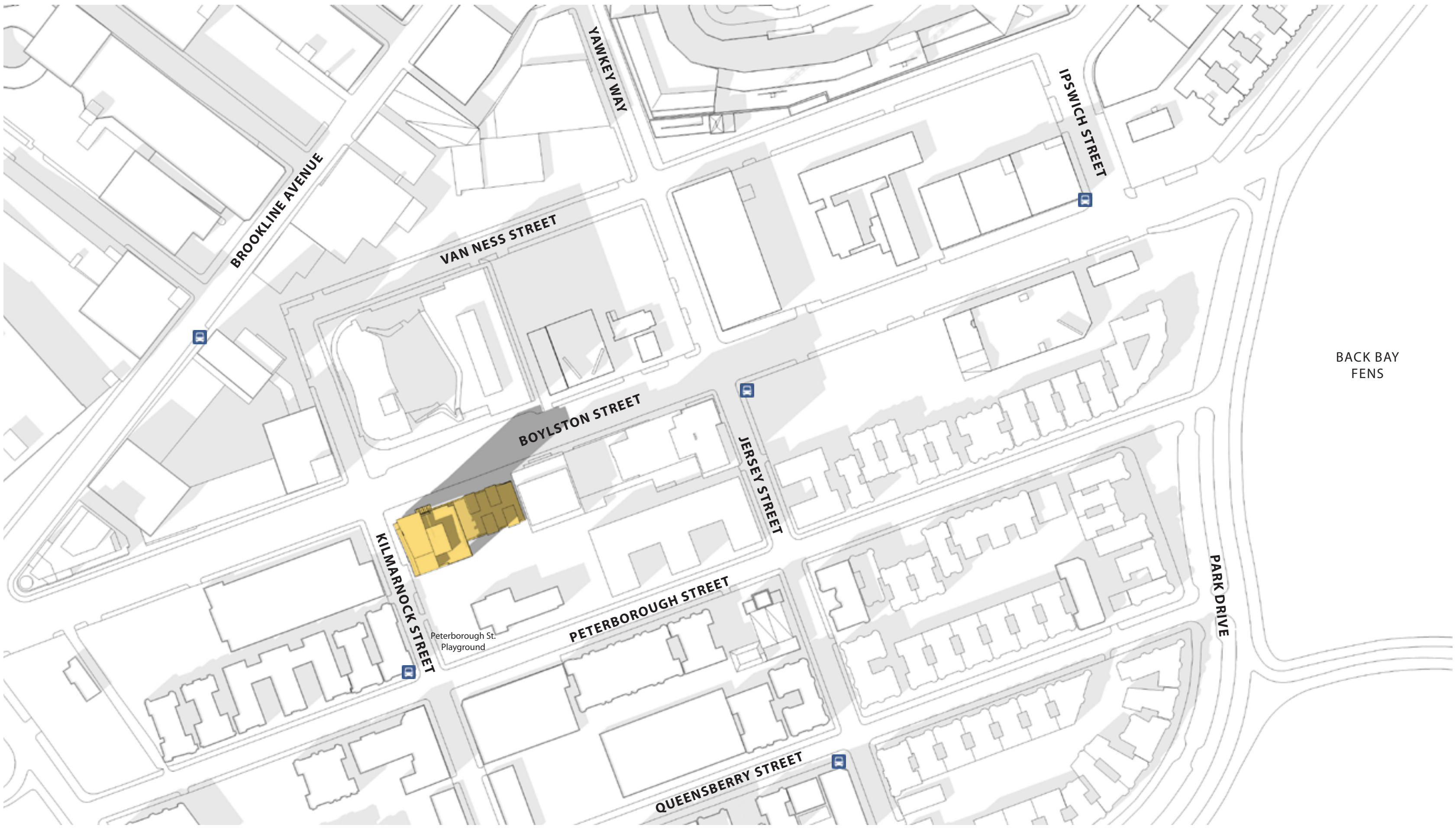
Figure 3.2-10

Shadow Studies 9/21 - 3pm



September 21st

3PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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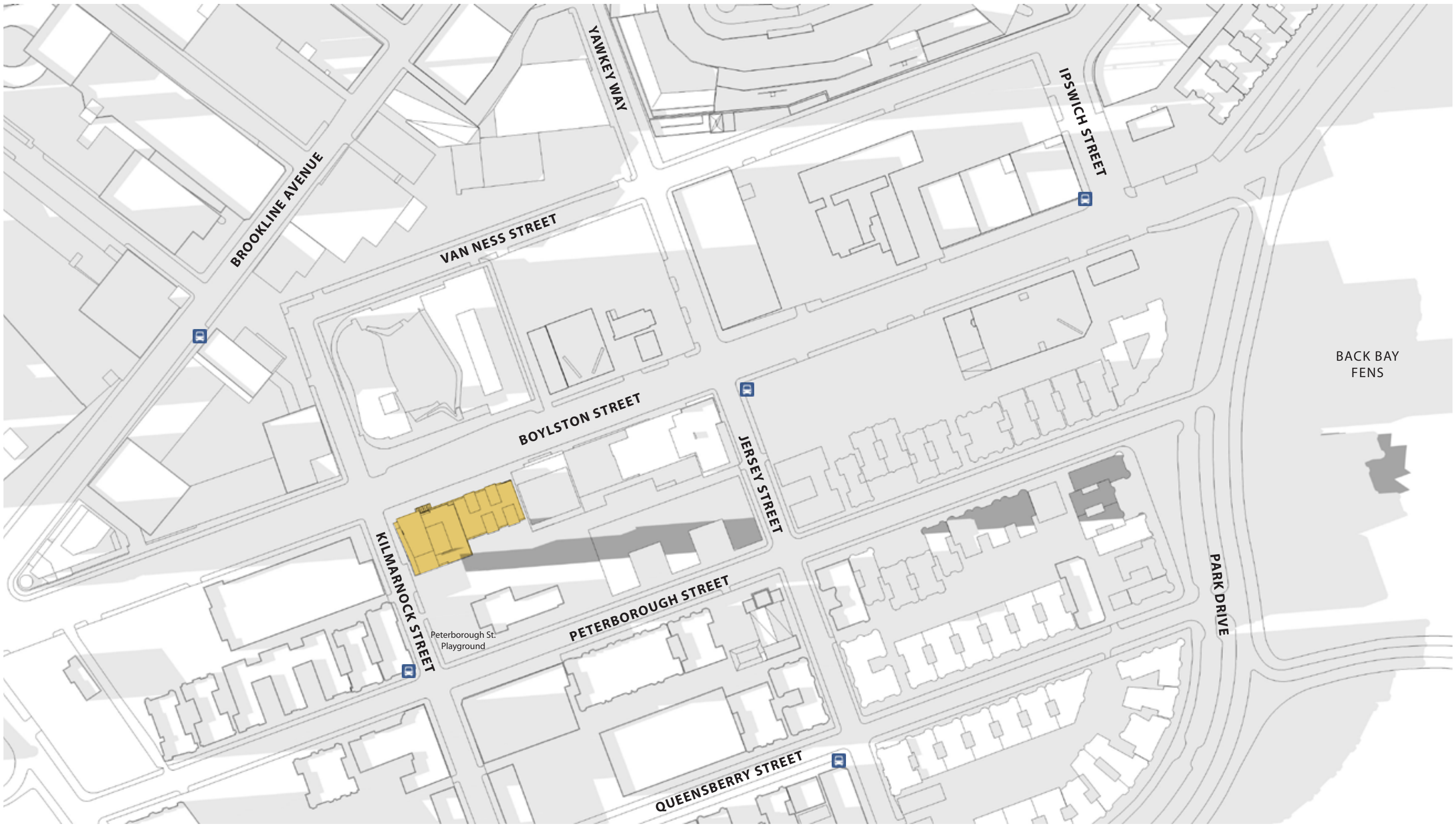
Figure 3.2-11

Shadow Studies 9/21 - 6pm



September 21st

6PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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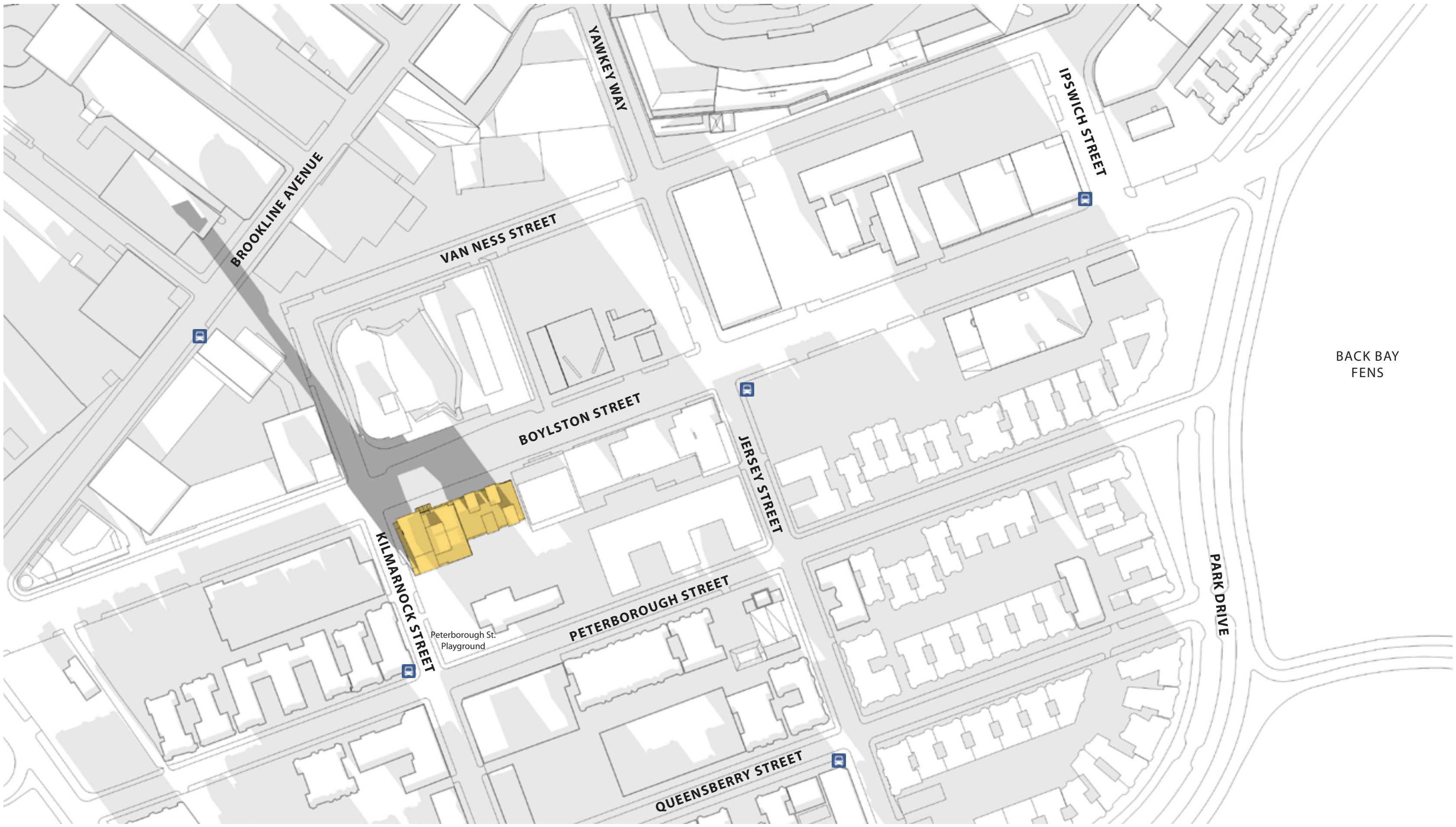
Figure 3.2-12

Shadow Studies 12/21 - 9am



December 21st

9AM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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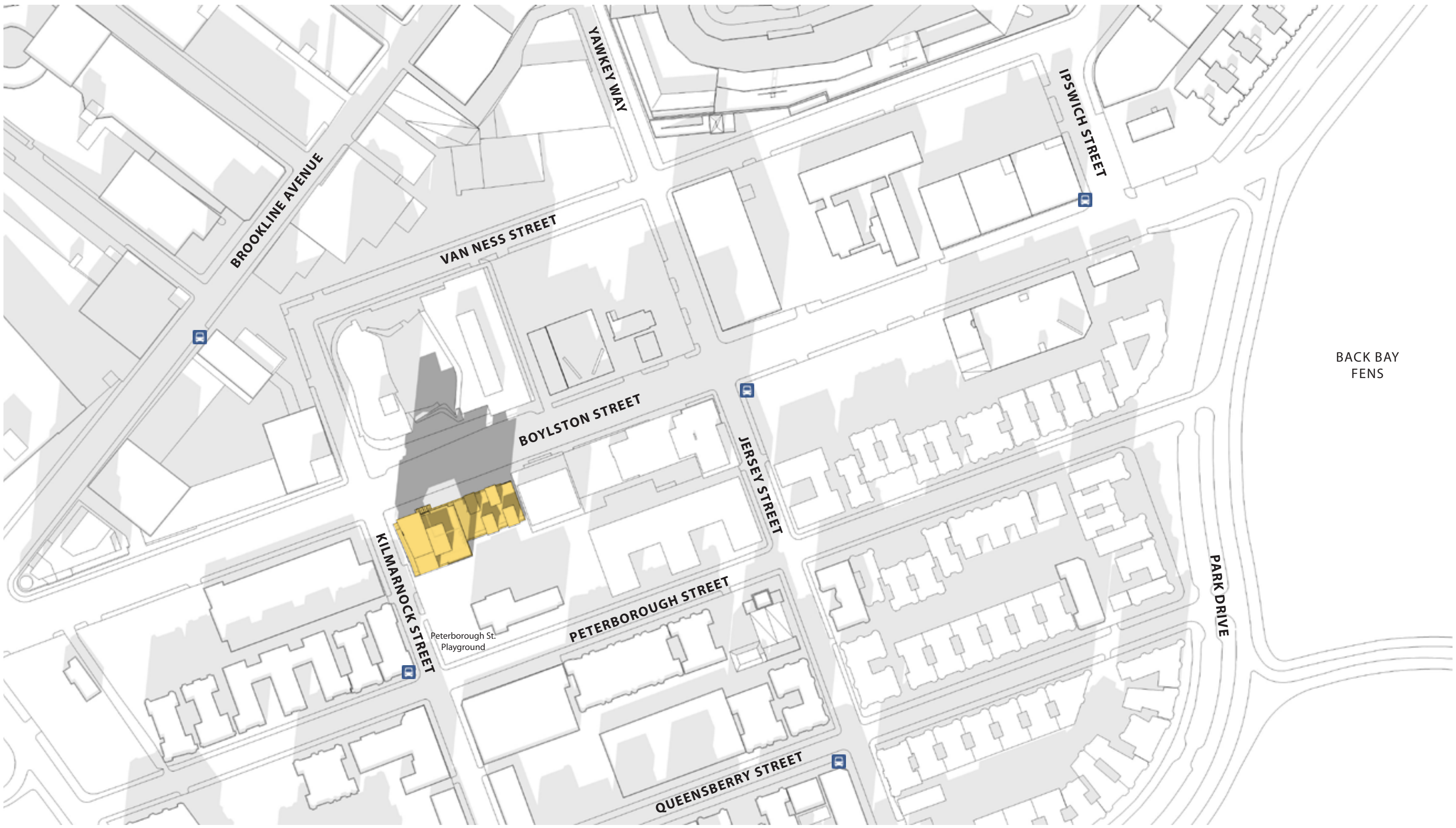
Figure 3.2-13

Shadow Studies 12/21 - 12pm



December 21st

12PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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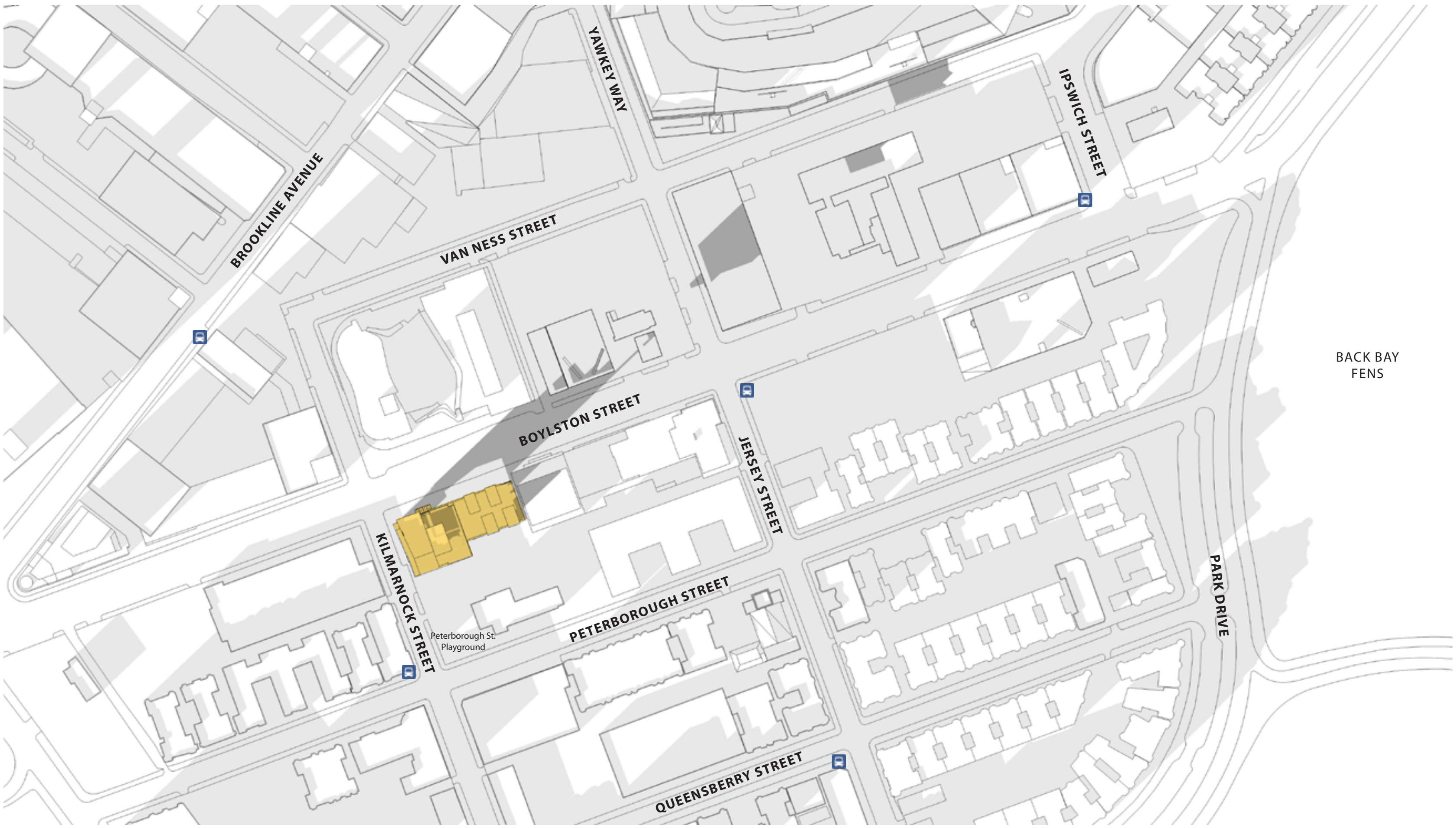
Figure 3.2-14

Shadow Studies 12/21 - 3pm



December 21st

3PM

EXISTING SHADOW

NEW SHADOW

0 50 100 200 400

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3.3 Daylight

3.3.1 Introduction

The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in the immediate vicinity of a project site. The daylight analysis for the Project considers the existing and proposed conditions, as well as typical daylight obstruction values of the surrounding area.

Because the Project site currently consists of a low-rise building and parking lots, the proposed Project will increase daylight obstruction; however, the resulting conditions will be typical of the Fenway area and other urban areas.

3.3.2 Methodology

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

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

The analysis compares three conditions: Existing Conditions; Proposed Conditions; and the context of the area.

Two viewpoints were chosen to evaluate the daylight obstruction for the Existing and Proposed Conditions, one from Boylston Street, and one from Kilmarnock Street. Three area context points were considered in order to provide a basis of comparison to existing conditions in the surrounding area. The viewpoint and area context viewpoints were taken in the following locations and are shown on Figure 3.3-1.

---

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

G:\Projects2\MA\Boston\3625\daylight.mxd

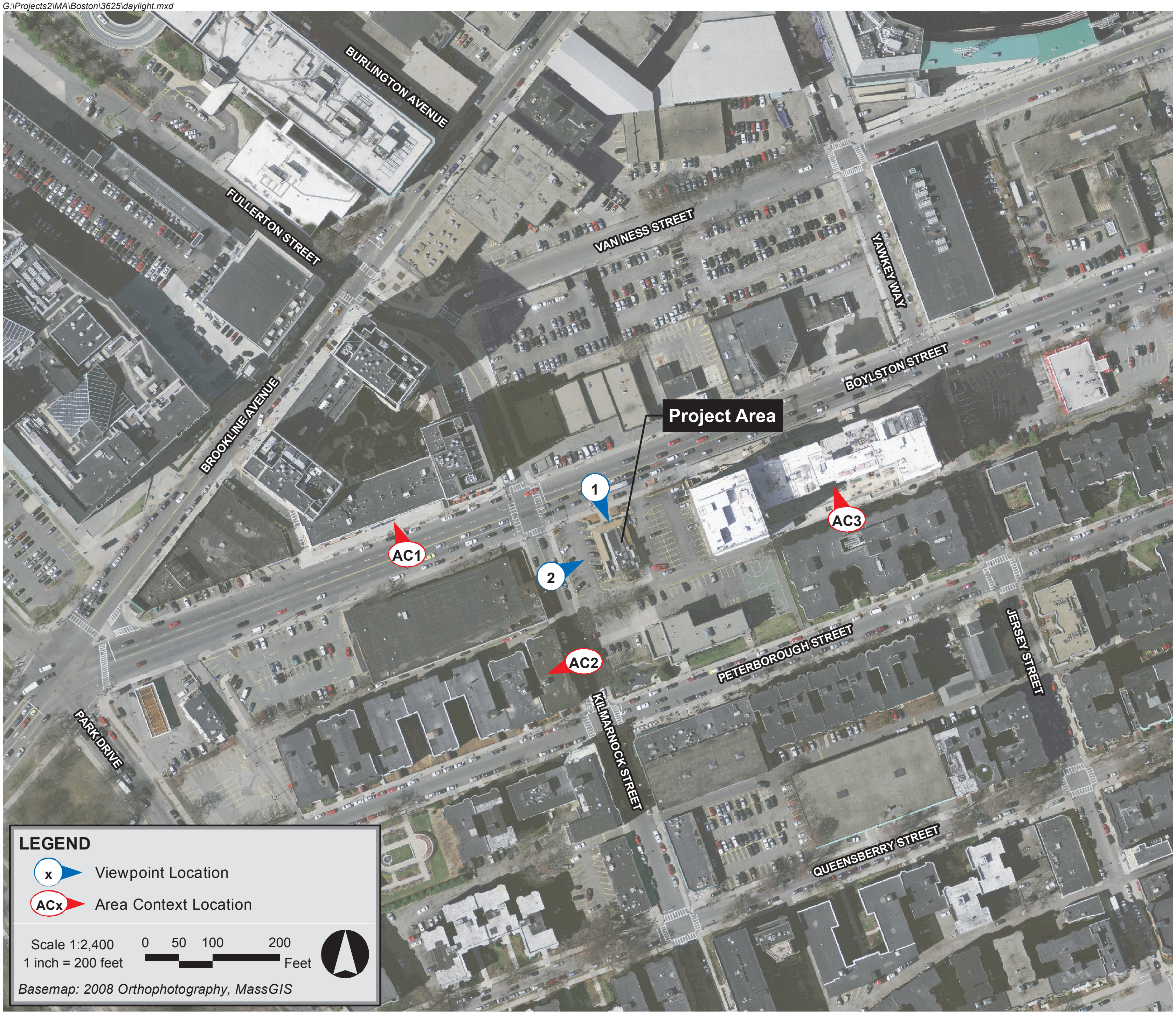

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Figure 3.3-1

Viewpoints
Daylight Analysis

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- **Viewpoint 1**: View from Boylston Street facing south toward the Project site
- **Viewpoint 2**: View from Kilmarnock Street facing east toward the Project site
- **Area Context Viewpoint AC1**: View from Boylston Street facing north toward the building at 1365-1371 Boylston Street
- **Area Context Viewpoint AC2**: View from Kilmarnock Street facing west toward the building at 105 Peterborough Street
- **Area Context Viewpoint AC3**: View from Peterborough Street facing north toward the building at 75 Peterborough Street

3.3.3 Results

The results for each viewpoint are described in Table 3.3-1. Figures 3.3-2 and 3.3-3 illustrate the BRADA results for each analysis.

Table 3.3-1 Daylight Analysis Results

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	View from Boylston Street facing south toward the Project site	5.8%	49.3%
Viewpoint 2	View from Kilmarnock Street facing east toward the Project site	5.0%	81.1%
Area Context Points			
AC1	View from Boylston Street facing north toward the building at 1365-1371 Boylston Street	70.9%	N/A
AC2	View from Kilmarnock Street facing west toward the building at 105 Peterborough Street	73.5%	N/A
AC3	View from Peterborough Street facing north toward the building at 75 Peterborough Street	40.1%	N/A

Boylston Street- Viewpoint 1

Boylston Street runs along the northern edge of the Project site. Viewpoint 1 was taken from the center of Boylston Street looking directly south toward the Project site. The site is currently occupied by a Burger King and a parking lot, and has an existing daylight obstruction value of 5.8% because the building only occupies a portion of the site. The

1350 BOYLSTON STREET

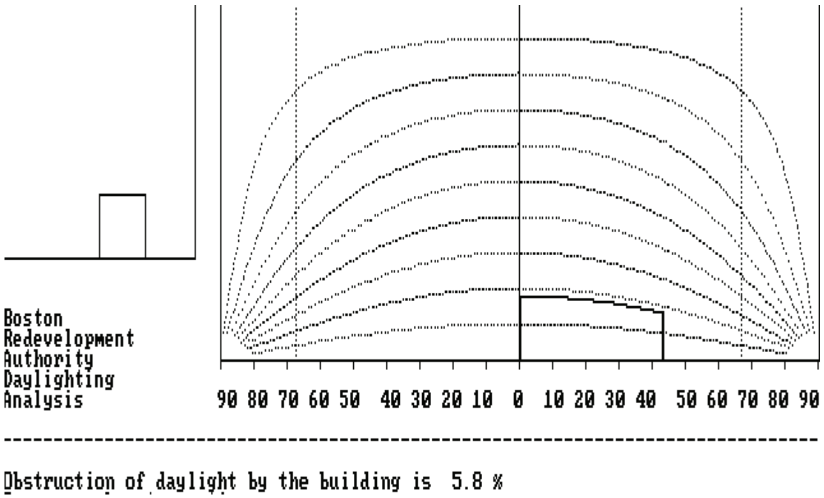
Figure 3.3-2

Existing and Proposed Conditions

Daylight Analysis

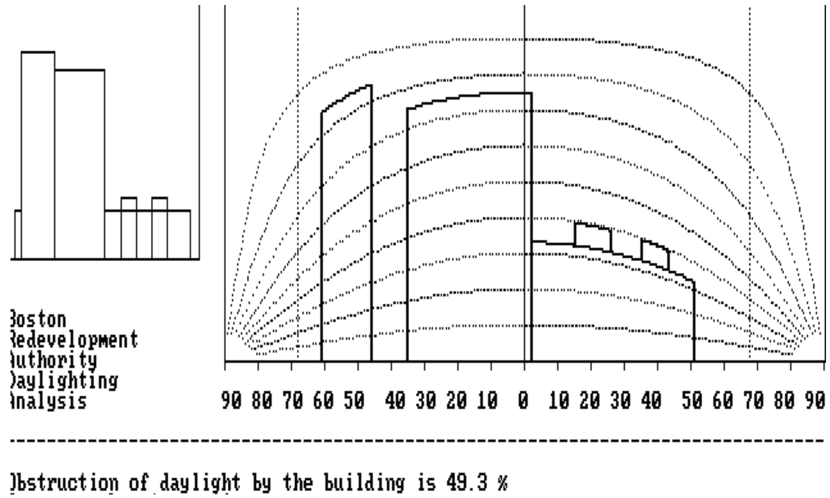
Existing Condition

Viewpoint 1: View from Boylston Street facing south toward the Project site

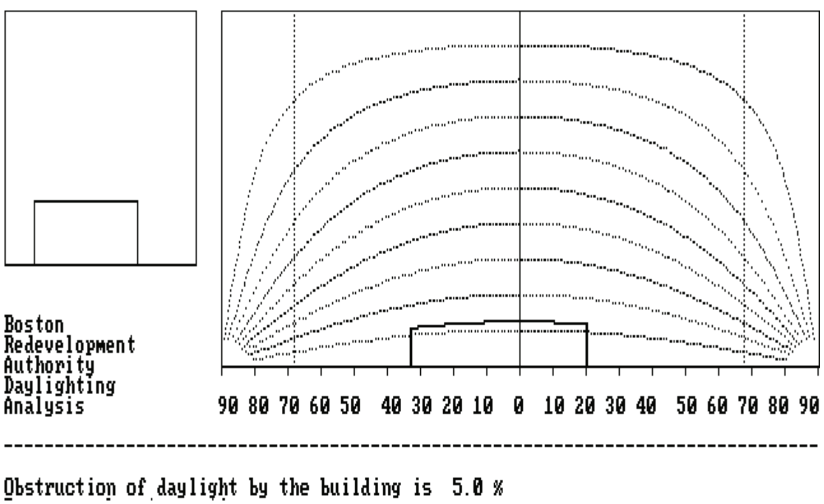


Proposed Condition

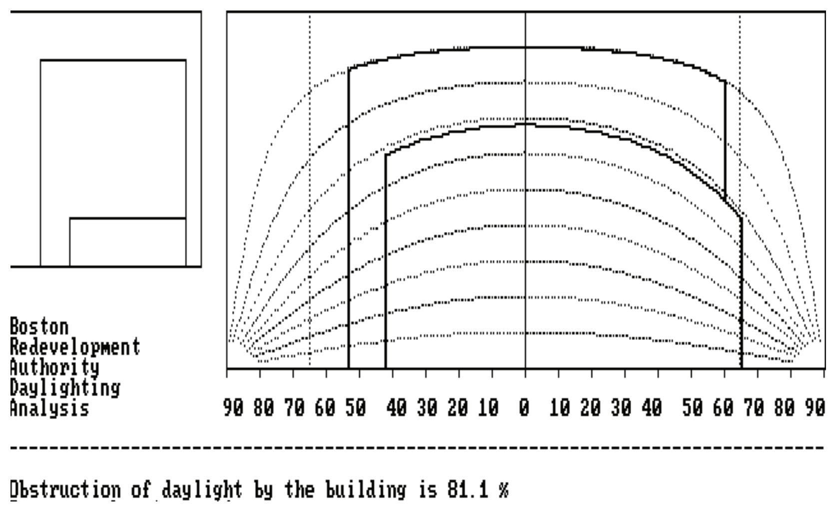
Viewpoint 1: View from Boylston Street facing south toward the Project site



Viewpoint 2: View from Kilmarnock Street facing east toward the Project site



Viewpoint 2: View from Kilmarnock Street facing east toward the Project site



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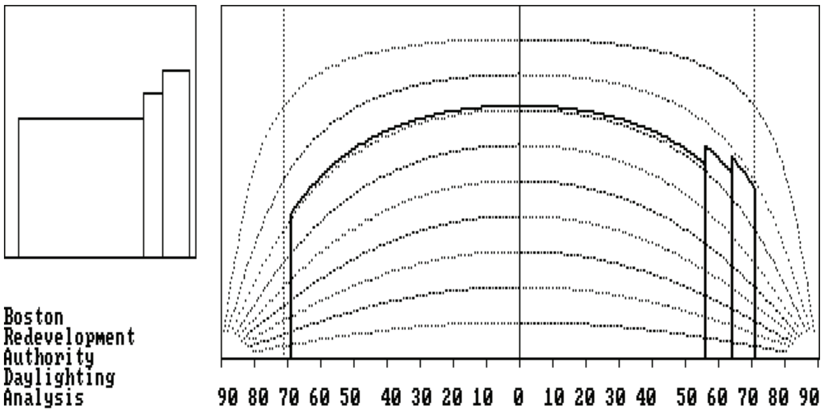
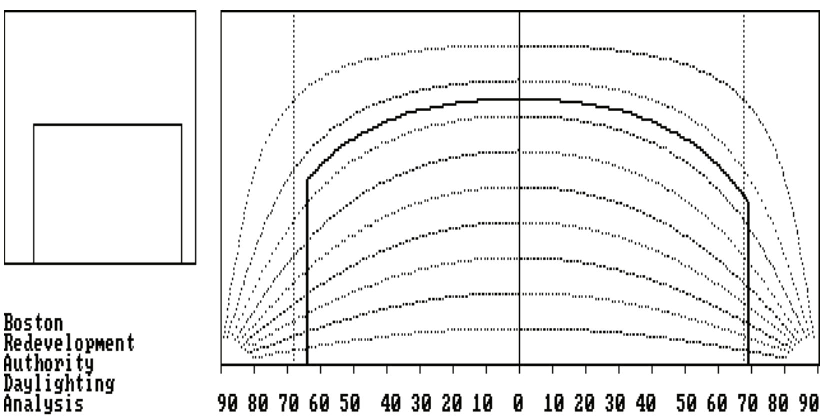
Area Context 1: View from Boylston Street
facing north toward the building at 1365-1371 Boylston Street



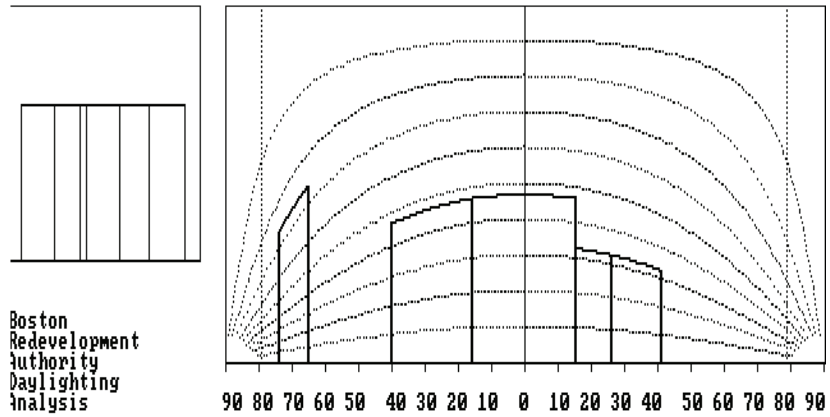
Obstruction of daylight by the building is 70.9 %

Area Context 2: View from Kilmarnock Street
facing west toward the building at 105 Peterborough Street



Obstruction of daylight by the building is 73.5 %

Area Context 3: View from Peterborough Street
facing north toward the building at 75 Peterborough Street



Obstruction of daylight by the building is 40.1 %

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Figure 3.3-3

Area Context

Daylight Analysis

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development of the Project will increase the daylight obstruction value to 49.3%. While this is an increase over existing conditions, the daylight obstruction value is consistent with other buildings in the area, including the Area Context buildings.

Kilmarnock Street- Viewpoint 2

Kilmarnock Street runs along the western edge of the Project site. Viewpoint 2 was taken from the center of Kilmarnock Street looking east toward the Project site. The site has an existing daylight obstruction of 5.0% due to the surface parking lot taking up a large portion of the site. The development of the Project will increase the daylight obstruction value to 81.1%. While this is an increase over existing conditions, the daylight obstruction value is consistent with other buildings in the area, including the Area Context buildings, and is typical of dense urban areas.

Area Context Views

The Project area currently consists of a mix of low-rise, mid-rise and high-rise residential towers, medical centers, and low-rise commercial buildings. However, as noted in section 1.3.1, this is a rapidly growing area with several large projects either in construction or under review by the BRA. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for the three Area Context Viewpoints described above and shown on Figure 3.3-1. The daylight obstruction values ranged from 40.1% for AC3 to 73.5% for AC2. Daylight obstruction values for the Project are consistent with the Area Context values.

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 results of the BRADA analysis indicate that while the development of the Project will result in increased daylight obstruction over existing conditions, the resulting conditions will be similar to the daylight obstruction values within the surrounding area and typical of densely built urban areas. The increased daylight obstruction value is mainly due to placing the buildings along the street edge and removing the surface parking lot, which is the preferred urban design of this area.

3.4 Solar Glare

The Project materials are still being studied and glazing of the windows will be determined as the design progresses. Due to the type of potential glass and glazing used, solar glare impacts are not currently anticipated.

3.5 Air Quality

3.5.1 Introduction

An air quality analysis was conducted to determine the impact of pollutant emissions from mobile sources generated by the Project. A microscale analysis was performed to evaluate the potential air quality impacts of carbon monoxide (CO) due to traffic flow around the Project area.

3.5.1.1 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, the U.S. Environmental Protection Agency (EPA) promulgated National Ambient Air Quality Standards (NAAQS) for these criteria pollutants: nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter (PM) (PM10 and PM2.5), carbon monoxide (CO), ozone (O3), and lead (Pb). The NAAQS are listed in Table 3.5-1. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS.

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

Table 3.5-1 National Ambient Air Quality Standards

Pollutant	Averaging Period	National Ambient Air Quality Standards and Massachusetts Ambient Air Quality Standards (micrograms per cubic meter)	
		Primary	Secondary
NO_2	Annual [1]	100	Same
	1-hour [7]	188	None
SO_2	Annual [1,8]	80	None
	24-hour [2,8]	365	None
	3-hour [2]	None	1,300
	1-hour [7]	195	None
PM10 [6]	Annual	50	Same
	24-hour [3]	150	Same
PM2.5	Annual [4]	12	15
	24-hour [5]	35	Same
CO	8-hour [2]	10,000	Same
	1-hour [2]	40,000	Same
Ozone	8-hour [3]	235	Same
Pb	3-month [1]	1.5	Same

Table 3.5-1 National Ambient Air Quality Standards (Continued)

Pollutant	Averaging Period	National Ambient Air Quality Standards and Massachusetts Ambient Air Quality Standards (micrograms per cubic meter)	
		Primary	Secondary

Notes:
[1] Not to be exceeded.
[2] Not to be exceeded more than once per year.
[3] Not to be exceeded more than an average of one day per year over three years.
[4] Not to be exceeded by the arithmetic average of the annual arithmetic averages from three successive years.
[5] Not to be exceeded based on the 98th percentile of data collection.
[6] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM10 standard in 2006 (effective December 17, 2006). However, the annual standard remains codified in 310 CMR 6.00.
[7] Not to be exceeded. Based on the three-year average of the 98th (NO_2) or 99th (SO_2) percentile of the daily maximum one-hour concentrations.
[8]The Annual and 24-hour SO_2 standards were revoked on June 2, 2010. However, these standards remain in effect until one year after an area is designated for the one-hour standard, unless currently in nonattainment.
Source: 40 CFR 50 and 310 CMR 6.00

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

The standards were developed by EPA to protect the human health against adverse health effects with a margin of safety.

3.5.1.2 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the Massachusetts Department of Environmental Protection (MassDEP) in their Annual Air Quality Reports was obtained for 2007 to 2011. MassDEP guidance specifies the use of the latest three years of available monitoring data from within 10 kilometers of the Project site.

The Clean Air Act allows for one exceedance per year of the CO and SO2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 µg/m3. For annual PM2.5 averages, the average of the highest yearly observations was used as the background concentration. For one-hour NO2, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 µg/m3.

Background concentrations were determined from the closest available monitoring stations to the proposed development. The closest monitor is located at Kenmore Square, in Boston. A summary of the background air quality concentrations are presented in Table 3.5-2.

Table 3.5-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

Pollutant	Averaging Time	2009	2010	2011	Background Concentration ($\mu g/m^3$)	Location
SO_2 (1)(7)(8)	1-Hour	65.0	69.9	127.4	127.4	Kenmore Sq., Boston
	3-Hour	88.4	62.4	49.4	88.4	Kenmore Sq., Boston
	24-Hour	23.4	21.8	31.5	31.5	Kenmore Sq., Boston
	Annual	6.5	5.8	6.1	6.5	Kenmore Sq., Boston
PM-10	24-Hour	69.0	40.0	38.0	69.0	Kenmore Sq., Boston
	Annual	20.6	15.5	16.8	20.6	Kenmore Sq., Boston
PM-2.5	24-Hour (4)	19.1	21.9	21.2	20.7	Kenmore Sq., Boston
	Annual (5)	9.0	9.3	9.4	9.2	Kenmore Sq., Boston
NO_2 (3)	1-Hour (6)	112.8	119.4	140.8	140.8	Kenmore Sq., Boston
	Annual	37.8	35.9	38.3	38.3	Kenmore Sq., Boston
CO (2)	1-Hour	1596	2166	1710	2166	Kenmore Sq., Boston
	8-Hour	1254	1710	1482	1710	Kenmore Sq., Boston

Notes: From 2007-2011 MassDEP Annual Data Summaries

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

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

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

4 Background level for 24-hour PM2.5 is the average concentration of the 98th percentile for three years.

5 Background level for annual PM2.5 is the average for three years.

6 Maximum annual one-hour concentrations.

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

8 The 2010 and 2011 SO_2 three-hour value is not reported. Years 2007-2009 used instead.

Air quality is generally good in the area, with all of the ambient concentrations well below their respective NAAQS. For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in parts per million (ppm) were 1.9 ppm (2166 μg/m3) for one-hour and 1.5 ppm (1710 μg/m3) for eight-hour CO.

3.5.2 Methodology

3.5.2.1 Microscale Analysis

The BRA typically requires an analysis of the effect on air quality of the increase in traffic generated by projects. This "microscale" analysis is typically required for any intersection (including garage entrances/exits) where the Level of Service (LOS) is expected to deteriorate to D and the proposed project causes a 10 percent increase in traffic or where the LOS is E or F and the proposed project contributes to a reduction in LOS. 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. The NAAQS standards do not allow ambient CO concentrations to exceed 35 ppm for a one-hour averaging period and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on current vehicles has reduced the occurrences of CO hot spots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The analyses for the Projects followed the procedure outlined in EPA's intersection modeling guidance.[3]

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

Baseline (2013) and future year (2020) emission factor data calculated from the MOBILE6.2 model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections.

Existing background values of CO at the nearest monitor location at Kenmore Square were obtained from MassDEP. CAL3QHC results were then added to background CO values of 1.9 ppm (one-hour) and 1.5 ppm (eight-hour), as provided by MassDEP, to determine total air quality impacts due to the project. These values were compared to the NAAQS for CO of 35 ppm (one-hour) and 9 ppm (eight-hour).

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

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

Intersection Selection

As stated previously, a "microscale" analysis is typically required for a project at intersections where 1) project traffic would impact intersections or roadway links currently operating at LOS D, E, or F or would cause LOS to decline to D, E, or F; 2) project traffic

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

would increase traffic volumes on nearby roadways by 10 percent or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) a project will generate 3,000 or more new average daily trips on roadways providing access to a single location.

Only two signalized intersections included in the traffic study meet the above conditions (see Chapter 2). The traffic volumes and LOS calculations provided in Chapter 2 form the basis of evaluating the traffic data versus the microscale thresholds. Both intersections were found to meet the criteria for inclusion in the microscale analysis:

- Boylston Street and Kilmarnock Street; and
- Boylston Street and Yawkey Way/ Jersey Street.

Microscale modeling was performed for the intersections based on the aforementioned methodology. The 2013 existing conditions, and the 2020 No Build and Build conditions were each evaluated for both morning (a.m.) and afternoon (p.m.) peak hours.

Emissions Calculations (MOBILE6.2)

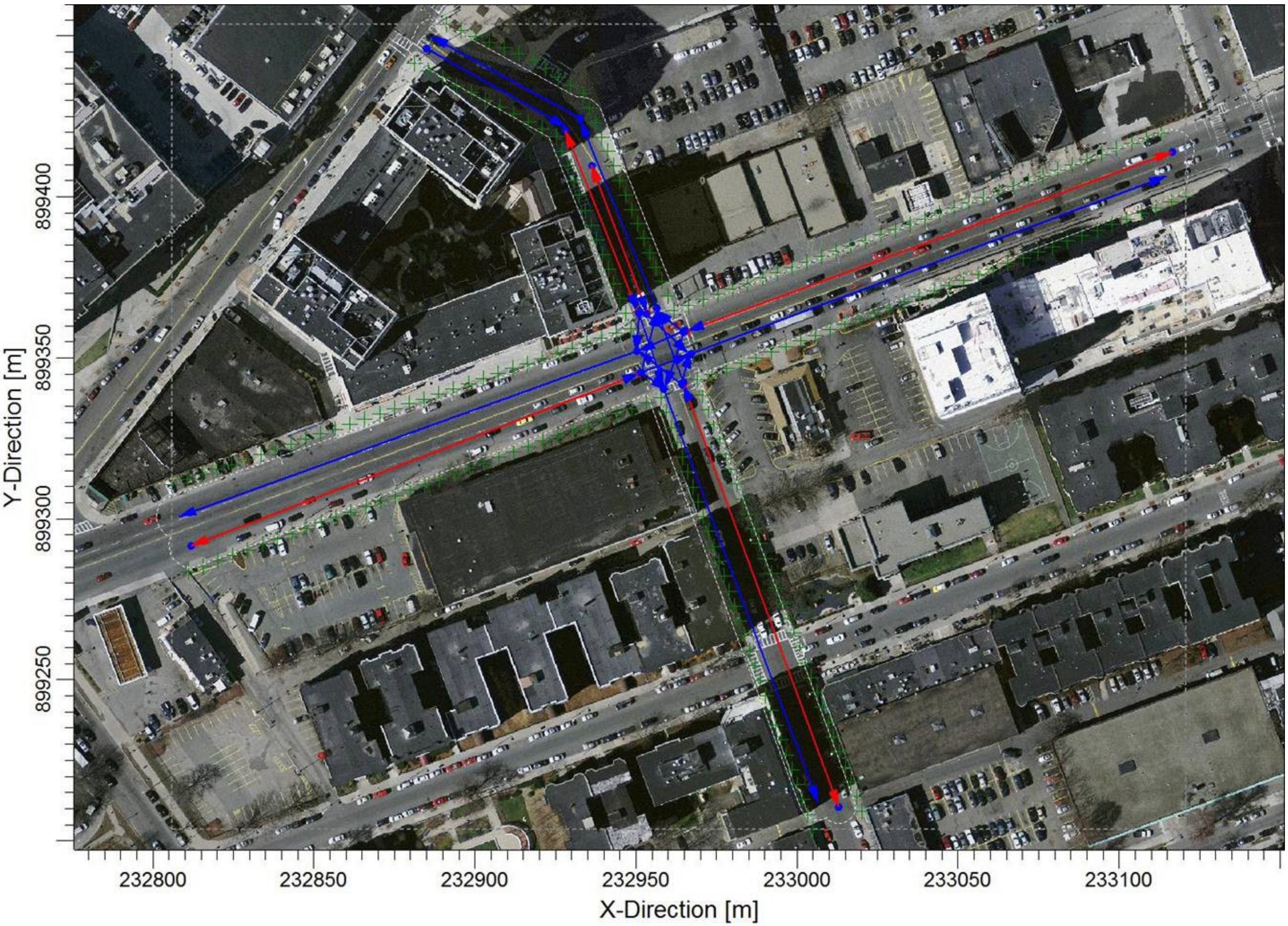
The EPA MOBILE6.2 computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOBILE6.2 model are based on motor vehicle operations typical of daily periods. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the state specific vehicle age registration distribution. The input files for MOBILE6.2 for the existing (2013) and Build year (2020) 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.

Idle emission factors are obtained from factors for a vehicle speed of 2.5 miles per hour (mph). The resulting emission rate given in (grams/mile) is then multiplied by 2.5 mph to estimate idle emissions (in grams/hour). Moving emissions are calculated based on actual speeds at which free-flowing vehicles travel through the intersections. A speed of 30 mph is used for all free-flow traffic. Speeds of 10 and 15 mph were used for right (and U-turns, if necessary) and left turns, respectively.

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

Receptors & Meteorology Inputs

Sets of up to 240 receptors were placed in the vicinity of each of the modeled intersections. Receptors extended approximately 300 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersections are presented in Figures 3.5-1 and 3.5-2.



1350 BOYLSTON STREET

Figure 3.5-1

Link and Receptor Locations for CAL3QHC Modeling of Intersection of Boylston St. & Kilmarnock St.

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Figure 3.5-2

Link and Receptor Locations for CAL3QHC Modeling of Intersection of Boylston St. & Yawkey Way

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For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[4], a wind speed of one meter per second, stability class D (4), and a mixing height of 1,000 meters were used. To account for the intersection geometry, wind directions from 0° to 350°, every 10°, were selected. A surface roughness length of 175 centimeters was selected for the two intersections.[5]

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. The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling outputs. The CAL3QHC input parameters are also described in Appendix D.

3.5.3 Air Quality Results

3.5.3.1 Microscale Analysis

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3.5-3 through 3.5-5 for the 2013 and 2020 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.7.[6]

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 (1.4 ppm) plus background (1.9 ppm) is 3.3 ppm for the 2020 morning peak hour case at the intersection of Boylston Street and Yawkey Way/Jersey Street for both the No Build and Build conditions. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (1.0 ppm) plus background (1.5 ppm) is 2.5 ppm at both intersections for the No Build and Build conditions. All concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

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

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

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

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

3.5.4 Conclusions

3.5.4.1 Microscale Analysis

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

3.5.5 Stationary Sources

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

It is expected that the majority of stationary sources (boilers, engines, etc) would be subject to the MassDEP's Environmental Results Program (ERP).

