EXPANDED PROJECT NOTIFICATION FORM

45 West Third Street

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

Submitted by:

Spaulding & Slye Investments
One Post Office Square, 28th Floor
Boston, MA 02109

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

In Association with:
Hacin + Associates
William F. Coyne, Jr., Esq, P.C.
Kevin P. Kerr, Esq.
Howard/Stein-Hudson Associates
Nitsch Engineering
Haley & Aldrich

February 12, 2014

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Chapter 1.0

Introduction / Project Description

1.0 INTRODUCTION / PROJECT DESCRIPTION

1.1 Introduction

Spaulding & Slye Investments (the Proponent), proposes to redevelop the approximately one acre site (the Project site) at 45 West Third Street in the South Boston neighborhood of Boston (the Project). The site is bordered by A Street, Athens Street, West Third Street and the depressed South Boston Haul Road, and includes 36 surface parking spaces and a one-story brick building of approximately 30,000 square feet (sf) used for light industry. The existing building will be demolished and replaced with a new mixed-use building including approximately 144,500 sf of residential space and ground floor retail/commercial space along A Street. Parking will be provided in a partially below-grade garage.

The Project will redevelop an underused parcel in the area surrounding the Massachusetts Bay Transportation Authority (MBTA) Broadway Station, which provides public bus and train service, that has seen a number of new developments over the last decade, and will, along with several projects under construction or under review by the Boston Redevelopment Authority (BRA) that are near the Project site, continue the evolution of the South Boston residential community. Improvements to the streetscape will be made along the major streets abutting the site including the widening of the sidewalk along West Third Street and the addition of new street trees. Active uses with distributed entries along West Third Street and A Street will promote a vibrant street life and create visual interest. The Project will also result in a number of public benefits, including new affordable housing, new tax revenue, new jobs, 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 Project Identification and Project Team

Address/Location:	45 West Third Street, South Boston
Entity Taking Title:	SSI West Third Boston LLC
Developer:	Spaulding & Slye Investments One Post Office Square, 28th Floor Boston, MA 02109 (617) 531-4244 Daniel St. Clair

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MEP/FP Engineer: Allied Consulting Engineering Services, Inc.
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John Wood

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Terry A. Louderback

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(617) 464-1440
David Warner

Sustainability Consultant: Soden Sustainability Consulting
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Winchester, MA 01890
(617) 372-7857
Colleen Soden

Wind Consultant: Rowan Williams Davies & Irwin Inc.
650 Woodlawn Road West
Guelph, Ontario, Canada N1K 1B8
(519) 823-1311
Jordan Gilmour

1.3 Project Description

1.3.1 Project Site

The Project site is approximately 42,509 sf in area and located in the South Boston neighborhood of Boston. It is bound by A Street to the west, Athens Street to the south, the depressed South Boston Haul Road to the east, and West Third Street to the north. The site currently includes 36 surface parking spaces and a one-story, approximately 30,000 sf brick building that has been used for light-industry since its construction in 1927, and by Cliflex Bellows Corporation, the current owner and occupant since 1962. Prior to the building's construction, the site was used for tenement housing. The site is no longer an economical location for that company to operate due to changes and trends in the bellows industry and it plans to cease operations at that location. The site occupies most of the block with the exception of three out parcels: 85-87 A Street on the corner of A Street and West Third Street and 66 and 68 Athens Street on the corner of Athens Street and A Street. See Figure 1-1 for an aerial locus map, Figure 1-2 for a site Plan, and Figures 1-3 and 1-4 for photographs of the existing conditions on the Project site.

1.3.2 Area Context

The Project site is located in South Boston in an area that is transitioning from mostly industrial and commercial uses to predominantly residential and ground floor retail uses. To the east of the site across the Haul Road is the more densely developed St. Vincent residential neighborhood with buildings ranging in height from two to four stories. To the west are new mid-rise residential developments under construction or constructed within the last decade, with buildings ranging in height from four to eight stories.

The site is located within one-quarter mile (a less than five minute walk) of the MBTA Broadway Station which provides excellent access to bus and Red Line service. This proximity to public transit makes the area an ideal location for transit-oriented development. The area has become increasingly desirable among young professionals, those at or near retirement, and others, and has seen a number of new residential developments over the past several years, with several currently under construction, including 11 West Broadway, 22-26 West Broadway, West Square and 339 D Street. Other notable new projects include One Channel Center, 500,000 sf for State Street with a large public park, and recent approval of the South Boston Boutique Hotel on Dorchester Avenue. See Figure 1-5 for a context map.

1.3.3 Proposed Development

The Project, as shown in Table 1-1, will be an approximately 144,500 sf, residential building with differentiated components of varying height up to six stories that will include approximately 164 residential units, approximately 2,200 sf of retail/commercial space on the ground floor and approximately 800 sf in a mezzanine for storage/mechanical space, or

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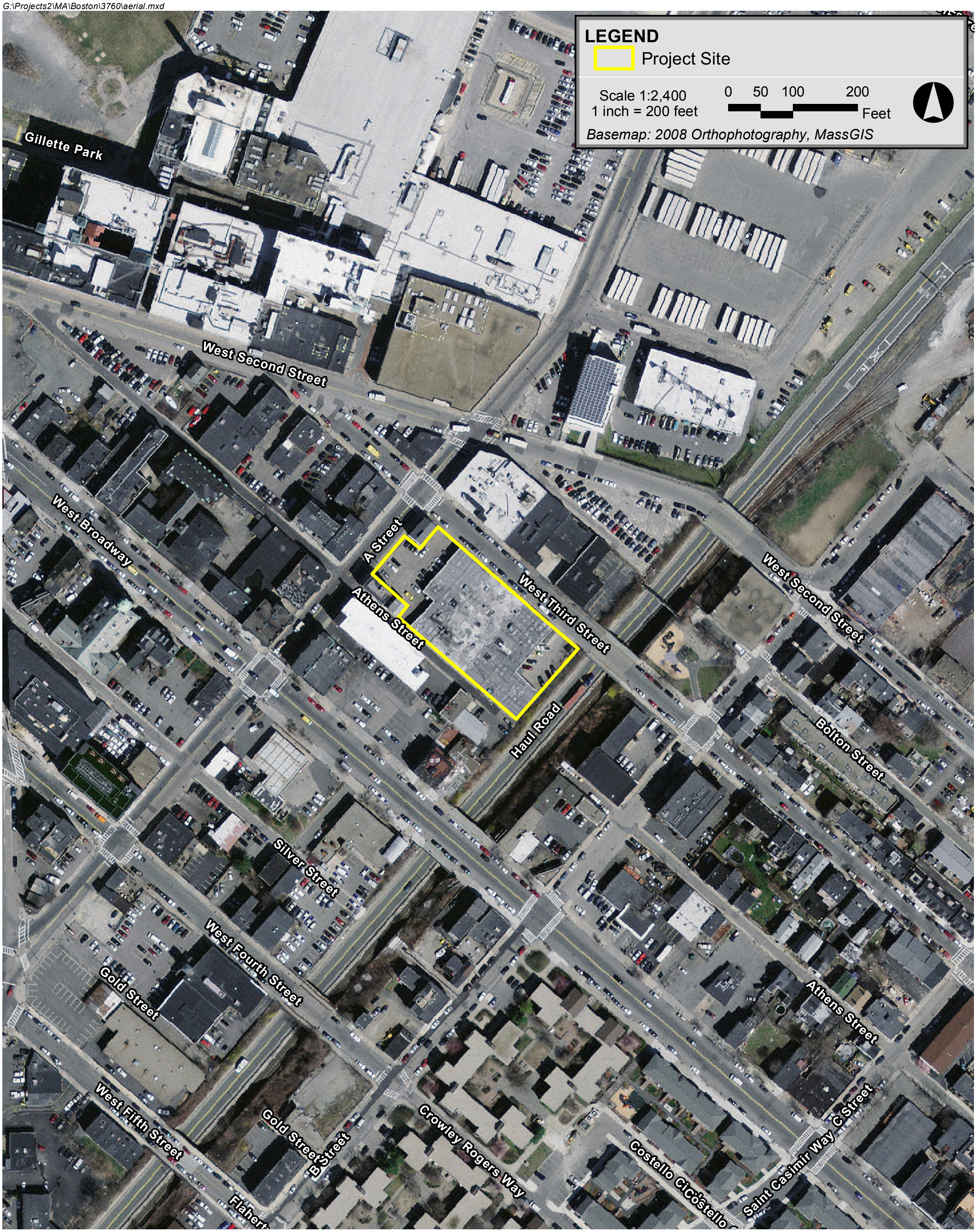
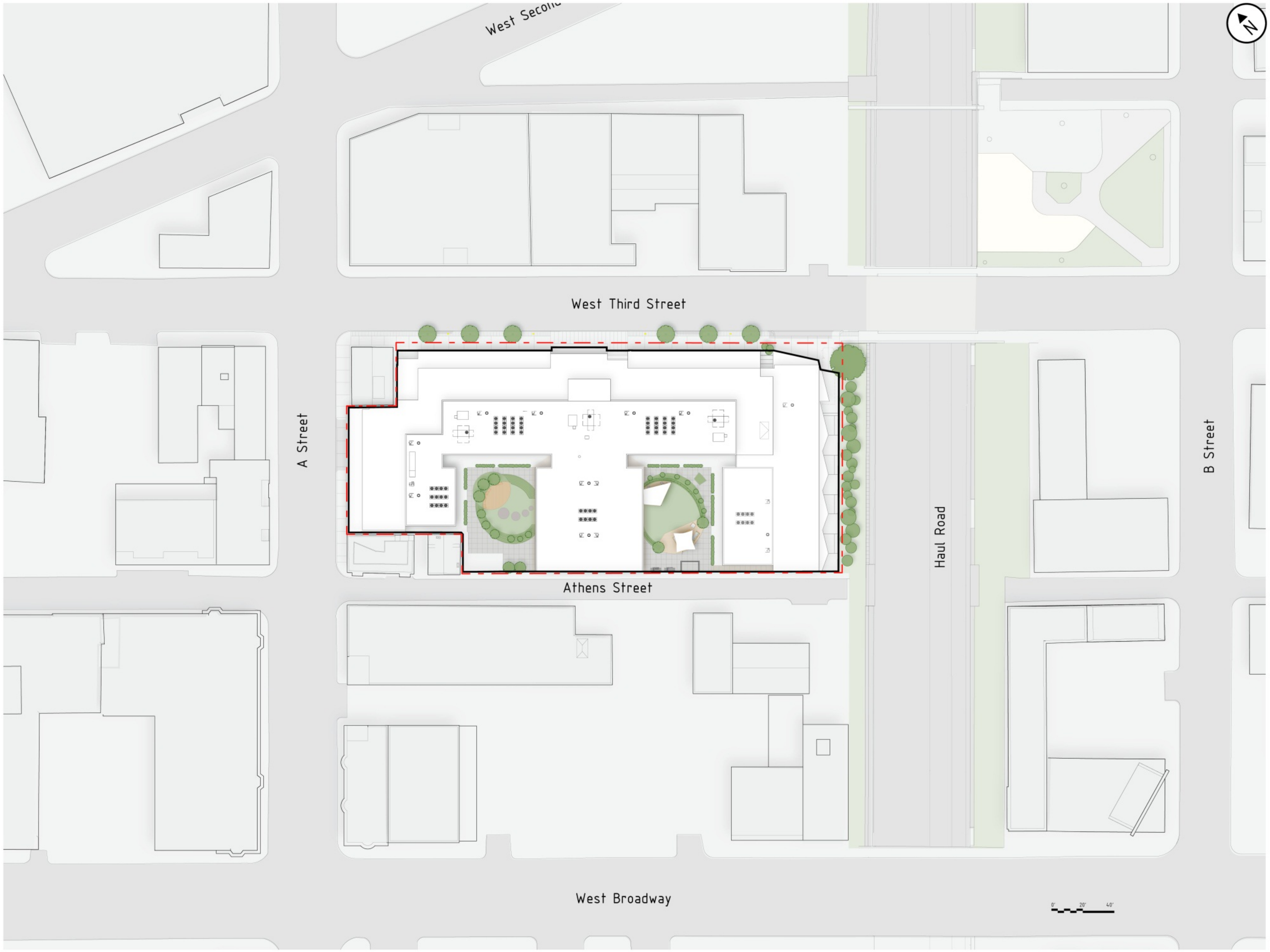


45 West Third Street **Boston, Massachusetts**

Figure 1-1
Aerial Locus Map



45 West Third Street   Boston, Massachusetts

Figure 1-2

Site Plan

West 3RD Street Bridge, Adjacent to Flaherty Park

Approach on A Street from the south west

Northwest corner of A Street and West 3RD Street

West Broadway

45 West Third Street   Boston, Massachusetts

Figure 1-3

Existing Conditions


Athens Street


West 3RD Street


West 3RD Street


West 3RD Street

45 West Third Street   Boston, Massachusetts

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112 Shawmut Avenue, Studio 5A, Boston, MA 02118

Figure 1-4

Existing Conditions

Figure 1-5

Context Map

possibly as an extension of the ground floor retail/commercial space. This space with an entrance on A Street will be used for a local business such as a restaurant. The residential units will include a variety of types and sizes to meet a number of different needs. Due to transitions in financing and marketing of residential developments, the types of units and ownership structure will be determined during final design and be dependent on market analyses. One level of parking that is partially below grade and accessed by West Third Street will include approximately 115 parking spaces and secure space for approximately 168 bicycles within the building—one bicycle space per residential unit and four spaces for site employees. Bicycle racks will also be provided outside of the building for visitors. See Figures 1-6 through 1-11 for floor plans.

Table 1-1 Program

Project Element	Approximate Dimension
Residential	164 units / 141,500 sf
Retail/Commercial	2,200 sf
Mezzanine (storage/mechanical or possibly extension of Retail/Commercial space)	800 sf
Total Square Footage	**144,500 sf**
Height	65 feet
Parking	115 Spaces

Access and egress for the partially below-grade parking garage will be at the northeast corner of the Project site on West Third Street. Pick up and drop off activities are anticipated to occur on West Third Street by the main residential entrance. The loading area will be adjacent to the parking garage entrance, in the same location as the existing loading dock. The loading dock will handle all move-in activity for residents and deliveries to the retail/commercial space on A Street on-site without impacting the public way. The loading dock will also include an area for the collection of trash and recyclables for both the residential and retail/commercial spaces that will be picked up on a regular basis—no trash will be stored outside of the building. See Figure 1-12 for a pedestrian and vehicular circulation plan.

The building will include two outdoor amenity spaces for residents on the roof of the first floor along Athens Street. One of the amenity spaces is envisioned as a passive space for quiet and relaxation, while the other amenity space will be dedicated to more active, social uses such as outdoor gatherings and barbeques. The amenity spaces will be carefully planned to be desirable for a diverse population of residents. The spaces will be oriented to capture the optimum sunlight and will include landscaped areas that will help reduce stormwater runoff from the site.

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Figure 1-6

Parking Level Floor Plan

45 West Third Street **Boston, Massachusetts**

Figure 1-7

First Residential Level Floor Plan

Figure 1-8

Second Residential Level Floor Plan

Figure 1-9

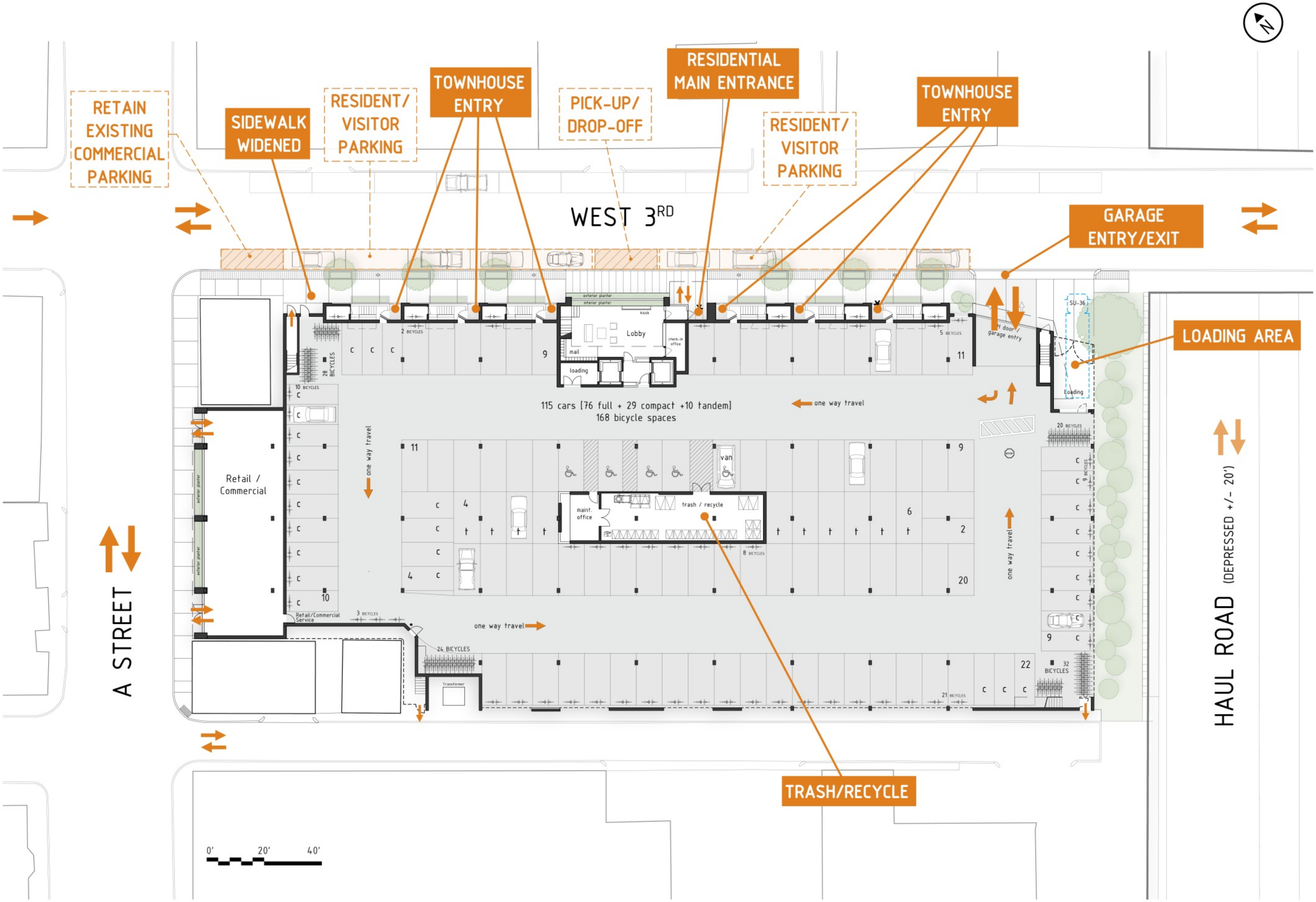
Third Residential Level Floor Plan

Figure 1-10

Fourth Residential Level Floor Plan

Figure 1-11

Fifth Residential Level Floor Plan



45 West Third Street Boston, Massachusetts

Hacin + Associates Inc. [architecture + design]
112 Shawmut Avenue, Studio 5A, Boston, MA 02118

Figure 1-12

Pedestrian and Vehicular Circulation

The Project will improve the surrounding streetscape with wider sidewalks, new lighting and street trees. Additional landscaped areas will further enhance the aesthetics of the streetscape along the site's edges.

1.4 Public Benefits

The Project will redevelop an underused site with a sustainably designed building and provide new housing in South Boston with ground floor retail space to activate the site. The Project will include numerous benefits to the neighborhood and the City of Boston, including the following:

- The Project will create approximately 164 new residential units proximate to public transportation.
- The Project will include approximately 22 affordable units in accordance with the Executive Order dated February 29, 2000 requiring that 15% of market rate units be affordable to specified levels of income households.
- Approximately 180 construction jobs and 15 permanent full- and part-time jobs will be created.
- The Project will substantially increase annual property taxes over 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 Project will provide a variety of urban design benefits to the surrounding neighborhood, including:

- The Project will meet the requirements of Article 37 of the Boston Zoning Code with a goal of meeting the Silver level of the Leadership in Energy and Environmental Design (LEED) for New Construction rating system.
- The Project will activate A Street with new ground floor retail/commercial space.
- The amenity space on the roof of the parking garage will include landscaped areas that will reduce stormwater runoff from the site.
- Improved streetscapes will be created along the major streets abutting the site with widened sidewalks, lighting and street trees.

1.5 City of Boston Zoning

The Project is located in an M-2 restricted manufacturing zoning district, and restricted parking district, on a 42,509 sf parcel at 45 West Third Street in the South Boston neighborhood of the City of Boston. Because the Project contains more than 50,000 gross square feet of additional floor area, Large Project Review is required under Article 80 of the Boston Zoning Code (the Code). Zoning relief will be sought from the Boston Board of Appeal, including a conditional use permit for residential dwellings. Zoning relief from dimensional requirements, including FAR and usable open space, are also anticipated. The dimensional zoning requirements for the Project are set forth in Table B of Article XIII of the Code. The M-2 zoning district does not have any minimum required lot square footage per residential unit, nor any maximum allowed building height. Under Section 13-4 of the Code, dimensional requirements for minimum lot area, minimum lot width, required front, side and rear yards, and required open space are taken from a near-by H-1 zoning district. Finally, under Section 23-1 of the Code, 0.7 parking spaces would be required on-site for each dwelling unit constructed thereon.

1.6 Legal Information

1.6.1 Legal Judgments Adverse to the Proposed Project

The Proponent is not aware of any legal judgments or pending actions against the proposed Project.

1.6.2 History of Tax Arrears on Property

The Proponent does not own any property in Boston on which the property taxes are in arrears.

1.6.3 Site Control / Public Easements

The Project site is one parcel currently owned by Cliflex Bellows Corporation. The Proponent has site control by virtue of a legally binding purchase and sale agreement with the owner. The Project is not subject to any easements for public use. The site survey can be found in Appendix A.

1.7 Anticipated Permits

Table 1-2 presents a preliminary list of permits and approvals from governmental agencies that are expected to be required for the Project. It is possible that only some of these permits or actions will be required, or that additional permits or actions will be required.

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 Board of Appeal	Zoning Relief
Boston Landmarks Commission	Article 85 Demolition Delay Review
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)

1.8 Public Participation

A Letter of Intent was filed with the BRA on January 17, 2014 beginning the Project's formal public review process. The Proponent has met with abutters, South Boston 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.

1.9 Schedule

Construction of the Project is estimated to last approximately 14 to 16 months, with initial site work expected to begin in the fourth quarter of 2014.

Chapter 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

Howard/Stein-Hudson Associates, Inc. (HSH) has conducted an evaluation of the transportation impacts of the proposed mixed-use redevelopment containing residential and retail/commercial uses to be located at 45 West Third Street in South Boston. This transportation study adheres to the Boston Transportation Department (BTD) *Transportation Access Plan Guidelines* and the Boston Redevelopment Authority's (BRA) Article 80 development review process. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, loading operations, transit services, and pedestrian activity.

2.1.1 Project Description

The Project site is located at 45 West Third Street in South Boston and is bounded by West Third Street to the north, A Street to the west, Athens Street to the south, and a depressed South Boston Haul Road to the east as shown in Figure 2-1. The Project site is situated less than a quarter mile from Broadway Station, which serves the MBTA Red Line and several MBTA bus routes, providing convenient access to multiple transit opportunities. The site is also near a bicycle sharing station provided by Hubway and is in proximity to both off-road multi-use paths and on-street bicycle facilities. The nearby transit opportunities and bicycle facilities will provide residents of the Project with alternative non-vehicular modes of transportation that will reduce the vehicular traffic related impacts of the Project. The site is also near car-sharing opportunities.

The site currently contains a one-story brick building used for light industry, areas of paved open space, and a 36-space parking lot. The Project will replace the existing uses and will include approximately 164 residential units and approximately 2,200 sf of ground floor retail/commercial space, and an approximately 800 sf mezzanine that could be used as an extension of the retail/commercial space, located along the A Street frontage. Approximately 115 parking spaces will be provided on-site in a partially below-grade garage. The parking is programmed for the residential use on the site. On-site, secure storage will be provided for approximately 168 bicycles and will be located in the garage (one bicycle space per residential unit and four spaces for site employees).

Vehicular access to the garage will be provided by a single driveway along West Third Street, approximately 300 feet east of A Street. Primary pedestrian access to the residential component will be provided by a main entrance and several other individual dwelling unit entrances along West Third Street with additional secondary pedestrian egress along Athens Street. Pedestrian access to the retail/commercial space will be provided along A Street. Loading, deliveries, and trash pick-up will take place in a loading area off West Third Street, adjacent to the entrance to the parking garage.

2.1.2 Study Area

The study area consists of the following six intersections, also shown on Figure 2-1:

- B Street/West Third Street;
- B Street/West Broadway;
- A Street/Athens Street;
- A Street/West Second Street;
- A Street/West Third Street; and
- A Street/West Broadway.

2.1.3 Study Methodology

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

The existing conditions analysis includes an inventory of the existing (2013) transportation conditions such as traffic characteristics, parking and curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site conditions. Existing counts for vehicles, bicycles, and pedestrians were collected in April and September 2013 at the study area intersections. The traffic counts form the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2019, based on a five-year horizon from the year of the filing of this traffic study. Expected roadway, parking, transit, pedestrian, bicycle accommodation, and loading capabilities and deficiencies are identified. This section includes the following scenarios:

- The 2019 No Build conditions scenario includes both general background traffic growth and traffic growth associated with specific developments and transportation improvements that are planned in the vicinity of the Project site.
- The 2019 Build conditions scenario includes Project-generated traffic volume estimates added to the traffic volumes developed as part of the 2019 No Build conditions scenario.

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

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

Figure 2-1

Study Area Intersections

2.2 Existing Conditions

2.2.1 Existing Roadway Conditions

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

West Third Street

- Is adjacent to the north side of the Project site.
- Is classified as a local roadway.
- Runs in an east-west direction between West Second Street to the west and Dorchester Street to the east.
- Is a two-way roadway with a single travel lane in each direction and parking provided along both sides in the vicinity of the Project site.
- Sidewalks are provided along both sides of West Third Street.

A Street

- Is adjacent to the west side of the Project site.
- Is classified as an urban principal arterial roadway.
- Runs in a north-south direction between Congress Street to the north and Dorchester Avenue to the south.
- Bicycle lanes are provided along A Street in both directions in the vicinity of the site.
- Is a two-way roadway with a single travel lane in each direction with no parking allowed along either side of the roadway in the vicinity of the Project site.
- Sidewalks are provided along both sides of A Street.

B Street

- Is east of the Project site.
- Is classified as an urban principal arterial roadway.
- Runs in a north-south direction between Dorchester Avenue to the south and West First Street to the north.
- Is a two-way roadway with parking along both sides south of West Third Street and one-way in the southbound direction north of West Third Street.
- Sidewalks are provided along both sides of B Street.

West Broadway

- Is south of the Project site.
- Is classified as an urban principal arterial roadway.
- Runs in an east-west direction between Dorchester Avenue to the west and Dorchester Street to the east.
- Is a two-way roadway with a single travel lane in each direction with parking along both sides.
- Sidewalks are provided along both sides of West Broadway.

Athens Street

- Is adjacent to the south side of the Project site.
- Is classified as a local roadway.
- Runs in an east-west direction between West Second Street to the west and Haul Road to the east.
- West of A Street, Athens Street is one-way in the westbound direction.
- East of A Street, Athens Street accommodates two-way travel, although it is only wide enough to allow a single vehicle to pass.
- The segment of Athens Street adjacent to the site has no outlet and does not allow travel east of Haul Road.
- Sidewalks are provided along both sides of Athens Street.

West Second Street

- Is north of the Project site.
- Is classified as a local roadway adjacent to the Project site and an urban principal arterial west of B Street.
- Runs in an east-west direction between Dorchester Avenue to the west and Dorchester Street to the east.
- Is one-way westbound with parking along both sides east of A Street, and two-way west of A Street.
- Sidewalks are provided along both sides of West Second Street.

2.2.2 Existing Intersection Conditions

Existing conditions at each of the study area intersections are described below.

B Street/West Third Street

- Is a four-legged, unsignalized intersection under BTD jurisdiction.
- The B Street northbound approach consists of a single travel lane under STOP control that accommodates left-turn and right-turn movements. Pavement markings are not provided to separate the directions of travel along this approach.
- The B Street southbound approach is one-way and consists of a single travel lane under STOP control.
- The West Third Street eastbound approach consists of a single travel lane under STOP control that accommodates through and right-turn movements.
- West Third Street, east of B Street, is one-way departing the intersection.
- Parking is allowed on both sides of all approaches to the intersection.
- Crosswalks are provided across all legs of the intersection.
- Sidewalks are provided along both sides of all approaches.

B Street/West Broadway

- Is a four-legged, unsignalized intersection under BTD jurisdiction.
- The B Street northbound and southbound approaches consist of single travel lanes under STOP control. Pavement markings are not provided to separate the directions of travel along B Street.
- The West Broadway eastbound and westbound approaches consist of single travel lanes. The directions of travel along the West Broadway approaches are separated by a double yellow centerline.
- Parking is allowed on both sides of all approaches to the intersection.
- An MBTA bus stop is provided along West Broadway eastbound, east of the intersection.
- Crosswalks are provided across all legs of the intersection.
- Sidewalks are provided along both sides of all approaches.

A Street/Athens Street

- Is a four-legged, unsignalized intersection under BTD jurisdiction.
- The A Street northbound and southbound approaches consist of single travel lanes under STOP control. The directions of travel along the A Street approaches are separated by a double yellow centerline. Exclusive bicycle lanes are also provided along both A Street approaches.

- The Athens Street westbound approach consists of a single travel lane under STOP control. This approach accommodates two-way travel, although the width can only accommodate a single vehicle.
- Athens Street, west of A Street, is one-way departing the intersection.
- Parking is generally not allowed along either roadway at the intersection with the exception of two spaces along the southern side of Athens Street, west of the intersection.
- Crosswalks are not provided at the intersection.
- Sidewalks are provided along both sides of all approaches.

A Street/West Second Street

- Is a four-legged, signalized intersection under BTD jurisdiction.
- The A Street northbound approach consists of a single travel lane that accommodates left-turn and through movements. A bicycle lane is also provided along the A Street northbound approach.
- The A Street southbound approach consists of a single travel lane that accommodates through and right-turn movements. A bicycle lane is also provided along the A Street southbound approach. The directions of travel along the A Street approaches are separated by a double yellow centerline.
- West Second Street is one-way in the westbound direction east of A Street and consists of an exclusive left-turn lane and a shared through/right-turn lane.
- West Second Street eastbound consists of a single travel lane that accommodates left-turn and right-turn movements. The directions of travel along this approach are separated by a double yellow centerline.
- Parking is not allowed along either roadway at the intersection.
- Crosswalks are provided across all legs of the intersection, although pedestrian signal equipment is not provided.
- Sidewalks are provided along both sides of all approaches.

A Street/West Third Street

- Is a four-legged, unsignalized intersection under BTD jurisdiction.
- The A Street northbound approach consists of a single travel lane that accommodates through and right-turn movements. A bicycle lane is also provided along this approach.

- The A Street southbound approach consists of a single travel lane that accommodates left-turn and through movements. A bicycle lane is also provided along this approach. The directions of travel along A Street are separated by a double yellow centerline.
- The West Third Street westbound approach consists of a single travel lane under STOP control that accommodates left-turn and right-turn movements. Pavement markings are not provided along this approach to separate the directions of travel.
- The West Second Street eastbound approach is one-way and consists of a single travel lane under STOP control.
- Parking is allowed on both sides of all approaches to the intersection.
- Crosswalks are provided across all legs of the intersection.
- Sidewalks are provided along both sides of all approaches.

A Street/West Broadway

- Is a four-legged, signalized intersection under BTD jurisdiction.
- The A Street northbound approach consists of a single travel lane that accommodates left-turn, through, and right-turn movements. An exclusive bicycle lane is also provided along this approach.
- The A Street southbound approach consists of an exclusive left-turn lane and a shared through/right-turn lane. An exclusive bicycle lane is also provided along this approach. The directions of travel along A Street are separated by a double yellow centerline.
- The West Broadway eastbound and westbound approaches both consist of single travel lanes that accommodate left-turn, through, and right-turn movements.
- An MBTA bus stop is provided along West Broadway eastbound, east of the intersection.
- Parking is not allowed along A Street and is allowed along West Broadway at the intersection.
- Pedestrian signals and crosswalks are provided for all legs of the intersection.
- Sidewalks are provided along both sides of all approaches.

2.2.3 Existing Traffic Conditions

Traffic movement data was collected at the intersections of B Street/West Third Street, B Street/West Broadway, and A Street/Athens Street on September 26, 2013 and at A Street/West Broadway, A Street/West Second Street, and A Street/West Third on April 25,

2013. Manual turning movement counts (TMCs) and vehicle classification counts were conducted during the weekday a.m. and p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) for the study area intersections.

The vehicle classification counts included car, truck, pedestrian, and bicycle movements. Based on the TMCs, the peak hours of vehicular traffic throughout the study area are 7:45 – 8:45 a.m. and 5:00 – 6:00 p.m. The detailed traffic counts are provided in Appendix B.

Seasonal Adjustment

To account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. Typically, nearby continuous traffic count stations are used to determine monthly fluctuations in traffic volumes. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the April and September 2013 TMCs. The 2011 seasonal adjustment factors for April and September for roadways similar to the study area are 0.92 and 0.93 respectively, which indicates that average month traffic volumes are approximately 92 percent of typical April traffic volumes and 93 percent of typical September traffic volumes. The traffic counts were not adjusted downward to reflect average month conditions in order to provide a more conservative analysis consistent with the peak season traffic volumes. The 2013 Existing weekday a.m. and p.m. peak hour traffic volumes are shown in Figure 2-2 and Figure 2-3, respectively.

2.2.4 Existing Traffic Operations

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay experienced by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 6) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM). Field observations were performed by HSH to collect intersection geometry such as number of turning lanes, lane length, and lane width that were then incorporated into the operations analysis.

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. Table 2-1 displays the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst (unacceptable) condition, with significant traffic delay. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

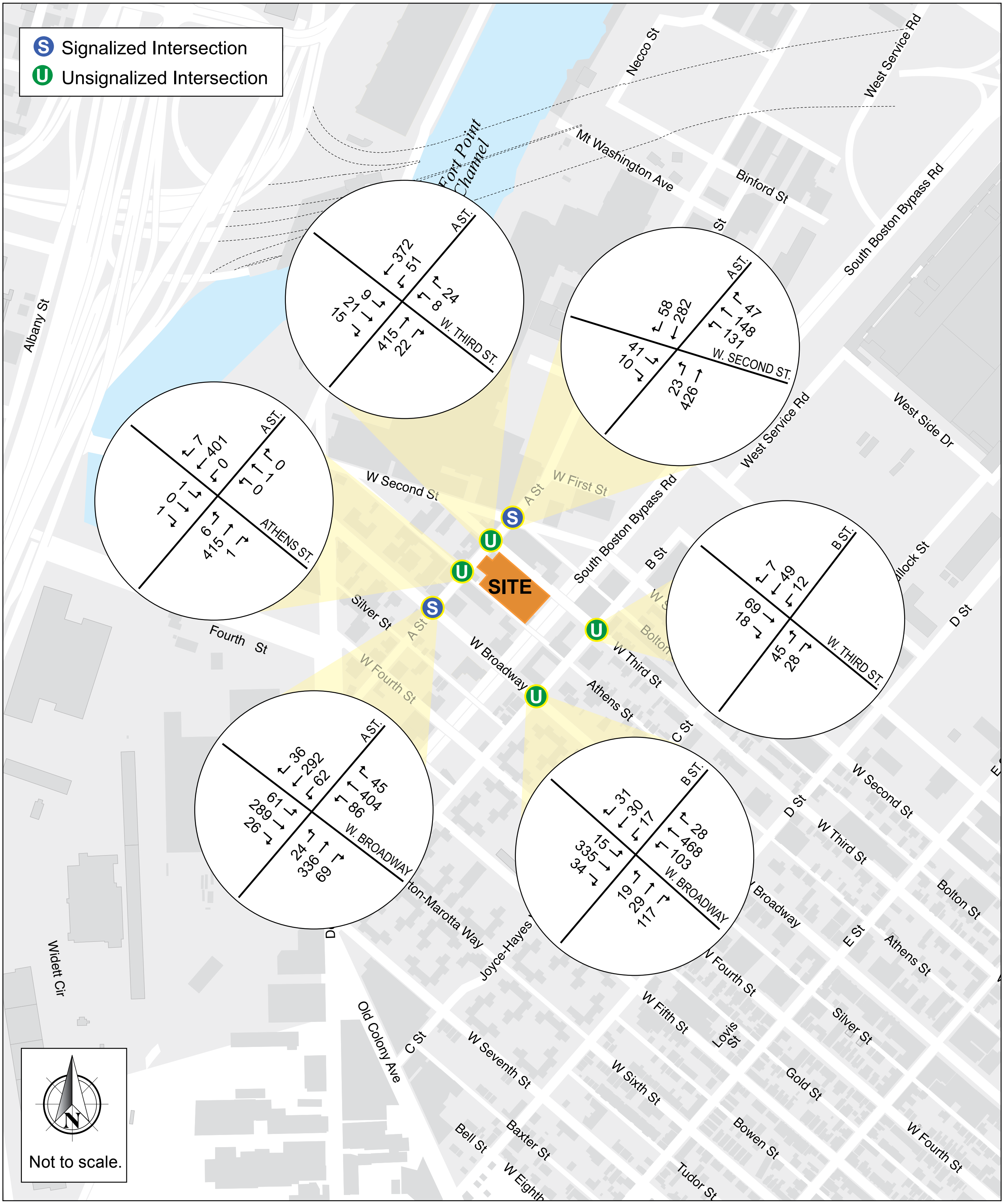


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Figure 2-2
Existing Conditions (2013) Turning Movement Volumes, a.m. Peak Hour (8:00-9:00 a.m.)

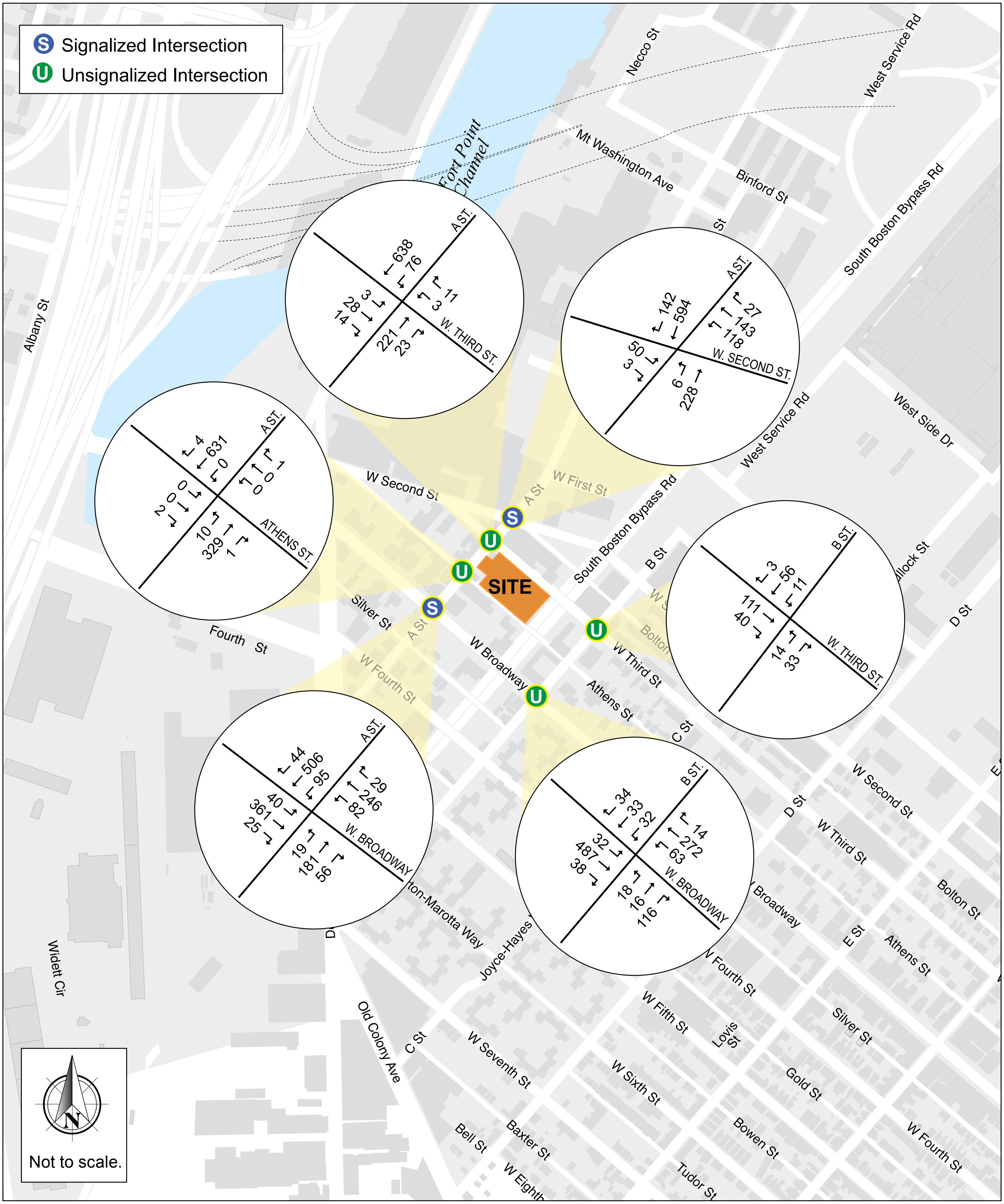

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Figure 2-3

Existing Conditions (2013) Turning Movement Volumes,
p.m. Peak Hour (4:15-5:15 p.m.)

Table 2-1 Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

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

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

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

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

Table 2-2 and Table 2-3 present the 2013 Existing conditions operational analysis for the study area intersections during the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in Appendix B.

Table 2-2 Existing Conditions (2013), Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
West 2nd Street/A Street	**B**	**10.1**	—	—	—
West 2nd Street EB left	B	16.2	0.23	13	25
West 2nd Street EB right	A	6.5	0.05	0	4
West 2nd Street WB left	B	17.8	0.41	45	59
West 2nd Street WB thru/right	B	16.7	0.51	59	74
A Street NB left/thru	A	6.5	0.44	71	180
A Street SB thru/right	A	6.3	0.33	41	102
A Street/West Broadway	**C**	**27.6**	—	—	—
West Broadway EB left/thru/right	B	17.5	0.56	165	258
West Broadway WB left/thru/right	C	22.5	0.73	264	409
A Street NB left/thru/right	D	41.2	0.82	271	#443
A Street SB left	C	31.9	0.41	36	70
A Street SB thru/right	C	28.9	0.57	155	294
Unsignalized Intersections					
A Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB left/thru/right	D	31.9	0.32	—	33
West 3rd Street WB left/right	D	26.8	0.21	—	19
A Street NB thru/right	A	0.0	0.31	—	0
A Street SB left/thru	A	2.6	0.10	—	8
A Street/Athens Street	—	—	—	—	—
Athens Street WB left/thru/right	D	26.2	0.02	—	2
A Street NB left/thru/right	A	0.2	0.01	—	1
A Street SB left/thru/right	A	0.0	0.00	—	0
B Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB thru/right	A	8.0	0.13	—	*
B Street NB left/right	A	7.9	0.13	—	*
B Street SB left/thru/right	A	8.0	0.13	—	*
B Street/West Broadway	—	—	—	—	—
West Broadway EB left/thru/right	A	0.9	0.03	—	2
West Broadway WB left/thru/right	A	5.0	0.19	—	18
B Street NB left/thru/right	F	>50.0	>1.00	—	**
B Street SB left/thru/right	F	>50.0	>1.00	—	**

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
Grey shading indicates LOS E or LOS F.
* Synchro does not calculate queues for all-way STOP controlled intersections.
** The v/c ratio is outside the acceptable limits for Synchro to calculate the 95th percentile queue.

Table 2-3 Existing Conditions (2013), Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
West 2nd Street/A Street	**B**	**18.4**	—	—	—
West 2nd Street EB left	D	49.4	0.44	39	68
West 2nd Street EB right	C	22.0	0.01	0	7
West 2nd Street WB left	D	47.3	0.52	99	128
West 2nd Street WB thru/right	D	49.8	0.67	137	183
A Street NB left/thru	A	4.1	0.17	1	82
A Street SB thru/right	A	6.4	0.50	158	301
A Street/West Broadway	**C**	**27.4**	—	—	—
West Broadway EB left/thru/right	C	33.1	0.75	250	381
West Broadway WB left/thru/right	C	33.2	0.73	207	331
A Street NB left/thru/right	B	16.1	0.39	109	166
A Street SB left	B	16.5	0.27	42	69
A Street SB thru/right	C	27.0	0.66	269	392
Unsignalized Intersections					
A Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB left/thru/right	F	>50.0	0.45	—	50
West 3rd Street WB left/right	E	39.9	0.21	—	19
A Street NB thru/right	A	0.0	0.15	—	0
A Street SB left/thru	A	2.2	0.09	—	7
A Street/Athens Street	—	—	—	—	—
Athens Street WB left/thru/right	B	11.8	0.01	—	1
A Street NB left/thru/right	A	0.8	0.03	—	2
A Street SB left/thru/right	A	0.0	0.00	—	0
B Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB thru/right	A	8.4	0.23	—	*
B Street NB left/right	A	7.4	0.07	—	*
B Street SB left/thru/right	A	8.1	0.14	—	*
B Street/West Broadway	—	—	—	—	—
West Broadway EB left/thru/right	A	1.2	0.04	—	3
West Broadway WB left/thru/right	A	5.6	0.19	—	17
B Street NB left/thru/right	F	>50.0	>1.00	—	**
B Street SB left/thru/right	F	>50.0	>1.00	—	**

Grey shading indicates LOS E or LOS F.
* Synchro does not calculate queues for all-way STOP controlled intersections.
** The v/c ratio is outside the acceptable limits for Synchro to calculate the 95th percentile queue.

As shown in Table 2-2, the signalized intersections in the study area currently operate at LOS C or better, with all movements at the intersections operating at LOS D or better during the a.m. peak hour. With the exception of the B Street/West Broadway intersection, the movements at the unsignalized intersections in the study area currently operate at LOS D or better, with minimal delay and queuing during the a.m. peak hour. The side street movements at the B Street/West Broadway intersection currently operate at LOS F. This type of operation is not uncommon for unsignalized side streets that intersect arterial roadways such as West Broadway. The HCM analysis for unsignalized intersections also assumes more conservative parameters than what is typically experienced in an urban environment, such as the critical gap[1]. The traffic signal to the west at the A Street/West Broadway intersection also creates a metering effect for the eastbound traffic, creating regular gaps to allow vehicles to enter West Broadway from B Street. The longest queues at the intersection occur along the A Street northbound approach to West Broadway and the West Broadway westbound approach to A Street. The 95th percentile queues along these approaches range from approximately 410 to 445 feet (17 to 18 vehicles). The longest 50th percentile queues along these approaches are much shorter and are approximately 275 feet (11 vehicles).

As shown in Table 2-3, during the p.m. peak hour, the signalized intersections in the study area currently operate at LOS C or better, with all movements at the intersections operating at LOS D or better. The movements at the unsignalized intersections of A Street/Athens Street and B Street/West Third Street currently operate at LOS B or better, with minimal delay and queuing during the p.m. peak hour. The side street movements at the B Street/West Broadway intersection currently operate at LOS F, and the side street movements at the A Street/West Third Street intersection currently operate at LOS E and F. As previously discussed, this type of operation is not uncommon for unsignalized side streets that intersect arterial roadways such as West Broadway and A Street. The longest queues at the intersection occur along the A Street southbound approach to West Broadway, and the West Broadway eastbound approach to A Street. The 95th percentile queues along these approaches range from approximately 380 to 400 feet (15 to 16 vehicles). The longest 50th percentile queues along these approaches are much shorter and range from approximately 250 to 275 feet (10 to 11 vehicles).

Based on the existing conditions traffic operational analysis, there are some movements that currently operate at capacity, specifically at the A Street/West Broadway intersection. This intersection was recently upgraded to provide bicycle lanes and reconfigured lane assignments along the A Street southbound approach.

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[1] The critical gap is the minimum length of time interval in the major street traffic stream that allows intersection entry for one minor street vehicle.

2.2.5 Existing Parking and Curb Usage

On-street parking surrounding the Project site generally consists of no parking, unrestricted parking, commercial parking, residential permit parking, and two-hour parking. West Third Street, adjacent to the site, is generally signed as no parking, with a small area designated for commercial parking near the intersection with A Street. Although it is generally signed as no parking, it was observed that vehicles park along West Third Street adjacent to the site. West Third Street, opposite the site, is signed as two-hour parking. Parking is not allowed along A Street or Athens Street adjacent to the site. The on-street parking regulations within the study area are shown on Figure 2-4.

2.2.6 Existing Public Transportation

The Project site is ideally situated to take advantage of several public transportation opportunities, and is located less than a quarter-mile from the MBTA Broadway Station and several MBTA bus routes. Broadway Station provides access to the MBTA Red Line and three MBTA bus routes. The following describes each public transportation route located in the vicinity of the Project site, with a map of the nearby public transportation services shown in Figure 2-5.

MBTA Bus Route 9 – This route provides service between the City Point bus terminal in South Boston and Copley Square in the Back Bay. Weekday and Saturday service run from approximately 5:10 a.m. to 1:15 a.m., with Sunday service running from approximately 6:00 a.m. to 1:15 a.m. Headways range from approximately 5 minutes to 30 minutes. The route runs along West Broadway in the vicinity of the site, with the nearest stops located at the intersections of West Broadway/B Street and West Broadway/C Street.

MBTA Bus Route 11 – This route provides service between the City Point bus terminal in South Boston and downtown Boston. Weekday and Saturday service run from approximately 5:10 a.m. to 1:25 a.m., with Sunday service running from approximately 6:15 a.m. to 1:30 a.m. Headways range from approximately 10 minutes to 50 minutes. The route runs along A Street and West Broadway in the vicinity of the site, with the nearest stops located at the intersections of West Second Street/West Third Street and West Broadway/A Street.

MBTA Bus Route 47 – This route provides service between Broadway Station in South Boston and Central Square in Cambridge via Ruggles Station in the Fenway area. Weekday service runs from approximately 6:00 a.m. to 1:00 a.m. with headways of approximately 10 to 45 minutes. Saturday service runs from approximately 5:35 a.m. to 1:10 a.m. with headways of approximately 25 to 40 minutes. Sunday service runs from approximately 8:00 a.m. to 1:10 a.m. with headways of approximately 40 minutes to one hour. The route runs along Dorchester Avenue, west of the Project site, with the nearest stop located at Broadway Station.

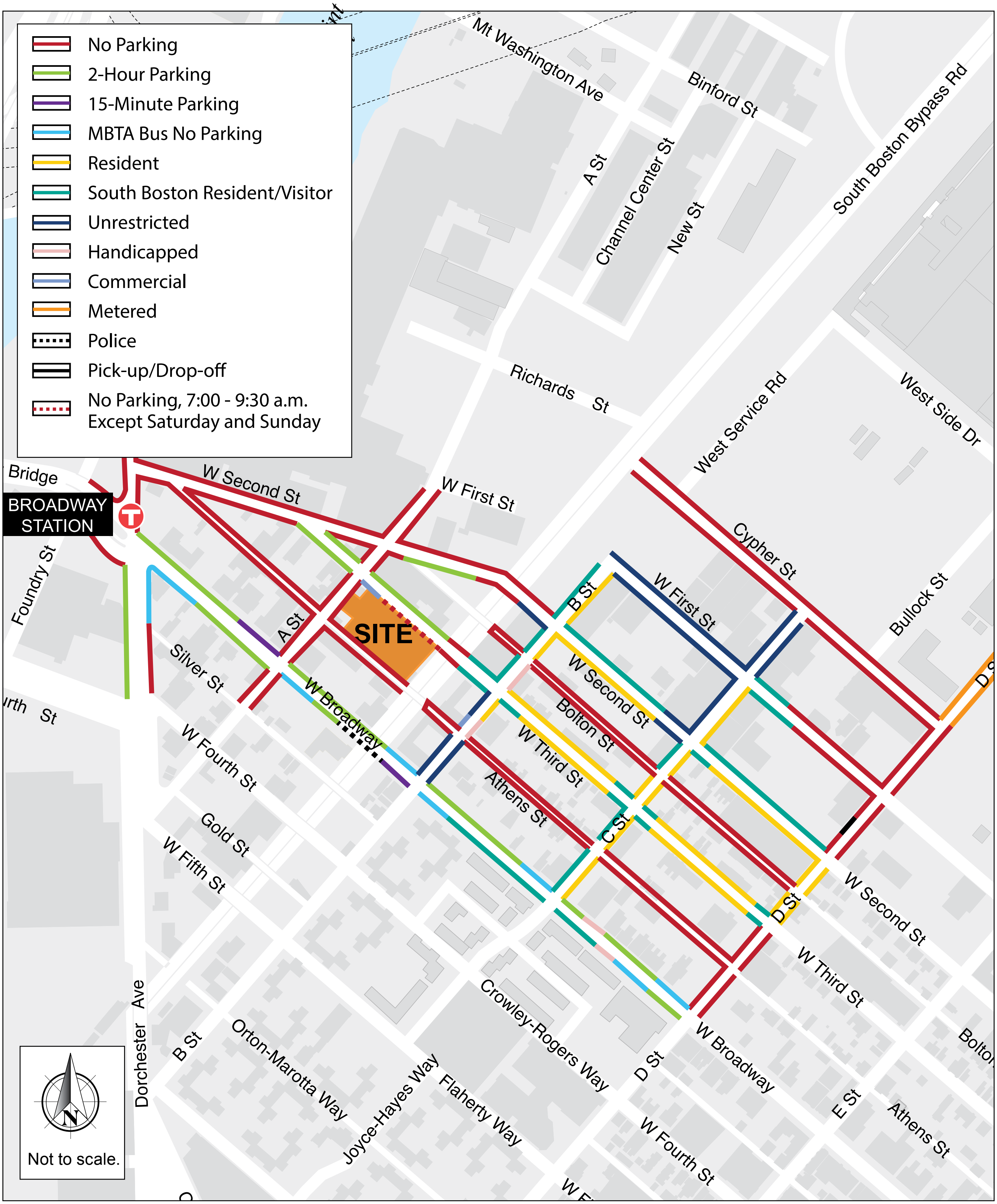

Figure 2-4
On-Street Parking Regulations

45 West Third Street **Boston, Massachusetts**

Figure 2-5

Public Transportation in the Study Area

MBTA Red Line – The Red Line branch of the MBTA subway system stops at Broadway Station. The Red Line provides access between Alewife Station to the north and both Ashmont Station and Braintree Station to the south. The Red Line also provides convenient access to downtown Boston, Cambridge, and Quincy. South Station, which provides access to bus terminals, commuter rail lines, regional rail lines, and Logan Airport via the MBTA Silver Line is one stop north of Broadway Station on the Red Line. The Red Line operates with headways of approximately 9 to 16 minutes.

2.2.7 Existing Pedestrian Conditions

The Project site is located adjacent to A Street, West Third Street, and Athens Street in South Boston. Sidewalks are provided along all streets within the study area. The sidewalks along West Third Street supply adequate capacity for the existing level of pedestrian activity, being approximately 7 to 8 feet in width, and are generally in good condition. The sidewalks along A Street supply adequate capacity, being approximately 6 to 10 feet in width, and are generally in good condition. A Street provides pedestrian access between the West Broadway neighborhood, including Broadway Station, and the Fort Point and Seaport areas of South Boston. The sidewalks along Athens Street are approximately 4 to 5 feet in width, and are generally in good condition. The pedestrian activity along Athens Street is minimal.

Crosswalks are provided at the study area intersections, with pedestrian signal equipment and phasing provided at the signalized locations. A Street and West Third Street currently provide the primary pedestrian access between the Project site and the public transportation and commercial businesses at Broadway Station and along West Broadway and Dorchester Avenue.

To estimate the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersections and are presented in Figure 2-6. As expected, the pedestrian activity within the study area is heaviest along West Broadway and A Street, with moderate activity along West Third Street.

2.2.8 Existing Bicycle Facilities

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located in close proximity to several bicycle facilities. The South Bay Harbor Trail is located to the west of the Project site and is a multi-use path that will ultimately connect the Fort Point district of Boston to the Southwest Corridor Park. Along with the South Bay Harbor Trail, the following roadways within the study area are designated bicycle routes on the City of Boston's "Bike Routes of Boston" map:

- **Dorchester Avenue** and **West Broadway** are designated as advanced routes suitable for traffic-confident cyclists with on-road experience.

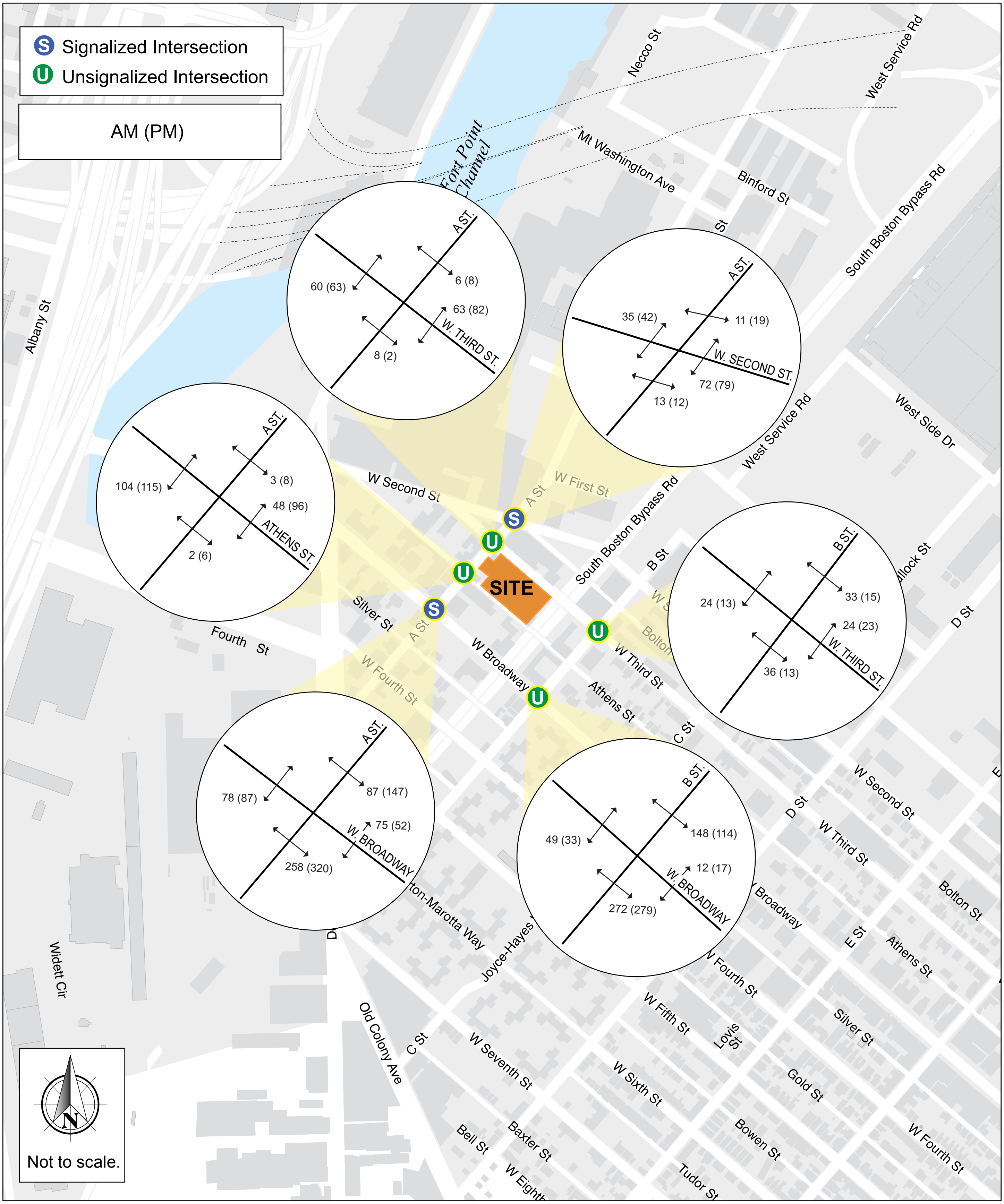

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Figure 2-6

Existing Pedestrian (2013) Volumes, a.m. and p.m. Peak Hour

- **West First Street, West Second Street,** and **A Street** are designated as intermediate routes suitable for riders with some on-road experience. Within the past year, exclusive bicycle lanes have been installed along A Street in both the northbound and southbound directions through the study area, allowing for a safer and more attractive option for bicyclists throughout the Seaport, Fort Point, and West Broadway neighborhoods of South Boston.

Bicycle counts were conducted concurrent with the vehicular TMCs and are presented in Figure 2-7. As shown in Figure 2-7, bicycle volumes are generally light around the Project site, with the heaviest movements along A Street and West Third Street.

The Project site is also located in close proximity to a bicycle sharing station provided by Hubway. Hubway is the bicycle sharing system in the Boston area, which was launched in 2011 and consists of over 100 stations and 1,000 bicycles. The nearest Hubway station is located along Dorchester Avenue at Gillette Park near the Dorchester Avenue/West Second Street intersection, approximately a quarter-mile west of the Project site (see Figure 2-8).

2.2.9 Car Sharing Services

Car sharing, predominantly served by Zipcar in the Boston area, provides easy access to short term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location.

There are currently three car sharing locations with a total of 10 vehicles in proximity to the Project site:

- 11 West Broadway (2 vehicles)
- 170 West Broadway (4 vehicles)
- West Broadway/F Street (4 vehicles)

The nearby Zipcar locations are shown in Figure 2-8.

2.3 Future Conditions

For transportation impact analyses, it is standard practice to evaluate two future conditions: No Build conditions (without the proposed project) and Build conditions (with the proposed project). In accordance with BTD guidelines, these conditions are projected to a future date five years from the current year. For the evaluation of this Project, 2019 was selected as the horizon year for the future conditions analyses.

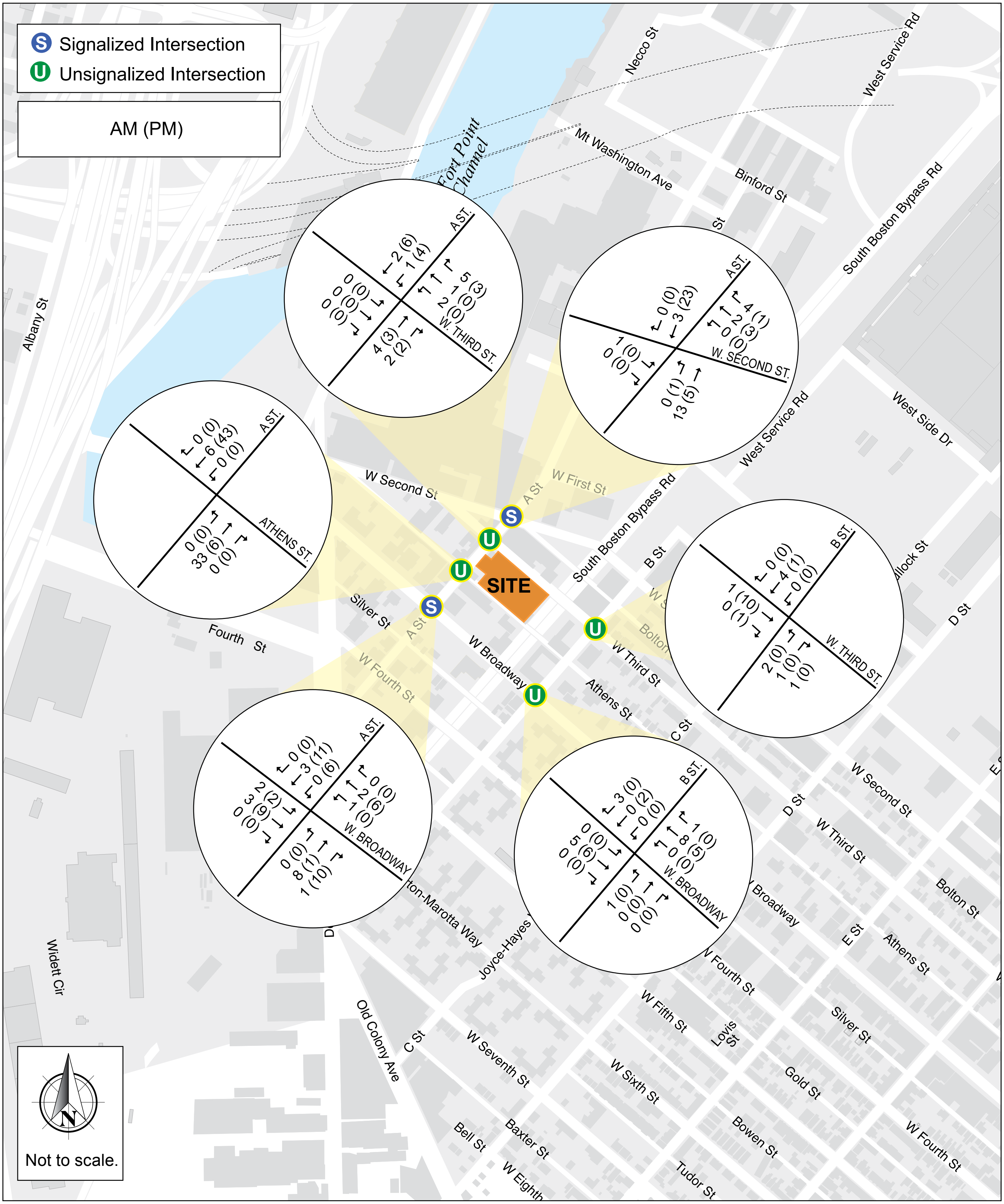

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Figure 2-7

Existing Bicycle (2013) Volumes, a.m. and p.m. Peak Hour

45 West Third Street   Boston, Massachusetts

Figure 2-8
ZipCar and Hubway Locations

This section presents a description of the 2019 future conditions scenarios and includes an evaluation of the transportation facilities under the No Build and Build conditions.

2.3.1 No Build Conditions

The No Build conditions reflect a future scenario that incorporates any anticipated traffic volume changes independent of the Project, and any planned infrastructure improvements that will affect travel patterns throughout the study area. Infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements. Traffic volume changes are based on two factors: an annual growth rate and growth associated with specific developments near the Project.

2.3.1.1 Background Traffic Growth

The methodology to account for future traffic growth, independent of the Project, consists of two parts. The first part of the methodology accounts for general background traffic growth that may be affected by changes in demographics, automobile usage, and automobile ownership. Based on a review of recent and historic traffic data collected for nearby projects and to account for any additional unforeseen traffic growth, a one percent per year annual traffic growth rate was used to develop the future conditions traffic volumes.

The second part of the methodology identifies any specific planned developments that are expected to affect traffic patterns throughout the study area within the future analysis time horizon. The projects listed in Table 2-4 are located in the vicinity of the study area. Table 5-4 also shows the overall development program, the permitting status of each project, and if the traffic volumes associated with each project were specifically included or assumed to be part of the background growth rate. The locations of these projects are also shown in Figure 2-9. Traffic volumes associated with the larger or closer projects in Table 2-4 were specifically accounted for in the future conditions scenarios. The remainder of the projects listed in Table 2-4 are also in the vicinity of the Project site, but are only expected to add minimal traffic to the study area intersections. Traffic volumes for these projects were assumed to be accounted for in the general background growth rate.

Table 2-4 Background Projects

Project Name	Development Program[1]	BRA Status[2]	Traffic Volumes[3]
South Boston Boutique Hotel	156-room hotel	Board approved	Included
One Channel Center	525,000 sf of office and 970 parking spaces	Under construction	Included
West Square	259 residential units and 143 parking spaces	Construction completed late 2013	Included

Table 2-4 Background Projects (Continued)

Project Name	Development Program[1]	BRA Status[2]	Traffic Volumes[3]
Eleven West Broadway	50 residential units, 8,000 sf of retail and an underground parking garage	Construction completed late 2013	Included
D Street Development	250-room limited service hotel, 250-room extended stay hotel, 26,300 sf of retail and 1,350 parking garage	Under construction	Included
411 D Street	197 residential units and 129 parking spaces	Under construction	Included
22-26 West Broadway	31 residential units and 3,834 sf of retail	Under construction	Background Growth
339 D Street	24 residential units and 30 parking spaces	Under construction	Background Growth Rate
Patriot Homes	24 residential units for veterans	Board approved	Background Growth Rate
333-339 West Broadway	15 ownership residential units, ground-floor commercial and 23 parking spaces	Board approved	Background Growth Rate
340 West Second Street	29 residential units, ground floor commercial and 43 parking spaces	Board approved	Background Growth Rate
395 West Broadway	24 residential units, ground floor retail and 20 parking spaces	Construction completed late 2013	Background Growth Rate
401 West First Street	45 residential units and 68 parking spaces	Under construction	Background Growth Rate

1 Based on information obtained from the Boston Redevelopment Authority.
2 Permitting status as of December 2013.
3 Traffic volumes for the nearby or larger projects were specifically included. Traffic volumes for the smaller projects outside the immediate vicinity of the Project site were assumed to be part of the overall background growth rate assumptions.

The one-percent per year annual growth rate was applied to the 2013 Existing conditions traffic volumes, then the traffic volumes associated with the background development projects were added to develop the 2019 No Build conditions traffic volumes. The 2019 No Build a.m. and p.m. peak hour traffic volumes are shown on Figure 2-10 and Figure 2-11, respectively.

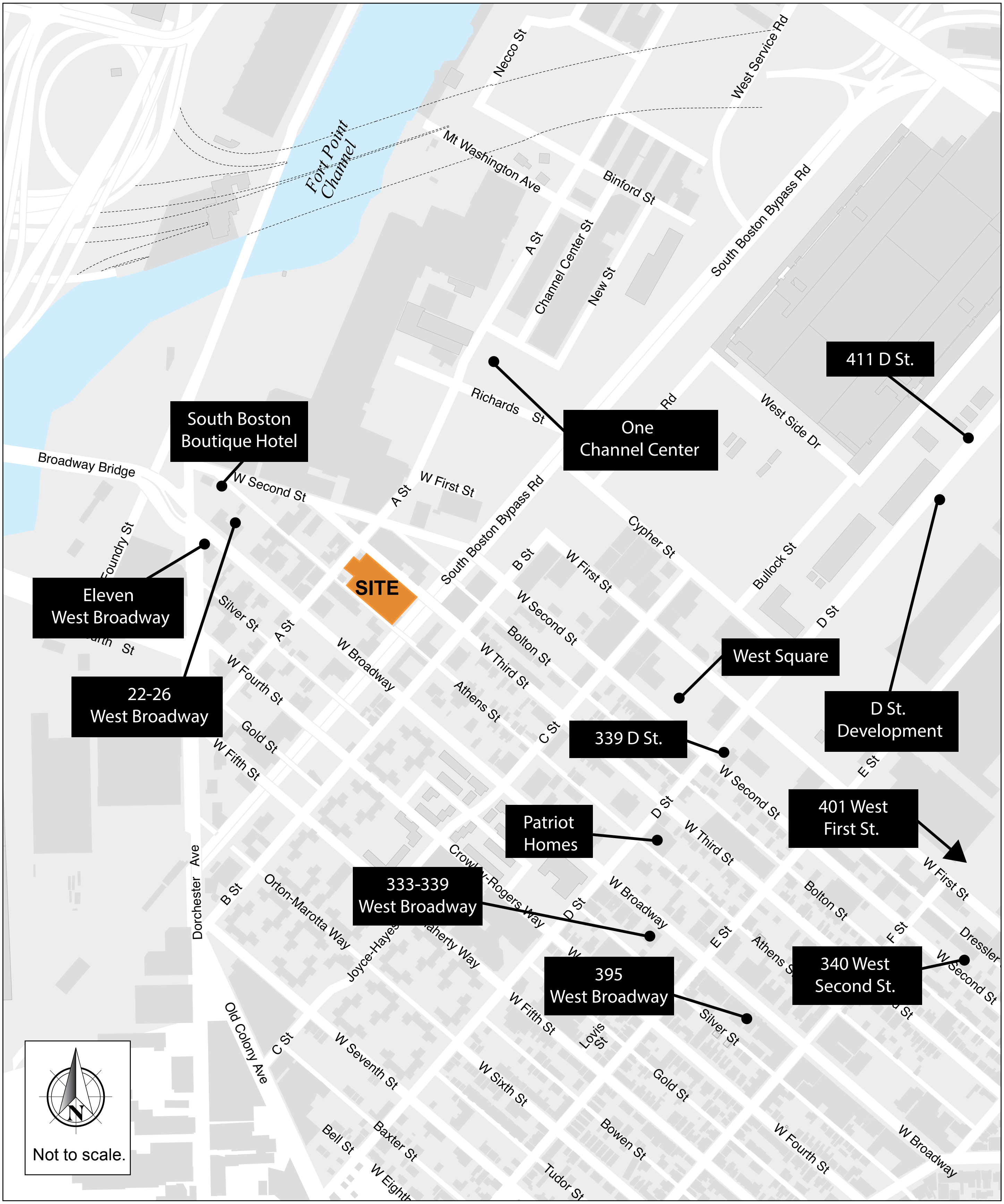

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Figure 2-9

Background Projects

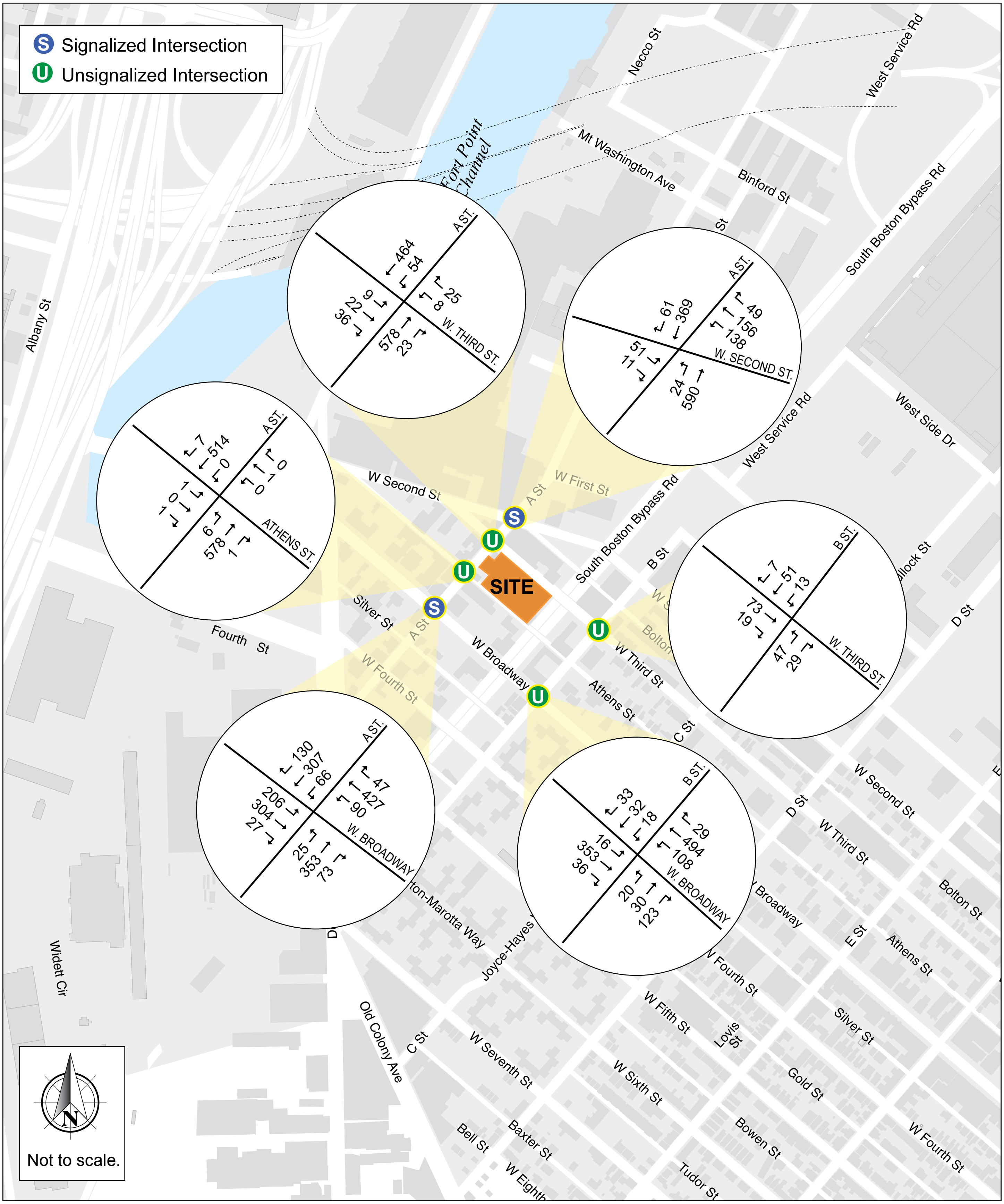

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Figure 2-10

No-Build Conditions (2018) Turning Movement Volumes, a.m. Peak Hour

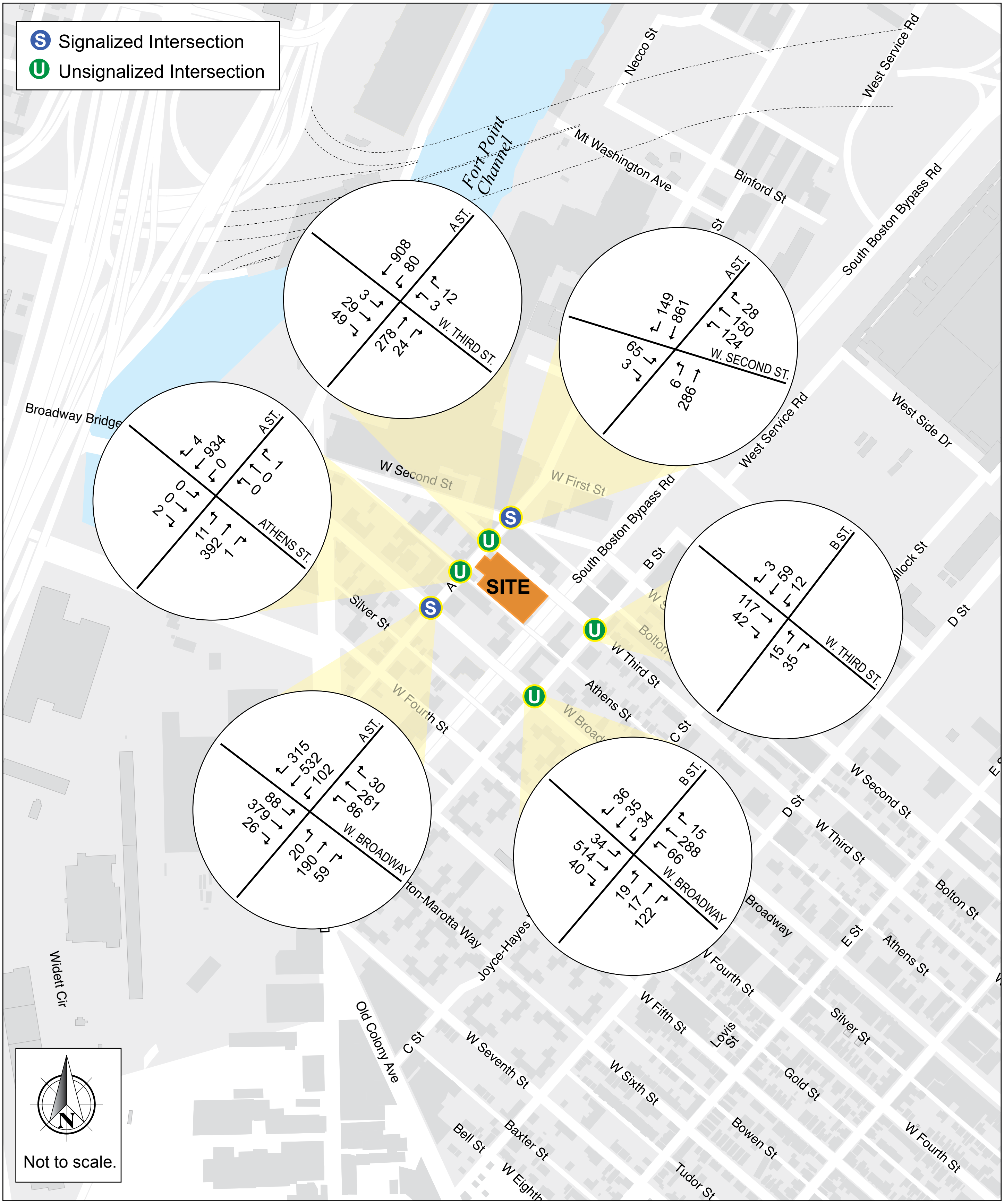

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Figure 2-11

No-Build Conditions (2018) Turning Movement Volumes, p.m. Peak Hour

2.3.1.2 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. Based on this review, the following improvements are proposed within the study area:

West Second Street/A Street – Improvements are proposed at this intersection as part of the Channel Center development. New traffic signal equipment, signage, and pavement markings will be provided at the intersection. Pedestrian signal equipment will also be added at the intersection.

West Broadway/A Street – Improvements are proposed at this intersection as part of the Channel Center development. New traffic signal equipment, signage, and pavement markings will be provided at the intersection. Pedestrian signal equipment will also be added at the intersection.

2.3.1.3 No Build Conditions Traffic Operations

The 2019 No Build conditions scenario analysis uses the same methodology as the 2013 Existing conditions scenario analysis. Table 2-5 and Table 2-6 present the 2019 No Build conditions operations analysis for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in Appendix B.

Table 2-5 No Build Conditions (2019), Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
West 2nd Street/A Street	**A**	**9.2**	—	—	—
West 2nd Street EB left	B	16.4	0.22	13	32
West 2nd Street EB right	A	7.5	0.03	0	8
West 2nd Street WB left	B	17.9	0.36	38	67
West 2nd Street WB thru/right	B	16.1	0.45	48	83
A Street NB left/thru	A	6.4	0.53	72	m163
A Street SB thru/right	A	6.5	0.38	50	127
A Street/West Broadway	**D**	**51.2**	—	—	—
West Broadway EB left/thru/right	F	>80.0	>1.00	~416	#628
West Broadway WB left/thru/right	C	23.8	0.75	277	430
A Street NB left/thru/right	E	65.7	0.97	298	#512
A Street SB left	C	30.8	0.36	31	82
A Street SB thru/right	D	38.9	0.80	217	#419

Table 2-5 No Build Conditions (2019), Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Unsignalized Intersections					
A Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB left/thru/right	E	35.3	0.38	—	42
West 3rd Street WB left/right	D	28.7	0.19	—	17
A Street NB thru/right	A	0.0	0.38	—	0
A Street SB left/thru	A	2.3	0.08	—	7
A Street/Athens Street	—	—	—	—	—
Athens Street WB left/thru/right	D	33.7	0.01	—	1
A Street NB left/thru/right	A	0.2	0.01	—	1
A Street SB left/thru/right	A	0.0	0.00	—	0
B Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB thru/right	A	7.8	0.12	—	*
B Street NB left/right	A	7.6	0.10	—	*
B Street SB left/thru/right	A	7.7	0.09	—	*
B Street/West Broadway	—	—	—	—	—
West Broadway EB left/thru/right	A	0.7	0.02	—	2
West Broadway WB left/thru/right	A	4.5	0.18	—	16
B Street NB left/thru/right	F	>50.0	>1.00	—	435
B Street SB left/thru/right	F	>50.0	>1.00	—	231

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
~ = 50th percentile volume exceeds capacity.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates that the LOS decreased to LOS E or worse between Existing and No Build conditions.
* Synchro does not calculate queues for all-way STOP controlled intersections.

Table 2-6 No Build Conditions (2019), Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
West 2nd Street/A Street	**B**	**17.5**	—	—	—
West 2nd Street EB left	D	52.6	0.49	46	88
West 2nd Street EB right	C	23.7	0.01	0	8
West 2nd Street WB left	D	47.9	0.50	87	140
West 2nd Street WB thru/right	D	50.0	0.63	122	185
A Street NB left/thru	A	3.9	0.19	47	92
A Street SB thru/right	A	9.8	0.68	289	544

Table 2-6 No Build Conditions (2019), Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
A Street/West Broadway	F	**>80.0**	—	—	—
West Broadway EB left/thru/right	D	46.9	0.90	309	#522
West Broadway WB left/thru/right	D	35.2	0.76	215	#353
A Street NB left/thru/right	C	28.1	0.69	128	242
A Street SB left	B	16.0	0.24	39	75
A Street SB thru/right	F	>80.0	>1.00	~668	#908
Unsignalized Intersections					
A Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB left/thru/right	F	>50.0	>1.00	—	158
West 3rd Street WB left/right	F	>50.0	0.37	—	32
A Street NB thru/right	A	0.0	0.19	—	0
A Street SB left/thru	A	2.2	0.08	—	7
A Street/Athens Street	—	—	—	—	—
Athens Street WB left/thru/right	B	12.4	0.01	—	0
A Street NB left/thru/right	A	0.8	0.03	—	2
A Street SB left/thru/right	A	0.0	0.00	—	0
B Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB thru/right	A	7.8	0.12	—	*
B Street NB left/right	A	7.6	0.10	—	*
B Street SB left/thru/right	A	7.7	0.09	—	*
B Street/West Broadway	—	—	—	—	—
West Broadway EB left/thru/right	A	1.0	0.04	—	3
West Broadway WB left/thru/right	A	4.6	0.17	—	13
B Street NB left/thru/right	F	>50.0	>1.00	—	**
B Street SB left/thru/right	F	>50.0	>1.00	—	**

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
~ = 50th percentile volume exceeds capacity.
Grey shading indicates that the LOS decreased to LOS E or worse between Existing and No Build conditions.
* Synchro does not calculate queues for all-way STOP controlled intersections.
** The v/c ratio is outside the acceptable limits for Synchro to calculate the 95th percentile queue.

As shown in Table 2-5, the intersection of A Street/West Broadway is expected to worsen from an overall LOS C to LOS D during the a.m. peak hour. This decrease in LOS is primarily caused by the increase in traffic volume for the West Broadway eastbound left-turn movement. The increase in traffic for this movement is associated with the larger background projects that were included in the future traffic volume projections. The eastbound movements at the unsignalized intersection of A Street/West Third Street are expected to worsen from LOS D to LOS E with the addition of the background traffic volumes. However, traffic volumes are light and the queues are expected to be minimal along this approach. The remainder of the study area intersections will continue to operate at the same LOS as the Existing conditions during the a.m. peak hour. The longest queues in the study area are expected to occur along the A Street northbound approach to West Broadway and the West Broadway eastbound approach to A Street.

As shown in Table 2-6, the intersection of A Street/West Broadway is expected to worsen from an overall LOS C to LOS F during the p.m. peak hour. Similar to operations during the a.m. peak hour, this decrease is primarily caused by the additional traffic volumes along the A Street southbound approach expected to be generated by the larger background development projects in the area. The westbound movements at the unsignalized intersection of A Street/West Third Street are expected to worsen from LOS E to LOS F with the addition of background traffic volumes. The remainder of the study area intersections will continue to operate at the same LOS as the Existing conditions during the p.m. peak hour. The longest queues in the study area are expected to occur along the A Street southbound approach to West Broadway and the West Broadway eastbound approach to A Street.

2.3.2 Build Conditions

As previously summarized, the Project will consist of approximately 164 residential apartment units and approximately 2,200 sf of ground floor retail/commercial space, and an approximately 800 sf mezzanine that could be used as an extension of the retail/commercial space. A total of approximately 115 parking spaces will be provided on-site in a garage accessed off of West Third Street to be programmed for the residential use. Secure storage for approximately 168 bicycles will also be provided on the site.

2.3.2.1 Site Access and Circulation

As shown in the Project site plan in Figure 2-12, access will be provided to a parking garage by a single driveway located along West Third Street, approximately 300 feet east of A Street. The parking garage will be located partially below-grade and will contain approximately 115 parking spaces programmed for the residential uses on the site.

Loading and service, including trash, recycling, and deliveries will occur on-site at the loading dock located on West Third Street, east of the parking garage driveway. In addition, adequate space has been provided on-site to accommodate residential move-in/move-out without impacting the public sidewalk, parking, or roadway.

Primary pedestrian access to the residential component will be provided by an entrance along West Third Street, with additional secondary and emergency access provided along Athens Street and through the parking garage. Pedestrian access to the retail portion of the site will be provided along A Street.

Figure 2-12

Parking Level Floor Plan

2.3.2.2 Trip Generation Methodology

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

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[2] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

To estimate the unadjusted number of vehicular trips for the Project, the following ITE land use codes (LUCs) were used:

Residential Uses: LUC 220 – Apartment. The apartment land use is defined as rental dwellings located within the same building with at least three other dwelling units. Trip generation estimates are based on average vehicle rates per unit. The Apartment land use code was selected because it has slightly higher trip generation rates than the other similar residential land uses (such as condominium units) provided in the *Trip Generation Manual* and presents a more conservative scenario.

Retail/Commercial Uses: LUC 820 – Shopping Center. The shopping center land use is defined as an integrated group of commercial establishments that is planned, developed, owned and managed as one unit. Trip generation estimates are based on average vehicular rates per 1,000 sf of gross leasable area. The shopping center land use was selected because it generally has higher trip generation rates than the other potential retail/commercial land uses provided in the *Trip Generation Manual* and presents a more conservative scenario.

2.3.2.3 Mode Share

The BTD publishes vehicle, transit, and walking/bicycling mode split rates for different areas of Boston. The Project site is located within BTD's designated Area 8. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[3]. The BTD's travel mode share data for Area 8 are shown in Table 2-7.

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

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

Table 2-7 Travel Mode Shares

Land Use	Direction	Walk/ Bicycle Share	Transit Share	Auto Share	Vehicle Occupancy Rate
Daily					
Residential	In	24%	23%	53%	1.13
	Out	24%	23%	53%	1.13
Retail/Commercial	In	29%	11%	60%	1.78
	Out	29%	11%	60%	1.78
a.m. Peak Hour					
Residential	In	22%	29%	49%	1.13
	Out	30%	26%	44%	1.13
Retail/Commercial	In	27%	14%	59%	1.78
	Out	36%	12%	52%	1.78
p.m. Peak Hour					
Residential	In	30%	26%	44%	1.13
	Out	22%	29%	49%	1.13
Retail/Commercial	In	36%	12%	52%	1.78
	Out	27%	14%	59%	1.78

2.3.2.4 Trip Generation

The mode share percentages shown in Table 2-7 were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The existing uses on the Project site currently generate minimal traffic volumes and were not accounted for in the trip generation estimates. The trip generation for the Project by mode is shown in Table 2-8. The detailed trip generation information is provided in Appendix B.

Table 2-8 Project Trip Generation

Land Use		Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Daily				
Residential[1] *164 units*	In	148	142	288
	Out	148	142	288
Retail/Commercial[2] *3,000 sf*	In	34	13	39
	Out	34	13	39
Total	In	182	155	327
	Out	182	155	327

Table 2-8 Project Trip Generation (Continued)

Land Use		Walk/Bicycle Trips	Transit Trips	Vehicle Trips
a.m. Peak Hour				
Residential[1] *164 units*	In Out	4 23	6 20	8 29
Retail/Commercial[2] *3,000 sf*	In Out	1 1	1 0	1 1
Total	In Out	5 24	7 20	9 30
p.m. Peak Hour				
Residential[1] *164 units*	In Out	23 9	20 12	29 18
Retail/Commercial[2] *3,000 sf*	In Out	3 3	1 2	3 3
Total	In Out	26 12	21 14	32 21

1 Based on ITE LUC 220 – Apartments for 164 units.
2 Based on ITE LUC 820 – Shopping Center for 3,000 sf.

2.3.2.5 Vehicle Trip Generation

To develop the overall trip generation characteristics, the adjusted vehicular trips associated with the Project were estimated. The Project-generated new vehicle trips are summarized in Table 2-9, with the detailed trip generation information provided in Appendix B.

Table 2-9 Project Vehicle Trip Generation

Time Period	Direction	Residential [1]	Retail/ Commercial [2]	Total
Daily	In	288	39	327
	Out	288	39	327
	Total	**576**	**78**	**654**
a.m. Peak Hour	In	8	1	9
	Out	29	1	30
	Total	**37**	**2**	**39**
p.m. Peak Hour	In	29	3	32
	Out	18	3	21
	Total	**47**	**6**	**53**

1 Based on ITE LUC 220 – Apartments for 164 units.
2 Based on ITE LUC 820 – Shopping Center for 3,000 sf.

As shown in Table 2-9, the Project is expected to generate approximately 654 new daily vehicle trips (327 entering and 327 exiting), with 39 new vehicle trips (9 entering and 30 exiting) during the a.m. peak hour and 53 new vehicle trips (32 entering and 21 exiting) during the p.m. peak hour.

2.3.2.6 Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 8 and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in Figure 2-13.

The Project-generated vehicle trips were assigned to the study area roadway network based on the trip distribution patterns shown in Figure 2-13, and are shown in Figure 2-14 and Figure 2-15 for the a.m. and p.m. peak hours, respectively. The Project-generated trips were added to the 2019 No Build conditions traffic volumes to develop the 2019 Build conditions peak hour traffic volume networks and are shown in Figure 2-16 and Figure 2-17 for the a.m. and p.m. peak hours, respectively.