The boilers are expected to be within the requirements of the ERP since individual estimated heat inputs are within or below the 10 to 40 MMBtu/hour ERP range.

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 will be greater than the ERP limit of 37 kW, it will be subject to the 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.

Table 3.5-3 Summary of Microscale Modeling Analysis (Existing 2013)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Boylston Street and Kilmarnock Street	AM	1.0	1.9	2.9	35
	PM	1.1	1.9	3.0	35
Boylston Street and Yawkey Way/Jersey Street	AM	1.1	1.9	3.0	35
	PM	1.1	1.9	3.0	35

Table 3.5-3 Summary of Microscale Modeling Analysis (Existing 2013) (Continued)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
8-Hour					
Boylston Street and Kilmarnock Street	AM	0.7	1.5	2.2	9
	PM	0.8	1.5	2.3	9
Boylston Street and Yawkey Way/Jersey Street	AM	0.8	1.5	2.3	9
	PM	0.8	1.5	2.3	9
Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.7.					

Table 3.5-4 Summary of Microscale Modeling Analysis (No-Build 2020)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Boylston Street and Kilmarnock Street	AM	1.2	1.9	3.1	35
	PM	1.3	1.9	3.2	35
Boylston Street and Yawkey Way/Jersey Street	AM	1.4	1.9	3.3	35
	PM	1.3	1.9	3.2	35
8-Hour					
Boylston Street and Kilmarnock Street	AM	0.8	1.5	2.3	9
	PM	0.9	1.5	2.4	9
Boylston Street and Yawkey Way/Jersey Street	AM	1.0	1.5	2.5	9
	PM	0.9	1.5	2.4	9
Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.7.					

Table 3.5-5 Summary of Microscale Modeling Analysis (Build 2020)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Boylston Street and Kilmarnock Street	AM	1.2	1.9	3.1	35
	PM	1.3	1.9	3.2	35
Boylston Street and Yawkey Way/Jersey Street	AM	1.4	1.9	3.3	35
	PM	1.3	1.9	3.2	35
8-Hour					
Boylston Street and Kilmarnock Street	AM	0.8	1.5	2.3	9
	PM	0.9	1.5	2.4	9
Boylston Street and Yawkey Way/Jersey Street	AM	1.0	1.5	2.5	9
	PM	0.9	1.5	2.4	9

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

3.6 Stormwater/Water Quality

Please see Section 6.3 for information on stormwater and water quality impacts.

3.7 Flood Hazard Zones/Wetlands

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for this area (25025C0076G) shows that the FEMA Flood Zone Designation for the Project site is Zone X, "Areas determined to be outside the 0.2% annual chance floodplain."

The Project site does not contain wetlands.

3.8 Geotechnical/Groundwater

3.8.1 Subsurface Soil and Bedrock Conditions

Based on available test boring information from previous investigations at or near the site, subsurface soil conditions underlying the Project site are anticipated to be characterized by the general soil profile described in Table 3.8-1.

Table 3-.8-1 General Soil Profile

Generalized Description	Approximate Elevation of Top of Layer (ft, BCB)
Fill	Ground Surface (El. 16 to El. 17)
Organic Deposits	El. 5
Glaciofluvial Sand	El. -3
Marine Clay	El. -10
Glacial Till	El. -190
Bedrock (Cambridge Argillite)	El. -195

3.8.2 Groundwater

Several groundwater monitoring wells exist in the vicinity of the site. Data obtained from the Boston Groundwater Trust (BGwT) website indicates the groundwater levels measured at these wells in 2013 range from El. 4 to El. 6 BCB.

Area groundwater levels may be influenced by local construction activity, pumping from foundation drains, leakage into or out of sewers, storm drains, and water lines near the site. Seasonal fluctuations in groundwater levels can also be expected.

Temporary construction dewatering will be required during excavation for the below grade space. Intermittent pumping will be used as needed to allow for construction in-the-dry for the two levels of below grade parking. Effluent generated during temporary construction dewatering will be chemically tested and discharged in compliance with applicable regulations and discharge permits, and will be infiltrated into the ground where possible. Dewatering discharge effluent quality will also be monitored during construction as part of the discharge permit requirements.

A program of monitoring existing observation wells located in the vicinity of the site will be conducted prior to and during construction to document groundwater levels.

3.8.3 Foundation Support and Below-grade Construction

The planned foundation construction will be conducted inside the limits of an excavation support system installed around the basement limits. The support system will be relatively impermeable to maintain groundwater levels.

After the excavation is completed to the proposed foundation bearing level, reinforced concrete footings or a reinforced concrete mat foundation will be constructed to support the building loads. The footings and/or mat will bear in the Marine Sand or Marine Clay. The basement walls will consist of cast-in-place concrete walls with waterproofing.

The foundation design that consists of spread footings will include a slab-on-grade for the lowest basement level, with an underslab drainage system to relieve hydrostatic uplift pressures. Groundwater flow will be minimal to the underslab drainage because lateral flow would be cut off by the excavation support wall (steel sheeting) that extends down into the clay deposit (all around the site).

The Project site is located within the Groundwater Conservation Overlay District. See Section 6.3.3 for information regarding compliance with Article 32 of the Boston Zoning Code.

3.9 Solid and Hazardous Waste

3.9.1 Hazardous Waste

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

Any material leaving the site will be required to be legally transported in accordance with local, state and federal requirements. In addition, any regulated soil and/or groundwater conditions related to oil and hazardous materials will be managed in accordance with appropriate Massachusetts Department of Environmental Protection (MassDEP) regulatory requirements.

3.9.2 Operational Solid and Hazardous Waste Generation

The Project will generate solid waste typical of residential development and a small retail space. Based on a generation rate of four pounds per bedroom per day and 5.5 tons per year per 1,000 sf of retail space, solid waste generated by the Project will be approximately 235 tons per year.

Solid waste will include wastepaper, cardboard, glass, bottles, food waste, and other waste typical of residential and retail uses. The building will include areas for trash collection and recycling collection on each floor, and a trash room adjacent to the loading dock.

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

3.9.2.1 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.

3.10 Noise

3.10.1 Introduction

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

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

3.10.2 Noise Terminology

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

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

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

The sound level meter used to measure noise is a standardized instrument[7]. It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various conditions. One network is the A-weighting network (there are also B- and C-weighting networks), which most closely approximates how the human ear responds to sound as a function of frequency, and is the accepted scale used for community sound level measurements. Sounds are frequently reported as detected with the A-weighting network of the sound level meter, in dBA. A-weighted sound levels emphasize the middle frequencies (i.e., middle pitched – around 1,000 Hertz sounds), and de-emphasize lower and higher frequencies.

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

- L_{eq}, the equivalent level, in dBA, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed.
- L_{90} is the sound level, in dBA, exceeded 90 percent of the time in a given measurement period. The L90, or residual sound level, is close to the lowest sound level observed when there are no obvious nearby intermittent noise sources.
- L_{50} is the median sound level, in dBA, exceeded 50 percent of the time in a given measurement period.
- L_{10} is the sound level, in dBA, exceeded only 10 percent of the time in a given measurement period. The L10, or intrusive sound level, is close to the maximum sound level observed due to occasional louder intermittent noises, like those from passing motor vehicles.
- L_{max} is the maximum instantaneous sound level observed in a given measurement period.

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

In the design of noise controls, which do not function quite like the human ear, it is important to understand the frequency spectrum of the noise source of interest. The spectra of noises are usually stated in terms of octave-band sound pressure levels, in dB, with the

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

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.

3.10.3 Noise Regulations and Criteria

The primary set of regulations relating to the potential increase in noise levels is the City of Boston Zoning District Noise Standards (City of Boston Code – Ordinances: Section 16–26 Unreasonable Noise and City of Boston Air Pollution Control Commission Regulations for the Control of Noise in the City of Boston). Results of the baseline ambient sound level survey and the modeled Project sound levels were compared to the City of Boston Zoning District Noise Standards. Separate regulations within the Standards provide criteria to control different types of noise. Regulation 2 is applicable to the effects of the proposed Project, as completed, and is considered in this noise study. Table 3.10-1 includes the Zoning District Standards.

Table 3.10-1 City of Boston Zoning District Noise Standards, Maximum Allowable Sound Pressure Levels

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

Notes:

- Noise standards are extracted from Regulation 2.5, City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976.
- All standards apply at the property line of the receiving property.
- dB and dBA based on a reference sound pressure of 20 micropascals.
- ‘Daytime’ refers to the period between 7:00 a.m. and 6:00 p.m. daily, excluding Sunday.

Additionally, MassDEP has the authority to regulate noise under 310 CMR 7.10, which is part of the Commonwealth's air pollution control regulations. According to MassDEP, "unnecessary" noise is considered an air contaminant and thus prohibited by 310 CMR 7.10. MassDEP administers this regulation through Noise Policy DAQC 90-001 which limits a source to a 10-dBA increase above the L90 ambient sound level measured at the Project property line and at the nearest residences. MassDEP policy further prohibits "pure tone" conditions where the sound pressure level in one octave-band is three decibel or more greater than the sound levels in each of two adjacent bands.

3.10.4 Existing Conditions

A background noise level survey was conducted to characterize the existing "baseline" acoustical environment in the vicinity of the Project, located in the Fenway neighborhood of Boston, Massachusetts. Existing noise sources in the vicinity of the Project currently include: vehicular traffic along local roadways, aircraft flyovers including helicopters, pedestrian conversation and foot traffic, birds, light wind noise and leaf rustle, mechanical equipment located on surrounding buildings, and the general noises of the City.

3.10.4.1 Noise Monitoring Methodology

Sound level measurements were made on Thursday, June 20, 2013 during the daytime (1:00 p.m. to 2:30 p.m.) and on Friday, June 21, 2013 during nighttime hours (12:00 a.m. to 2:00 a.m.). Since noise impacts from the Project on the community are highest when background noise levels are the lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to avoid peak traffic conditions. All measurements were 20 minutes in duration.

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

3.10.4.2 Noise Monitoring Locations

The selection of the noise monitoring locations was based upon a review of zoning and land -use in the Project area. Four noise monitoring locations were selected as representative sites to obtain a sampling of the ambient baseline noise environment. These measurement locations are depicted on Figure 3.10-1 and described below.

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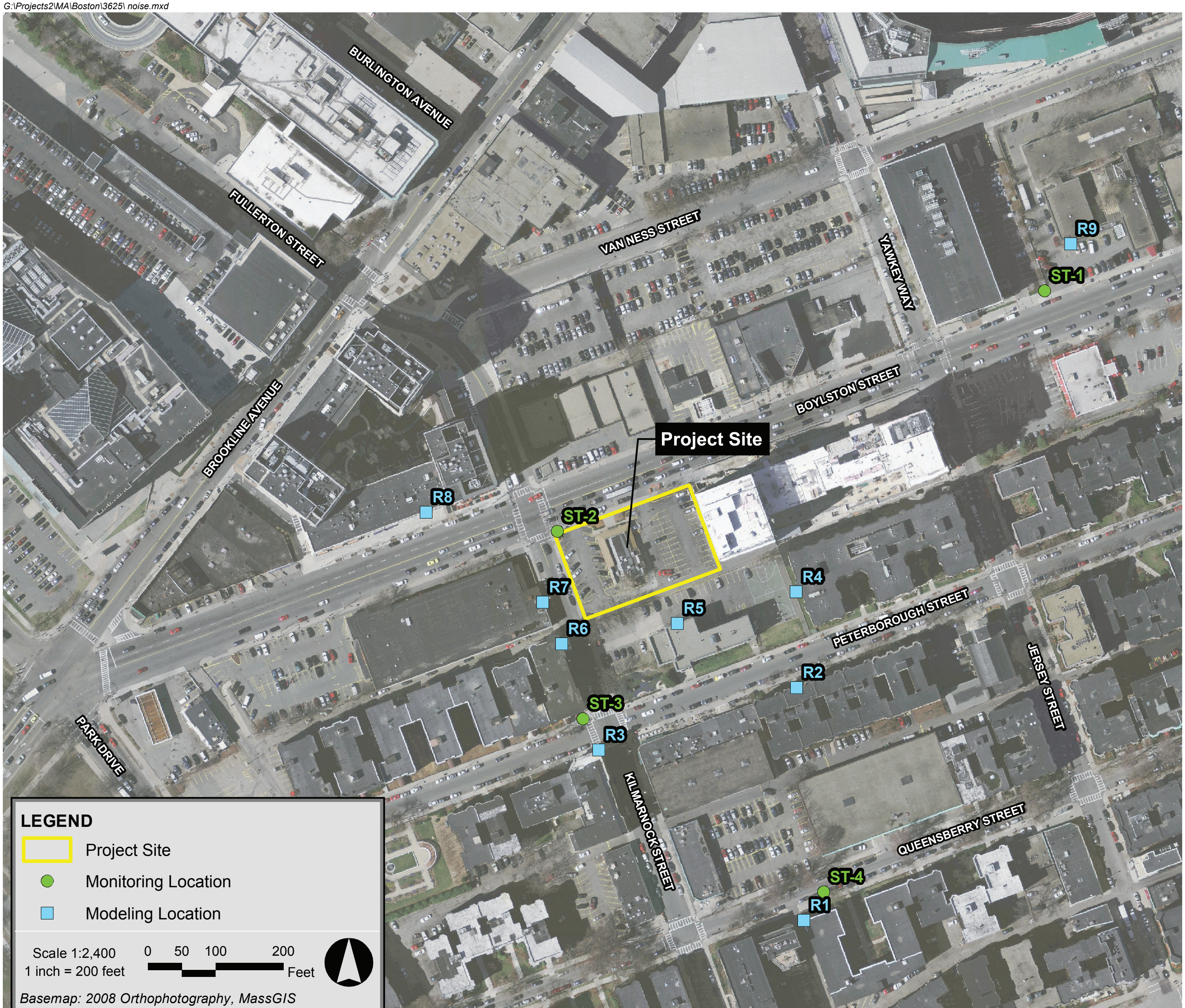

1350 BOYLSTON STREET

Figure 3.10-1

Noise Monitoring and Modeling Locations

SKANSKA

prepared by:
EPSILON ASSOCIATES, INC.

♦ **Location ST-1** was located at the southwest corner of the Howard Johnson hotel property line along Boylston Street. This location was selected to represent sound levels at commercial receptors along Boylston Street north and northeast of the Project.

♦ **Location ST-2** was located at the southeast corner of the intersection of Boylston Street and Kilmarnock Street. This location was selected to represent sound levels at the Project property line and at commercial receptors along Boylston Street to the north and west of the Project.

♦ **Location ST-3** was located at the northwest corner of the intersection of Peterborough Street and Kilmarnock Street. This location was selected to represent sound levels at residential receptors along Peterborough Street and Kilmarnock Street south of the Project.

♦ **Location ST-4** was located on the sidewalk in front of 64 Queensberry Street. This location was selected to represent sound levels in the residential neighborhood south of the Project set back from Boylston Street.

3.10.4.3 Noise Monitoring Equipment

Two Norsonic Model Nor140 sound level meters equipped with Norsonic 1209 Type I Preamplifiers, GRAS 40AN half-inch microphones, and manufacturer-provided windscreens were used to collect background sound pressure level data. This instrumentation meets the "Type 1 - Precision" requirements set forth in American National Standards Institute (ANSI) S1.4 for acoustical measuring devices. 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 S1.40-1984. Statistical descriptors (Leq, L90, etc.) were calculated for each 20-minute sampling period, with octave-band sound levels corresponding to the same data set processed for the broadband levels.

3.10.4.4 Measured Background Noise Levels

Baseline noise monitoring results are presented in Table 3.10-2, and summarized below:

♦ The daytime residual background (L_{90} dBA) measurements ranged from 51 to 61 dBA;

♦ The nighttime residual background (L_{90} dBA) measurements ranged from 47 to 55 dBA;

♦ The daytime equivalent level (L_{eq} dBA) measurements ranged from 62 to 75 dBA;

♦ The nighttime equivalent level (L_{eq} dBA) measurements ranged from 48 to 70 dBA;

Table 3.10.2 Summary of Measured Background Noise Levels

Location	Period	Start Time	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}
			dBA	dBA	dBA	dBA	dBA
ST-1	Day	1:17 PM	64	88	67	63	58
ST-2	Day	1:43 PM	75	101	70	66	61
ST-3	Day	1:45 PM	62	86	64	59	56
ST-4	Day	1:11 PM	63	82	66	57	51
ST-2	Night	1:16 AM	70	101	67	59	55
ST-3	Night	12:52 AM	54	70	56	52	50
ST-4	Night	12:20 AM	48	60	49	47	47

Weather Conditions:

	Date	Temp	RH	Sky	Wind
Daytime	Thursday, June 20, 2013	81ºF	28%	Sunny	Light < 3mph
Nighttime	Friday, June 21, 2013	66ºF	57%	Clear	Calm < 1mph

Monitoring Equipment Used:

	Manufacturer	Model	S/N
Sound Level Meter	Norsonic	Nor140	1403178,1403381
Microphone	GRAS	40AN	73449,63854
Preamp	Norsonic	1209	12492,12726
Calibrator	Norsonic	1251	32059

3.10.5 Future Conditions

3.10.5.1 Overview of Potential Noise Sources

The primary sources of continuous sound exterior to the Project, consisting of a mixed-use commercial and residential apartment complex, will include ventilation, cooling, and emergency power noise sources, the majority of which will be rooftop in nature with the exception of exhaust fans related to parking garage ventilation.

Two cooling towers and one energy recovery units (ERUs) will be located on the roof of the proposed building, while eight garage ventilation fans will be exhausted horizontally through the southern façade of the proposed building near the loading dock and transformer switch. Other secondary noise sources, including domestic hot water heaters, boilers, and pumps will be located within a rooftop penthouse and are not considered in this analysis to contribute significantly to the overall sound level.

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

Mitigation will be applied to multiple sources as needed, to ensure compliance with the applicable noise regulations. The noise control features assumed in this analysis, as described in Table 3.10-4, were louvered openings on the garage inlet and exhaust fan ducts, as well as a sound-attenuating generator enclosure and critical-grade generator exhaust silencer. To further limit impacts, the required periodic routine testing of the emergency generators would be scheduled during daytime hours when background sound levels will be highest.

A tabular summary of the modeled mechanical equipment proposed for the Project is presented below in Table 3.10-3a. Sound power level data for each unit, as provided by the manufacturer or calculated from provided sound pressure level data, is presented in Table 3.10-3b. Sound power levels of those units for which data was not provided were assumed based on data for similar or representative equipment. The approximate locations of the mechanical equipment were provided by the Project team in a preliminary roof plan.

Table 3.10-3-a Modeled Noise Sources

Noise Source	Quantity	Location	Size/Capacity per Unit
Cooling Tower	2	Roof - 190' AGL	750 GPM
Energy Recovery Unit	1	Roof - 190' AGL	13,000 CFM
Garage Intake Fan	4	Garage (2 per Floor) - 5' AGL	12,000 CFM
Garage Exhaust Fan	4	Garage (2 per Floor) - 5' AGL	12,000 CFM
Emergency Generator	1	Roof - 190' AGL	600 kW

Table 3.10-3-b Modeled Sound Power Levels per Unit

Noise Source	Broadband	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
Cooling Tower[1]	88	100	100	97	90	83	82	79	76	68
Energy Recovery Unit[2]	99	93	93	93	95	97	94	90	86	80
Garage Exhaust Fan[3]	92	84	84	84	87	89	88	84	80	69
Emergency Generator - Mechanical (Enclosed)[4]	102	117	117	111	107	98	91	89	86	80

Table 3.10-3-b Modeled Sound Power Levels per Unit (Continued)

Noise Source	Broadband	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
Emergency Generator - Exhaust (Unsilenced)[5]	125	116	116	116	119	118	120	117	117	105

Notes:

1. BAC Model VTL-272-OM Low Profile Series V, 750 GPM w/Attenuation
2. AAON RN-050-3-0-EB09-3D9: VFFE-D0B-DLM-AGB-0AA00CE-00-0B00000AB, Discharge
3. Greenheck QEI Mixed Flow Fan Model QEI-22-I, 12,000 CFM, Outlet
4. Caterpillar Diesel Generator Set (DM8518), 600 kW, SA Canopy
5. Caterpillar Diesel Generator Set (SR4B Generator/C27 TA Engine), 800 kW, Open Exhaust

Table 3.10-4 Attenuation Values Used for Noise Modeling (dB)

Noise Control	Noise Source	Noise Reduction (dB) per Octave-band Center Frequency (Hz)								
		32	63	125	250	500	1000	2000	4000	8000
Exhaust Silencer[1]	Emergency Diesel Generator Exhaust	-	20	35	35	27	20	20	22	22
Acoustical Louvers[2]	Garage Exhaust Fans	7	15	14	15	19	30	31	29	29

Notes:

1. Assumed JB Series Critical Grade Silencer (JB-18), or similar
2. Assumed Safe Air Dowco Model UFD-12 acoustical louvers, or similar

3.10.5.2 Noise Modeling Methodology

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

An initial analysis considered all of the mechanical equipment without the emergency generators running, to simulate typical nighttime operating conditions at nearby receptors. A second analysis combined the mechanical equipment and the emergency generators, to reflect worse-case daytime conditions during brief, routine, testing of the generators.

3.10.5.3 Noise Modeling Results

In the first modeling scenario, the analysis of sound levels at night considered all of the mechanical equipment without the emergency generators running, to simulate typical nighttime operating conditions at nearby receptors. In the second modeling scenario, the analysis combined sound emissions from the mechanical equipment and the emergency generators, to reflect worse-case conditions during brief, routine, daytime testing of the generators when ambient levels are higher. Nine modeling locations with a height of 1.5 meters above-grade were included in both analyses, consisting of nearby residential and business locations, and were evaluated against the applicable daytime or nighttime background sound levels and noise limits. Sound levels at the McKinley Prep High School along Peterborough Street were compared to daytime residential limits while the Howard Johnson Hotel along Boylston Street was compared against nighttime residential limits. Figure 3.10-1 shows the locations of each modeled receptor as well as the monitoring locations selected for background measurements.

In both scenarios, the predicted future sound levels (Project + Background) are well below the MassDEP criteria of 10 dBA over the measured background L90 sound levels at all sensitive receptor locations. This evaluation, with and without emergency generators, is presented in Tables 3.10-5a and b, respectively. The Project's mechanical equipment is not expected to create any "pure-tone" conditions as defined by the MassDEP at these locations. Additionally, modeled sound levels from Project equipment are within the most stringent broadband and octave-band residential zoning limits for the City of Boston at the closest residential receptors and also meet the business limits where applicable. This evaluation is presented with and without emergency generators in Tables 3.10-6a and b, respectively.

Table 3.10-5a MassDEP Compliance Evaluation (*With* Emergency Generators)

Receptor ID	Land Use	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets MassDEP Noise Policy?
				dBA	dBA	dBA	dBA	
R1	Residential	ST-4	Day	51	44	52	1	YES
R2	Residential	ST-4	Day	51	46	52	1	YES
R3	Residential	ST-3	Day	56	41	56	0	YES
R4	Residential	ST-4	Day	51	48	53	2	YES
R5	Residential	ST-3	Day	56	46	56	0	YES
R6	Residential	ST-3	Day	56	42	56	0	YES
R7	Business	ST-3	Day	56	40	56	0	YES
R8	Business	ST-2	Day	61	44	61	0	YES
R9	Residential	ST-1	Day	58	42	58	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel

Table 3.10-5b MassDEP Compliance Evaluation (*Without* Emergency Generators)

Receptor ID	Land Use	Representative Background ID	Evaluation Period	Measured Background Noise Level	Modeled Project-Only Noise Level	Combined Project + Background Noise Level	Project Impact[1]	Meets MassDEP Noise Policy?
				dBA	dBA	dBA	dBA	
R1	Residential	ST-4	Night	47	41	48	1	YES
R2	Residential	ST-4	Night	47	39	47	1	YES
R3	Residential	ST-3	Night	50	39	51	0	YES
R4	Residential	ST-4	Night	47	38	47	1	YES
R5	Residential	ST-3	Day	56	42	56	0	YES
R6	Residential	ST-3	Night	50	40	51	0	YES
R7	Business	ST-3	Day	56	35	56	0	YES
R8	Business	ST-2	Day	61	41	61	0	YES
R9	Residential	ST-2	Night	55	24	55	0	YES

1. Calculation of increase over background performed using data rounded to nearest whole decibel.

Table 3.10-6a City of Boston Compliance Evaluation: Project-Only Modeling Results (*With* Emergency Generators)

Receptor ID	Land Use	Period	dBA	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
				dB	dB	dB	dB	dB	dB	dB	dB	dB
R1	Residential	Day	44	61	58	52	46	39	39	33	25	0
R2	Residential	Day	46	66	61	55	48	40	39	32	25	4
R3	Residential	Day	41	63	58	51	43	36	32	26	19	1
R4	Residential	Day	48	67	63	56	50	42	42	36	29	8
R5	Residential	Day	46	66	61	53	48	43	39	33	29	13
R6	Residential	Day	42	63	58	50	43	39	34	28	22	7
R7	Business	Day	40	64	58	49	41	33	32	27	22	7
R8	Business	Day	44	64	60	53	46	39	37	32	26	8
R9	Residential	Day	42	61	57	50	45	35	37	29	18	0
City of Boston Noise Limits	Residential	Day	60	76	75	69	62	56	50	45	40	38
		Night	50	68	67	61	52	46	40	33	28	26
	Residential/Industrial	Day	65	79	78	73	68	62	56	51	47	44
		Night	55	72	71	65	57	51	45	39	34	32
	Business	Day	65	79	78	73	68	62	56	51	47	44
		Night	65	79	78	73	68	62	56	51	47	44
	Industrial	Day	70	83	82	77	73	67	61	57	53	50
		Night	70	83	82	77	73	67	61	57	53	50

Table 3.10-6b City of Boston Compliance Evaluation: Project-Only Modeling Results (*Without* Emergency Generators)

Receptor ID	Land Use	Period	dBA	32 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
				dB	dB	dB	dB	dB	dB	dB	dB	dB
R1	Residential	Night	41	51	51	48	42	38	35	31	23	0
R2	Residential	Night	39	51	51	47	41	37	32	25	18	0
R3	Residential	Night	39	53	52	48	41	36	31	25	17	0
R4	Residential	Night	38	50	48	44	40	37	30	23	17	1
R5	Residential	Day	42	53	51	47	44	42	32	27	23	10
R6	Residential	Night	40	54	52	48	41	38	33	27	19	5
R7	Business	Day	35	52	50	45	37	32	28	23	17	4
R8	Business	Day	41	53	53	50	43	38	36	31	25	8
R9	Residential	Night	24	37	35	30	26	24	18	9	0	0
City of Boston Noise Limits	**Residential**	Day	60	76	75	69	62	56	50	45	40	38
		Night	50	68	67	61	52	46	40	33	28	26
	Residential/Industrial	Day	65	79	78	73	68	62	56	51	47	44
		Night	55	72	71	65	57	51	45	39	34	32
	Business	Day	65	79	78	73	68	62	56	51	47	44
		Night	65	79	78	73	68	62	56	51	47	44
	Industrial	Day	70	83	82	77	73	67	61	57	53	50
		Night	70	83	82	77	73	67	61	57	53	50

3.10.6 Conclusions

Baseline noise levels were measured in the vicinity of the proposed Project and were compared to predicted noise levels based on information provided by the manufacturers of representative mechanical equipment or estimated from the equipment's capacity. With appropriate mitigation (listed below), the Project is not expected to introduce significant outdoor mechanical equipment noise into the surrounding community.

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

- The emergency generator should be fitted with a critical-grade exhaust silencer and weather-proof, sound-attenuating enclosure, similar to that specified in Tables 3.10-3b and 3.10-4. Routine testing of the generators should be scheduled during daytime hours only when background sound levels are higher.

- Garage inlet and exhaust fan ducts exiting through the southern façade of the proposed building should terminate at openings fitted with acoustical louvers to provide necessary noise reduction.

Results of this analysis indicate that noise levels from the Project at the nearest receptors will be equal to or below the City of Boston Noise Zoning requirements based on land -use, and will comply with all MassDEP A-weighted and tonal noise limits. The results in Section 3.10.5.3 indicate that the proposed Project can operate without significant impact on the existing acoustical environment.

At this time, the mechanical equipment and noise controls are conceptual in nature and, during the final design phase of the Project, will be specified to meet the applicable City of Boston and MassDEP noise limits. Additional mitigation may include the selection of quieter units, acoustical louvers, screening walls, mufflers, or equipment enclosures, as needed.

3.11 Construction

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 and businesses, will be employed. Techniques such as barricades, walkways and signage will be used. The CMP will include routing plans for trucking and deliveries, plans for the protection of existing utilities, and control of noise and dust.

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 who is responsible for responding to the questions/comments/complaints of the residents of the neighborhood.

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

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.

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

3.11.3 Construction Schedule

The Proponent anticipates that the Project will commence in the second quarter of 2014 and construction will be completed in the second quarter of 2016.

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 Proponent 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 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 Charles River" plaques will be installed at storm drains that are replaced or installed as part of the Project.

3.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 400 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 construction team 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 & 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 demolition, excavation and the early phases of construction. Plans for controlling fugitive dust during demolition, excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks. The construction contract will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts, pursuant to this 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, 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 the building permit application for the Project. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work for each phase of the Project, in compliance with the City's requirements.

3.11.14 Wildlife Habitat

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

3.12 Sustainable Design

3.12.1 Green Building

The Proponent takes a triple bottom line approach to sustainability, looking at the social, economic and environmental aspects and impacts of their projects. The Proponent has set internal benchmarks, based on a philosophy of continual improvement set up by its ISO-14001 certified environmental management system. Specifically for the Project, the following target goals apply:

- LEED- NC Gold certification.
- Skanska will perform a carbon footprint analysis on the Project that gets reported publicly.
- Energy performance targeting a 25% reduction below the ASHRAE 90.1-2007 baseline.
- Water consumption at least 30% below the Uniform Plumbing Code (UPC) 2006 baseline.
- Using local and low-toxicity materials wherever possible and incorporating green roofs and natural materials.

To comply with Article 37, the Proponent intends to measure the results of their sustainability initiatives using the framework of the LEED rating system. As new construction for hotel, residential, medical office and retail uses, the Project will use the LEED V3 NC 2009 (New Construction) as a rating system to show compliance with Article 37. The LEED rating system tracks the sustainable features of a project by achieving points in the following categories: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation in Design.

A LEED checklist is included in Appendix E, and shows the credits the Project anticipates achieving. The checklist will be updated regularly as the design develops and engineering assumptions are substantiated. Presently, 60 points have been targeted, not including any of the potential Boston Zoning Code Article 37 points.

Sustainable Sites

SS Prerequisite 1, Construction Activity Pollution Prevention. The Project will implement a full erosion and sedimentation control plan; this plan will conform to the requirements of 2003 EPA Construction General Permit.

SS Credit 1, Site Selection. This Project meets all the criteria for site selection; the site is not Prime Farmland, it is not below the 100-year flood elevation, it is not a habitat for threatened or endangered species, it is not within 100 feet of wetlands, and it is not public parkland. It is a previously developed urban site.

SS Credit 2, Development Density and Community Connectivity. The Project is in compliance with Option 2, Community Connectivity. Within a one-half mile radius of the building's main entrance, there are residential areas and many basic services with pedestrian access. These basic services include banks, places of worship, convenience groceries, day cares, cleaners, fire station, library, hospital and dental offices, parks, pharmacies, post office, restaurants, supermarkets, museums, and fitness centers.

SS Credit 4.1, Alternative Transportation- Public Transportation Access. The Project is located within one-quarter mile of at least two public bus stops and one-half mile of at least one public subway station.

SS Credit 4.2, Alternative Transportation- Bicycle Storage and Changing Rooms. The Project will provide bike storage for 15% of residential occupants and 5% of full-time equivalent employees. The Project will also provide a shower and changing facility for the full-time equivalent employees.

SS Credit 4.3, Alternative Transportation- Low Emission & Fuel Efficient Vehicles. The Project will provide preferred parking spaces for low-emitting and fuel-efficient vehicles for 5% of the total parking capacity. The low-e and fuel efficient vehicles must have a minimum green score of 40 from the ACEEE Annual Rating Guide or be a ZEV (zero emissions vehicle).

SS Credit 4.4, Alternative Transportation- Parking Capacity. The Project will have a parking ratio of approximately 0.42 vehicles per unit, less than what is requested in the Fenway Urban Village Plan, and less than 0.75 spaces per residential unit and 0.75 per 1,000 sf of commercial space recommended by the Boston Transportation Department. The Project will provide the infrastructure for car-sharing services and support programs.

SS Credit 5.2, Site Development- Maximize Open Space. The Project will provide a minimum of 20% open space of the total site area. Since the Project is located in an urban area, pedestrian-oriented hardscape and vegetated roof areas can contribute to this credit's compliance.

SS Credit 6.1, Stormwater Design - Quantity Control. The Project will meet the criteria for stormwater quantity control for a previously developed site with existing imperviousness greater than 50%. The Project will decrease the stormwater runoff by 25% from the two-year 24-hour design storm.

SS Credit 6.2, Stormwater Management- Quality Control. The Project will meet the criteria for stormwater quality control by capturing and treating 90% of the average annual rainfall using acceptable best management practices (BMPs). The BMPs used to treat the runoff will remove 80% of the total suspended solids (TSS).

SS Credit 7.1, Heat Island Effect- Non-Roof. The Project will place 100% of the on-site parking spaces underground, which exceeds the minimum requirements of placing 50% of the spaces under cover (defined as underground, under deck, under roof, or under a building). The pedestrian-oriented hardscape will be light-colored with a compliant SRI value of 29 or higher.

SS Credit 7.2, Heat Island Effect – Roof. The Project will achieve this credit by having a combined roofing system that consists of a high albedo membrane roof system (minimum SRI of 78) and vegetated roof surfaces. Together, the membrane roof and the vegetated roof achieve the credit's requirements with the equation: (Area of SRI Qualified Roof/0.75) + (Area of Vegetated Roof/0.50) ≥ Total Roof Area.

Water Efficiency

WE Prerequisite 1, Water Use Reduction- 20% Reduction. The Project will comply with the minimum potable water consumption reduction of 20% less water used when compared to a baseline case by using low-flow and efficient plumbing fixtures (not including irrigation).

WE Credit 1.1, Water Efficient Landscaping. The Project will reduce potable water consumption used for irrigation by using native or adapted plant species and an efficient irrigation system. The water demand is calculated for the month of July. The following equations were employed from the LEED reference guide to formulate the table information:

- KL (landscape coefficient) = KS (species factor) x Kd(density factor) x Kmc (micro climate factor)
- ETL (evapotranspiration rate) = KL x ETO
- TPWA (total potable water applied) = Area x ETL/IE

WE Credit 3.1, Water Use Reduction. The Project will reduce the potable water consumption by at least 30% less water used when compared to a baseline case by using low-flow and efficient plumbing fixtures (not including irrigation).

Energy and Atmosphere

EA Prerequisite 1, Fundamental Commissioning of the Building Energy Systems. The Project will have a commissioning authority (CxA) that will fulfill the requirements of the prerequisite. The CxA's services will include review of the Owner's Project Requirements (OPR) and Basis of Design (BOD) documents, development of a commissioning plan, incorporation of a commissioning specification section into the construction documents and verification through startup observation and functional testing that the installed systems are operating in accordance with the OPR, BOD, and construction documents. The previous services apply to the following commissioned systems: HVAC, lighting control, and domestic hot water heating.

EA Prerequisite 2, Minimum Energy Performance. The Project will comply with the minimum energy performance improvement of 10% compared to the ASHRAE 90.1-2007 baseline standard.

EA Prerequisite 3, Fundamental Refrigerant Management. The Project will not use chlorofluorocarbon (CFC)-based refrigerants in the HVAC&R systems.

EA Credit 1, Optimize Energy Performance. The Project will at least achieve a minimum energy performance improvement of 22% compared to the ASHRAE 90.1-2007 baseline standard. This is achieved by using an energy-efficient building envelope, lighting systems, and HVAC systems.

EA Credit 3, Enhanced Commissioning. The Project will have a CxA that will fulfill the requirements of the credit. The CxA's services will include review of the Owner's Project Requirements (OPR) and Basis of Design (BOD) documents, development of a commissioning plan, incorporation of a commissioning specification section into the construction documents and verification through startup observation and functional testing that the installed systems are operating in accordance with the OPR, BOD, and construction documents. The previous services apply to the following commissioned systems: HVAC, lighting control, and domestic hot water heating.

EA Credit 4, Enhanced Refrigerant Management. The Project will select refrigerants for the HVAC&R systems that minimize or eliminate the emissions of compounds that contribute to ozone depletion and climate change.

EA Credit 6, Green Power. The Project will engage in at least a two-year renewable energy contract to provide at least 35% of the building's electricity usage from renewable sources.

Materials and Resources

MR Prerequisite 1, Storage and Collection of Recyclables. The Project will provide recycling areas that serve the entire building for paper, corrugated cardboard, glass, plastics, and metals.

MR Credit 2, Construction Waste Management. The Project will recycle/salvage construction and demolition debris for a minimum of 75% of the total construction and demolition debris. The construction manager for the Project will develop and implement a construction waste management plan (CWMP).

MR Credit 4, Recycled Content. The Project will use materials with recycled content so that the sum of the postconsumer recycled content plus one-half of the preconsumer content constitutes at least 20% based on cost of the total material value in the Project. This is based on specification divisions 03-10, 31, 32 (furniture may be included at Project's decision).

MR Credit 5, Regional Materials. The Project will use regional materials within 500 miles of the Project site that constitute at least 20% based on cost of the total material value in the Project. This is based on specification divisions 03-10, 31, 32 (furniture may be included at Project's decision).

MR Credit 7, Certified Wood. The Project will use FSC-certified wood materials and products that constitute at least 50% based on cost of the total new wood material value in the Project. Only permanently installed wood products and materials are included in this credit (formwork, scaffolding, bracing, etc. are not included). This is based on specification divisions 03-10, 31, 32 (furniture may be included at Project's decision).

Indoor Environmental Quality

IEQ Prerequisite 1, Minimum Indoor Air Quality Performance. The Project will comply with ASHRAE 62.1-2007 for mechanically and naturally ventilated spaces. There will be HVAC units that perform the majority of the common area ventilation by delivering 100% outside air to all corridors on every level; this positively pressurizes the building to prevent air from leaking in and prevents air in apartments from leaking out into the corridors. In each apartment the tenant also has the ability to open their windows allowing for occupant controlled ventilation. The operable window area in all apartments is greater than 4% of the room area served by the window.

IEQ Prerequisite 2, Environmental Tobacco Smoke Control. The Project will comply with the prerequisite requirements by:

- prohibiting smoking in all common areas;
- locating designated exterior smoking areas 25 feet away from entries, windows, and air intakes;
- weather-stripping all exterior doors and residential unit entry doors and operable windows;
- sealing wall, floor, and ceiling penetrations between residential units;
- demonstrate acceptable sealing of the residential units by using the blower door test in accordance with ASTM-E779-03 standard; and
- use progressive sampling methods defined by Chapter 4 of Residential Manual for Compliance with California's 2001 Energy Efficient Standards.

IEQ Credit 3.1, Construction IAQ Management Plan- During Construction. The Project will develop and implement an IAQ Management Plan for the construction phase of the Project that will comply with the SMACNA 008-2008 Guidelines, will protect on-site absorptive materials from moisture, and will use the appropriate filtration media for permanently installed air handlers used during construction.

IEQ Credit 4.1, Low-Emitting Materials- Adhesives & Sealants. The Project will use adhesives and sealants that comply with the South Coast Air Quality Management District (SCAQMD) Rule #1168 and Green Seal Standard GS-36. The VOC limits stated in these standards will not be exceeded for all of the adhesives and sealants used inside of the weatherproofing system and applied on-site. The contractor will submit Material Safety Data Sheets (MSDS) highlighting the VOC content (g/L) for verification in the construction administration process.

IEQ Credit 4.2, Low-Emitting Materials- Paints & Coatings. The Project will use paints and coatings inside of the weatherproofing system and applied on-site that complies with the Green Seal Standard GS-11 for paints and primers; Green Seal Standard GS-03 for anticorrosive paints; and the South Coast Air Quality Management District (SCAQMD) Rule #1113 for finishes, stains, and sealers. The contractor will submit Material Safety Data Sheets (MSDS) highlighting the VOC content (g/L) for verification in the construction administration process.

IEQ Credit 4.3, Low-Emitting Materials- Flooring Systems. The Project will use carpet and carpet cushions that meet the testing and product requirements of the Carpet and Rug Institute's (CRI) Green Label Plus program and all hard surface flooring will be FloorScore certified. Also, all of the flooring's adhesives and/or grouts will meet the SCAQMD Rule #1168 VOC limits, and all sealers, stains, and coatings will meet SCAQMD Rule #1113 VOC Limits. The contractor will submit the flooring certification and the coating/adhesive's Material Safety Data Sheets (MSDS) highlighting the VOC content (g/L) for verification in the construction administration process.

IEQ Credit 4.4, Low-Emitting Materials- Composite Wood & Agrifiber Products. The Project will not use composite wood and agrifiber products that contain urea-formaldehyde resins inside the weatherproofing system. The contractor will submit a manufacturer letter or a Material Safety LEED NC 2.2 Credit Narratives Page 7 Data Sheets (MSDS) highlighting the laminating adhesives used for verification in the construction administration process.

IEQ Credit 5, Indoor Chemical and Pollutant Source Control. For this Project, all janitors' closets where chemicals are stored are provided with ventilation; the room will be negatively pressurized in order to prevent any odors from leaking out. Also, all janitors' closet doors will be constructed to reduce the leakage, and the wall around each closet will not have openings above to allow more leakage. Each of the three roof top units will be equipped with a MERV 13 air filter to reduce dust and particles in the air supply. At every main, high-volume entryway there will be special floor mats to prevent outside materials from being carried into the building. Each of these mats will be cleaned on a regular basis and the MERV 13 filters will be replaced before occupancy and after construction.

IEQ Credit 6.1, Controllability of Systems – Lighting. The Project will provide individual lighting controls for at least 90% of the building occupants. For the residential units, all of the living rooms, dining rooms, bedrooms, and studies will have on/off switches to control their lighting.

IEQ Credit 6.2, Controllability of Systems – Thermal Comfort. The Project will provide thermal comfort controls for at least 50% of the building occupants. Each residential unit will have a main thermostat control and operable windows. All regularly-occupied common areas will have thermostat controls.

IEQ Credit 8.2, Daylight and Views. The Project will provide at least 90% of all regularly occupied spaces with access to outdoor views. Of these spaces with access to views, a direct line of sight will be achieved via vision glazing (between 2'-6" and 7'- 6" above finish floor), and there will be no obstructions above 42 inches.

Innovation in Design

The Project anticipates that several points will be achieved in the Innovation & Design category.

ID Credit 1.1, SS 4.1 Exemplary Performance- Doubled Public Transportation Access. The Project is located in a dense urban fabric that has access to several different subway stops, commuter rail lines, and bus stops. The Project is located within a one-half mile radius of two or more subway stops, and/or within a one-quarter mile radius of four or more bus stops. Also, the frequency of the transit system is at least 50 transit rides per day.

ID Credit 1.2, SS 7.1 Exemplary Performance- 100% Covered Parking. The Project will exceed the LEED SSc7.1 requirements by having 100% of the on-site parking spaces under cover. All parking will be completely enclosed by the building's structure with an entry ramp from ground level.

ID Credit 1.3, MR 4 Exemplary Performance- 30% Recycled Content. The Project will use materials with recycled content so that the sum of the postconsumer recycled content plus one-half of the preconsumer content constitutes at least 30% based on cost of the total material value in the Project. This is based on specification divisions 03-10, 31, 32 (furniture may be included at Project's decision).

ID Credit 1.4, Green Education Program. The Project will establish an educational program that is actively instructional. Two of the following three elements must be included in the educational program:

- A comprehensive signage program built into the building's spaces to educate the occupants and visitors of the benefits of green buildings. This program may include windows to view energy-saving mechanical equipment or signs to call attention to water-conserving landscape features.

- The development of a manual, guideline or case study to inform the design of other buildings based on the successes of this Project. This manual will be made available to the USGBC for sharing with other projects.

- An educational outreach program including a guided tour focusing on sustainable design, operations and maintenance using the Project as an example.

ID Credit 2, LEED Accredited Professional. The Project complies with the credit requirements of having at least one LEED AP on the Project team.

Regional Priority

The regional priority (RP) credits are additional points that identify credits that have environmental importance for a geographic region. The credits are assigned by an area's zip code. The Project's zip code is 02215, and the available RP credits include SSc3, SSc6.1, SSc7.1, SSc7.2, EAc2, MRc1.1. The Project anticipates that several points will be achieved in the Regional Priority category.

1. RP Credit 1.2, SS Credit 6.1, Stormwater Design- Quantity Control.

2. RP Credit 1.3, SS Credit 7.1, Heat Island Effect- Non-Roof

3. RP Credit 1.4, SS Credit 7.2, Heat Island Effect- Roof

3.12.1 Climate Change Preparedness

The Proponent understands that the City of Boston is especially interested in the adaptability of the city to long-term climate change. This interest has been manifested already by the Mayor's Executive Order Relative to Climate Change in Boston and the recent convening of the Mayor's Climate Action Leadership Committee. The Climate Change Preparedness Questionnaire has been submitted electronically to the BRA.

In general, the proposed Project team examined three areas of concern related to climate change: sea level rise, drought conditions, and increased number of high-heat days and higher cost of energy.

Sea Level Rise

According to the Intergovernmental Panel on Climate Change (IPCC), if sea level continues to rise at the current rate, the sea level in Massachusetts as a whole will rise by one foot by the year 2100[8]. However, using a high emissions scenario, sea level rise could reach six feet. According to The Boston Harbor Association's Seal-level Rise Maps, the Project site would not be impacted by a rise in sea level of up to five feet. The Proponent has not taken any special precautions to protect against sea level rise.

Drought Conditions

As a result of Climate Change, the Northeast is expected to experience more frequent and intense storms. In order to mitigate this, the Project will decrease stormwater runoff by 25% from the two-year 24-hour design storm. Emergency mechanical equipment will not be placed on the first floor in order to protect it from flooding. A permeable paving strip and landscaping feature is also being considered on a portion of the Boylston Street sidewalk to allow for stormwater infiltration.

High Heat Days and Cost of Energy

The IPCC has also predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from 5 to 20 days. In order to prepare for this, the Project will reduce the heat island effect by placing all parking spaces underground, which will

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

reduce the amount of impervious pavement on the Project site, and will use light-colored paving materials on the pedestrian-oriented hardscape in order to absorb less heat. The Project will also have vegetated roof surfaces, which can reduce energy use in addition to reducing the heat island effect. High performance glass will be employed on the south façade to reduce solar heat gain in the hot summer months.

In order to minimize the Project's impact on Climate Change, the Project's energy performance is anticipated to be at 22% above the ASHRAE 90.1-2007 baseline standard. The Project will explore renewable energy contracts to provide a portion of the building's electricity usage from renewable sources.

Chapter 4.0

Urban Design

4.0 URBAN DESIGN

The site at 1350 Boylston Street is currently a Burger King restaurant surrounded by an asphalt parking lot that is a vestige of 1950's planning for the car. Transforming the site into an approximately 240-unit rental apartment building with ground floor retail and underground parking brings the site into the 21st century, where urban living is sought after, and buildings provide active edges for vibrant pedestrian streets. Figures 4-1 through 4-4 include photographs of the existing site and surrounding area.

After studying various massing alternatives (see Section 1.4.3.3) and through discussions with the BRA and Fenway community groups, it was decided that an 18-story tower with a four-story base was preferred. The four-story base provides a number of benefits to the Project and the surrounding area. The height of the base provides a transition from the growing Boylston Street developments towards the established residential neighborhood south of the Project site (see Figure 4-5). The base breaks up the mass of the building, creating visual variety as one looks at the Project from various locations on Boylston Street and from the neighborhood to the south. The base also allows for loft units that include a second level structure that extends above the fourth floor roof, providing variety to the rooftop and a unique identity to the building from the surrounding area. Adjacent to these structures are private outdoor spaces that will include an active green roof which may include a number of plantings, and possibly trees, further distinguishing this building from the surrounding buildings. Finally, the base allows for sun and air to penetrate the southern side of Boylston Street, which would not be possible with a mass spanning the site along Boylston Street. See Figures 4-6 through 4-8 for images of the Project from several perspectives.

The western portion of the site will include the 18-story portion of the building set back from the base along Kilmarnock Street to create a southwest facing amenity deck. The massing of this portion of the building is proposed to be broken up into two sides to minimize the visual impact on the surrounding area: one of metal panel with a sloping façade along Boylston Street and the other of textured precast concrete. Separating those two masses is a glass window wall. The overall heights of these two components also differs, as the mechanical penthouse is included only on the western-most portion of the tower roof, and will be screened by a mechanical penthouse. The heights will create steps from the west to east. See Figure 4-9 for an axonometric diagram of the Project.

The ground floor will have storefront glass at the retail locations and building lobby. This glass will connect visually to the glass wall between the two components of the tower. The adjacent sidewalks will be consistent with new developments in the area, allowing for street benches, street lights, and street trees. See Figures 4-10 through 4-12 for street level perspectives and proposed streetscape design, and Figures 4-13 and 4-14 for a landscape and urban design references. A permeable paving strip and a landscaping feature are also being considered on a portion of the Boylston Street sidewalk to allow for stormwater infiltration. The extent of the site along Boylston Street will conform to Boston's Complete Streets Guidelines.

There is an existing service alley to the south of the site that provides access to buildings toward the east (see Figure 4-15). The alley will be kept clear of any obstructions with the proposed design, and the building steps back from the easement for over half of the site length in order to provide visual relief and create ground floor area for the loading, transformers and switchgear (see Figure 1-3).

The streetscape for the Project follows MassDOT's current plan for Boylston Street, including street trees with a continuous band of permeable paving along the curb (see Figure 4-11). On-street parking is proposed for approximately four cars. Bike racks are provided in two locations, and a small planted seating area is designed in close relationship to what is found in the MassDOT's plan. This expanded seating area is located at the corner of Boylston and Kilmarnock streets and matches the character of landscape seating areas that have been developed by others in coordination with MassDOT. The complementary character is achieved with similarity in scale, location and material selection.

1350 BOYLSTON STREET

Figure 4-1

Views of Site
Urban Design

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EPSILON ASSOCIATES INC.

prepared by: ADD Inc

1350 BOYLSTON STREET

Figure 4-2

Aerial View
Urban Design

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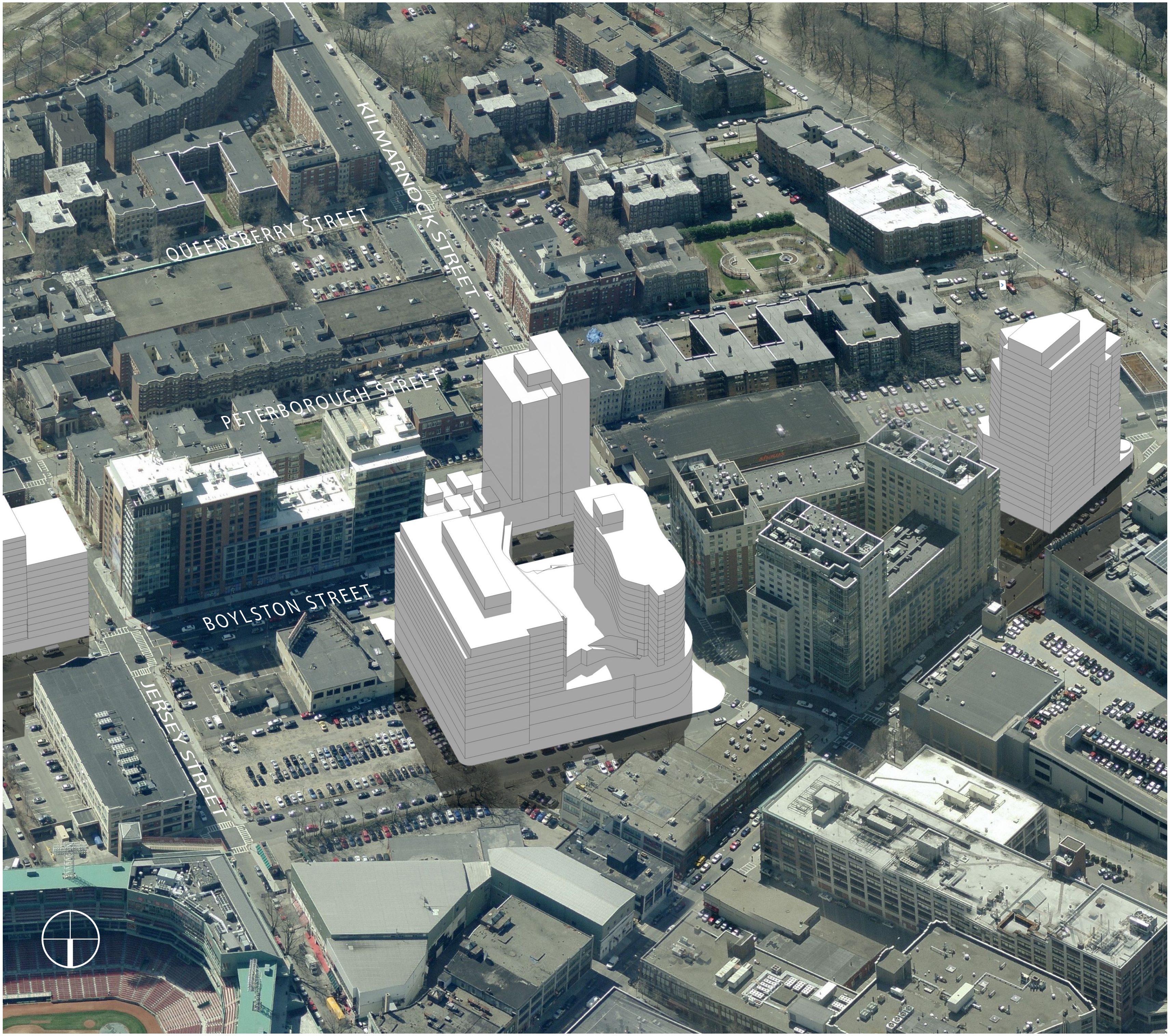
EPSILON ASSOCIATES INC.

prepared by: ADD Inc



1350 BOYLSTON STREET

Figure 4-3
Aerial Buildout
Urban Design

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EPSILON ASSOCIATES INC.

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FENWAY TRIOLOGY FROM SITE

SHAWS SUPERMARKET

1330 BOYLSTON STREET

MCKINLEY SCHOOL

1350 BOYLSTON STREET

Figure 4-4

Context Photos
Urban Design

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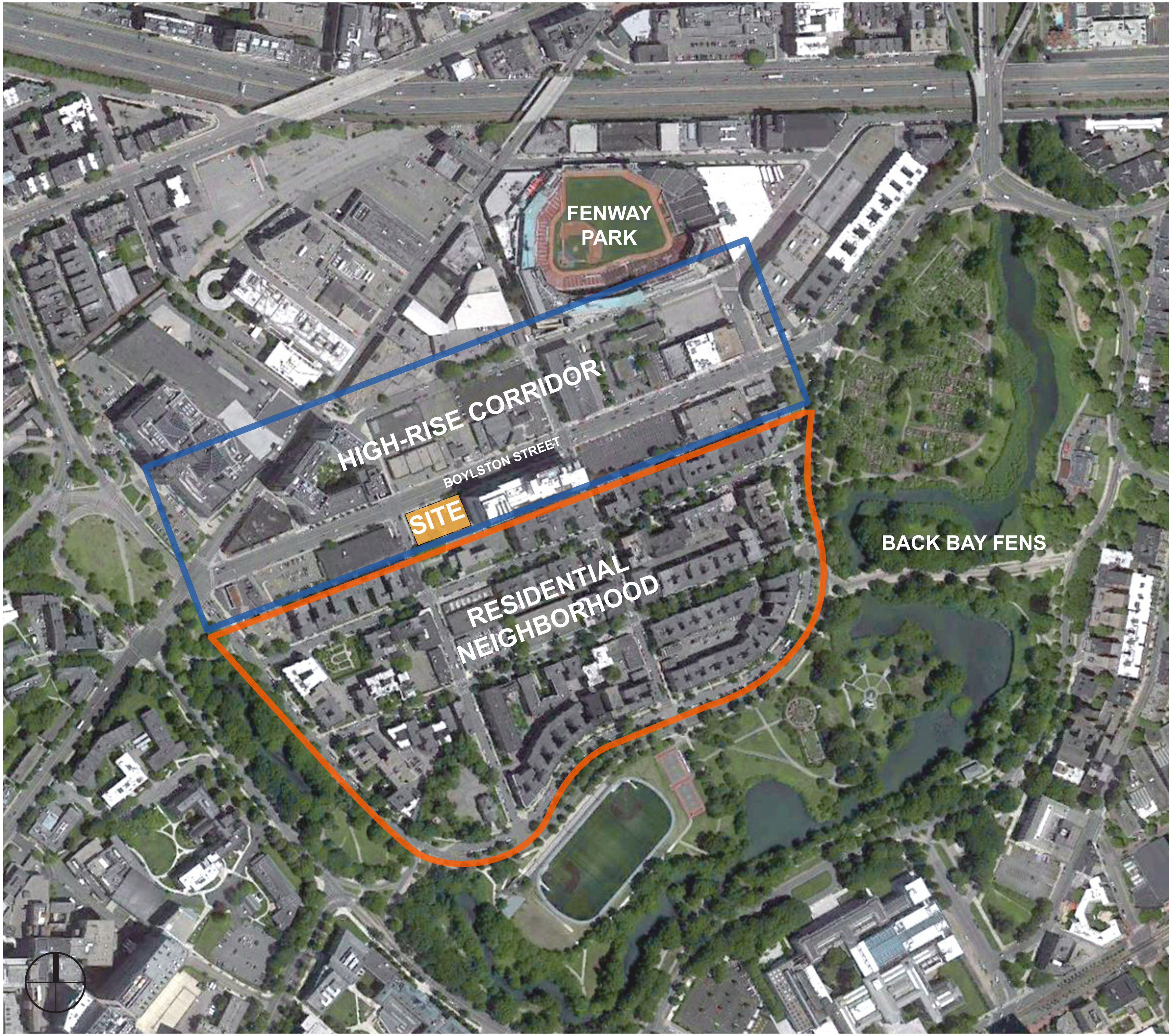

1350 BOYLSTON STREET

Figure 4-5

Context Diagram
Urban Design

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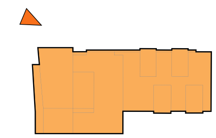
1350 BOYLSTON STREET

Figure 4-6

Boylston Rendering
Building Design



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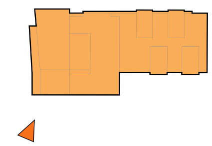
1350 BOYLSTON STREET

Figure 4-7

Kilmarnock Rendering

Building Design



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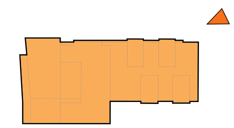
1350 BOYLSTON STREET

Figure 4-8

Perspective
Building Design



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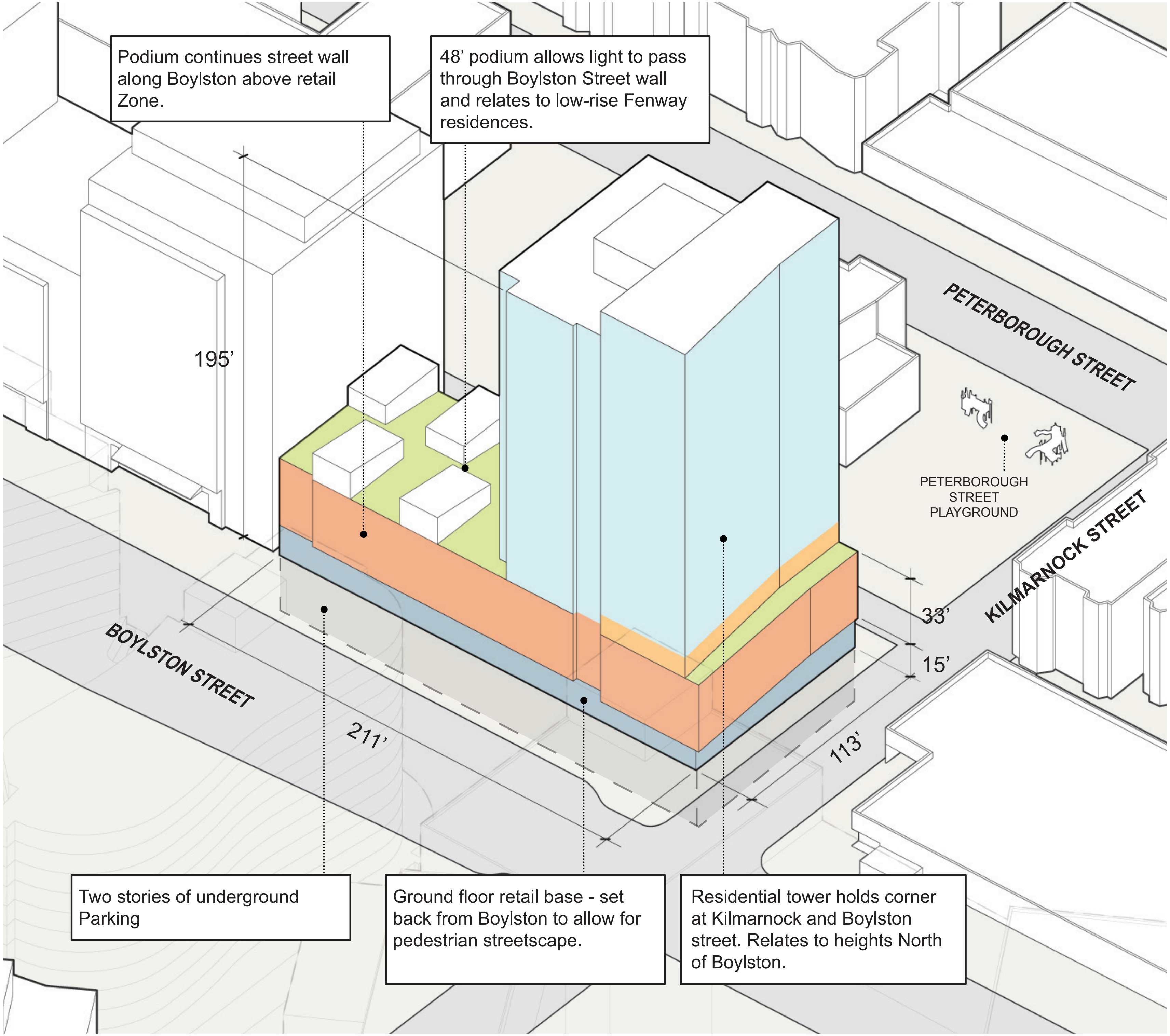

1350 BOYLSTON STREET

Figure 4-9

Site Diagram

Urban Design

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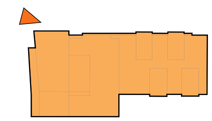
1350 BOYLSTON STREET

Figure 4-10

Ground Floor
Entry & Retail
Building Design



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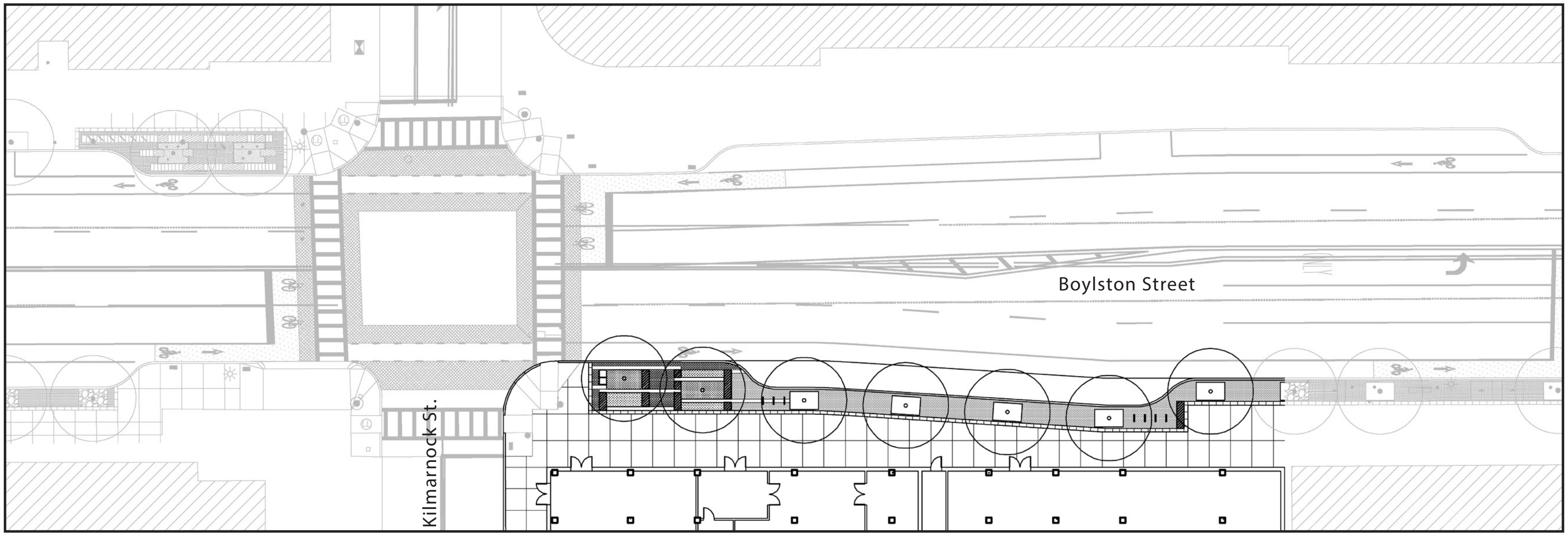

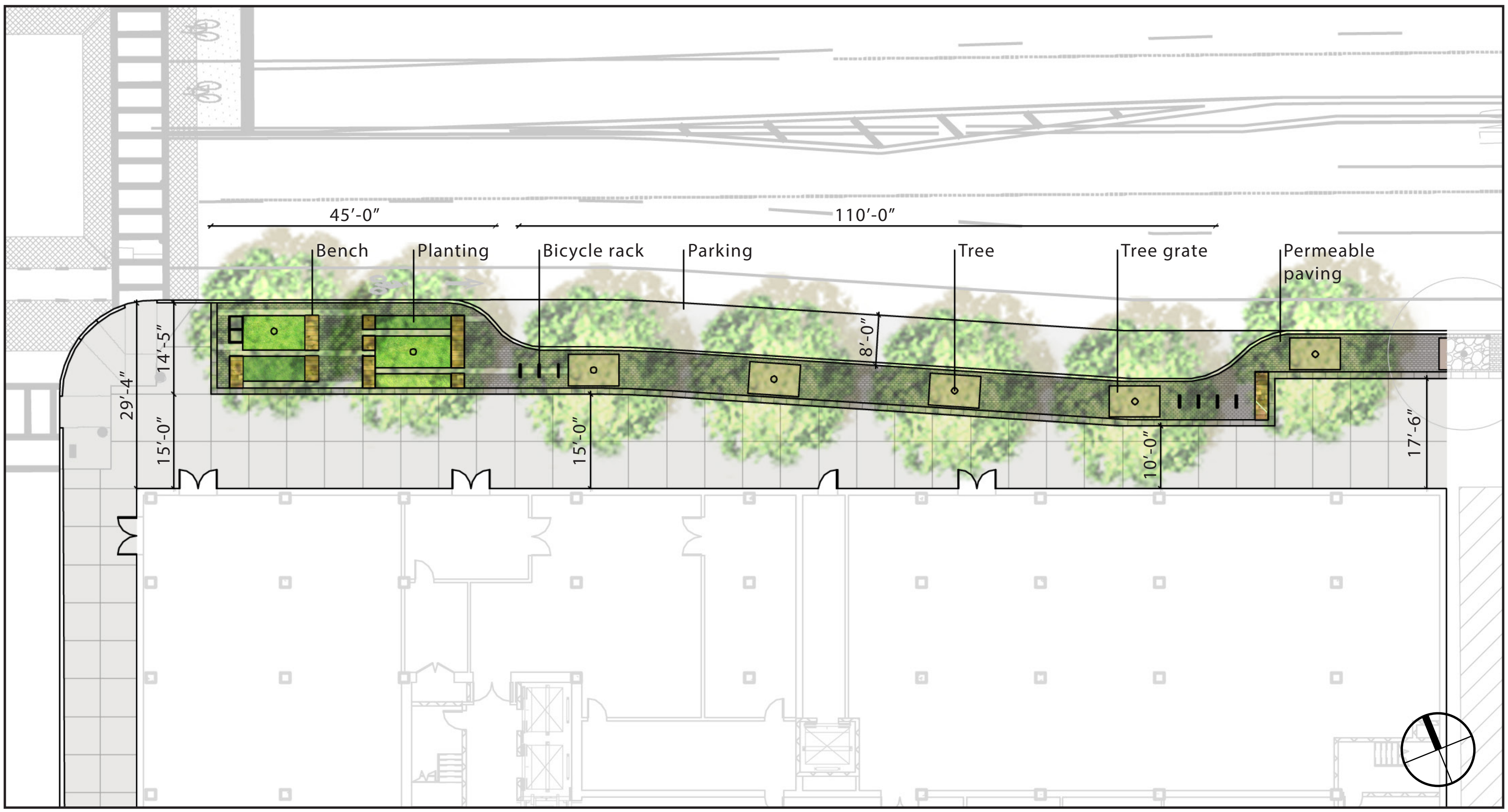

1350 BOYLSTON STREET

Figure 4-11

Streetscape
Urban Design

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1350 BOYLSTON STREET

Figure 4-12

Streetscape
Urban Design

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1350 BOYLSTON STREET

Figure 4-13

Streetscape
Urban Design





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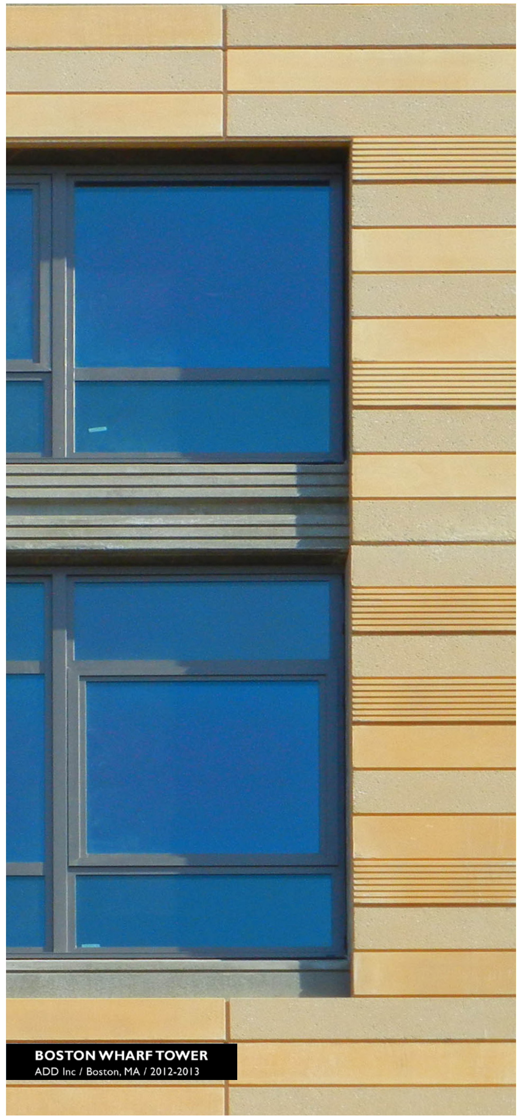
1350 BOYLSTON STREET

Figure 4-14

References
Urban Design

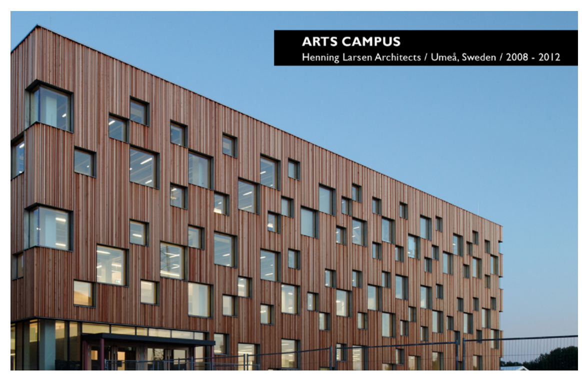
ROMEO & JULIET
An 1870 oil painting by Madox Brown.
Inspiration for interlocking tower volumes.



BOSTON WHARF TOWER
ADD Inc / Boston, MA / 2012-2013

STOCKHOLM CITY STATION
3Xn / Stockholm, Sweden / 2017

FALUN RED



ARTS CAMPUS
Henning Larsen Architects / Umeå, Sweden / 2008 - 2012

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EPSILON ASSOCIATES INC.

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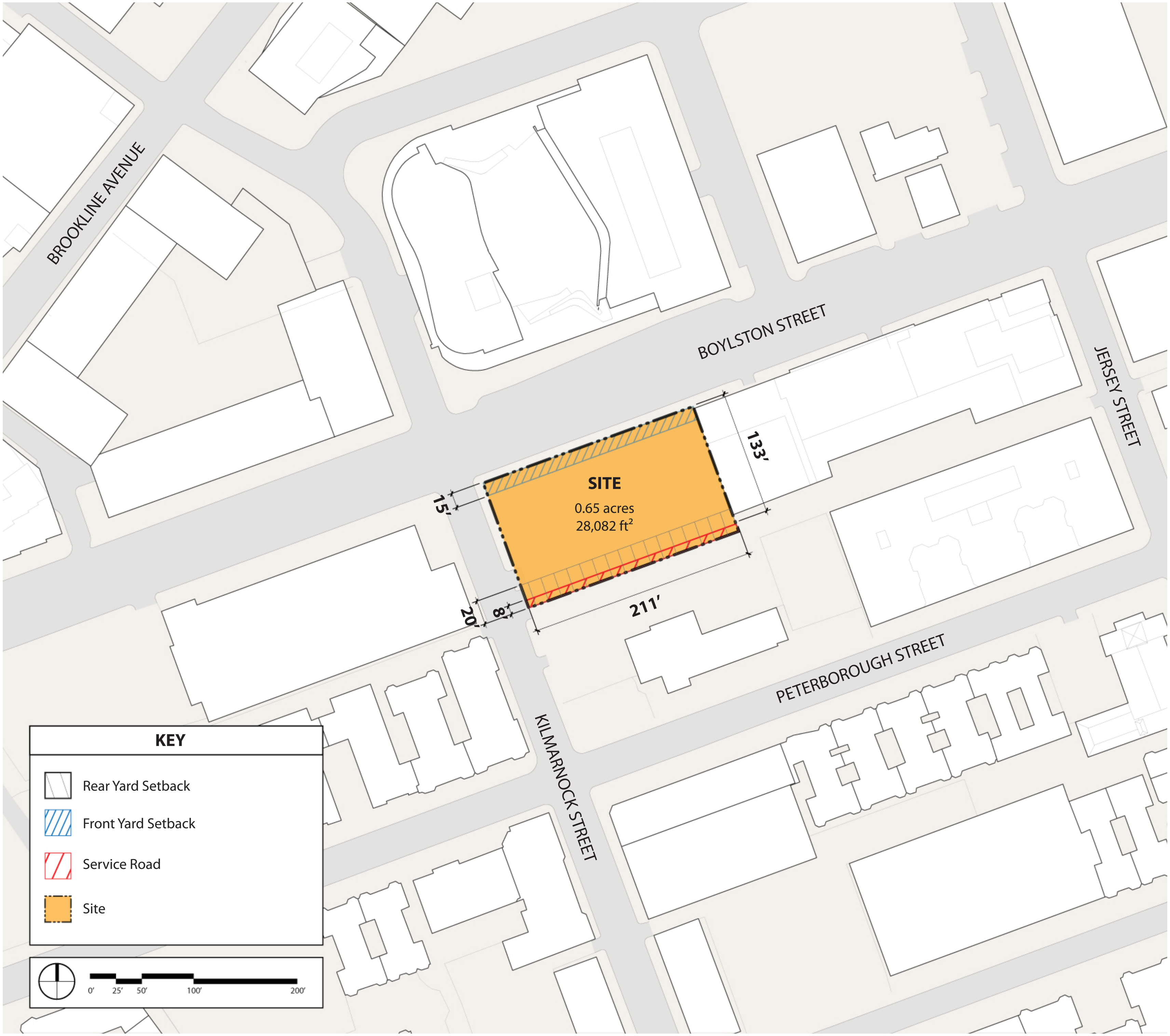

1350 BOYLSTON STREET

Figure 4-15

Site Extents
Urban Design

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Chapter 5.0

Historic and Archaeological Resources

5.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

5.1 Buildings on the Project Site

The site contains a one-story building. Constructed in 1971, the one-story restaurant is not historically significant and is not listed in the State or National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth.

5.2 Historic Resources in the Project Vicinity

Table 5-1 lists State and National Register-listed properties and historic districts located within a quarter mile radius of the Project site. Figure 5-1 identifies the locations of these properties and historic districts.

Table 5-1 State and National Register-Listed Properties and Historic Districts

Properties Listed in the State and National Register of Historic Places		
Map No.	Name	Address
A	Fenway Park	24 Yawkey Way
B	Sears Roebuck Mail Order Store	309 Park Drive
C	Back Bay Fens	Emerald Necklace
Properties Included in the Inventory of Historic and Archaeological Assets of the Commonwealth		
1	Martin Millmore School	85 Peterborough Street
2	Sumner Apartment Building	35-45 Peterborough Street
3	Church of the Disciples	Peterborough Street
4	Stuart Apartment Building	36-46 Peterborough Street
5	H.C. Birburie Town House	22-32 Peterborough Street
6	The Pantry Grocery Store	37 Queensberry Street
7	Robert Treat Paine Town House	1 Queensberry Street
8	Fen Drive Apartment Building	61 Park Street
9	Nashdome Apartments	65 Park Street
10	Park Drive Apartment	69 Park Street
11	111 Park Drive	111 Park Drive
12	Rotenberg and Rudnik Apartment Building	125-151 Park Drive
13	Peterborough Chambers Apartment Building	131 Peterborough Street
14	Richardson Building	5-15 Jersey Street

G:\Projects2\MA\Boston\3625\historic.mxd

1350 BOYLSTON STREET

Figure 5-1

Historic Resources

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EPSILON ASSOCIATES, INC.

5.3 Impacts to Historic Resources

5.3.1 Visual Impacts

The site at 1350 Boylston Street is currently a Burger King restaurant surrounded by an asphalt parking lot which detracts from the urban streetscape. The proposed 18-story tower with a four-story base will restore the streetscape to an urban feel consistent with the remainder of the Fenway neighborhood. The building's four-story base will serve as a transition between the smaller-scaled Martin Millmore School (now known as the McKinley Preparatory High School) to the south and the adjacent new construction to the east. The base also breaks up the mass of the building, creating visual variety as one looks at the Project from various locations on Boylston Street and from the setting of historic properties on Peterborough Street.

The Boylston and Kilmarnock streets ground floor elevations will have storefront glass at the retail locations and building lobby that will connect visually to the glass walls utilized in the tower. The Boylston Street sidewalk width will be consistent with the new developments in the area, allowing for street benches, street lights, and street trees. There is an existing service alley to the south, adjacent to the Millmore School, which will be kept clear of any obstructions with the proposed design, and the building steps back from the easement for over half of the site length in order to provide visual relief and create ground floor area for the loading, transformers and switchgear. The ground level will serve as loading and service areas, while the upper levels of the base and the tower will feature the same glass, cast concrete and metal panels as the remainder of the building.

The taller tower section is situated at the corner of Boylston and Kilmarnock streets to provide the necessary square footage required for the building, while maintaining more daylight above and behind the Millmore School. The tower portion will be set back from the base along Kilmarnock Street to further accentuate the base. The massing of the tower portion of the building is proposed to be broken up into two sides to minimize the visual impact on nearby historic resources. The facades will feature a glass, precast concrete and metal panels, and will be set on separate planes to create shadow lines.

The overall design of the building featuring a strong base and varied elevations of the tower will improve the urban fabric of the area. Careful consideration was given to the choice of materials and location of the tower component to blend with the surrounding neighborhood. Visual impacts to nearby historic resources are limited to the building's visibility with the setting of the resources. However, the Project will improve the overall streetscape by creating a strong building base that is absent from the existing site.

5.3.2 Shadow Impacts

New shadow impacts to historic resources is limited during all periods of the year. During the spring equinox, fleeting new shadow falls on the roof of the Sumner Apartment Building at 6:00 p.m. when most of the area is already in shadow. On June 21^{st}, new shadow falls on the rear elevation and roof of the Martin Millmore School at 6:00 p.m. At 6:00 p.m. on September 21^{st}, new shadow is cast onto the roof of the Stuart Apartment Building and the H.C. Birburie Town House. During this period, existing shadow falls on much of the area. On December 21^{st} at 3:00 p.m., a small area of shadow falls on Yawkey Way adjacent to Fenway Park. During this time, however, much of the area is already in shadow. Due to the high density of existing buildings within the neighborhood of the proposed Project, much of the area is already in shadow which results in minimal new shadow impacts to historic resources.

5.4 Archaeological Resources

The proposed Project is located on filled land which has been previously disturbed by prior construction. No previously identified archaeological resources are located within the Project site. No impacts to archaeological resources are anticipated.

Chapter 6.0

Infrastructure

6.0 INFRASTRUCTURE

6.1 Wastewater

6.1.1 Existing Sewer System

Sanitary service is currently provided by the Boston Water and Sewer Commission (BWSC) via a 22″x15″ concrete sewer main within Kilmarnock Street as well as a 32″x42″ brick sewer main within Boylston Street. The BWSC sanitary lines connect to the Massachusetts Water Resource Authority (MWRA) system and eventually discharge to the Deer Island Treatment Plant. Based upon record plans and tie cards available from BWSC, the Project site currently has a sanitary connection to the 22″x15″ concrete sewer main within Kilmarnock Street.

6.1.2 Project-Generated Sanitary Sewer Flow

The Project will generate an estimated 37,185 gallons per day (gpd) of wastewater as further broken down in the below table. These rates were calculated using the Massachusetts State Environmental Code (310 CMR 15.000).

Use	*Quantity*	*Sewage Flow (GPD)*	*Total Estimated Flow (GPD)*
Residential	279 bedrooms	110 gpd/bedroom	30,690
Retail	2,500 sf	50 gpd/1,000 sf of retail	125
Restaurant	4,550 sf / 182 seats	35 gpd/seat	6,370
TOTAL			**37,185**

6.1.3 Sanitary Sewer Connection

The proposed sanitary sewer service connections for the Project are anticipated to tie into the 22″x15″ concrete sewer main within Kilmarnock Street and/or the 32″x42″ brick sewer main within Boylston Street. Existing building services will be cut and capped at the main if the wyes are not used.

The Proponent will also coordinate with BWSC on the design and capacity of the proposed sanitary connections to their system. Initial discussions with BWSC suggest that there is ample capacity in their system to accommodate the Project. A General Services Application and Site Plan will be submitted to BWSC for review and approval as the Project development progresses. In addition, 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.

6.2 Water System

6.2.1 Existing Water Service

Water supply for the Project site is provided by BWSC via the "southern low" water system/ service district including a 10″ water main within Kilmarnock Street and a 16″ water main within Boylston Street. Based upon record plans and tie cards available from BWSC, the existing building currently has a 2″ water service which connects to the 10″ main within Kilmarnock Street. Existing water services to be abandoned will be cut and capped at the main with the valve box, frame and cover removed, and the water meters returned to BWSC.

It should be noted that there are several existing fire hydrants within the immediate vicinity of the Project site, including one on the opposite side of Boylston Street and one on the opposite side of Kilmarnock Street.

6.2.2 Anticipated Water Consumption

The domestic water demand is based on the Project's estimated sewage flow. A conservative factor of 1.1 was applied to the average daily wastewater flows. This factor accounts for consumption and other miscellaneous losses. Given this, it is estimated that the proposed site will consume approximately 40,904 gpd of domestic water. More detailed water use and meter sizing calculations will be submitted to BWSC as part of the Site Plan review process.6.2.3 Proposed Water Service

It is assumed that the development will be served by a new 6″ cement-lined ductile iron (class 56) pipe with a 3″ meter. Calculations for sizing the water meter will be provided as part of the Site Plan submittal to BWSC. The domestic water service will be tied into the 10″ water main within Kilmarnock Street. Water meters will be of a type approved by BWSC and tied into the BWSC's Automatic Meter Reading system. The Project will be provided with a triplex domestic water pump to provide adequate pressure throughout the building.

The Project will also be served by two 8″ dedicated fire protection lines which will provide redundant fire protection service as required by code. It is anticipated that fire protection services will have separate taps into the 10″ water main in Kilmarnock Street and be provided with backflow prevention devices pending confirmation of capacity via fire flow tests and calculations. Should the line in Kilmarnock Street be deemed insufficient, a connection to the 16″ main in Boylston Street will be proposed. The building will be provided with a 750 gallon per minute (GPM) fire pump that will provide the required standpipe pressure and sprinkler flow. The Proponent's engineer will coordinate with the Boston Fire Department regarding the availability and accessibility to siamese connection locations. The design will meet BWSC and Boston Fire Department requirements for spacing between hydrants and siamese connections.

The Proponent will also coordinate with BWSC and Boston Fire Department during the design phase to determine if there is a need for an additional hydrant on-site.

6.3 Storm Drainage System

6.3.1 Existing Storm Drainage System

The existing site is currently occupied by a one-story brick building with associated parking and landscaped areas. Based on record plans available from BWSC, stormwater runoff is currently collected via several on-site catch basins before being discharged to the 24″x52″ drain line within Kilmarnock Street which generally flows towards the Charles River Basin. There appears to be no water quality treatment in place to treat existing stormwater collected from the site and little, if any, recharge is provided. In general, the site appears to slope from east to west, towards Kilmarnock Street.

6.3.2 Proposed Storm Drainage System

The Project will include a new stormwater management system to help improve both the quality and quantity of stormwater runoff generated from the site. The design of the on-site stormwater system is currently under development; however, it will include water quality and quantity control measures such as deep sump catch basins, oil/water separators and partial vegetated green roofs. The design will also address BWSC and MassDEP's requirements for phosphorus treatment. Once collected from the site, a new connection to the 24″x52″ drain line within Kilmarnock Street will be proposed as part of the Project.

The storm drainage collected in the proposed underground parking structure will be captured by floor drains and pumped to an oil/water interceptor prior to being piped to the storm drainage system.

The storm drain system will be deigned in accordance with BWSC's requirements and will require the review and approval of BWSC in the form of a Site Plan. All existing drain connections will be cut and capped at the main in accordance with BWSC standards. In addition, an operation and maintenance plan will be developed for the proposed stormwater management system. Furthermore, erosion and sediment control measures will be used during construction to protect adjacent properties and BWSC's stormwater system.

6.3.3 Groundwater Conservation Overlay District

As the Project site is located within the Groundwater Conservation Overlay District, BWSC will review the proposed site plan to verify that one inch of runoff over the proposed impervious area is collected and recharged back into the ground. The proposed Project will comply with this requirement.

6.3.4 State Stormwater Standards

The Project is anticipated to comply with the MassDEP Stormwater Management Standards as further outlined 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.

The proposed design will comply with this standard. The proposed development will be designed so that all proposed pavement areas are collected through the stormwater management system for treatment prior to being discharged.

Standard #2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

The proposed design will comply with this standard. Runoff rates for the post-development conditions will be calculated for the 2-year, 10-year, 25-year and 100-year 24-hour storm events to confirm there is no increase when compared to existing conditions.

Standard #3: Loss of annual recharge to ground water 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.

The proposed design will comply with this standard. The best management practices (BMPs) will be implemented into the proposed stormwater management system which will help exceed the required groundwater recharge volume.

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

The proposed design will comply with this standard. The proposed stormwater management system will be designed to provide at least 80% removal of TSS under post-development conditions.

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.

The proposed design will comply with this standard. The Project is not anticipated to be considered a land use with higher pollutant loads.

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.

The proposed design will comply with this standard. 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.

The proposed design will comply with this standard. The site will be designed in accordance with the Massachusetts Stormwater Management regulations and will meet 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.

The proposed design will comply with this standard. An Erosion and Sediment control plan will be prepared as part of the design and implemented during construction.

Standard #9: A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

The proposed design will comply with this standard. A Long Term Operation and Maintenance Plan for the proposed BMPs will be developed and maintained for this project.

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

The proposed design will comply with this standard. No illicit discharges will be created as part of the site construction.

6.4 Electrical Service

Electric power will be provided to the Project by NStar. Service will be provided from multiple underground medium voltage circuits, one primary and one standby. A pad mount switch and two service transformers will be located on the site. Secondary voltage power will be provided from the transformers to the service switchboards located in the building. The demand load is estimated at 1,850 kW. Capacity of the service equipment will be determined by NStar based on the anticipated loads in the building.

6.5 Telecommunications Systems

Several companies provide telecommunication services in Boston. During the design phase, the Project's engineer will coordinate with local private utility companies in the area, such as Comcast and Verizon to determine how connections will be made to the future development.

6.6 Gas Systems

The Project will take a low pressure gas service from National Grid. The Project is expected to use natural gas for heating and domestic hot water and provisions will be made for a future restaurant in the retail space. There will be one meter for the residential heating and hot water, and a separate meter for a future restaurant. The actual size and location of the building services will be coordinated with National Grid.

6.7 Utility Protection During Construction

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

Chapter 7.0

Coordination

7.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

7.1 Architectural Access Board Requirements

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

7.2 Massachusetts Environmental Policy Act (MEPA)

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

7.3 Massachusetts Historical Commission

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

7.4 Boston Civic Design Commission

The Project will comply with the provisions of Article 28 of the Boston Zoning Code. This PNF will be submitted to the Boston Civic Design Commission by the BRA as part of the Article 80 process.

Chapter 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

Shawn Hurley

SCD 1350 Boylston Street, LLC
253 Summer Street
Boston, MA 02210

Date 7/3/13

Signature of Preparer

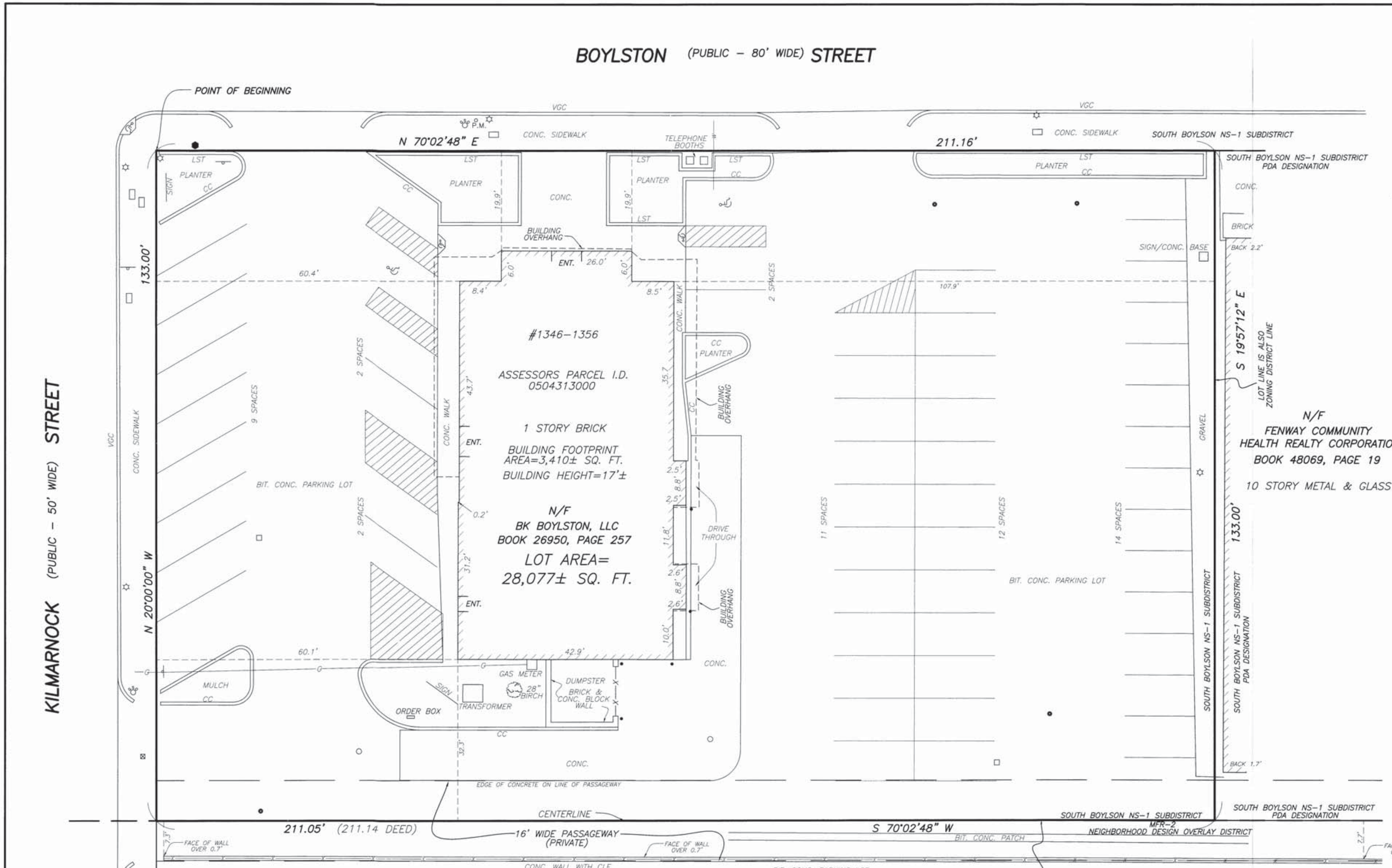
Geoffrey Starsiak

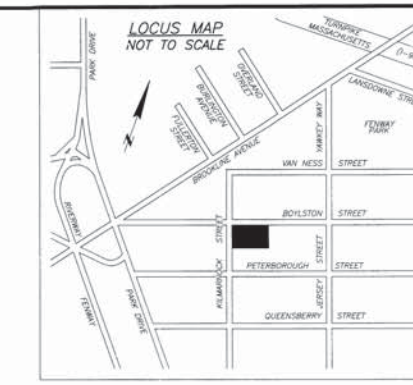
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754

Date 7/3/13

Appendix A

Site Survey





RECORD BOUNDARY DESCRIPTION (FROM DEED BOOK 26950, PAGE 257)

A CERTAIN PARCEL OF LAND, WITH THE BUILDINGS THEREON KNOWN AS AND NUMBERED 1346–1356 BOYLSTON STREET, BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, BOUNDED AND DESCRIBED AS FOLLOWS:

NORTHERLY BY BOYLSTON STREET, TWO HUNDRED ELEVEN AND SIXTEEN ONE–HUNDREDTHS (211.16) FEET; WESTERLY BY KILMARNOCK STREET, ONE HUNDRED AND THIRTY–THREE (133) FEET; SOUTHERLY BY LAND NOW OR FORMERLY OF SHAPIRO, TWO HUNDRED ELEVEN AND FOURTEEN ONE–HUNDRETHS (211.14) FEET; AND EASTERLY BY LAND NOW OR FORMERLY OF BOYLSTON STREET LAND COMPANY, ONE HUNDRED AND THIRTY–THREE (133) FEET; CONTAINING 28,082 SQUARE FEET OF LAND, BY ANY AND ALL OF SAID MEASUREMENTS MORE OR LESS OR HOWEVER OTHERWISE SAID PREMISES MAY BE BOUNDED, MEASURED OR DESCRIBED.

NOTES:

1) BY GRAPHIC PLOTTING ONLY, THE PARCEL SHOWN HEREON LIES WITHIN A ZONE "X" (UNSHADED), AN AREA OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD, AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A) FLOOD INSURANCE RATE MAP (F.I.R.M.) FOR SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0076G AND 25025C0078G, HAVING AN EFFECTIVE DATE OF SEPTEMBER 25, 2009.

2) THE PARCEL SHOWN ON THIS PLAN IS THE SAME PARCEL DESCRIBED IN FIRST AMERICAN TITLE INSURANCE COMPANY TITLE COMMITMENT NO. NCS–494993–BOS1.

3) ZONING INFORMATION NOT SUPPLIED BY INSURER.

4) LOCUS IS SUBJECT TO AN ACTIVITY AND USE LIMITATION RECORDED IN BOOK 44250, PAGE 297 (NO PLAN RECORDED SEPARATELY). THE LIMITATION COVERS THE ENTIRE PARCEL AS SHOWN ON EXHIBIT "B" RECORDED WITH THE DOCUMENT.

5) THE TITLE COMMITMENT REFERS TO DEED BOOK 2764, PAGE 529 AND DEED BOOK 2764, PAGE 531 ALL THE PREVIOUSLY MENTIONED DOCUMENTS REFER TO LAND SOUTH OF THE PASSAGEWAY THAT RUNS ALONG THE REAR OF LOCUS. THESE DOCUMENTS DO NOT APPEAR TO CONTAIN RIGHTS OR EASEMENTS AFFECTING LOCUS. THE SURVEYOR WOULD NEED TO PERFORM A MORE EXHAUSTIVE STUDY OF THE LOCATION OF THESE PARCELS TO OFFER AN OPINION ON THE SPECIFIC LOCATION OF THESE PARCELS. AT WORST, THEY ONLY SEEM TO REFER TO THE EXISTING PASSAGEWAY SHOWN ON THE SURVEY.

6) THE TITLE COMMITMENT REFERS TO DEED BOOK 2764, PAGE 562 AND DEED BOOK 2764, PAGE 564. ALL THE PREVIOUSLY MENTIONED DOCUMENTS REFER TO LAND NEAR OR INCLUDING LOCUS. THESE DOCUMENTS DO NOT APPEAR TO CONTAIN ADDITIONAL RIGHTS OR EASEMENTS AFFECTING LOCUS. THE SURVEYOR WOULD NEED TO PERFORM A MORE EXHAUSTIVE STUDY OF THE LOCATION OF THESE PARCELS TO OFFER AN OPINION ON THE SPECIFIC LOCATION OF THESE PARCELS. AT WORST, THEY ONLY SEEM TO REFER TO THE EXISTING PASSAGEWAY SHOWN ON THE SURVEY.