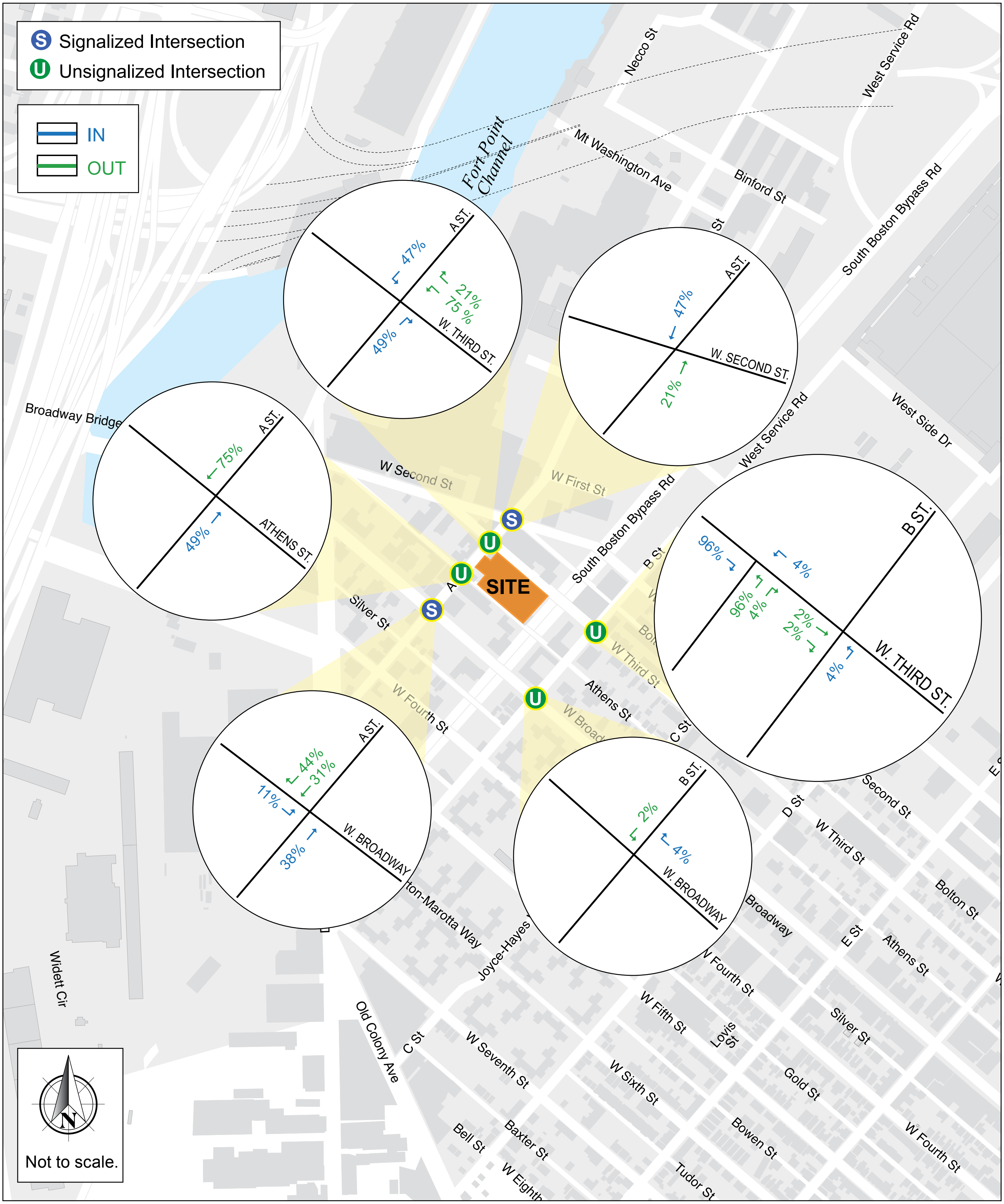
2.3.2.7 Build Conditions Traffic Operations

The 2019 Build conditions scenario analyses use the same methodology as the 2013 Existing and 2019 No Build conditions scenario analyses. The results of the 2019 Build condition traffic analysis at study area intersections are presented in Table 2-10 and Table 2-11 for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in Appendix B.

As shown in Table 2-10, under the 2019 Build conditions, the study area intersections generally operate at the same LOS as under the 2019 No Build conditions during the a.m. peak hour. The West Third Street westbound movements at A Street were shown to decrease from LOS D to LOS F with the addition of Project-related traffic. However, this approach has adequate capacity to accommodate the expected traffic volumes, with minimal queuing.

As shown in Table 2-11, under the 2019 Build conditions, the study area intersections generally operate at the same LOS as under the 2019 No Build conditions during the p.m. peak hour.

Based on the results presented in Table 2-10 and Table 2-11, the existing operational deficiencies will continue to exist with or without the Project at the A Street/West Broadway intersection. The Project generally has minimal impact at this intersection and throughout the study area. There are no additional capacity improvements at the study area intersections that are necessary to accommodate the anticipated Project-generated traffic.



45 West Third Street   Boston, Massachusetts

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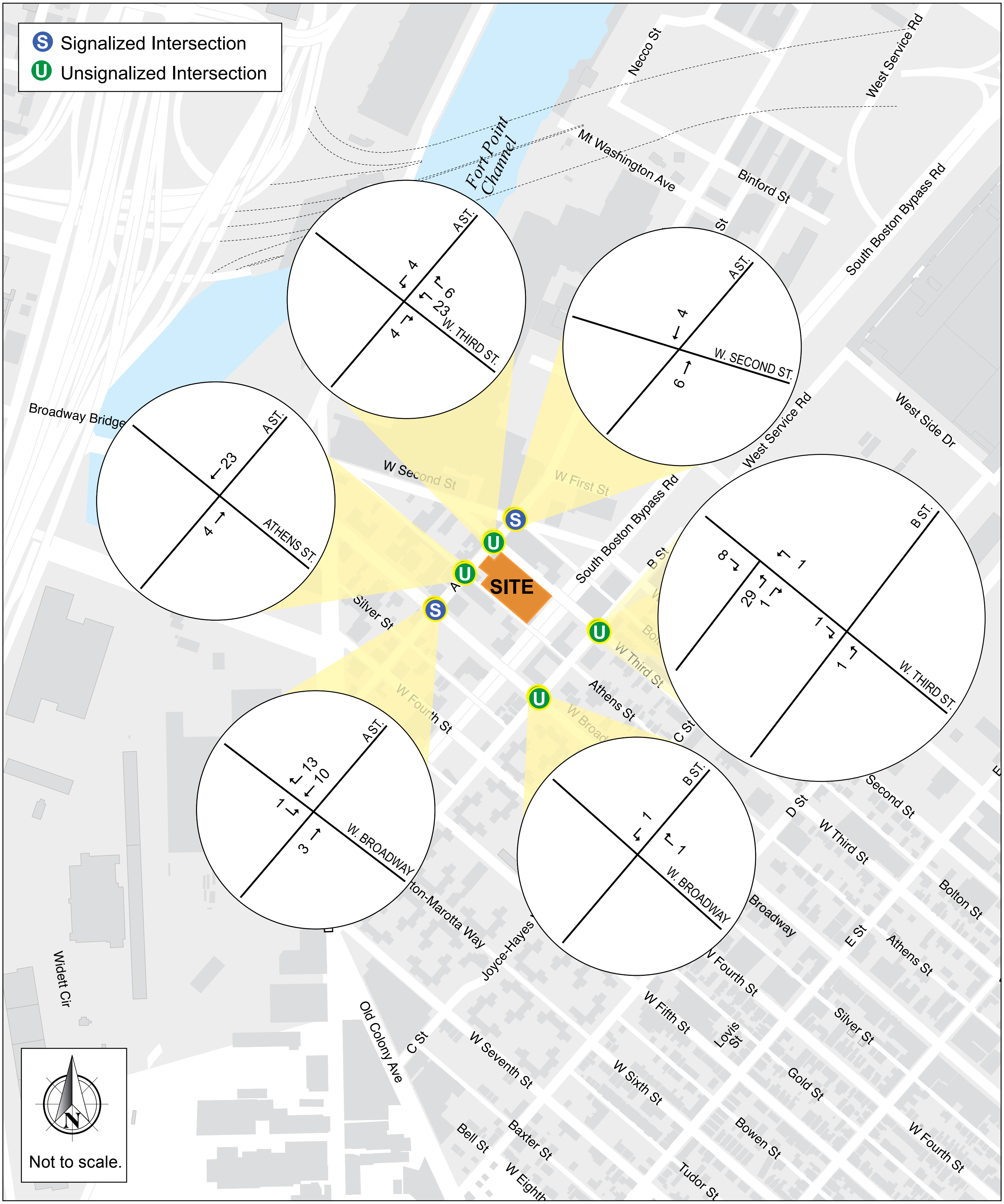
Figure 2-13

Vehicle Trip Distribution



45 West Third Street   Boston, Massachusetts

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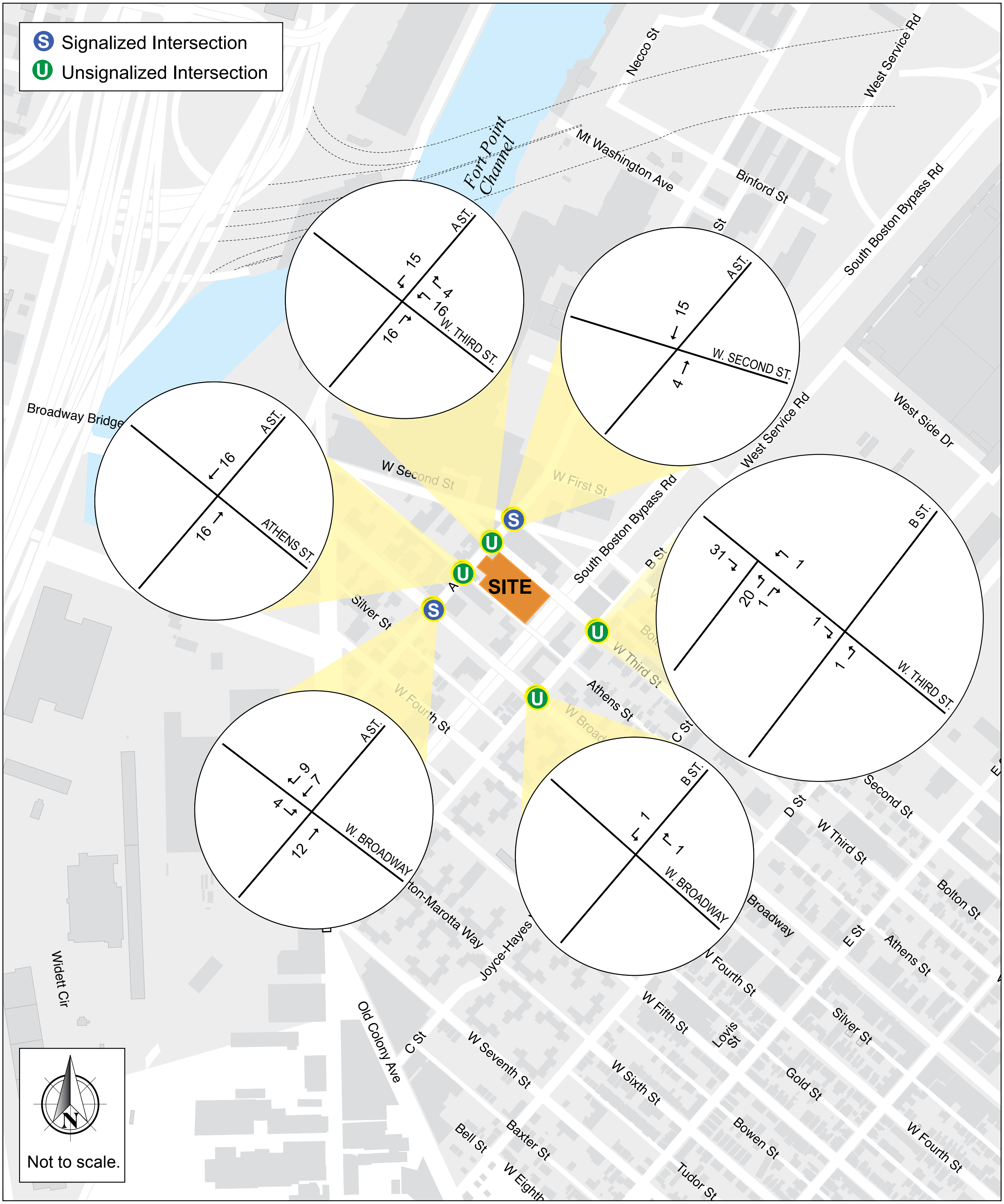
Figure 2-14
Project Generated Trips,
a.m. Peak Hour



45 West Third Street   Boston, Massachusetts

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Figure 2-15
Project Generated Trips,
p.m. Peak Hour

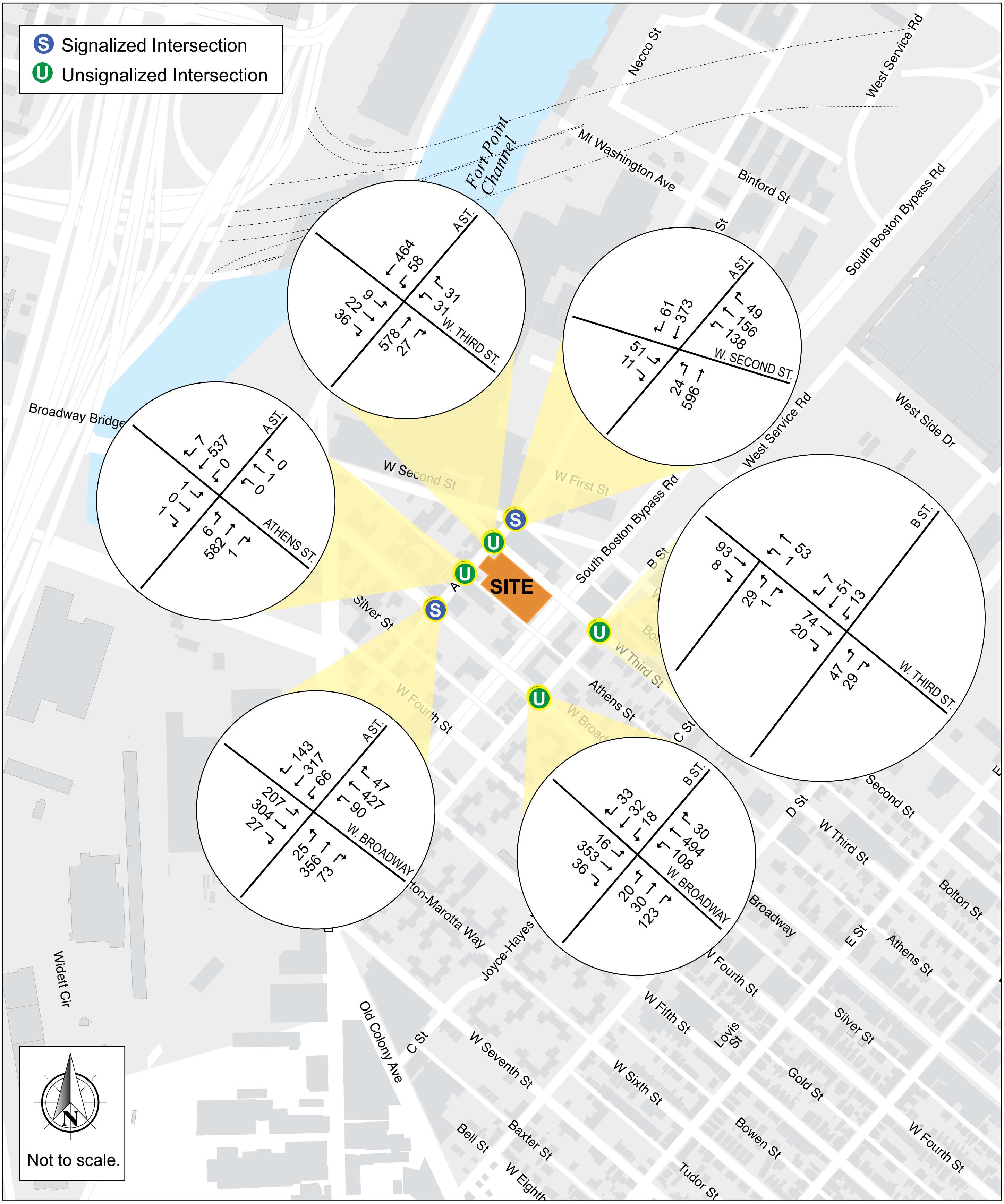
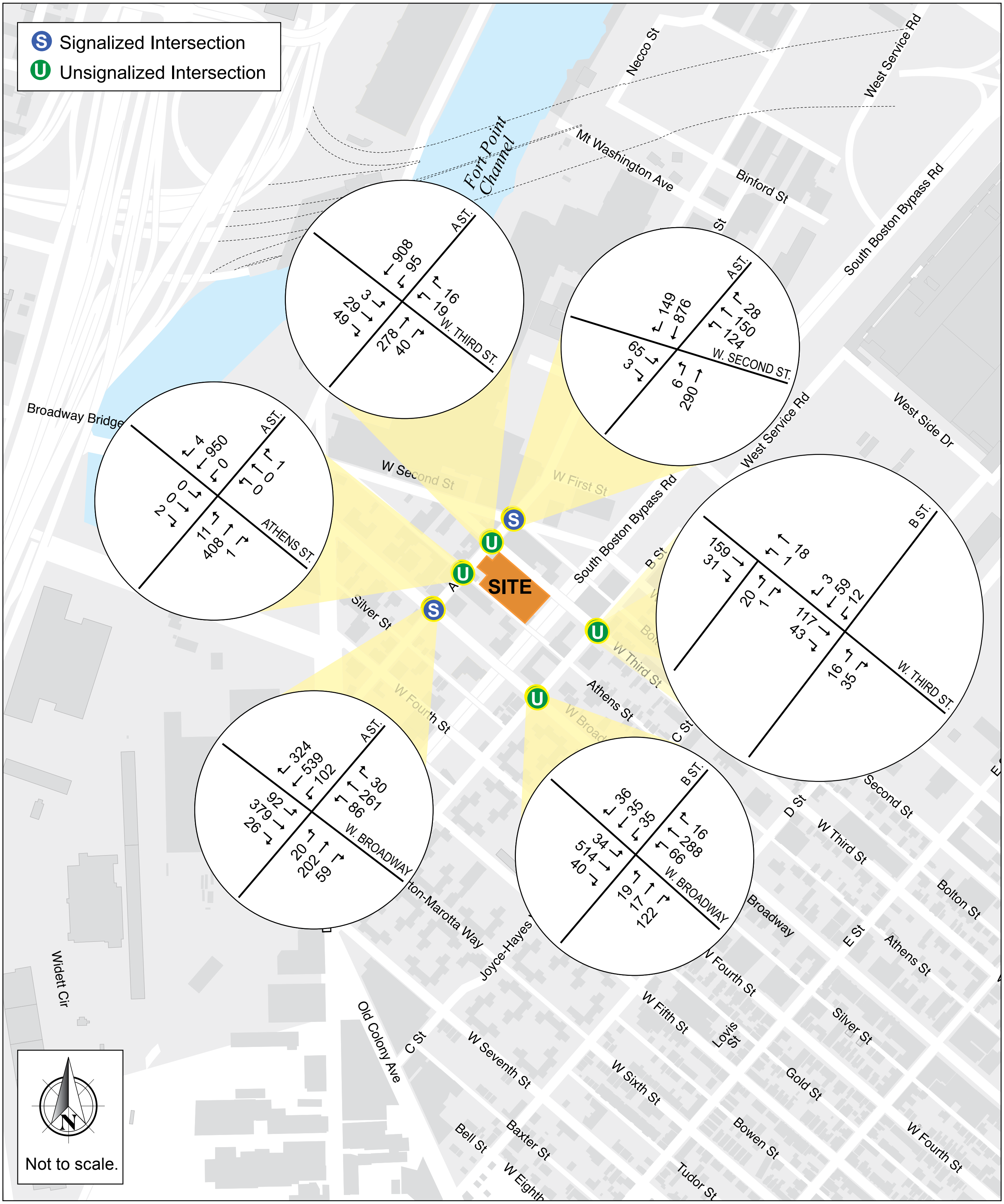


Figure 2-16

Build Conditions (2018) Turning Movement Volumes, a.m. Peak Hour



45 West Third Street Boston, Massachusetts

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Figure 2-17

Build Conditions (2018) Turning Movement Volumes, p.m. Peak Hour

Table 2-10 Build Conditions (2019), Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
West 2nd Street/A Street	**A**	**9.4**	—	—	—
West 2nd Street EB left	B	16.4	0.22	13	32
West 2nd Street EB right	A	7.5	0.03	0	8
West 2nd Street WB left	B	17.9	0.36	38	67
West 2nd Street WB thru/right	B	16.1	0.45	48	83
A Street NB left/thru	A	6.8	0.54	106	m187
A Street SB thru/right	A	6.5	0.38	51	129
A Street/West Broadway	**D**	**53.6**	—	—	—
West Broadway EB left/thru/right	F	>80.0	>1.00	~435	#649
West Broadway WB left/thru/right	C	28.4	0.80	299	#467
A Street NB left/thru/right	D	45.0	0.87	279	#473
A Street SB left/thru	C	26.6	0.31	30	79
A Street SB right	D	36.0	0.78	227	#420
Unsignalized Intersections					
A Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB left/thru/right	E	36.7	0.39	—	44
West 3rd Street WB left/right	F	>50.0	0.56	—	67
A Street NB thru/right	A	0.0	0.39	—	0
A Street SB left/thru	A	2.4	0.09	—	8
A Street/Athens Street	—	—	—	—	—
Athens Street WB left/thru/right	E	35.3	0.01	—	1
A Street NB left/thru/right	A	0.2	0.01	—	1
A Street SB left/thru/right	A	0.0	0.00	—	0
B Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB thru/right	A	7.8	0.12	—	*
B Street NB left/right	A	7.6	0.10	—	*
B Street SB left/thru/right	A	7.7	0.09	—	*
B Street/West Broadway	—	—	—	—	—
West Broadway EB left/thru/right	A	0.7	0.02	—	2
West Broadway WB left/thru/right	A	4.5	0.18	—	16
B Street NB left/thru/right	F	>50.0	>1.00	—	435
B Street SB left/thru/right	F	>50.0	>1.00	—	231

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
~ = 50th percentile volume exceeds capacity.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates that the LOS decreased to LOS E or worse between No Build and Build conditions.
* Synchro does not calculate queues for all-way STOP controlled intersections.

Table 2-11 Build Conditions (2019), Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized Intersections					
West 2nd Street/A Street	**B**	**17.7**	—	—	—
West 2nd Street EB left	D	52.6	0.49	46	88
West 2nd Street EB right	C	23.7	0.01	0	8
West 2nd Street WB left	D	47.9	0.50	87	140
West 2nd Street WB thru/right	D	50.0	0.63	122	185
A Street NB left/thru	A	3.9	0.20	48	94
A Street SB thru/right	B	10.1	0.69	298	562
A Street/West Broadway	**F**	**>80.0**	—	—	—
West Broadway EB left/thru/right	D	49.4	0.91	315	#550
West Broadway WB left/thru/right	D	35.2	0.76	215	#353
A Street NB left/thru/right	C	34.4	0.77	143	#304
A Street SB left/thru	B	16.1	0.25	39	76
A Street SB right	F	>80.0	>1.00	~693	#935
Unsignalized Intersections					
A Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB left/thru/right	F	>50.0	>1.00	—	174
West 3rd Street WB left/right	F	>50.0	>1.00	—	**
A Street NB thru/right	A	0.0	0.20	—	0
A Street SB left/thru	A	2.7	0.10	—	8
A Street/Athens Street	—	—	—	—	—
Athens Street WB left/thru/right	B	12.6	0.00	—	0
A Street NB left/thru/right	A	0.9	0.03	—	2
A Street SB left/thru/right	A	0.0	0.00	—	0
B Street/West 3rd Street	—	—	—	—	—
West 3rd Street EB thru/right	A	8.1	0.20	—	*
B Street NB left/right	A	7.3	0.06	—	*
B Street SB left/thru/right	A	7.8	0.10	—	*
B Street/West Broadway	—	—	—	—	—
West Broadway EB left/thru/right	A	1.0	0.04	—	3
West Broadway WB left/thru/right	A	4.6	0.15	—	13
B Street NB left/thru/right	F	>50.0	>1.00	—	**
B Street SB left/thru/right	F	>50.0	>1.00	—	**

= 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
~ = 50th percentile volume exceeds capacity.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicates that the LOS decreased to LOS E or worse between Existing and No Build conditions.
* Synchro does not calculate queues for all-way STOP controlled intersections.
** The v/c ratio is outside the acceptable limits for Synchro to calculate the 95th percentile queue.

2.3.2.8 Parking

This section presents the Project's parking supply and an evaluation of the Project's parking demand. The Project will provide a total of approximately 115 parking spaces on the site in a partially below-grade garage, resulting in a parking ratio of 0.8 spaces per market rate unit. This parking ratio is consistent with the district-based parking goals developed by the BTD for South Boston (0.75-1.25 parking spaces per unit for developments near an MBTA station).

The parking demand for the retail/commercial component of the Project is expected to be minimal and will be accommodated by the on-street parking in the vicinity of the Project site.

To accommodate the change in land use on the site, the Proponent is requesting that BTD modify the parking regulations along West Third Street adjacent to the Project to allow South Boston resident permit parking/visitor parking and a pick-up/drop-off area that can accommodate two vehicles near the pedestrian entrance along West Third Street. The requested parking regulations are presented in Figure 1-12.

2.3.2.9 Public Transportation

As previously discussed, the Project is ideally situated to take advantage of nearby public transportation opportunities. Broadway Station provides convenient access to the MBTA Red Line and several MBTA bus routes. Based on the transit mode shares presented earlier, the future transit trips associated with the Project were estimated and are summarized in Table 2-12.

Table 2-12 Project Transit Trips

Time Period	Direction	Residential	Retail/ Commercial	Total
Daily	In	142	13	155
	Out	142	13	155
	Total	**284**	**26**	**310**
a.m. Peak Hour	In	6	1	7
	Out	20	0	20
	Total	**26**	**1**	**27**
p.m. Peak Hour	In	20	1	21
	Out	12	2	14
	Total	**32**	**3**	**35**

As shown in Table 2-12, the Project will generate an estimated 310 new transit trips on a daily basis. Approximately 27 new transit trips (7 alighting and 20 boarding) will occur during the a.m. peak hour and 35 new trips (21 alighting and 14 boarding) will occur during the p.m. peak hour.

The majority of these transit trips will be accommodated by the MBTA Red Line at Broadway Station. The MBTA bus routes that run along West Broadway, A Street, and Dorchester Avenue will also serve the residents of the Project.

2.3.2.10 Pedestrians

Based on the walk mode shares presented earlier, the future walk trips were estimated and are summarized in Table 2-13.

Table 2-13 Project Pedestrian Trips

Time Period	Direction	Residential	Retail/ Commercial	Total
Daily	In	148	34	182
	Out	148	34	182
	Total	**296**	**68**	**364**
a.m. Peak Hour	In	4	1	5
	Out	23	1	24
	Total	**27**	**2**	**29**
p.m. Peak Hour	In	23	3	26
	Out	9	3	12
	Total	**32**	**6**	**38**

Over the course of a day, the Project will generate an estimated 364 new pedestrian trips and an additional 310 new transit trips that will require a walk to or from the site. This results in an additional 674 new pedestrian trips per day. Approximately 29 new pedestrian trips will occur during the a.m. peak hour and 38 new pedestrian trips will occur during the p.m. peak hour in addition to the transit trips that will also require a walk from the site. The pedestrian facilities surrounding the site have adequate capacity to accommodate the pedestrian trips generated by the Project.

The Proponent is proposing to upgrade all sidewalks that are immediately adjacent to the Project site in accordance with the City of Boston's Complete Streets guidelines. These improvements will enhance the overall pedestrian network throughout the West Broadway neighborhood and will provide additional benefit to residents and businesses in the vicinity of the Project.

2.3.2.11 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure covered bicycle parking for residents and employees, and short-term bicycle racks for visitors. The Project will provide approximately 168 covered and secure bicycle storage spaces on-site in the garage. Additional storage will be provided by outdoor bicycle racks accessible to visitors to the site in accordance with BTD guidelines.

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

2.3.2.12 Loading and Service Activity

Loading and service operations will occur on-site at the loading area along West Third Street, east of the parking garage driveway. All trash truck activity and residential move-in/move-out activity will also take place at this location.

A summary of anticipated loading/service activity by land use is presented in Table 2-14; the sources of the assumptions are presented below. Delivery trip estimates were based on data provided in the Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area report[4]. Deliveries to the Project site will be limited to SU-36 trucks and smaller delivery vehicles.

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

Retail/Commercial. Retail/commercial uses depend on more frequent deliveries from smaller trucks. Based on the CTPS report, retail/commercial uses generate approximately 0.15 light truck trips per 1,000 sf of floor area and 0.15 medium/heavy truck trips per 1,000 sf of gross floor area.

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[4] *Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area*; Central Transportation Planning Staff; September 1993.

Table 2-14 Delivery Activity by Land Use

Land Use	Number of Deliveries	General Delivery Times
Residential	1	10% before 7:00 a.m. 70% between 7:00 a.m. and 1:00 p.m. 20% after 1:00 p.m.
Retail/Commercial	1	
Total	2	

The Project is expected to generate approximately two deliveries per day. It is anticipated that the majority of these deliveries will occur between 7:00 a.m. and 1:00 p.m. These numbers do not include trash truck trips. For this area, trash truck trips generally occur between 5:00 a.m. and 7:00 a.m. and do not coincide with the regular delivery activities. The low number of anticipated deliveries will have minimal impact on the vehicular operations along West Third Street. All move-in/move-out activity can occur at the loading area on the Project site without impacting the public sidewalk, parking, or roadway.

2.4 Transportation Mitigation Measures

While the traffic impacts associated with the new trips are minimal, the Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible, the installation of new, accessible ramps, improvements to street lighting where necessary, planting of street trees, and providing bicycle storage racks surrounding the site, where appropriate. The Proponent will also provide new pavement markings along West Third Street between B Street and A Street to delineate the directions of travel. The Proponent is requesting from BTD that the parking regulations along the southerly side of West Third Street adjacent to the Site be changed to accommodate the current short-term commercial parking near the intersection with A Street (approximately 40 feet), a short-term pick-up/drop-off zone to accommodate two vehicles (approximately 40 feet) near the main pedestrian entrance, and South Boston residential permit parking/visitor parking along the remainder of the site frontage. The requested parking regulations are shown in Figure 1-12.

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

The Proponent will also produce a Construction Management Plan (CMP) for review and approval by BTD. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project. See Section 2.6 for additional information related to the CMP.

2.5 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to minimize automobile usage and Project related traffic impacts. TDM will be facilitated by the nature of the Project (which does not generate significant peak hour trips) and its proximity to numerous public transit alternatives.

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

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

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

- **Orientation Packets**: The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby vehicle sharing and bicycle sharing locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.
- **Bicycle Accommodation**: The Proponent will provide bicycle storage in secure, sheltered areas for residents. Secure bicycle storage will also be made available to employees to encourage bicycling as an alternative mode of transportation. Subject to necessary approvals, public use bicycle racks for visitors will be placed near building entrances.
- **Transportation Coordinator**: The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries, and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.

- **Project Web Site**: The web site will include transportation-related information for residents, workers, and visitors.
- **Electric Charging Stations**: The Proponent will provide a total of three electric charging stations on the site.
- **Priority Parking Spaces**: The Proponent will provide priority parking spaces for low-emitting and fuel-efficient vehicles on the site.
- **Vehicle Sharing Program**: The Proponent will explore the feasibility of providing spaces in the garage for a car sharing service.

2.6 Evaluation of Short-term Construction Impacts

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

To minimize transportation impacts during the construction period, the following measures will be considered for the CMP:

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

The CMP will be executed with the City prior to commencement of construction and will document all committed measures.

Chapter 3.0

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW COMPONENT

3.1 Wind

3.1.1 Introduction

Rowan Williams Davies & Irwin Inc. (RWDI) has reviewed the potential pedestrian wind conditions around the proposed development at 45 West Third Street in Boston, MA. This section presents RWDI's findings, based on the current design drawings and RWDI's experience of wind-tunnel testing for buildings in the Boston area.

3.1.2 Site Information

As discussed in Section 1.3, the proposed development will be located on a site bordered by West Third Street, A Street, Athens Street and South Boston Bypass Road in South Boston, as shown in Figure 1-1. Currently, the site is covered by a large one-story building, with parcels not owned by the Proponent on the corners of A Street and Athens Street, and A Street and West Third Street. The surrounding buildings are of a similar height, with many taller buildings to the west through north. The Project is five residential levels above a partially below-grade parking garage. Pedestrian areas on and around the development include building entrances, public sidewalks, outdoor green spaces and private rooftop terraces.

An analysis of the long-term wind data in the Boston area indicates that, on an annual basis, the most common wind directions are those between southwest and northwest. Winds from the east and east-southeast are also relatively common. In the case of strong winds, northeast and west-northwest are the dominant wind directions. Typically, winds are stronger in the winter and spring than those in the summer and fall.

3.1.3 Pedestrian Wind Assessment

To provide assessments on the overall wind conditions expected around the proposed development, RWDI reviewed meteorological data for the area, drawings of the proposed development, aerial and "street view" photographs of the surroundings, and past wind tunnel projects with similar exposures in Boston. This data, in conjunction with RWDI's experience in the area and engineering judgment, allows RWDI to summarize the expected wind conditions as follows:

- The proposed development will not have significant wind effects on surrounding areas, due to its limited height.
- The height of the proposed development will be similar to surrounding buildings. The existing buildings at the intersections of A Street with West Third and Athens Streets will remain on the site, as shown in Figure 3.1-1. The proposed

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Figure 3.1-1

South View of Proposed Development

development is lower than many existing buildings to the west through north. As a result, wind conditions along A Street and West Third Street will be similar to those that currently exist in the area.

- At the other end of the development close to South Boston Bypass Road, the proposed building will shelter the area from the west and northwest winds, but slightly higher wind speeds are expected along West Third Street when winds are from the easterly and northeasterly directions. Overall, the wind conditions on sidewalks are predicted to be comfortable for walking or better throughout the year.
- The residential entrance will be located at the middle of the West Third Street façade (Location A in Figure 3.1-2), and the retail/commercial entrance at A Street (Location B). They will both be away from building corners, slightly recessed from the main building façade and sheltered by small canopies. Suitable wind conditions for pedestrians entering and exiting are expected around these entrances.
- Private terraces at the rooftop are more exposed (Location C in Figure 3.1-2). However, wind conditions are predicted to be suitable for sitting or standing in the summer, when these areas will typically be in use.
- The green spaces are protected by the proposed development from the prevailing northwest and northeast winds (Figure 3.1-1). They are exposed to the southwesterly winds, which are of relatively low speeds, especially during the summer. Extensive landscaping has been proposed for these spaces, as shown in Figure 3.1-3. The proposed trees, screens and umbrellas will further reduce the wind speeds in these areas. Therefore, wind conditions suitable for standing or better are expected for these green spaces.

3.1.4 Conclusion

The Project will not cause a significant wind impact on the surrounding areas when compared to the existing conditions. Based on wind tunnel tests of buildings with similar exposures, wind conditions suitable for walking or better are predicted at sidewalks and building entrances throughout the year. Wind conditions suitable for standing or better are also predicted for the green spaces and private terraces in the summer when these spaces will typically be in use.

Given the limited height of the proposed development and favorable wind conditions predicted, it is RWDI's opinion that no further wind study is necessary.

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Figure 3.1-2

Building Entrances and Terraces

Figure 3.1-3

Green Space

3.2 Shadow

3.2.1 Introduction and Methodology

As 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 winter solstice (December 21). 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 the existing shadow and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. The analysis focuses on nearby open spaces, sidewalks and bus stops 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 immediately surrounding streets and sidewalks. New shadow will be cast onto Flaherty Park during two of the fourteen time periods studied. No new shadow will be cast onto nearby bus stops.

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 A Street and its eastern and western sidewalks. No new shadow will be cast onto nearby bus stops or public open spaces.

At 12:00 p.m., new shadow will be cast to the north onto West Third Street and portions of its southern sidewalks, and a minor portion of A Street and its eastern sidewalk. No new shadow will be cast onto nearby bus stops or public open spaces.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of West Third Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or public 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 west onto a portion of A Street and its eastern sidewalk, and onto a portion of Athens Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or public open spaces.

At 12:00 p.m., new shadow will be cast to the north and will be limited to a small portion of West Third Street and its southern sidewalk, and a small portion of A Street's eastern sidewalk. No new shadow will be cast onto nearby bus stops or public open spaces.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of West Third Street and portions of its southern sidewalk. No new shadow will be cast onto nearby bus stops or public open spaces.

At 6:00 p.m., new shadow will be cast to the east onto West Third Street and its northern and southern sidewalks, and a small portion of B Street's western sidewalk. New shadow will be cast onto the southwestern portion of Flaherty Park, some of which will be under shadow from the existing trees, which are not included in the shadow analysis. No new shadow will be cast onto nearby bus stops or other public 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 A Street and its eastern and western sidewalks. No new shadow will be cast onto nearby bus stops or public open spaces.

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

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

At 6:00 p.m., most of the area is under existing shadow. New shadow will be cast to the east onto a portion of West Third Street and its northern and southern sidewalks, a portion of West Second Street and its northern and southern sidewalks, and portions of B Street and its eastern and western sidewalks. New shadow will be cast onto Flaherty Park starting at approximately 5:14 p.m. and lasting until sunset. Due to the existing trees (not included in this analysis), a portion of the park will be under existing shadow. No new shadow will be cast onto nearby bus stops or other public 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 A Street and its eastern and western sidewalks, as well as onto a portion of West Third Street and its northern sidewalk. No new shadow will be cast onto nearby bus stops or public open spaces.

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

At 3:00 p.m., most of the area is under existing shadow. New shadow will be cast to the northeast onto a small portion of West Third Street and its northern sidewalk, and a portion of West Second Street and its northern and southern sidewalks. No new shadow will be cast onto nearby bus stops or public open spaces.

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 two of the fourteen time periods, June 21 at 6:00 p.m. and September 21 at 6:00 p.m., new shadow will be cast onto Flaherty Park. No new shadow will be cast onto nearby bus stops during the time periods studied.

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Figure 3.2-1

Shadow Study: March 21, 9:00 a.m.

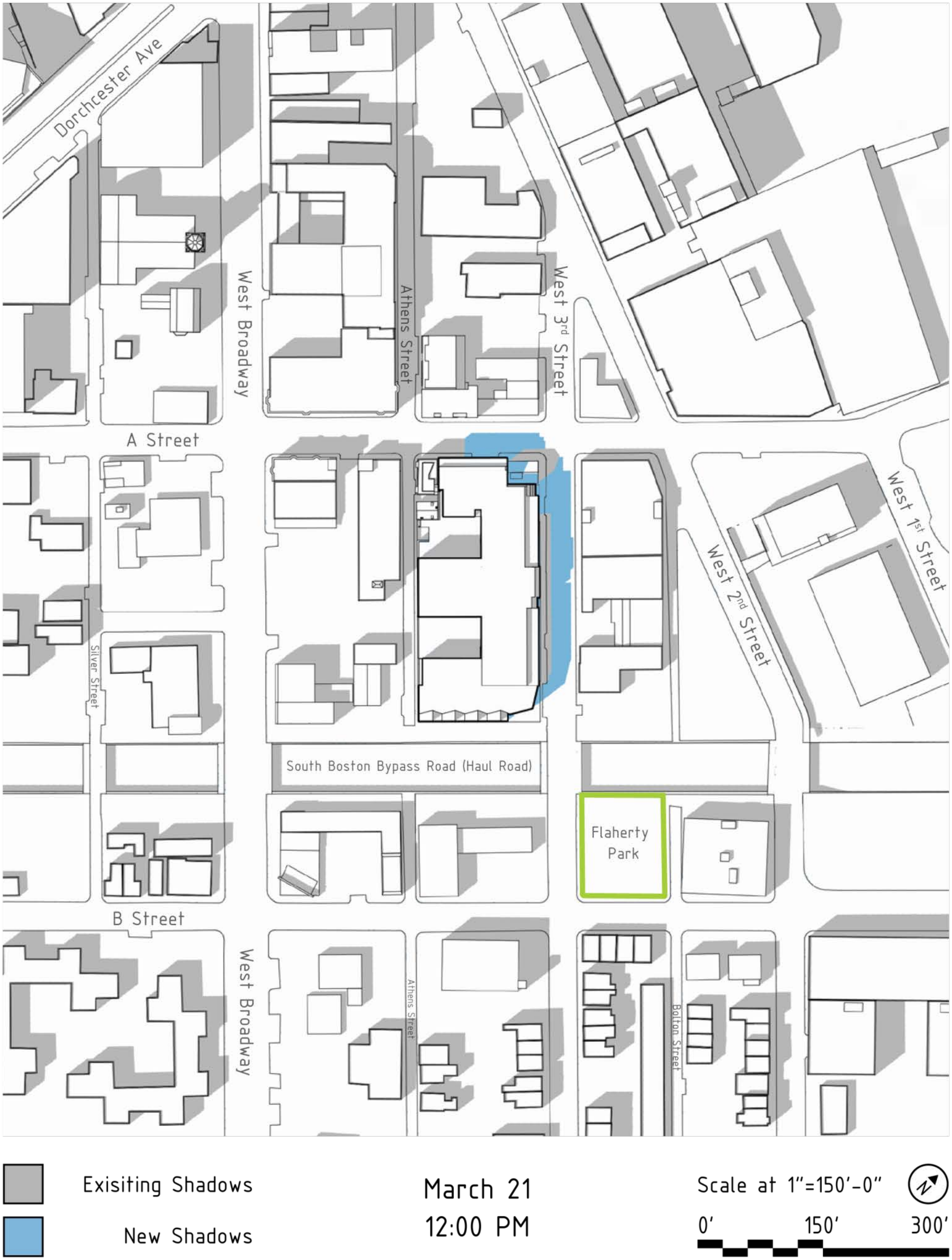

Figure 3.2-2

Shadow Study: March 21, 12:00 p.m.

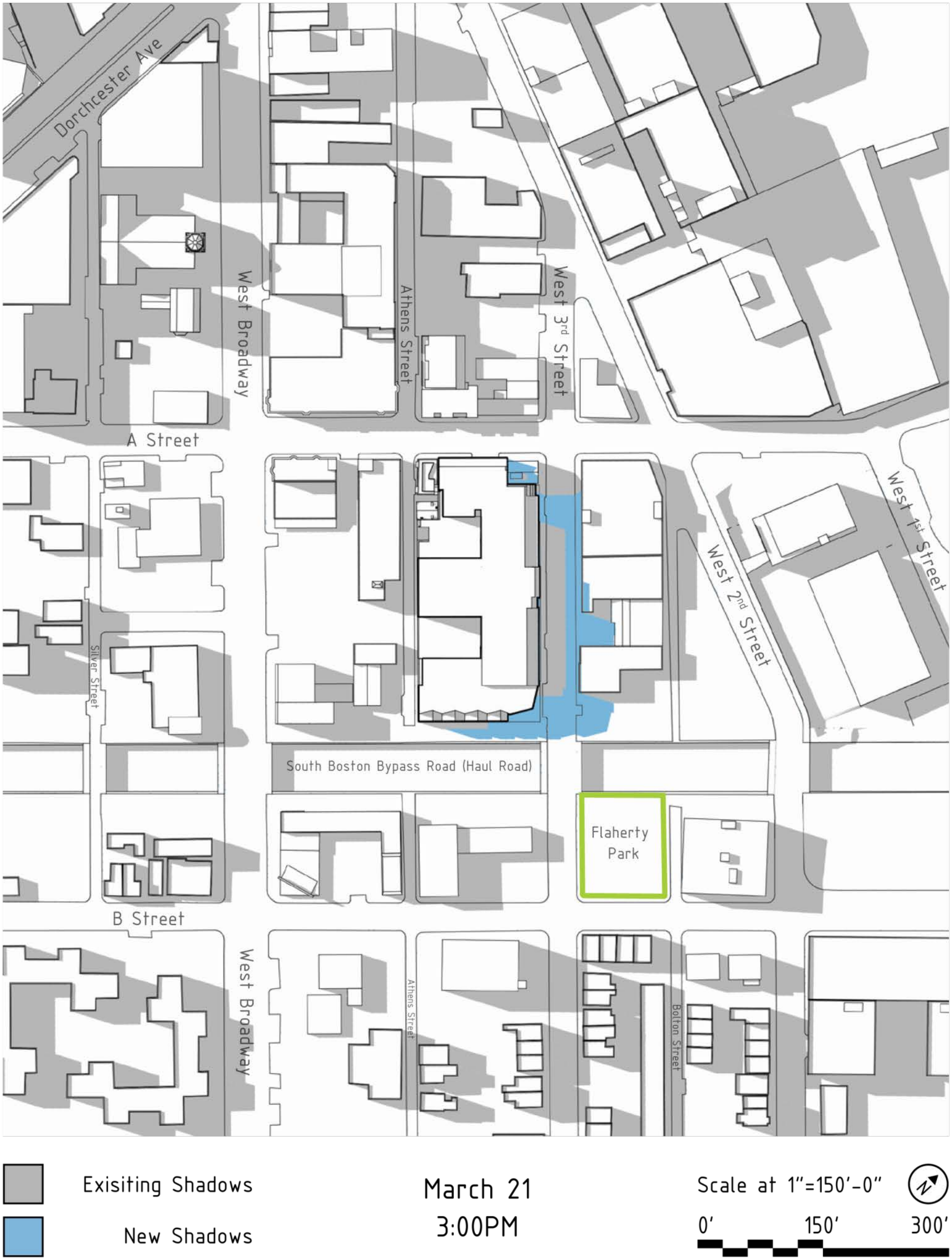

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Figure 3.2-3

Shadow Study: March 21, 3:00 p.m.

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Figure 3.2-4

Shadow Study: June 21, 9:00 a.m.

Figure 3.2-5

Shadow Study: June 21, 12:00 p.m.