7) THE TITLE COMMITMENT REFERS TO DEED BOOK 2590, PAGE 309 WHICH DOES INCLUDE THE LIMITS OF THE LOCUS PROPERTY WITHIN THE DESCRIBED TRACT. THE DOCUMENT REFERS TO VARIOUS RIGHTS AND RESTRICTIONS ON THE PARCEL THAT THE SURVEYOR IS UNAWARE OF THE CURRENT LEGAL IMPACT TO LOCUS.

McKINLEY PREPARATORY HIGH SCHOOL
N/F CITY OF BOSTON
BOOK 4747, PAGE 217

LOT LINE IS ALSO ZONING DISTRICT LINE

LEGEND:

•	BOLLARD
	SIGN
	HANDICAP RAMP
□	CATCH BASIN
○	CATCH BASIN–ROUND
	LIGHT POLE
	BOSTON WATER VALVE
	GAS SHUT OFF
●	TRAFFIC SIGNAL
oP.M.	PARKING METER
BIT.	BITUMINOUS
CONC.	CONCRETE
VGC	VERTICAL GRANITE CURB
CC	CONCRETE CURB
CLF	CHAIN LINK FENCE
N/F	NOW OR FORMERLY
LST	LANDSCAPE TIMBER
	OBSERVATION WELL
——X——	FENCE
——W——	WATER
——G——	GAS

REFERENCES:

SUFFOLK COUNTY REGISTRY OF DEEDS:

BOOK 2694 PAGE 167
BOOK 2764 PAGE 562
BOOK 4747 PAGE 217
BOOK 5888 PAGE 222
BOOK 6133 PAGE 327
BOOK 6238 PAGE 596
BOOK 9054 PAGE 44
BOOK 9054 PAGE 45
BOOK 18571 PAGE 290 (LOCUS)
BOOK 18571 PAGE 291 (LOCUS)
BOOK 26950 PAGE 257 (LOCUS)

CITY OF BOSTON ENGINEERING DEPARTMENT:

PLAN NO. L–2620
PLAN NO. L–2796
PLAN NO. L–3006
PLAN NO. L–5429
PLAN NO. L–5805
PLAN NO. 4377A
FIELD BOOK 770 PAGES 40–41
FIELD BOOK 907 PAGES 28–31
FIELD BOOK 952 PAGE 112

PARKING SUMMARY:

REGULAR SPACES	53
H.P. SPACES	2
TOTAL	55

ZONING DIMENSIONAL REGULATIONS
FENWAY NEIGHBORHOOD DISTRICT
SOUTH BOYLSTON NS–1 SUBDISTRICT
(NEIGHBORHOOD SHOPPING SUBDISTRICT)

	REQUIRED	EXISTING
MINIMUM LOT SIZE	NONE	28,077 SQ.FT.
MINIMUM LOT WIDTH	NONE	133.00 FEET
MAXIMUM FLOOR AREA RATIO	4.0	0.12
MAXIMUM HEIGHT (STORIES)	6	1
MAXIMUM HEIGHT (FEET)	75 FEET	17± FEET
MINIMUM FRONT YARD	NONE	19.9 FEET
MINIMUM SIDE YARD	NONE	107.9 FEET
MINIMUM REAR YARD	20 FEET	32.3 FEET

TO: SCD ACQUISITIONS, LLC
FIRST AMERICAN TITLE INSURANCE COMPANY
BRENNAN, DAIN, LE RAY, WIEST, TORPY AND GARNER P.C.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WHERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEY, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 7(a), 7(b)(1), 7(c), 8, 9, 10(a), 11(a), 13, AND 21 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON JUNE 7, 2011.

COMMONWEALTH OF MASSACHUSETTS
DANIEL GERARD MacISAAC No. 41408
PROFESSIONAL LAND SURVEYOR

9.6.2011

DANIEL G. MacISAAC
PROFESSIONAL LAND SURVEYOR
REGISTRATION NO. 41408
dmacisaac@harryrfeldman.com

DATE

UPDATED SURVEY INSPECTION 06–07–2011
UPDATED SURVEY INSPECTION 06–13–2007

ALTA/ACSM LAND TITLE SURVEY
1346–1356 BOYLSTON STREET
BOSTON, MASS.

SCALE: 1"=10'
HARRY R. FELDMAN, INC.
112 SHAWMUT AVENUE
BOSTON, MASS. 02118

NOVEMBER 20, 2006
LAND SURVEYORS
PHONE: (617)357–9740
WWW.HARRYRFELDMAN.COM

FELDMAN
Professional Land Surveyors

GRAPHIC SCALE
10 0 5 10 20 40

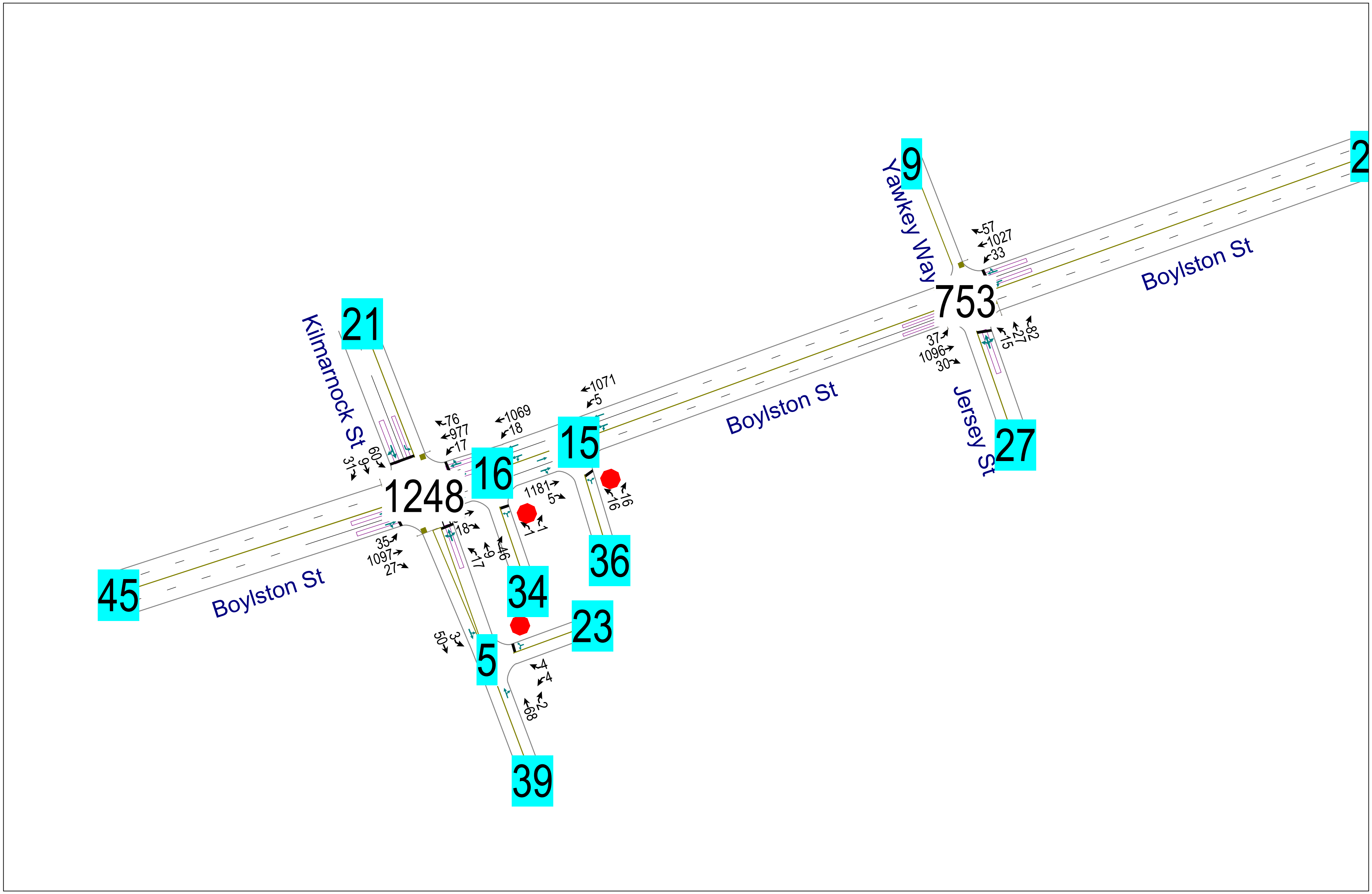
RESEARCH RPA	FIELD CHIEF LW/TA	CHECKED DGM	APPROVED DGM	FILE NAME 13177–ALTA
CALC RGA	CADD MF/APR/GL	FIELD CHECKED LW	CRD FILE 13177 ALTA	JOB NO. 13177

Appendix B

Transportation

Map - 2013 AM Peak Hour EXISTING
Node Numbers

6/19/2013



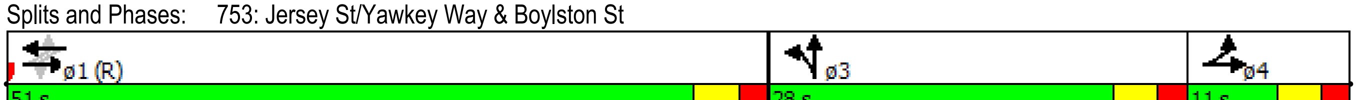
2013 AM Peak Hour EXISTING

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	1096	30	33	1027	57	15	27	82	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	12	12	12	12	16	12	12	16	12
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.93				
Frt		0.996			0.992			0.911				
Flt Protected		0.998			0.999			0.994				
Satd. Flow (prot)	0	2687	0	0	3084	0	0	1505	0	0	0	0
Flt Permitted		0.881			0.879			0.994				
Satd. Flow (perm)	0	2372	0	0	2713	0	0	1505	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		452			473			167			162	
Travel Time (s)		10.3			10.8			3.8			3.7	
Confl. Peds. (#/hr)			63			110			72			51
Confl. Bikes (#/hr)			7			7			7			1
Peak Hour Factor	0.95	0.95	0.95	0.94	0.94	0.94	0.82	0.82	0.82	0.25	0.25	0.25
Heavy Vehicles (%)	14%	2%	0%	3%	3%	4%	7%	7%	9%	0%	0%	0%
Parking (#/hr)		0	0									
Adj. Flow (vph)	39	1154	32	35	1093	61	18	33	100	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1225	0	0	1189	0	0	151	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.30	1.39	1.30	1.14	1.14	1.14	1.14	0.97	1.14	1.14	0.97	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	50		50	50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	D.P+P	NA		Perm	NA		Split	NA				
Protected Phases	4	1 4			1		3	3				
Permitted Phases	1			1								
Detector Phase	4	1 4		1	1		3	3				
Switch Phase												
Minimum Initial (s)	5.0			21.0	21.0		8.0	8.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	11.0			28.0	28.0		28.0	28.0				
Total Split (s)	11.0			51.0	51.0		28.0	28.0				
Total Split (%)	12.2%			56.7%	56.7%		31.1%	31.1%				
Maximum Green (s)	6.0			46.0	46.0		23.0	23.0				
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0				
All-Red Time (s)	2.0			2.0	2.0		2.0	2.0				
Lost Time Adjust (s)					-1.0			-1.0				
Total Lost Time (s)					4.0			4.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?	Yes						Yes	Yes				
Vehicle Extension (s)	2.0			3.0	3.0		2.0	2.0				
Recall Mode	None			C-Max	C-Max		None	None				
Walk Time (s)				15.0	15.0		7.0	7.0				
Flash Dont Walk (s)				6.0	6.0		14.0	14.0				
Pedestrian Calls (#/hr)				0	0		20	20				
Act Effct Green (s)		62.1			55.1			15.9				
Actuated g/C Ratio		0.69			0.61			0.18				
v/c Ratio		0.74			0.72			0.57				
Control Delay		8.6			16.4			41.3				
Queue Delay		0.0			0.0			0.0				
Total Delay		8.6			16.4			41.3				
LOS		A			B			D				
Approach Delay		8.6			16.4			41.3				
Approach LOS		A			B			D				
Queue Length 50th (ft)		90			212			81				
Queue Length 95th (ft)		156			366			116				
Internal Link Dist (ft)		372			393			87			82	
Turn Bay Length (ft)												
Base Capacity (vph)		1661			1661			401				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.74			0.72			0.38				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 89.5%	ICU Level of Service E
Analysis Period (min) 15	
Description: 0753	

Splits and Phases: 753: Jersey St/Yawkey Way & Boylston St



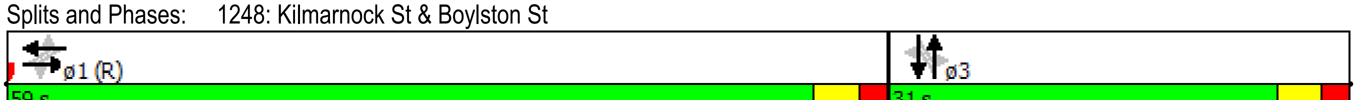
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1097	27	17	977	76	17	9	46	60	9	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	13	12	12	13	12	12	14	12	12	16	12
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.98			0.93			0.94	
Frt		0.996			0.989			0.914			0.884	
Flt Protected		0.999			0.999			0.988		0.950		
Satd. Flow (prot)	0	3091	0	0	3160	0	0	1467	0	1518	1537	0
Flt Permitted		0.885			0.924			0.926		0.721		
Satd. Flow (perm)	0	2738	0	0	2922	0	0	1375	0	1152	1537	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		352			80			193			201	
Travel Time (s)		8.0			1.8			4.4			4.6	
Confl. Peds. (#/hr)			67			74			83			53
Confl. Bikes (#/hr)			11			2			5			2
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.95	0.95	0.95	0.69	0.69	0.69
Heavy Vehicles (%)	3%	2%	7%	29%	3%	0%	6%	0%	4%	7%	11%	3%
Parking (#/hr)		0	0									
Adj. Flow (vph)	37	1167	29	18	1028	80	18	9	48	87	13	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1233	0	0	1126	0	0	75	0	87	58	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.17	1.14	1.14	1.10	1.14	1.14	1.05	1.14	1.14	0.97	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	50		50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Detector Phase	1	1		1	1		3	3		3	3	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	22.0	22.0		22.0	22.0		29.0	29.0		29.0	29.0	
Total Split (s)	59.0	59.0		59.0	59.0		31.0	31.0		31.0	31.0	
Total Split (%)	65.6%	65.6%		65.6%	65.6%		34.4%	34.4%		34.4%	34.4%	
Maximum Green (s)	54.0	54.0		54.0	54.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0		-1.0	-1.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		20	20		20	20	
Act Effct Green (s)		70.1			70.1			15.3		15.3	15.3	
Actuated g/C Ratio		0.78			0.78			0.17		0.17	0.17	
v/c Ratio		0.58			0.49			0.32		0.44	0.22	
Control Delay		7.7			2.6			34.0		38.7	31.5	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		7.7			2.6			34.0		38.7	31.5	
LOS		A			A			C		D	C	
Approach Delay		7.7			2.6			34.0			35.8	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)		115			31			40		47	30	
Queue Length 95th (ft)		276			64			71		61	43	
Internal Link Dist (ft)		272			1			113			121	
Turn Bay Length (ft)												
Base Capacity (vph)		2131			2275			412		345	461	
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		0.58			0.49			0.18		0.25	0.13	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 7.9 Intersection LOS: A
Intersection Capacity Utilization 87.8% ICU Level of Service E
Analysis Period (min) 15
Description: 1248

Splits and Phases: 1248: Kilmarnock St & Boylston St



Intersection	
Intersection Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1185	18	18	1069	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1247	19	19	1125	1	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1266	0	1858	633
Stage 1	-	-	-	-	1257	-
Stage 2	-	-	-	-	601	-
Follow-up Headway	-	-	2.22	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	545	-	65	422
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	510	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	545	-	59	422
Mov Capacity-2 Maneuver	-	-	-	-	59	-
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	463	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	40.3
HCM LOS			E

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	104	-	-	545	-
HCM Lane V/C Ratio	0.02	-	-	0.035	-
HCM Control Delay (s)	40.3	-	-	11.843	0.5
HCM Lane LOS	E			B	A
HCM 95th %tile Q(veh)	0.062	-	-	0.108	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection						
Intersection Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1181	5	5	1071	16	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1243	5	5	1127	17	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1248	0	1820	624
Stage 1	-	-	-	-	1246	-
Stage 2	-	-	-	-	574	-
Follow-up Headway	-	-	2.22	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	553	-	69	428
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	527	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	553	-	67	428
Mov Capacity-2 Maneuver	-	-	-	-	67	-
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	514	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		48.3	
HCM LOS					E	

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	116	-	-	553	-
HCM Lane V/C Ratio	0.29	-	-	0.01	-
HCM Control Delay (s)	48.3	-	-	11.572	0.1
HCM Lane LOS	E			B	A
HCM 95th %tile Q(veh)	1.108	-	-	0.029	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection						
Intersection Delay, s/veh	0.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	4	4	68	2	3	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	72	2	3	53

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	132	73	0	0	74	0
Stage 1	73	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Follow-up Headway	3.518	3.318	-	-	2.218	-
Pot Capacity-1 Maneuver	862	989	-	-	1526	-
Stage 1	950	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	860	989	-	-	1526	-
Mov Capacity-2 Maneuver	860	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	962	-	-	-	-	-

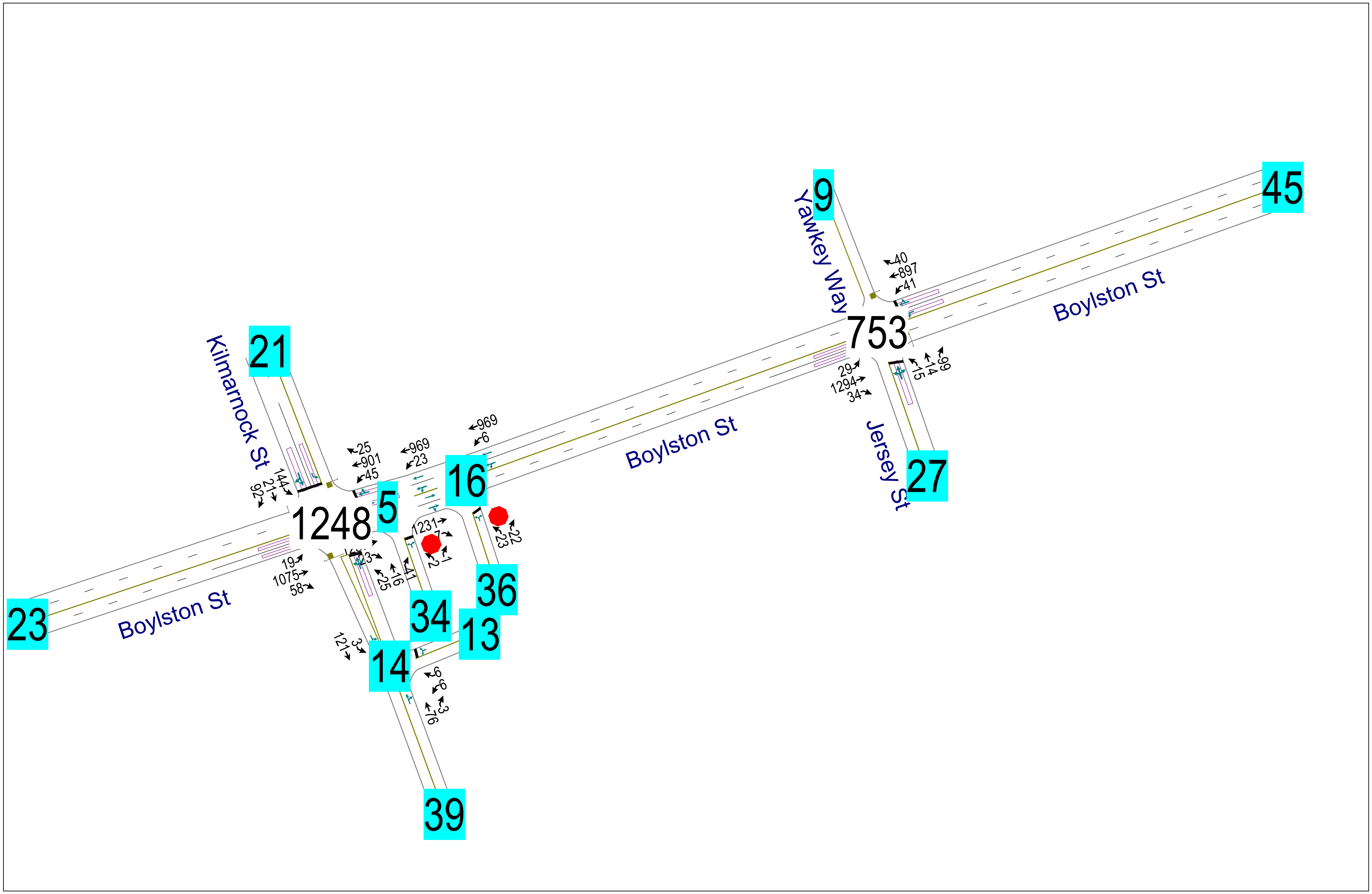
Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	920	1526	-
HCM Lane V/C Ratio	-	-	0.009	0.002	-
HCM Control Delay (s)	-	-	8.9	7.364	0
HCM Lane LOS			A	A	A
HCM 95th %tile Q(veh)	-	-	0.028	0.006	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Map - 2013 PM Peak Hour EXISTING
Node Numbers **6/20/2013**



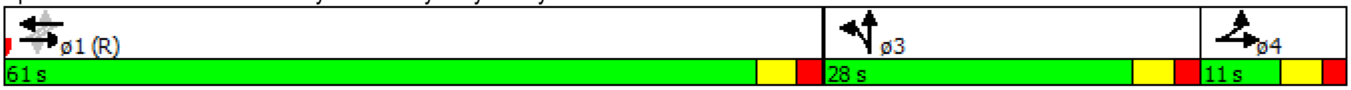
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	1294	34	41	897	40	15	14	99	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	12	12	12	12	16	12	12	16	12
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.98			0.84				
Frt		0.996			0.994			0.896				
Flt Protected		0.999			0.998			0.994				
Satd. Flow (prot)	0	2221	0	0	3084	0	0	1316	0	0	0	0
Flt Permitted		0.913			0.819			0.994				
Satd. Flow (perm)	0	2030	0	0	2531	0	0	1316	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		480			473			167			162	
Travel Time (s)		10.9			10.8			3.8			3.7	
Confl. Peds. (#/hr)			147			196			138			127
Confl. Bikes (#/hr)			10			8			7			5
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.80	0.80	0.80	0.25	0.25	0.25
Heavy Vehicles (%)	14%	2%	0%	5%	2%	10%	13%	14%	9%	0%	0%	0%
Bus Blockages (#/hr)	0	50	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		30	30									
Adj. Flow (vph)	30	1334	35	44	965	43	19	18	124	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1399	0	0	1052	0	0	161	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.30	1.74	1.30	1.14	1.14	1.14	1.14	0.97	1.14	1.14	0.97	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	50		50	50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	D.P+P	NA		Perm	NA		Split	NA				
Protected Phases	4	1 4			1		3	3				
Permitted Phases	1			1								
Detector Phase	4	1 4		1	1		3	3				
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0			21.0	21.0		8.0	8.0				
Minimum Split (s)	11.0			28.0	28.0		28.0	28.0				
Total Split (s)	11.0			61.0	61.0		28.0	28.0				
Total Split (%)	11.0%			61.0%	61.0%		28.0%	28.0%				
Maximum Green (s)	6.0			56.0	56.0		23.0	23.0				
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0				
All-Red Time (s)	2.0			2.0	2.0		2.0	2.0				
Lost Time Adjust (s)					-1.0			-1.0				
Total Lost Time (s)					4.0			4.0				
Lead/Lag	Lag						Lead	Lead				
Lead-Lag Optimize?	Yes						Yes	Yes				
Vehicle Extension (s)	2.0			3.0	3.0		2.0	2.0				
Recall Mode	None			C-Max	C-Max		None	None				
Walk Time (s)				15.0	15.0		7.0	7.0				
Flash Dont Walk (s)				6.0	6.0		14.0	14.0				
Pedestrian Calls (#/hr)				0	0		0	0				
Act Effct Green (s)		70.6			63.6			17.4				
Actuated g/C Ratio		0.71			0.64			0.17				
v/c Ratio		0.97			0.65			0.71				
Control Delay		25.8			14.8			54.7				
Queue Delay		0.0			0.0			0.0				
Total Delay		25.8			14.8			54.7				
LOS		C			B			D				
Approach Delay		25.8			14.8			54.7				
Approach LOS		C			B			D				
Queue Length 50th (ft)		124			177			86				
Queue Length 95th (ft)		#576			287			119				
Internal Link Dist (ft)		400			393			87			82	
Turn Bay Length (ft)												
Base Capacity (vph)		1446			1610			315				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.97			0.65			0.51				

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 23.1 Intersection LOS: C
Intersection Capacity Utilization 91.4% ICU Level of Service F
Analysis Period (min) 15
Description: 0753
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 753: Jersey St/Yawkey Way & Boylston St



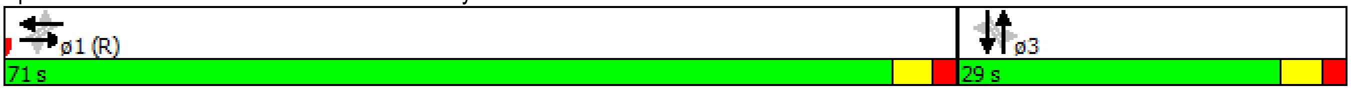
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	1075	58	45	901	25	25	16	41	144	21	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	12	13	12	12	14	12	12	16	12
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.99			0.84			0.83	
Frt		0.992			0.996			0.932			0.878	
Flt Protected		0.999			0.998			0.985		0.950		
Satd. Flow (prot)	0	2211	0	0	3264	0	0	1350	0	1547	1396	0
Flt Permitted		0.926			0.826			0.888		0.662		
Satd. Flow (perm)	0	2049	0	0	2702	0	0	1217	0	1078	1396	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			66			170			201	
Travel Time (s)		8.0			1.5			3.9			4.6	
Confl. Peds. (#/hr)			153			97			227			149
Confl. Bikes (#/hr)			17			5			5			3
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	2%	9%	1%	0%	4%	13%	2%	5%	0%	1%
Bus Blockages (#/hr)	0	50	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		25	25									
Adj. Flow (vph)	20	1132	61	49	979	27	29	19	48	157	23	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1213	0	0	1055	0	0	96	0	157	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.30	1.71	1.30	1.14	1.10	1.14	1.14	1.05	1.14	1.14	0.97	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	50		50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Detector Phase	1	1		1	1		3	3		3	3	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	22.0	22.0		22.0	22.0		29.0	29.0		29.0	29.0	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	66.0	66.0		66.0	66.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0		-1.0	-1.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		73.2			73.2			18.8		18.8	18.8	
Actuated g/C Ratio		0.73			0.73			0.19		0.19	0.19	
v/c Ratio		0.81			0.53			0.42		0.78	0.47	
Control Delay		16.0			5.0			39.9		62.5	40.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		16.0			5.0			39.9		62.5	40.7	
LOS		B			A			D		E	D	
Approach Delay		16.0			5.0			39.9			52.9	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)		205			60			48		84	61	
Queue Length 95th (ft)		#410			88			80		140	104	
Internal Link Dist (ft)		271			1			90			121	
Turn Bay Length (ft)												
Base Capacity (vph)		1499			1977			304		269	349	
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		0.81			0.53			0.32		0.58	0.35	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 45 (45%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 16.4 Intersection LOS: B
Intersection Capacity Utilization 90.8% ICU Level of Service E
Analysis Period (min) 15
Description: 1248
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1248: Kilmarnock St & Boylston St



Intersection	
Intersection Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1237	23	23	969	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1302	24	24	1020	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1326	0	1872	663
Stage 1	-	-	-	-	1314	-
Stage 2	-	-	-	-	558	-
Follow-up Headway	-	-	2.22	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	517	-	64	404
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	537	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	517	-	57	404
Mov Capacity-2 Maneuver	-	-	-	-	57	-
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	480	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	51.8
HCM LOS			F

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	80	-	-	517	-
HCM Lane V/C Ratio	0.039	-	-	0.047	-
HCM Control Delay (s)	51.8	-	-	12.305	0.6
HCM Lane LOS	F			B	A
HCM 95th %tile Q(veh)	0.122	-	-	0.147	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1231	7	6	969	23	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1296	7	6	1020	24	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1303	0	1822	652
Stage 1	-	-	-	-	1299	-
Stage 2	-	-	-	-	523	-
Follow-up Headway	-	-	2.22	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	527	-	69	411
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	559	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	527	-	67	411
Mov Capacity-2 Maneuver	-	-	-	-	67	-
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	544	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	58.1
HCM LOS			F

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	113	-	-	527	-
HCM Lane V/C Ratio	0.419	-	-	0.012	-
HCM Control Delay (s)	58.1	-	-	11.914	0.2
HCM Lane LOS	F			B	A
HCM 95th %tile Q(veh)	1.779	-	-	0.036	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	6	6	76	3	3	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	6	80	3	3	127

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	216	82	0	0	83	0
Stage 1	82	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Follow-up Headway	3.518	3.318	-	-	2.218	-
Pot Capacity-1 Maneuver	772	978	-	-	1514	-
Stage 1	941	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	770	978	-	-	1514	-
Mov Capacity-2 Maneuver	770	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.2
HCM LOS	A		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	862	1514	-
HCM Lane V/C Ratio	-	-	0.015	0.002	-
HCM Control Delay (s)	-	-	9.2	7.383	0
HCM Lane LOS			A	A	A
HCM 95th %tile Q(veh)	-	-	0.045	0.006	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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N/S: Kilmarnock Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Cars - Heavy Vehicles

	Kilmarnock Street From North			Boylston Street From East				Kilmarnock Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	8	1	7	15	247	7	0	13	1	2	9	239	2	0	551
07:15 AM	8	1	14	18	257	4	0	11	2	4	5	289	7	0	620
07:30 AM	6	4	11	18	261	4	0	11	2	5	7	288	12	0	629
07:45 AM	9	4	23	24	234	4	0	13	1	5	9	229	8	0	563
Total	31	10	55	75	999	19	0	48	6	16	30	1045	29	0	2363
08:00 AM	8	0	12	16	225	5	0	11	4	3	6	291	8	0	589
08:15 AM	5	5	19	22	259	0	0	13	4	5	10	240	11	0	593
08:30 AM	7	4	9	27	270	1	0	13	4	3	6	247	7	0	598
08:45 AM	10	1	22	18	260	1	0	8	4	3	11	209	4	0	551
Total	30	10	62	83	1014	7	0	45	16	14	33	987	30	0	2331
09:00 AM	8	7	17	18	194	3	0	18	0	1	7	234	5	0	512
09:15 AM	7	2	24	11	204	6	0	16	1	4	6	222	9	0	512
09:30 AM	5	8	17	12	253	3	0	15	3	9	5	241	4	0	575
09:45 AM	4	5	14	12	262	3	0	7	1	2	10	234	4	0	558
Total	24	22	72	53	913	15	0	56	5	16	28	931	22	0	2157
10:00 AM	4	5	20	12	174	4	0	5	2	4	6	228	6	0	470
10:15 AM	12	5	14	5	185	4	0	9	2	2	10	228	5	0	481
10:30 AM	12	4	15	4	201	2	0	8	1	3	15	198	7	0	470
10:45 AM	12	2	14	8	201	6	0	11	2	8	11	251	4	1	531
Total	40	16	63	29	761	16	0	33	7	17	42	905	22	1	1952
11:00 AM	6	3	19	11	206	2	0	8	3	12	8	210	2	0	490
11:15 AM	9	2	16	10	220	0	1	11	2	15	5	245	5	0	541
11:30 AM	13	0	20	18	211	0	0	10	1	4	0	232	1	0	510
11:45 AM	11	2	24	8	191	3	0	10	3	5	0	232	7	0	496
Total	39	7	79	47	828	5	1	39	9	36	13	919	15	0	2037
12:00 PM	7	0	19	7	216	2	1	6	2	3	3	258	3	0	527
12:15 PM	11	0	26	5	223	3	0	12	3	4	0	247	6	0	540
12:30 PM	13	0	19	8	197	0	0	4	4	4	0	249	10	0	508
12:45 PM	12	0	15	21	145	0	0	5	2	3	0	269	9	0	481
Total	43	0	79	41	781	5	1	27	11	14	3	1023	28	0	2056
01:00 PM	11	3	25	5	191	1	0	12	4	4	0	220	0	0	476
01:15 PM	9	1	26	7	180	3	0	5	0	1	1	258	4	1	496
01:30 PM	10	6	28	6	227	4	0	10	2	4	0	245	9	0	551
01:45 PM	9	5	29	12	198	3	1	11	2	7	0	238	7	0	522
Total	39	15	108	30	796	11	1	38	8	16	1	961	20	1	2045
02:00 PM	4	1	26	14	191	6	0	12	7	5	11	231	1	0	509
02:15 PM	15	6	29	13	186	6	0	9	6	8	10	252	6	0	546
02:30 PM	10	6	23	16	199	5	0	10	4	7	9	245	4	0	538
02:45 PM	8	3	17	12	195	6	0	18	7	3	15	285	4	0	573
Total	37	16	95	55	771	23	0	49	24	23	45	1013	15	0	2166
03:00 PM	6	8	26	20	211	6	0	15	3	2	15	228	3	0	543
03:15 PM	9	7	17	20	174	3	0	11	6	5	10	226	5	0	493
03:30 PM	8	7	21	11	191	7	0	11	0	5	12	239	9	0	521
03:45 PM	11	3	28	19	217	5	1	13	4	5	16	288	4	0	614
Total	34	25	92	70	793	21	1	50	13	17	53	981	21	0	2171
04:00 PM	13	7	25	6	218	3	0	15	4	7	8	256	3	0	565
04:15 PM	16	5	23	11	235	4	0	11	4	6	22	270	4	0	611

PRECISION
D A T A
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N/S: Kilmarnock Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Cars - Heavy Vehicles

	Kilmarnock Street From North			Boylston Street From East				Kilmarnock Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
04:30 PM	21	4	34	6	230	8	0	6	5	8	13	264	5	0	604
04:45 PM	25	7	34	3	212	11	0	10	6	8	18	278	7	0	619
Total	75	23	116	26	895	26	0	42	19	29	61	1068	19	0	2399
05:00 PM	26	8	36	11	236	16	0	8	1	6	10	261	3	0	622
05:15 PM	20	2	40	5	223	10	0	17	4	3	17	272	4	0	617
05:30 PM	14	2	30	7	217	6	1	17	2	5	17	282	2	0	602
05:45 PM	13	6	39	9	202	5	0	17	4	4	10	265	4	0	578
Total	73	18	145	32	878	37	1	59	11	18	54	1080	13	0	2419
Grand Total	465	162	966	541	9429	185	5	486	129	216	363	10913	234	2	24096
Apprch %	29.2	10.2	60.6	5.3	92.8	1.8	0	58.5	15.5	26	3.2	94.8	2	0	
Total %	1.9	0.7	4	2.2	39.1	0.8	0	2	0.5	0.9	1.5	45.3	1	0	
Cars	444	151	911	534	9248	153	5	465	116	206	340	10671	212	2	23458
% Cars	95.5	93.2	94.3	98.7	98.1	82.7	100	95.7	89.9	95.4	93.7	97.8	90.6	100	97.4
Heavy Vehicles	21	11	55	7	181	32	0	21	13	10	23	242	22	0	638
% Heavy Vehicles	4.5	6.8	5.7	1.3	1.9	17.3	0	4.3	10.1	4.6	6.3	2.2	9.4	0	2.6

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	8	1	14	23	18	257	4	0	279	11	2	4	17	5	289	7	0	301	620
07:30 AM	6	**4**	11	21	18	**261**	4	0	**283**	11	2	**5**	18	7	288	**12**	0	**307**	**629**
07:45 AM	**9**	4	**23**	**36**	**24**	234	4	0	262	**13**	1	5	**19**	**9**	229	8	0	246	563
08:00 AM	8	0	12	20	16	225	**5**	0	246	11	**4**	3	18	6	**291**	8	0	305	589
Total Volume	31	9	60	100	76	977	17	0	1070	46	9	17	72	27	1097	35	0	1159	2401
% App. Total	31	9	60		7.1	91.3	1.6	0		63.9	12.5	23.6		2.3	94.7	3	0		
PHF	.861	.563	.652	.694	.792	.936	.850	.000	.945	.885	.563	.850	.947	.750	.942	.729	.000	.944	.954
Cars	30	8	56	94	76	950	12	0	1038	44	9	16	69	25	1076	34	0	1135	2336
% Cars	96.8	88.9	93.3	94.0	100	97.2	70.6	0	97.0	95.7	100	94.1	95.8	92.6	98.1	97.1	0	97.9	97.3
Heavy Vehicles	1	1	4	6	0	27	5	0	32	2	0	1	3	2	21	1	0	24	65
% Heavy Vehicles	3.2	11.1	6.7	6.0	0	2.8	29.4	0	3.0	4.3	0	5.9	4.2	7.4	1.9	2.9	0	2.1	2.7
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 11:15 AM																			
11:15 AM	9	**2**	16	27	10	**220**	0	**1**	**231**	**11**	2	**15**	**28**	**5**	245	5	0	255	**541**
11:30 AM	**13**	0	20	33	**18**	211	0	0	229	10	1	4	15	0	232	1	0	233	510
11:45 AM	11	2	**24**	**37**	8	191	**3**	0	202	10	**3**	5	18	0	232	**7**	0	239	496
12:00 PM	7	0	19	26	7	216	2	1	226	6	2	3	11	3	**258**	3	0	**264**	527
Total Volume	40	4	79	123	43	838	5	2	888	37	8	27	72	8	967	16	0	991	2074
% App. Total	32.5	3.3	64.2		4.8	94.4	0.6	0.2		51.4	11.1	37.5		0.8	97.6	1.6	0		
PHF	.769	.500	.823	.831	.597	.952	.417	.500	.961	.841	.667	.450	.643	.400	.937	.571	.000	.938	.958
Cars	38	3	69	110	43	819	5	2	869	36	6	27	69	8	937	13	0	958	2006
% Cars	95.0	75.0	87.3	89.4	100	97.7	100	100	97.9	97.3	75.0	100	95.8	100	96.9	81.3	0	96.7	96.7
Heavy Vehicles	2	1	10	13	0	19	0	0	19	1	2	0	3	0	30	3	0	33	68
% Heavy Vehicles	5.0	25.0	12.7	10.6	0	2.3	0	0	2.1	2.7	25.0	0	4.2	0	3.1	18.8	0	3.3	3.3

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E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 04:30 PM																			
04:30 PM	21	4	34	59	6	230	8	0	244	6	5	**8**	19	13	264	5	0	282	604
04:45 PM	25	7	34	66	3	212	11	0	226	10	**6**	8	**24**	**18**	**278**	**7**	0	**303**	619
05:00 PM	**26**	**8**	36	**70**	**11**	**236**	**16**	0	**263**	8	1	6	15	10	261	3	0	274	**622**
05:15 PM	20	2	**40**	62	5	223	10	0	238	**17**	4	3	24	17	272	4	0	293	617
Total Volume	92	21	144	257	25	901	45	0	971	41	16	25	82	58	1075	19	0	1152	2462
% App. Total	35.8	8.2	56		2.6	92.8	4.6	0		50	19.5	30.5		5	93.3	1.6	0		
PHF	.885	.656	.900	.918	.568	.954	.703	.000	.923	.603	.667	.781	.854	.806	.967	.679	.000	.950	.990
Cars	91	21	137	249	25	888	41	0	954	40	14	24	78	57	1056	19	0	1132	2413
% Cars	98.9	100	95.1	96.9	100	98.6	91.1	0	98.2	97.6	87.5	96.0	95.1	98.3	98.2	100	0	98.3	98.0
Heavy Vehicles	1	0	7	8	0	13	4	0	17	1	2	1	4	1	19	0	0	20	49
% Heavy Vehicles	1.1	0	4.9	3.1	0	1.4	8.9	0	1.8	2.4	12.5	4.0	4.9	1.7	1.8	0	0	1.7	2.0

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N/S: Kilmarnock Street
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Groups Printed- Cars

	Kilmarnock Street From North			Boylston Street From East				Kilmarnock Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	7	1	7	15	245	6	0	11	1	2	8	232	2	0	537
07:15 AM	8	1	13	18	251	3	0	11	2	3	4	285	7	0	606
07:30 AM	6	4	9	18	253	3	0	11	2	5	7	284	12	0	614
07:45 AM	9	3	22	24	229	2	0	12	1	5	9	223	7	0	546
Total	30	9	51	75	978	14	0	45	6	15	28	1024	28	0	2303
08:00 AM	7	0	12	16	217	4	0	10	4	3	5	284	8	0	570
08:15 AM	5	4	19	22	255	0	0	13	4	5	10	234	9	0	580
08:30 AM	7	4	9	27	264	0	0	13	3	3	5	240	6	0	581
08:45 AM	9	1	19	18	251	0	0	8	4	3	6	207	3	0	529
Total	28	9	59	83	987	4	0	44	15	14	26	965	26	0	2260
09:00 AM	5	7	16	17	187	2	0	17	0	1	7	224	4	0	487
09:15 AM	7	2	24	11	201	5	0	16	1	4	5	215	8	0	499
09:30 AM	5	7	15	12	247	3	0	13	3	9	4	238	4	0	560
09:45 AM	4	5	14	12	258	2	0	5	1	2	10	226	4	0	543
Total	21	21	69	52	893	12	0	51	5	16	26	903	20	0	2089
10:00 AM	4	4	16	12	169	4	0	5	2	3	6	218	5	0	448
10:15 AM	10	5	13	5	183	4	0	9	2	2	7	223	3	0	466
10:30 AM	10	4	14	4	198	1	0	7	1	3	15	191	6	0	454
10:45 AM	11	2	14	8	196	5	0	10	2	7	11	244	3	1	514
Total	35	15	57	29	746	14	0	31	7	15	39	876	17	1	1882
11:00 AM	6	3	17	11	200	1	0	8	3	12	8	205	2	0	476
11:15 AM	8	2	13	10	214	0	1	11	2	15	5	238	4	0	523
11:30 AM	13	0	15	18	207	0	0	9	1	4	0	223	0	0	490
11:45 AM	11	1	23	8	186	3	0	10	1	5	0	228	6	0	482
Total	38	6	68	47	807	4	1	38	7	36	13	894	12	0	1971
12:00 PM	6	0	18	7	212	2	1	6	2	3	3	248	3	0	511
12:15 PM	9	0	26	5	217	2	0	12	3	4	0	243	6	0	527
12:30 PM	12	0	16	8	191	0	0	4	4	4	0	240	9	0	488
12:45 PM	12	0	14	21	142	0	0	5	2	2	0	268	8	0	474
Total	39	0	74	41	762	4	1	27	11	13	3	999	26	0	2000
01:00 PM	10	3	25	5	186	1	0	11	4	4	0	216	0	0	465
01:15 PM	8	1	22	7	179	3	0	5	0	1	1	253	3	1	484
01:30 PM	10	6	27	6	224	2	0	8	2	4	0	238	8	0	535
01:45 PM	9	4	28	12	194	3	1	10	2	7	0	234	6	0	510
Total	37	14	102	30	783	9	1	34	8	16	1	941	17	1	1994
02:00 PM	4	1	24	11	186	5	0	12	5	5	11	229	1	0	494
02:15 PM	15	6	28	13	184	5	0	9	6	6	10	248	5	0	535
02:30 PM	10	5	22	15	197	4	0	9	3	6	9	239	4	0	523
02:45 PM	8	3	14	12	192	5	0	18	6	2	14	279	4	0	557
Total	37	15	88	51	759	19	0	48	20	19	44	995	14	0	2109
03:00 PM	6	7	25	18	209	4	0	14	3	2	14	222	3	0	527
03:15 PM	9	7	17	20	173	3	0	10	5	4	9	221	5	0	483
03:30 PM	8	6	20	11	189	5	0	11	0	5	10	234	8	0	507
03:45 PM	11	3	28	19	212	5	1	12	3	5	14	285	4	0	602
Total	34	23	90	68	783	17	1	47	11	16	47	962	20	0	2119
04:00 PM	12	5	25	6	214	2	0	15	4	7	8	250	3	0	551
04:15 PM	16	5	23	11	235	3	0	11	3	6	21	264	4	0	602

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Page No : 2

Groups Printed- Cars

	Kilmarnock Street From North			Boylston Street From East				Kilmarnock Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
04:30 PM	21	4	33	6	230	7	0	5	5	7	13	261	5	0	597
04:45 PM	25	7	33	3	204	11	0	10	5	8	18	273	7	0	604
Total	74	21	114	26	883	23	0	41	17	28	60	1048	19	0	2354
05:00 PM	26	8	33	11	233	14	0	8	1	6	10	254	3	0	607
05:15 PM	19	2	38	5	221	9	0	17	3	3	16	268	4	0	605
05:30 PM	13	2	30	7	214	6	1	17	2	5	17	280	2	0	596
05:45 PM	13	6	38	9	199	4	0	17	3	4	10	262	4	0	569
Total	71	18	139	32	867	33	1	59	9	18	53	1064	13	0	2377
Grand Total	444	151	911	534	9248	153	5	465	116	206	340	10671	212	2	23458
Apprch %	29.5	10	60.5	5.4	93	1.5	0.1	59.1	14.7	26.2	3	95.1	1.9	0	
Total %	1.9	0.6	3.9	2.3	39.4	0.7	0	2	0.5	0.9	1.4	45.5	0.9	0	

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	8	1	13	22	18	251	3	0	272	11	2	3	16	4	**285**	7	0	296	606
07:30 AM	6	**4**	9	19	18	**253**	3	0	**274**	11	2	**5**	**18**	7	284	**12**	0	**303**	**614**
07:45 AM	**9**	3	**22**	**34**	**24**	229	2	0	255	**12**	1	5	18	**9**	223	7	0	239	546
08:00 AM	7	0	12	19	16	217	**4**	0	237	10	**4**	3	17	5	284	8	0	297	570
Total Volume	30	8	56	94	76	950	12	0	1038	44	9	16	69	25	1076	34	0	1135	2336
% App. Total	31.9	8.5	59.6		7.3	91.5	1.2	0		63.8	13	23.2		2.2	94.8	3	0		
PHF	.833	.500	.636	.691	.792	.939	.750	.000	.947	.917	.563	.800	.958	.694	.944	.708	.000	.936	.951
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 11:30 AM																			
11:30 AM	**13**	0	15	28	**18**	207	0	0	**225**	9	1	4	14	0	223	0	0	223	490
11:45 AM	11	**1**	23	**35**	8	186	**3**	0	197	10	1	**5**	16	0	228	**6**	0	234	482
12:00 PM	6	0	18	24	7	212	2	**1**	222	6	2	3	11	**3**	**248**	3	0	**254**	511
12:15 PM	9	0	**26**	35	5	**217**	2	0	224	**12**	**3**	4	**19**	0	243	6	0	249	**527**
Total Volume	39	1	82	122	38	822	7	1	868	37	7	16	60	3	942	15	0	960	2010
% App. Total	32	0.8	67.2		4.4	94.7	0.8	0.1		61.7	11.7	26.7		0.3	98.1	1.6	0		
PHF	.750	.250	.788	.871	.528	.947	.583	.250	.964	.771	.583	.800	.789	.250	.950	.625	.000	.945	.954
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	21	4	33	58	6	230	7	0	243	5	**5**	7	17	13	261	5	0	279	597
04:45 PM	25	7	33	65	3	204	11	0	218	10	5	**8**	**23**	**18**	**273**	**7**	0	**298**	604
05:00 PM	**26**	**8**	33	**67**	**11**	**233**	**14**	0	**258**	8	1	6	15	10	254	3	0	267	**607**
05:15 PM	19	2	**38**	59	5	221	9	0	235	**17**	3	3	23	16	268	4	0	288	605
Total Volume	91	21	137	249	25	888	41	0	954	40	14	24	78	57	1056	19	0	1132	2413
% App. Total	36.5	8.4	55		2.6	93.1	4.3	0		51.3	17.9	30.8		5	93.3	1.7	0		
PHF	.875	.656	.901	.929	.568	.953	.732	.000	.924	.588	.700	.750	.848	.792	.967	.679	.000	.950	.994

PRECISION
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N/S: Kilmarnock Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Heavy Vehicles