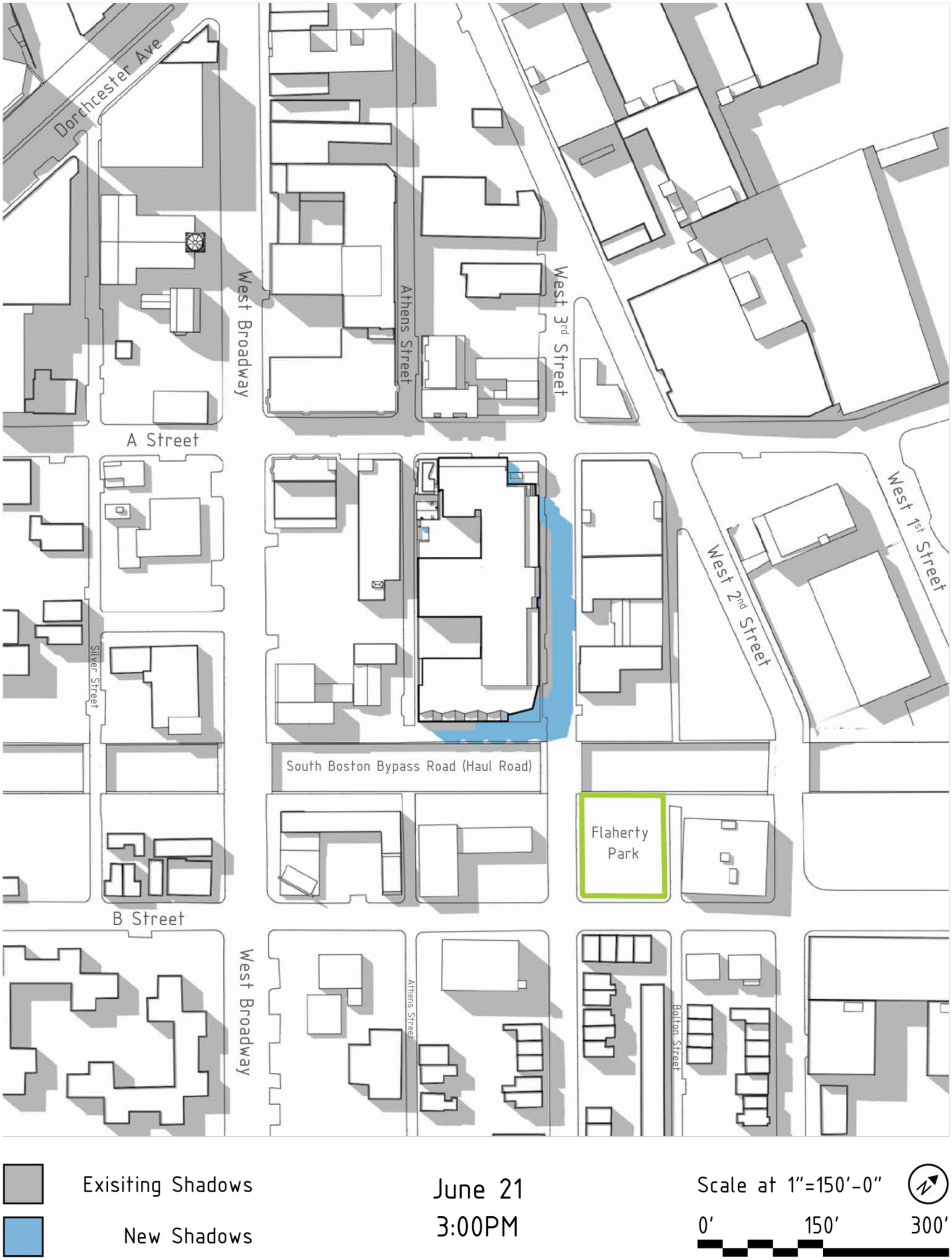

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Figure 3.2-6

Shadow Study: June 21, 3:00 p.m.

Figure 3.2-7

Shadow Study: June 21, 6:00 p.m.

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Figure 3.2-8

Shadow Study: September 21, 9:00 a.m.

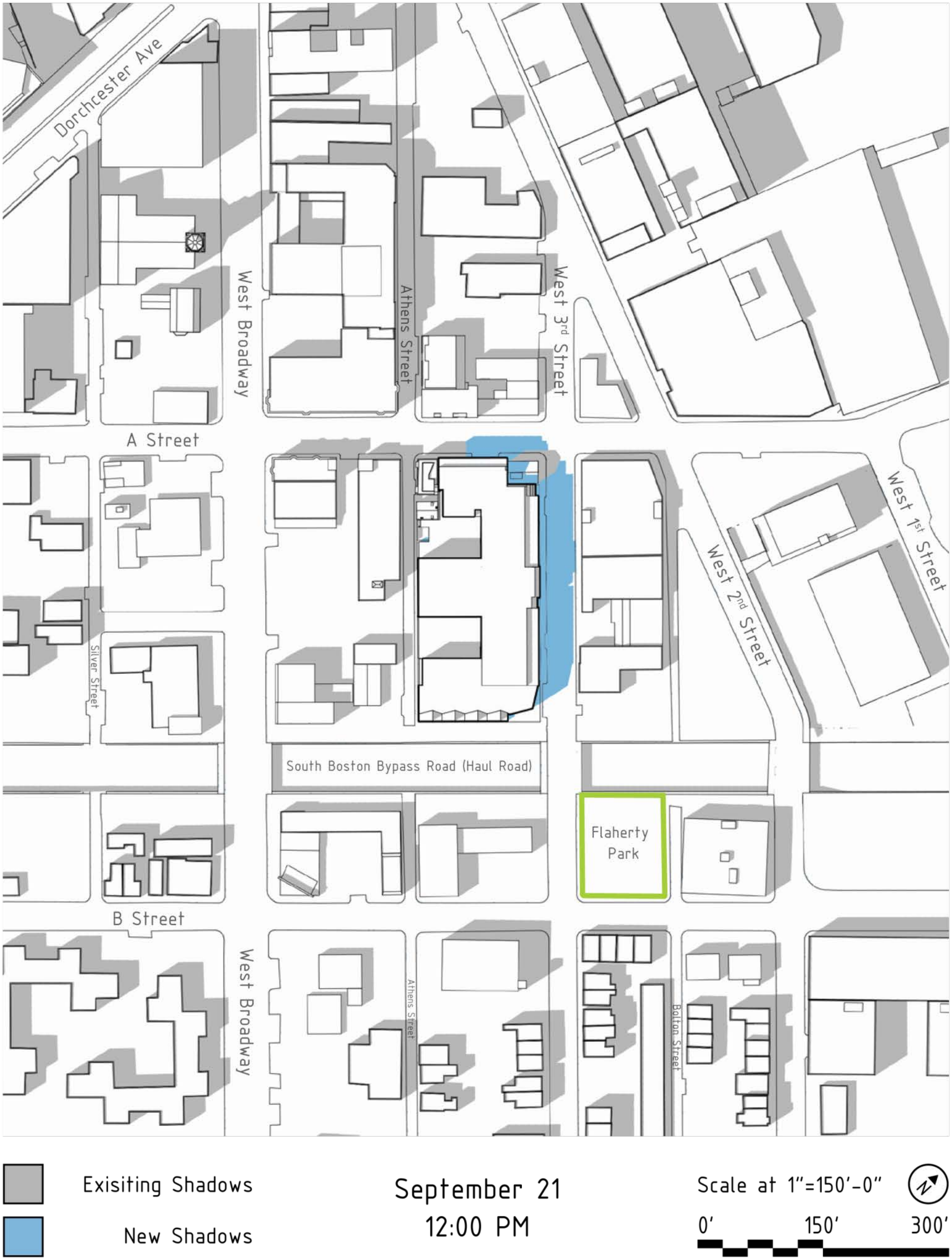

Figure 3.2-9

Shadow Study: September 21, 12:00 p.m.

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Figure 3.2-10

Shadow Study: September 21, 3:00 p.m.

Figure 3.2-11

Shadow Study: September 21, 6:00 p.m.

Figure 3.2-12
Shadow Study: December 21, 9:00 a.m.

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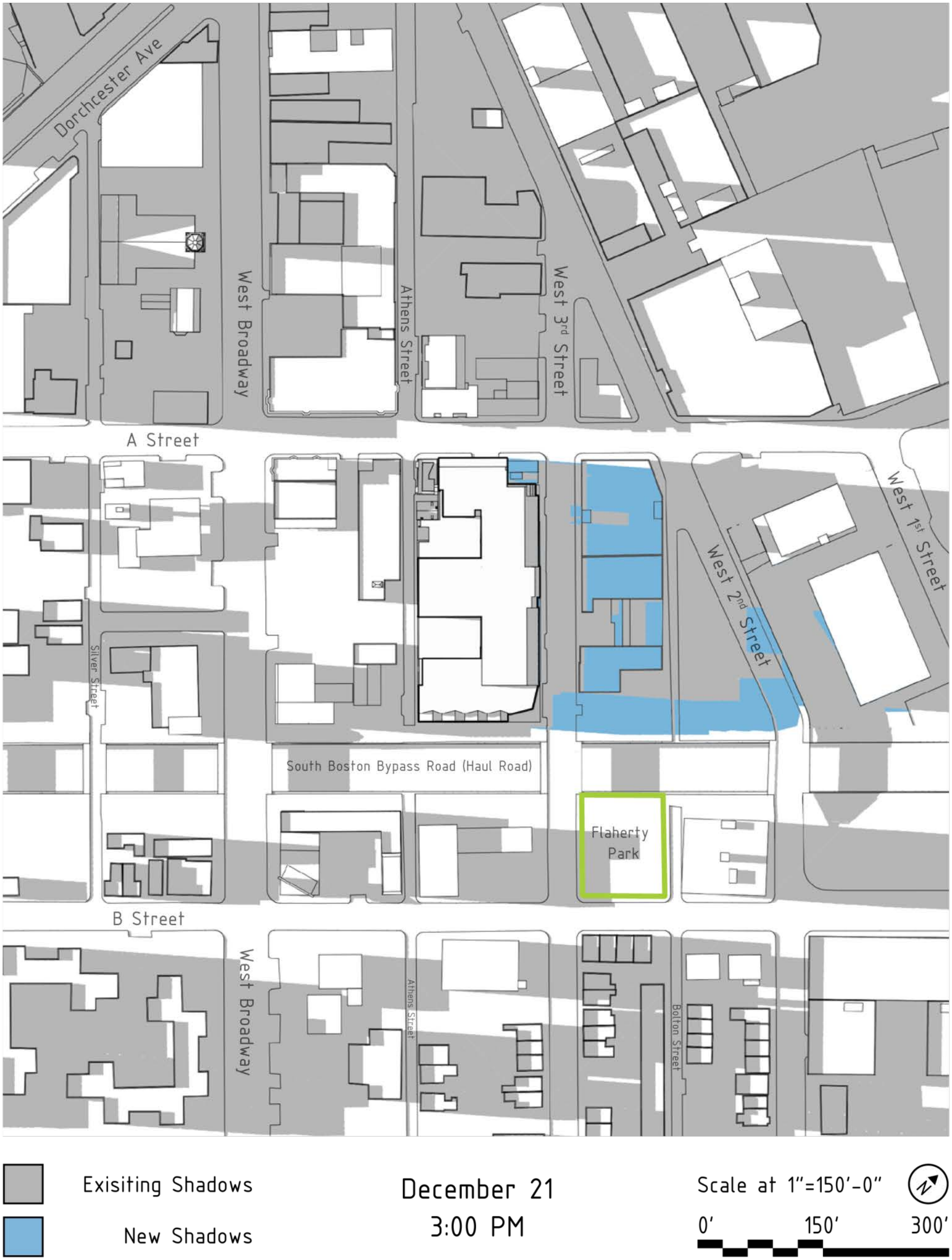
Figure 3.2-13

Shadow Study: December 21, 12:00 p.m.



45 West Third Street Boston, Massachusetts

Figure 3.2-14

Shadow Study: December 21, 3:00 p.m.

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 contains low-rise buildings that do not occupy the entire site, the proposed Project will slightly increase daylight obstruction; however, the resulting conditions will be typical of the South Boston area and other urban areas.

3.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program[1]. 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.

Three viewpoints were chosen to evaluate the daylight obstruction for the Existing and Proposed Conditions. Three area context points were considered 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.

- **Viewpoint 1:** View from West Third Street facing southwest toward the Project site
- **Viewpoint 2:** View from A Street facing southeast toward the Project site

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

- **Viewpoint 3:** View from Athens Street facing northeast toward the Project site
- **Area Context Viewpoint AC1:** View from A Street facing northwest toward the building at 50 West Broadway
- **Area Context Viewpoint AC2:** View from West Second Street facing southwest toward the building at 141 West Second Street
- **Area Context Viewpoint AC3:** View from West Second Street facing northeast toward the building at 44 West Second Street

3.3.3 Results

The results for each viewpoint are described in Table 3.3-1. Figures 3.3-2 through 3.3-4 illustrate the BRADA results for each analysis.

Table 3.3-1 Daylight Analysis Results

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	View from West Third Street facing southwest toward the Project site	47.8%	77.4%
Viewpoint 2	View from A Street facing southeast toward the Project site	15.7%	58.4%
Viewpoint 3	View from Athens Street facing northeast toward the Project site	23.1%	39.3%
Area Context Points			
AC1	View from A Street facing northwest toward the building at 50 West Broadway	64.0%	N/A
AC2	View from West Second Street facing southwest toward the building at 141 West Second Street	69.3%	N/A
AC3	View from West Second Street facing northeast toward the building at 44 West Second Street	77.6%	N/A

West Third Street – Viewpoint 1

West Third Street runs along the northeastern edge of the Project site. Viewpoint 1 was taken from the center of West Third Street looking southwest toward the Project site. The site has an existing daylight obstruction of 47.8% due to portions of the site being undeveloped. The development of the Project will increase the daylight obstruction value to 77.4%. 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.

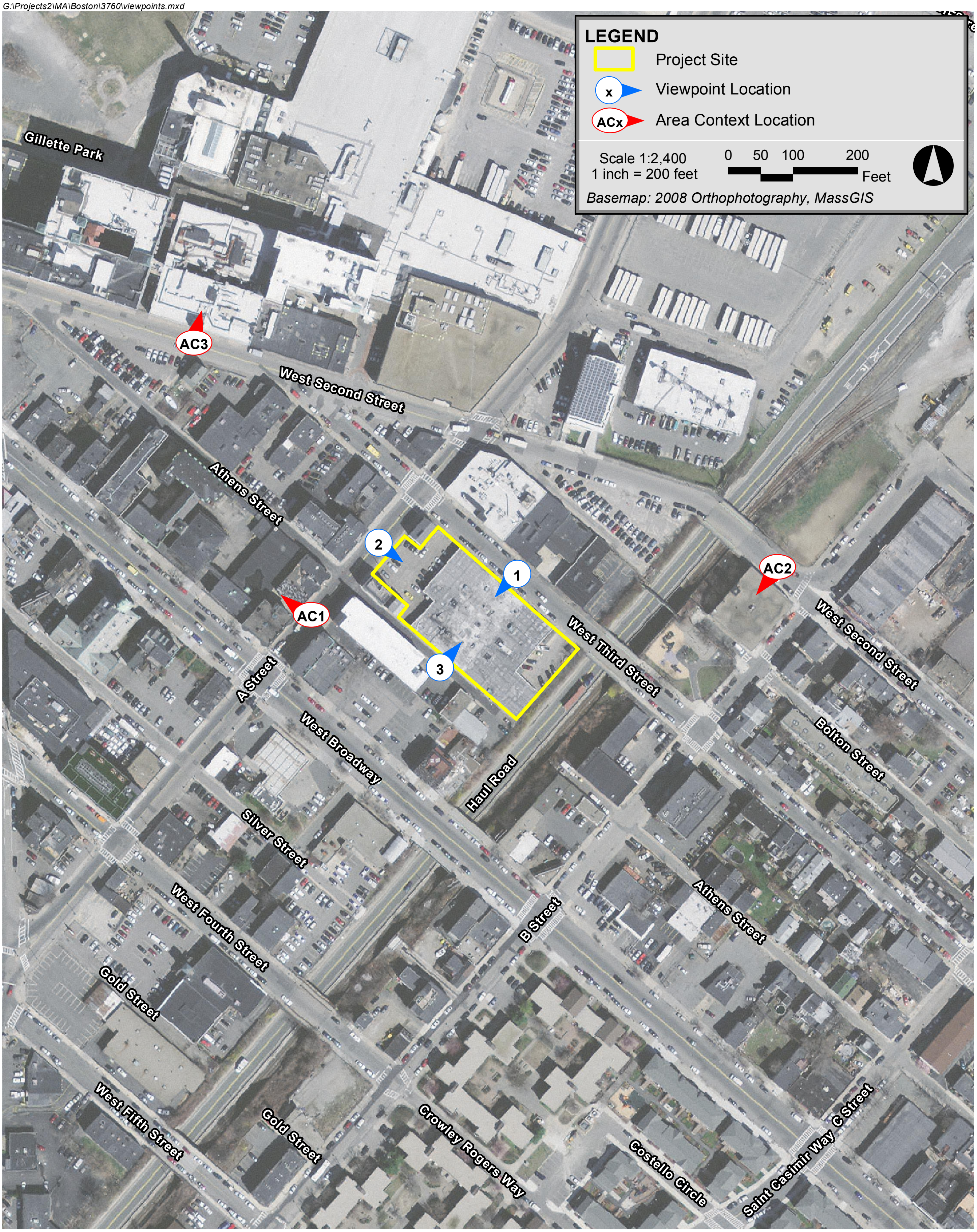

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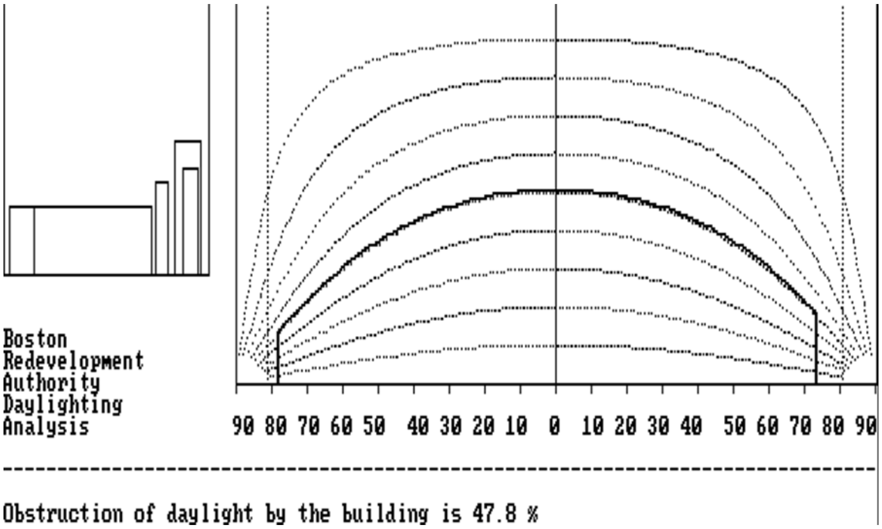
Figure 3.3-1

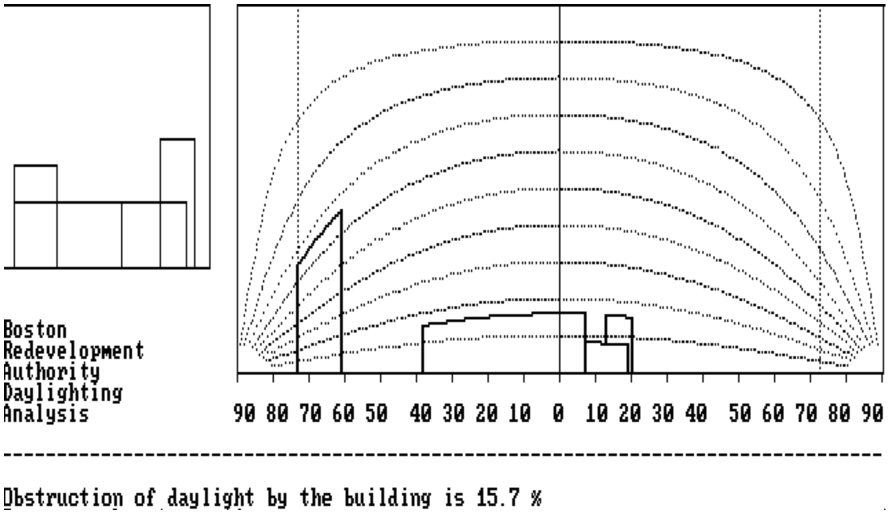
Viewpoint Locations

Viewpoint 1: View from West Third Street facing southwest toward the Project site



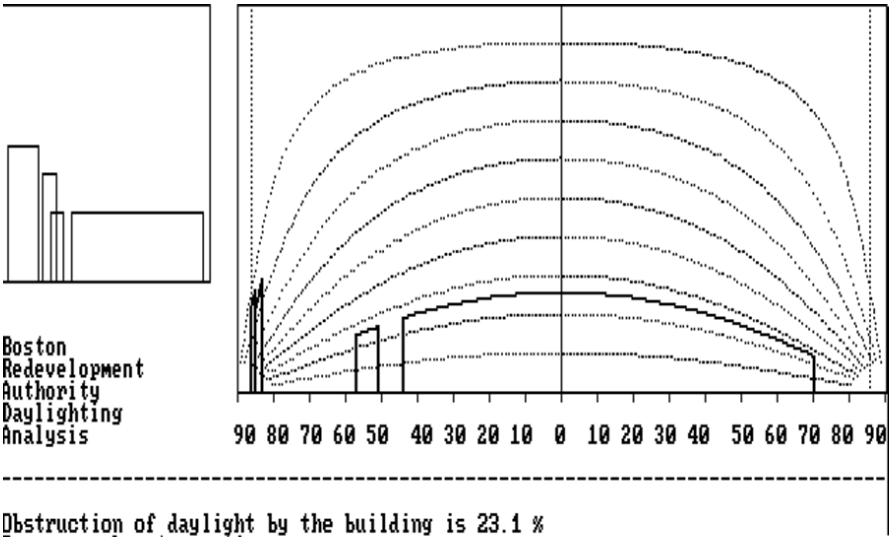
Obstruction of daylight by the building is 47.8 %

Viewpoint 2: View from A Street facing southeast toward the Project site



Obstruction of daylight by the building is 15.7 %

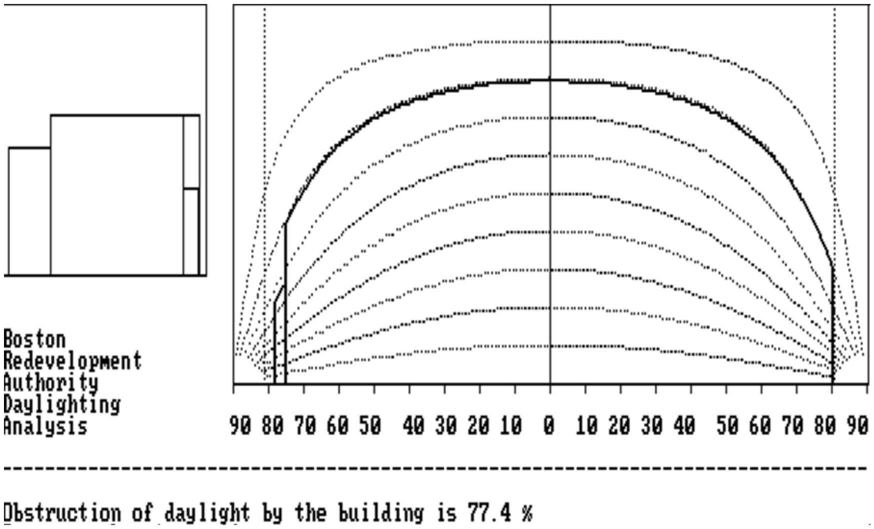
Viewpoint 3: View from Athens Street facing northeast toward the Project site



Obstruction of daylight by the building is 23.1 %

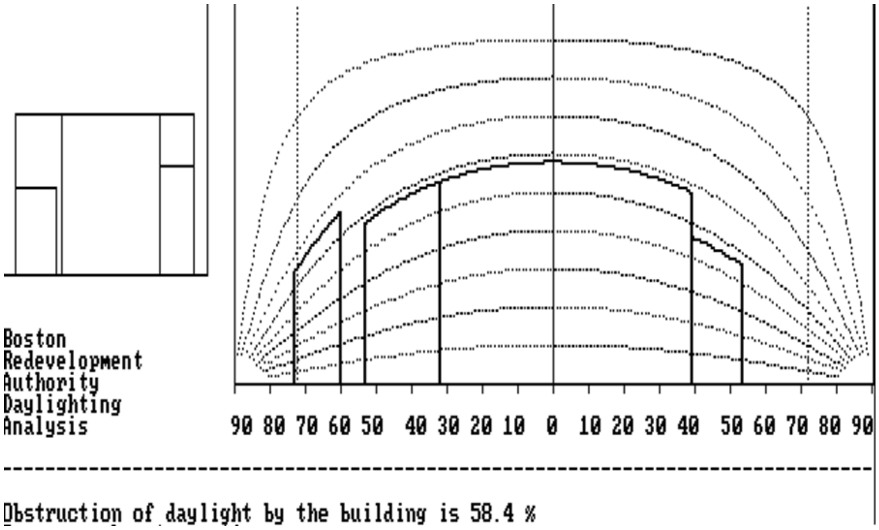
Figure 3.3-2
Existing Conditions

Viewpoint 1: View from West Third Street facing southwest toward the Project site



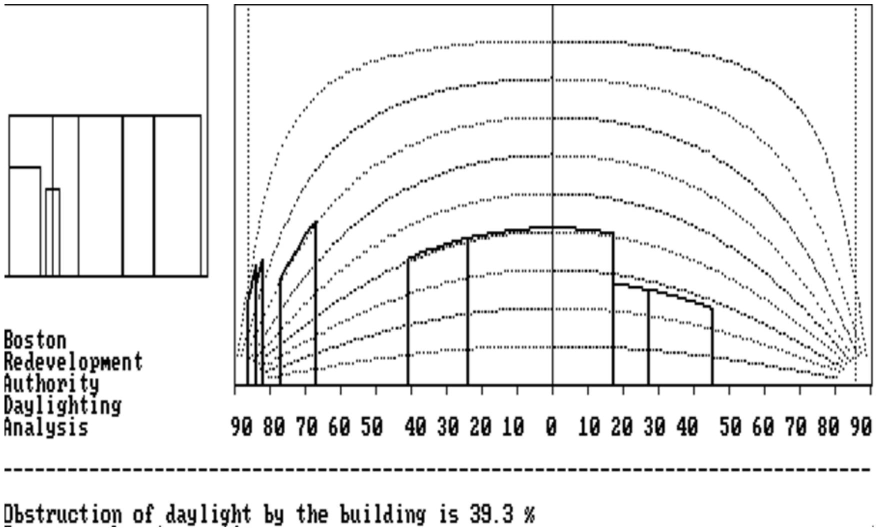
Obstruction of daylight by the building is 77.4 %

Viewpoint 2: View from A Street facing southeast toward the Project site



Obstruction of daylight by the building is 58.4 %

Viewpoint 3: View from Athens Street facing northeast toward the Project site

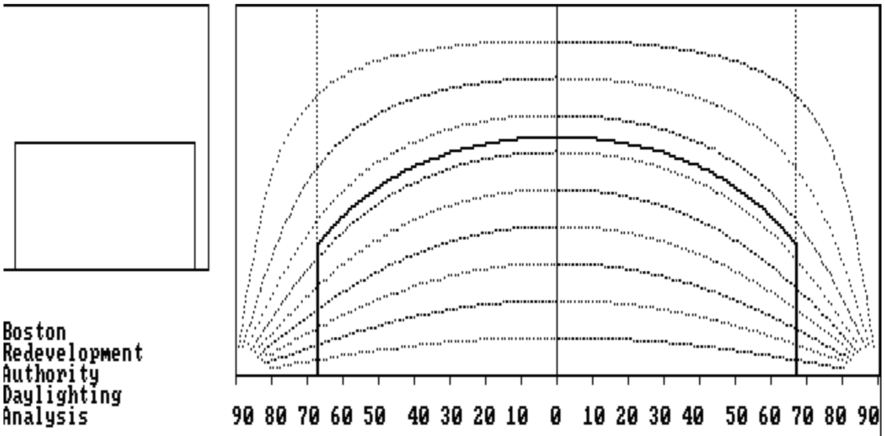


Obstruction of daylight by the building is 39.3 %

Figure 3.3-3

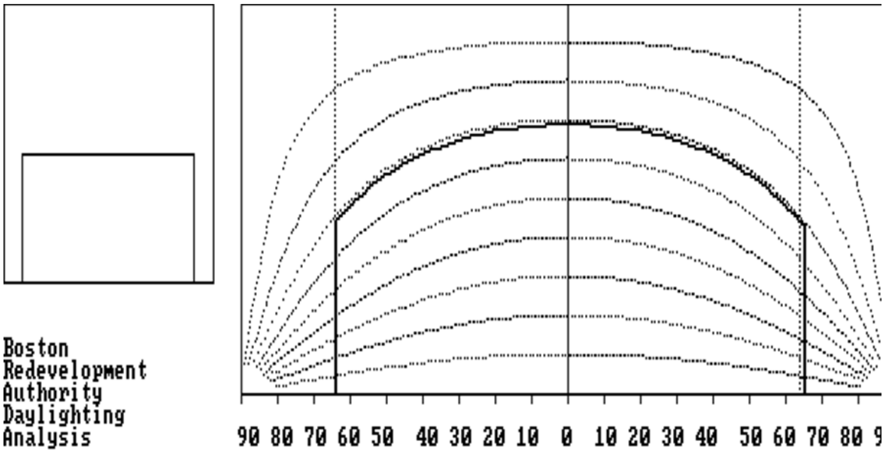
Proposed Conditions

Area Context Viewpoint AC1: View from A Street facing northwest toward the building at 50 West Broadway



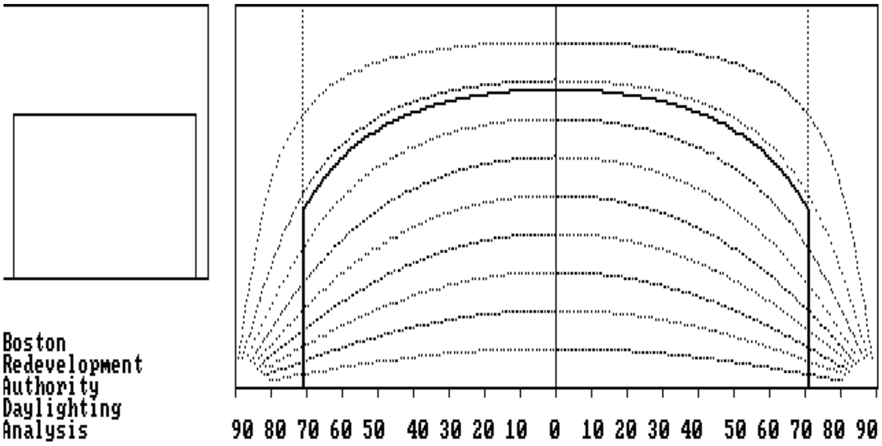
Obstruction of daylight by the building is 64.0 %

Area Context Viewpoint AC2: View from West 2nd Street facing southwest toward the building at 141 West Second Street



Obstruction of daylight by the building is 69.3 %

Area Context Viewpoint AC3: View from West Second Street facing northeast toward the building at 44 West Second Street



Obstruction of daylight by the building is 77.6 %

Figure 3.3-4
Area Context

A Street – Viewpoint 2

A Street runs along the northwestern edge of the Project site. Viewpoint 2 was taken from the center of A Street looking southeast toward the Project site. The existing site has a daylight obstruction value of 15.7%. The development of the Project will increase the daylight obstruction value to 58.4%. 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.

Athens Street – Viewpoint 3

Athens Street runs along the southwestern edge of the Project site. Viewpoint 3 was taken from the center of Athens Street looking northeast toward the Project site. The existing site has a daylight obstruction value of 23.1%. The Project will increase the daylight obstruction value to 39.3%, the lowest of the three viewpoints studied because the two outdoor amenity spaces on the site allow for a view of the sky.

Area Context Viewpoints

The Project site is located in South Boston in an area with a mix of relatively low density commercial and residential uses with surface parking lots. However, the area has seen a number of new developments over the past several years. 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 64.0% for AC1 to 77.6% for AC3. 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 proposed density and characteristics of the massing which is consistent with other projects in the 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 areas.

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, 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.

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.

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 the U. S. Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety.

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

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

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 MassDEP in its Annual Air Quality Reports was obtained for 2007 to 2012. MassDEP guidance specifies the use of the latest three years of available monitoring data from within 10 km of the Project site.

The Clean Air Act allows one exceedance per year of the CO and SO_2 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. A new one-hour NO_2 standard was recently promulgated. To attain this standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 μg/m3.

Background concentrations were determined from the closest available monitoring stations to the proposed development. The closest monitor is located at Harrison Avenue 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	2010	2011	2012	Background Concentration (μg/m^3)	Location
SO_2 (1)(7)(8)	1-Hour	63.2	93.3	55.4	93.3	Harrison Ave., Boston
	3-Hour	62.4	54.6	72.8	72.8	Harrison Ave., Boston
	24-Hour	22.9	33.5	20.5	33.5	Harrison Ave., Boston
	Annual	4.2	3.3	2.9	4.2	Harrison Ave., Boston
PM10	24-Hour	50.0	42.0	72.0	72.0	Harrison Ave., Boston
	Annual	14.1	14.8	14.1	14.8	Harrison Ave., Boston
PM2.5	24-Hour (4)	22.5	20.9	20.6	21.3	Harrison Ave., Boston
	Annual (5)	8.3	8.5	8.3	8.3	Harrison Ave., Boston
NO_2 (3)	1-Hour (6)	116.6	139.1	126.0	139.1	Harrison Ave., Boston
	Annual	32.1	34.8	29.7	34.8	Harrison Ave., Boston
CO (2)	1-Hour	3306	2816	2622	3306	Harrison Ave., Boston
	8-Hour	2394	2166	2166	2394	Harrison Ave., Boston

Notes: From 2007-2012 MassDEP Annual Data Summaries

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

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

[3] NO_2 reported in ppm or ppb. Converted to μg/m^3 using factor of 1 ppm = 1880 μg/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 - 2012 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 ppm were 2.9 ppm (3306 μg/m3) for one-hour and 2.1 ppm (2394 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 the Project. This "microscale" analysis is 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 CO emissions from vehicles idling at and traveling through both signalized 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 do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on current vehicles has reduced the occurrences of CO hotspots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The analyses for the Project followed the procedure outlined in EPA's intersection modeling guidance[2].

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. The modeling methodology was developed in accordance with the latest MassDEP modeling policies and federal modeling guidelines[3].

Baseline (2013) and future year (2018) 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.

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

[3] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

Existing background values of CO at the nearest monitor location on Harrison Avenue were obtained from the MassDEP. CAL3QHC results were then added to background CO values of 2.9 ppm (one-hour) and 2.1 ppm (eight-hour), as provided by the 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).

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

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

Only one signalized intersection (the intersection of West Broadway and A Street) included in the traffic study meets 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.

Microscale modeling was performed for the intersection based on the aforementioned methodology. The 2013 existing conditions, and the 2018 No Build and Build conditions were each evaluated for both the 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 (2018) have been 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 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 intersection. 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 analyses.

Receptors & Meteorology Inputs

A set of 189 receptors was 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 intersection are presented in Figure 3.5-1.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[4], a wind speed of one meter per second (m/s), stability class D (4), and a mixing height of 1,000 meters was used. To account for the intersection geometry, wind directions from 0° to 350°, every 10° were selected. A surface roughness length of 370 cm was selected.[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[6]. 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 C.

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 Table 3.5-3 for the 2013 and 2018 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.7[7].

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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.

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

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Figure 3.5-1

Link and Receptor Locations for CAL3QHC modeling of Intersection of W. Broadway & A Street.

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 (1.1 ppm) plus background (2.9 ppm) is 4.0 ppm for the 2018 afternoon peak hour case. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (0.8 ppm) plus background (2.1 ppm) is 2.9 ppm for the same scenario. All concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

3.5.4 Conclusions

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.

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					
W. Broadway & A Street	AM	1.0	2.9	3.9	35
	PM	0.9	2.9	3.8	35
8-Hour					
W. Broadway & A Street	AM	0.7	2.1	2.8	9
	PM	0.6	2.1	2.7	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 2018)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
W. Broadway & A Street	AM	1.0	2.9	3.9	35
	PM	1.1	2.9	4.0	35
8-Hour					
W. Broadway & A Street	AM	0.7	2.1	2.8	9
	PM	0.8	2.1	2.9	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 2018)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
W. Broadway & A Street	AM	1.0	2.9	3.9	35
	PM	1.1	2.9	4.0	35
8-Hour					
W. Broadway & A Street	AM	0.7	2.1	2.8	9
	PM	0.8	2.1	2.9	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 7.4 for information on stormwater and water quality impacts.

3.7 Flood Hazard Zones/Wetlands

The most current version of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for this area (25025C0083G) shows that the Project site is located outside of the 500-year flood zone area. The Project site remains outside of the 500-year flood zone area in the Preliminary FEMA Flood Hazard Map.

The Project site does not contain wetlands.

3.8 Geotechnical/Groundwater

3.8.1 Existing Site Conditions

The Project site is an approximately 42,509 sf property, occupied by a one-story, approximately 30,000 sf brick building that has been used for light-industry (copper bellows manufacturing) since at least 1962. Portions of the site not occupied by buildings include asphalt paved parking lots. Site grades are relatively level around the property, ranging from El. 26 to El. 23 Boston City Base (BCB).

3.8.2 Subsurface Conditions

Available subsurface data and geologic information was collected for the site to define existing subsurface soil and groundwater conditions. In general, subsurface conditions anticipated are approximately 6 to 14 feet of fill over up to 30 feet of glacial deposits. Bedrock is anticipated to be at a depth of 45 feet.

Groundwater levels in the Project area measured during the exploration phase range from approximately 5.4 to 10.8 feet below ground surface.

3.8.3 Proposed Foundation Construction Methodology

The proposed site development includes construction of a mid-rise building with a partially below-grade parking garage on the first level.

Column loads for the mid-rise structure are expected to require foundations that extend into naturally deposited bearing soils. The type of foundations being considered at this time are reinforced concrete footings bearing on undisturbed, naturally deposited glaciomarine deposits or on Compacted Granular Fill or Lean Concrete placed following removal of unsuitable fill soils, if present below the proposed bearing elevation. Construction will require an excavation extending to the depth required for below-grade construction, approximately 1.5 to 4.5 feet below ground surface for the floor slab, and an additional 3 feet locally for the footings. It is anticipated that the excavation may terminate within either the fill or the glaciomarine deposits.

3.8.4 Potential Impacts During Excavation and Foundation Construction

The depth of excavation and foundation construction will have limited impacts to the area. The foundation design and construction will be specified and conducted to eliminate potential adverse impacts, especially to adjacent structures and to groundwater levels. The lowest floor level for the proposed Project is planned to be at El. 24.5 BCB, which will be above the average measured groundwater level for the area.

The Project is not located in the Groundwater Conservation Overlay District (GCOD) and will therefore not need to comply with the requirements of Article 32 of the City of Boston Zoning Code.

3.9 Solid and Hazardous Waste

3.9.1 Hazardous Waste

A Phase I Environmental Site Assessment (Phase I ESA) dated July 12, 2013 was prepared using methods consistent with ASTM E1527-05. The Phase I ESA identified two Suspect Recognized Environmental Conditions (existence of urban fill, and historical industrial use of solvents, heavy metals, and other chemicals), and one Historical Recognized Environmental Condition (historical release of transformer oil in August 1989, which achieved regulatory compliance in April 1990).

Recent initial characterization of the soil and groundwater at the site has been conducted. No site conditions were identified which would preclude residential development at the site.

Management of soil and groundwater during construction will be in accordance with applicable local, state, and federal laws and regulations. Additional characterization of material to be excavated for off-site disposition will be undertaken prior to removing any material from the property. Regulatory compliance will be achieved for the site through typical soil and groundwater management procedures.

3.9.2 Solid Waste and Recycling

The Project will generate solid waste typical of residential and retail uses. Solid waste is expected to include wastepaper, cardboard, glass bottles and food. Recyclable materials will be recycled through a program implemented by building management. The Project will generate approximately 141 tons of solid waste per year.

With the exception of household hazardous wastes typical of residential and retail/commercial developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials. Typical waste generated by the uses will be handled in compliance with all local, state and federal regulations.

The building will include areas for trash collection and recycling collection on each floor, and a trash room in close proximity to the loading dock. Recycling facilities will be provided on-site for paper, glass, plastic and metal.

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 Project site, 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 section 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 dB 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[8]. 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 L_{90}, or residual sound level, is close to the lowest sound level observed when there are no obvious nearby intermittent noise sources.

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[8] *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.

- 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 L_{10}, 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 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 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	Residential Zoning District		Residential-Industrial Zoning District		Business Zoning District	Industrial Zoning District
Frequency (Hz)	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:

1. 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.
2. All standards apply at the property line of the receiving property.
3. dB and dBA based on a reference sound pressure of 20 micropascals.
4. ‘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 L_{90} ambient sound level measured at the Project property line and at the nearest residences. The MassDEP policy further prohibits “pure tone” conditions where the sound pressure level in one octave-band is three or more dB 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 within the South Boston neighborhood of Boston, Massachusetts. Existing noise sources in the vicinity of the Project site currently include: vehicular traffic along local roadways; birds; pedestrian conversation and foot traffic; some roadway construction; some air traffic; and the general noises of the City.

3.10.4.1 Noise Monitoring Methodology

Sound level measurements were made on Tuesday, December 3, 2013 during the daytime (12:30 p.m. to 2:00 p.m.) and on Wednesday, December 4, 2013 during nighttime hours (12:30 a.m. to 2:00 a.m.). Since noise impacts from the Project on the community will be 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 Project site.

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. Three 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.

- **Location ST-1** was located in front of J & J Discount Mini Mart located on West Broadway Street, northwest of B Street. This location was selected to represent sound levels at residential receptors in the neighborhood south of the Project.

- **Location ST-2** was located on the sidewalk in front of 129 B Street, on the corner of B Street and West 3rd Street. This location was selected to represent sound levels at residential receptors to the east of the Project.

- **Location ST-3** was located on the northeast side of KO Pies on the corner of West 3rd Street and A Street. This location was selected to represent sound levels at residential receptors to the west of the Project. Roadway construction was present at the intersection of A Street and Athens Street, which was mildly audible during the daytime measurement period. No construction activity was present during the nighttime measurement period.

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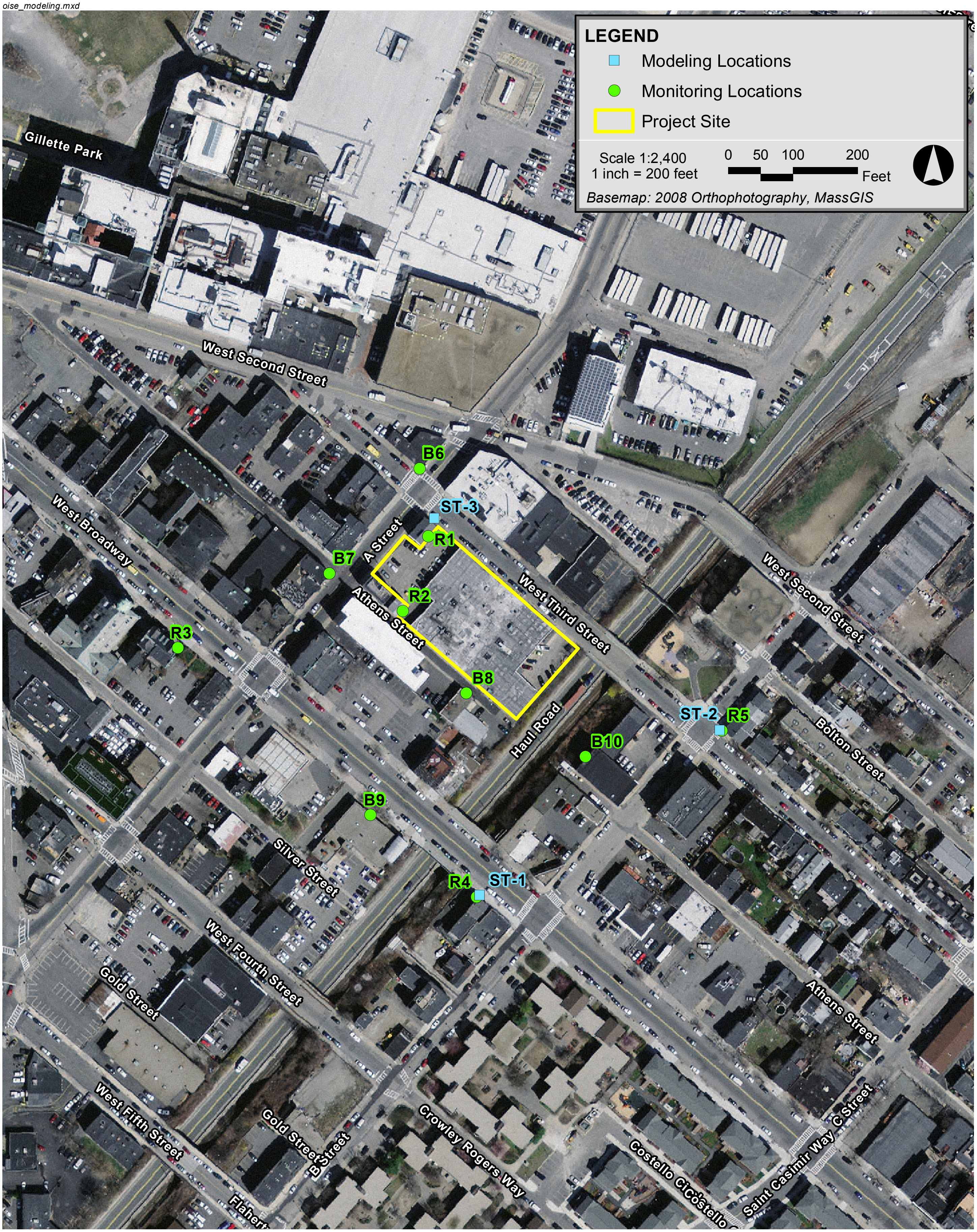

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Figure 3.10-1
Noise Monitoring & Modeling Locations

3.10.4.3 Noise Monitoring Equipment

A Larson Davis Model 831 sound level meter equipped with a PRM831 Type I Preamplifier, a 377B20 half-inch microphone, and manufacturer-provided windscreen was 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 Larson Davis CAL200 acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. Statistical descriptors (L_{eq}, L_{90}, 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 55 to 58 dBA.
- The nighttime residual background (L_{90} dBA) measurements ranged from 52 to 53 dBA.
- The daytime equivalent level (L_{eq} dBA) measurements ranged from 61 to 66 dBA.
- The nighttime equivalent level (L_{eq} dBA) measurements ranged from 54 to 63 dBA.

3.10.5 Future Conditions

3.10.5.1 Overview of Potential Project Noise Sources

The primary sources of continuous sound exterior to the Project will consist of ventilation, cooling, and standby power equipment located on the roof of the proposed building. These sources include bathroom and dryer exhaust fans, a commercial kitchen exhaust fan and make-up air unit, energy recovery ventilators, and cooling units.

Other secondary noise sources, such as hot water heaters, boilers, and pumps will either be enclosed within the building interior, or are assumed to have sound levels 10 dBA lower than the primary sources of noise, and were not considered in this analysis to contribute significantly to the overall sound level. One 27 kW rooftop standby generator is proposed for the Project.

Table 3.10-2 Summary of Measured Background Noise Levels

Location	Period	Start Time	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}	L_{90} Sound Pressure Levels by Octave-Band								
								31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
			dBA	dBA	dBA	dBA	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
ST-1	Day	12:37 PM	66	86	69	64	57	70	74	68	63	62	63	58	52	48
ST-2	Day	1:02 PM	61	79	63	58	55	67	70	69	60	57	56	52	47	42
ST-3	Day	1:36 PM*	66	87	68	62	58	71	71	71	65	62	60	57	53	47
ST-1	Night	12:31 AM	63	77	68	57	53	66	67	61	58	58	61	56	46	39
ST-2	Night	1:20 AM	54	68	55	54	52	60	62	59	52	52	51	41	31	26
ST-3	Night	12:56 AM	59	76	62	54	52	63	66	65	58	56	55	50	43	35

*Roadway construction noise observed during this period.

Weather Conditions:

	Date	Temp	RH	Sky	Wind
Daytime	Tuesday, December 3, 2013	46.2 °F	56%	clear/sunny	N @ 0-3 mph
Nighttime	Wednesday, December 4, 2013	37.9 °F	69%	clear	N @ 0-6 mph

Monitoring Equipment Used:

	Manufacturer	Model	S/N
Sound Level Meter	Larson Davis	LD831	3047
Microphone	Larson Davis	377B20	130579
Preamp	Larson Davis	PRM831	23825
Calibrator	Larson Davis	Cal200	2853

Mitigation will be applied to sources as needed, to ensure compliance with the applicable noise regulations. The noise control features assumed in this analysis consisted of a five-foot high screening wall along portions of the proposed building roof identified in the site plan drawing.