	Kilmarnock Street From North			Boylston Street From East				Kilmarnock Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	0	0	0	2	1	0	2	0	0	1	7	0	0	14
07:15 AM	0	0	1	0	6	1	0	0	0	1	1	4	0	0	14
07:30 AM	0	0	2	0	8	1	0	0	0	0	0	4	0	0	15
07:45 AM	0	1	1	0	5	2	0	1	0	0	0	6	1	0	17
Total	1	1	4	0	21	5	0	3	0	1	2	21	1	0	60
08:00 AM	1	0	0	0	8	1	0	1	0	0	1	7	0	0	19
08:15 AM	0	1	0	0	4	0	0	0	0	0	0	6	2	0	13
08:30 AM	0	0	0	0	6	1	0	0	1	0	1	7	1	0	17
08:45 AM	1	0	3	0	9	1	0	0	0	0	5	2	1	0	22
Total	2	1	3	0	27	3	0	1	1	0	7	22	4	0	71
09:00 AM	3	0	1	1	7	1	0	1	0	0	0	10	1	0	25
09:15 AM	0	0	0	0	3	1	0	0	0	0	1	7	1	0	13
09:30 AM	0	1	2	0	6	0	0	2	0	0	1	3	0	0	15
09:45 AM	0	0	0	0	4	1	0	2	0	0	0	8	0	0	15
Total	3	1	3	1	20	3	0	5	0	0	2	28	2	0	68
10:00 AM	0	1	4	0	5	0	0	0	0	1	0	10	1	0	22
10:15 AM	2	0	1	0	2	0	0	0	0	0	3	5	2	0	15
10:30 AM	2	0	1	0	3	1	0	1	0	0	0	7	1	0	16
10:45 AM	1	0	0	0	5	1	0	1	0	1	0	7	1	0	17
Total	5	1	6	0	15	2	0	2	0	2	3	29	5	0	70
11:00 AM	0	0	2	0	6	1	0	0	0	0	0	5	0	0	14
11:15 AM	1	0	3	0	6	0	0	0	0	0	0	7	1	0	18
11:30 AM	0	0	5	0	4	0	0	1	0	0	0	9	1	0	20
11:45 AM	0	1	1	0	5	0	0	0	2	0	0	4	1	0	14
Total	1	1	11	0	21	1	0	1	2	0	0	25	3	0	66
12:00 PM	1	0	1	0	4	0	0	0	0	0	0	10	0	0	16
12:15 PM	2	0	0	0	6	1	0	0	0	0	0	4	0	0	13
12:30 PM	1	0	3	0	6	0	0	0	0	0	0	9	1	0	20
12:45 PM	0	0	1	0	3	0	0	0	0	1	0	1	1	0	7
Total	4	0	5	0	19	1	0	0	0	1	0	24	2	0	56
01:00 PM	1	0	0	0	5	0	0	1	0	0	0	4	0	0	11
01:15 PM	1	0	4	0	1	0	0	0	0	0	0	5	1	0	12
01:30 PM	0	0	1	0	3	2	0	2	0	0	0	7	1	0	16
01:45 PM	0	1	1	0	4	0	0	1	0	0	0	4	1	0	12
Total	2	1	6	0	13	2	0	4	0	0	0	20	3	0	51
02:00 PM	0	0	2	3	5	1	0	0	2	0	0	2	0	0	15
02:15 PM	0	0	1	0	2	1	0	0	0	2	0	4	1	0	11
02:30 PM	0	1	1	1	2	1	0	1	1	1	0	6	0	0	15
02:45 PM	0	0	3	0	3	1	0	0	1	1	1	6	0	0	16
Total	0	1	7	4	12	4	0	1	4	4	1	18	1	0	57
03:00 PM	0	1	1	2	2	2	0	1	0	0	1	6	0	0	16
03:15 PM	0	0	0	0	1	0	0	1	1	1	1	5	0	0	10
03:30 PM	0	1	1	0	2	2	0	0	0	0	2	5	1	0	14
03:45 PM	0	0	0	0	5	0	0	1	1	0	2	3	0	0	12
Total	0	2	2	2	10	4	0	3	2	1	6	19	1	0	52
04:00 PM	1	2	0	0	4	1	0	0	0	0	0	6	0	0	14
04:15 PM	0	0	0	0	0	1	0	0	1	0	1	6	0	0	9

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City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011
Page No : 2

Groups Printed- Heavy Vehicles

	Kilmarnock Street From North			Boylston Street From East				Kilmarnock Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
04:30 PM	0	0	1	0	0	1	0	1	0	1	0	3	0	0	7
04:45 PM	0	0	1	0	8	0	0	0	1	0	0	5	0	0	15
Total	1	2	2	0	12	3	0	1	2	1	1	20	0	0	45
05:00 PM	0	0	3	0	3	2	0	0	0	0	0	7	0	0	15
05:15 PM	1	0	2	0	2	1	0	0	1	0	1	4	0	0	12
05:30 PM	1	0	0	0	3	0	0	0	0	0	0	2	0	0	6
05:45 PM	0	0	1	0	3	1	0	0	1	0	0	3	0	0	9
Total	2	0	6	0	11	4	0	0	2	0	1	16	0	0	42
Grand Total	21	11	55	7	181	32	0	21	13	10	23	242	22	0	638
Apprch %	24.1	12.6	63.2	3.2	82.3	14.5	0	47.7	29.5	22.7	8	84.3	7.7	0	
Total %	3.3	1.7	8.6	1.1	28.4	5	0	3.3	2	1.6	3.6	37.9	3.4	0	

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 08:15 AM																			
08:15 AM	0	**1**	0	1	0	4	0	0	4	0	0	0	0	0	6	**2**	0	8	13
08:30 AM	0	0	0	0	0	6	**1**	0	7	0	**1**	0	**1**	1	7	1	0	9	17
08:45 AM	1	0	**3**	**4**	0	**9**	1	0	**10**	0	0	0	0	**5**	2	1	0	8	22
09:00 AM	**3**	0	1	4	**1**	7	1	0	9	**1**	0	0	1	0	**10**	1	0	**11**	**25**
Total Volume	4	1	4	9	1	26	3	0	30	1	1	0	2	6	25	5	0	36	77
% App. Total	44.4	11.1	44.4		3.3	86.7	10	0		50	50	0		16.7	69.4	13.9	0		
PHF	.333	.250	.333	.563	.250	.722	.750	.000	.750	.250	.250	.000	.500	.300	.625	.625	.000	.818	.770
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	**1**	**4**	**5**	0	**5**	0	0	5	0	0	**1**	1	0	**10**	1	0	**11**	**22**
10:15 AM	**2**	0	1	3	0	2	0	0	2	0	0	0	0	**3**	5	**2**	0	10	15
10:30 AM	2	0	1	3	0	3	**1**	0	4	**1**	0	0	1	0	7	1	0	8	16
10:45 AM	1	0	0	1	0	5	1	0	**6**	1	0	1	**2**	0	7	1	0	8	17
Total Volume	5	1	6	12	0	15	2	0	17	2	0	2	4	3	29	5	0	37	70
% App. Total	41.7	8.3	50		0	88.2	11.8	0		50	0	50		8.1	78.4	13.5	0		
PHF	.625	.250	.375	.600	.000	.750	.500	.000	.708	.500	.000	.500	.500	.250	.725	.625	.000	.841	.795
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 02:15 PM																			
02:15 PM	0	0	1	1	0	2	1	0	3	0	0	**2**	2	0	4	**1**	0	5	11
02:30 PM	0	**1**	1	2	1	2	1	0	4	**1**	**1**	1	**3**	0	**6**	0	0	6	15
02:45 PM	0	0	**3**	**3**	0	**3**	1	0	4	0	1	1	2	**1**	6	0	0	**7**	**16**
03:00 PM	0	1	1	2	**2**	2	**2**	0	**6**	1	0	0	1	1	6	0	0	7	16
Total Volume	0	2	6	8	3	9	5	0	17	2	2	4	8	2	22	1	0	25	58
% App. Total	0	25	75		17.6	52.9	29.4	0		25	25	50		8	88	4	0		
PHF	.000	.500	.500	.667	.375	.750	.625	.000	.708	.500	.500	.500	.667	.500	.917	.250	.000	.893	.906

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N/S: Kilmarnock Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Peds and Bicycles

	Kilmarnock Street From North				Boylston Street From East				Kilmarnock Street From South				Boylston 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	0	0	3	0	8	0	0	0	5	0	0	0	7	23
07:15 AM	1	1	0	2	0	1	0	7	0	0	0	4	0	0	0	4	20
07:30 AM	0	0	0	4	0	0	0	5	0	0	0	14	0	0	1	7	31
07:45 AM	0	0	0	9	0	0	0	12	0	0	0	22	0	1	0	15	59
Total	1	1	0	15	0	4	0	32	0	0	0	45	0	1	1	33	133
08:00 AM	0	0	0	15	0	0	0	15	0	3	0	20	0	0	0	14	67
08:15 AM	0	1	0	3	0	1	0	11	1	0	0	10	0	2	0	13	42
08:30 AM	0	1	1	12	0	1	0	18	0	0	0	23	0	2	0	14	72
08:45 AM	0	0	0	19	0	0	0	30	0	2	0	27	0	5	0	9	92
Total	0	2	1	49	0	2	0	74	1	5	0	80	0	9	0	50	273
09:00 AM	0	0	1	7	0	0	0	14	1	1	0	16	0	1	0	18	59
09:15 AM	0	0	0	10	0	2	0	14	0	0	0	14	0	2	0	28	70
09:30 AM	0	1	0	17	0	0	0	16	0	0	1	26	0	3	0	12	76
09:45 AM	0	1	0	20	0	1	0	22	0	1	0	16	0	2	0	20	83
Total	0	2	1	54	0	3	0	66	1	2	1	72	0	8	0	78	288
10:00 AM	0	0	0	19	0	0	0	15	0	0	0	14	0	3	0	7	58
10:15 AM	0	2	0	9	0	0	1	8	0	0	0	21	0	1	0	17	59
10:30 AM	0	0	0	8	1	5	0	12	0	0	1	25	0	0	0	14	66
10:45 AM	0	0	0	19	0	1	0	20	0	0	0	22	0	3	0	21	86
Total	0	2	0	55	1	6	1	55	0	0	1	82	0	7	0	59	269
11:00 AM	0	0	0	12	0	0	0	11	0	0	0	20	0	1	0	16	60
11:15 AM	0	0	0	8	0	0	0	17	0	1	0	23	0	2	0	13	64
11:30 AM	0	0	0	22	1	0	0	38	0	0	0	25	0	0	0	18	104
11:45 AM	0	0	0	18	0	0	0	24	0	0	0	21	0	1	0	20	84
Total	0	0	0	60	1	0	0	90	0	1	0	89	0	4	0	67	312
12:00 PM	0	0	0	35	0	1	0	48	1	0	0	44	0	0	0	47	176
12:15 PM	0	0	0	25	0	2	0	22	0	0	0	51	0	4	1	51	156
12:30 PM	0	0	0	21	0	1	0	47	0	0	0	63	0	1	0	33	166
12:45 PM	0	0	0	27	0	3	0	19	0	0	0	60	0	1	0	51	161
Total	0	0	0	108	0	7	0	136	1	0	0	218	0	6	1	182	659
01:00 PM	0	0	0	24	0	1	0	47	0	0	0	47	0	3	0	33	155
01:15 PM	0	0	1	32	0	2	0	19	0	0	0	60	0	1	0	40	155
01:30 PM	0	0	1	31	0	2	0	41	0	1	0	42	0	3	0	33	154
01:45 PM	1	0	0	23	0	1	0	36	0	0	0	26	0	5	0	41	133
Total	1	0	2	110	0	6	0	143	0	1	0	175	0	12	0	147	597
02:00 PM	0	0	1	22	0	0	0	23	0	0	0	48	1	4	0	38	137
02:15 PM	0	3	0	24	0	0	0	13	0	0	0	41	0	3	0	36	120
02:30 PM	0	2	0	29	0	3	0	28	0	1	0	44	0	3	0	43	153
02:45 PM	0	0	0	22	0	1	0	24	0	2	0	52	0	3	0	19	123
Total	0	5	1	97	0	4	0	88	0	3	0	185	1	13	0	136	533
03:00 PM	0	1	0	23	0	0	0	22	0	1	0	38	0	1	0	22	108
03:15 PM	0	1	1	32	0	1	0	20	0	0	0	39	0	1	0	37	132
03:30 PM	0	3	0	41	0	1	0	32	0	1	0	35	0	5	0	39	157
03:45 PM	0	1	0	22	0	5	0	37	0	0	0	45	0	2	0	19	131
Total	0	6	1	118	0	7	0	111	0	2	0	157	0	9	0	117	528
04:00 PM	0	0	0	18	0	3	0	26	0	1	0	66	0	5	0	28	147
04:15 PM	0	1	0	22	0	2	0	30	0	1	1	46	0	3	0	31	137

N/S: Kilmarnock Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

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File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Peds and Bicycles

	Kilmarnock Street From North				Boylston Street From East				Kilmarnock Street From South				Boylston Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:30 PM	0	0	0	12	0	1	0	15	0	0	0	47	0	3	0	27	105
04:45 PM	0	2	0	24	0	1	0	15	0	1	0	43	0	2	0	46	134
Total	0	3	0	76	0	7	0	86	0	3	1	202	0	13	0	132	523
05:00 PM	0	0	0	45	0	1	0	23	0	0	0	68	1	1	0	33	172
05:15 PM	0	0	1	34	0	0	0	20	0	2	1	44	0	3	0	21	126
05:30 PM	0	1	0	29	0	2	0	21	1	1	0	57	1	2	0	50	165
05:45 PM	0	1	0	41	0	2	0	33	0	0	0	58	0	9	0	49	193
Total	0	2	1	149	0	5	0	97	1	3	1	227	2	15	0	153	656
Grand Total	2	23	7	891	2	51	1	978	4	20	4	1532	3	97	2	1154	4771
Apprch %	0.2	2.5	0.8	96.5	0.2	4.9	0.1	94.8	0.3	1.3	0.3	98.2	0.2	7.7	0.2	91.9	
Total %	0	0.5	0.1	18.7	0	1.1	0	20.5	0.1	0.4	0.1	32.1	0.1	2	0	24.2	

	Kilmarnock Street From North					Boylston Street From East					Kilmarnock Street From South					Boylston 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 08:45 AM

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
08:45 AM	0	0	0	**19**	**19**	0	0	0	**30**	**30**	0	**2**	0	**27**	**29**	0	**5**	0	9	14	**92**
09:00 AM	0	0	**1**	7	8	0	0	0	14	14	**1**	1	0	16	18	0	1	0	18	19	59
09:15 AM	0	0	0	10	10	0	**2**	0	14	16	0	0	0	14	14	0	2	0	**28**	**30**	70
09:30 AM	0	**1**	0	17	18	0	0	0	16	16	0	0	**1**	26	27	0	3	0	12	15	76
Total Volume	0	1	1	53	55	0	2	0	74	76	1	3	1	83	88	0	11	0	67	78	297
% App. Total	0	1.8	1.8	96.4		0	2.6	0	97.4		1.1	3.4	1.1	94.3		0	14.1	0	85.9		
PHF	.000	.250	.250	.697	.724	.000	.250	.000	.617	.633	.250	.375	.250	.769	.759	.000	.550	.000	.598	.650	.807

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

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
12:00 PM	0	0	0	**35**	**35**	0	1	0	**48**	**49**	**1**	0	0	44	45	0	0	0	47	47	**176**
12:15 PM	0	0	0	25	25	0	2	0	22	24	0	0	0	51	51	0	**4**	**1**	**51**	**56**	156
12:30 PM	0	0	0	21	21	0	1	0	47	48	0	0	0	**63**	**63**	0	1	0	33	34	166
12:45 PM	0	0	0	27	27	0	**3**	0	19	22	0	0	0	60	60	0	1	0	51	52	161
Total Volume	0	0	0	108	108	0	7	0	136	143	1	0	0	218	219	0	6	1	182	189	659
% App. Total	0	0	0	100		0	4.9	0	95.1		0.5	0	0	99.5		0	3.2	0.5	96.3		
PHF	.000	.000	.000	.771	.771	.000	.583	.000	.708	.730	.250	.000	.000	.865	.869	.000	.375	.250	.892	.844	.936

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

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
05:00 PM	0	0	0	**45**	**45**	0	1	0	23	24	0	0	0	**68**	**68**	**1**	1	0	33	35	172
05:15 PM	0	0	**1**	34	35	0	0	0	20	20	0	**2**	**1**	44	47	0	3	0	21	24	126
05:30 PM	0	**1**	0	29	30	0	**2**	0	21	23	**1**	1	0	57	59	1	2	0	**50**	53	165
05:45 PM	0	1	0	41	42	0	2	0	**33**	**35**	0	0	0	58	58	0	**9**	0	49	**58**	**193**
Total Volume	0	2	1	149	152	0	5	0	97	102	1	3	1	227	232	2	15	0	153	170	656
% App. Total	0	1.3	0.7	98		0	4.9	0	95.1		0.4	1.3	0.4	97.8		1.2	8.8	0	90		
PHF	.000	.500	.250	.828	.844	.000	.625	.000	.735	.729	.250	.375	.250	.835	.853	.500	.417	.000	.765	.733	.850

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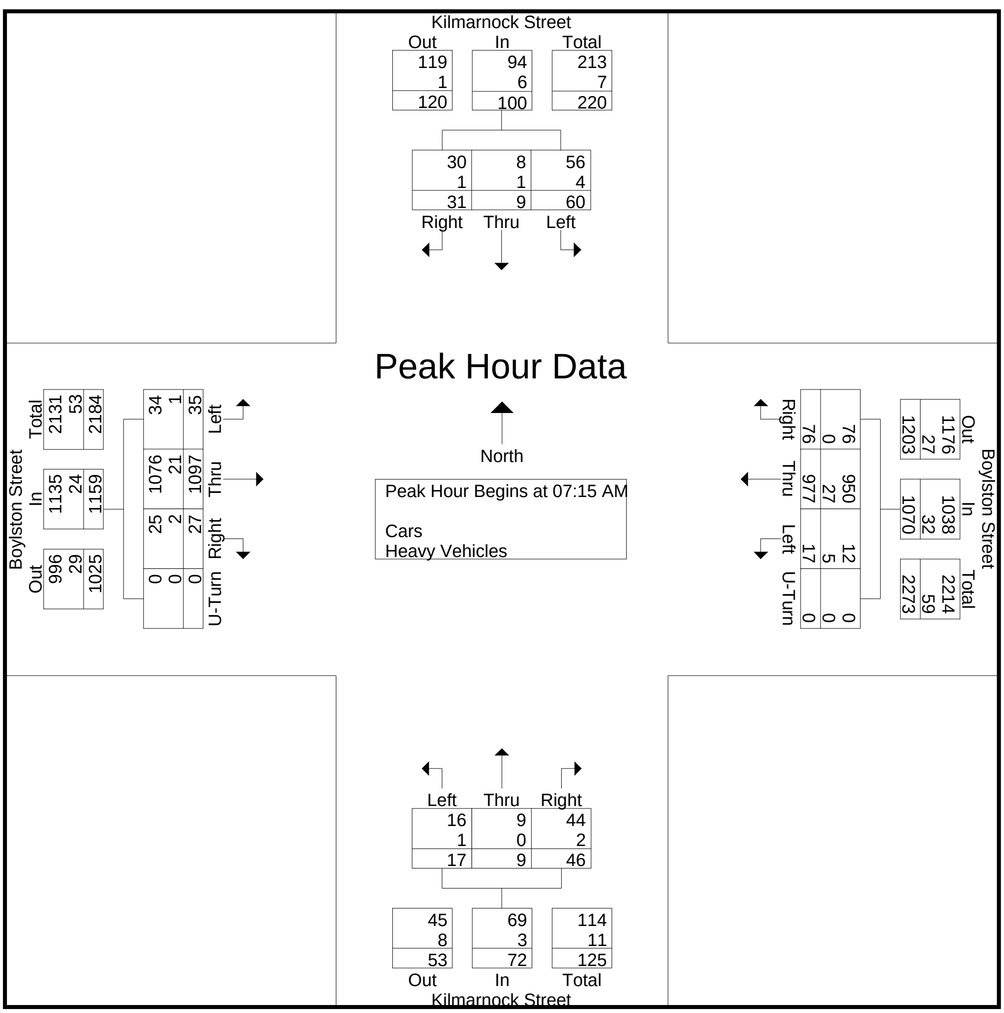
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011
Page No : 1

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	8	1	14	23	18	257	4	0	279	11	2	4	17	5	289	7	0	301	620
07:30 AM	6	**4**	11	21	18	**261**	4	0	**283**	11	2	**5**	**18**	**7**	**288**	**12**	0	**307**	**629**
07:45 AM	**9**	4	**23**	**36**	**24**	234	4	0	262	**13**			**19**	**9**	229	8	0	246	563
08:00 AM	8	0	12	20	16	225	**5**	0	246	11	**4**	3	18	6	**291**	8	0	305	589
Total Volume	31	9	60	100	76	977	17	0	1070	46	9	17	72	27	1097	35	0	1159	2401
% App. Total	31	9	60		7.1	91.3	1.6	0		63.9	12.5	23.6		2.3	94.7	3	0		
PHF	.861	.563	.652	.694	.792	.936	.850	.000	.945	.885	.563	.850	.947	.750	.942	.729	.000	.944	.954
Cars	30	8	56	94	76	950	12	0	1038	44	9	16	69	25	1076	34	0	1135	2336
% Cars	96.8	88.9	93.3	94.0	100	97.2	70.6	0	97.0	95.7	100	94.1	95.8	92.6	98.1	97.1	0	97.9	97.3
Heavy Vehicles	1	1	4	6	0	27	5	0	32	2	0	1	3	2	21	1	0	24	65
% Heavy Vehicles	3.2	11.1	6.7	6.0	0	2.8	29.4	0	3.0	4.3	0	5.9	4.2	7.4	1.9	2.9	0	2.1	2.7



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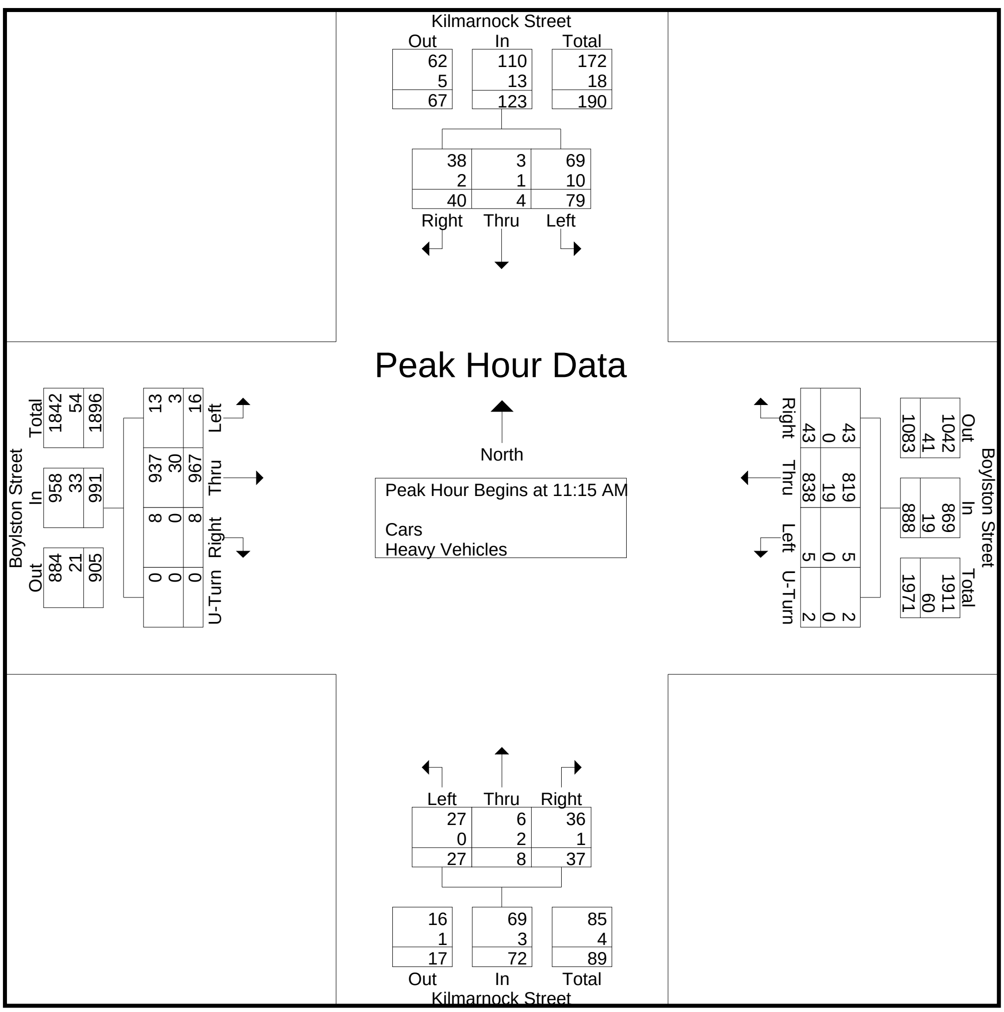
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 11:15 AM																			
11:15 AM	9	**2**	16	27	10	**220**	0	**1**	**231**	**11**	**2**	**15**	**28**	**5**	245	5	0	255	**541**
11:30 AM	**13**	0	20	33	**18**	211	0	0	229	10	1	4	15	0	232	1	0	233	510
11:45 AM	11	2	**24**	**37**	8	191	**3**	0	202	10	**3**	5	18	0	232	**7**	0	239	496
12:00 PM	7	0	19	26	7	216	2	1	226	6	2	3	11	3	**258**	3	0	**264**	527
Total Volume	40	4	79	123	43	838	5	2	888	37	8	27	72	8	967	16	0	991	2074
% App. Total	32.5	3.3	64.2		4.8	94.4	0.6	0.2		51.4	11.1	37.5		0.8	97.6	1.6	0		
PHF	.769	.500	.823	.831	.597	.952	.417	.500	.961	.841	.667	.450	.643	.400	.937	.571	.000	.938	.958
Cars	38	3	69	110	43	819	5	2	869	36	6	27	69	8	937	13	0	958	2006
% Cars	95.0	75.0	87.3	89.4	100	97.7	100	100	97.9	97.3	75.0	100	95.8	100	96.9	81.3	0	96.7	96.7
Heavy Vehicles	2	1	10	13	0	19	0	0	19	1	2	0	3	0	30	3	0	33	68
% Heavy Vehicles	5.0	25.0	12.7	10.6	0	2.3	0	0	2.1	2.7	25.0	0	4.2	0	3.1	18.8	0	3.3	3.3



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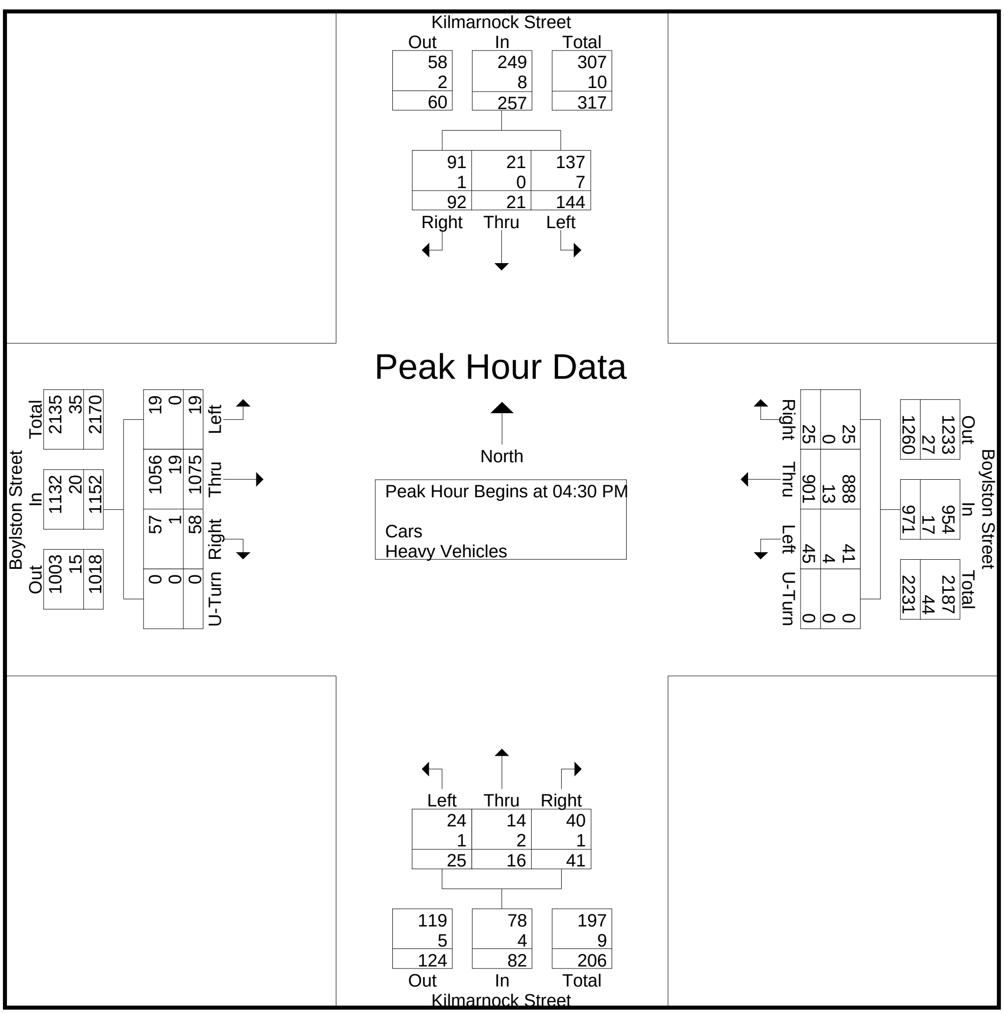
File Name : 112476 G
Site Code : 407
Start Date : 4/14/2011

	Kilmarnock Street From North				Boylston Street From East					Kilmarnock Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 04:30 PM																			
04:30 PM	21	4	34	59	6	230	8	0	244	6	5	**8**	**19**	**13**	**264**	**5**	**0**	**282**	**604**
04:45 PM	**25**	**7**	**34**	**66**	**3**	**212**	**11**	**0**	**226**	**10**	**6**	8	**24**	**18**	**278**	**7**	0	**303**	619
05:00 PM	**26**	**8**	36	**70**	**11**	**236**	**16**	0	**263**	8	1	6	15	10	261	3	0	274	**622**
05:15 PM	20	2	**40**	62	5	223	10	0	238	**17**									
Total Volume	92	21	144	257	25	901	45	0	971	41	16	25	82	58	1075	19	0	1152	2462
% App. Total	35.8	8.2	56		2.6	92.8	4.6	0		50	19.5	30.5		5	93.3	1.6	0		
PHF	.885	.656	.900	.918	.568	.954	.703	.000	.923	.603	.667	.781	.854	.806	.967	.679	.000	.950	.990
Cars	91	21	137	249	25	888	41	0	954	40	14	24	78	57	1056	19	0	1132	2413
% Cars	98.9	100	95.1	96.9	100	98.6	91.1	0	98.2	97.6	87.5	96.0	95.1	98.3	98.2	100	0	98.3	98.0
Heavy Vehicles	1	0	7	8	0	13	4	0	17	1	2	1	4	1	19	0	0	20	49
% Heavy Vehicles	1.1	0	4.9	3.1	0	1.4	8.9	0	1.8	2.4	12.5	4.0	4.9	1.7	1.8	0	0	1.7	2.0



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E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Yawkey Way From North			Boylston Street From East				Jersey Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	8	282	5	0	14	1	5	6	236	4	0	561
07:15 AM	0	0	0	18	271	8	0	21	4	4	5	293	9	0	633
07:30 AM	0	0	0	17	271	3	0	19	8	4	10	282	10	0	624
07:45 AM	0	0	0	16	245	13	1	26	7	5	6	241	9	0	569
Total	0	0	0	59	1069	29	1	80	20	18	27	1052	32	0	2387
08:00 AM	0	0	1	6	240	8	0	16	8	2	9	280	9	0	579
08:15 AM	0	0	0	11	259	9	0	23	0	6	3	242	10	0	563
08:30 AM	0	0	0	18	283	5	0	16	1	3	5	224	6	0	561
08:45 AM	0	0	0	13	252	4	0	9	0	5	5	238	7	0	533
Total	0	0	1	48	1034	26	0	64	9	16	22	984	32	0	2236
09:00 AM	0	0	0	16	229	2	0	13	4	4	7	237	9	0	521
09:15 AM	0	0	0	13	219	7	0	10	6	3	6	238	6	0	508
09:30 AM	0	0	0	17	285	6	0	10	0	1	9	254	9	0	591
09:45 AM	0	0	0	12	259	5	0	10	2	2	8	239	15	0	552
Total	0	0	0	58	992	20	0	43	12	10	30	968	39	0	2172
10:00 AM	0	0	0	15	209	5	0	7	2	1	6	225	12	0	482
10:15 AM	0	0	0	11	187	8	0	9	2	3	4	214	13	0	451
10:30 AM	0	0	0	11	200	4	0	9	1	1	1	186	7	0	420
10:45 AM	0	0	0	13	203	9	0	13	4	3	8	233	12	0	498
Total	0	0	0	50	799	26	0	38	9	8	19	858	44	0	1851
11:00 AM	0	0	0	9	195	10	0	11	5	2	8	204	7	0	451
11:15 AM	0	1	0	13	218	5	0	4	3	5	14	249	8	0	520
11:30 AM	0	0	0	16	219	3	0	8	1	2	8	240	9	0	506
11:45 AM	0	0	0	16	187	6	1	5	1	1	10	219	7	1	454
Total	0	1	0	54	819	24	1	28	10	10	40	912	31	1	1931
12:00 PM	1	0	0	6	207	9	0	11	0	1	25	203	5	0	468
12:15 PM	0	0	0	13	240	7	0	11	7	3	10	250	12	0	553
12:30 PM	0	0	1	13	215	9	0	7	1	2	16	224	8	4	500
12:45 PM	0	0	0	9	177	7	0	11	4	1	20	241	4	0	474
Total	1	0	1	41	839	32	0	40	12	7	71	918	29	4	1995
01:00 PM	1	0	1	14	188	8	0	11	4	2	8	222	11	0	470
01:15 PM	0	0	0	14	173	10	0	20	4	3	13	237	11	0	485
01:30 PM	0	0	0	12	211	7	0	16	3	2	10	262	8	0	531
01:45 PM	1	0	1	8	215	11	0	12	2	2	10	238	11	0	511
Total	2	0	2	48	787	36	0	59	13	9	41	959	41	0	1997
02:00 PM	0	0	0	10	203	10	0	9	4	2	7	239	9	0	493
02:15 PM	0	0	0	10	207	7	1	14	1	2	6	272	4	0	524
02:30 PM	0	0	0	10	207	6	0	13	3	2	9	282	5	0	537
02:45 PM	0	0	0	20	212	9	0	14	2	1	9	287	4	0	558
Total	0	0	0	50	829	32	1	50	10	7	31	1080	22	0	2112
03:00 PM	0	0	0	9	242	10	2	18	2	2	6	273	3	0	567
03:15 PM	0	0	0	6	193	6	0	12	1	1	11	251	5	0	486
03:30 PM	1	0	0	8	204	11	0	18	7	2	10	270	5	0	536
03:45 PM	0	0	0	10	220	9	1	14	3	3	8	294	5	0	567
Total	1	0	0	33	859	36	3	62	13	8	35	1088	18	0	2156
04:00 PM	0	0	0	11	216	6	0	17	3	2	7	288	5	0	555
04:15 PM	0	0	0	10	209	15	1	17	1	3	4	265	3	0	528

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E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Cars - Heavy Vehicles

	Yawkey Way From North			Boylston Street From East				Jersey Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
04:30 PM	0	0	0	15	231	7	1	15	4	6	12	301	7	0	599
04:45 PM	0	0	0	9	204	9	0	21	5	2	9	280	7	0	546
Total	0	0	0	45	860	37	2	70	13	13	32	1134	22	0	2228
05:00 PM	0	0	0	8	244	9	1	29	1	5	6	301	9	0	613
05:15 PM	1	0	0	8	218	13	1	34	4	2	7	295	6	0	589
05:30 PM	0	0	0	4	217	7	0	20	0	7	10	304	5	0	574
05:45 PM	0	0	0	8	200	10	0	17	4	4	7	284	7	0	541
Total	1	0	0	28	879	39	2	100	9	18	30	1184	27	0	2317
Grand Total	5	1	4	514	9766	337	10	634	130	124	378	11137	337	5	23382
Apprch %	50	10	40	4.8	91.9	3.2	0.1	71.4	14.6	14	3.2	93.9	2.8	0	
Total %	0	0	0	2.2	41.8	1.4	0	2.7	0.6	0.5	1.6	47.6	1.4	0	
Cars	5	1	4	475	9558	321	10	587	115	116	368	10882	289	5	22736
% Cars	100	100	100	92.4	97.9	95.3	100	92.6	88.5	93.5	97.4	97.7	85.8	100	97.2
Heavy Vehicles	0	0	0	39	208	16	0	47	15	8	10	255	48	0	646
% Heavy Vehicles	0	0	0	7.6	2.1	4.7	0	7.4	11.5	6.5	2.6	2.3	14.2	0	2.8

	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	0	0	0	0	**18**	**271**	8	0	**297**	21	4	4	29	5	**293**	9	0	**307**	**633**
07:30 AM	0	0	0	0	17	271	3	0	291	19	**8**	4	31	**10**	282	**10**	0	302	624
07:45 AM	0	0	0	0	16	245	**13**	**1**	275	**26**	7	**5**	**38**	6	241	9	0	256	569
08:00 AM	0	0	**1**	**1**	6	240	8	0	254	16	8	2	26	9	280	9	0	298	579
Total Volume	0	0	1	1	57	1027	32	1	1117	82	27	15	124	30	1096	37	0	1163	2405
% App. Total	0	0	100		5.1	91.9	2.9	0.1		66.1	21.8	12.1		2.6	94.2	3.2	0		
PHF	.000	.000	.250	.250	.792	.947	.615	.250	.940	.788	.844	.750	.816	.750	.935	.925	.000	.947	.950
Cars	0	0	1	1	55	994	31	1	1081	75	25	14	114	30	1072	32	0	1134	2330
% Cars	0	0	100	100	96.5	96.8	96.9	100	96.8	91.5	92.6	93.3	91.9	100	97.8	86.5	0	97.5	96.9
Heavy Vehicles	0	0	0	0	2	33	1	0	36	7	2	1	10	0	24	5	0	29	75
% Heavy Vehicles	0	0	0	0	3.5	3.2	3.1	0	3.2	8.5	7.4	6.7	8.1	0	2.2	13.5	0	2.5	3.1
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	13	**240**	7	0	**260**	**11**	**7**	**3**	**21**	10	**250**	**12**	0	**272**	**553**
12:30 PM	0	0	**1**	1	13	215	**9**	0	237	7	1	2	10	16	224	8	**4**	252	500
12:45 PM	0	0	0	0	9	177	7	0	193	11	4	1	16	**20**	241	4	0	265	474
01:00 PM	**1**	0	1	**2**	**14**	188	8	0	210	11	4	2	17	8	222	11	0	241	470
Total Volume	1	0	2	3	49	820	31	0	900	40	16	8	64	54	937	35	4	1030	1997
% App. Total	33.3	0	66.7		5.4	91.1	3.4	0		62.5	25	12.5		5.2	91	3.4	0.4		
PHF	.250	.000	.500	.375	.875	.854	.861	.000	.865	.909	.571	.667	.762	.675	.937	.729	.250	.947	.903
Cars	1	0	2	3	45	798	29	0	872	31	14	6	51	54	914	31	4	1003	1929
% Cars	100	0	100	100	91.8	97.3	93.5	0	96.9	77.5	87.5	75.0	79.7	100	97.5	88.6	100	97.4	96.6
Heavy Vehicles	0	0	0	0	4	22	2	0	28	9	2	2	13	0	23	4	0	27	68
% Heavy Vehicles	0	0	0	0	8.2	2.7	6.5	0	3.1	22.5	12.5	25.0	20.3	0	2.5	11.4	0	2.6	3.4

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N/S: Yawkey Way/ Jersey Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 04:30 PM																			
04:30 PM	0	0	0	0	**15**	231	7	**1**	254	15	4	**6**	25	**12**	**301**	7	0	**320**	599
04:45 PM	0	0	0	0	9	204	9	0	222	21	**5**	2	28	9	280	7	0	296	546
05:00 PM	0	0	0	0	8	**244**	9	1	**262**	29	1	5	35	6	301	**9**	0	316	**613**
05:15 PM	**1**	0	0	**1**	8	218	**13**	1	240	**34**	4	2	**40**	7	295	6	0	308	589
Total Volume	1	0	0	1	40	897	38	3	978	99	14	15	128	34	1177	29	0	1240	2347
% App. Total	100	0	0		4.1	91.7	3.9	0.3		77.3	10.9	11.7		2.7	94.9	2.3	0		
PHF	.250	.000	.000	.250	.667	.919	.731	.750	.933	.728	.700	.625	.800	.708	.978	.806	.000	.969	.957
Cars	1	0	0	1	36	881	38	3	958	94	14	14	122	34	1156	24	0	1214	2295
% Cars	100	0	0	100	90.0	98.2	100	100	98.0	94.9	100	93.3	95.3	100	98.2	82.8	0	97.9	97.8
Heavy Vehicles	0	0	0	0	4	16	0	0	20	5	0	1	6	0	21	5	0	26	52
% Heavy Vehicles	0	0	0	0	10.0	1.8	0	0	2.0	5.1	0	6.7	4.7	0	1.8	17.2	0	2.1	2.2

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City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Cars

	Yawkey Way From North			Boylston Street From East				Jersey Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	8	279	4	0	12	1	5	5	229	4	0	547
07:15 AM	0	0	0	18	266	8	0	19	4	4	5	289	8	0	621
07:30 AM	0	0	0	17	261	3	0	18	7	3	10	277	8	0	604
07:45 AM	0	0	0	14	237	12	1	23	7	5	6	235	8	0	548
Total	0	0	0	57	1043	27	1	72	19	17	26	1030	28	0	2320
08:00 AM	0	0	1	6	230	8	0	15	7	2	9	271	8	0	557
08:15 AM	0	0	0	10	254	9	0	23	0	6	3	236	10	0	551
08:30 AM	0	0	0	17	275	4	0	14	1	3	5	220	5	0	544
08:45 AM	0	0	0	11	246	3	0	8	0	3	5	234	6	0	516
Total	0	0	1	44	1005	24	0	60	8	14	22	961	29	0	2168
09:00 AM	0	0	0	16	221	2	0	12	4	4	7	228	8	0	502
09:15 AM	0	0	0	13	212	7	0	10	6	3	6	234	4	0	495
09:30 AM	0	0	0	17	277	6	0	9	0	1	8	250	8	0	576
09:45 AM	0	0	0	11	253	5	0	10	2	2	8	230	12	0	533
Total	0	0	0	57	963	20	0	41	12	10	29	942	32	0	2106
10:00 AM	0	0	0	13	202	5	0	6	2	1	6	217	9	0	461
10:15 AM	0	0	0	11	185	7	0	8	1	3	4	208	13	0	440
10:30 AM	0	0	0	10	196	4	0	8	0	1	1	179	4	0	403
10:45 AM	0	0	0	12	199	8	0	13	4	2	8	224	11	0	481
Total	0	0	0	46	782	24	0	35	7	7	19	828	37	0	1785
11:00 AM	0	0	0	7	193	10	0	11	5	1	8	198	5	0	438
11:15 AM	0	1	0	13	213	4	0	3	3	5	13	241	6	0	502
11:30 AM	0	0	0	14	218	3	0	7	1	2	8	228	7	0	488
11:45 AM	0	0	0	16	184	6	1	4	1	1	9	216	7	1	446
Total	0	1	0	50	808	23	1	25	10	9	38	883	25	1	1874
12:00 PM	1	0	0	5	203	9	0	10	0	1	23	197	4	0	453
12:15 PM	0	0	0	12	232	7	0	8	7	3	10	244	11	0	534
12:30 PM	0	0	1	12	209	7	0	4	0	1	16	216	7	4	477
12:45 PM	0	0	0	8	174	7	0	9	4	1	20	239	3	0	465
Total	1	0	1	37	818	30	0	31	11	6	69	896	25	4	1929
01:00 PM	1	0	1	13	183	8	0	10	3	1	8	215	10	0	453
01:15 PM	0	0	0	14	171	10	0	20	3	3	13	233	9	0	476
01:30 PM	0	0	0	11	206	7	0	15	2	2	10	252	7	0	512
01:45 PM	1	0	1	7	211	10	0	11	1	2	9	231	11	0	495
Total	2	0	2	45	771	35	0	56	9	8	40	931	37	0	1936
02:00 PM	0	0	0	9	198	10	0	7	1	2	7	235	9	0	478
02:15 PM	0	0	0	10	205	7	1	14	1	2	5	268	3	0	516
02:30 PM	0	0	0	9	204	6	0	12	3	2	9	274	5	0	524
02:45 PM	0	0	0	19	209	9	0	14	2	1	8	281	3	0	546
Total	0	0	0	47	816	32	1	47	7	7	29	1058	20	0	2064
03:00 PM	0	0	0	8	236	10	2	16	2	2	6	266	2	0	550
03:15 PM	0	0	0	6	192	4	0	12	1	1	11	246	5	0	478
03:30 PM	1	0	0	5	200	11	0	17	5	2	10	265	4	0	520
03:45 PM	0	0	0	8	215	8	1	13	3	3	8	291	4	0	554
Total	1	0	0	27	843	33	3	58	11	8	35	1068	15	0	2102
04:00 PM	0	0	0	10	211	5	0	16	3	2	6	285	5	0	543
04:15 PM	0	0	0	9	208	13	1	17	0	3	4	262	2	0	519

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E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Cars

	Yawkey Way From North			Boylston Street From East				Jersey Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
04:30 PM	0	0	0	14	229	7	1	13	4	6	12	299	5	0	590
04:45 PM	0	0	0	8	197	9	0	20	5	2	9	275	7	0	532
Total	0	0	0	41	845	34	2	66	12	13	31	1121	19	0	2184
05:00 PM	0	0	0	7	239	9	1	28	1	5	6	292	7	0	595
05:15 PM	1	0	0	7	216	13	1	33	4	1	7	290	5	0	578
05:30 PM	0	0	0	3	213	7	0	18	0	7	10	302	5	0	565
05:45 PM	0	0	0	7	196	10	0	17	4	4	7	280	5	0	530
Total	1	0	0	24	864	39	2	96	9	17	30	1164	22	0	2268
Grand Total	5	1	4	475	9558	321	10	587	115	116	368	10882	289	5	22736
Apprch %	50	10	40	4.6	92.2	3.1	0.1	71.8	14.1	14.2	3.2	94.3	2.5	0	
Total %	0	0	0	2.1	42	1.4	0	2.6	0.5	0.5	1.6	47.9	1.3	0	

	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	0	0	0	0	**18**	**266**	8	0	**292**	19	4	4	27	5	**289**	**8**	0	**302**	**621**
07:30 AM	0	0	0	0	17	261	3	0	281	18	**7**	3	28	**10**	277	8	0	295	604
07:45 AM	0	0	0	0	14	237	**12**	**1**	264	**23**	7	**5**	**35**	6	235	8	0	249	548
08:00 AM	0	0	**1**	**1**	6	230	8	0	244	15	7	2	24	9	271	8	0	288	557
Total Volume	0	0	1	1	55	994	31	1	1081	75	25	14	114	30	1072	32	0	1134	2330
% App. Total	0	0	100		5.1	92	2.9	0.1		65.8	21.9	12.3		2.6	94.5	2.8	0		
PHF	.000	.000	.250	.250	.764	.934	.646	.250	.926	.815	.893	.700	.814	.750	.927	1.000	.000	.939	.938

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 01:00 PM

Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:00 PM	**1**	0	**1**	**2**	13	183	8	0	204	10	**3**	1	14	8	215	10	0	233	453
01:15 PM	0	0	0	0	**14**	171	**10**	0	195	**20**	3	**3**	**26**	**13**	233	9	0	255	476
01:30 PM	0	0	0	0	11	206	7	0	224	15	2	2	19	10	**252**	7	0	**269**	**512**
01:45 PM	1	0	1	2	7	**211**	10	0	**228**	11	1	2	14	9	231	**11**	0	251	495
Total Volume	2	0	2	4	45	771	35	0	851	56	9	8	73	40	931	37	0	1008	1936
% App. Total	50	0	50		5.3	90.6	4.1	0		76.7	12.3	11		4	92.4	3.7	0		
PHF	.500	.000	.500	.500	.804	.914	.875	.000	.933	.700	.750	.667	.702	.769	.924	.841	.000	.937	.945

Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:30 PM

Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:30 PM	0	0	0	0	**14**	229	7	**1**	251	13	4	**6**	23	**12**	**299**	5	0	**316**	590
04:45 PM	0	0	0	0	8	197	9	0	214	20	**5**	2	27	9	275	**7**	0	291	532
05:00 PM	0	0	0	0	7	**239**	9	1	**256**	28	1	5	34	6	292	7	0	305	**595**
05:15 PM	**1**	0	0	**1**	7	216	**13**	1	237	**33**	4	1	**38**	7	290	5	0	302	578
Total Volume	1	0	0	1	36	881	38	3	958	94	14	14	122	34	1156	24	0	1214	2295
% App. Total	100	0	0		3.8	92	4	0.3		77	11.5	11.5		2.8	95.2	2	0		
PHF	.250	.000	.000	.250	.643	.922	.731	.750	.936	.712	.700	.583	.803	.708	.967	.857	.000	.960	.964

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Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011
Page No : 1

Groups Printed- Heavy Vehicles

	Yawkey Way From North			Boylston Street From East				Jersey Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	3	1	0	2	0	0	1	7	0	0	14
07:15 AM	0	0	0	0	5	0	0	2	0	0	0	4	1	0	12
07:30 AM	0	0	0	0	10	0	0	1	1	1	0	5	2	0	20
07:45 AM	0	0	0	2	8	1	0	3	0	0	0	6	1	0	21
Total	0	0	0	2	26	2	0	8	1	1	1	22	4	0	67
08:00 AM	0	0	0	0	10	0	0	1	1	0	0	9	1	0	22
08:15 AM	0	0	0	1	5	0	0	0	0	0	0	6	0	0	12
08:30 AM	0	0	0	1	8	1	0	2	0	0	0	4	1	0	17
08:45 AM	0	0	0	2	6	1	0	1	0	2	0	4	1	0	17
Total	0	0	0	4	29	2	0	4	1	2	0	23	3	0	68
09:00 AM	0	0	0	0	8	0	0	1	0	0	0	9	1	0	19
09:15 AM	0	0	0	0	7	0	0	0	0	0	0	4	2	0	13
09:30 AM	0	0	0	0	8	0	0	1	0	0	1	4	1	0	15
09:45 AM	0	0	0	1	6	0	0	0	0	0	0	9	3	0	19
Total	0	0	0	1	29	0	0	2	0	0	1	26	7	0	66
10:00 AM	0	0	0	2	7	0	0	1	0	0	0	8	3	0	21
10:15 AM	0	0	0	0	2	1	0	1	1	0	0	6	0	0	11
10:30 AM	0	0	0	1	4	0	0	1	1	0	0	7	3	0	17
10:45 AM	0	0	0	1	4	1	0	0	0	1	0	9	1	0	17
Total	0	0	0	4	17	2	0	3	2	1	0	30	7	0	66
11:00 AM	0	0	0	2	2	0	0	0	0	1	0	6	2	0	13
11:15 AM	0	0	0	0	5	1	0	1	0	0	1	8	2	0	18
11:30 AM	0	0	0	2	1	0	0	1	0	0	0	12	2	0	18
11:45 AM	0	0	0	0	3	0	0	1	0	0	1	3	0	0	8
Total	0	0	0	4	11	1	0	3	0	1	2	29	6	0	57
12:00 PM	0	0	0	1	4	0	0	1	0	0	2	6	1	0	15
12:15 PM	0	0	0	1	8	0	0	3	0	0	0	6	1	0	19
12:30 PM	0	0	0	1	6	2	0	3	1	1	0	8	1	0	23
12:45 PM	0	0	0	1	3	0	0	2	0	0	0	2	1	0	9
Total	0	0	0	4	21	2	0	9	1	1	2	22	4	0	66
01:00 PM	0	0	0	1	5	0	0	1	1	1	0	7	1	0	17
01:15 PM	0	0	0	0	2	0	0	0	1	0	0	4	2	0	9
01:30 PM	0	0	0	1	5	0	0	1	1	0	0	10	1	0	19
01:45 PM	0	0	0	1	4	1	0	1	1	0	1	7	0	0	16
Total	0	0	0	3	16	1	0	3	4	1	1	28	4	0	61
02:00 PM	0	0	0	1	5	0	0	2	3	0	0	4	0	0	15
02:15 PM	0	0	0	0	2	0	0	0	0	0	1	4	1	0	8
02:30 PM	0	0	0	1	3	0	0	1	0	0	0	8	0	0	13
02:45 PM	0	0	0	1	3	0	0	0	0	0	1	6	1	0	12
Total	0	0	0	3	13	0	0	3	3	0	2	22	2	0	48
03:00 PM	0	0	0	1	6	0	0	2	0	0	0	7	1	0	17
03:15 PM	0	0	0	0	1	2	0	0	0	0	0	5	0	0	8
03:30 PM	0	0	0	3	4	0	0	1	2	0	0	5	1	0	16
03:45 PM	0	0	0	2	5	1	0	1	0	0	0	3	1	0	13
Total	0	0	0	6	16	3	0	4	2	0	0	20	3	0	54
04:00 PM	0	0	0	1	5	1	0	1	0	0	1	3	0	0	12
04:15 PM	0	0	0	1	1	2	0	0	1	0	0	3	1	0	9

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File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Heavy Vehicles

	Yawkey Way From North			Boylston Street From East				Jersey Street From South			Boylston Street From West				
Start Time	Right	Thru	Left	Right	Thru	Left	U-Turn	Right	Thru	Left	Right	Thru	Left	U-Turn	Int. Total
04:30 PM	0	0	0	1	2	0	0	2	0	0	0	2	2	0	9
04:45 PM	0	0	0	1	7	0	0	1	0	0	0	5	0	0	14
Total	0	0	0	4	15	3	0	4	1	0	1	13	3	0	44
05:00 PM	0	0	0	1	5	0	0	1	0	0	0	9	2	0	18
05:15 PM	0	0	0	1	2	0	0	1	0	1	0	5	1	0	11
05:30 PM	0	0	0	1	4	0	0	2	0	0	0	2	0	0	9
05:45 PM	0	0	0	1	4	0	0	0	0	0	0	4	2	0	11
Total	0	0	0	4	15	0	0	4	0	1	0	20	5	0	49
Grand Total	0	0	0	39	208	16	0	47	15	8	10	255	48	0	646
Apprch %	0	0	0	14.8	79.1	6.1	0	67.1	21.4	11.4	3.2	81.5	15.3	0	
Total %	0	0	0	6	32.2	2.5	0	7.3	2.3	1.2	1.5	39.5	7.4	0	

	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	0	0	0	0	0	5	0	0	5	2	0	0	2	0	4	1	0	5	12
07:30 AM	0	0	0	0	0	**10**	0	0	10	1	**1**	**1**	**3**	0	5	**2**	0	7	20
07:45 AM	0	0	0	0	**2**	8	**1**	0	**11**	**3**	0	0	3	0	6	1	0	7	21
08:00 AM	0	0	0	0	0	10	0	0	10	1	1	0	2	0	**9**	1	0	**10**	**22**
Total Volume	0	0	0	0	2	33	1	0	36	7	2	1	10	0	24	5	0	29	75
% App. Total	0	0	0		5.6	91.7	2.8	0		70	20	10		0	82.8	17.2	0		
PHF	.000	.000	.000	.000	.250	.825	.250	.000	.818	.583	.500	.250	.833	.000	.667	.625	.000	.725	.852
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	**1**	**8**	0	0	**9**	**3**	0	0	3	0	6	**1**	0	7	19
12:30 PM	0	0	0	0	1	6	**2**	0	9	3	**1**	**1**	**5**	0	**8**	1	0	**9**	**23**
12:45 PM	0	0	0	0	1	3	0	0	4	2	0	0	2	0	2	1	0	3	9
01:00 PM	0	0	0	0	1	5	0	0	6	1	1	1	3	0	7	1	0	8	17
Total Volume	0	0	0	0	4	22	2	0	28	9	2	2	13	0	23	4	0	27	68
% App. Total	0	0	0		14.3	78.6	7.1	0		69.2	15.4	15.4		0	85.2	14.8	0		
PHF	.000	.000	.000	.000	1.000	.688	.250	.000	.778	.750	.500	.500	.650	.000	.719	1.000	.000	.750	.739
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 03:00 PM																			
03:00 PM	0	0	0	0	1	**6**	0	0	7	**2**	0	0	2	0	**7**	**1**	0	**8**	**17**
03:15 PM	0	0	0	0	0	1	**2**	0	3	0	0	0	0	0	5	0	0	5	8
03:30 PM	0	0	0	0	**3**	4	0	0	7	1	**2**	0	**3**	0	5	1	0	6	16
03:45 PM	0	0	0	0	2	5	1	0	**8**	1	0	0	1	0	3	1	0	4	13
Total Volume	0	0	0	0	6	16	3	0	25	4	2	0	6	0	20	3	0	23	54
% App. Total	0	0	0		24	64	12	0		66.7	33.3	0		0	87	13	0		
PHF	.000	.000	.000	.000	.500	.667	.375	.000	.781	.500	.250	.000	.500	.000	.714	.750	.000	.719	.794

PRECISION
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N/S: Yawkey Way/ Jersey Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Peds and Bicycles

	Yawkey Way From North				Boylston Street From East				Jersey Street From South				Boylston 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	4	0	0	0	9	0	0	0	7	0	1	0	11	32
07:15 AM	1	1	0	7	0	1	0	21	0	0	0	14	0	0	0	9	54
07:30 AM	0	0	1	18	0	1	1	24	0	1	0	10	0	3	0	17	76
07:45 AM	0	0	0	12	0	0	0	29	1	0	0	16	0	0	0	19	77
Total	1	1	1	41	0	2	1	83	1	1	0	47	0	4	0	56	239
08:00 AM	0	1	0	14	0	0	0	38	0	2	0	21	0	0	0	11	87
08:15 AM	0	0	0	11	0	2	0	23	1	2	0	16	0	1	0	15	71
08:30 AM	0	0	0	8	0	4	1	24	0	0	0	10	0	3	0	15	65
08:45 AM	0	0	0	18	0	0	0	25	1	1	0	25	1	2	0	22	95
Total	0	1	0	51	0	6	1	110	2	5	0	72	1	6	0	63	318
09:00 AM	0	2	0	8	1	3	0	24	0	1	0	10	0	2	0	9	60
09:15 AM	0	0	0	8	0	1	0	16	0	0	0	16	0	1	0	17	59
09:30 AM	0	0	0	17	0	0	0	13	0	1	0	14	0	1	0	13	59
09:45 AM	0	0	0	10	0	1	0	21	0	0	0	21	0	3	0	24	80
Total	0	2	0	43	1	5	0	74	0	2	0	61	0	7	0	63	258
10:00 AM	0	0	0	16	0	1	0	12	0	0	0	19	0	4	0	27	79
10:15 AM	0	0	0	8	0	0	0	16	0	0	0	14	0	11	0	21	70
10:30 AM	0	0	0	8	1	3	0	10	0	0	0	21	0	1	0	22	66
10:45 AM	0	0	0	5	0	0	0	6	0	0	0	8	0	1	0	17	37
Total	0	0	0	37	1	4	0	44	0	0	0	62	0	17	0	87	252
11:00 AM	0	0	0	6	0	1	0	10	0	0	0	11	0	1	0	11	40
11:15 AM	0	0	0	12	0	1	0	14	0	0	0	11	0	1	0	12	51
11:30 AM	0	1	0	6	0	1	0	9	0	0	0	6	0	0	0	8	31
11:45 AM	0	0	0	13	0	3	0	19	0	0	0	4	0	2	0	19	60
Total	0	1	0	37	0	6	0	52	0	0	0	32	0	4	0	50	182
12:00 PM	0	0	0	23	0	1	0	68	0	0	0	14	0	1	0	23	130
12:15 PM	0	1	0	27	0	0	0	20	0	0	0	17	0	3	0	34	102
12:30 PM	0	0	0	30	0	1	0	25	0	0	1	29	0	3	0	41	130
12:45 PM	0	0	0	41	0	2	0	32	2	0	0	27	0	4	0	34	142
Total	0	1	0	121	0	4	0	145	2	0	1	87	0	11	0	132	504
01:00 PM	0	0	0	23	0	1	0	33	0	1	0	25	0	4	0	25	112
01:15 PM	0	0	0	22	0	1	0	33	0	0	0	36	1	3	0	32	128
01:30 PM	0	0	0	29	0	0	0	20	0	0	0	19	0	2	0	24	94
01:45 PM	1	0	0	38	0	0	0	27	0	2	0	29	1	2	0	33	133
Total	1	0	0	112	0	2	0	113	0	3	0	109	2	11	0	114	467
02:00 PM	0	2	0	27	0	0	0	23	0	0	0	31	0	4	0	19	106
02:15 PM	0	1	0	19	0	0	0	17	0	0	0	29	0	0	0	35	101
02:30 PM	0	0	1	25	0	3	0	19	0	0	0	17	0	2	0	26	93
02:45 PM	0	0	0	20	0	2	0	21	0	0	0	28	0	1	0	23	95
Total	0	3	1	91	0	5	0	80	0	0	0	105	0	7	0	103	395
03:00 PM	0	1	0	23	1	2	0	16	0	1	0	36	0	1	0	45	126
03:15 PM	1	3	0	24	0	1	0	23	0	0	0	19	1	1	0	22	95
03:30 PM	0	1	0	31	0	0	0	44	0	1	0	40	0	3	0	35	155
03:45 PM	0	0	0	25	0	1	0	33	0	1	0	24	0	2	0	19	105
Total	1	5	0	103	1	4	0	116	0	3	0	119	1	7	0	121	481
04:00 PM	0	1	0	15	0	1	1	26	0	1	0	25	0	3	2	26	101
04:15 PM	0	1	0	14	0	2	0	38	1	0	0	35	0	2	0	27	120

PRECISION
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N/S: Yawkey Way/ Jersey Street
E/W: Boylston Street
City, State: Boston, MA
Client: Jacobs/ A. Fernandes

File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011

Groups Printed- Peds and Bicycles

	Yawkey Way From North				Boylston Street From East				Jersey Street From South				Boylston Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:30 PM	0	0	0	30	2	1	0	47	0	0	0	29	0	5	0	40	154
04:45 PM	0	2	0	36	0	1	0	50	1	0	0	35	0	4	0	28	157
Total	0	4	0	95	2	5	1	161	2	1	0	124	0	14	2	121	532
05:00 PM	0	1	0	36	0	1	0	64	0	2	0	28	0	2	1	38	173
05:15 PM	0	1	0	21	0	5	0	33	1	3	0	42	0	2	0	31	139
05:30 PM	0	1	0	34	0	1	0	49	0	0	0	33	0	1	0	50	169
05:45 PM	0	0	0	26	0	2	2	36	0	0	0	36	0	7	0	30	139
Total	0	3	0	117	0	9	2	182	1	5	0	139	0	12	1	149	620
Grand Total	3	21	2	848	5	52	5	1160	8	20	1	957	4	100	3	1059	4248
Apprch %	0.3	2.4	0.2	97	0.4	4.3	0.4	94.9	0.8	2	0.1	97.1	0.3	8.6	0.3	90.8	
Total %	0.1	0.5	0	20	0.1	1.2	0.1	27.3	0.2	0.5	0	22.5	0.1	2.4	0.1	24.9	

	Yawkey Way From North					Boylston Street From East					Jersey Street From South					Boylston 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 08:00 AM																					
08:00 AM	0	**1**	0	14	15	0	0	0	**38**	**38**	0	**2**	0	21	23	0	0	0	11	11	87
08:15 AM	0	0	0	11	11	0	2	0	23	25	**1**	2	0	16	19	0	1	0	15	16	71
08:30 AM	0	0	0	8	8	0	**4**	**1**	24	29	0	0	0	10	10	0	**3**	0	15	18	65
08:45 AM	0	0	0	**18**	**18**	0	0	0	25	25	1	1	0	**25**	**27**	**1**	2	0	**22**	**25**	**95**
Total Volume	0	1	0	51	52	0	6	1	110	117	2	5	0	72	79	1	6	0	63	70	318
% App. Total	0	1.9	0	98.1		0	5.1	0.9	94		2.5	6.3	0	91.1		1.4	8.6	0	90		
PHF	.000	.250	.000	.708	.722	.000	.375	.250	.724	.770	.500	.625	.000	.720	.731	.250	.500	.000	.716	.700	.837
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:30 PM																					
12:30 PM	0	0	0	30	30	0	1	0	25	26	0	0	**1**	29	30	0	3	0	**41**	**44**	130
12:45 PM	0	0	0	**41**	**41**	0	**2**	0	32	**34**	**2**	0	0	27	29	0	**4**	0	34	38	**142**
01:00 PM	0	0	0	23	23	0	1	0	**33**	34	0	**1**	0	25	26	0	4	0	25	29	112
01:15 PM	0	0	0	22	22	0	1	0	33	34	0	0	0	**36**	**36**	**1**	3	0	32	36	128
Total Volume	0	0	0	116	116	0	5	0	123	128	2	1	1	117	121	1	14	0	132	147	512
% App. Total	0	0	0	100		0	3.9	0	96.1		1.7	0.8	0.8	96.7		0.7	9.5	0	89.8		
PHF	.000	.000	.000	.707	.707	.000	.625	.000	.932	.941	.250	.250	.250	.813	.840	.250	.875	.000	.805	.835	.901
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	**2**	0	**36**	**38**	0	1	0	50	51	**1**	0	0	35	36	0	**4**	0	28	32	157
05:00 PM	0	1	0	36	37	0	1	0	**64**	**65**	0	2	0	28	30	0	2	**1**	38	41	**173**
05:15 PM	0	1	0	21	22	0	**5**	0	33	38	1	**3**	0	**42**	**46**	0	2	0	31	33	139
05:30 PM	0	1	0	34	35	0	1	0	49	50	0	0	0	33	33	0	1	0	**50**	**51**	169
Total Volume	0	5	0	127	132	0	8	0	196	204	2	5	0	138	145	0	9	1	147	157	638
% App. Total	0	3.8	0	96.2		0	3.9	0	96.1		1.4	3.4	0	95.2		0	5.7	0.6	93.6		
PHF	.000	.625	.000	.882	.868	.000	.400	.000	.766	.785	.500	.417	.000	.821	.788	.000	.563	.250	.735	.770	.922

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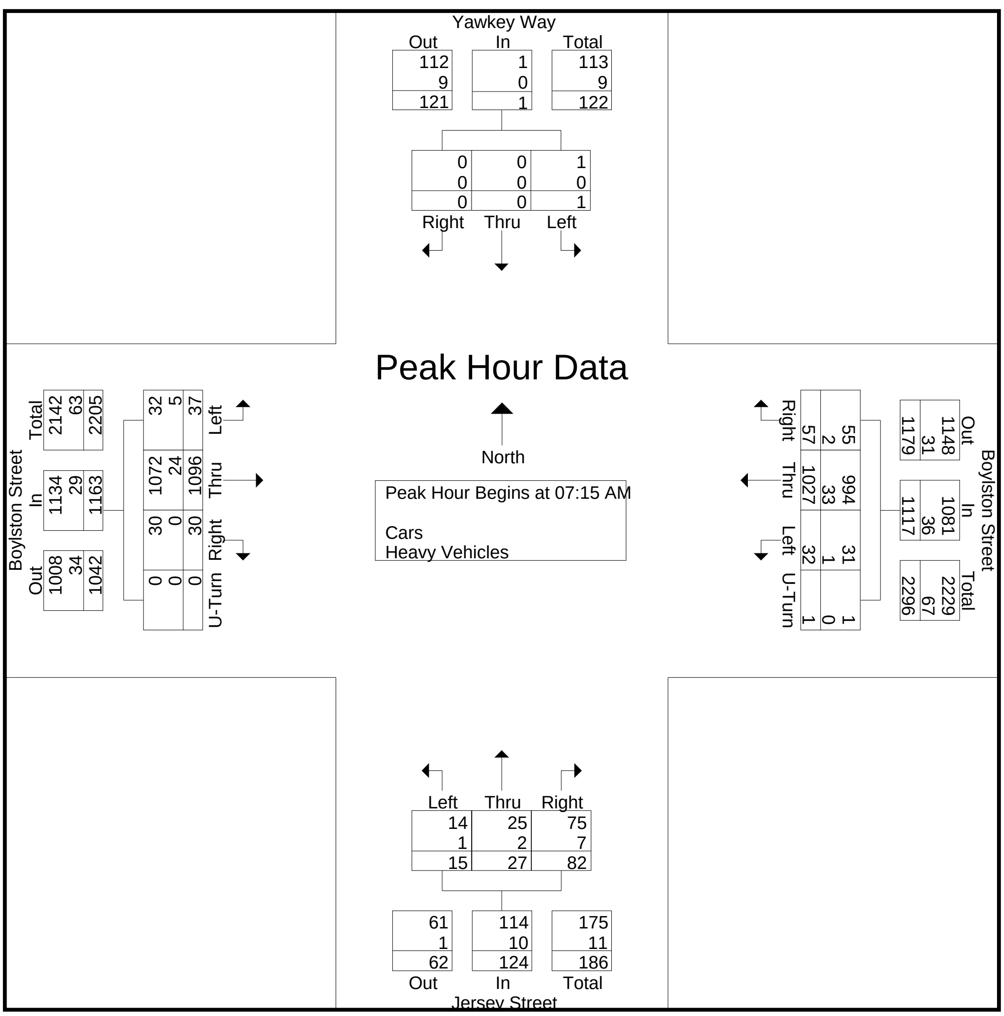
File Name : 112476 N
Site Code : 407
Start Date : 4/14/2011
Page No : 1

	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	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 07:15 AM																			
07:15 AM	0	0	0	0	**18**	**271**	8	0	**297**	21	4	4	29	5	**293**	9	0	**307**	**633**
07:30 AM	0	0	0	0	17	271	3	0	291	19	**8**	4	31	**10**	282	**10**	0	302	624
07:45 AM	0	0	0	0	16	245	**13**	**1**	275	**26**	7	**5**	**38**	6	241	9	0	256	569
08:00 AM	0	0	**1**	**1**	6	240	8	0	254	16	8	2	26	9	280	9	0	298	579
Total Volume	0	0	1	1	57	1027	32	1	1117	82	27	15	124	30	1096	37	0	1163	2405
% App. Total	0	0	100		5.1	91.9	2.9	0.1		66.1	21.8	12.1		2.6	94.2	3.2	0		
PHF	.000	.000	.250	.250	.792	.947	.615	.250	.940	.788	.844	.750	.816	.750	.935	.925	.000	.947	.950
Cars	0	0	1	1	55	994	31	1	1081	75	25	14	114	30	1072	32	0	1134	2330
% Cars	0	0	100	100	96.5	96.8	96.9	100	96.8	91.5	92.6	93.3	91.9	100	97.8	86.5	0	97.5	96.9
Heavy Vehicles	0	0	0	0	2	33	1	0	36	7	2	1	10	0	24	5	0	29	75
% Heavy Vehicles	0	0	0	0	3.5	3.2	3.1	0	3.2	8.5	7.4	6.7	8.1	0	2.2	13.5	0	2.5	3.1



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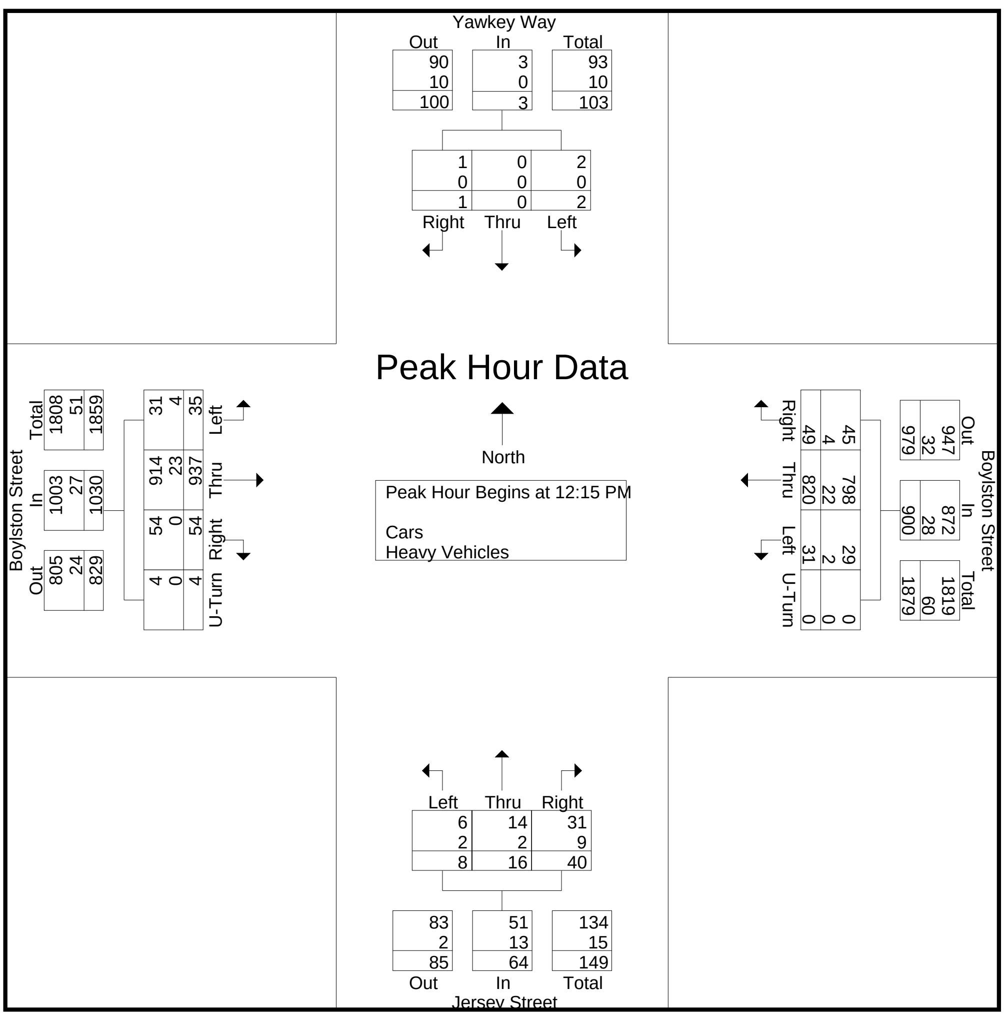
	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 12:15 PM																			
12:15 PM	0	0	0	0	13	**240**	7	0	**260**	**11**	**7**	**3**	**21**	10	**250**	**12**	0	**272**	**553**
12:30 PM	0	0	**1**	1	13	215	**9**	0	237	7	1	2	10	16	224	8	**4**	252	500
12:45 PM	0	0	0	0	9	177	7	0	193	11	4	1	16	**20**	241	4	0	265	474
01:00 PM	**1**	0	1	**2**	**14**	188	8	0	210	11	4	2	17	8	222	11	0	241	470
Total Volume	1	0	2	3	49	820	31	0	900	40	16	8	64	54	937	35	4	1030	1997
% App. Total	33.3	0	66.7		5.4	91.1	3.4	0		62.5	25	12.5		5.2	91	3.4	0.4		
PHF	.250	.000	.500	.375	.875	.854	.861	.000	.865	.909	.571	.667	.762	.675	.937	.729	.250	.947	.903
Cars	1	0	2	3	45	798	29	0	872	31	14	6	51	54	914	31	4	1003	1929
% Cars	100	0	100	100	91.8	97.3	93.5	0	96.9	77.5	87.5	75.0	79.7	100	97.5	88.6	100	97.4	96.6
Heavy Vehicles	0	0	0	0	4	22	2	0	28	9	2	2	13	0	23	4	0	27	68
% Heavy Vehicles	0	0	0	0	8.2	2.7	6.5	0	3.1	22.5	12.5	25.0	20.3	0	2.5	11.4	0	2.6	3.4



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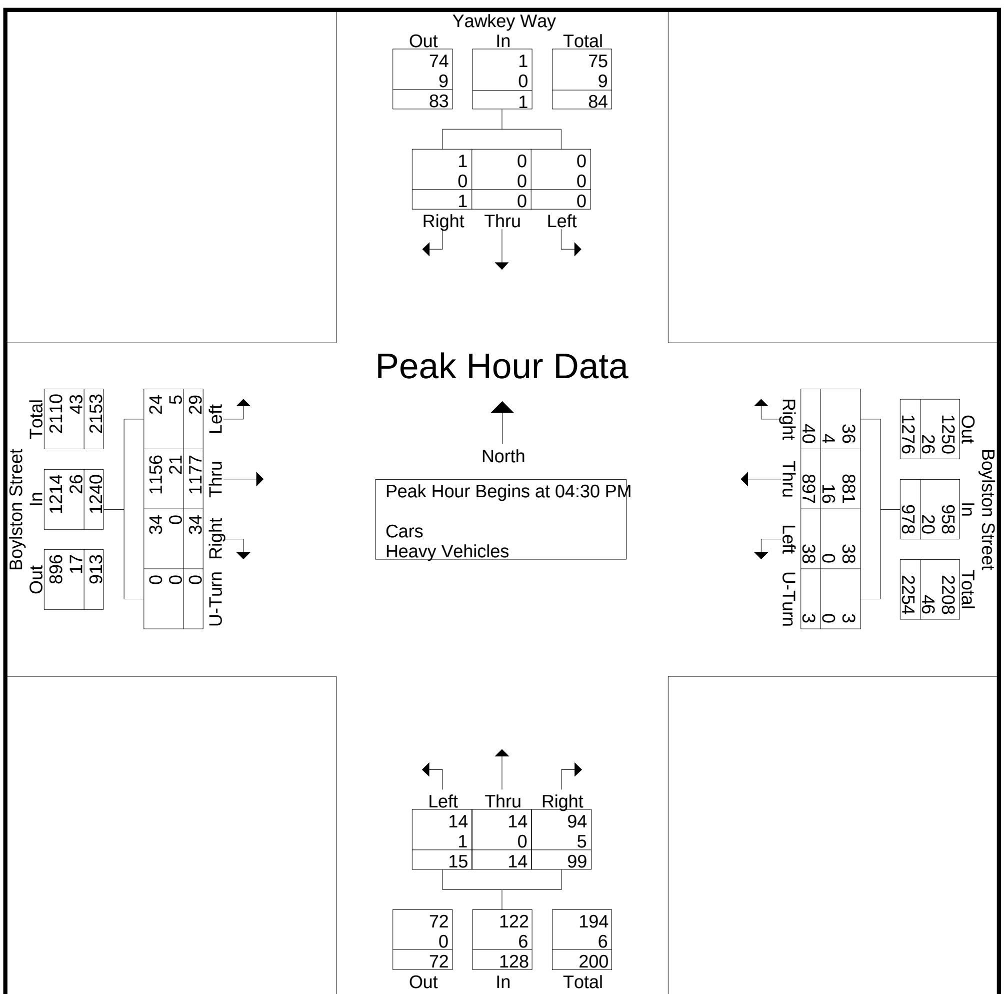
	Yawkey Way From North				Boylston Street From East					Jersey Street From South				Boylston Street From West					
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	0	0	0	0	**15**	231	7	**1**	254	15	4	**6**	25	**12**	**301**	7	0	**320**	599
04:45 PM	0	0	0	0	9	204	9	0	222	21	**5**	2	28	9	280	7	0	296	546
05:00 PM	0	0	0	0	8	**244**	9	1	**262**	29	1	5	35	6	301	**9**	0	316	**613**
05:15 PM	**1**	0	0	**1**	8	218	**13**	1	240	**34**	4	2	**40**	7	295	6	0	308	589
Total Volume	1	0	0	1	40	897	38	3	978	99	14	15	128	34	1177	29	0	1240	2347
% App. Total	100	0	0		4.1	91.7	3.9	0.3		77.3	10.9	11.7		2.7	94.9	2.3	0		
PHF	.250	.000	.000	.250	.667	.919	.731	.750	.933	.728	.700	.625	.800	.708	.978	.806	.000	.969	.957
Cars	1	0	0	1	36	881	38	3	958	94	14	14	122	34	1156	24	0	1214	2295
% Cars	100	0	0	100	90.0	98.2	100	100	98.0	94.9	100	93.3	95.3	100	98.2	82.8	0	97.9	97.8
Heavy Vehicles	0	0	0	0	4	16	0	0	20	5	0	1	6	0	21	5	0	26	52
% Heavy Vehicles	0	0	0	0	10.0	1.8	0	0	2.0	5.1	0	6.7	4.7	0	1.8	17.2	0	2.1	2.2



To:	**Mark McGowan**	Date:	**November 11, 2011**
From:	**Jane Howard, Jared Hite**	HSH Project No.:	**2011153**
Subject:	**1346-1356 Boylston Street (Burger King)**		

As requested, Howard Stein Hudson Associates, Inc. (HSH) evaluated the driveway operations at the existing Burger King located at 1346-1356 Boylston Street in the Fenway neighborhood of Boston.

The following sections of this memorandum detail the existing site conditions and vehicular activity at the site driveways.

Existing Site Conditions

Site Layout and Access

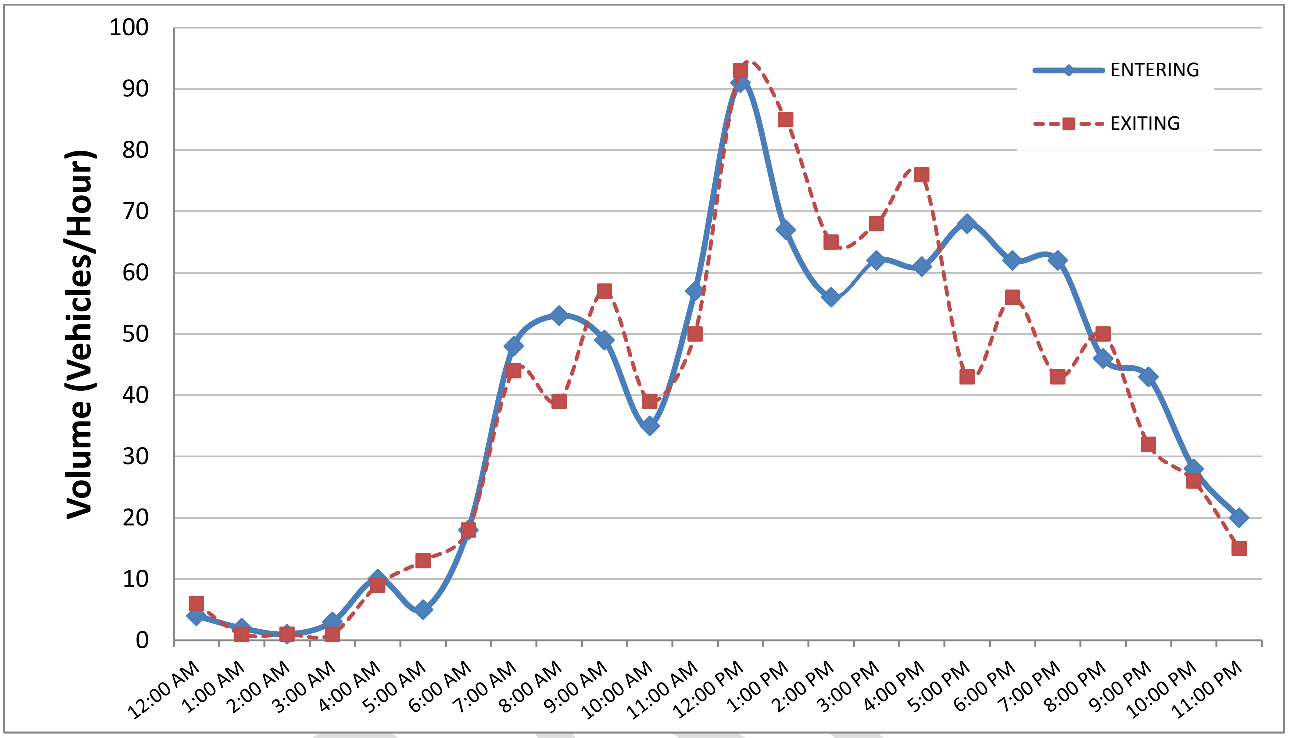
The site is currently occupied by a 3,410 square-foot Burger King with a drive-through window and 55 surface parking spaces. The site is located at 1346-1356 Boylston Street at the southeast corner of the intersection of Boylston Street and Kilmarnock Street. Vehicular access to the site is provided by three site driveways; including one full-access driveway located on Kilmarnock Street approximately 175-feet south of Boylston Street; a full access driveway on Boylston Street approximately 50-feet east of Kilmarnock Street; and an exit only driveway on Boylston Street approximately 150-feet east of Kilmarnock Street.

Traffic Conditions

In order to determine the total number of vehicles accessing the site on a typical weekday/weekend, HSH collected traffic volume data at all entrance and exit points of the site, using an automatic traffic recorder (ATR) for a 72-hour period from Thursday, November 3, 2011 through Saturday, November 5, 2011.

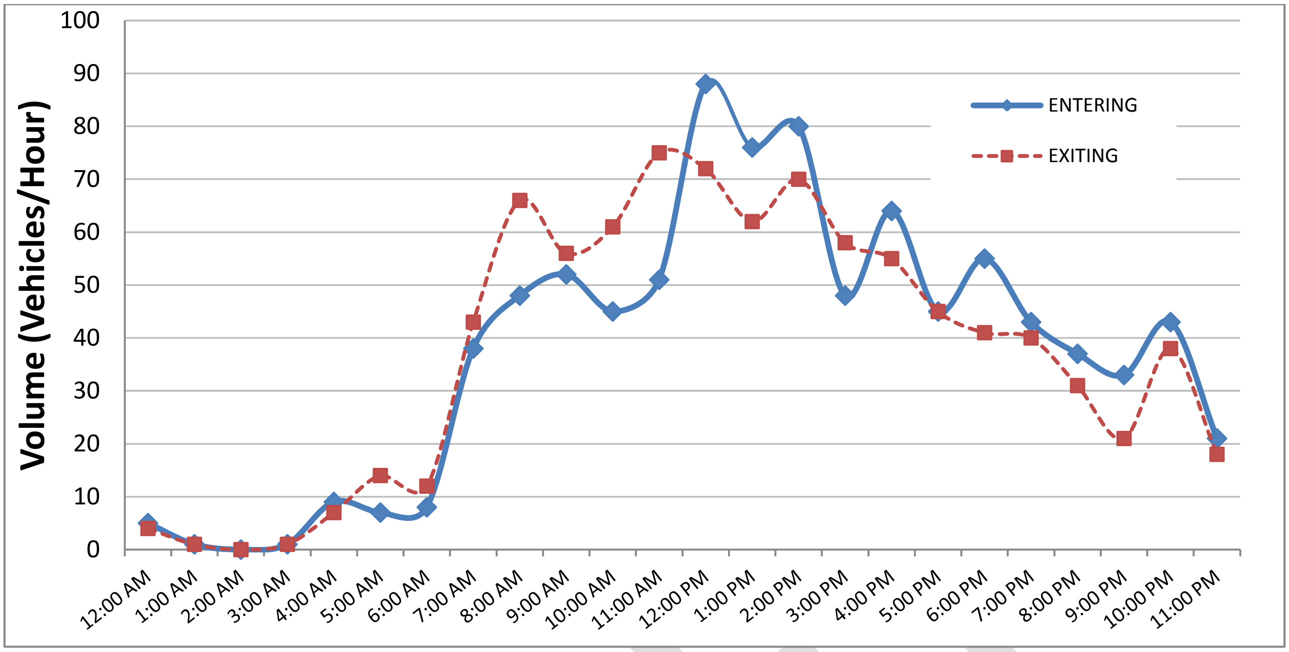
According to the ATR data, a total of 951 vehicles entered the site and 930 vehicles exited the site during the course of the day on Thursday (see **Figure 1**). On Friday, 898 vehicles entered the site and 891 exited the site (see **Figure 2**); and Saturday consisted of 639 vehicles entering the site and 664 vehicles exiting the site (see **Figure 3).**

Figure 1. Vehicles Entering and Exiting by Hour (Thursday, November 3, 2011)



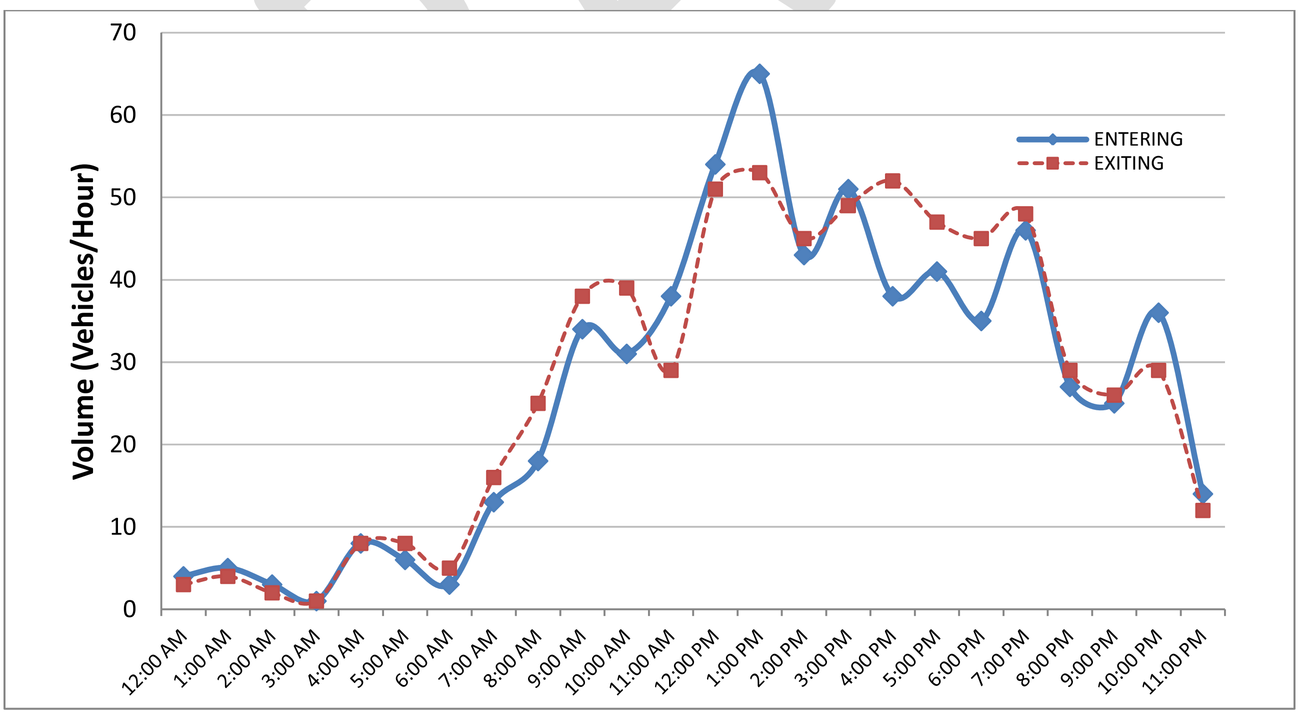
As shown in **Figure 1**, the site experiences peak activity during the mid-day with a majority of vehicles entering and exiting the site between Noon and 1:00 p.m. The site also experiences moderate activity throughout the day.

Figure 2. Vehicles Entering and Exiting by Hour (Friday, November 4, 2011)



As shown in **Figure 2**, the site experiences peak activity during the mid-day with a majority of vehicles entering and exiting the site between Noon and 1:00 p.m. The site also experiences moderate activity throughout the day.

Figure 3. Vehicles Entering and Exiting by Hour (Saturday, November 5, 2011)



As shown in **Figure 3**, the site experiences peak activity during the mid-day with a majority of vehicles entering and exiting the site between the hour of 1:00 p.m. and 2 p.m. The site also experiences moderate activity throughout the day.

Comparison to ITE Trip Generation

HSH compared the observed trip generation collected at the Burger King with empirical data contained in the Institute of Transportation Engineers (ITE) *Trip Generation* (8th Edition) manual (see **Table 1**). The ITE trip generation data used is unadjusted vehicle trips. Using ITE land use code (LUC) 934 (Fast-Food Restaurant with a drive-through window) the daily weekday estimated trips are approximately 1,692 (846 entering and 846 exiting). Based on the data gathered from the ATR, the average weekday volume for the site is 1,836 trips (925 entering and 911 exiting), which is nearly an 8% increase of the compared ITE trip generation trips.

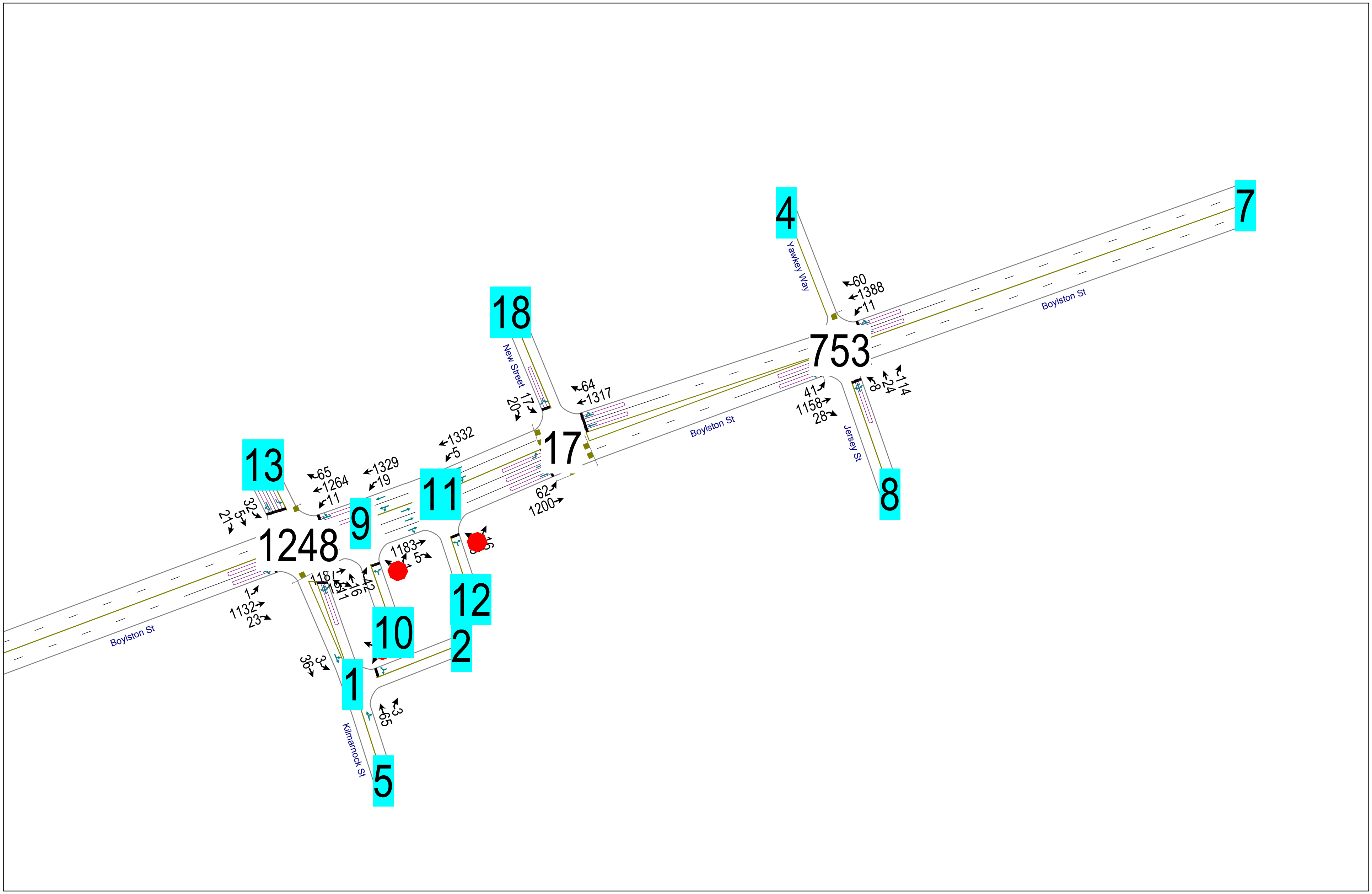
Table 1 Comparison of ATR Average Daily trips vs. ITE Daily trips

	3,410 Square-foot Restaurant with a drive through					
	Average Weekday			Saturday		
	ATR[1]	ITE[2]	Difference	ATR[3]	ITE[2]	Difference
Total	1,836	1,692	144	1,303	2,462	-1,159
Entering	925	846	79	639	1,231	-592
Exiting	911	846	65	664	1,231	-567

1. ATR data conducted on November 3rd & 4th 2011 (Averaged)
2. ITE Trip Generation, 8th Edition, LUC 934 (Fast-Food Restaurant with Drive-Through Window), average rate
3. ATR 24-hour data conducted on November 5th 2011

According to the ITE trip generation, an estimated number of 2,462 trips (1,231 entering and 1,231 exiting) will occur on a typical Saturday. The Saturday trips based on the ATR data gathered on November 5, 2011 indicate 1,303 trips (639 entering and 664 exiting) will access the site, which is nearly 50% decrease of the compared ITE trip generation trips.