A tabular summary of the modeled mechanical equipment proposed for the Project is presented below in Table 3.10-3. Sound power level data for each unit, as provided by the manufacturer or calculated from provided sound pressure level data, is presented in Table 3.10-4. 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.

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. The analysis considered all of the mechanical equipment operating during the quietest nighttime hours at the nearest residential receptors.

3.10.5.3 Noise Modeling Results

Ten modeling locations with a height of 1.5 meters above-grade were included in the analysis representing the nearest noise-sensitive residential and commercial receptors. Figure 3.10-1 shows the locations of each modeled receptor as well as the monitoring locations selected for background measurements.

The predicted future sound levels (Project + background), presented in Table 3.10-5, are well below the MassDEP criteria of 10 dBA over the measured background L_{90} sound levels at all sensitive receptor locations. The Project's mechanical equipment is not expected to create or exacerbate any "pure-tone" conditions as defined by MassDEP when combined with existing background sound levels at these locations. Predicted sound levels combining Project and background sources are shown in Table 3.10-6. 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 and commercial receptors. This evaluation is presented in Table 3.10-7.

Table 3.10-3 Modeled Noise Sources

Noise Source	Quantity	Anticipated Location	Size/Capacity per Unit
Bathroom Exhaust Fan	10	Upper Roof (x8) 65' AGL, Lower Roof (x2) 55' AGL	500 CFM
Commercial Kitchen Exhaust Fan	1	Upper Roof 65' AGL	4,500 CFM
Commercial Kitchen MAU	1	Upper Roof 65' AGL	4,500 CFM
Dryer Exhaust	13	Upper Roof (x10) 65' AGL, Lower Roof (x3) 55' AGL	N/A
Energy Recovery Ventilator	3	Upper Roof 65' AGL	1,500 CFM
Standby Generator	1	Upper Roof 65' AGL	27 kW
Rooftop Unit	3	Upper Roof 65' AGL	3 TON
Commercial Cooling Unit	2	Upper Roof 65' AGL	3 TON
Residential Cooling Unit	163	Upper Roof (x131) 65' AGL, Lower Roof (x32) 55' AGL	1.5 TON

Table 3.10-4 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
Bathroom Exhaust Fan[1]	69	78	78	76	72	65	61	57	54	47
Commercial Kitchen Exhaust Fan[2]	84	88	88	87	85	84	77	74	70	63
Commercial Kitchen MAU[3]	85	85	85	84	85	81	81	76	74	68
Dryer Exhaust[4]	70	-	-	78	76	67	59	56	48	38
Energy Recovery Ventilator[5]	77	79	79	78	73	72	71	70	68	64
Standby Generator[6]	95	-	-	-	-	-	-	-	-	-
Rooftop Unit[7]	75	-	-	63	66	70	71	68	62	53
Commercial Cooling Unit[8]	73	-	-	53	61	67	69	67	62	53
Residential Cooling Unit[9]	72	-	-	53	60	65	69	67	62	55

Notes:

1. Greenheck Model G-090-VG Direct Drive Centrifugal Roof Exhaust Fan, 500 CFM, Inlet Lw
2. Greenheck Model SWB-118-30 Backward Inclined Centrifugal Utility Fan, 4500 CFM, Inlet Lw
3. Greenheck Model IGX-112-H22 Make Up Air Unit, 4500 CFM, Supply Lw
4. Exhausto Model BESB250 Box Ventilator
5. Greenheck Model ERCH-45-15H-EH-01Energy Recovery Ventilator, 1500 CFM, Supply Lw
6. Generac Quietsource Series Model QT027 Standby Generator, 27 kW
7. Lennox Landmark Model 036 Rooftop Unit, 3-ton
8. Lennox Merit Series Model 13ACX-036 Cooling Unit, 3-ton
9. Lennox Merit Series Model 13ACX-018 Cooling Unit, 1.5-ton

Table 3.10-5 MassDEP Compliance Evaluation

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-3	Night	52	39	52	0	YES
R2	Residential	ST-3	Night	52	41	53	1	YES
R3	Residential	ST-1	Night	53	27	53	0	YES
R4	Residential	ST-1	Night	53	34	53	0	YES
R5	Residential	ST-2	Night	52	36	52	0	YES
B6	Business	ST-3	Night	52	34	52	0	YES
B7	Business	ST-3	Night	52	31	52	0	YES
B8	Business	ST-2	Night	52	39	52	0	YES
B9	Business	ST-1	Night	53	35	53	0	YES
B10	Business	ST-1	Night	53	36	53	0	YES

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

Table 3.10-6 MassDEP "Pure Tone" Evaluation: Combined Project + Background Levels

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	52	63	66	65	58	56	55	50	43	35
R2	Residential	Night	53	63	66	65	58	56	55	50	43	35
R3	Residential	Night	53	66	67	61	58	58	61	56	46	39
R4	Residential	Night	53	66	67	61	58	58	61	56	46	39
R5	Residential	Night	52	60	62	59	52	52	51	42	31	26
B6	Business	Night	52	63	66	65	58	56	55	50	43	35
B7	Business	Night	52	63	66	65	58	56	55	50	43	35
B8	Business	Night	52	60	62	59	52	52	51	42	32	26
B9	Business	Night	53	66	67	61	58	58	61	56	46	39
B10	Business	Night	53	66	67	61	58	58	61	56	46	39

Table 3.10-7 City of Boston Compliance Evaluation: Project-Only Modeling Results

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	39	45	44	41	38	34	37	30	23	13
R2	Residential	Night	41	47	46	42	38	34	39	31	24	14
R3	Residential	Night	27	26	23	22	22	19	26	17	5	0
R4	Residential	Night	34	35	35	34	32	29	31	24	14	0
R5	Residential	Night	36	37	37	36	33	30	34	27	19	4
B6	Business	Night	34	41	38	34	30	25	32	24	14	0
B7	Business	Night	31	42	39	36	32	27	28	21	14	2
B8	Business	Night	39	44	42	39	36	32	37	31	23	13
B9	Business	Night	35	35	34	34	32	29	32	25	14	0
B10	Business	Night	36	40	38	35	32	29	34	26	17	2
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 Project site 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 (as described in Section 3.10.5.1), the Project is not expected to introduce significant outdoor mechanical equipment noise into the surrounding community.

Results of the analysis indicate that noise levels from the Project are expected to remain at or below 40 dBA at the nearest receptors, well below the City of Boston Noise Zoning requirements (50 dBA), and will comply with MassDEP A-weighted and tonal noise limits. It should be noted that the existing ambient background levels immediately surrounding the Project already exceed 50 dBA without any contribution from the Project. The results presented in Section 3.10.5.3 indicate that the Project is not anticipated to impact 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, screening walls, mufflers, or equipment enclosures, as needed.

3.11 Construction

3.11.1 Introduction

A Construction Management Plan (CMP) prepared in compliance with the City's Construction Management Program will be submitted to 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 as necessary. 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, and 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

Construction of the Project is estimated to last approximately 14 to 16 months, with initial site work expected to begin in the fourth quarter of 2014.

Typical construction hours will be from 7:00 a.m. to 6:00 p.m., Monday through Friday, with most shifts ordinarily ending at 3:30 p.m. No substantial sound-generating activity will occur before 7:00 a.m. If longer hours, additional shifts, or Saturday work is required, the Proponent will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. 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 Boston Harbor" 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 180 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.

Chapter 4.0

Sustainable Design and Climate Change

4.0 SUSTAINABLE DESIGN AND CLIMATE CHANGE

4.1 Green Building

Sustainability has informed every design decision for the Project. Enduring and efficient buildings conserve embodied energy and preserve natural resources. The Project team is working to minimize energy use to the extent practicable by evaluating every possible efficiency measure.

The Project embraces the opportunity to positively influence the urban environment. Its urban location takes advantage of existing infrastructure, while convenient access to public transportation will reduce dependence on single occupant vehicle trips and minimize transportation impacts. Bicycle storage will be provided on site.

Article 37 of the Boston Zoning Code requires that projects that are subject to Article 80B, Large Project Review, be Leadership in Energy and Environmental Design (LEED) certifiable. The Project will use the LEED for New Construction 2009 rating system to show Article 37 compliance. Formal LEED Certification is being considered. The LEED rating system tracks the sustainable features of the Project by assigning points in the following categories: Sustainable Sites; Water Efficiency; Energy & Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation & Design Process.

The following is a credit-by-credit analysis of the Project team's approach for achieving LEED-NC v2009 at the Silver level by currently targeting 54 credit points. There are a number of additional credit points, listed in italics below, which are still under consideration and will be decided as the design develops and engineering assumptions are substantiated. The LEED-NC v2009 checklist is included at the end of this section. The discussion below and associated checklist are preliminary and will be updated as the design of the Project moves forward.

Sustainable Sites

SSp1 - Construction Activity Pollution Prevention: The Project's erosion and sedimentation plan conforms to local codes and the EPA Construction General Permit (Phase I and Phase II) of the National Pollutant Discharge Elimination System Program (NPDES).

SSc1 – Site Selection: The Project site was previously developed, and the Project will not be developed on any restricted sites.

SSc2 - Development Density and Community Connectivity: The Project site was previously developed, is within ½ mile of a dense residential area in Boston, and is within ½ mile, with pedestrian access, of at least 10 basic services.

SSc3 – Brownfield Redevelopment: The Proponent performed a Phase I site inspection, and found certain soil conditions common in urban soils and consistent with the site's historic use. Excess soils will be removed and remediated in accordance with state regulations. More information on site conditions can be found in Section 3.9.1.

SSc4.1 - Alternative Transportation, Public Transportation Access: The Project site is located within ½ mile walking distance of the MBTA Broadway Station which is serviced by the Red Line and three bus lines (routes 9, 11 and 47).

SSc4.2 - Alternative Transportation, Bicycle Storage & Changing Rooms: Secure, covered storage for 168 bicycles and exterior racks will be provided, consistent with BTD requirements and exceeding LEED requirements for this credit. A shower will be provided for staff.

SS Credit 4.3 - Alternative Transportation - Low-emitting and Fuel-efficient Vehicles: The Project will include 115 covered parking spaces including 6 low-emitting and fuel efficient spaces.

SSc4.4 - Alternative Transportation, Parking Capacity: The Project will include 115 parking spaces, which does not exceed zoning requirements. Ride share boards will be provided for the Project.

SSc5.1 - Site Development—Protect or Restore Habitat: The Project will exceed the 20% requirement for native and adaptive vegetation with a combination of green areas on the ground floor and roof area. Section 5.4 includes information about the landscaped roof areas.

SSc6 - Stormwater Design—Quantity and Quality Control: Every effort has been made to increase pervious surfaces, including pervious paving on sections of the surrounding sidewalks, and selected plant material and strategies that will minimize rate and quantity of runoff and maximize infiltration (see Section 7.4 for more information). The Proponent anticipates achieving both of these credits. *The Quality Control is still being evaluated and the final calculation will be run during the CD phase of the Project.*

SSc7.1 - Heat Island Effect, Non-Roof: More than 50% of the parking spaces will be below grade, and the Project will have a Solar Reflectance Index (SRI) Compliant Roof.

SSc7.2 - Heat Island Effect, Roof: 100% of the roofing material will comply with the SRI requirements.

Water Efficiency

WEp1 – Water Use Reduction: The Project will exceed the prerequisite of a 20% reduction in water use through the use of low flow plumbing fixtures.

WEc1.1 - Water Efficient Landscaping, Reduce by 50%: The Project will reduce potable water consumption for irrigation by 50% with the proposed highly efficient irrigation system and the use of native plants.

WEc3- Water Use Reduction, 30%-40 Reduction: With the use of high efficient plumbing fixtures, an approximately 36% water use reduction is anticipated to be achieved.

Energy & Atmosphere

EAp1 - Fundamental Building Systems Commissioning: Commissioning process activities will be completed for the following energy-related systems, at a minimum:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls;
- Lighting and daylighting controls;
- Domestic hot water systems; and
- Renewable energy systems (wind, solar, etc.).

The Project's exterior envelope consultant will review building enclosure details.

EAp2 - Minimum Energy Performance: The Project will, at a minimum, meet the Stretch Code provisions of the Massachusetts State Building Code which requires a 20% reduction per ASHRAE 90.1. The energy model will test energy conservation measures (ECMs) to reduce energy beyond the Stretch Code.

EAp3 - Fundamental Refrigerant Management: The Project will be designed without the use of chlorofluorocarbon (CFC) or hydrochlorofluorocarbon (HCFC) refrigerants.

EAc1 - Optimize Energy Performance: The Project will meet the Stretch Code requirement of a 20% reduction per ASHRAE 90.1 at a minimum. The energy model will test ECMs to reduce energy beyond the Stretch Code.

EAc3 - Enhanced Commissioning: Enhanced Commissioning will be evaluated for the Project.

EAc4 - Enhanced Refrigerant Management: The Proponent will confirm calculations for the Enhanced Refrigerant Management standard when final equipment is selected.

EAc5 - Measurement and Verification: The Project will meet MPR6 through the establishment of an ENERGY STAR Portfolio Manager account to enable the USGBC to review whole building energy and water use for five years after occupancy.

EAc6 – Green Power: The Proponent will determine prior to occupancy if the Project will pursue Green Power. If so, a renewable energy contract will be included in the construction submission.

Materials & Resources

MRp1 – Storage & Collection of Recyclables: The Project will have a dedicated recycling area as a part of the trash collection for the building. At a minimum, paper, corrugated cardboard, glass, plastics and metals will be collected. An independent third-party service will take the single stream recycled material to an off-site facility.

MRc2 - Construction Waste Management: The Project will develop and implement a construction waste management plan under which the materials to be diverted from disposal will be identified and a determination made on whether the materials will be sorted on site or co-mingled. The Proponent is targeting a minimum of 75% diversion from landfill.

MRc4 - Recycled Content- 10% of Content, 20% of Content: Ten percent of Project materials will be recycled content materials.

MRc5 - Regional Materials-10% of Materials, 20% of Materials: Ten percent of Project materials will be regional materials.

Indoor Environmental Quality

EQp1 - Minimum IAQ Performance: The Project will be designed to meet the minimum requirements of ASHRAE 62-2007 Table 6-1, the "Minimum Ventilation Rates in Breathing Zone."

EQp2 - Environmental Tobacco Smoke (ETS) Control: Smoking will not be allowed on the Project property, inside or outside the building. This policy will be outlined in the tenant handbook.

EQc3.1 Construction IAQ Management Plan: The Project will follow all of the requirements for implementation and documentation of SMACNA, and installation and replacement of filtration media prior to occupancy.

EQc3.2 Construction IAQ Management Plan: A flush-out will be performed prior to Project occupancy.

EQc4.1 Low-Emitting Materials, Adhesives & Sealants: The Project will comply with the requirements for adhesives and sealants.

EQc4.2 Low-Emitting Materials, Paints: The Project will comply with the requirements for paints.

EQc4.3 Low-Emitting Materials, Flooring Systems: The Project will comply with the requirements for flooring systems.

EQc4.4 - Low-Emitting Materials, Composite Wood & Agrifiber Products: The Proponent plans to prioritize use of no added urea formaldehyde but cannot commit to achieving this for all wood products.

EQc5 - Indoor Chemical & Pollutant Source Control: The Proponent is evaluating compliance with all requirements for indoor chemical and pollutant source control.

EQc6.1 - Controllability of Systems, Lighting: The Project will include individual lighting controls for at least 90% of the occupants.

EQc6.2 - Controllability of Systems, Thermal Comfort: The Project will allow at least 50% of occupants individual access to control either the air speed, air temperature, radiant temperature, or humidity provided by mechanical systems, in individually occupied spaces. In all multi-occupant spaces, at least one means to control thermal comfort will be provided.

EQc7.1 - Thermal Comfort, Design: Compliance with ASHRAE Standard 55 will be evaluated in the next stage of Project design.

EQ - c7.2 Thermal Comfort Verification: If ASHRAE 55 is met, the Proponent will survey the occupants 6 to 18 months following completion of the improvements to assess if they are satisfied with thermal conditions in the building. A corrective action plan will be designed and implemented if greater than 20% of occupants report dissatisfaction with a certain element of thermal comfort.

EQc8.1 - Daylight & Views: The Project is designed to maximize daylighting and window-to-wall areas ratios to provide views. This credit is not being pursued formally for the LEED Certifiability submission.

EQc8.2 - Daylight & Views, Views for 90% of Spaces: The Project will be designed to maximize daylighting and window-to-wall areas ratios to provide views. This credit is not being pursued formally for the LEED Certifiability submission.

Innovation & Design (I.D.) Process

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

IDc1.1 - Innovation & Design- Energy Star Appliances: The Project intends to achieve the Energy Star Appliances Credit through the LEED CI rating systems, as all appliances will be specified to be Energy Star.

IDc1.2 - Innovation & Design- Exemplary Performance: SSc7.1 Urban Heat Island Non Roof- 100% of parking spaces will be covered.

IDc1.3 Innovation & Design- Green Housekeeping: To reduce the exposure of building occupants and maintenance personnel to potentially hazardous chemical, biological and particulate contaminants, the project will develop a green cleaning policy for the building and site.

IDc1.4 Innovation & Design- Education & Outreach: The project will develop an education and outreach plan that will include 2 of the following; signage, manual, or tour.

IDc2 LEED Accredited Professional: Colleen Soden is the LEED AP for the Project.

Regional Priority Credits

Regional Priority Credits (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project. This Project anticipates achieving four RPCs for the following:

Regional Priority: SSc3: Brownfield Redevelopment

Regional Priority: SS c6.1: Stormwater Design – Quantity Control

Regional Priority: SS c6.2: Stormwater Design – Quality Control

Regional Priority: SSc7.1: Heat Island Effect – Non-roof

4.2 Climate Change Preparedness

Projects subject to Article 80, Large Project Review are required to complete the Climate Change Preparedness Checklist. Climate change conditions considered include sea-level rise, higher maximum and mean temperatures, more frequent and longer extreme heat events, more frequent and longer droughts, more severe freezing rain and heavy rainfall events, and increased wind gusts.

The expected life of the Project is anticipated to be approximately 50 years. Therefore, the Proponent planned for climate change conditions projected at a 50 year time span. A copy of the completed checklist is included in Appendix D. Given the preliminary level of design, the responses are also preliminary and may be updated as the Project design progresses.

Extreme Heat Events

The Intergovernmental Panel on Climate Change (IPCC) has predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from the current five-to-twenty days annually, to thirty-to-sixty days annually[1]. The Project design will incorporate a number of measures to minimize the impact of high temperature events, including:

- Using the amenity space as a building cool zone during periods of extreme heat and during blackouts (approximately 2,500 sf with an emergency capacity of approximately 200 persons);
- Installing operable windows where possible;
- Using Energy Recovery Ventilation to reduce cooling loads;
- Potentially providing external shading devices in some locations, including balconies strategically placed to provide shading;
- Specifying high reflective paving materials, high albedo roof tops and green roofs to minimize the heat island effect; and
- Planting new street trees to shade the sidewalks adjacent to the site.

Energy modeling for the Project has not yet been completed; however, as indicated on the LEED Checklist, the Proponent will strive to reduce the Project's overall energy demand and GHG emissions that contribute to global warming. The Project's proposed TDM program described in Section 2.5 will also help to lessen fossil fuel consumption.

Sea Level Rise

According to the IPCC, if the sea level continues to rise at historic rates, the sea level in Massachusetts as a whole will rise by one foot by the year 2100. However, if sea level rise is projected using a high emissions scenario of climate change, sea level rise could reach six feet. Adding this potential rise to the mean higher high water (MHHW) level, in 50 years the MHHW could be as high as 15.2 feet Boston City Base (BCB), assuming a sea level rise of approximately four feet.[2] Although the Project is considered to be located in the coastal zone, the lowest site elevation is 23 feet BCB, which is well above the potential MHHW in 50 years.

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[1] 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.

[2] "Preparing for the Rising Tide". The Boston Harbor Association. February 2013.

Sea level rise is also a concern when combined with a large storm. If a major storm, such as another "Superstorm Sandy" with significant storm surge, were to impact Boston at high tide, the potential for flooding would markedly increase. Such a storm would be anticipated to increase sea level to approximately 18.7 feet BCB, which is still below the site elevation.[3] The Project is not expected to be vulnerable to sea level rise within the expected life of the Project. However, measures have been taken to reduce risk to extreme weather events that could lead to flooding, as described below in the section on Rain Events.

Rain Events

As a result of climate change, the Northeast is expected to experience more frequent and intense storms. To mitigate this, the Proponent will take measures to minimize stormwater runoff and protect the Project's mechanical equipment. These measures include:

- Decreasing stormwater runoff from the two-year 24-hour design storm;
- Incorporating a green roof (for the outdoor amenity spaces);
- Locating critical mechanical and electrical equipment at the highest elevation possible to prevent exposure to flood waters;
- Locating the backup generator on the roof;
- Directing stormwater runoff from the roof to a subsurface recharge system on-site;
- Incorporating pervious paving along portions of the sidewalks surrounding the building; and
- Wastewater and stormwater back flow prevention.

Drought Conditions

Under the high emissions scenario, the occurrence of droughts lasting one to three months could go up by as much as 75% over existing conditions by the end of the century. To minimize the Project's susceptibility to drought conditions, the landscape design is anticipated to incorporate native and adaptive plant materials and, if an irrigation system is required, the design of the irrigation system will target a 50% reduction in potable water use when compared to a mid-summer baseline. Aeration fixtures and appliances will be chosen for water conservation qualities, conserving potable water supplies. In public areas, sensor operated faucets and toilets will be installed.

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[3] Ibid.

LEED 2009 for New Construction and Major Renovations

Project Checklist

45 W 3rd Street

#######

Sustainable Sites

Y	?	N			
23	1	2		Possible Points:	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
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
1			Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
	1		Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

Water Efficiency

Y	?	N			
5		5		Possible Points:	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
3		1	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere

Y	?	N			
6	13	16		Possible Points:	35
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5	5	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
1	2		Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2

Materials and Resources

Y	?	N			
4	2	8		Possible Points:	14
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

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

Indoor Environmental Quality

Y	?	N			
7	6	2		Possible Points:	15
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
		1	Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
	1		Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
	1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
	1		Credit 7.1	Thermal Comfort—Design	1
	1		Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process

Y	?	N			
5	1			Possible Points:	6
1			Credit 1.1	Innovation in Design: Energy Star	1
1			Credit 1.2	Innovation in Design: Exemplary Perf SS 7.1	1
1			Credit 1.3	Innovation in Design: Green Houskeepingr	1
1			Credit 1.4	Innovation in Design: Education	1
	1		Credit 1.5	Innovation in Design: TBD	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits

Y	?	N			
4				Possible Points:	4
1			Credit 1.1	Regional Priority: Brownfield	1
1			Credit 1.2	Regional Priority: Heat Island 7.1	1
1			Credit 1.3	Regional Priority:Heat Island 7.2	1
1			Credit 1.4	Regional Priority: SS 6.1	1

Total

Y	?	N			
54	23	33	Total	Possible Points:	110

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

Chapter 5.0

Urban Design

5.0 URBAN DESIGN

5.1 Introduction

The Project site at 45 West Third Street currently consists of surface parking and a one-story, brick building that has been used for light industry since its construction in 1927. The site is on the western edge of the more densely developed South Boston residential areas, but within a five minute walk of the MBTA Broadway Station. The area around the site includes a mix of relatively low density, legacy commercial and residential uses with surface parking lots, as well as a number of newer residential developments that are taking advantage of the close proximity to transit, Downtown, and the growing South Boston waterfront. Transforming the site into approximately 164 residential units with retail/commercial space on the ground floor along A Street will continue the development of this growing area that has become increasingly desirable among young professionals and families.

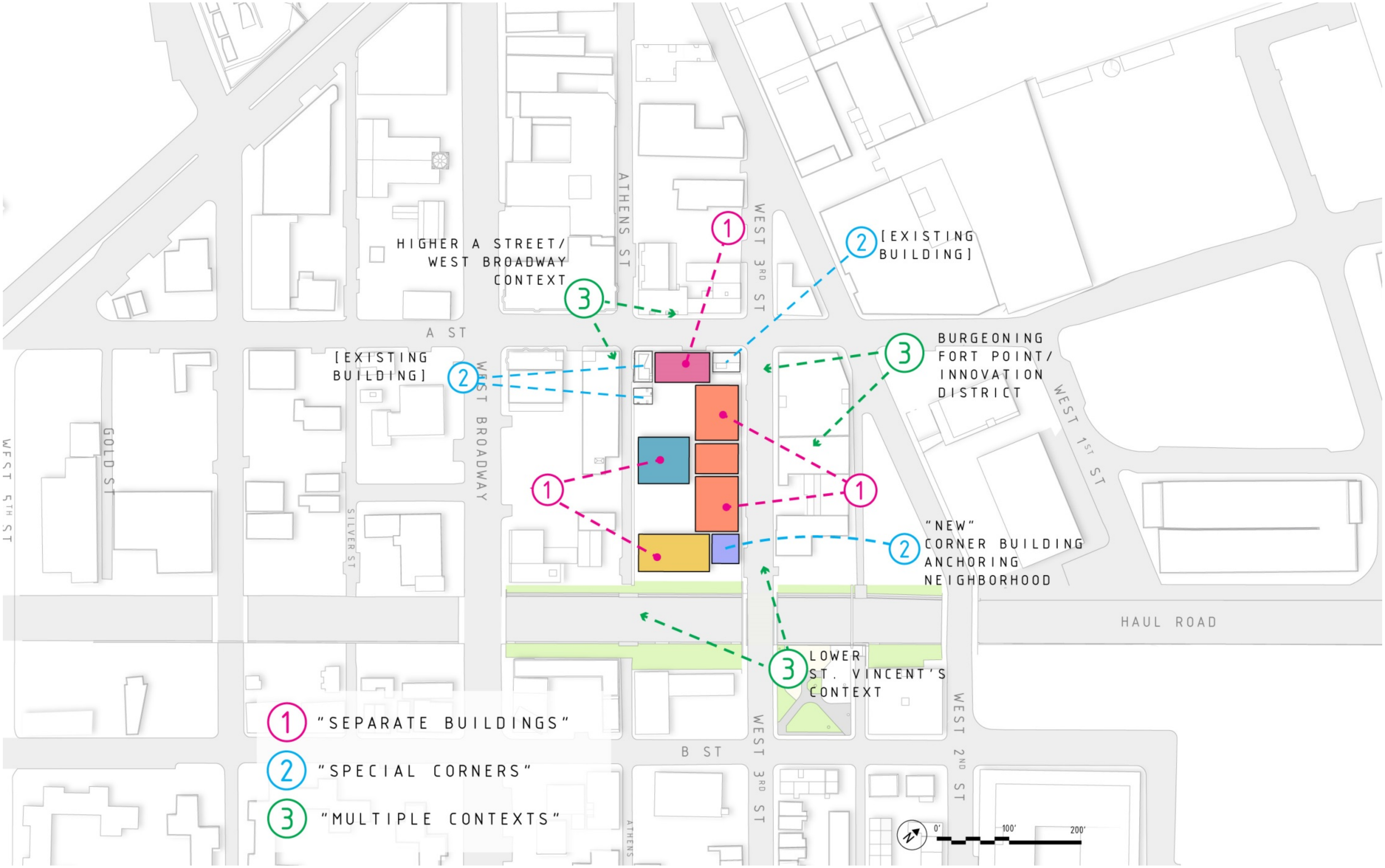
The intention of the Project is to enhance the public realm around the Project site, and develop an appropriately scaled building for the area that recognizes its unique location at the edge of the mature residential areas of South Boston and the growing areas of the Fort Point district and South Boston waterfront, as well as proximity to public transportation. As the Project site is situated in a transitional zone between several distinct neighborhoods with buildings ranging in height from one to six stories, the Project consists of several differently scaled components. Each component is designed to integrate into its surroundings. Replacing the surface parking lots with a covered, partially below grade garage will improve the streetscape and create a pedestrian friendly environment.

5.2 Design Principles

The proposed Project was developed around three fundamental principles described below and depicted in Figure 5-1:

1. Separate Buildings: The site, almost an entire block, is bound by A Street to the west, West Third Street to the north, the depressed Haul Road to the east, and Athens Street to the south. Rather than a large, singular architectural gesture that fills out the parcel, the proposed Project is conceived as a group of differently scaled, complimentary building components. This strategy respects and reflects the historic, incremental growth of the surrounding context. Figure 5-2 provides an aerial view of the proposed massing.

2. Special Corners: The site occupies most of the block with the exception of three out parcels, two of which — 85-87 A Street and 66 Athens Street — anchor important corner sites along A Street. The proposed Project recognizes and expresses a third important site corner at West Third Street and the Haul Road. The proposed Project also anticipates potential future development at 85-87 A Street and can support and integrate this scenario.



45 West Third Street **Boston, Massachusetts**

Hacin + Associates Inc. [architecture + design]
112 Shawmut Avenue, Studio 5A, Boston, MA 02118

Figure 5-1

Design Principles

Figure 5-2

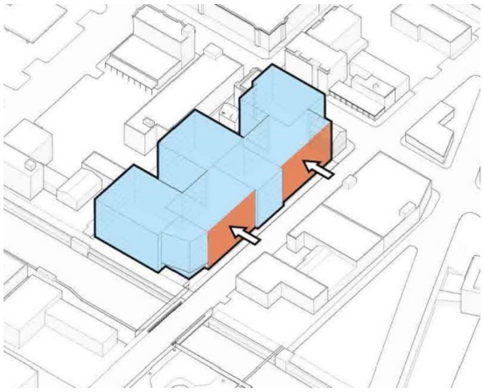
Aerial View from North with Proposed Massing

3. Multiple Contexts: The proposed Project is situated in a transitional zone between several distinct neighborhoods including the high density, high traffic West Broadway district to the southwest, the burgeoning 100 Acres/Fort Point/Innovation District to the north, and the finer grained, lower scale St. Vincent Neighborhood across the Haul Road to the southeast. The proposed Project aspires to integrate and invigorate these varied contexts with an appropriate urban transition.

5.3 Vision

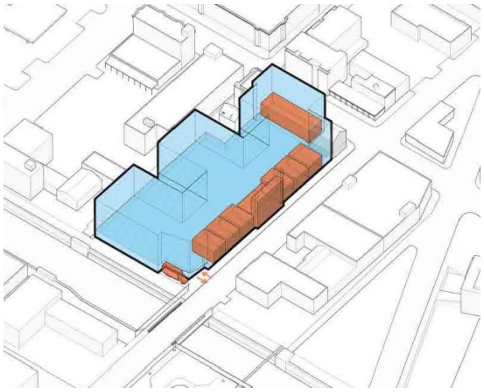
The design of the proposed Project acknowledges the complex, episodic relationships to the surrounding neighborhoods. The architecture responds to specific contextual conditions to enhance and improve the proposed Project's integration into the public realm in the following ways:

Widen sidewalk along West Third Street: The existing sidewalk on West Third Street is eight feet wide. The proposed Project will widen this sidewalk to create a more appropriately scaled pedestrian zone and comply with the City of Boston's Complete Streets Initiative.

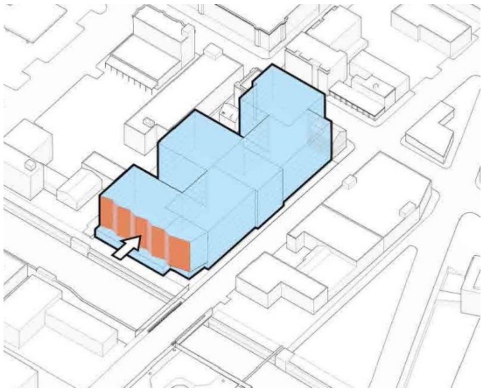


Townhouses, residential lobby and retail entries activate A Street and West Third Street:

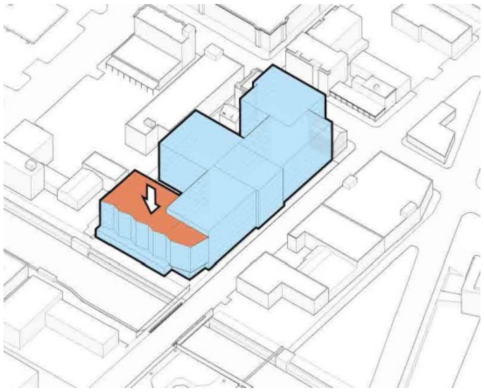
Active uses with distributed entries promote a vibrant street life and provide the crucial dimensions of visual interest and passive security ("eyes on the streets").



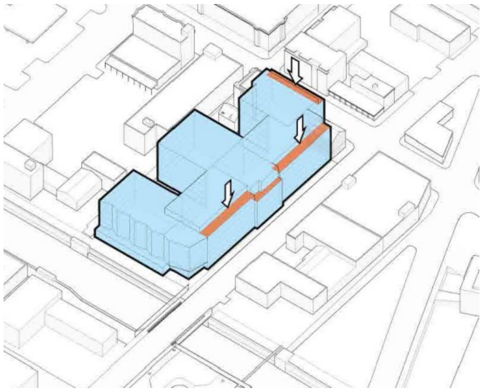
Setback from depressed Haul Road:
The depressed Haul Road is a unique condition since there is no public access along this entire side of the block. The proposed Project is set back along Haul Road and provides a modulated façade to mitigate any acoustic nuisance from the traffic below.



Step down massing toward the St. Vincent neighborhood: The proposed Project steps down to provide an appropriate scale transition to the lower scale of the St. Vincent neighborhood to the South East.



Setback building along West Third Street and A Street:
Setbacks of the top story help to further integrate the proposed Project into the neighboring context. These setbacks provide open space for the upper floor units and create a dynamic cornice profile against the sky.



5.4 Building Form

As described above, the Project is designed to integrate into the varied contexts of the surrounding neighborhood. From the southeast along West Third Street, the site acts as a transition point for the St. Vincent neighborhood, an area that consists primarily of two to four story residential buildings. The proposed Project's northwest corner anchors the view from the neighborhood across the West Third Street-Haul Road bridge. The massing appears as a series of separate buildings including a folded façade with exterior decks recalling the scale and rhythm of traditional three-family houses (see Figures 5-3 and 5-4).

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Figure 5-3

Approach from St. Vincent Neighborhood

Figure 5-4

Approach from St. Vincent Neighborhood

At the pedestrian level on West Third Street, the proposed Project is set back to enlarge the sidewalk. The sidewalk will be improved with street trees, planters and new lighting. Private townhouse entries and the main residential lobby entry enliven this vital pedestrian link between the St. Vincent and West Broadway neighborhoods (see Figures 5-5 and 5-6).

At the northern approach from A Street, the Project site appears as a group of differently scaled, complimentary building components. This more easily relates to the scale of the existing building at 85-87 A Street (or potential future development) and 66 Athens Street. The main lobby creates a prominent West Third Street residential address and further breaks down the scale of the block (see Figures 5-7 and 5-8).

At the southern approach from A Street, a large retail use will activate the ground floor. The proposed Project relates to the largely masonry context and recalls the loft building character in the Fort Point District beyond. Glimpsed down the dead end of Athens Street, the proposed Project is arranged to form two elevated courtyards above the parking garage that will provide both passive and active amenity space for building residents (see Figures 5-9 and 5-10). The courtyards are oriented to capture the optimum sunlight, and the more active amenity space, anticipated to include a gathering space and barbeque, is strategically placed farther away from the existing residential units on the corner of Athens and A Street to minimize impacts to those neighbors. The view from West Broadway looks into one of the two elevated courtyards, although it is generally an obstructed view (see Figures 5-11 and 5-12).

Figure 5-5

View on West Third Street Sidewalk

45 West Third Street **Boston, Massachusetts**

Figure 5-6

View on West Third Street Sidewalk

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Figure 5-7
View from A Street North

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Figure 5-8

View from A Street North

Figure 5-9

View from A Street South

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Figure 5-10

View from A Street South

Figure 5-11
View from West Broadway

Figure 5-12

View from West Broadway

Chapter 6.0

Historic and Archaeological Resources

6.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

6.1 Project Site

No historic resources listed in the State and National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth are located within the Project site.

The Project site includes a one-story former garage building constructed in 1927. Building permits indicate that the original approximately 30,000 sf building was constructed in stages with the original building and an addition (second phase of development) designed by Frederick Norcross for Kitty DiPietro. The former garage building replaced earlier multi-family tenement buildings on the site. The garage was constructed as a load bearing brick masonry building at a cost of $80,000. In 1966, the building use was changed from a garage to a manufacturing building by the Cliflex Bellows Corporation which manufactured bellows and thermometers. During this period, a number of window openings were modified, steel sash removed, and some openings infilled with brick. The interior of the building was also modified with the construction of rooms with concrete block walls. In 1970, the parapet was removed due to its poor condition. In 1982, a new overhead door was created through an exterior wall. Later alterations to the building and removal of historic fabric have materially altered the original architectural integrity of the building.

6.2 Historic Resources in the Project Vicinity

The Project site is located within the vicinity of several historic resources listed in the State and National Registers and included in the Inventory. Table 6-1 and Figure 6-1 identify historic resources within one-quarter mile of the Project site.

A four-story red brick building at 82 West Broadway is situated on the adjacent block. The industrial, two-story steel reinforced concrete Gillette Research Facility at 87-97 A Street is situated across the street from the Project site. Located at the northeast corner of the site within the public right-of-way, is the West Third Street Bridge over Conrail. That bridge now crosses the South Boston Haul Road as well as the railroad right-of-way. The Boston Fire Department Hose Company No. 1 at 116 B Street is located east of the site across the railroad tracks. These resources are located around other new and non-historic, older industrial and residential buildings.

Table 6-1 State and National Register-Listed Properties and Historic Districts

Map No.	Name	Address
State and National Registers of Historic Places		
A	United States Post Office Garage (demolished)	135 A Street
B	Fort Point Channel Historic District	
Inventory of Historic and Archaeological Resources		
1		82 West Broadway
2	Gillette Research Facility	87-97 A Street
3	West Third Street Bridge over Conrail	West Third Street
4	Ipswich Mills	154 West Second Street
5	C Street Area	
6		161-167 West Second Street
7	Boston Fire Department Hose Co. No. 9	116 B Street
8	Lawrence School	125 B Street
9		117 West Third Street
10		92-94 B Street
11	Silver Street Bridge over Conrail	Silver Street
12		146 and 150-154 West Fourth Street
13		123-125 West Fourth Street
14	West Fifth Street Bridge over Conrail	West Fifth Street
15	St. Peter's Lithuanian Catholic Church	Flaherty Way
16		264-272 West Broadway
17	Boston Beer Company (demolished)	300-312 D Street and 249 West Second Street
18	South Boston Hotel	99-101 West Fourth Street
19		55-59 West Broadway
20	St. Peter and Paul Church	45 West Broadway
21	Cardinal Cushing Central High School for Girls (demolished)	54-58 West Broadway
22	Broadway MBTA Station	Broadway
23	Broadway MBTA Bus Station	Broadway
24		450-454 Broadway
25	Macallen Co.	135-137 Dorchester Avenue, 8-20 Greenbaum Street, 70-76 Foundry
26	West Fourth Street Bridge	West Fourth Street at Broadway
27	Old Colony Railroad Bridge	Fort Point Channel
28	Fort Point Channel Bridge	Fort Point Channel at Dorchester Avenue

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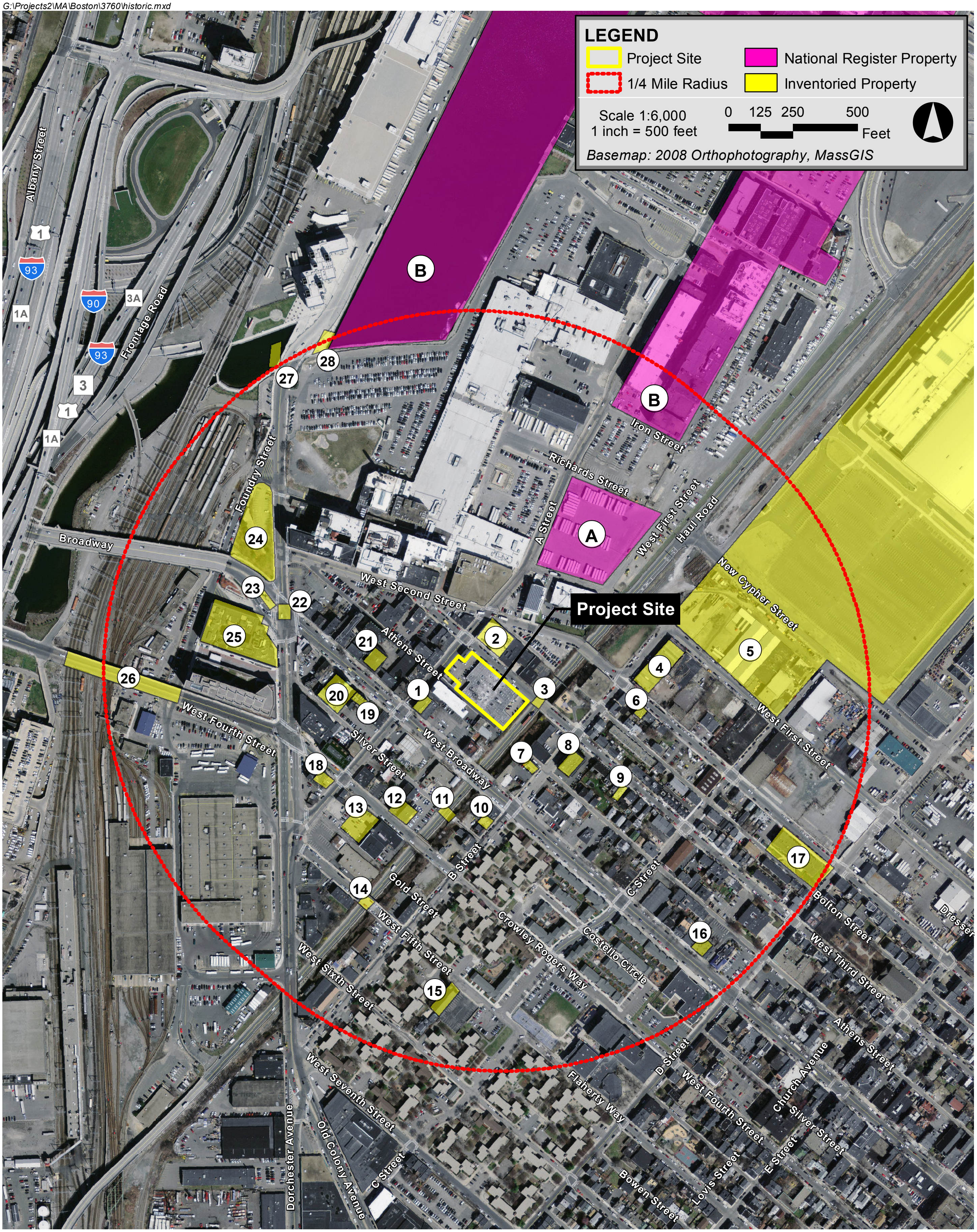


Figure 6-1

Historic Resources

6.3 Impacts to Historic Resources

6.3.1 Urban Design

The Project is an approximately 144,500 sf, six-story (approximately 65 feet) residential building that includes approximately 164 rental residential units and approximately 3,000 sf of retail/commercial space on the ground floor. Parking will be provided in a partially below-grade garage. The new building will have varied elevations with different setbacks and elements that are characteristic of the nearby residential neighborhood. The building will have a flat roof, and is anticipated to use brick masonry, cast stone and rain-screen panels as exterior cladding. The top floor of the building will be set back from the building elevations to minimize the visibility of the height of the building while also providing outdoor terraces for the top floor units. This building is located within a transitional zone between the larger scale historic buildings of the Fort Point Channel and the smaller two-to-four-story residential buildings in the South Boston neighborhood. The new construction has been designed to take into consideration the historic characteristics of the surrounding neighborhoods, but is executed in a manner that clearly reads as new. The introduction of ground floor commercial space and the addition of street trees and the widening of the sidewalk on West Third Street will enhance the pedestrian experience.

6.3.2 Shadow

New shadow cast by the Project on historic resources is limited to two resources situated in the immediate vicinity of the Project site. New shadow during the spring equinox is limited to new façade shadow on the Gillette Research Facility Building across West Third Street from the Project site. At 6:00 p.m. at the summer solstice, new shadow on historic resources is limited to the West Third Street Bridge over Conrail at the northeast corner of the site. During the autumnal equinox, new shadow is cast on the Gillette Research Facility at 3:00 p.m. By 6:00 p.m. during this period, new shadow falls on the same building's roof; however, much of the area is already in shadow. Fleeting shadow at 12:00 p.m. on the winter solstice will be cast on the façade of Gillette Research Facility. By 3:00 p.m., the shadow is cast on the rooftop of the building; however, the façade of the building is already in shadow at this period. Overall, impacts to historic resources by new shadow are minimal.

6.3.3 Wind

The Project is not expected to cause significant impacts to pedestrian level winds, and is unlikely to affect the setting of nearby historic properties.

6.4 Archaeological Resources

A review of the Inventory determined no previously identified archaeological resources located within the Project site. Due to the Project site's previous disturbance, no archaeological resources are anticipated to be located within the Project site.

6.5 Status of Project Reviews with Historical Agencies

6.5.1 Boston Landmarks Commission Article 85 Review

The existing building on the site is over 50 years of age; therefore, the proposed demolition of the building is subject to review by the Boston Landmarks Commission under Article 85 of the Boston Zoning Code. An application for Article 85 Review will be filed for the proposed demolition.

6.5.2 Massachusetts Historical Commission Review

At this time, no state or federal funding, licensing, permits and/or approvals requiring review by the Massachusetts Historical Commission (MHC) are anticipated. However, if a state or federal action is identified as required for the Project, a MHC Project Notification Form will be filed for the Project in compliance with State Register Review (950 CMR 71.00) and/or Section 106 of the National Historic Preservation Act (36 CFR 800).

Chapter 7.0

Infrastructure

7.0 INFRASTRUCTURE SYSTEMS COMPONENT

7.1 Introduction

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

- Sewer
- Domestic water
- Fire protection
- Drainage
- Natural gas
- Electricity
- Telecommunications

The Project includes the development of an approximately 144,500 sf, six-story residential building on a site with an existing one-story manufacturing building and parking area. The Project site is bound by West Third Street to the north, A Street to the west, Athens Street to the south and an inaccessible bypass road, Haul Road, to the east in South Boston.

7.2 Wastewater

7.2.1 Sewer Infrastructure

There are existing Boston Water and Sewer Commission (BWSC) combined sewer mains located in West Third Street, A Street, and Athens Street adjacent to the Project site. There is a 24- x 27-inch combined sewer main beneath West Third Street flowing in a westerly direction and connects to the 24- x 28-inch combined sewer main beneath West Second Street which flows westerly. There is a 16-inch combined sewer beneath A Street flowing in a northerly direction which flows to the 24- x 27-inch combined sewer beneath West Third Street. There is also a 16- x 24-inch combined sewer beneath Athens Street flowing in a westerly direction that increases to a 20- x 22-inch combined sewer main, and then connects to the 24- x 28-inch combined sewer main within West Second Street. The 24- x 28-inch combined sewer within West Second Street connects to the 36- x 38-inch combined sewer main beneath Dorchester Avenue which flows northerly and is directed to either the South Boston Interceptor combined sewer, or during time of high flow, to a combined sewer overflow that directs flow into the Fort Point Channel. The South Boston Interceptor ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

BWSC is performing sewer separation of the existing combined sewer infrastructure. The combined sewer mains located in West Third Street, A Street, and Athens Street will be rehabilitated by BWSC as sanitary sewer mains. Construction for the sewer separation project is planned to begin in 2014 and the proposed design will result in a 24- x 27-inch sanitary sewer main within West Third Street, a 16-inch sanitary sewer main within A Street, and a 16- x 24-inch sanitary sewer main within Athens Street.

The existing sewer system is illustrated in Figure 7-1.

7.2.2 Wastewater Generation

The Project's sewage generation rates were estimated using the Massachusetts Division of Water Pollution Control Sewer System Extension and Connection Permit Program at 314 CMR 07.00 and the proposed building program. 314 CMR 7.00 lists typical sewage generation values for the proposed sources, as shown in Table 7-1. Typical generation values are conservative values for estimating the sewage flows from new construction. 314 CMR 7.00 sewage generation values are used to evaluate new sewage flows or an increase in flows to existing connections.

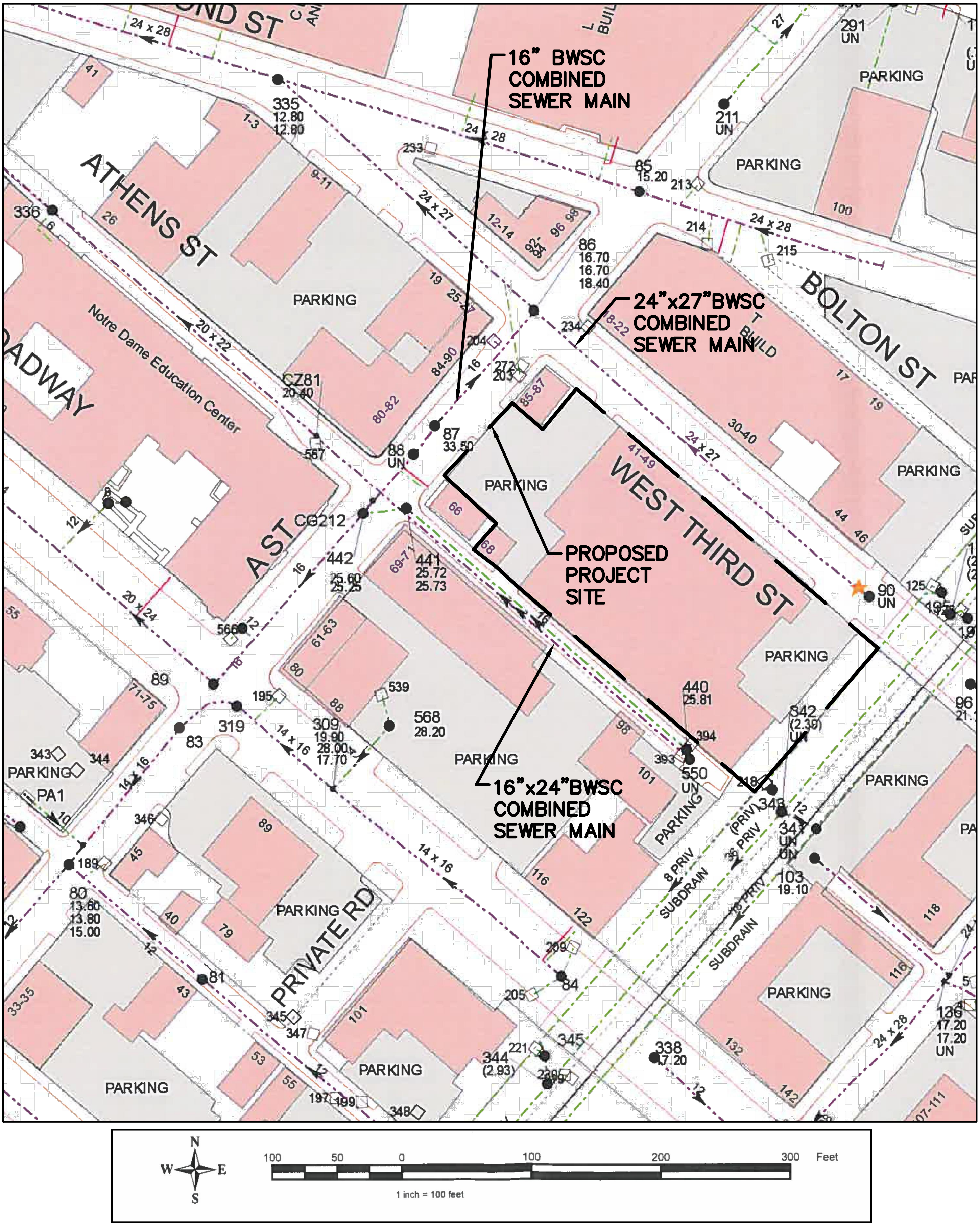
The Project will generate an estimated 25,650 gallons per day (gpd) of wastewater flows, a net increase of 25,200 gpd over the estimated flows from the existing building. Table 7-1 describes the increased sewage generation in gallons per day (gpd) due to the Project.

Table 7-1 Proposed Project Wastewater Generation

Room Use	Size		314 CMR Value (gpd/unit)		Total Flow (gpd)
Proposed Use					
Residential	195	bedrooms	110	/bedroom	21,450
Restaurant	120	seats	35	/seat	4,200
				TOTAL:	25,650

Existing Use					
Manufacturing Building	30	employees	15	/employee	450

Total Change In Sewer Flows Due to the Proposed Building				
Total change in sewer flows = Proposed Sewer Flows - Existing Sewer Flows				
	Proposed Flows	Existing Flows	Difference	
	gpd	gpd	gpd	
	25,650	450	25,200	Total increase in sewer flows due to proposed building (gpd)



45 West Third Street, Boston, Massachusetts

Nitsch Engineering

Figure 7-1

Existing Sewer System

7.2.3 Sewage Capacity and Impacts

The proposed Project's impact to the existing BWSC systems in West Third Street, A Street, and Athens Street was analyzed. The existing sewer system capacity calculations are presented in Table 7-2.

Table 7.2 Sewer Hydraulic Capacity Analysis

Manhole (BWSC Number)	Distance (feet)	Invert Elevation (up)	Invert Elevation (down)	Slope (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
Athens Street								
550 to CZ-81	375	22.86	20.4	0.7%	16x24	0.013	8.96	5.79
						Minimum Flow Analyzed:	8.96	5.79
A Street								
88 to 442	55	19.50	18.60	1.6%	16	0.013	9.82	6.34
87 to 88	25	20.40	19.50	3.6%	16	0.013	14.56	9.41
87 to 86	110	17.00	11.80	4.7%	16	0.013	16.68	10.78
						Minimum Flow Analyzed:	9.82	6.34
West Third Street								
90 to 86	330	13.2	10.1	0.9%	24x27	0.013	21.81	14.10
						Minimum Flow Analyzed:	21.81	14.10

Notes:
1. Manhole numbers taken from BWSC As-Builts and Sewer System Map no. 21K and 22K
2. Flow Calculations based on Manning Equation
3. Invert Data from survey titled "Topographic and Utility Plan, 45 West Third Street, Boston, Massachusetts", performed by Nitsch Engineering, dated 8/21/2013.

7.2.4 Proposed Conditions

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Project is expected to generate an increase in wastewater flows of approximately 25,200 gpd. Because the net sanitary flow is greater than 15,000 gpd and less than 50,000 gpd, a MassDEP Sewer Compliance Certification will be required. MassDEP is currently in the process of eliminating its sewer connection permit program. Depending on the timing, the Project may not be required to submit to MassDEP. In that case, approval for the increase in sanitary flow will come from BWSC.

The sewer services for the Project will connect to the newly rehabilitated sanitary sewer mains located in West Third Street, A Street, and/or Athens Street.

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

7.2.5 Proposed Impacts

The adjacent roadway sewer systems in West Third Street, A Street, and Athens Street and potential building service connections to the sewer system were analyzed.

Results shown in Table 7-2 indicate that the hydraulic capacity of the 24 x 27-inch combined sewer within West Third Street, the 16-inch combined sewer system within A Street and the 16- x 24-inch combined sewer in Athens Street near the Project have capacity to support the Project. The minimum hydraulic capacity is 14.10 million gallons per day (MGD) or 21.81 cubic feet per second (cfs) for the 24- x 27-inch system within West Third Street, 6.34 MGD or 9.82 cfs for the 16-inch system within A Street, and 5.79 MGD or 8.96 cfs for the 16- x 24-inch system within Athens Street. Based on an increase of average daily flow estimate for the Project of 25,200 gpd or 0.02 MGD; and with a factor of safety of 10 (total estimate = 0.02 MGD x 10 = 0.2 MGD), no capacity problems are expected within the West Second Street, A Street, or Athens Street systems.

7.3 Water Supply

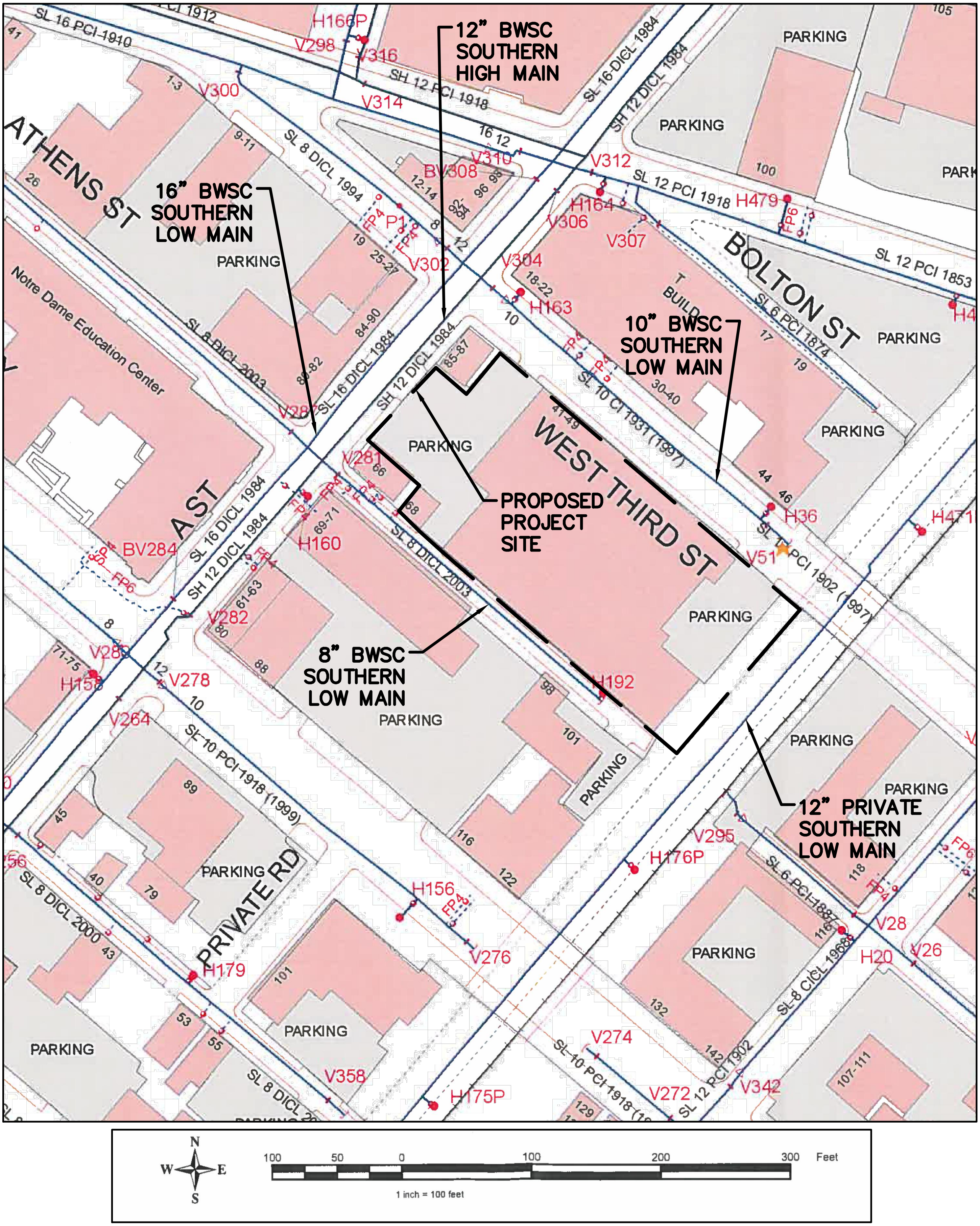
7.3.1 Water Infrastructure

Water for the Project site will be provided by the BWSC. There are five water systems within the City, and these provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high. There is a 10-inch Southern Low main beneath West Third Street. There is a 12-inch Southern High Main and a 16-inch Southern Low main beneath A Street. There is an 8-inch Southern Low main beneath Athens Street. Also, there is a 12-inch private Southern Low main in Haul Road. Haul Road passes beneath West Third Street and Athens Street and is inaccessible from the Project site and the adjacent streets. The existing water system is illustrated in Figure 7-2.

The existing building's water service(s) will be removed as part of the Project.

7.3.2 Water Consumption

The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described above. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 07.00 values to account for consumption, system losses and other usages to estimate an average



45 West Third Street, Boston, Massachusetts

Nitsch Engineering

Figure 7-2

Existing Water System

daily water demand. The Project's estimated increase in domestic water demand is 27,120 gpd. The water for the Project will be supplied by the BWSC systems within West Third Street, A Street, and/or Athens Street.

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

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

7.3.3 Existing Water Capacity and Impacts

BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the Project site was requested by the Proponent. BWSC did not have record data near the Project site. The Proponent will request BWSC to perform hydrant flow testing adjacent to the Project, as hydrant flow data should be less than a year old to be used as a design tool. As the design progresses, the Proponent will request hydrant flows be conducted by BWSC adjacent to the Project site.

7.3.4 Project Water Services

The domestic and fire protection water services for the Project will connect to the existing BWSC water mains in West Third Street, A Street, and/or Athens Street.

The domestic and fire protection water service connections required by the Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connection will be reviewed as part of BWSC's Site Plan Review process. This review includes, but is not limited to, sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.

7.3.5 Proposed Impacts

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

7.4 Stormwater

There are existing BWSC storm drains in Athens Street and Haul Road. There is a 16-inch storm drain main within Athens Street that flows in a westerly direction to A Street. There is an 8-inch private subdrain, 36-inch private storm drain, and 18-inch private subdrain within

Haul Road flowing in the south-westerly direction; Haul Road passes beneath West Third Street and Athens Street and is inaccessible from the Project site and the adjacent streets. There are also the combined sewer mains within West Third Street, A Street, and Athens Street, as previously described in Section 7.2.1.

Within Athens Street, the 16-inch storm drain main flows westerly to the 16-inch combined sewer in A Street, which flows southerly towards the intersection of Athens and West Broadway, which then increases to a 20- x 24-inch combined sewer flowing westerly within West Broadway. The 20- x 24-inch main within West Broadway increases to a 36-inch combined sewer main within Dorchester Avenue. The 36-inch combined sewer main increases to a 36- x 38-inch combined sewer and is directed to either the South Boston Interceptor combined sewer, or during time of high flow, to a combined sewer overflow that directs flow into the Fort Point Channel. The South Boston Interceptor ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

BWSC is separating the existing combined sewers within West Third Street, A Street, and Athens Street; a 12-inch storm drain main will be placed in West Third Street flowing in a north-westerly direction to the intersection of West Third Street and A Street, where it will follow a northerly path. The existing BWSC storm drain system is illustrated in Figure 7-3.

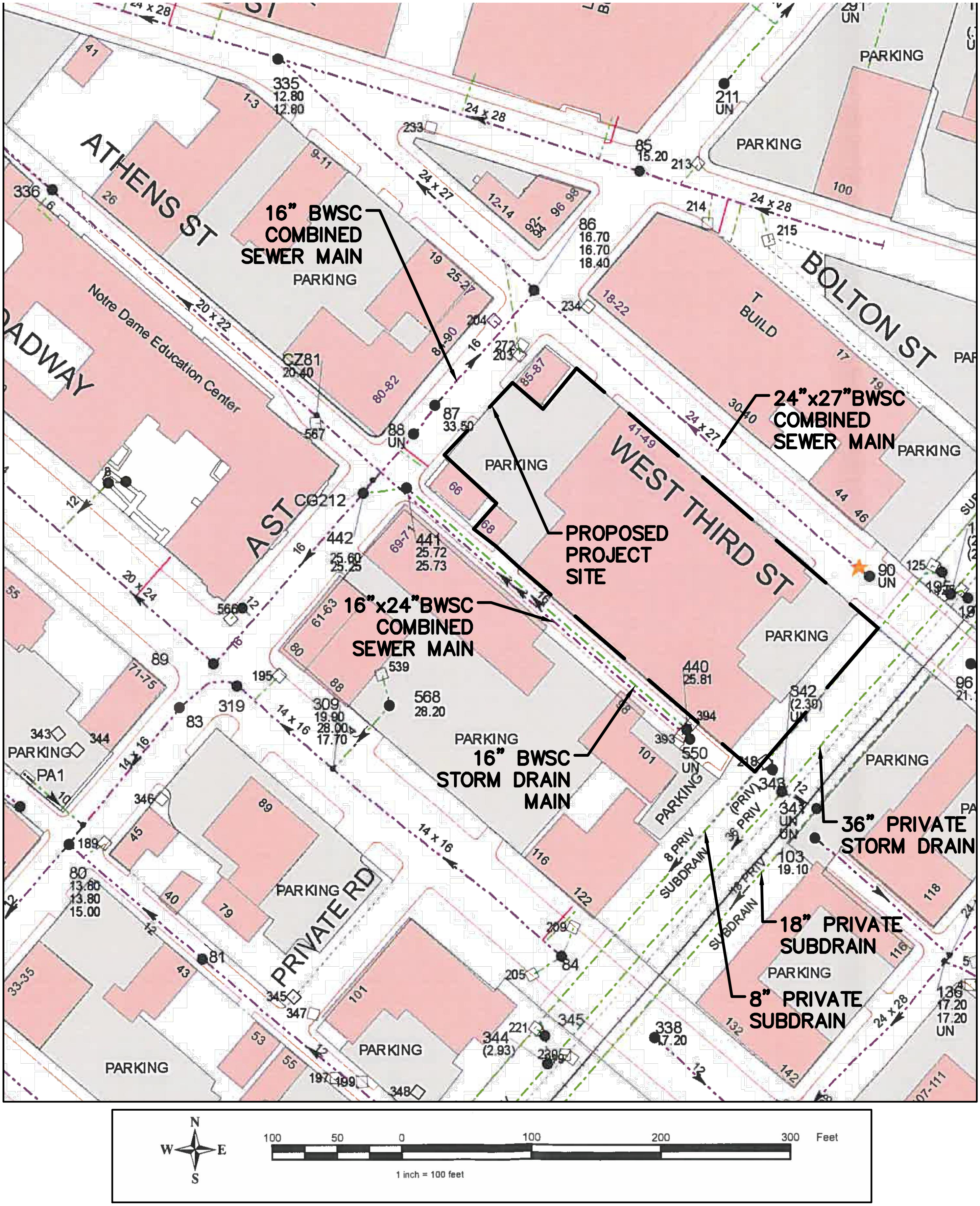
The BWSC is performing sewer separation of the existing combined sewer infrastructure that will result in separate sanitary sewer and storm drain mains for the existing combined sewer infrastructure adjacent to the Project site in West Third Street, A Street and Athens Street. Construction for the sewer separation project is planned to begin in 2014 and the proposed design will result in a 12-inch storm drain main within West Third Street. The BWSC master plan of the proposed combined sewer separation is illustrated in Figure 7-4.

Stormwater runoff from the existing parking lot and building and flows from the adjacent properties flows into the storm drains within the closed drainage system in West Third Street, A Street, Athens Street, and Haul Road.

7.4.1 Project Stormwater

The design intent is to collect stormwater runoff from the roof of the Project and direct it to a subsurface recharge system on site which will overflow to an adjacent BWSC storm drain main. Soil testing will be performed to confirm that this is feasible. The Project is committed to treating phosphorus and other TSS prior to discharge into the BWSC storm drain system. Site runoff will be collected by a closed drainage system, treated and recharged into the ground before overflowing to the BWSC storm drainage system.

The existing site contains a paved parking lot and building and is nearly 100% impervious cover. The Project will maintain the same impervious area at the site relative to existing conditions. The Project will maintain or decrease the existing peak rates and volumes of stormwater runoff from the site.

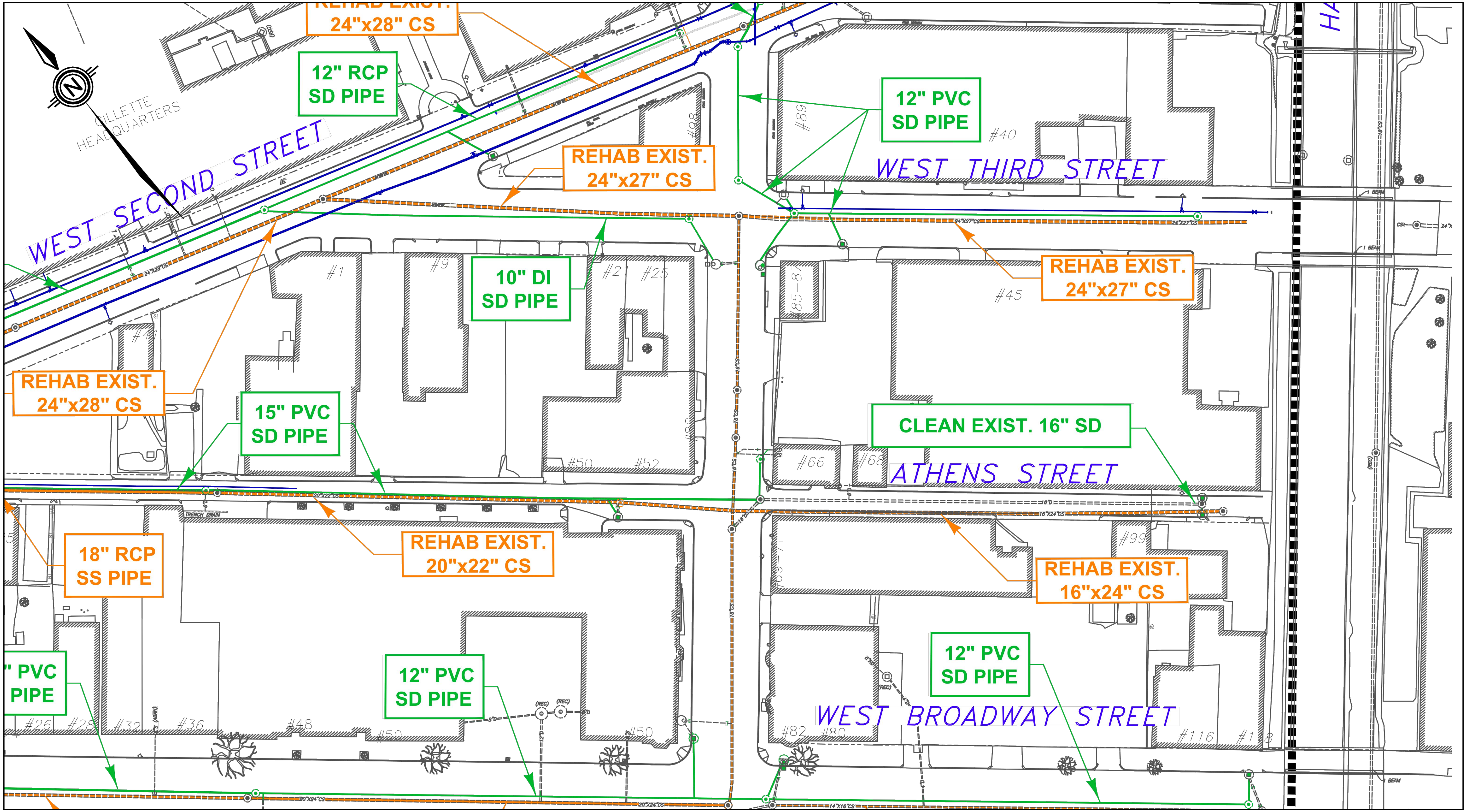


45 West Third Street, Boston, Massachusetts

Figure 7-3

Existing Storm Drain System

Nitsch Engineering



SCALE:
1" = 60'

60 30 0 60 120

45 West Third Street Boston, Massachusetts

Nitsch Engineering

Figure 7-4

BWSC Master Plan

All improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's Site Plan Review process. The process includes a comprehensive design review of the proposed service connections, assessment of Project demands and system capacity, and compliance with the City of Boston Zoning Code.

7.4.2 Water Quality Impact

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

All necessary dewatering will be conducted in accordance with applicable Massachusetts Water Resources Authority and BWSC discharge permits. Once construction is complete, the Project will be in compliance with all local and state stormwater management policies. See below for additional information.

7.4.3 MassDEP Stormwater Management Policy Standards

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

A brief explanation of each Policy Standard and the Project's compliance is provided below:

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

Compliance: The proposed design will comply with this Standard. The Project site is not located near any wetlands or water bodies. Therefore, no new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

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

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

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

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

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

> *a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*
>
> *b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*
>
> *c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

Compliance: The proposed design will comply with this Standard. Within the Project's limit of work, there will be mostly roof and pedestrian areas. Any paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded catch basins and conveyed through water quality units before discharging into the BWSC system.

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

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

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

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

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

Standard #8: Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

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

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

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

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

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

7.5 Protection Proposed During Construction

Existing public and private infrastructure located within nearby public rights-of-way will be protected during construction of each component of the Project. The installation of proposed utility connections within public ways will be undertaken in accordance with BWSC, Boston Public Works Department, the Dig-Safe Program, and applicable utility company requirements. Specific methods for constructing proposed utilities where they are near to, or connect with, existing water, sewer, and drain facilities will be reviewed by the BWSC as part of its Site Plan Review process. All necessary permits will be obtained before the commencement of work.

The Proponent will continue to work and coordinate with the BWSC and the utility companies to ensure safe and coordinated utility operations in connection with the Project.

7.6 Conservation of Resources

The State Building Code requires the use of water-conserving fixtures. Water conservation measures such as low-flow toilets and restricted flow faucets will help reduce the domestic water demand on the existing distribution system. The installation of sensor-operated sinks with water conserving aerators and sensor-operated toilets in publicly accessible restrooms will be incorporated into the design plans for the proposed Project.

7.7 Electrical Service

NSTAR owns the electrical system in the vicinity of the Project site. It is expected that adequate service is available in the existing electrical systems in A Street, West Third Street and Athens Street to serve the Project. It is assumed that one or more new pad-mount transformers will be required. The Proponent will work with NSTAR to confirm adequate system capacity as design is finalized.

7.8 Telecommunications Systems

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

7.9 Gas Systems

National Grid has gas services in A Street and Athens Street adjacent to the site. There is adequate capacity in the gas supply system to meet the Project's demand.

Chapter 8.0

Coordination With Other Governmental Agencies

8.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

8.1 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.

8.2 Massachusetts Environmental Policy Act (MEPA)

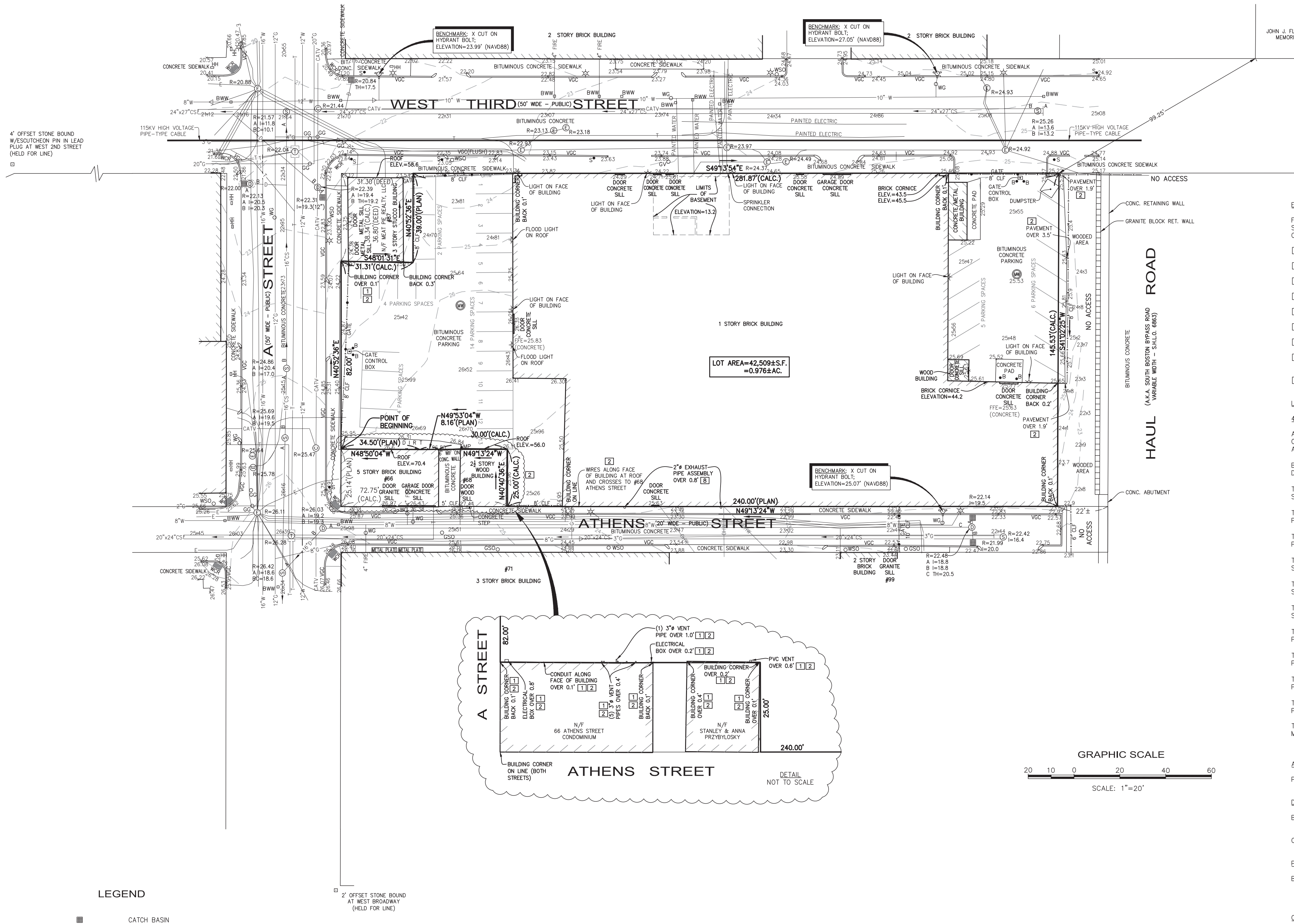
The Proponent does not expect that the Project will require review by the Massachusetts Environmental Policy Act (MEPA) Office of the Massachusetts Executive Office of Energy and Environmental Affairs. Current plans do not call for the Project to receive any state permits or state funding or involve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

8.3 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.

Appendix A

Site Survey



GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"=20'

EXCEPTIONS

FIRST AMERICAN TITLE INSURANCE COMPANY
SCHEDULE B – SECTION 2
COMMITMENT #2002089

1 – ANY FACTS, RIGHTS, INTERESTS OR CLAIMS – SHOWN HEREON.

2 – ANY ENCROACHMENT, ENCUMBRENCE, VIOLATION, VARIATION – SHOWN HEREON.

3 – NOT DEPICTABLE.

4 – NOT DEPICTABLE.

5 – NOT DEPICTABLE.

6 – NOT APPLICABLE.

7 – NOT DEPICTABLE.

8 – RIGHTS OF THE PUBLIC IN & TO THOSE PORTIONS OF THE PREMISES LYING WITHIN THE BOUNDS OF ATHENS STREET – SHOWN HEREON.

9 – NOT DEPICTABLE.

LEGAL DESCRIPTION

45 WEST 3RD STREET

A CERTAIN PARCEL OF LAND WITH THE BUILDINGS THEREON SITUATED ON THE WESTERLY SIDELINE OF WEST 3RD STREET IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT LOCATED ON THE SOUTHERLY SIDELINE OF "A" STREET N40°52'36"E, A DISTANCE OF 25.14 FEET FROM THE EASTERLY SIDELINE OF ATHENS STREET;

THENCE RUNNING N40°52'36"E, A DISTANCE OF 82.00 FEET ALONG THE SOUTHERLY SIDELINE OF "A" STREET;

THENCE TURNING AND RUNNING S48°01'31"E, A DISTANCE OF 31.31 FEET ALONG THE WESTERLY PROPERTY LINE OF MEAT PIE REALTY, LLC;

THENCE TURNING AND RUNNING N40°52'36"E, A DISTANCE OF 39.00 FEET ALONG THE SOUTHERLY PROPERTY LINE OF MEAT PIE REALTY, LLC;

THENCE TURNING AND RUNNING S49°13'51"E, A DISTANCE OF 281.87 FEET ALONG THE WESTERLY SIDELINE OF WEST 3RD STREET;

THENCE TURNING AND RUNNING S41°02'25"W, A DISTANCE OF 145.53 FEET ALONG THE NORTHERLY SIDELINE OF HAUL ROAD;

THENCE TURNING AND RUNNING N49°13'24"W, A DISTANCE OF 240.00 FEET ALONG THE EASTERLY SIDELINE OF ATHENS STREET;

THENCE TURNING AND RUNNING N40°40'36"E, A DISTANCE OF 25.00 FEET ALONG THE SOUTHERLY PROPERTY LINE OF STANLEY & ANNA PRZYBYLOSKY;

THENCE TURNING AND RUNNING N49°13'24"W, A DISTANCE OF 30.00 FEET ALONG THE EASTERLY PROPERTY LINE OF STANLEY & ANNA PRZYBYLOSKY;

THENCE TURNING AND RUNNING N49°53'04"W, A DISTANCE OF 8.16 FEET ALONG THE EASTERLY PROPERTY LINE OF 66 ATHENS STREET CONDOMINIUM;

THENCE TURNING AND RUNNING N48°50'04"W, A DISTANCE OF 34.50 FEET ALONG THE EASTERLY PROPERLY LINE OF 66 ATHENS STREET CONDOMINIUM TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS AN AREA OF 42,509± SQUARE FEET OF LAND, MORE OR LESS.

ASSESSORS REFERENCE

PARCEL ID: 0601233000

DEED REFERENCES

BOOK 12619, PAGE 040
51731, 298

CERT. 1242357

PLAN REFERENCES	CITY OF BOSTON LAYOUTS
BOOK D610, PAGE END	L–950
D4947, 545	L–4216
D7986, 536	L–10998
	L–11010

OWNER/OCCUPANT:

CLIFLEX BELLOWS CORPORATION
45 WEST THIRD STREET
BOSTON, MA 02127

LEGEND

▦	CATCH BASIN
Ⓒ	CABLE TELEVISION MANHOLE
Ⓓ	DRAIN MANHOLE
Ⓔ	ELECTRIC MANHOLE
Ⓜ	MISCELLANEOUS MANHOLE
Ⓢ	SEWER MANHOLE
Ⓣ	TELEPHONE MANHOLE
GV ○	GATE VALVE; UNIDENTIFIED
GSO ○	GAS SHUT–OFF
WSO ○	WATER SHUT–OFF
GG ○	GAS GATE
WG ○	WATER GATE
BWW □	BOSTON WATER WORKS
	FIRE HYDRANT
	LIGHT POLE
HH ▭	HAND HOLE
B ●	BOLLARD
PM ●	PARKING METER
MP ●	METAL POST
S ●	SIGN POST
FFE=	FINISHED FLOOR ELEVATION EQUALS
25×26	SPOT ELEVATION
CLF	CHAIN LINK FENCE
WIF	WROUGHT IRON FENCE
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP
R=	RIM ELEVATION EQUALS
I=	INVERT ELEVATION EQUALS
TH=	TOP OF HOOD ELEVATION EQUALS
NPV	NO PIPES VISIBLE
TOW=	TOP OF WATER
——CATV——	UNDERGROUND CABLE TELEVISION LINE
——CS——	UNDERGROUND SEWER LINE
——D——	UNDERGROUND DRAIN LINE
——E——	UNDERGROUND ELECTRIC LINE
——G——	UNDERGROUND GAS LINE
——T——	UNDERGROUND TELEPHONE LINE
——W——	UNDERGROUND WATER LINE
——OHW——	OVERHEAD WIRES
Ⓜ︎Ⓦ	MONITORING WELL

UTILITY INFORMATION STATEMENT

1. THE SUB–SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE CLIENT, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB–SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB–SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.

2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.

3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.

4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.

5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.

6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.

7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1–888–344–7233, SEVENTY–TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

NOTES

1.) THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF NITSCH ENGINEERING. IT IS ISSUED TO SPAULDING & SLYE INVESTMENTS FOR PURPOSES RELATED DIRECTLY AND SOLELY TO NITSCH ENGINEERING'S SCOPE OF SERVICES UNDER CONTRACT WITH SPAULDING & SLYE INVESTMENTS FOR 45 WEST THIRD STREET, BOSTON. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT AND PROJECT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN AUTHORIZATION IS GIVEN THEREFOR BY NITSCH ENGINEERING.

2.) HORIZONTAL COORDINATES REFER TO NORTH AMERICAN DATUM OF 1983 (NAD 83).

3.) ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

4.) THE INFORMATION CONTAINED ON THE DISK OR ELECTRONIC DRAWING FILE ACCOMPANYING THIS PLAN MUST BE COMPARED TO THE SEALED AND SIGNED HARD COPY OF THE PLAN TO ENSURE THE ACCURACY OF ALL INFORMATION AND TO ENSURE NO CHANGES, ALTERATIONS, OR MODIFICATIONS HAVE BEEN MADE. RELIANCE SHALL NOT BE MADE ON A DOCUMENT TRANSMITTED BY COMPUTER OR OTHER ELECTRONIC MEANS UNLESS FIRST COMPARED TO THE ORIGINAL SEALED DOCUMENT ISSUED AT THE TIME OF THE SURVEY. DUE TO THE CRITICAL NATURE OF SURVEYING, DATA ACQUISITION, AND AUTOCAD PLAN DEVELOPMENT, IF CRITICAL DIMENSIONAL INFORMATION IS NEEDED AND IS NOT SPECIFICALLY SHOWN ON THE ELECTRONIC DRAWING FILE, PLEASE CONTACT NITSCH ENGINEERING.

I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF TO:

SPAULDING & SLYE INVESTMENTS
FIRST AMERICAN TITLE INSURANCE COMPANY

THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE "2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS," JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS IN 2011 AND INCLUDES ITEMS 2, 3, 4, 5, 7(a), 7(b)(2), 7(c), 8, 9, 10, 11(b), 13, 14, 21, and 22 OF TABLE A THEREOF. PURSUANT TO THE ACCURACY STANDARDS AS ADOPTED BY ALTA AND NSPS AND IN EFFECT ON THE DATE OF THIS CERTIFICATION, THE UNDERSIGNED FURTHER CERTIFIES THAT IN MY PROFESSIONAL OPINION, AS A LAND SURVEYOR REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS, THE RELATIVE POSITIONAL ACCURACY OF THIS SURVEY DOES NOT EXCEED THAT WHICH IS SPECIFIED THEREIN.

THIS IS TO FURTHER CERTIFY THAT THE SUBJECT PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA AND LIES IN ZONE X AS SHOWN ON FLOOD INSURANCE RATE MAP NO. 25025C0083G, WITH AN EFFECTIVE DATE OF SEPTEMBER 25, 2009, FOR COMMUNITY NO.25025, IN SUFFOLK COUNTY, COMMONWEALTH OF MASSACHUSETTS, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PREMISES IS SITUATED.

NITSCH ENGINEERING, INC.

____
MARK R. SIEGRIST, PLS DATE
NO. 35793

Nitsch Engineering

www.nitscheng.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Sustainable Site Consulting
- Planning
- GIS

ALTA/ACSM LAND TITLE SURVEY

45 WEST THIRD STREET
BOSTON, MASSACHUSETTS

PREPARED FOR:
SPAULDING & SLYE INVESTMENTS
ONE POST OFFICE SQUARE, 28TH FLOOR, BOSTON, MASSACHUSETTS 02109

REV.	COMMENTS	DATE

REVISIONS

PROJECT #	9844
FILE:	9844_ALTA1.dwg
SCALE:	1"=20'
DATE:	AUGUST 7, 2013
DES./COMP:	MRS
FIELD BOOK:	566
DRAFTED BY:	PAR/MRS
CHECKED BY:	MRS

SHEET:

EX-1

OF I REV.