Map - 2020 AM Peak Hour NO BUILD
Node Numbers **6/19/2013**



2020 AM Peak Hour NO BUILD Weekday Morning Peak Hour
Nitsch Engineereing

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	1158	28	11	1388	60	8	24	114	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.91				
Frt		0.997			0.994			0.895				
Flt Protected		0.998						0.997				
Satd. Flow (prot)	0	3053	0	0	3041	0	0	1271	0	0	0	0
Flt Permitted		0.812			0.940			0.997				
Satd. Flow (perm)	0	*3200	0	0	*3200	0	0	1267	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			8			73				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		324			473			167			162	
Travel Time (s)		8.8			12.9			4.6			4.4	
Confl. Peds. (#/hr)	24		46	46		24	44		86	86		44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	4%	25%	2%	9%	2%	0%	7%	0%	0%	0%
Adj. Flow (vph)	45	1259	30	12	1509	65	9	26	124	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1334	0	0	1586	0	0	159	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	50		50	50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	D.P+P	NA		Perm	NA		Perm	NA				
Protected Phases	4	1 4			1			5				
Permitted Phases	1			1			5					
Detector Phase	4	1 4		1	1		5	5				
Switch Phase												
Minimum Initial (s)	5.0			8.0	8.0		5.0	5.0				
Minimum Split (s)	9.0			55.0	55.0		26.0	26.0				
Total Split (s)	9.0			55.0	55.0		26.0	26.0				
Total Split (%)	10.0%			61.1%	61.1%		28.9%	28.9%				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	5.0			49.0	49.0		22.0	22.0				
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0				
All-Red Time (s)	1.0			3.0	3.0		1.0	1.0				
Lost Time Adjust (s)					-2.0			0.0				
Total Lost Time (s)					4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0				
Recall Mode	Max			C-Max	C-Max		None	None				
Walk Time (s)				35.0	35.0		7.0	7.0				
Flash Dont Walk (s)				10.0	10.0		15.0	15.0				
Pedestrian Calls (#/hr)				50	50		20	20				
Act Effct Green (s)		68.0			59.0			14.0				
Actuated g/C Ratio		0.76			0.66			0.16				
v/c Ratio		0.55			0.76			0.62				
Control Delay		7.5			15.4			28.5				
Queue Delay		0.0			0.0			0.0				
Total Delay		7.5			15.4			28.5				
LOS		A			B			C				
Approach Delay		7.5			15.4			28.5				
Approach LOS		A			B			C				
Queue Length 50th (ft)		87			261			46				
Queue Length 95th (ft)		372			494			98				
Internal Link Dist (ft)		244			393			87			82	
Turn Bay Length (ft)												
Base Capacity (vph)		2419			2100			364				
Starvation Cap Reductn		26			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.56			0.76			0.44				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 44 (49%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 97.2%	ICU Level of Service F
Analysis Period (min) 15	

* User Entered Value

Splits and Phases: 753: Jersey St/Yawkey Way & Boylston St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1132	23	11	1264	65	11	16	42	32	5	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.96		0.97	0.96	
Frt		0.997			0.993			0.917			0.877	
Flt Protected								0.992		0.950		
Satd. Flow (prot)	0	3061	0	0	3036	0	0	1352	0	1570	1291	0
Flt Permitted		0.954			0.941			0.957		0.710		
Satd. Flow (perm)	0	*2200	0	0	*2910	0	0	1297	0	1134	1291	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			12			46			23	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		375			73			164			96	
Travel Time (s)		10.2			2.0			4.5			2.6	
Confl. Peds. (#/hr)	6		14	14		6	27		32	32		27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	2%	13%	64%	2%	4%	22%	0%	7%	0%	0%	10%
Adj. Flow (vph)	1	1230	25	12	1374	71	12	17	46	35	5	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1256	0	0	1457	0	0	75	0	35	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	50		50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	49.0	49.0		49.0	49.0		27.0	27.0		27.0	27.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	57.0	57.0		57.0	57.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			0.0		0.0	0.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	33.0	33.0		33.0	33.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	33	33		33	33		16	16		16	16	
Act Effct Green (s)		72.2			72.2			12.6		12.6	12.6	
Actuated g/C Ratio		0.80			0.80			0.14		0.14	0.14	
v/c Ratio		0.71			0.62			0.34		0.22	0.14	
Control Delay		10.6			1.9			18.7		33.8	14.8	
Queue Delay		0.0			0.2			0.0		0.0	0.0	
Total Delay		10.6			2.1			18.7		33.8	14.8	
LOS		B			A			B		C	B	
Approach Delay		10.6			2.1			18.7			25.4	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		97			1			16		19	3	
Queue Length 95th (ft)		382			4			48		41	23	
Internal Link Dist (ft)		295			1			84			16	
Turn Bay Length (ft)												
Base Capacity (vph)		1765			2336			365		289	347	
Starvation Cap Reductn		0			250			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.71			0.70			0.21		0.12	0.08	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 6.8 Intersection LOS: A
Intersection Capacity Utilization 72.9% ICU Level of Service C
Analysis Period (min) 15
* User Entered Value

Splits and Phases: 1248: Kilmarnock St & Boylston St

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	62	1200	1317	64	17	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	10	11
Storage Length (ft)	0			0	100	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.993		0.926	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1711	3421	3397	0	1574	0
Flt Permitted	0.155				0.978	
Satd. Flow (perm)	279	3421	3397	0	1574	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			10		22	
Link Speed (mph)		25	25		25	
Link Distance (ft)		142	324		159	
Travel Time (s)		3.9	8.8		4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	1304	1432	70	18	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	1304	1502	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.09	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	1	1		1	
Detector Template						
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	50	50	50		50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Turn Type	Perm	NA	NA		NA	
Protected Phases		1	1		5	
Permitted Phases	1					
Detector Phase	1	1	1		5	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	27.0	27.0	27.0		30.0	
Total Split (s)	60.0	60.0	60.0		30.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (%)	66.7%	66.7%	66.7%		33.3%	
Maximum Green (s)	54.0	54.0	54.0		26.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	3.0	3.0	3.0		1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0		0.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		Min	
Walk Time (s)	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	14.0	14.0	14.0		19.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)	75.1	75.1	75.1		6.9	
Actuated g/C Ratio	0.83	0.83	0.83		0.08	
v/c Ratio	0.29	0.46	0.53		0.28	
Control Delay	5.9	3.4	0.5		27.8	
Queue Delay	0.0	0.5	0.1		0.0	
Total Delay	5.9	3.9	0.5		27.9	
LOS	A	A	A		C	
Approach Delay		4.0	0.5		27.9	
Approach LOS		A	A		C	
Queue Length 50th (ft)	5	62	0		10	
Queue Length 95th (ft)	m22	196	0		40	
Internal Link Dist (ft)		62	244		79	
Turn Bay Length (ft)					100	
Base Capacity (vph)	233	2854	2836		470	
Starvation Cap Reductn	0	1001	282		0	
Spillback Cap Reductn	0	100	25		38	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.29	0.70	0.59		0.09	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 2.6 Intersection LOS: A
Intersection Capacity Utilization 55.2% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Boylston St & New Street

Intersection						
Intersection Delay, s/veh	2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1187	19	19	1329	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1290	21	21	1445	1	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1311	0	2065	655
Stage 1	-	-	-	-	1301	-
Stage 2	-	-	-	-	764	-
Follow-up Headway	-	-	3.12	-	3.67	3.92
Pot Capacity-1 Maneuver	-	-	276	-	64	350
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	409	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	276	-	39	350
Mov Capacity-2 Maneuver	-	-	-	-	39	-
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	252	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.8	58.1
HCM LOS			F

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	70	-	-	276	-
HCM Lane V/C Ratio	0.031	-	-	0.075	-
HCM Control Delay (s)	58.1	-	-	19.096	3.6
HCM Lane LOS	F			C	A
HCM 95th %tile Q(veh)	0.095	-	-	0.241	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection						
Intersection Delay, s/veh	1.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1183	5	5	1332	16	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1286	5	5	1448	17	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1291	0	2024	646
Stage 1	-	-	-	-	1289	-
Stage 2	-	-	-	-	735	-
Follow-up Headway	-	-	3.12	-	3.67	3.92
Pot Capacity-1 Maneuver	-	-	283	-	68	355
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	423	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	283	-	62	355
Mov Capacity-2 Maneuver	-	-	-	-	62	-
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	385	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	54.7
HCM LOS			F

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	106	-	-	283	-
HCM Lane V/C Ratio	0.328	-	-	0.019	-
HCM Control Delay (s)	54.7	-	-	17.97	0.8
HCM Lane LOS	F			C	A
HCM 95th %tile Q(veh)	1.281	-	-	0.059	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection						
Intersection Delay, s/veh	0.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	4	4	65	3	3	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	71	3	3	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	118	72	0	0	74	0
Stage 1	72	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Follow-up Headway	3.518	3.318	-	-	2.218	-
Pot Capacity-1 Maneuver	878	990	-	-	1526	-
Stage 1	951	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	876	990	-	-	1526	-
Mov Capacity-2 Maneuver	876	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	974	-	-	-	-	-

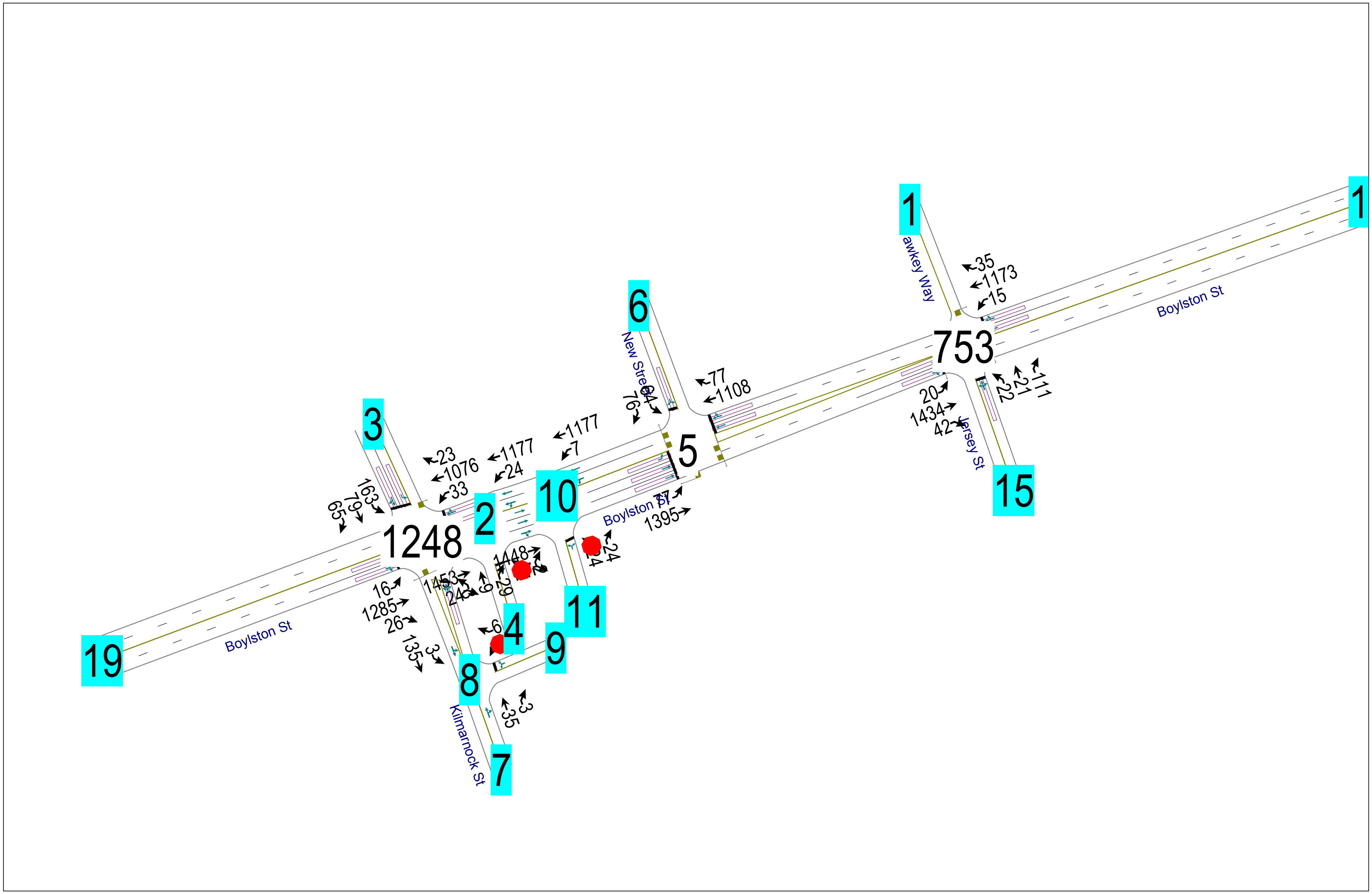
Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.6
HCM LOS	A		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	930	1526	-
HCM Lane V/C Ratio	-	-	0.009	0.002	-
HCM Control Delay (s)	-	-	8.9	7.364	0
HCM Lane LOS			A	A	A
HCM 95th %tile Q(veh)	-	-	0.028	0.006	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Map - 2020 PM Peak NO BUILD
Node Numbers

6/19/2013



2020 PM Peak NO BUILD Weekday Evening Peak Hour
Nitsch Engineering

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1434	42	15	1173	35	22	21	111	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			0.88				
Frt		0.996			0.996			0.903				
Flt Protected		0.999			0.999			0.993				
Satd. Flow (prot)	0	3067	0	0	3046	0	0	1302	0	0	0	0
Flt Permitted		0.934			0.917			0.993				
Satd. Flow (perm)	0	*1530	0	0	*4400	0	0	1284	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			4			27				
Link Speed (mph)		10			10			25			25	
Link Distance (ft)		324			473			167			162	
Travel Time (s)		124.0			27.0			4.6			4.4	
Confl. Peds. (#/hr)	67		158	158		67	79		116	116		79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	1%	0%	0%	2%	10%	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	22	1559	46	16	1275	38	24	23	121	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1627	0	0	1329	0	0	168	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	50		50	50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	D.P+P	NA		Perm	NA		Perm	NA				
Protected Phases	4	1 4			1			5				
Permitted Phases	1			1			5					
Detector Phase	4	1 4		1	1		5	5				
Switch Phase												
Minimum Initial (s)	5.0			8.0	8.0		5.0	5.0				
Minimum Split (s)	9.0			31.0	31.0		27.0	27.0				
Total Split (s)	19.0			44.0	44.0		27.0	27.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	21.1%			48.9%	48.9%		30.0%	30.0%				
Maximum Green (s)	16.0			38.0	38.0		23.0	23.0				
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0				
All-Red Time (s)	0.0			3.0	3.0		1.0	1.0				
Lost Time Adjust (s)					-2.0			0.0				
Total Lost Time (s)					4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			3.0	3.0		2.0	2.0				
Recall Mode	Max			C-Max	C-Max		None	None				
Walk Time (s)				15.0	15.0		7.0	7.0				
Flash Dont Walk (s)				10.0	10.0		15.0	15.0				
Pedestrian Calls (#/hr)				50	50		20	20				
Act Effct Green (s)		62.6			47.6			15.4				
Actuated g/C Ratio		0.70			0.53			0.17				
v/c Ratio		1.23			0.57			0.70				
Control Delay		126.4			16.6			43.3				
Queue Delay		0.0			0.1			1.6				
Total Delay		126.4			16.6			44.9				
LOS		F			B			D				
Approach Delay		126.4			16.6			44.9				
Approach LOS		F			B			D				
Queue Length 50th (ft)		~344			246			77				
Queue Length 95th (ft)		#779			370			133				
Internal Link Dist (ft)		244			393			87			82	
Turn Bay Length (ft)												
Base Capacity (vph)		1322			2329			348				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			143			73				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		1.23			0.61			0.61				

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 17 (19%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 75.3 Intersection LOS: E

Intersection Capacity Utilization 89.6% ICU Level of Service E

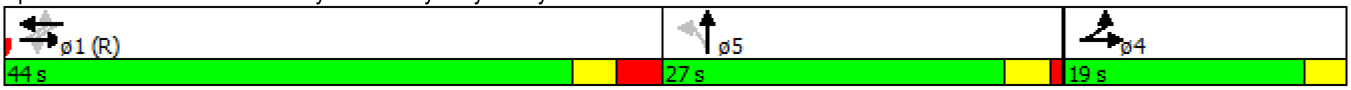
Analysis Period (min) 15

* User Entered Value

~ 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: 753: Jersey St/Yawkey Way & Boylston St



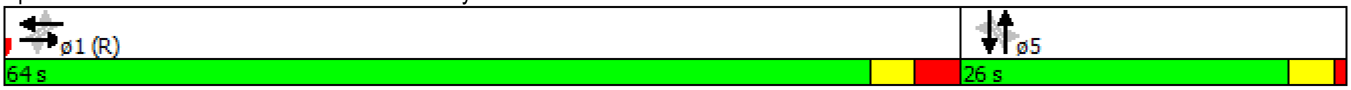
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1285	26	33	1076	23	3	9	29	163	79	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.92		0.91	0.96	
Frt		0.997			0.997			0.904			0.932	
Flt Protected		0.999			0.999			0.997		0.950		
Satd. Flow (prot)	0	2939	0	0	2942	0	0	1348	0	1540	1456	0
Flt Permitted		0.932			0.860			0.984		0.829		
Satd. Flow (perm)	0	*1420	0	0	*1720	0	0	1325	0	1223	1456	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			5			32			44	
Link Speed (mph)		10			10			25			25	
Link Distance (ft)		375			74			161			139	
Travel Time (s)		189.0			38.0			4.4			3.8	
Confl. Peds. (#/hr)	11		57	57		11	64		78	78		64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	10%	0%	2%	2%	1%
Parking (#/hr)		0	0		0	0						
Adj. Flow (vph)	17	1397	28	36	1170	25	3	10	32	177	86	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1442	0	0	1231	0	0	45	0	177	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.19	1.27	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	50		50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	49.0	49.0		49.0	49.0		26.0	26.0		26.0	26.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Maximum Green (s)	58.0	58.0		58.0	58.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			0.0		0.0	0.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	33.0	33.0		33.0	33.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	33	33		33	33		16	16		16	16	
Act Effct Green (s)		65.2			65.2			16.8		16.8	16.8	
Actuated g/C Ratio		0.72			0.72			0.19		0.19	0.19	
v/c Ratio		1.40			0.99			0.16		0.78	0.51	
Control Delay		205.0			40.5			14.8		56.3	28.2	
Queue Delay		0.0			39.0			0.0		0.0	0.0	
Total Delay		205.0			79.4			14.8		56.3	28.2	
LOS		F			E			B		E	C	
Approach Delay		205.0			79.4			14.8			43.1	
Approach LOS		F			E			B			D	
Queue Length 50th (ft)		~592			237			6		95	56	
Queue Length 95th (ft)		#751			#551			33		159	110	
Internal Link Dist (ft)		295			1			81			59	
Turn Bay Length (ft)												
Base Capacity (vph)		1029			1246			348		298	389	
Starvation Cap Reductn		0			262			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		1.40			1.25			0.13		0.59	0.40	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.40
Intersection Signal Delay: 133.8 Intersection LOS: F
Intersection Capacity Utilization 85.3% ICU Level of Service E
Analysis Period (min) 15
* User Entered Value
~ 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: 1248: Kilmarnock St & Boylston St



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	77	1395	1108	77	64	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	10	11
Storage Length (ft)	0			0	100	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.990		0.927	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1711	3421	3387	0	1576	0
Flt Permitted	0.193				0.978	
Satd. Flow (perm)	348	3421	3387	0	1576	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			15		67	
Link Speed (mph)		10	10		30	
Link Distance (ft)		152	324		168	
Travel Time (s)		10.4	22.1		3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	1516	1204	84	70	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	1516	1288	0	153	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.09	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	1	1		1	
Detector Template						
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	50	50	50		50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Turn Type	Perm	NA	NA		NA	
Protected Phases		1	1		5	
Permitted Phases	1					
Detector Phase	1	1	1		5	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	27.0	27.0	27.0		30.0	
Total Split (s)	60.0	60.0	60.0		30.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (%)	66.7%	66.7%	66.7%		33.3%	
Maximum Green (s)	54.0	54.0	54.0		26.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	3.0	3.0	3.0		1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0		0.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		Min	
Walk Time (s)	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	14.0	14.0	14.0		19.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)	71.3	71.3	71.3		10.7	
Actuated g/C Ratio	0.79	0.79	0.79		0.12	
v/c Ratio	0.31	0.56	0.48		0.62	
Control Delay	3.7	3.4	9.3		32.1	
Queue Delay	0.0	11.5	0.9		0.7	
Total Delay	3.7	14.9	10.2		32.8	
LOS	A	B	B		C	
Approach Delay		14.3	10.2		32.8	
Approach LOS		B	B		C	
Queue Length 50th (ft)	9	103	91		46	
Queue Length 95th (ft)	m9	m89	265		101	
Internal Link Dist (ft)		72	244		88	
Turn Bay Length (ft)					100	
Base Capacity (vph)	275	2710	2686		502	
Starvation Cap Reductn	0	1188	1026		0	
Spillback Cap Reductn	0	94	711		147	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.31	1.00	0.78		0.43	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 13.5 Intersection LOS: B

Intersection Capacity Utilization 55.6% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 5: Boylston St & New Street

Intersection	
Intersection Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1453	24	24	1177	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1579	26	26	1279	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1605	0	2284	803
Stage 1	-	-	-	-	1592	-
Stage 2	-	-	-	-	692	-
Follow-up Headway	-	-	3.12	-	3.67	3.92
Pot Capacity-1 Maneuver	-	-	198	-	47	280
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	445	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	198	-	26	280
Mov Capacity-2 Maneuver	-	-	-	-	26	-
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	243	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	87.3
HCM LOS			F

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	48	-	-	198	-
HCM Lane V/C Ratio	0.091	-	-	0.132	-
HCM Control Delay (s)	87.3	-	-	25.922	5.7
HCM Lane LOS	F			D	A
HCM 95th %tile Q(veh)	0.284	-	-	0.446	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection						
Intersection Delay, s/veh	3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	1448	7	7	1177	24	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1574	8	8	1279	26	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1582	0	2233	791
Stage 1	-	-	-	-	1578	-
Stage 2	-	-	-	-	655	-
Follow-up Headway	-	-	3.12	-	3.67	3.92
Pot Capacity-1 Maneuver	-	-	203	-	50	285
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	465	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	203	-	43	285
Mov Capacity-2 Maneuver	-	-	-	-	43	-
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	402	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	124.9
HCM LOS			F

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	75	-	-	203	-
HCM Lane V/C Ratio	0.696	-	-	0.037	-
HCM Control Delay (s)	124.9	-	-	23.423	1.6
HCM Lane LOS	F			C	A
HCM 95th %tile Q(veh)	3.221	-	-	0.116	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	6	6	35	3	3	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	38	3	3	147

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	193	40	0	0	41	0
Stage 1	40	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Follow-up Headway	3.518	3.318	-	-	2.218	-
Pot Capacity-1 Maneuver	796	1031	-	-	1568	-
Stage 1	982	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	794	1031	-	-	1568	-
Mov Capacity-2 Maneuver	794	-	-	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	873	-	-	-	-	-

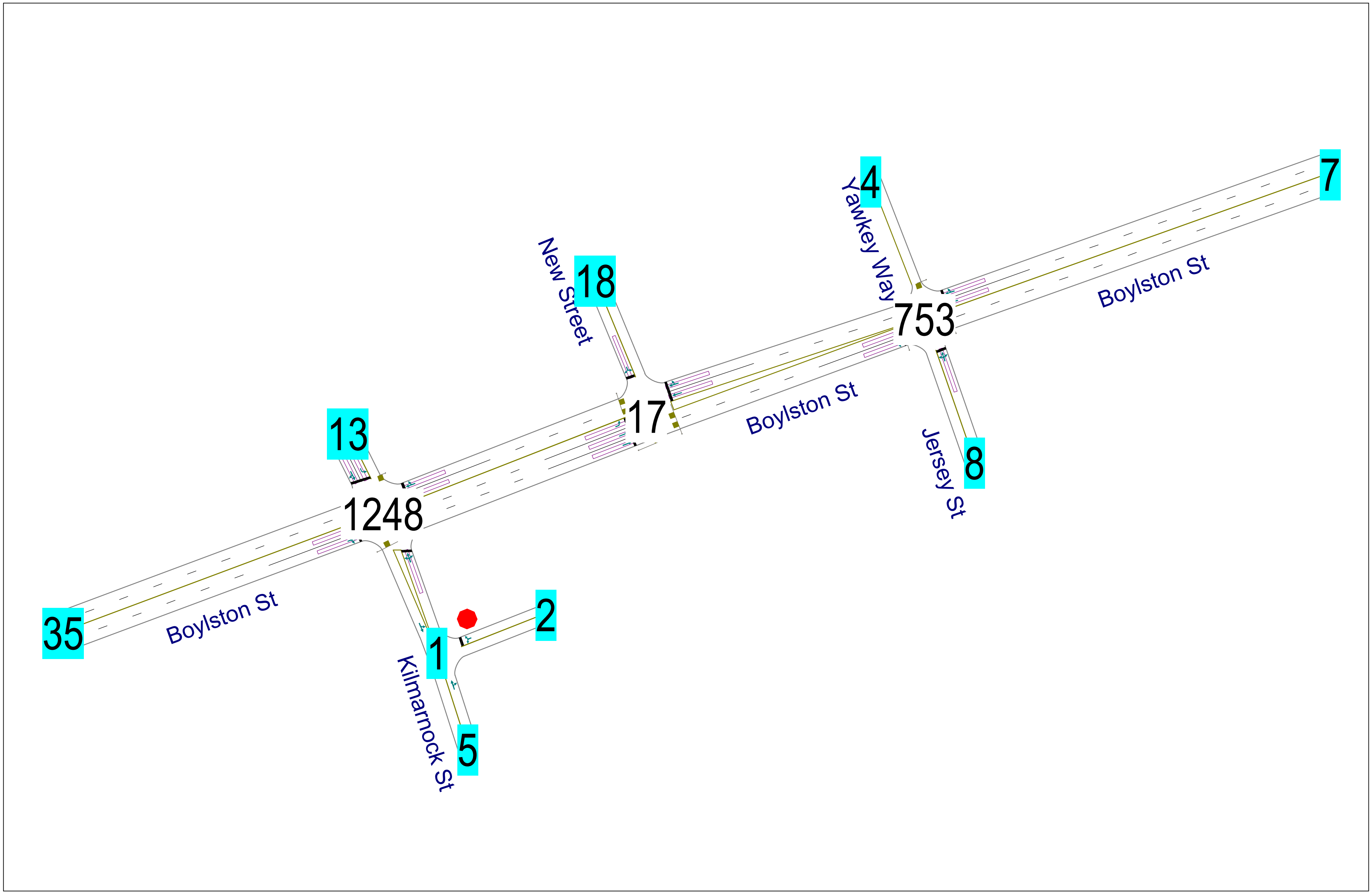
Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.2
HCM LOS	A		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	897	1568	-
HCM Lane V/C Ratio	-	-	0.015	0.002	-
HCM Control Delay (s)	-	-	9.1	7.301	0
HCM Lane LOS			A	A	A
HCM 95th %tile Q(veh)	-	-	0.044	0.006	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Map - 1350 Boylston - BUILD (w Boylston Improvements)
Node Numbers

6/25/2013



1350 Boylston - BUILD (w Boylston Improvements) Weekday Morning Peak Hour
Nelson\Nygaard

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	62	1208	1312	64	17	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	10	11
Storage Length (ft)	0			0	100	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.993		0.926	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1711	3421	3397	0	1574	0
Flt Permitted	0.157				0.978	
Satd. Flow (perm)	283	3421	3397	0	1574	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			10		22	
Link Speed (mph)		25	25		25	
Link Distance (ft)		309	324		159	
Travel Time (s)		8.4	8.8		4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	1313	1426	70	18	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	1313	1496	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.09	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	1	1		1	
Detector Template						
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	50	50	50		50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Turn Type	Perm	NA	NA		NA	
Protected Phases		1	1		5	
Permitted Phases	1					
Detector Phase	1	1	1		5	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	27.0	27.0	27.0		30.0	
Total Split (s)	60.0	60.0	60.0		30.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (%)	66.7%	66.7%	66.7%		33.3%	
Maximum Green (s)	54.0	54.0	54.0		26.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	3.0	3.0	3.0		1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0		0.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		Min	
Walk Time (s)	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	14.0	14.0	14.0		19.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)	75.1	75.1	75.1		6.9	
Actuated g/C Ratio	0.83	0.83	0.83		0.08	
v/c Ratio	0.28	0.46	0.53		0.28	
Control Delay	5.8	3.4	0.5		27.8	
Queue Delay	0.0	0.5	0.1		0.0	
Total Delay	5.8	3.9	0.5		27.9	
LOS	A	A	A		C	
Approach Delay		4.0	0.5		27.9	
Approach LOS		A	A		C	
Queue Length 50th (ft)	5	62	0		10	
Queue Length 95th (ft)	m22	197	0		40	
Internal Link Dist (ft)		229	244		79	
Turn Bay Length (ft)					100	
Base Capacity (vph)	236	2854	2836		470	
Starvation Cap Reductn	0	986	283		0	
Spillback Cap Reductn	0	101	25		38	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.28	0.70	0.59		0.09	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 49 (54%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 2.6	Intersection LOS: A
Intersection Capacity Utilization 55.1%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 17: Boylston St & New Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	1165	28	11	1383	60	8	24	114	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.91				
Frt		0.997			0.994			0.895				
Flt Protected		0.998						0.997				
Satd. Flow (prot)	0	3053	0	0	3041	0	0	1271	0	0	0	0
Flt Permitted		0.809			0.940			0.997				
Satd. Flow (perm)	0	*3200	0	0	*3200	0	0	1267	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			8			72				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		324			473			167			162	
Travel Time (s)		8.8			12.9			4.6			4.4	
Confl. Peds. (#/hr)	24		46	46		24	44		86	86		44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	4%	25%	2%	9%	2%	0%	7%	0%	0%	0%
Adj. Flow (vph)	46	1266	30	12	1503	65	9	26	124	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1342	0	0	1580	0	0	159	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	50		50	50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	D.P+P	NA		Perm	NA		Perm	NA				
Protected Phases	4	1 4			1			5				
Permitted Phases	1			1			5					
Detector Phase	4	1 4		1	1		5	5				
Switch Phase												
Minimum Initial (s)	5.0			8.0	8.0		5.0	5.0				
Minimum Split (s)	9.0			55.0	55.0		26.0	26.0				
Total Split (s)	9.0			55.0	55.0		26.0	26.0				
Total Split (%)	10.0%			61.1%	61.1%		28.9%	28.9%				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	5.0			49.0	49.0		22.0	22.0				
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0				
All-Red Time (s)	1.0			3.0	3.0		1.0	1.0				
Lost Time Adjust (s)					-2.0			0.0				
Total Lost Time (s)					4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0				
Recall Mode	Max			C-Max	C-Max		None	None				
Walk Time (s)				35.0	35.0		7.0	7.0				
Flash Dont Walk (s)				10.0	10.0		15.0	15.0				
Pedestrian Calls (#/hr)				50	50		20	20				
Act Effct Green (s)		68.0			59.0			14.0				
Actuated g/C Ratio		0.76			0.66			0.16				
v/c Ratio		0.55			0.75			0.62				
Control Delay		7.6			15.3			28.7				
Queue Delay		0.0			0.0			0.0				
Total Delay		7.6			15.3			28.7				
LOS		A			B			C				
Approach Delay		7.6			15.3			28.7				
Approach LOS		A			B			C				
Queue Length 50th (ft)		87			258			47				
Queue Length 95th (ft)		374			491			99				
Internal Link Dist (ft)		244			393			87			82	
Turn Bay Length (ft)												
Base Capacity (vph)		2419			2100			364				
Starvation Cap Reductn		19			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.56			0.75			0.44				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 44 (49%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 98.3% ICU Level of Service F
Analysis Period (min) 15
* User Entered Value

Splits and Phases: 753: Jersey St/Yawkey Way & Boylston St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1122	24	16	1252	65	16	16	42	32	6	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.96		0.97	0.97	
Frt		0.997			0.993			0.922			0.885	
Flt Protected					0.999			0.989		0.950		
Satd. Flow (prot)	0	3061	0	0	3026	0	0	1346	0	1570	1312	0
Flt Permitted		0.954			0.932			0.939		0.692		
Satd. Flow (perm)	0	*2200	0	0	*2910	0	0	1270	0	1106	1312	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			12			46			23	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		375			309			164			96	
Travel Time (s)		10.2			8.4			4.5			2.6	
Confl. Peds. (#/hr)	6		14	14		6	27		32	32		27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	2%	13%	64%	2%	4%	22%	0%	7%	0%	0%	10%
Adj. Flow (vph)	1	1220	26	17	1361	71	17	17	46	35	7	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1247	0	0	1449	0	0	80	0	35	30	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	50		50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	49.0	49.0		49.0	49.0		27.0	27.0		27.0	27.0	
Total Split (s)	63.0	63.0		63.0	63.0		27.0	27.0		27.0	27.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	57.0	57.0		57.0	57.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			0.0		0.0	0.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	33.0	33.0		33.0	33.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	33	33		33	33		16	16		16	16	
Act Effct Green (s)		72.2			72.2			12.6		12.6	12.6	
Actuated g/C Ratio		0.80			0.80			0.14		0.14	0.14	
v/c Ratio		0.71			0.62			0.37		0.23	0.15	
Control Delay		10.4			1.8			20.3		34.1	15.5	
Queue Delay		0.0			0.2			0.0		0.0	0.0	
Total Delay		10.4			2.0			20.3		34.1	15.5	
LOS		B			A			C		C	B	
Approach Delay		10.4			2.0			20.3			25.5	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)		95			1			19		19	4	
Queue Length 95th (ft)		374			1			52		41	25	
Internal Link Dist (ft)		295			229			84			16	
Turn Bay Length (ft)												
Base Capacity (vph)		1765			2336			358		282	352	
Starvation Cap Reductn		0			255			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.71			0.70			0.22		0.12	0.09	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 63 (70%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 6.7 Intersection LOS: A
Intersection Capacity Utilization 76.6% ICU Level of Service D
Analysis Period (min) 15
* User Entered Value

Splits and Phases: 1248: Kilmarnock St & Boylston St

Intersection	
Intersection Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	1	26	65	1	10	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	28	71	1	11	39

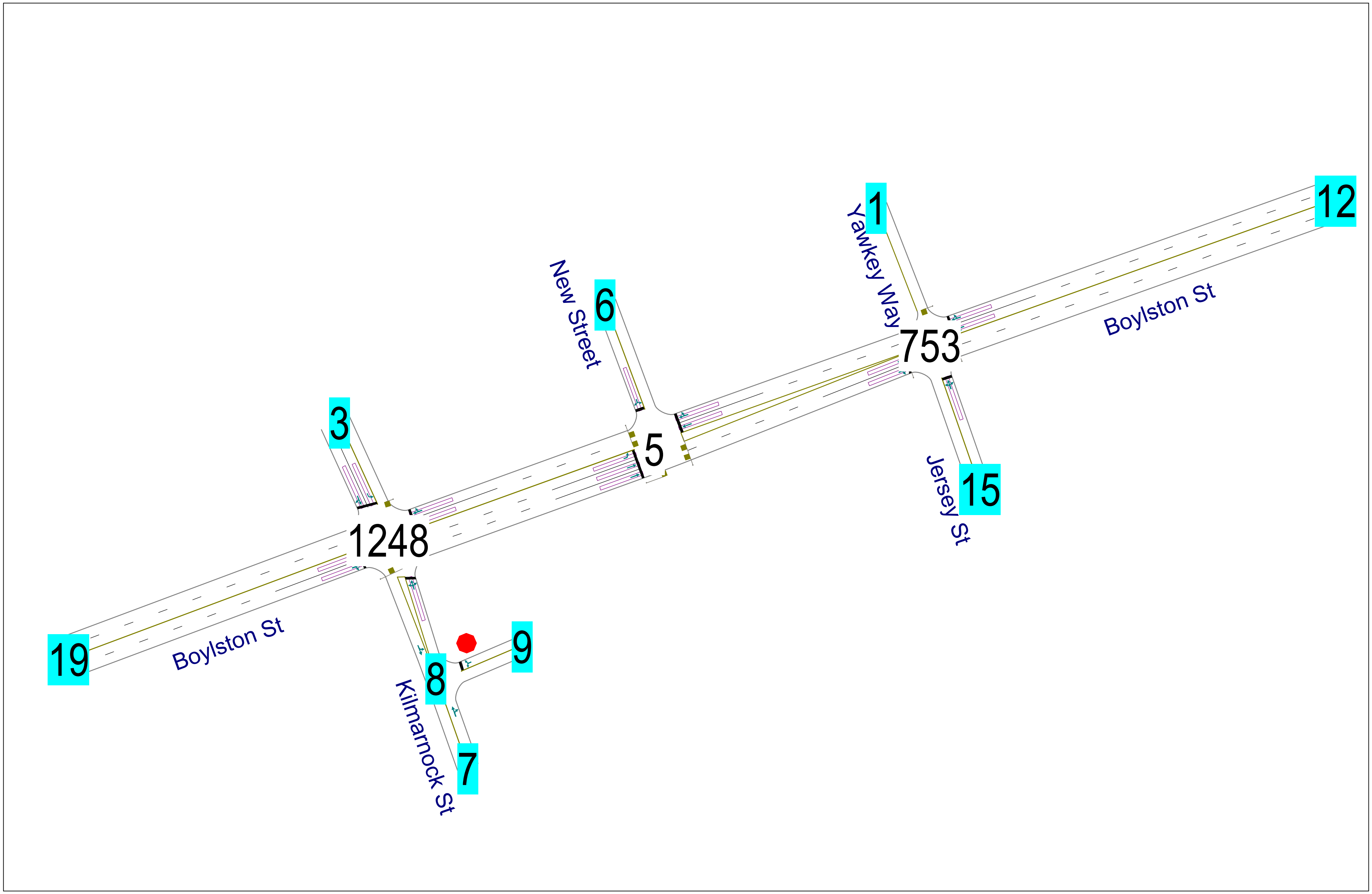
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	132	71	0	0	72	0
Stage 1	71	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Follow-up Headway	3.518	3.318	-	-	2.218	-
Pot Capacity-1 Maneuver	862	991	-	-	1528	-
Stage 1	952	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	856	991	-	-	1528	-
Mov Capacity-2 Maneuver	856	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.6
HCM LOS	A		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	985	1528	-
HCM Lane V/C Ratio	-	-	0.03	0.007	-
HCM Control Delay (s)	-	-	8.8	7.373	0
HCM Lane LOS			A	A	A
HCM 95th %tile Q(veh)	-	-	0.092	0.021	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Map - 1350 Boylston BUILD (w Boylston Improvements)
Node Numbers **6/25/2013**



1350 Boylston BUILD (w Boylston Improvements) Weekday Evening Peak Hour
Nelson\Nygaard

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	77	1400	1113	77	64	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	10	11
Storage Length (ft)	0			0	100	0
Storage Lanes	1			0	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.990		0.927	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1711	3421	3387	0	1576	0
Flt Permitted	0.191				0.978	
Satd. Flow (perm)	344	3421	3387	0	1576	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			15		67	
Link Speed (mph)		10	10		30	
Link Distance (ft)		310	324		168	
Travel Time (s)		21.1	22.1		3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	1522	1210	84	70	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	1522	1294	0	153	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		10	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.09	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	1	1		1	
Detector Template						
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	50	50	50		50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Turn Type	Perm	NA	NA		NA	
Protected Phases		1	1		5	
Permitted Phases	1					
Detector Phase	1	1	1		5	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	
Minimum Split (s)	27.0	27.0	27.0		30.0	
Total Split (s)	60.0	60.0	60.0		30.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (%)	66.7%	66.7%	66.7%		33.3%	
Maximum Green (s)	54.0	54.0	54.0		26.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	3.0	3.0	3.0		1.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0		0.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		Min	
Walk Time (s)	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	14.0	14.0	14.0		19.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)	71.3	71.3	71.3		10.7	
Actuated g/C Ratio	0.79	0.79	0.79		0.12	
v/c Ratio	0.31	0.56	0.48		0.62	
Control Delay	3.8	3.4	9.3		32.1	
Queue Delay	0.0	13.4	1.0		2.5	
Total Delay	3.8	16.8	10.3		34.6	
LOS	A	B	B		C	
Approach Delay		16.1	10.3		34.6	
Approach LOS		B	B		C	
Queue Length 50th (ft)	9	103	92		46	
Queue Length 95th (ft)	m9	m90	267		101	
Internal Link Dist (ft)		230	244		88	
Turn Bay Length (ft)					100	
Base Capacity (vph)	272	2710	2686		502	
Starvation Cap Reductn	0	1194	1026		0	
Spillback Cap Reductn	0	93	158		243	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.31	1.00	0.78		0.59	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 55.7%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Boylston St & New Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	1438	42	15	1178	35	22	21	111	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			0.88				
Frt		0.996			0.996			0.903				
Flt Protected		0.999			0.999			0.993				
Satd. Flow (prot)	0	3067	0	0	3046	0	0	1302	0	0	0	0
Flt Permitted		0.932			0.917			0.993				
Satd. Flow (perm)	0	*1530	0	0	*4400	0	0	1284	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			4			27				
Link Speed (mph)		10			10			25			25	
Link Distance (ft)		324			473			167			162	
Travel Time (s)		124.0			27.0			4.6			4.4	
Confl. Peds. (#/hr)	67		158	158		67	79		116	116		79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	1%	0%	0%	2%	10%	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	23	1563	46	16	1280	38	24	23	121	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1632	0	0	1334	0	0	168	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1				
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50				
Trailing Detector (ft)	0	0		0	0		0	0				
Detector 1 Position(ft)	0	0		0	0		0	0				
Detector 1 Size(ft)	50	50		50	50		50	50				
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Turn Type	D.P+P	NA		Perm	NA		Perm	NA				
Protected Phases	4	1 4			1			5				
Permitted Phases	1			1			5					
Detector Phase	4	1 4		1	1		5	5				
Switch Phase												
Minimum Initial (s)	5.0			8.0	8.0		5.0	5.0				
Minimum Split (s)	9.0			31.0	31.0		27.0	27.0				
Total Split (s)	19.0			44.0	44.0		27.0	27.0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	21.1%			48.9%	48.9%		30.0%	30.0%				
Maximum Green (s)	16.0			38.0	38.0		23.0	23.0				
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0				
All-Red Time (s)	0.0			3.0	3.0		1.0	1.0				
Lost Time Adjust (s)					-2.0			0.0				
Total Lost Time (s)					4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			3.0	3.0		2.0	2.0				
Recall Mode	Max			C-Max	C-Max		None	None				
Walk Time (s)				15.0	15.0		7.0	7.0				
Flash Dont Walk (s)				10.0	10.0		15.0	15.0				
Pedestrian Calls (#/hr)				50	50		20	20				
Act Effct Green (s)		62.6			47.6			15.4				
Actuated g/C Ratio		0.70			0.53			0.17				
v/c Ratio		1.23			0.57			0.70				
Control Delay		128.0			16.6			43.3				
Queue Delay		0.0			0.1			1.6				
Total Delay		128.0			16.7			44.9				
LOS		F			B			D				
Approach Delay		128.0			16.7			44.9				
Approach LOS		F			B			D				
Queue Length 50th (ft)		~351			247			77				
Queue Length 95th (ft)		#783			372			133				
Internal Link Dist (ft)		244			393			87			82	
Turn Bay Length (ft)												
Base Capacity (vph)		1322			2329			348				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			148			73				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		1.23			0.61			0.61				

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 17 (19%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 76.2 Intersection LOS: E

Intersection Capacity Utilization 90.5% ICU Level of Service E

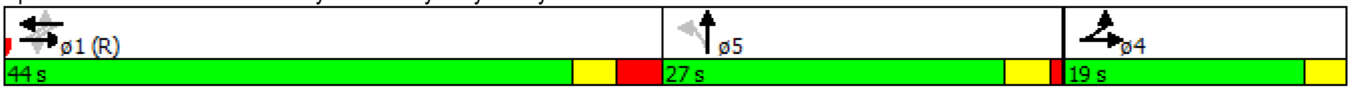
Analysis Period (min) 15

* User Entered Value

~ 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: 753: Jersey St/Yawkey Way & Boylston St



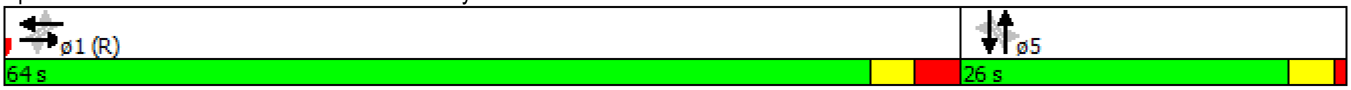
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1269	32	51	1061	23	8	8	46	163	80	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.91		0.92	0.96	
Frt		0.996			0.997			0.901			0.933	
Flt Protected		0.999			0.998			0.993		0.950		
Satd. Flow (prot)	0	2935	0	0	2939	0	0	1346	0	1540	1458	0
Flt Permitted		0.931			0.799			0.961		0.750		
Satd. Flow (perm)	0	*1420	0	0	*1720	0	0	1292	0	1113	1458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			5			50			43	
Link Speed (mph)		10			10			25			25	
Link Distance (ft)		375			310			161			139	
Travel Time (s)		189.0			38.0			4.4			3.8	
Confl. Peds. (#/hr)	11		57	57		11	64		78	78		64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	10%	0%	2%	2%	1%
Parking (#/hr)		0	0		0	0						
Adj. Flow (vph)	17	1379	35	55	1153	25	9	9	50	177	87	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1431	0	0	1233	0	0	68	0	177	158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.19	1.27	1.19	1.19	1.27	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	50	50		50	50		50	50		50	50	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	49.0	49.0		49.0	49.0		26.0	26.0		26.0	26.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	64.0	64.0		64.0	64.0		26.0	26.0		26.0	26.0	
Total Split (%)	71.1%	71.1%		71.1%	71.1%		28.9%	28.9%		28.9%	28.9%	
Maximum Green (s)	58.0	58.0		58.0	58.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			0.0		0.0	0.0	
Total Lost Time (s)		4.0			4.0			4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	33.0	33.0		33.0	33.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	33	33		33	33		16	16		16	16	
Act Effct Green (s)		64.3			64.3			17.7		17.7	17.7	
Actuated g/C Ratio		0.71			0.71			0.20		0.20	0.20	
v/c Ratio		1.41			1.00			0.23		0.81	0.49	
Control Delay		208.3			41.9			13.8		61.2	27.5	
Queue Delay		0.0			13.8			0.0		0.0	0.0	
Total Delay		208.3			55.8			13.8		61.2	27.5	
LOS		F			E			B		E	C	
Approach Delay		208.3			55.8			13.8			45.3	
Approach LOS		F			E			B			D	
Queue Length 50th (ft)		~591			~412			8		95	57	
Queue Length 95th (ft)		#744			#526			41		#177	112	
Internal Link Dist (ft)		295			230			81			59	
Turn Bay Length (ft)												
Base Capacity (vph)		1016			1231			353		272	388	
Starvation Cap Reductn		0			52			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		1.41			1.05			0.19		0.65	0.41	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 76 (84%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.41	
Intersection Signal Delay: 124.9	Intersection LOS: F
Intersection Capacity Utilization 100.2%	ICU Level of Service G
Analysis Period (min) 15	

* User Entered Value
~ 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: 1248: Kilmarnock St & Boylston St



Intersection	
Intersection Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	1	28	35	1	28	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	30	38	1	30	147

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	247	39	0	0	39	0
Stage 1	39	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Follow-up Headway	3.518	3.318	-	-	2.218	-
Pot Capacity-1 Maneuver	741	1033	-	-	1571	-
Stage 1	983	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	725	1033	-	-	1571	-
Mov Capacity-2 Maneuver	725	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	1.3
HCM LOS	A		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1018	1571	-
HCM Lane V/C Ratio	-	-	0.031	0.019	-
HCM Control Delay (s)	-	-	8.6	7.337	0
HCM Lane LOS			A	A	A
HCM 95th %tile Q(veh)	-	-	0.096	0.059	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

BTD AVERAGE Mode Split for Fenway/Longwood

Trips Ending in Zone 4

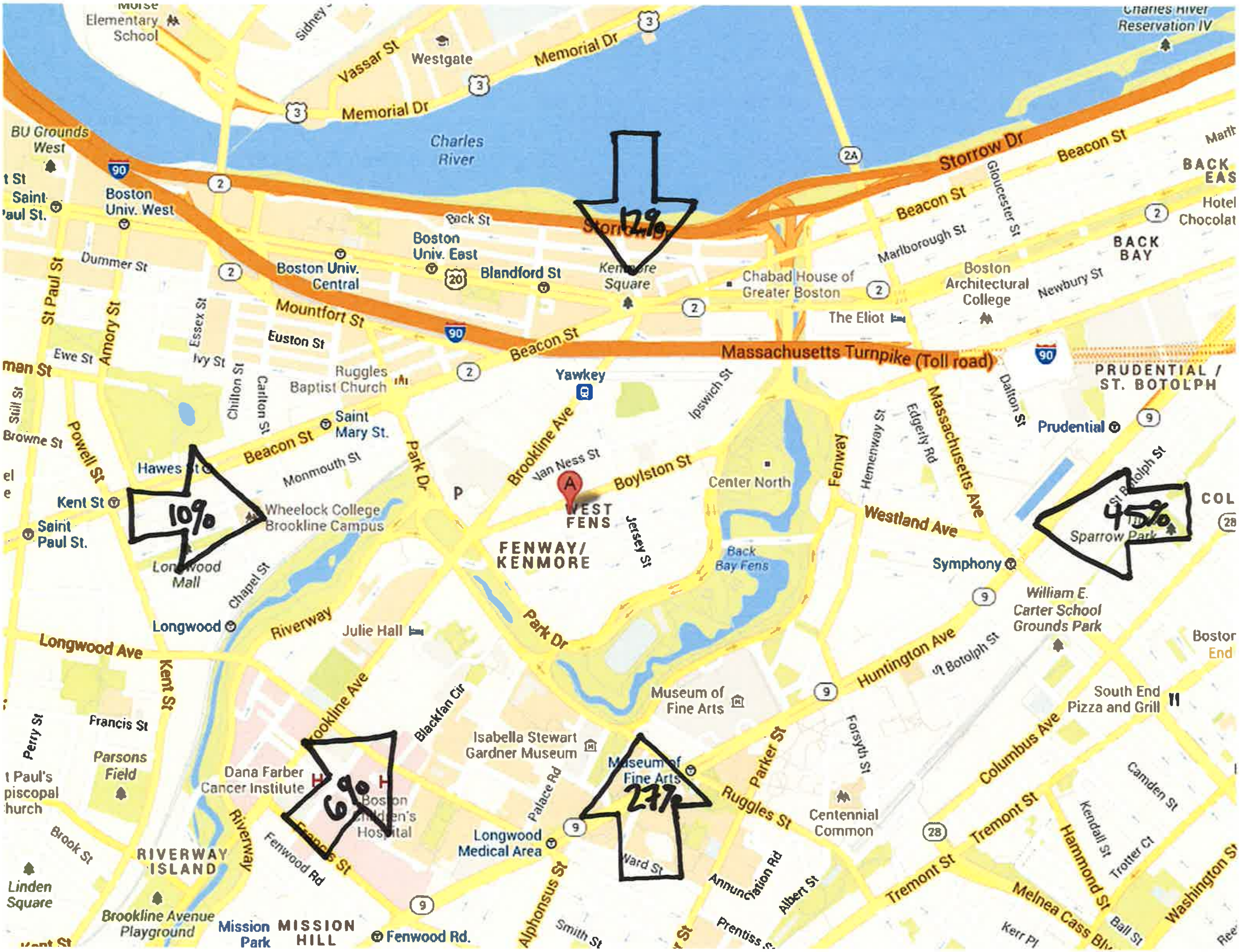
	All Purposes	Home	Work	Other (Retail)
Daily avg. mode shares				
Auto	33%	24%	44%	29%
Transit	21%	19%	32%	16%
Walk	46%	57%	24%	55%
AM peak mode shares				
Auto	33%	19%	37%	24%
Transit	31%	22%	38%	19%
Walk	36%	59%	25%	57%
Rest of day mode shares				
Auto	33%	24%	52%	30%
Transit	19%	19%	26%	16%
Walk	48%	57%	22%	54%
PM peak mode shares				
Auto	22%	21%	43%	26%
Transit	15%	15%	28%	13%
Walk	63%	64%	29%	61%