Appendix B

Transportation

TRANSPORTATION TECHNICAL APPENDIX

- TRAFFIC COUNTS
- TRIP GENERATION CALCULATIONS
- INTERSECTION CAPACITY ANALYSIS WORKSHEETS

TRAFFIC COUNTS

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

Groups Printed- Cars - Trucks

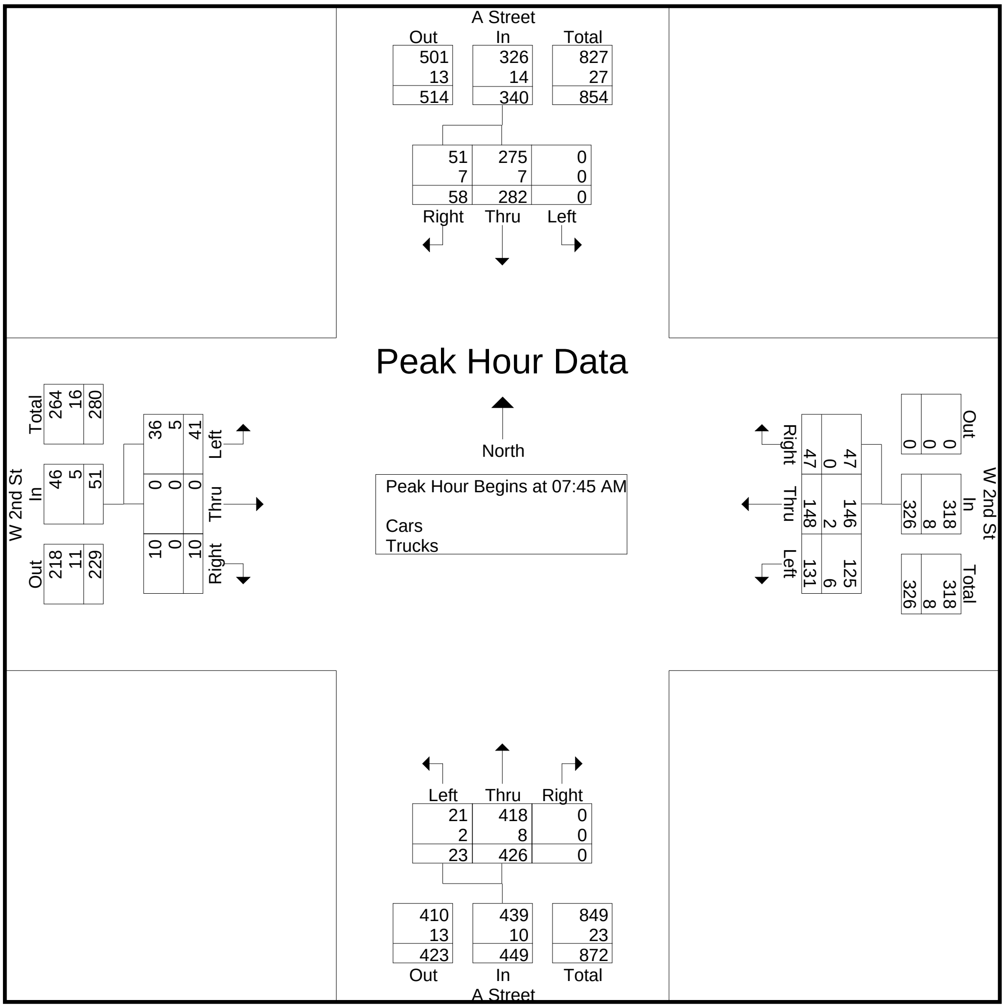
	A Street From North			W 2nd St From East			A Street From South			W 2nd St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	58	7	12	26	6	6	90	0	10	0	1	216
07:15 AM	0	58	20	22	29	14	0	79	0	6	0	0	228
07:30 AM	0	68	12	23	37	12	4	79	0	9	0	2	246
07:45 AM	0	77	16	27	31	11	4	100	0	11	0	5	282
Total	0	261	55	84	123	43	14	348	0	36	0	8	972
08:00 AM	0	66	8	45	50	8	7	101	0	5	0	1	291
08:15 AM	0	59	16	30	30	11	7	100	0	11	0	3	267
08:30 AM	0	80	18	29	37	17	5	125	0	14	0	1	326
08:45 AM	0	68	15	25	25	9	4	123	0	11	0	0	280
Total	0	273	57	129	142	45	23	449	0	41	0	5	1164
Grand Total	0	534	112	213	265	88	37	797	0	77	0	13	2136
Apprch %	0	82.7	17.3	37.6	46.8	15.5	4.4	95.6	0	85.6	0	14.4	
Total %	0	25	5.2	10	12.4	4.1	1.7	37.3	0	3.6	0	0.6	
Cars	0	518	96	201	258	87	35	774	0	69	0	12	2050
% Cars	0	97	85.7	94.4	97.4	98.9	94.6	97.1	0	89.6	0	92.3	96
Trucks	0	16	16	12	7	1	2	23	0	8	0	1	86
% Trucks	0	3	14.3	5.6	2.6	1.1	5.4	2.9	0	10.4	0	7.7	4

	A Street From North				W 2nd St From East				A Street From South				W 2nd St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	77	16	93	27	31	11	69	4	100	0	104	11	0	**5**	**16**	282
08:00 AM	0	66	8	74	**45**	**50**	8	**103**	**7**	101	0	108	5	0	1	6	291
08:15 AM	0	59	16	75	30	30	11	71	7	100	0	107	11	0	3	14	267
08:30 AM	0	**80**	**18**	**98**	29	37	**17**	83	5	**125**	0	**130**	**14**	0	1	15	**326**
Total Volume	0	282	58	340	131	148	47	326	23	426	0	449	41	0	10	51	1166
% App. Total	0	82.9	17.1		40.2	45.4	14.4		5.1	94.9	0		80.4	0	19.6		
PHF	.000	.881	.806	.867	.728	.740	.691	.791	.821	.852	.000	.863	.732	.000	.500	.797	.894
Cars	0	275	51	326	125	146	47	318	21	418	0	439	36	0	10	46	1129
% Cars	0	97.5	87.9	95.9	95.4	98.6	100	97.5	91.3	98.1	0	97.8	87.8	0	100	90.2	96.8
Trucks	0	7	7	14	6	2	0	8	2	8	0	10	5	0	0	5	37
% Trucks	0	2.5	12.1	4.1	4.6	1.4	0	2.5	8.7	1.9	0	2.2	12.2	0	0	9.8	3.2

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2



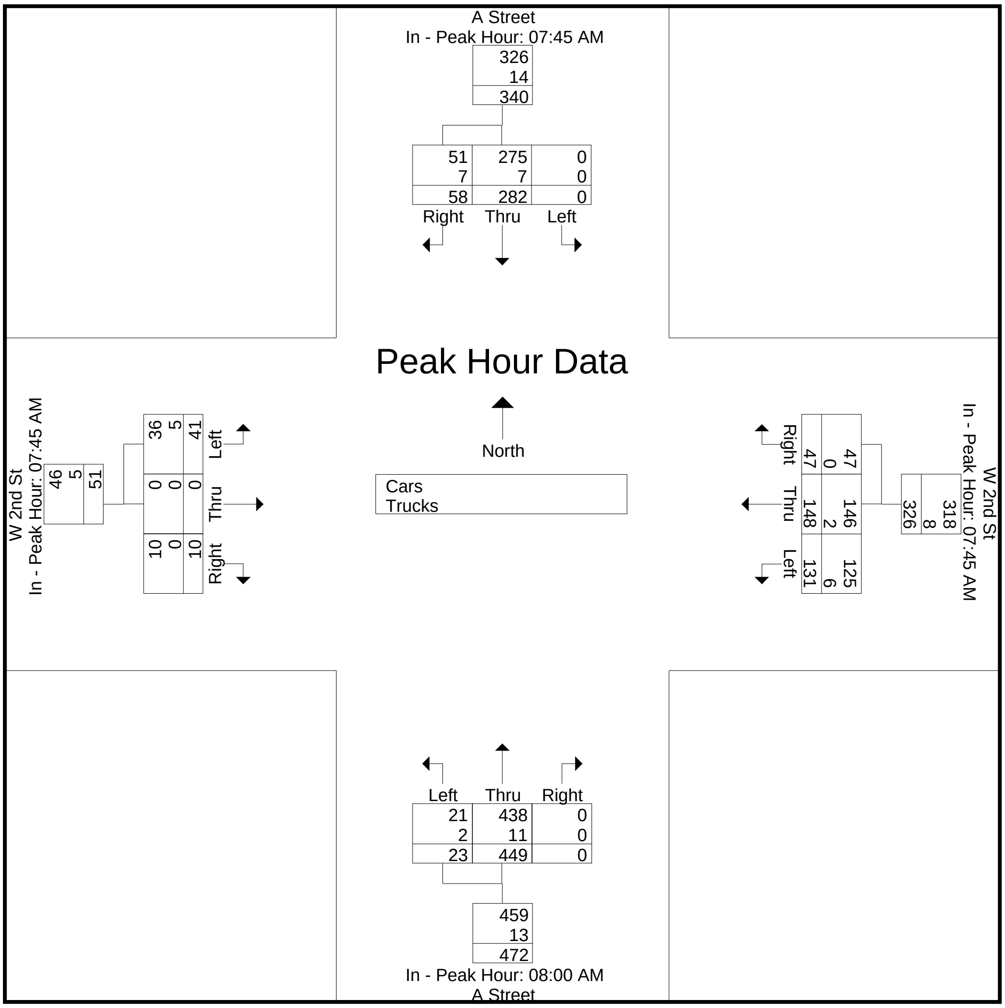
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				08:00 AM				07:45 AM			
+0 mins.	0	77	16	93	27	31	11	69	**7**	101	0	108	11	0	**5**	**16**
+15 mins.	0	66	8	74	**45**	**50**	8	**103**	7	100	0	107	5	0	1	6
+30 mins.	0	59	16	75	30	30	11	71	5	**125**	0	**130**	11	0	3	14
+45 mins.	0	**80**	**18**	**98**	29	37	**17**	83	4	123	0	127	**14**	0	1	15
Total Volume	0	282	58	340	131	148	47	326	23	449	0	472	41	0	10	51
% App. Total	0	82.9	17.1		40.2	45.4	14.4		4.9	95.1	0		80.4	0	19.6	
PHF	.000	.881	.806	.867	.728	.740	.691	.791	.821	.898	.000	.908	.732	.000	.500	.797
Cars	0	275	51	326	125	146	47	318	21	438	0	459	36	0	10	46
% Cars	0	97.5	87.9	95.9	95.4	98.6	100	97.5	91.3	97.6	0	97.2	87.8	0	100	90.2
Trucks	0	7	7	14	6	2	0	8	2	11	0	13	5	0	0	5
% Trucks	0	2.5	12.1	4.1	4.6	1.4	0	2.5	8.7	2.4	0	2.8	12.2	0	0	9.8

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

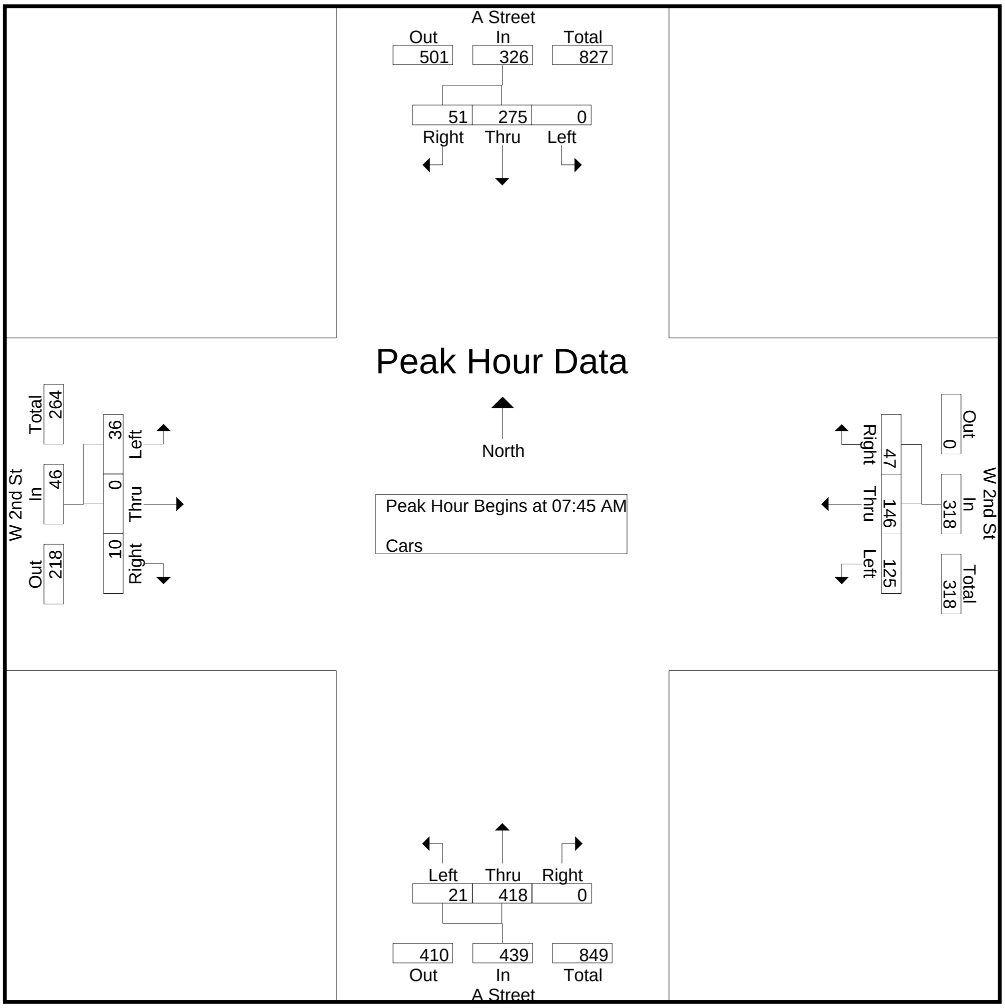
Groups Printed- Cars

	A Street From North			W 2nd St From East			A Street From South			W 2nd St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	56	5	11	26	6	6	85	0	8	0	1	204
07:15 AM	0	52	18	20	28	13	0	75	0	6	0	0	212
07:30 AM	0	67	9	21	35	12	4	78	0	9	0	1	236
07:45 AM	0	75	16	25	31	11	4	98	0	10	0	5	275
Total	0	250	48	77	120	42	14	336	0	33	0	7	927
08:00 AM	0	66	7	45	49	8	7	100	0	4	0	1	287
08:15 AM	0	55	14	27	30	11	5	99	0	9	0	3	253
08:30 AM	0	79	14	28	36	17	5	121	0	13	0	1	314
08:45 AM	0	68	13	24	23	9	4	118	0	10	0	0	269
Total	0	268	48	124	138	45	21	438	0	36	0	5	1123
Grand Total	0	518	96	201	258	87	35	774	0	69	0	12	2050
Apprch %	0	84.4	15.6	36.8	47.3	15.9	4.3	95.7	0	85.2	0	14.8	
Total %	0	25.3	4.7	9.8	12.6	4.2	1.7	37.8	0	3.4	0	0.6	

	A Street From North				W 2nd St From East				A Street From South				W 2nd St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	75	**16**	91	25	31	11	67	4	98	0	102	10	0	**5**	**15**	275
08:00 AM	0	66	7	73	**45**	**49**	8	**102**	**7**	100	0	107	4	0	1	5	287
08:15 AM	0	55	14	69	27	30	11	68	5	99	0	104	9	0	3	12	253
08:30 AM	0	**79**	14	**93**	28	36	**17**	81	5	**121**	0	**126**	**13**	0	1	14	**314**
Total Volume	0	275	51	326	125	146	47	318	21	418	0	439	36	0	10	46	1129
% App. Total	0	84.4	15.6		39.3	45.9	14.8		4.8	95.2	0		78.3	0	21.7		
PHF	.000	.870	.797	.876	.694	.745	.691	.779	.750	.864	.000	.871	.692	.000	.500	.767	.899

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

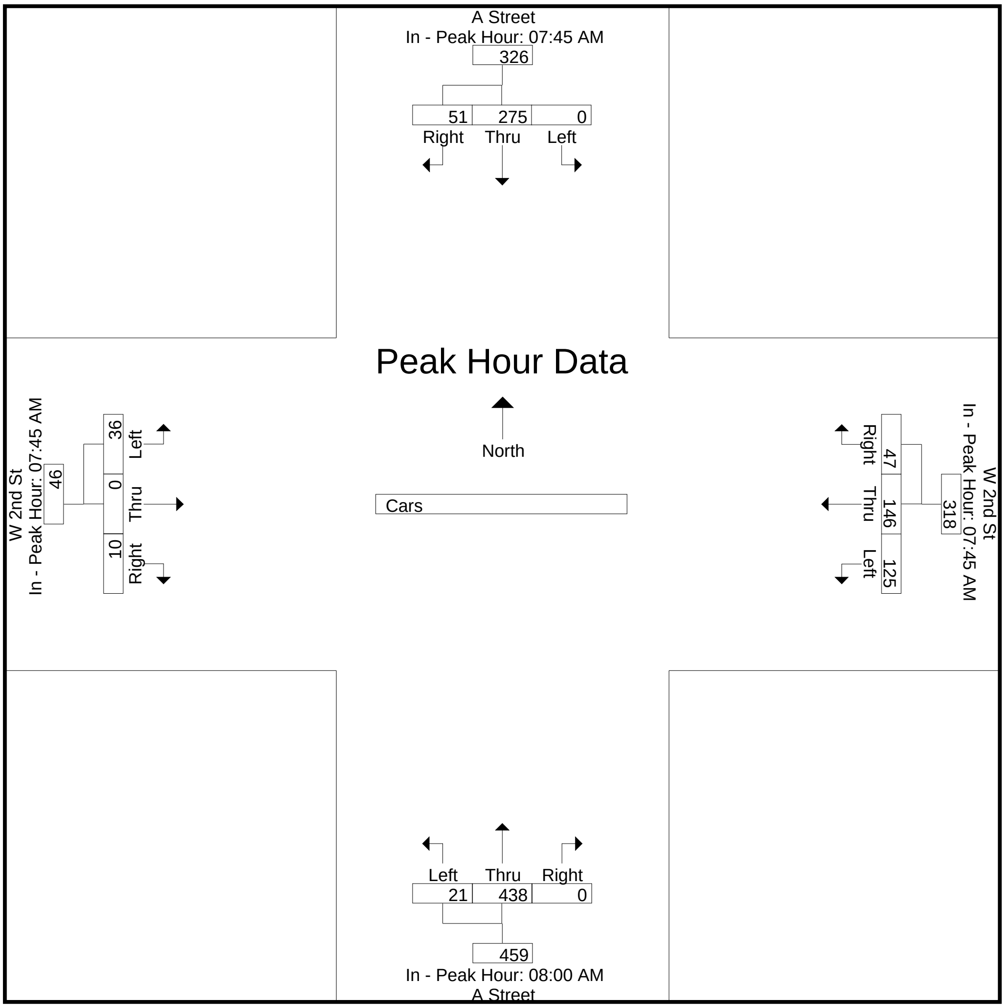
Peak Hour for Each Approach Begins at:	07:45 AM				07:45 AM				08:00 AM				07:45 AM			
+0 mins.	0	75	**16**	91	25	31	11	67	**7**	100	0	107	10	0	**5**	**15**
+15 mins.	0	66	7	73	**45**	**49**	8	**102**	5	99	0	104	4	0	1	5
+30 mins.	0	55	14	69	27	30	11	68	5	**121**	0	**126**	9	0	3	12
+45 mins.	0	**79**	14	**93**	28	36	**17**	81	4	118	0	122	**13**	0	1	14
Total Volume	0	275	51	326	125	146	47	318	21	438	0	459	36	0	10	46
% App. Total	0	84.4	15.6		39.3	45.9	14.8		4.6	95.4	0		78.3	0	21.7	
PHF	.000	.870	.797	.876	.694	.745	.691	.779	.750	.905	.000	.911	.692	.000	.500	.767

Accurate Counts

978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

Groups Printed- Trucks

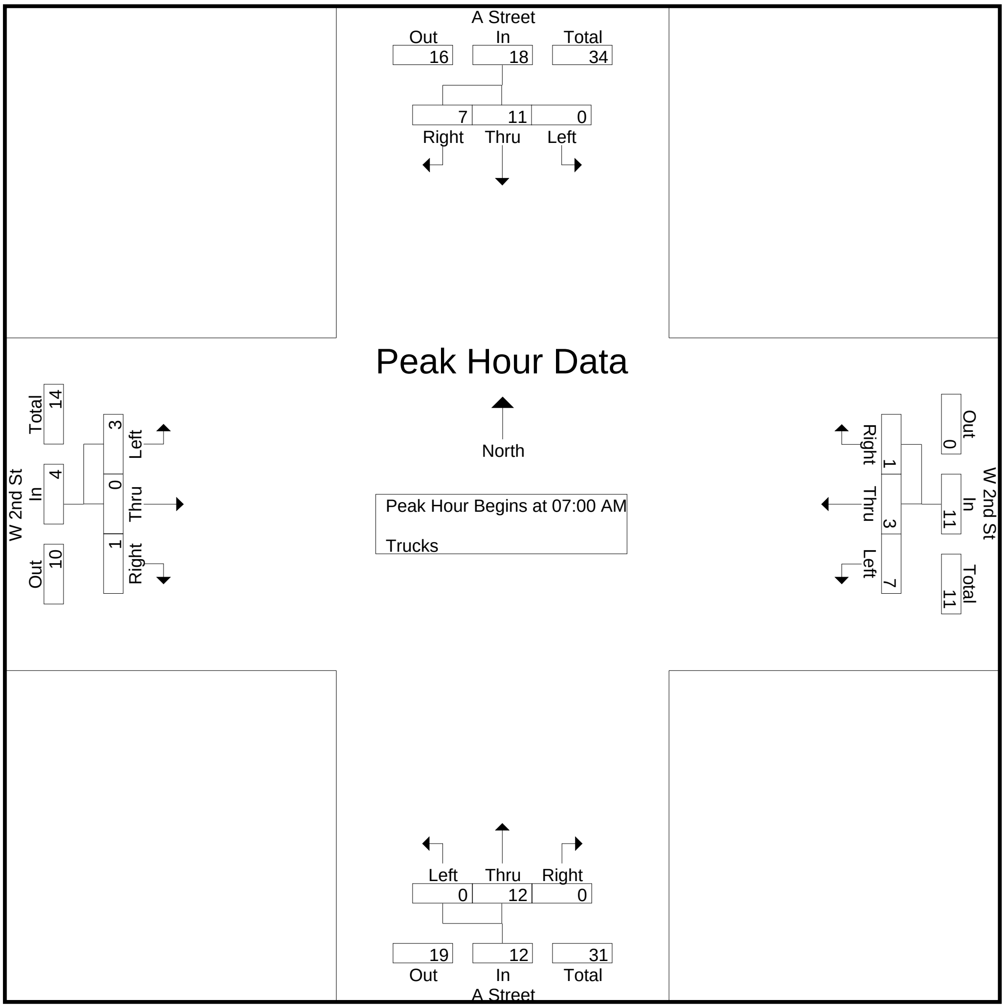
	A Street From North			W 2nd St From East			A Street From South			W 2nd St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	2	2	1	0	0	0	5	0	2	0	0	12
07:15 AM	0	6	2	2	1	1	0	4	0	0	0	0	16
07:30 AM	0	1	3	2	2	0	0	1	0	0	0	1	10
07:45 AM	0	2	0	2	0	0	0	2	0	1	0	0	7
Total	0	11	7	7	3	1	0	12	0	3	0	1	45
08:00 AM	0	0	1	0	1	0	0	1	0	1	0	0	4
08:15 AM	0	4	2	3	0	0	2	1	0	2	0	0	14
08:30 AM	0	1	4	1	1	0	0	4	0	1	0	0	12
08:45 AM	0	0	2	1	2	0	0	5	0	1	0	0	11
Total	0	5	9	5	4	0	2	11	0	5	0	0	41
Grand Total	0	16	16	12	7	1	2	23	0	8	0	1	86
Apprch %	0	50	50	60	35	5	8	92	0	88.9	0	11.1	
Total %	0	18.6	18.6	14	8.1	1.2	2.3	26.7	0	9.3	0	1.2	

	A Street From North				W 2nd St From East				A Street From South				W 2nd St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	2	2	4	1	0	0	1	0	**5**	0	**5**	**2**	0	0	**2**	12
07:15 AM	0	**6**	2	**8**	**2**	1	**1**	**4**	0	4	0	4	0	0	0	0	**16**
07:30 AM	0	1	**3**	4	2	**2**	0	4	0	1	0	1	0	0	**1**	1	10
07:45 AM	0	2	0	2	2	0	0	2	0	2	0	2	1	0	0	1	7
Total Volume	0	11	7	18	7	3	1	11	0	12	0	12	3	0	1	4	45
% App. Total	0	61.1	38.9		63.6	27.3	9.1		0	100	0		75	0	25		
PHF	.000	.458	.583	.563	.875	.375	.250	.688	.000	.600	.000	.600	.375	.000	.250	.500	.703

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2

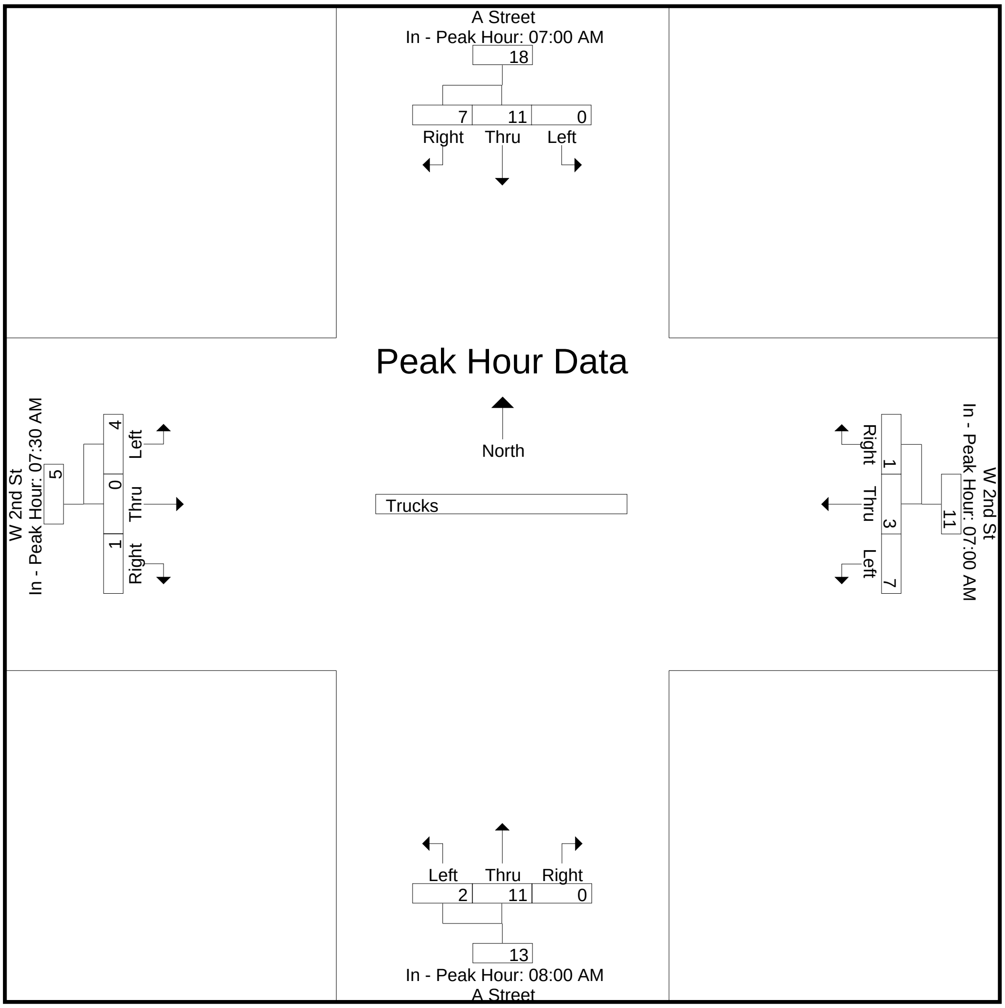


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:30 AM			
+0 mins.	0	2	2	4	1	0	0	1	0	1	0	1	0	0	**1**	1
+15 mins.	0	**6**	2	**8**	**2**	1	**1**	**4**	**2**	1	0	3	1	0	0	1
+30 mins.	0	1	**3**	4	2	**2**	0	4	0	4	0	4	1	0	0	1
+45 mins.	0	2	0	2	2	0	0	2	0	**5**	0	**5**	**2**	0	0	**2**
Total Volume	0	11	7	18	7	3	1	11	2	11	0	13	4	0	1	5
% App. Total	0	61.1	38.9		63.6	27.3	9.1		15.4	84.6	0		80	0	20	
PHF	.000	.458	.583	.563	.875	.375	.250	.688	.250	.550	.000	.650	.500	.000	.250	.625

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

Groups Printed- Bikes Peds

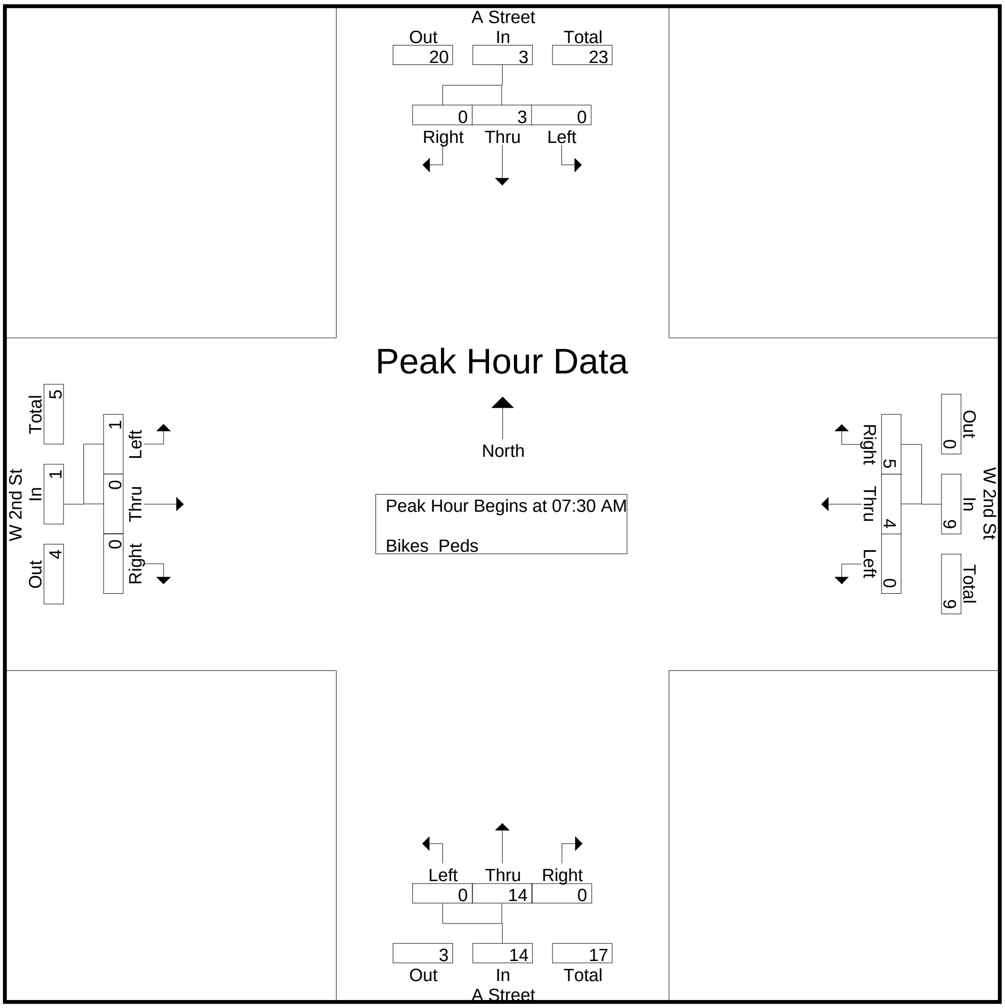
	A Street From North				**W 2nd St From East**				**A Street From South**				**W 2nd St From West**						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	2	0	1	0	5	0	1	0	0	0	0	0	6	13	3	16
07:15 AM	0	0	0	6	0	2	0	7	0	4	0	3	1	0	0	5	21	7	28
07:30 AM	0	0	0	3	0	2	1	11	0	3	0	2	0	0	0	4	20	6	26
07:45 AM	0	2	0	5	0	0	2	10	0	4	0	7	0	0	0	1	23	8	31
Total	0	3	0	16	0	5	3	33	0	12	0	12	1	0	0	16	77	24	101
08:00 AM	0	1	0	2	0	1	1	23	0	2	0	0	0	0	0	13	38	5	43
08:15 AM	0	0	0	2	0	1	1	19	0	5	0	2	1	0	0	12	35	8	43
08:30 AM	0	0	0	2	0	0	0	20	0	2	0	4	0	0	0	9	35	2	37
08:45 AM	0	1	0	4	0	0	1	32	0	6	0	4	1	0	0	11	51	9	60
Total	0	2	0	10	0	2	3	94	0	15	0	10	2	0	0	45	159	24	183
Grand Total	0	5	0	26	0	7	6	127	0	27	0	22	3	0	0	61	236	48	284
Apprch %	0	100	0		0	53.8	46.2		0	100	0		100	0	0				
Total %	0	10.4	0		0	14.6	12.5		0	56.2	0		6.2	0	0		83.1	16.9	

	A Street From North				**W 2nd St From East**				**A Street From South**				**W 2nd St From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	**2**	1	**3**	0	3	0	3	0	0	0	0	6
07:45 AM	0	**2**	0	**2**	0	0	**2**	2	0	4	0	4	0	0	0	0	**8**
08:00 AM	0	1	0	1	0	1	1	2	0	2	0	2	0	0	0	0	5
08:15 AM	0	0	0	0	0	1	1	2	0	**5**	0	**5**	**1**	0	0	**1**	8
Total Volume	0	3	0	3	0	4	5	9	0	14	0	14	1	0	0	1	27
% App. Total	0	100	0		0	44.4	55.6		0	100	0		100	0	0		
PHF	.000	.375	.000	.375	.000	.500	.625	.750	.000	.700	.000	.700	.250	.000	.000	.250	.844

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2



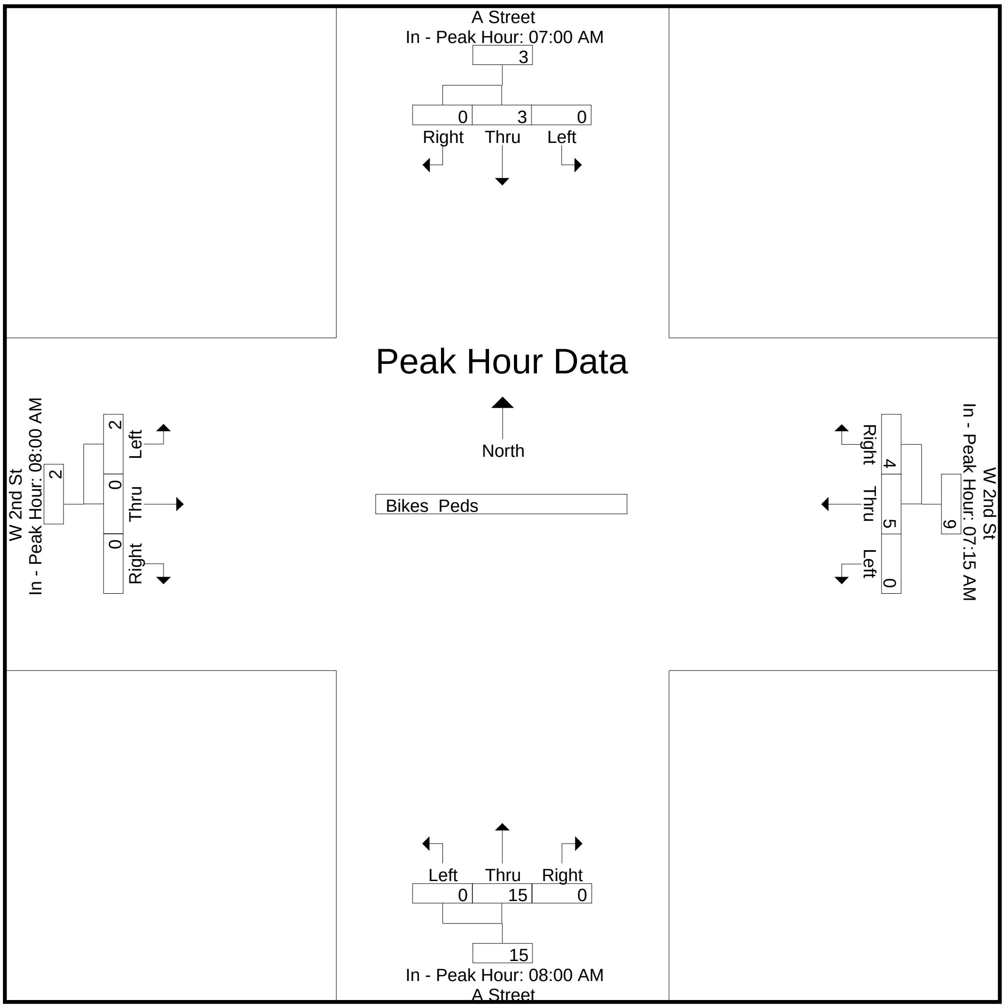
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				08:00 AM				08:00 AM			
+0 mins.	0	1	0	1	0	**2**	0	2	0	2	0	2	0	0	0	0
+15 mins.	0	0	0	0	0	2	1	**3**	0	5	0	5	**1**	0	0	**1**
+30 mins.	0	0	0	0	0	0	**2**	2	0	2	0	2	0	0	0	0
+45 mins.	0	**2**	0	**2**	0	1	1	2	0	**6**	0	**6**	1	0	0	1
Total Volume	0	3	0	3	0	5	4	9	0	15	0	15	2	0	0	2
% App. Total	0	100	0		0	55.6	44.4		0	100	0		100	0	0	
PHF	.000	.375	.000	.375	.000	.625	.500	.750	.000	.625	.000	.625	.500	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

Groups Printed- Cars - Trucks

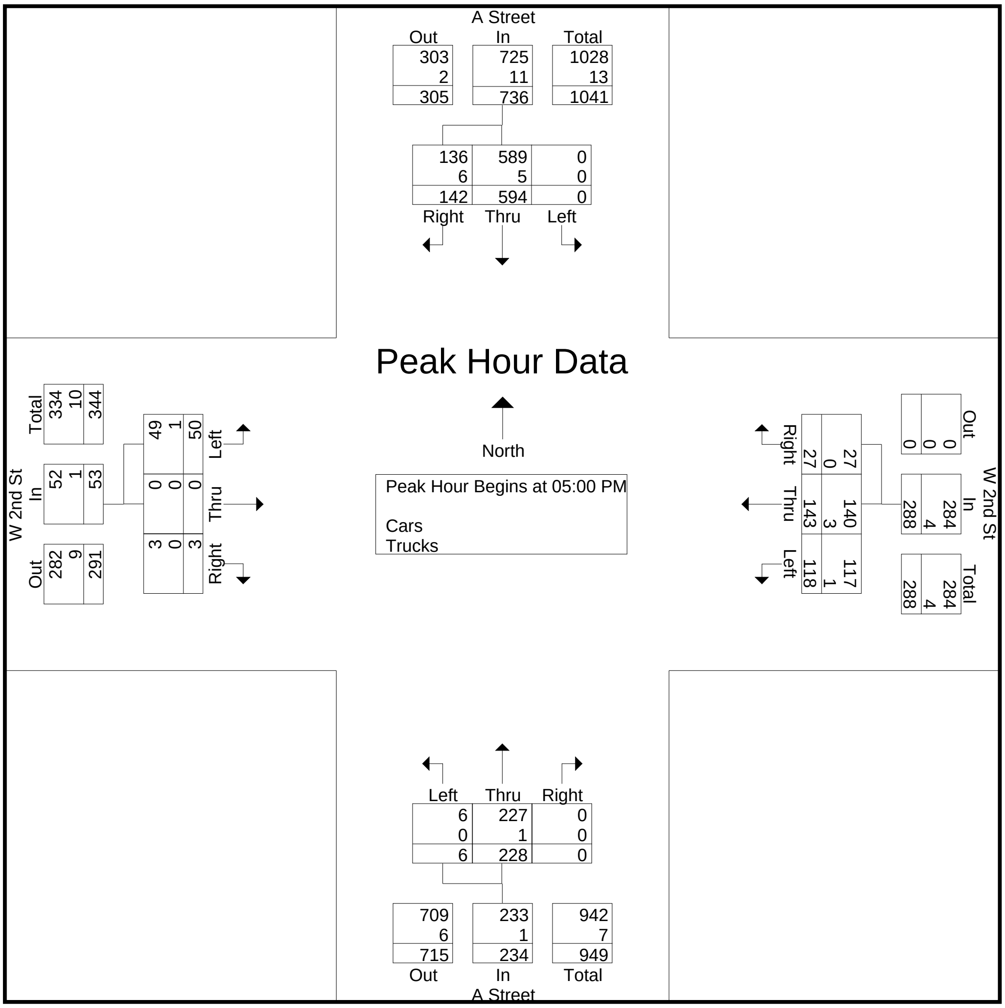
	A Street From North			**W 2nd St From East**			**A Street From South**			**W 2nd St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	160	28	27	26	11	5	28	0	12	0	1	298
04:15 PM	0	134	34	23	17	10	1	51	0	7	0	0	277
04:30 PM	0	111	26	19	30	6	0	65	0	13	0	1	271
04:45 PM	0	144	31	25	30	8	1	68	0	10	0	0	317
Total	0	549	119	94	103	35	7	212	0	42	0	2	1163
05:00 PM	0	151	34	39	39	2	2	59	0	8	0	1	335
05:15 PM	0	145	27	36	30	6	0	55	0	13	0	1	313
05:30 PM	0	154	36	20	43	12	1	57	0	14	0	1	338
05:45 PM	0	144	45	23	31	7	3	57	0	15	0	0	325
Total	0	594	142	118	143	27	6	228	0	50	0	3	1311
Grand Total	0	1143	261	212	246	62	13	440	0	92	0	5	2474
Apprch %	0	81.4	18.6	40.8	47.3	11.9	2.9	97.1	0	94.8	0	5.2	
Total %	0	46.2	10.5	8.6	9.9	2.5	0.5	17.8	0	3.7	0	0.2	
Cars	0	1131	241	208	240	62	13	434	0	91	0	5	2425
% Cars	0	99	92.3	98.1	97.6	100	100	98.6	0	98.9	0	100	98
Trucks	0	12	20	4	6	0	0	6	0	1	0	0	49
% Trucks	0	1	7.7	1.9	2.4	0	0	1.4	0	1.1	0	0	2

	A Street From North				**W 2nd St From East**				**A Street From South**				**W 2nd St From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	151	34	185	**39**	39	2	**80**	2	**59**	0	**61**	8	0	**1**	9	335
05:15 PM	0	145	27	172	36	30	6	72	0	55	0	55	13	0	1	14	313
05:30 PM	0	**154**	36	**190**	20	**43**	**12**	75	1	57	0	58	14	0	1	**15**	**338**
05:45 PM	0	144	**45**	189	23	31	7	61	**3**	57	0	60	**15**	0	0	15	325
Total Volume	0	594	142	736	118	143	27	288	6	228	0	234	50	0	3	53	1311
% App. Total	0	80.7	19.3		41	49.7	9.4		2.6	97.4	0		94.3	0	5.7		
PHF	.000	.964	.789	.968	.756	.831	.563	.900	.500	.966	.000	.959	.833	.000	.750	.883	.970
Cars	0	589	136	725	117	140	27	284	6	227	0	233	49	0	3	52	1294
% Cars	0	99.2	95.8	98.5	99.2	97.9	100	98.6	100	99.6	0	99.6	98.0	0	100	98.1	98.7
Trucks	0	5	6	11	1	3	0	4	0	1	0	1	1	0	0	1	17
% Trucks	0	0.8	4.2	1.5	0.8	2.1	0	1.4	0	0.4	0	0.4	2.0	0	0	1.9	1.3

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2



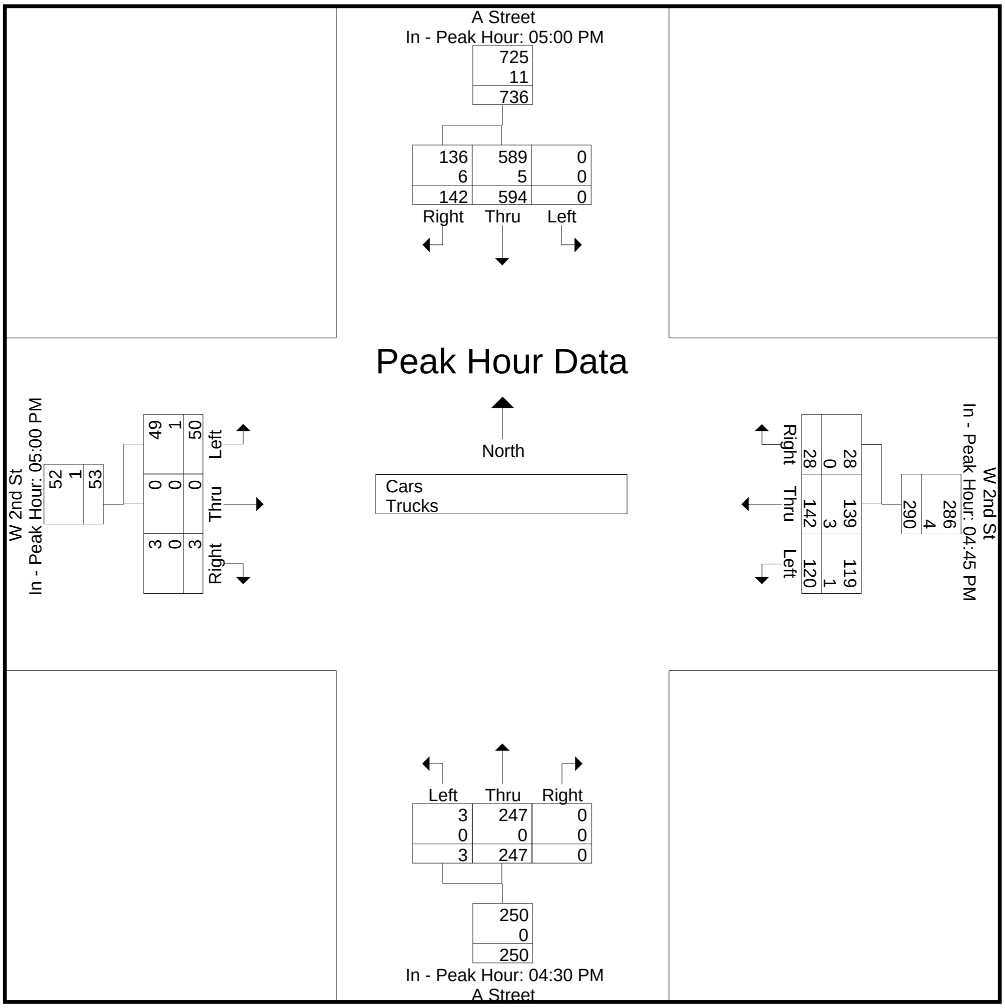
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:30 PM				05:00 PM			
+0 mins.	0	151	34	185	25	30	8	63	0	65	0	65	8	0	**1**	9
+15 mins.	0	145	27	172	**39**	39	2	**80**	1	**68**	0	**69**	13	0	1	14
+30 mins.	0	**154**	36	**190**	36	30	6	72	**2**	59	0	61	14	0	1	**15**
+45 mins.	0	144	**45**	189	20	**43**	**12**	75	0	55	0	55	**15**	0	0	15
Total Volume	0	594	142	736	120	142	28	290	3	247	0	250	50	0	3	53
% App. Total	0	80.7	19.3		41.4	49	9.7		1.2	98.8	0		94.3	0	5.7	
PHF	.000	.964	.789	.968	.769	.826	.583	.906	.375	.908	.000	.906	.833	.000	.750	.883
Cars	0	589	136	725	119	139	28	286	3	247	0	250	49	0	3	52
% Cars	0	99.2	95.8	98.5	99.2	97.9	100	98.6	100	100	0	100	98	0	100	98.1
Trucks	0	5	6	11	1	3	0	4	0	0	0	0	1	0	0	1
% Trucks	0	0.8	4.2	1.5	0.8	2.1	0	1.4	0	0	0	0	2	0	0	1.9

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

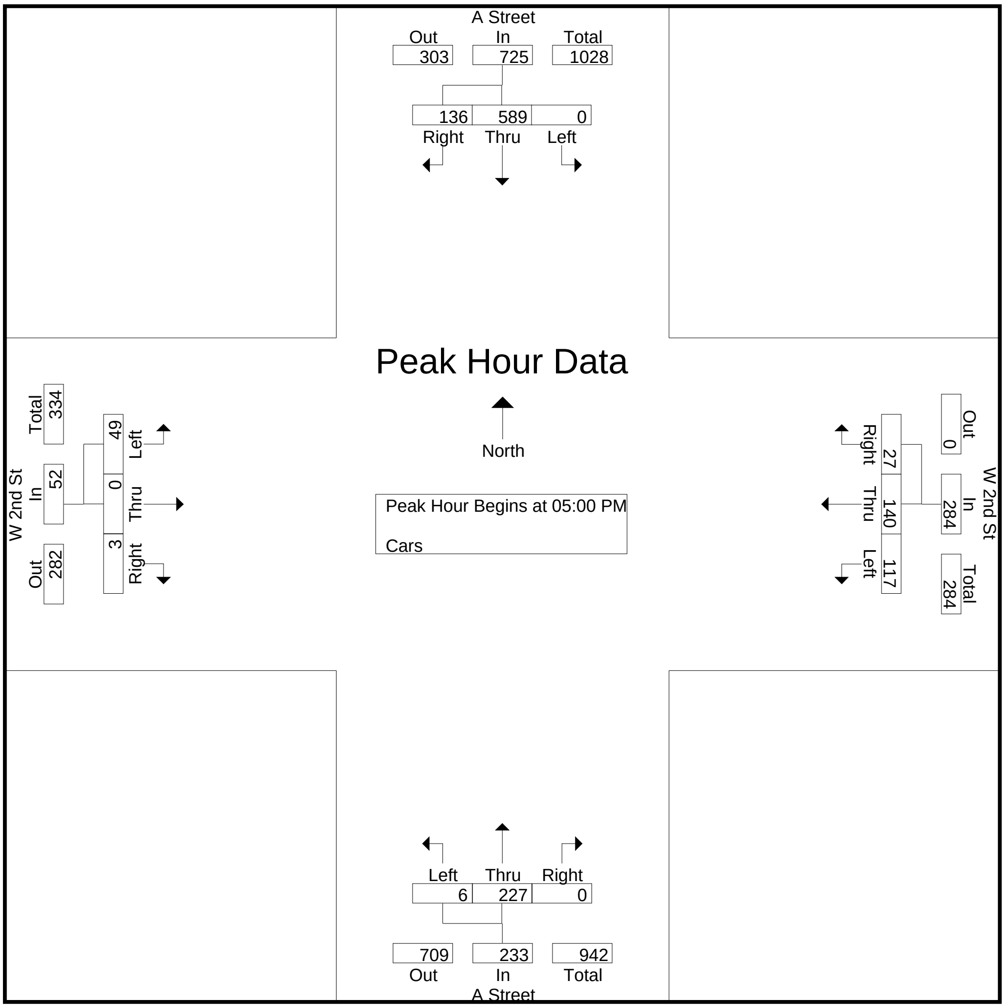
Groups Printed- Cars

	A Street From North			W 2nd St From East			A Street From South			W 2nd St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	159	25	27	26	11	5	27	0	12	0	1	293
04:15 PM	0	132	31	22	17	10	1	47	0	7	0	0	267
04:30 PM	0	110	21	18	28	6	0	65	0	13	0	1	262
04:45 PM	0	141	28	24	29	8	1	68	0	10	0	0	309
Total	0	542	105	91	100	35	7	207	0	42	0	2	1131
05:00 PM	0	150	33	39	38	2	2	59	0	8	0	1	332
05:15 PM	0	144	26	36	30	6	0	55	0	13	0	1	311
05:30 PM	0	152	34	20	42	12	1	56	0	14	0	1	332
05:45 PM	0	143	43	22	30	7	3	57	0	14	0	0	319
Total	0	589	136	117	140	27	6	227	0	49	0	3	1294
Grand Total	0	1131	241	208	240	62	13	434	0	91	0	5	2425
Apprch %	0	82.4	17.6	40.8	47.1	12.2	2.9	97.1	0	94.8	0	5.2	
Total %	0	46.6	9.9	8.6	9.9	2.6	0.5	17.9	0	3.8	0	0.2	

	A Street From North				W 2nd St From East				A Street From South				W 2nd St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	150	33	183	**39**	38	2	**79**	2	**59**	0	**61**	8	0	**1**	9	**332**
05:15 PM	0	144	26	170	36	30	6	72	0	55	0	55	13	0	1	14	311
05:30 PM	0	**152**	34	**186**	20	**42**	**12**	74	1	56	0	57	**14**	0	1	**15**	332
05:45 PM	0	143	**43**	186	22	30	7	59	**3**	57	0	60	14	0	0	14	319
Total Volume	0	589	136	725	117	140	27	284	6	227	0	233	49	0	3	52	1294
% App. Total	0	81.2	18.8		41.2	49.3	9.5		2.6	97.4	0		94.2	0	5.8		
PHF	.000	.969	.791	.974	.750	.833	.563	.899	.500	.962	.000	.955	.875	.000	.750	.867	.974