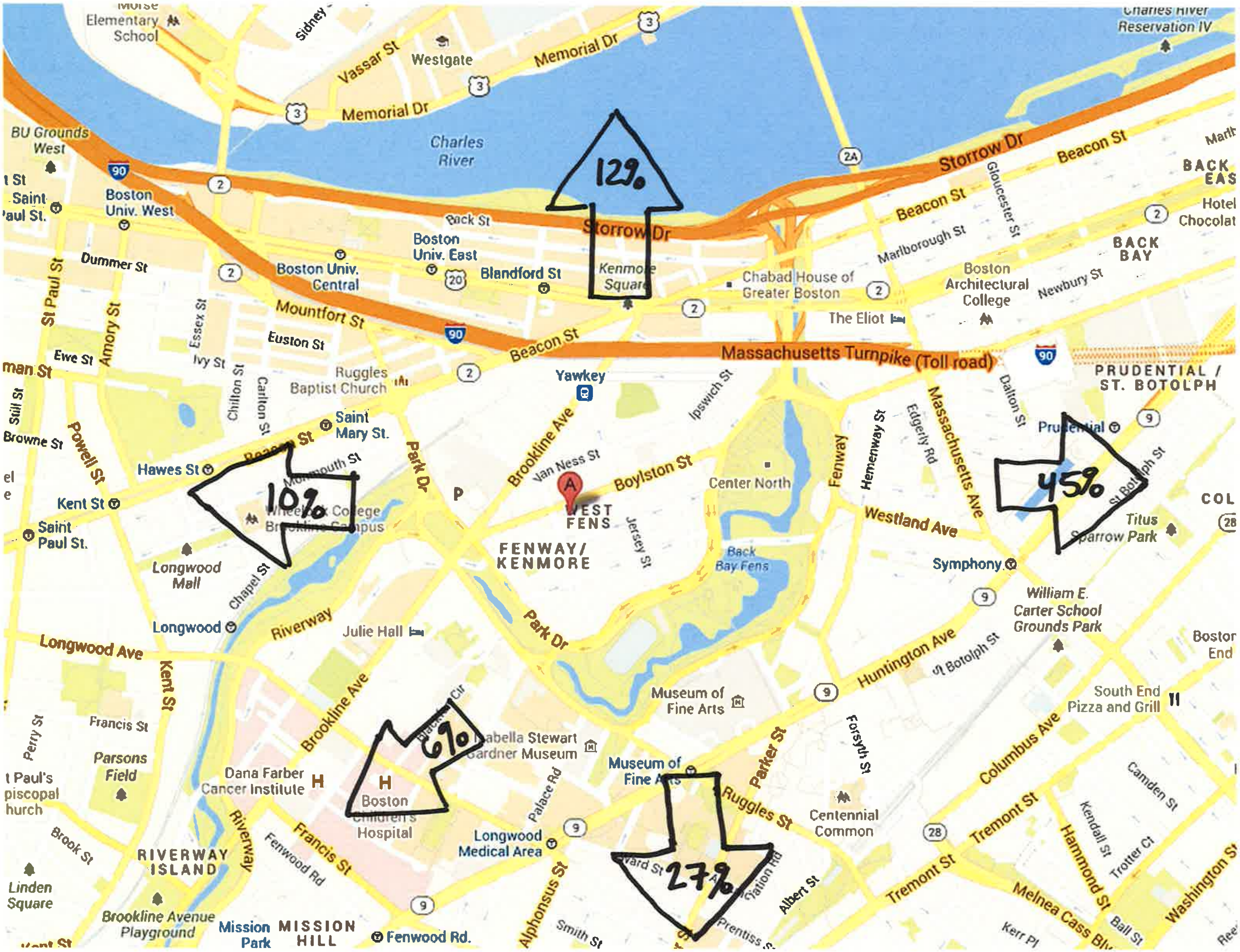
Trips Beginning in Zone 4

	All Purposes	Home	Work	Other (Retail)
Daily avg. mode shares				
Auto	33%	24%	44%	29%
Transit	21%	19%	32%	16%
Walk	46%	57%	24%	55%
	100%			
AM peak mode shares				
Auto	22%	21%	43%	26%
Transit	15%	15%	28%	13%
Walk	63%	64%	29%	61%
Rest of day mode shares				
Auto	34%	27%	44%	29%
Transit	23%	23%	32%	16%
Walk	43%	50%	24%	54%
PM peak mode shares				
Auto	33%	19%	37%	24%
Transit	31%	22%	38%	19%
Walk	36%	59%	25%	57%

**Purpose refers to the activity that occurs in Zone 4.*

Boston Vehicle Occupancy	1.10	*American Community Survey 2010*


12%
10%
45%
27%
6%
Charles River
Storrow Dr
Memorial Dr
Vassar St
Westgate
Beacon St
Back St
Boston Univ. West
Boston Univ. Central
Boston Univ. East
Blandford St
Kenmore Square
Chabad House of Greater Boston
The Eliot
Boston Architectural College
Marlborough St
Newbury St
Gloucester St
BACK BAY
Massachusetts Turnpike (Toll road)
PRUDENTIAL / ST. BOTOLPH
Prudential
Mountfort St
Euston St
Yawkey
Ruggles Baptist Church
Saint Mary St.
Brookline Ave
Van Ness St
Boylston St
Ipswich St
WEST FENS
FENWAY/ KENMORE
Jersey St
Center North
Back Bay Fens
Fenway
Hemenway St
Edgerly Rd
Massachusetts Ave
Dalton St
Westland Ave
Symphony
Sparrow Park
William E. Carter School Grounds Park
Huntington Ave
St Botolph St
Museum of Fine Arts
Isabella Stewart Gardner Museum
Park Dr
Julie Hall
Riverway
Longwood
Longwood Ave
Kent St
Longwood Mall
Wheelock College Brookline Campus
Chapel St
Monmouth St
Hawes St
Kent St
Saint Paul St.
Amory St
St Paul St
Powell St
BU Grounds West
Dana Farber Cancer Institute
Boston Children's Hospital
Blackfan Cir
Palace Rd
Longwood Medical Area
Fenwood Rd
Fenwood Rd.
Francis St
MISSION HILL
Mission Park
RIVERWAY ISLAND
Brookline Avenue Playground
Linden Square
Parsons Field
Ruggles St
Parker St
Forsyth St
Centennial Common
Ward St
Annunciation Rd
Albert St
Alphonsus St
Smith St
Columbus Ave
Tremont St
South End Pizza and Grill
Camden St
Kendall St
Trotter Ct
Hammond St
Melnea Cass Blvd
Washington St
Ball St
Kerr Pl
Dummer St
Essex St
Ivy St
Chilton St
Carlton St
Ewe St
Browne St
Perry St
Brook St
Elementary School
Charles River Reservation IV


12%
45%
27%
6%
10%
Charles River
Storrow Dr
Memorial Dr
Beacon St
Massachusetts Turnpike (Toll road)
Kenmore Square
Boston Univ. East
Boston Univ. Central
Boston Univ. West
Blandford St
Mountfort St
Commonwealth Ave
Brookline Ave
Boylston St
Yawkey
Park Dr
Fenway
Westland Ave
Massachusetts Ave
Hemenway St
Huntington Ave
Symphony
Prudential
PRUDENTIAL / ST. BOTOLPH
BACK BAY
FENWAY/ KENMORE
WEST FENS
Back Bay Fens
Museum of Fine Arts
Isabella Stewart Gardner Museum
Longwood Medical Area
Boston Children's Hospital
Dana Farber Cancer Institute
Longwood Ave
Longwood
Riverway
Ruggles St
Tremont St
Columbus Ave
Parker St
Centennial Common
MISSION HILL
Fenwood Rd.
RIVERWAY ISLAND
Saint Mary St.
Hawes St
Kent St
Saint Paul St.
Longwood Mall
Wheelock College Brookline Campus
Julie Hall
Chabad House of Greater Boston
The Eliot
Boston Architectural College
William E. Carter School Grounds Park
South End Pizza and Grill
Titus Sparrow Park

Existing to NoBuild Driveway Volume Increases

	Per Year	to 2020
Percent Increase	0.5%	1.045911

			2011AM	2011PM	2020AM	2020PM
Kilmarnock & Site Driveway 3	Enter	SB LT	3	3	3	3
	Enter	NB RT	2	3	3	3
	Exit	WB RT	4	6	4	6
	Exit	WB LT	4	6	4	6
Boylston & Site Driveway 1	Exit	NB LT	1	2	1	2
	Exit	NB RT	1	1	1	2
	Enter	EB RT	18	23	19	24
	Enter	WB LT	18	23	19	24
Boylston & Site Driveway 2 (far	Exit	NB LT	16	23	16	24
	Exit	NB RT	16	22	16	24
	Enter	EB RT	5	7	5	7
	Enter	WB LT	5	6	5	7

High Turnover Restaurant/Shopping Center/Apartments

Proposed: 1350 Boylston ITE Trip Generation

240 units
2529 Shopping Center (820)
4163 High Turnover (Sit-Down) Restaurant (932)

ITE Class	Apartment (220) trips per occupied dwelling					Shopping Center (820) trips per 1000 SF GLA**					High Turnover (Sit-Down) Restaurant (932)					SUM	
Time	**ITE Rate**	**VEH TRIPS**	**PERSON TRIPS**	**Entering**	**Exiting**	**ITE**	**VEH TRIPS**	**PERSON TRIPS**	**Entering**	**Exiting**	**ITE trips per 1000 sq feet GFA**	**VEH TRIPS**	**PERSON TRIPS**	**Entering**	**Exiting**	**Entering**	**Exiting**
Weekday	6.65	1596	1756	878	878	42.94	109	119	60	60	127.15	529	582	291	291	1229	1229
Saturday	6.39	1534	1687	843	843	49.97	126	139	70	70	158.37	659	725	363	363	1276	1276
AM Peak Hour*	0.51	122	135	27	108	1	3	3	2	1	11.52	48	53	27	25	56	134
PM Peak Hour*	0.62	149	164	106	57	3.73	9	10	5	5	11.15	46	51	30	21	142	84

*Peak hour of Adjacent Street Traffic

TRIP GENERATION with BTD Area 4 Mode Splits applied

PROPOSED	ENTERING					EXITING					
Daily avg. mode shares	**Apartment +**	**Shopping**	**+ Restaurant**	ENTERING TOTAL PERSON TRIPS	ENTERING TOTAL VEHICLE TRIPS	**Apartment +**	**Shopping**	**+ Restaurant**	EXITING TOTAL PERSON TRIPS	EXITING TOTAL VEHICLE TRIPS	**= TOTAL PERSON TRIPS**
Auto	211	17	84	312	284	211	17	84	312	284	625
Transit	167	10	47	223		167	10	47	223		446
Walk	500	33	160	693		500	33	160	693		1387
AM peak mode shares											
Auto	5	0	7	12	11	23	0	7	29	27	42
Transit	6	0	5	11		16	0	3	20		31
Walk	16	1	16	32		69	1	15	85		118
PM peak mode shares											
Auto	22	1	8	31	29	11	1	5	17	16	49
Transit	16	1	4	21		13	1	4	18		38
Walk	68	3	18	90		34	3	12	49		138
Saturday Mode Shares											
Auto	202	21	109	332	302	228	20	105	353	321	685
Transit	160	11	58	229		194	11	58	263		493
Walk	481	38	196	714		422	38	196	655		1369

Appendix C

Wind

CONSULTING ENGINEERS & SCIENTISTS

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
1	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	9	-31%	Sitting	15	-29%	Acceptable
		Summer	7	-30%	Sitting	12	-25%	Acceptable
		Fall	8	-33%	Sitting	14	-30%	Acceptable
		Winter	9	-36%	Sitting	15	-32%	Acceptable
		Annual	8	-33%	Sitting	14	-30%	Acceptable
	C	Spring	7	-46%	Sitting	12	-43%	Acceptable
		Summer	6	-40%	Sitting	10	-38%	Acceptable
		Fall	6	-50%	Sitting	11	-45%	Acceptable
		Winter	7	-50%	Sitting	12	-45%	Acceptable
		Annual	6	-50%	Sitting	11	-45%	Acceptable
2	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	11	-39%	Sitting	18	-33%	Acceptable
		Summer	10	-29%	Sitting	16	-27%	Acceptable
		Fall	11	-35%	Sitting	17	-35%	Acceptable
		Winter	12	-37%	Sitting	19	-32%	Acceptable
		Annual	11	-35%	Sitting	18	-31%	Acceptable
	C	Spring	9	-50%	Sitting	14	-48%	Acceptable
		Summer	8	-43%	Sitting	12	-45%	Acceptable
		Fall	9	-47%	Sitting	14	-46%	Acceptable
		Winter	9	-53%	Sitting	15	-46%	Acceptable
		Annual	9	-47%	Sitting	14	-46%	Acceptable
3	A	Spring	16		Walking	24		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	18	+12%	Walking	26		Acceptable
		Summer	16	+33%	Walking	23	+21%	Acceptable
		Fall	17	+13%	Walking	25	+14%	Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17	+13%	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.

<u>Configurations</u>

A – No Build
B – Build
C – Full Build

<u>Mean Wind Speed Criteria</u>

Comfortable for Sitting: ≤ 12 mph
Comfortable for Standing: > 12 and ≤ 15 mph
Comfortable for Walking: > 15 and ≤ 19 mph
Uncomfortable for Walking: > 19 and ≤ 27 mph
Dangerous Conditions: > 27 mph

<u>Effective Gust Criteria</u>

Acceptable: ≤ 31 mph
Unacceptable: > 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	C	Spring	12	-25%	Sitting	18	-25%	Acceptable
		Summer	10	-17%	Sitting	16	-16%	Acceptable
		Fall	11	-27%	Sitting	17	-23%	Acceptable
		Winter	11	-35%	Sitting	18	-31%	Acceptable
		Annual	11	-27%	Sitting	17	-26%	Acceptable
4	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	14	+27%	Standing	22	+22%	Acceptable
		Summer	13	+44%	Standing	20	+43%	Acceptable
		Fall	14	+27%	Standing	22	+29%	Acceptable
		Winter	14	+17%	Standing	23	+21%	Acceptable
		Annual	14	+27%	Standing	22	+22%	Acceptable
	C	Spring	7	-36%	Sitting	12	-33%	Acceptable
		Summer	6	-33%	Sitting	10	-29%	Acceptable
		Fall	7	-36%	Sitting	11	-35%	Acceptable
		Winter	7	-42%	Sitting	12	-37%	Acceptable
		Annual	7	-36%	Sitting	12	-33%	Acceptable
5	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	19	+46%	Walking	27	+35%	Acceptable
		Summer	15	+50%	Standing	22	+47%	Acceptable
		Fall	18	+50%	Walking	26	+44%	Acceptable
		Winter	20	+54%	Uncomfortable	29	+45%	Acceptable
		Annual	19	+58%	Walking	27	+42%	Acceptable
	C	Spring	16	+23%	Walking	22		Acceptable
		Summer	13	+30%	Standing	19	+27%	Acceptable
		Fall	15	+25%	Standing	21	+17%	Acceptable
		Winter	16	+23%	Walking	23	+15%	Acceptable
		Annual	15	+25%	Standing	21	+11%	Acceptable
6	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

CONSULTING ENGINEERS & SCIENTISTS

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	12		Sitting	18		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11	-15%	Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	C	Spring	10	-17%	Sitting	17	-11%	Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11	-15%	Sitting	18		Acceptable
		Annual	10	-17%	Sitting	17		Acceptable
7	A	Spring	17		Walking	23		Acceptable
		Summer	13		Standing	17		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	17		Walking	23		Acceptable
		Annual	16		Walking	21		Acceptable
	B	Spring	25	+47%	Uncomfortable	33	+43%	Unacceptable
		Summer	19	+46%	Walking	26	+53%	Acceptable
		Fall	23	+53%	Uncomfortable	31	+48%	Acceptable
		Winter	26	+53%	Uncomfortable	34	+48%	Unacceptable
		Annual	24	+50%	Uncomfortable	32	+52%	Unacceptable
	C	Spring	18		Walking	24		Acceptable
		Summer	14		Standing	19	+12%	Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
8	A	Spring	18		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	12	-33%	Sitting	18	-28%	Acceptable
		Summer	9	-31%	Sitting	14	-26%	Acceptable
		Fall	11	-31%	Sitting	17	-26%	Acceptable
		Winter	11	-35%	Sitting	18	-28%	Acceptable
		Annual	11	-31%	Sitting	17	-26%	Acceptable
	C	Spring	11	-39%	Sitting	17	-32%	Acceptable
		Summer	9	-31%	Sitting	14	-26%	Acceptable
		Fall	10	-38%	Sitting	16	-30%	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
C – Full Build

Mean Wind Speed Criteria

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	12	-29%	Sitting	18	-28%	Acceptable
		Annual	11	-31%	Sitting	16	-30%	Acceptable
9	A	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	11	-31%	Sitting	19	-21%	Acceptable
		Summer	9	-31%	Sitting	15	-17%	Acceptable
		Fall	11	-27%	Sitting	18	-18%	Acceptable
		Winter	12	-29%	Sitting	20	-20%	Acceptable
		Annual	11	-27%	Sitting	18	-22%	Acceptable
	C	Spring	11	-31%	Sitting	18	-25%	Acceptable
		Summer	9	-31%	Sitting	14	-22%	Acceptable
		Fall	11	-27%	Sitting	17	-23%	Acceptable
		Winter	12	-29%	Sitting	19	-24%	Acceptable
		Annual	11	-27%	Sitting	17	-26%	Acceptable
10	A	Spring	20		Uncomfortable	28		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
	B	Spring	12	-40%	Sitting	20	-29%	Acceptable
		Summer	10	-38%	Sitting	16	-30%	Acceptable
		Fall	11	-42%	Sitting	19	-27%	Acceptable
		Winter	13	-38%	Standing	21	-28%	Acceptable
		Annual	12	-37%	Sitting	20	-26%	Acceptable
	C	Spring	13	-35%	Standing	20	-29%	Acceptable
		Summer	10	-38%	Sitting	16	-30%	Acceptable
		Fall	12	-37%	Sitting	19	-27%	Acceptable
		Winter	14	-33%	Standing	21	-28%	Acceptable
		Annual	13	-32%	Standing	20	-26%	Acceptable
11	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	11	-48%	Sitting	18	-40%	Acceptable
		Summer	9	-47%	Sitting	14	-42%	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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Fall	10	-47%	Sitting	17	-39%	Acceptable
		Winter	12	-45%	Sitting	19	-39%	Acceptable
		Annual	11	-45%	Sitting	17	-39%	Acceptable
	C	Spring	15	-29%	Standing	22	-27%	Acceptable
		Summer	12	-29%	Sitting	17	-29%	Acceptable
		Fall	14	-26%	Standing	20	-29%	Acceptable
		Winter	16	-27%	Walking	23	-26%	Acceptable
		Annual	14	-30%	Standing	21	-25%	Acceptable
12	A	Spring	16		Walking	25		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	14	-12%	Standing	22	-12%	Acceptable
		Summer	10	-17%	Sitting	17	-11%	Acceptable
		Fall	12	-14%	Sitting	20		Acceptable
		Winter	13	-13%	Standing	21	-12%	Acceptable
		Annual	13	-13%	Standing	20	-13%	Acceptable
	C	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17	+13%	Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
13	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	C	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	13	-13%	Acceptable
		Fall	11		Sitting	16	-11%	Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17	-11%	Acceptable
14	A	Spring	13		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	22		Acceptable
		Annual	12		Sitting	20		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	17	+31%	Walking	25	+19%	Acceptable
		Summer	14	+40%	Standing	20	+25%	Acceptable
		Fall	16	+33%	Walking	23	+21%	Acceptable
		Winter	19	+46%	Walking	26	+18%	Acceptable
		Annual	17	+42%	Walking	24	+20%	Acceptable
15	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	32		Unacceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	C	Spring	14	-33%	Standing	21	-30%	Acceptable
		Summer	12	-29%	Sitting	17	-26%	Acceptable
		Fall	13	-35%	Standing	20	-29%	Acceptable
		Winter	15	-35%	Standing	22	-31%	Acceptable
		Annual	14	-33%	Standing	20	-31%	Acceptable
16	A	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15	-17%	Acceptable
		Fall	12		Sitting	18		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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	C	Spring	11	-21%	Sitting	17	-19%	Acceptable
		Summer	9	-18%	Sitting	14	-22%	Acceptable
		Fall	10	-23%	Sitting	16	-20%	Acceptable
		Winter	11	-21%	Sitting	17	-23%	Acceptable
		Annual	11	-15%	Sitting	16	-20%	Acceptable
17	A	Spring	17		Walking	24		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	13	-24%	Standing	20	-17%	Acceptable
		Summer	10	-33%	Sitting	15	-29%	Acceptable
		Fall	12	-25%	Sitting	18	-22%	Acceptable
		Winter	12	-29%	Sitting	19	-24%	Acceptable
		Annual	12	-25%	Sitting	18	-22%	Acceptable
	C	Spring	10	-41%	Sitting	16	-33%	Acceptable
		Summer	9	-40%	Sitting	13	-38%	Acceptable
		Fall	10	-38%	Sitting	15	-35%	Acceptable
		Winter	10	-41%	Sitting	16	-36%	Acceptable
		Annual	10	-38%	Sitting	15	-35%	Acceptable
18	A	Spring	16		Walking	25		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	14	-12%	Standing	21	-16%	Acceptable
		Summer	11	-21%	Sitting	17	-19%	Acceptable
		Fall	13	-19%	Standing	20	-13%	Acceptable
		Winter	14	-18%	Standing	21	-16%	Acceptable
		Annual	13	-19%	Standing	20	-17%	Acceptable
	C	Spring	18	+12%	Walking	25		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	19	+12%	Walking	26		Acceptable
		Annual	18	+12%	Walking	24		Acceptable
19	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	19		Walking	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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	B	Spring	15	-25%	Standing	23	-15%	Acceptable
		Summer	13	-28%	Standing	19	-21%	Acceptable
		Fall	14	-26%	Standing	22	-15%	Acceptable
		Winter	15	-25%	Standing	23	-18%	Acceptable
		Annual	14	-26%	Standing	22	-19%	Acceptable
	C	Spring	10	-50%	Sitting	15	-44%	Acceptable
		Summer	8	-56%	Sitting	12	-50%	Acceptable
		Fall	9	-53%	Sitting	14	-46%	Acceptable
		Winter	10	-50%	Sitting	15	-46%	Acceptable
		Annual	9	-53%	Sitting	14	-48%	Acceptable
20	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	13		Standing	20	+18%	Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	22		Acceptable
	C	Spring	7	-50%	Sitting	11	-48%	Acceptable
		Summer	6	-50%	Sitting	10	-41%	Acceptable
		Fall	7	-46%	Sitting	11	-45%	Acceptable
		Winter	8	-47%	Sitting	12	-45%	Acceptable
		Annual	7	-50%	Sitting	11	-45%	Acceptable
21	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	19	+36%	Walking	26	+24%	Acceptable
		Summer	16	+33%	Walking	22	+22%	Acceptable
		Fall	17	+31%	Walking	24	+20%	Acceptable
		Winter	18	+29%	Walking	26	+24%	Acceptable
		Annual	18	+29%	Walking	24	+20%	Acceptable
	C	Spring	7	-50%	Sitting	11	-48%	Acceptable
		Summer	5	-58%	Sitting	9	-50%	Acceptable
		Fall	6	-54%	Sitting	10	-50%	Acceptable
		Winter	7	-50%	Sitting	11	-48%	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
C – Full Build

<u>Mean Wind Speed Criteria</u>

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	6	-57%	Sitting	11	-45%	Acceptable
22	A	Spring	19		Walking	27		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	22	+16%	Uncomfortable	29		Acceptable
		Summer	19	+19%	Walking	24		Acceptable
		Fall	21	+17%	Uncomfortable	28	+12%	Acceptable
		Winter	22	+16%	Uncomfortable	29	+12%	Acceptable
		Annual	21	+17%	Uncomfortable	28	+12%	Acceptable
	C	Spring	13	-32%	Standing	19	-30%	Acceptable
		Summer	10	-38%	Sitting	15	-32%	Acceptable
		Fall	12	-33%	Sitting	18	-28%	Acceptable
		Winter	13	-32%	Standing	19	-27%	Acceptable
		Annual	12	-33%	Sitting	18	-28%	Acceptable
23	A	Spring	24		Uncomfortable	32		Unacceptable
		Summer	18		Walking	24		Acceptable
		Fall	22		Uncomfortable	29		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	22		Uncomfortable	29		Acceptable
	B	Spring	25		Uncomfortable	33		Unacceptable
		Summer	19		Walking	25		Acceptable
		Fall	23		Uncomfortable	30		Acceptable
		Winter	24		Uncomfortable	32		Unacceptable
		Annual	23		Uncomfortable	30		Acceptable
	C	Spring	18	-25%	Walking	24	-25%	Acceptable
		Summer	14	-22%	Standing	19	-21%	Acceptable
		Fall	17	-23%	Walking	22	-24%	Acceptable
		Winter	18	-22%	Walking	25	-19%	Acceptable
		Annual	17	-23%	Walking	23	-21%	Acceptable
24	A	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	19	+19%	Walking	27	+17%	Acceptable
		Summer	15	+15%	Standing	21	+17%	Acceptable
		Fall	18	+20%	Walking	25	+19%	Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A – No Build
B – Build
C – Full Build

<u>Mean Wind Speed Criteria</u>

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	20	+25%	Uncomfortable	28	+22%	Acceptable
		Annual	18	+20%	Walking	26	+18%	Acceptable
	C	Spring	12	-25%	Sitting	19	-17%	Acceptable
		Summer	9	-31%	Sitting	15	-17%	Acceptable
		Fall	11	-27%	Sitting	17	-19%	Acceptable
		Winter	12	-25%	Sitting	19	-17%	Acceptable
		Annual	11	-27%	Sitting	18	-18%	Acceptable
25	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	16	-11%	Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
26	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	19		Walking	26		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	20		Uncomfortable	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	20		Uncomfortable	27		Acceptable
		Annual	19		Walking	26		Acceptable
	C	Spring	13	-35%	Standing	21	-22%	Acceptable
		Summer	10	-29%	Sitting	16	-20%	Acceptable
		Fall	12	-33%	Sitting	20	-20%	Acceptable
		Winter	14	-26%	Standing	23	-12%	Acceptable
		Annual	13	-28%	Standing	21	-16%	Acceptable
27	A	Spring	11		Sitting	18		Acceptable
		Summer	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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Fall	10		Sitting	17		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	8	-11%	Sitting	14		Acceptable
		Fall	9		Sitting	16		Acceptable
		Winter	9		Sitting	16		Acceptable
		Annual	9		Sitting	16		Acceptable
	C	Spring	13	+18%	Standing	19		Acceptable
		Summer	11	+22%	Sitting	16		Acceptable
		Fall	12	+20%	Sitting	18		Acceptable
		Winter	12	+20%	Sitting	18		Acceptable
		Annual	12	+20%	Sitting	18		Acceptable
28	A	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	23		Acceptable
	C	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	19	+19%	Walking	28	+12%	Acceptable
		Annual	17	+13%	Walking	25		Acceptable
29	A	Spring	10		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	9		Sitting	15	-12%	Acceptable
		Summer	8	-11%	Sitting	12	-14%	Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	15		Acceptable
	C	Spring	13	+30%	Standing	19	+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

A – No Build
B – Build
C – Full Build

Mean Wind Speed Criteria

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Summer	11	+22%	Sitting	16	+14%	Acceptable
		Fall	12	+20%	Sitting	18	+20%	Acceptable
		Winter	13	+30%	Standing	19	+12%	Acceptable
		Annual	12	+20%	Sitting	18	+12%	Acceptable
30	A	Spring	17		Walking	25		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	25		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
	C	Spring	25	+47%	Uncomfortable	34	+36%	Unacceptable
		Summer	20	+25%	Uncomfortable	26	+18%	Acceptable
		Fall	24	+41%	Uncomfortable	31	+29%	Acceptable
		Winter	28	+56%	Dangerous	37	+42%	Unacceptable
		Annual	25	+47%	Uncomfortable	33	+32%	Unacceptable
31	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	8	-11%	Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	C	Spring	18	+64%	Walking	27	+50%	Acceptable
		Summer	14	+56%	Standing	21	+40%	Acceptable
		Fall	17	+70%	Walking	25	+47%	Acceptable
		Winter	19	+73%	Walking	29	+61%	Acceptable
		Annual	17	+55%	Walking	27	+59%	Acceptable
32	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	B	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	19		Acceptable
		Annual	11		Sitting	17		Acceptable
	C	Spring	14	+17%	Standing	21	+11%	Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13	+18%	Standing	19	+12%	Acceptable
		Winter	15	+25%	Standing	22	+16%	Acceptable
		Annual	13	+18%	Standing	20	+11%	Acceptable
33	A	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	15	-12%	Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	C	Spring	12		Sitting	19		Acceptable
		Summer	9	-18%	Sitting	15	-12%	Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	18		Acceptable
34	A	Spring	12		Sitting	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	C	Spring	16	+33%	Walking	26	+30%	Acceptable
		Summer	13	+30%	Standing	20	+33%	Acceptable
		Fall	15	+36%	Standing	24	+33%	Acceptable
		Winter	18	+50%	Walking	28	+40%	Acceptable
		Annual	16	+45%	Walking	25	+39%	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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

CONSULTING ENGINEERS & SCIENTISTS

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
35	A	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	9	-25%	Sitting	15	-21%	Acceptable
		Summer	7	-36%	Sitting	12	-29%	Acceptable
		Fall	8	-27%	Sitting	14	-22%	Acceptable
		Winter	9	-25%	Sitting	16	-16%	Acceptable
		Annual	9	-25%	Sitting	15	-17%	Acceptable
	C	Spring	18	+50%	Walking	24	+26%	Acceptable
		Summer	14	+27%	Standing	19	+12%	Acceptable
		Fall	17	+55%	Walking	23	+28%	Acceptable
		Winter	19	+58%	Walking	26	+37%	Acceptable
		Annual	18	+50%	Walking	24	+33%	Acceptable
36	A	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	10		Sitting	16		Acceptable
		Summer	7	-12%	Sitting	12	-14%	Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	15		Acceptable
	C	Spring	18	+80%	Walking	27	+59%	Acceptable
		Summer	14	+75%	Standing	21	+50%	Acceptable
		Fall	17	+70%	Walking	25	+56%	Acceptable
		Winter	20	+100%	Uncomfortable	29	+71%	Acceptable
		Annual	18	+80%	Walking	26	+62%	Acceptable
37	A	Spring	20		Uncomfortable	28		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
	B	Spring	20		Uncomfortable	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		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

A – No Build
B – Build
C – Full Build

Mean Wind Speed Criteria

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	19		Walking	27		Acceptable
	C	Spring	21		Uncomfortable	28		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21	+11%	Uncomfortable	28		Acceptable
38	A	Spring	20		Uncomfortable	29		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	20		Uncomfortable	29		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	C	Spring	24	+20%	Uncomfortable	31		Acceptable
		Summer	19	+19%	Walking	25		Acceptable
		Fall	23	+21%	Uncomfortable	30	+11%	Acceptable
		Winter	26	+24%	Uncomfortable	34	+13%	Unacceptable
		Annual	23	+15%	Uncomfortable	31	+11%	Acceptable
39	A	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	C	Spring	18	+38%	Walking	25	+25%	Acceptable
		Summer	13	+18%	Standing	19	+12%	Acceptable
		Fall	16	+33%	Walking	23	+15%	Acceptable
		Winter	17	+21%	Walking	25	+14%	Acceptable
		Annual	16	+23%	Walking	24	+20%	Acceptable
40	A	Spring	19		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	26		Acceptable
	B	Spring	19		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	18		Walking	26		Acceptable
	C	Spring	19		Walking	27		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	21		Uncomfortable	28		Acceptable
		Annual	19		Walking	26		Acceptable
41	A	Spring	11		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	11		Sitting	15		Acceptable
		Winter	12		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
	B	Spring	10		Sitting	15		Acceptable
		Summer	8	-11%	Sitting	12		Acceptable
		Fall	9	-18%	Sitting	14		Acceptable
		Winter	10	-17%	Sitting	15	-12%	Acceptable
		Annual	10		Sitting	14	-12%	Acceptable
	C	Spring	11		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	12		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
42	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	13	-13%	Standing	21		Acceptable
		Summer	11		Sitting	17	-11%	Acceptable
		Fall	12	-14%	Sitting	19		Acceptable
		Winter	12	-14%	Sitting	20		Acceptable
		Annual	12	-14%	Sitting	19		Acceptable
	C	Spring	13	-13%	Standing	19	-14%	Acceptable
		Summer	10	-17%	Sitting	16	-16%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Fall	12	-14%	Sitting	18	-14%	Acceptable
		Winter	12	-14%	Sitting	19		Acceptable
		Annual	12	-14%	Sitting	18	-14%	Acceptable
43	A	Spring	10		Sitting	16		Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	15		Acceptable
	B	Spring	17	+70%	Walking	25	+56%	Acceptable
		Summer	15	+88%	Standing	21	+75%	Acceptable
		Fall	16	+78%	Walking	24	+60%	Acceptable
		Winter	18	+80%	Walking	26	+62%	Acceptable
		Annual	17	+89%	Walking	24	+60%	Acceptable
	C	Spring	15	+50%	Standing	21	+31%	Acceptable
		Summer	12	+50%	Sitting	17	+42%	Acceptable
		Fall	14	+56%	Standing	19	+27%	Acceptable
		Winter	15	+50%	Standing	22	+38%	Acceptable
		Annual	14	+56%	Standing	20	+33%	Acceptable
44	A	Spring	13		Standing	20		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	17	+31%	Walking	25	+25%	Acceptable
		Summer	14	+56%	Standing	19	+36%	Acceptable
		Fall	16	+33%	Walking	23	+28%	Acceptable
		Winter	17	+42%	Walking	25	+32%	Acceptable
		Annual	16	+33%	Walking	23	+28%	Acceptable
	C	Spring	13		Standing	20		Acceptable
		Summer	11	+22%	Sitting	16	+14%	Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14	+17%	Standing	20		Acceptable
		Annual	13		Standing	19		Acceptable
45	A	Spring	11		Sitting	19		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	12		Sitting	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build
C – Full Build

Mean Wind Speed Criteria

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Summer	9	+12%	Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	C	Spring	9	-18%	Sitting	15	-21%	Acceptable
		Summer	9	+12%	Sitting	13		Acceptable
		Fall	9		Sitting	14	-18%	Acceptable
		Winter	10		Sitting	15	-12%	Acceptable
		Annual	10		Sitting	14	-18%	Acceptable
46	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	20	+54%	Uncomfortable	28	+47%	Acceptable
		Summer	16	+60%	Walking	22	+47%	Acceptable
		Fall	18	+50%	Walking	26	+44%	Acceptable
		Winter	20	+54%	Uncomfortable	29	+45%	Acceptable
		Annual	19	+58%	Walking	27	+50%	Acceptable
	C	Spring	11	-15%	Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	17		Acceptable
47	A	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	12		Sitting	17		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	17		Acceptable
	B	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
	C	Spring	12		Sitting	17		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	11		Sitting	15	-12%	Acceptable
		Winter	12		Sitting	17	-11%	Acceptable
		Annual	11		Sitting	16		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
48	A	Spring	12		Sitting	18		Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	C	Spring	9	-25%	Sitting	15	-17%	Acceptable
		Summer	8	-11%	Sitting	12	-20%	Acceptable
		Fall	9	-18%	Sitting	14	-18%	Acceptable
		Winter	10	-23%	Sitting	16	-20%	Acceptable
		Annual	9	-25%	Sitting	15	-17%	Acceptable
49	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	12		Sitting	20	+11%	Acceptable
		Summer	9		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	9	-18%	Sitting	15	-17%	Acceptable
		Summer	7	-22%	Sitting	12	-14%	Acceptable
		Fall	9	-18%	Sitting	14	-18%	Acceptable
		Winter	10	-17%	Sitting	15	-21%	Acceptable
		Annual	9	-18%	Sitting	14	-22%	Acceptable
50	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	8	-11%	Sitting	14		Acceptable
		Summer	6	-14%	Sitting	10	-17%	Acceptable
		Fall	7	-12%	Sitting	13		Acceptable
		Winter	8	-20%	Sitting	13	-19%	Acceptable
		Annual	8	-11%	Sitting	13		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A – No Build
B – Build
C – Full Build

Mean Wind Speed Criteria

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	C	Spring	6	-33%	Sitting	10	-33%	Acceptable
		Summer	5	-29%	Sitting	9	-25%	Acceptable
		Fall	6	-25%	Sitting	10	-29%	Acceptable
		Winter	7	-30%	Sitting	11	-31%	Acceptable
		Annual	6	-33%	Sitting	10	-29%	Acceptable
51	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	C	Spring	10		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	15		Acceptable
52	A	Spring	14		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	19		Acceptable
	C	Spring	12	-14%	Sitting	18	-14%	Acceptable
		Summer	10		Sitting	14	-12%	Acceptable
		Fall	11	-15%	Sitting	17	-11%	Acceptable
		Winter	12	-14%	Sitting	18	-14%	Acceptable
		Annual	12		Sitting	17	-11%	Acceptable
53	A	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	12		Sitting	18		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	C	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	12		Sitting	18		Acceptable
54	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	11		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	8	-11%	Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	C	Spring	10		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	10		Sitting	15		Acceptable
55	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	11		Sitting	17	-11%	Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16	-11%	Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10	-17%	Sitting	17		Acceptable
	C	Spring	10	-17%	Sitting	16	-16%	Acceptable
		Summer	8	-20%	Sitting	13	-13%	Acceptable
		Fall	9	-18%	Sitting	15	-17%	Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A – No Build
B – Build
C – Full Build

<u>Mean Wind Speed Criteria</u>

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	10	-17%	Sitting	16	-16%	Acceptable
		Annual	10	-17%	Sitting	15	-17%	Acceptable
56	A	Spring	11		Sitting	17		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	10		Sitting	16		Acceptable
	C	Spring	9	-18%	Sitting	14	-18%	Acceptable
		Summer	8	-20%	Sitting	12	-20%	Acceptable
		Fall	9		Sitting	14	-12%	Acceptable
		Winter	9	-18%	Sitting	15	-12%	Acceptable
		Annual	9	-18%	Sitting	14	-12%	Acceptable
57	A	Spring	11		Sitting	17		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	9	+12%	Sitting	14		Acceptable
		Fall	10		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	C	Spring	8	-27%	Sitting	13	-24%	Acceptable
		Summer	7	-12%	Sitting	11	-21%	Acceptable
		Fall	8	-20%	Sitting	12	-25%	Acceptable
		Winter	8	-27%	Sitting	13	-28%	Acceptable
		Annual	8	-20%	Sitting	13	-24%	Acceptable
58	A	Spring	11		Sitting	17		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	11		Sitting	18		Acceptable
		Summer	9	+12%	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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

CONSULTING ENGINEERS & SCIENTISTS

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	17		Acceptable
	C	Spring	9	-18%	Sitting	15	-12%	Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	9		Sitting	14	-12%	Acceptable
		Winter	10		Sitting	16	-11%	Acceptable
		Annual	9		Sitting	14	-12%	Acceptable
59	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	12	-20%	Sitting	19	-14%	Acceptable
		Summer	9	-25%	Sitting	14	-18%	Acceptable
		Fall	11	-21%	Sitting	17	-15%	Acceptable
		Winter	12	-25%	Sitting	19	-17%	Acceptable
		Annual	12	-14%	Sitting	18	-14%	Acceptable
	C	Spring	9	-40%	Sitting	15	-32%	Acceptable
		Summer	7	-42%	Sitting	11	-35%	Acceptable
		Fall	8	-43%	Sitting	14	-30%	Acceptable
		Winter	10	-38%	Sitting	16	-30%	Acceptable
		Annual	9	-36%	Sitting	15	-29%	Acceptable
60	A	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	12	-14%	Sitting	19		Acceptable
		Summer	9	-18%	Sitting	15	-12%	Acceptable
		Fall	11	-15%	Sitting	18		Acceptable
		Winter	13	-13%	Standing	20	-13%	Acceptable
		Annual	12	-14%	Sitting	19		Acceptable
	C	Spring	10	-29%	Sitting	16	-24%	Acceptable
		Summer	8	-27%	Sitting	13	-24%	Acceptable
		Fall	9	-31%	Sitting	15	-25%	Acceptable
		Winter	11	-27%	Sitting	18	-22%	Acceptable
		Annual	10	-29%	Sitting	16	-24%	Acceptable
61	A	Spring	12		Sitting	20		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
	B	Spring	15	+25%	Standing	23	+15%	Acceptable
		Summer	12	+20%	Sitting	19	+19%	Acceptable
		Fall	14	+17%	Standing	22	+16%	Acceptable
		Winter	16	+23%	Walking	24	+14%	Acceptable
		Annual	15	+25%	Standing	23	+21%	Acceptable
	C	Spring	10	-17%	Sitting	17	-15%	Acceptable
		Summer	9		Sitting	14	-12%	Acceptable
		Fall	10	-17%	Sitting	16	-16%	Acceptable
		Winter	10	-23%	Sitting	17	-19%	Acceptable
		Annual	10	-17%	Sitting	16	-16%	Acceptable
62	A	Spring	16		Walking	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	C	Spring	11	-31%	Sitting	17	-26%	Acceptable
		Summer	9	-31%	Sitting	14	-26%	Acceptable
		Fall	10	-33%	Sitting	16	-27%	Acceptable
		Winter	11	-35%	Sitting	17	-32%	Acceptable
		Annual	10	-38%	Sitting	16	-30%	Acceptable
63	A	Spring	10		Sitting	16		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	15		Acceptable
		Annual	10		Sitting	15		Acceptable
	B	Spring	9		Sitting	15		Acceptable
		Summer	8	-11%	Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	9		Sitting	14		Acceptable
		Annual	9		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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	C	Spring	9		Sitting	14	-12%	Acceptable
		Summer	8	-11%	Sitting	12		Acceptable
		Fall	8	-11%	Sitting	13	-13%	Acceptable
		Winter	9		Sitting	13	-13%	Acceptable
		Annual	8	-20%	Sitting	13	-13%	Acceptable
64	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	14		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	C	Spring	10	-23%	Sitting	16	-20%	Acceptable
		Summer	8	-20%	Sitting	13	-19%	Acceptable
		Fall	10	-17%	Sitting	15	-21%	Acceptable
		Winter	11	-21%	Sitting	17	-19%	Acceptable
		Annual	10	-23%	Sitting	16	-20%	Acceptable
65	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	14		Standing	20		Acceptable
		Annual	13		Standing	18		Acceptable
	C	Spring	9	-31%	Sitting	15	-21%	Acceptable
		Summer	8	-20%	Sitting	12	-20%	Acceptable
		Fall	9	-25%	Sitting	14	-22%	Acceptable
		Winter	10	-23%	Sitting	15	-21%	Acceptable
		Annual	9	-25%	Sitting	14	-22%	Acceptable
66	A	Spring	23		Uncomfortable	31		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	20		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.

<u>Configurations</u>

A – No Build
B – Build
C – Full Build

<u>Mean Wind Speed Criteria</u>

Comfortable for Sitting:	≤ 12 mph
Comfortable for Standing:	> 12 and ≤ 15 mph
Comfortable for Walking:	> 15 and ≤ 19 mph
Uncomfortable for Walking:	> 19 and ≤ 27 mph
Dangerous Conditions:	> 27 mph

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
	B	Spring	23		Uncomfortable	31		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
	C	Spring	14	-39%	Standing	20	-35%	Acceptable
		Summer	11	-35%	Sitting	15	-35%	Acceptable
		Fall	13	-35%	Standing	18	-36%	Acceptable
		Winter	14	-33%	Standing	19	-34%	Acceptable
		Annual	13	-35%	Standing	18	-36%	Acceptable
67	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	17		Walking	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	17		Walking	23		Acceptable
		Annual	16		Walking	22		Acceptable
	C	Spring	15		Standing	21		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
68	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable
	C	Spring	13		Standing	20		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Annual	13		Standing	20		Acceptable
69	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	16		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	C	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	15		Standing	21		Acceptable
		Annual	14		Standing	19		Acceptable
70	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	22		Uncomfortable	32		Unacceptable
		Annual	20		Uncomfortable	30		Acceptable
	C	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
71	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations	Mean Wind Speed Criteria		Effective Gust Criteria	
A – No Build	Comfortable for Sitting:	≤ 12 mph	Acceptable:	≤ 31 mph
B – Build	Comfortable for Standing:	> 12 and ≤ 15 mph	Unacceptable:	> 31 mph
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	C	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
72	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	9		Sitting	15		Acceptable
		Summer	7		Sitting	13		Acceptable
		Fall	8		Sitting	14		Acceptable
		Winter	9		Sitting	16		Acceptable
		Annual	8		Sitting	15		Acceptable
	C	Spring	8		Sitting	14		Acceptable
		Summer	7		Sitting	11		Acceptable
		Fall	8		Sitting	13		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	8		Sitting	14		Acceptable
73	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	C	Spring	10		Sitting	15		Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	14		Acceptable
74	A		DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					

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
C – Full Build	Comfortable for Walking:	> 15 and ≤ 19 mph		
	Uncomfortable for Walking:	> 19 and ≤ 27 mph		
	Dangerous Conditions:	> 27 mph		

Table 1: Pedestrian Wind Comfort and Safety Categories - Multiple Seasons

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed(mph)	%Change	RATING	Speed(mph)	%Change	RATING
			DATA NOT AVAILABLE					
			DATA NOT AVAILABLE					
	B	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
	C	Spring	12		Sitting	19		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	19		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A – No Build
B – Build
C – Full 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

Appendix D

Air

APPENDIX D AIR QUALITY

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale air quality analysis.

Motor Vehicle Emissions

The EPA 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 2013 and 2020 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 175 cm was used for all intersections. Idle emission rates for queue links were based on 2.5 mph emission rates derived in MOBILE6.2 and converted from grams per mile to grams per hour. Emission rates for speeds of 10, 15, and 30 mph were used for right turn, left turn, and free flow links, respectively.

1350 Boylston Street - Boston, MA
Calculation of Microscale Modeling Emission Factors
Summary of MOBILE6 Output

Carbon Monoxide Only

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

Winter	**2013**	**2020**	**Units**
Idle	48.058	46.705	g/hr
2.5 mph	19.223	18.682	g/mile
10 mph	10.408	10.470	g/mile
15 mph	9.367	9.506	g/mile
30 mph	8.818	8.593	g/mile

Note: Winter CO emission factors are higher than Summer and are conservatively used

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

Appendix E

LEED Checklist

LEED 2009 for New Construction and Major Renovations

Project Checklist

1350 Boylston

2013.06.19

Sustainable Sites — Possible Points: 26

Y	?	N			Points
20	2	1		**Sustainable Sites**	26
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
	1		Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
1			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
1			Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
1			Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y	?	N			Points
4	4	2		**Water Efficiency**	10
Y			Prereq 1	Water Use Reduction—20% Reduction	
2	2		Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y	?	N			Points
12	7	16		**Energy and Atmosphere**	35
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
6	4	9	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y	?	N			Points
7	1	6		**Materials and Resources**	14
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

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

Indoor Environmental Quality — Possible Points: 15

Y	?	N			Points
9	3	3		**Indoor Environmental Quality**	15
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
		1	Credit 1	Outdoor Air Delivery Monitoring	1
	1		Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
	1		Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
		1	Credit 7.1	Thermal Comfort—Design	1
		1	Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
1			Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

Y	?	N			Points
5	1			**Innovation and Design Process**	6
1			Credit 1.1	Innovation in Design: SS4.1 Exemplary Performance	1
1			Credit 1.2	Innovation in Design: SS7.1 Exemplary Performance	1
1			Credit 1.3	Innovation in Design: MR4 Exemplary Performance	1
1			Credit 1.4	Innovation in Design: Green Education Program	1
	1		Credit 1.5	Innovation in Design: Water Filtration System	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

Y	?	N			Points
3	1			**Regional Priority Credits**	4
	1		Credit 1.1	Zip 02215: SS3, Brownfield Redev./EA2, Onsite Renew. Energy	1
1			Credit 1.2	Zip 02215: SS6.1, Stormwater Design-Quantity Control	1
1			Credit 1.3	Zip 02215: SS7.1, Heat Island-Nonroof	1
1			Credit 1.4	Zip 02215: SS7.2, Heat Island-Roof	1

Total — Possible Points: 110

Y	?	N		Possible Points
60	19	28	**Total**	110

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