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

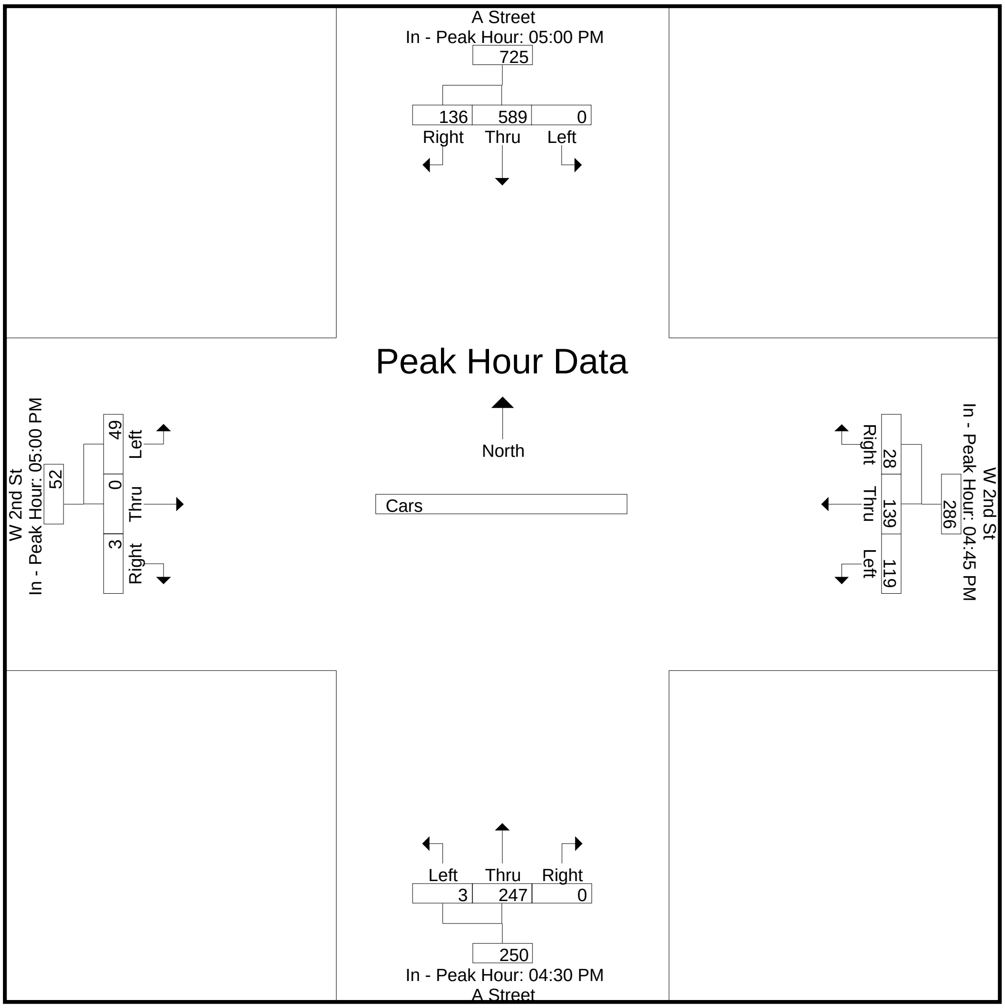
	05:00 PM				04:45 PM				04:30 PM				05:00 PM			
+0 mins.	0	150	33	183	24	29	8	61	0	65	0	65	8	0	**1**	9
+15 mins.	0	144	26	170	**39**	38	2	**79**	1	**68**	0	**69**	13	0	1	14
+30 mins.	0	**152**	34	**186**	36	30	6	72	**2**	59	0	61	**14**	0	1	**15**
+45 mins.	0	143	**43**	186	20	**42**	**12**	74	0	55	0	55	14	0	0	14
Total Volume	0	589	136	725	119	139	28	286	3	247	0	250	49	0	3	52
% App. Total	0	81.2	18.8		41.6	48.6	9.8		1.2	98.8	0		94.2	0	5.8	
PHF	.000	.969	.791	.974	.763	.827	.583	.905	.375	.908	.000	.906	.875	.000	.750	.867

Accurate Counts

978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

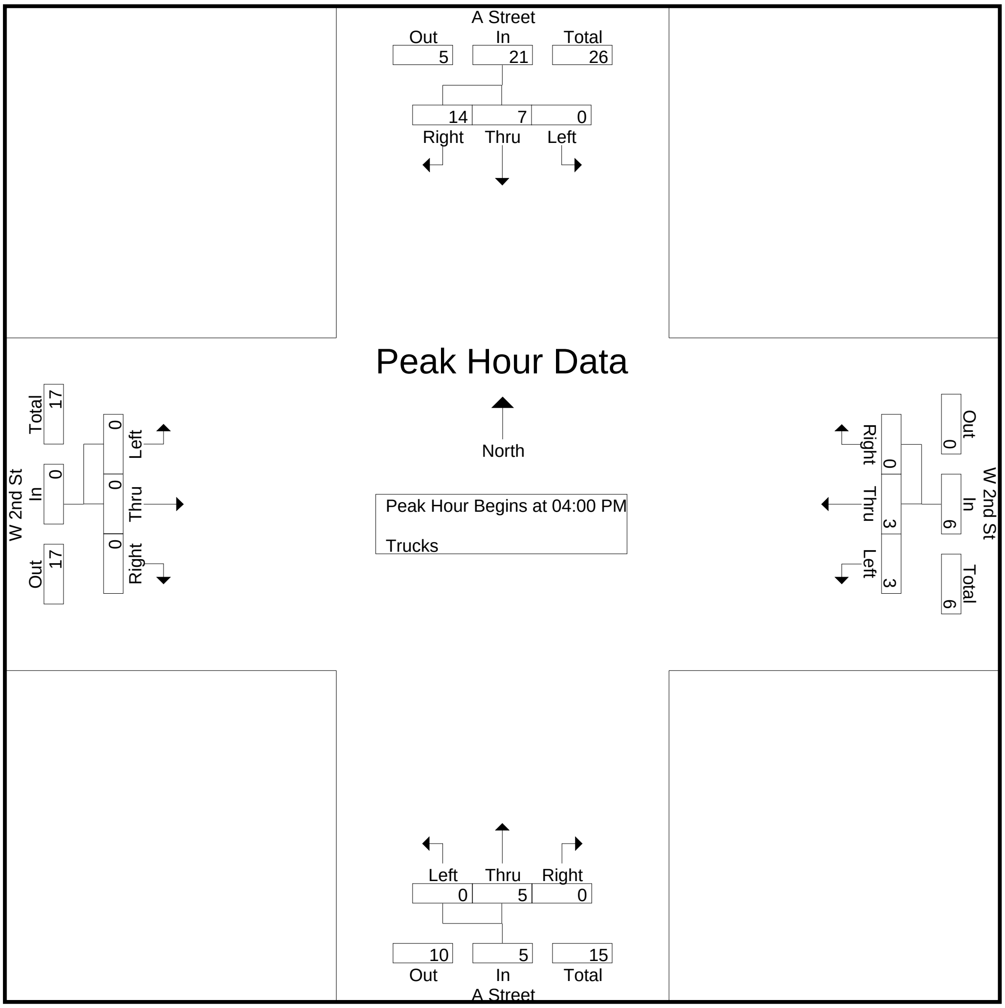
Groups Printed- Trucks

	A Street From North			**W 2nd St From East**			**A Street From South**			**W 2nd St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	1	3	0	0	0	0	1	0	0	0	0	5
04:15 PM	0	2	3	1	0	0	0	4	0	0	0	0	10
04:30 PM	0	1	5	1	2	0	0	0	0	0	0	0	9
04:45 PM	0	3	3	1	1	0	0	0	0	0	0	0	8
Total	0	7	14	3	3	0	0	5	0	0	0	0	32
05:00 PM	0	1	1	0	1	0	0	0	0	0	0	0	3
05:15 PM	0	1	1	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	2	2	0	1	0	0	1	0	0	0	0	6
05:45 PM	0	1	2	1	1	0	0	0	0	1	0	0	6
Total	0	5	6	1	3	0	0	1	0	1	0	0	17
Grand Total	0	12	20	4	6	0	0	6	0	1	0	0	49
Apprch %	0	37.5	62.5	40	60	0	0	100	0	100	0	0	
Total %	0	24.5	40.8	8.2	12.2	0	0	12.2	0	2	0	0	

	A Street From North				**W 2nd St From East**				**A Street From South**				**W 2nd St From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	3	4	0	0	0	0	0	1	0	1	0	0	0	0	5
04:15 PM	0	2	3	5	**1**	0	0	1	0	**4**	0	**4**	0	0	0	0	**10**
04:30 PM	0	1	**5**	**6**	1	**2**	0	**3**	0	0	0	0	0	0	0	0	9
04:45 PM	0	**3**	3	6	1	1	0	2	0	0	0	0	0	0	0	0	8
Total Volume	0	7	14	21	3	3	0	6	0	5	0	5	0	0	0	0	32
% App. Total	0	33.3	66.7		50	50	0		0	100	0		0	0	0		
PHF	.000	.583	.700	.875	.750	.375	.000	.500	.000	.313	.000	.313	.000	.000	.000	.000	.800

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2

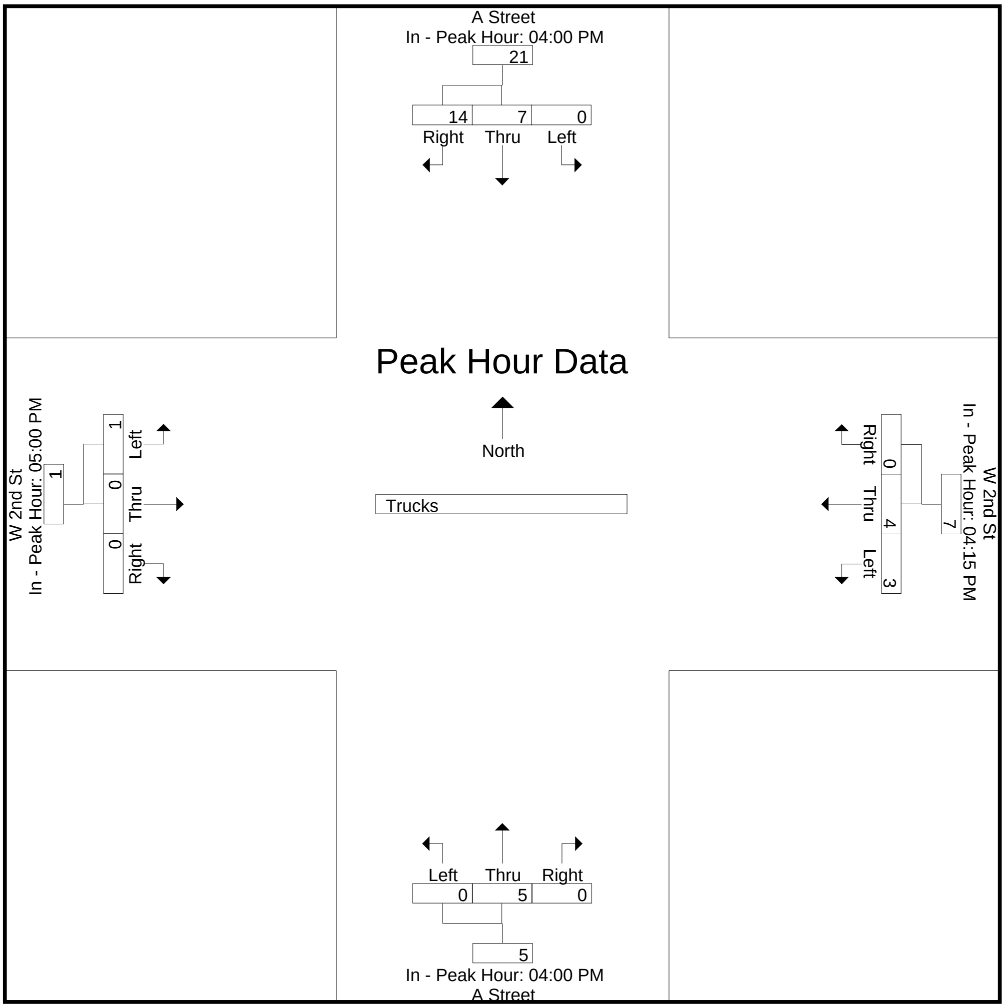


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				05:00 PM			
+0 mins.	0	1	3	4	**1**	0	0	1	0	1	0	1	0	0	0	0
+15 mins.	0	2	3	5	1	**2**	0	**3**	0	**4**	0	**4**	0	0	0	0
+30 mins.	0	1	**5**	**6**	1	1	0	2	0	0	0	0	0	0	0	0
+45 mins.	0	**3**	3	6	0	1	0	1	0	0	0	0	**1**	0	0	**1**
Total Volume	0	7	14	21	3	4	0	7	0	5	0	5	1	0	0	1
% App. Total	0	33.3	66.7		42.9	57.1	0		0	100	0		100	0	0	
PHF	.000	.583	.700	.875	.750	.500	.000	.583	.000	.313	.000	.313	.250	.000	.000	.250

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 1

Groups Printed- Bikes Peds

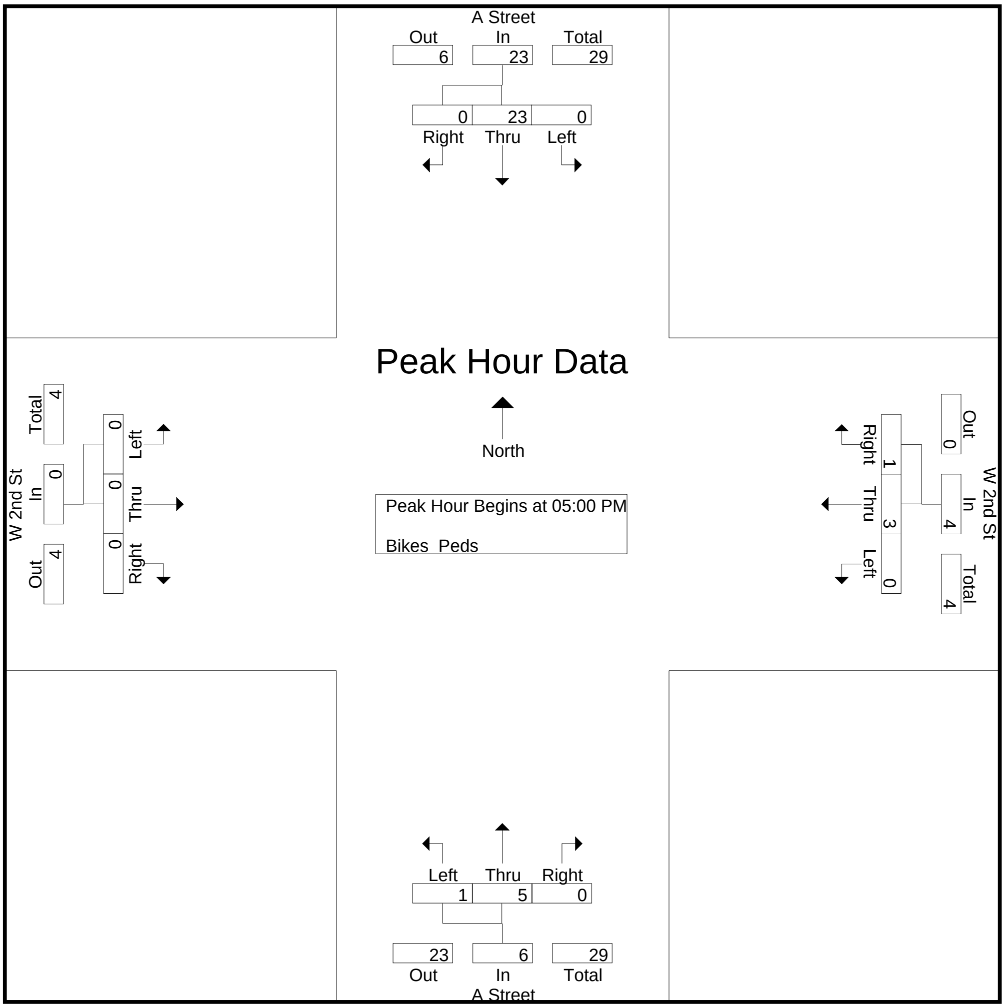
	A Street From North				W 2nd St From East				A Street From South				W 2nd St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	1	0	3	0	0	0	4	0	1	0	2	0	1	0	3	12	3	15
04:15 PM	0	3	0	6	0	0	1	8	0	1	0	1	0	0	0	1	16	5	21
04:30 PM	0	2	1	2	0	0	0	9	0	0	0	0	0	0	0	0	11	3	14
04:45 PM	0	4	0	4	0	0	0	13	0	1	0	0	0	0	0	9	26	5	31
Total	0	10	1	15	0	0	1	34	0	3	0	3	0	1	0	13	65	16	81
05:00 PM	0	3	0	3	0	0	0	18	0	1	0	7	0	0	0	7	35	4	39
05:15 PM	0	7	0	2	0	0	1	24	0	3	0	1	0	0	0	15	42	11	53
05:30 PM	0	6	0	5	0	2	0	21	0	0	0	3	0	0	0	8	37	8	45
05:45 PM	0	7	0	9	0	1	0	16	1	1	0	1	0	0	0	12	38	10	48
Total	0	23	0	19	0	3	1	79	1	5	0	12	0	0	0	42	152	33	185
Grand Total	0	33	1	34	0	3	2	113	1	8	0	15	0	1	0	55	217	49	266
Apprch %	0	97.1	2.9		0	60	40		11.1	88.9	0		0	100	0				
Total %	0	67.3	2		0	6.1	4.1		2	16.3	0		0	2	0		81.6	18.4	

	A Street From North				W 2nd St From East				A Street From South				W 2nd St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
05:15 PM	0	**7**	0	**7**	0	0	**1**	1	0	**3**	0	**3**	0	0	0	0	**11**
05:30 PM	0	6	0	6	0	**2**	0	**2**	0	0	0	0	0	0	0	0	8
05:45 PM	0	7	0	7	0	1	0	1	**1**	1	0	2	0	0	0	0	10
Total Volume	0	23	0	23	0	3	1	4	1	5	0	6	0	0	0	0	33
% App. Total	0	100	0		0	75	25		16.7	83.3	0		0	0	0		
PHF	.000	.821	.000	.821	.000	.375	.250	.500	.250	.417	.000	.500	.000	.000	.000	.000	.750

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 2

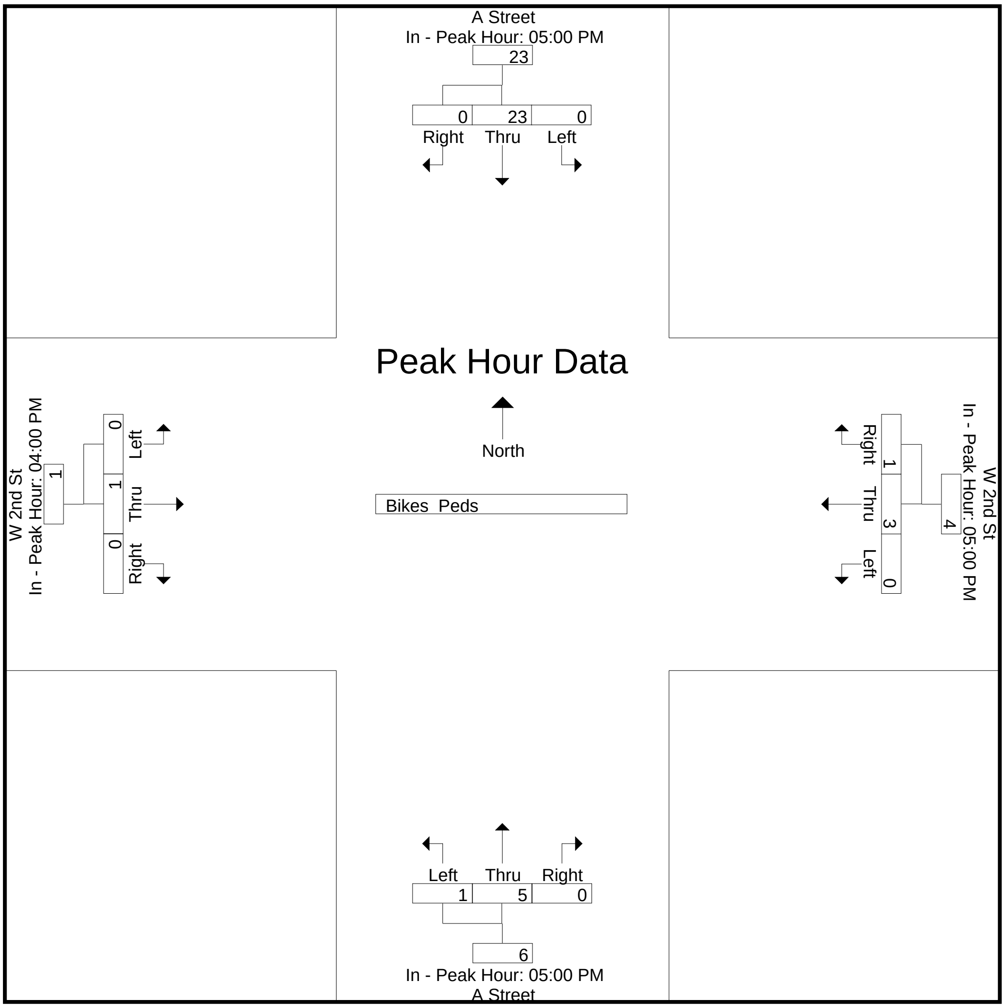


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	3	0	3	0	0	0	0	0	1	0	1	0	**1**	0	**1**
+15 mins.	0	**7**	0	**7**	0	0	**1**	1	0	**3**	0	**3**	0	0	0	0
+30 mins.	0	6	0	6	0	**2**	0	**2**	0	0	0	0	0	0	0	0
+45 mins.	0	7	0	7	0	1	0	1	**1**	1	0	2	0	0	0	0
Total Volume	0	23	0	23	0	3	1	4	1	5	0	6	0	1	0	1
% App. Total	0	100	0		0	75	25		16.7	83.3	0		0	100	0	
PHF	.000	.821	.000	.821	.000	.375	.250	.500	.250	.417	.000	.500	.000	.250	.000	.250

N/S Street : A Street
E/W Street : West 2nd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117003
Site Code : 12117003
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

Groups Printed- Cars - Trucks

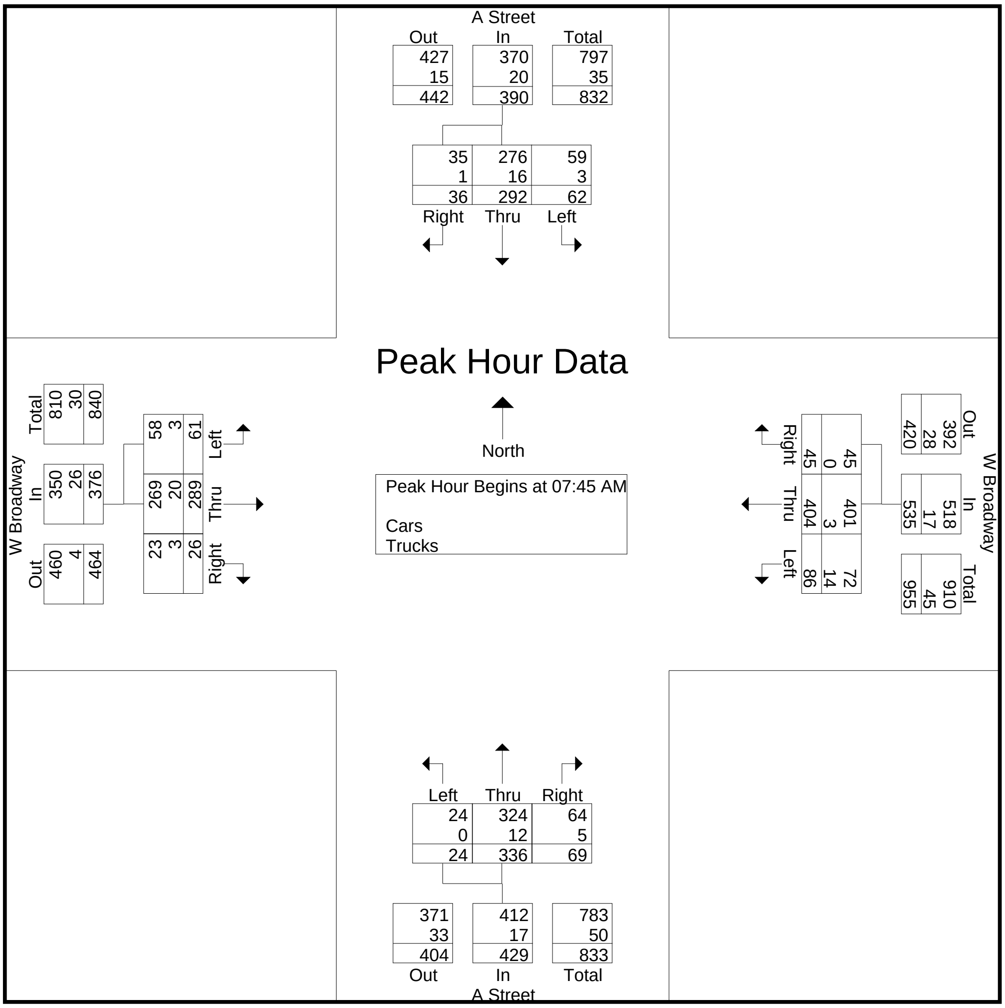
	A Street From North			**W Broadway From East**			**A Street From South**			**W Broadway From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	16	46	6	16	91	9	5	76	13	9	67	2	356
07:15 AM	10	52	8	16	98	8	2	64	10	6	77	4	355
07:30 AM	12	65	11	19	103	13	9	60	15	4	62	6	379
07:45 AM	20	74	9	21	100	5	5	74	20	20	73	5	426
Total	58	237	34	72	392	35	21	274	58	39	279	17	1516
08:00 AM	21	74	9	17	111	12	5	78	14	10	71	7	429
08:15 AM	9	72	3	23	93	14	8	91	17	12	80	6	428
08:30 AM	12	72	15	25	100	14	6	93	18	19	65	8	447
08:45 AM	13	68	4	21	74	12	6	92	16	18	77	1	402
Total	55	286	31	86	378	52	25	354	65	59	293	22	1706
Grand Total	113	523	65	158	770	87	46	628	123	98	572	39	3222
Apprch %	16.1	74.6	9.3	15.6	75.9	8.6	5.8	78.8	15.4	13.8	80.7	5.5	
Total %	3.5	16.2	2	4.9	23.9	2.7	1.4	19.5	3.8	3	17.8	1.2	
Cars	105	488	62	131	761	85	46	597	107	94	531	35	3042
% Cars	92.9	93.3	95.4	82.9	98.8	97.7	100	95.1	87	95.9	92.8	89.7	94.4
Trucks	8	35	3	27	9	2	0	31	16	4	41	4	180
% Trucks	7.1	6.7	4.6	17.1	1.2	2.3	0	4.9	13	4.1	7.2	10.3	5.6

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	20	**74**	9	103	21	100	5	126	5	74	**20**	99	**20**	73	5	**98**	426
08:00 AM	**21**	74	9	**104**	17	**111**	12	**140**	5	78	14	97	10	71	7	88	429
08:15 AM	9	72	3	84	23	93	**14**	130	**8**	91	17	116	12	**80**	6	98	428
08:30 AM	12	72	**15**	99	**25**	100	14	139	6	**93**	18	**117**	19	65	**8**	92	**447**
Total Volume	62	292	36	390	86	404	45	535	24	336	69	429	61	289	26	376	1730
% App. Total	15.9	74.9	9.2		16.1	75.5	8.4		5.6	78.3	16.1		16.2	76.9	6.9		
PHF	.738	.986	.600	.938	.860	.910	.804	.955	.750	.903	.863	.917	.763	.903	.813	.959	.968
Cars	59	276	35	370	72	401	45	518	24	324	64	412	58	269	23	350	1650
% Cars	95.2	94.5	97.2	94.9	83.7	99.3	100	96.8	100	96.4	92.8	96.0	95.1	93.1	88.5	93.1	95.4
Trucks	3	16	1	20	14	3	0	17	0	12	5	17	3	20	3	26	80
% Trucks	4.8	5.5	2.8	5.1	16.3	0.7	0	3.2	0	3.6	7.2	4.0	4.9	6.9	11.5	6.9	4.6

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 2



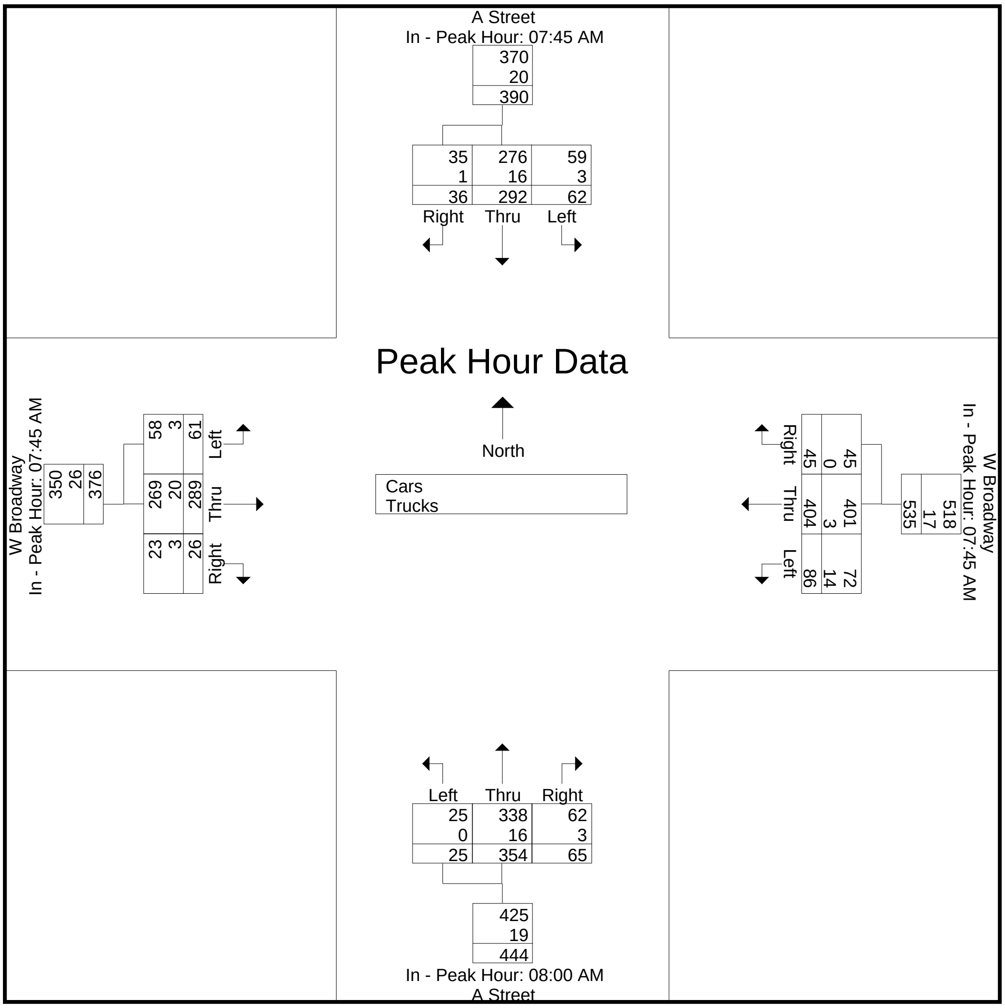
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				08:00 AM				07:45 AM			
+0 mins.	20	**74**	9	103	21	100	5	126	5	78	14	97	**20**	73	5	**98**
+15 mins.	**21**	74	9	**104**	17	**111**	12	**140**	**8**	91	17	116	10	71	7	88
+30 mins.	9	72	3	84	23	93	**14**	130	6	**93**	**18**	**117**	12	**80**	6	98
+45 mins.	12	72	**15**	99	**25**	100	14	139	6	92	16	114	19	65	**8**	92
Total Volume	62	292	36	390	86	404	45	535	25	354	65	444	61	289	26	376
% App. Total	15.9	74.9	9.2		16.1	75.5	8.4		5.6	79.7	14.6		16.2	76.9	6.9	
PHF	.738	.986	.600	.938	.860	.910	.804	.955	.781	.952	.903	.949	.763	.903	.813	.959
Cars	59	276	35	370	72	401	45	518	25	338	62	425	58	269	23	350
% Cars	95.2	94.5	97.2	94.9	83.7	99.3	100	96.8	100	95.5	95.4	95.7	95.1	93.1	88.5	93.1
Trucks	3	16	1	20	14	3	0	17	0	16	3	19	3	20	3	26
% Trucks	4.8	5.5	2.8	5.1	16.3	0.7	0	3.2	0	4.5	4.6	4.3	4.9	6.9	11.5	6.9

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

Groups Printed- Cars

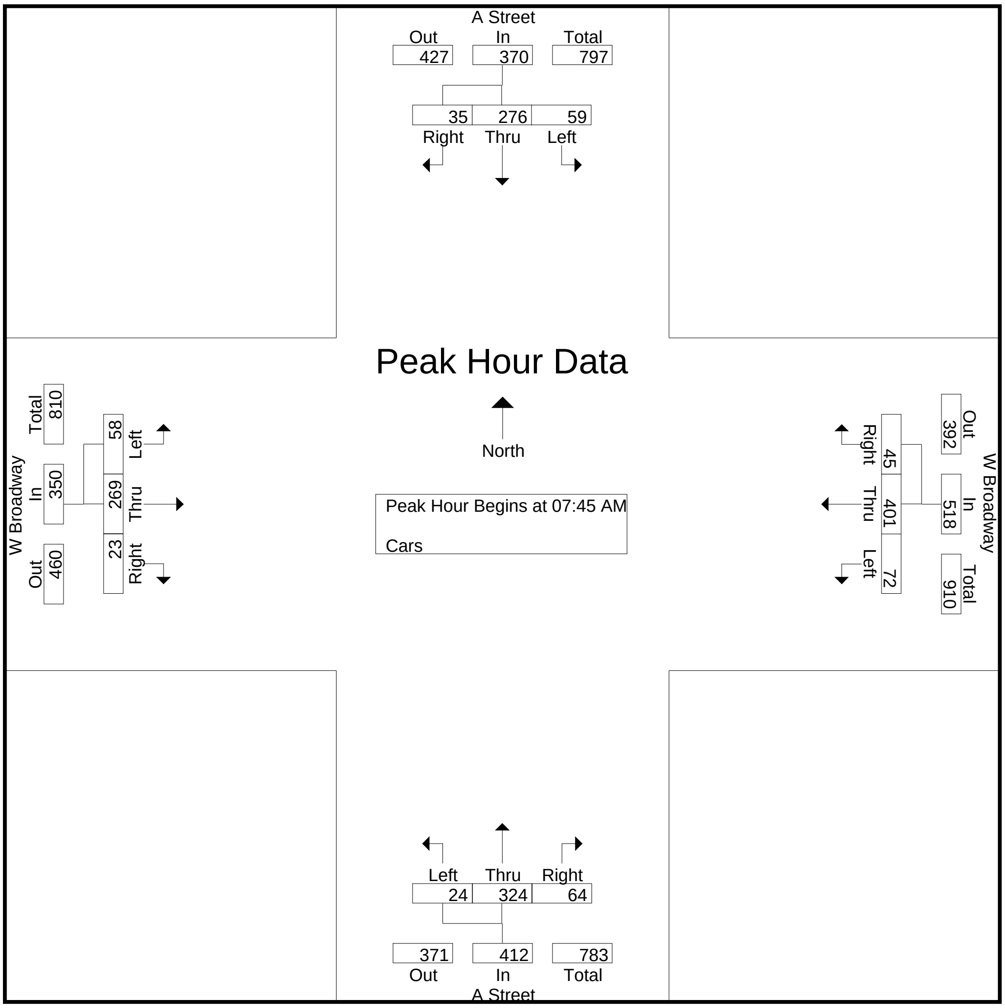
	A Street From North			W Broadway From East			A Street From South			W Broadway From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	14	41	5	14	90	8	5	70	8	8	59	1	323
07:15 AM	8	46	8	11	97	8	2	57	10	6	72	4	329
07:30 AM	11	60	10	16	101	13	9	59	10	4	59	6	358
07:45 AM	17	71	9	18	100	5	5	73	17	19	66	5	405
Total	50	218	32	59	388	34	21	259	45	37	256	16	1415
08:00 AM	21	68	8	14	110	12	5	75	12	10	65	6	406
08:15 AM	9	67	3	19	92	14	8	88	17	10	76	6	409
08:30 AM	12	70	15	21	99	14	6	88	18	19	62	6	430
08:45 AM	13	65	4	18	72	11	6	87	15	18	72	1	382
Total	55	270	30	72	373	51	25	338	62	57	275	19	1627
Grand Total	105	488	62	131	761	85	46	597	107	94	531	35	3042
Apprch %	16	74.5	9.5	13.4	77.9	8.7	6.1	79.6	14.3	14.2	80.5	5.3	
Total %	3.5	16	2	4.3	25	2.8	1.5	19.6	3.5	3.1	17.5	1.2	

	A Street From North				W Broadway From East				A Street From South				W Broadway From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	17	**71**	9	**97**	18	100	5	123	5	73	17	95	**19**	66	5	90	405
08:00 AM	**21**	68	8	97	14	**110**	12	**136**	5	75	12	92	10	65	**6**	81	406
08:15 AM	9	67	3	79	19	92	**14**	125	**8**	**88**	17	**113**	10	**76**	6	**92**	409
08:30 AM	12	70	**15**	97	**21**	99	14	134	6	88	**18**	112	19	62	6	87	**430**
Total Volume	59	276	35	370	72	401	45	518	24	324	64	412	58	269	23	350	1650
% App. Total	15.9	74.6	9.5		13.9	77.4	8.7		5.8	78.6	15.5		16.6	76.9	6.6		
PHF	.702	.972	.583	.954	.857	.911	.804	.952	.750	.920	.889	.912	.763	.885	.958	.951	.959

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 2



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

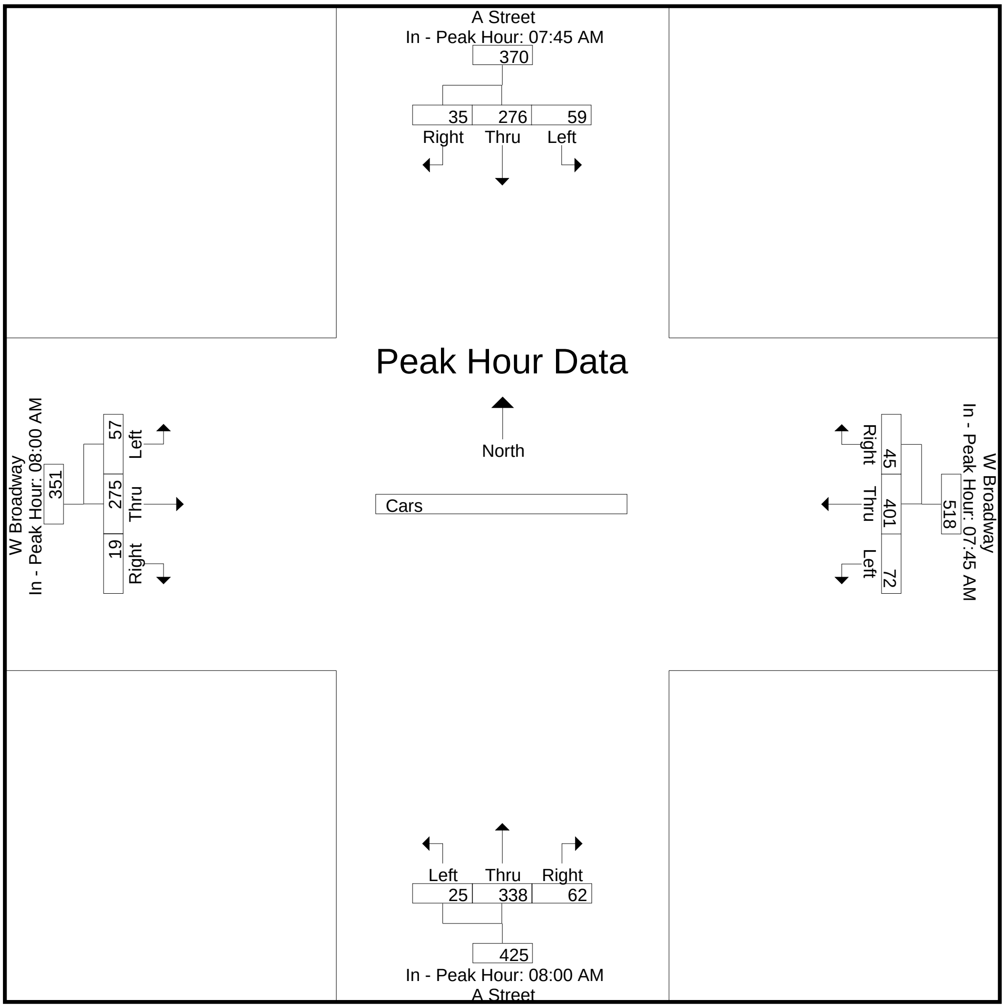
	07:45 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	17	**71**	9	**97**	18	100	5	123	5	75	12	92	10	65	**6**	81
+15 mins.	**21**	68	8	97	14	**110**	12	**136**	**8**	**88**	17	**113**	10	**76**	6	**92**
+30 mins.	9	67	3	79	19	92	**14**	125	6	88	**18**	112	**19**	62	6	87
+45 mins.	12	70	**15**	97	**21**	99	14	134	6	87	15	108	18	72	1	91
Total Volume	59	276	35	370	72	401	45	518	25	338	62	425	57	275	19	351
% App. Total	15.9	74.6	9.5		13.9	77.4	8.7		5.9	79.5	14.6		16.2	78.3	5.4	
PHF	.702	.972	.583	.954	.857	.911	.804	.952	.781	.960	.861	.940	.750	.905	.792	.954

Accurate Counts

978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

Groups Printed- Trucks

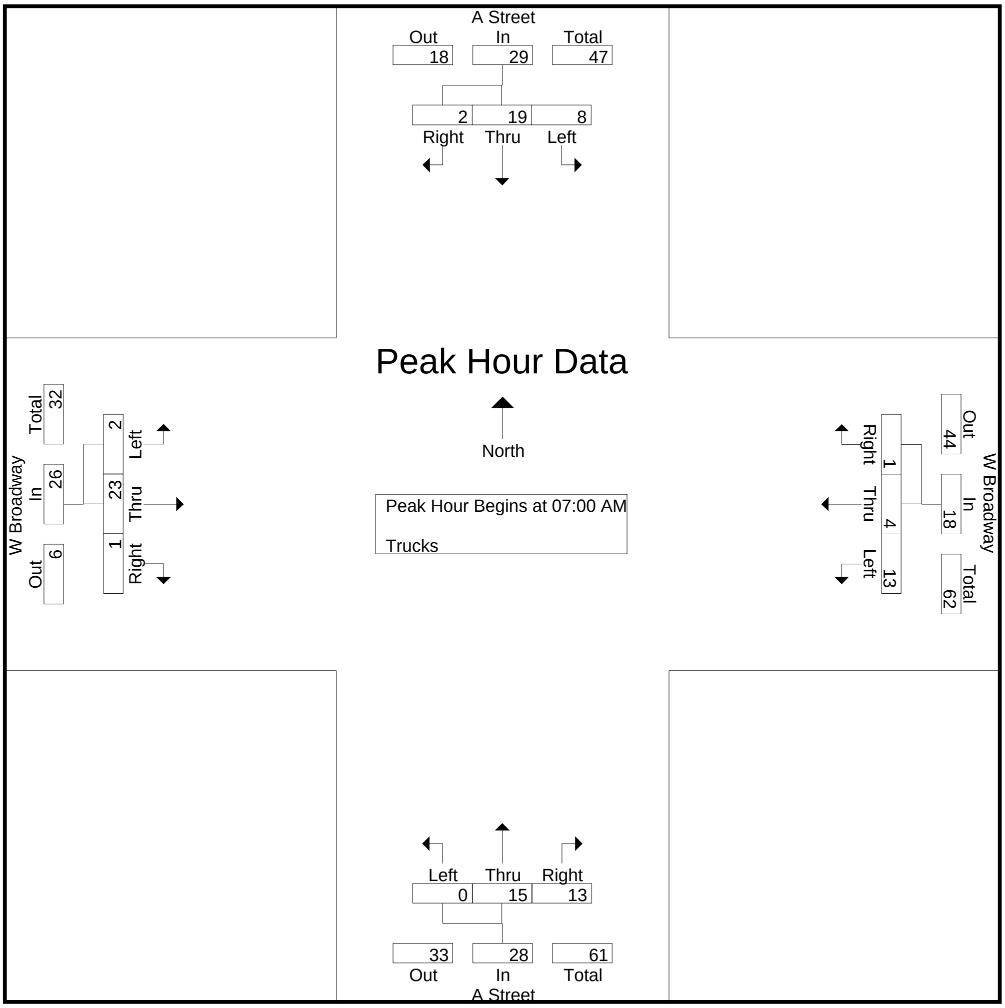
	A Street From North			**W Broadway From East**			**A Street From South**			**W Broadway From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	2	5	1	2	1	1	0	6	5	1	8	1	33
07:15 AM	2	6	0	5	1	0	0	7	0	0	5	0	26
07:30 AM	1	5	1	3	2	0	0	1	5	0	3	0	21
07:45 AM	3	3	0	3	0	0	0	1	3	1	7	0	21
Total	8	19	2	13	4	1	0	15	13	2	23	1	101
08:00 AM	0	6	1	3	1	0	0	3	2	0	6	1	23
08:15 AM	0	5	0	4	1	0	0	3	0	2	4	0	19
08:30 AM	0	2	0	4	1	0	0	5	0	0	3	2	17
08:45 AM	0	3	0	3	2	1	0	5	1	0	5	0	20
Total	0	16	1	14	5	1	0	16	3	2	18	3	79
Grand Total	8	35	3	27	9	2	0	31	16	4	41	4	180
Apprch %	17.4	76.1	6.5	71.1	23.7	5.3	0	66	34	8.2	83.7	8.2	
Total %	4.4	19.4	1.7	15	5	1.1	0	17.2	8.9	2.2	22.8	2.2	

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	5	**1**	**8**	2	1	**1**	4	0	6	**5**	**11**	**1**	**8**	**1**	**10**	**33**
07:15 AM	2	**6**	0	8	**5**	1	0	**6**	0	**7**	0	7	0	5	0	5	26
07:30 AM	1	5	1	7	3	**2**	0	5	0	1	5	6	0	3	0	3	21
07:45 AM	**3**	3	0	6	3	0	0	3	0	1	3	4	1	7	0	8	21
Total Volume	8	19	2	29	13	4	1	18	0	15	13	28	2	23	1	26	101
% App. Total	27.6	65.5	6.9		72.2	22.2	5.6		0	53.6	46.4		7.7	88.5	3.8		
PHF	.667	.792	.500	.906	.650	.500	.250	.750	.000	.536	.650	.636	.500	.719	.250	.650	.765

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 2



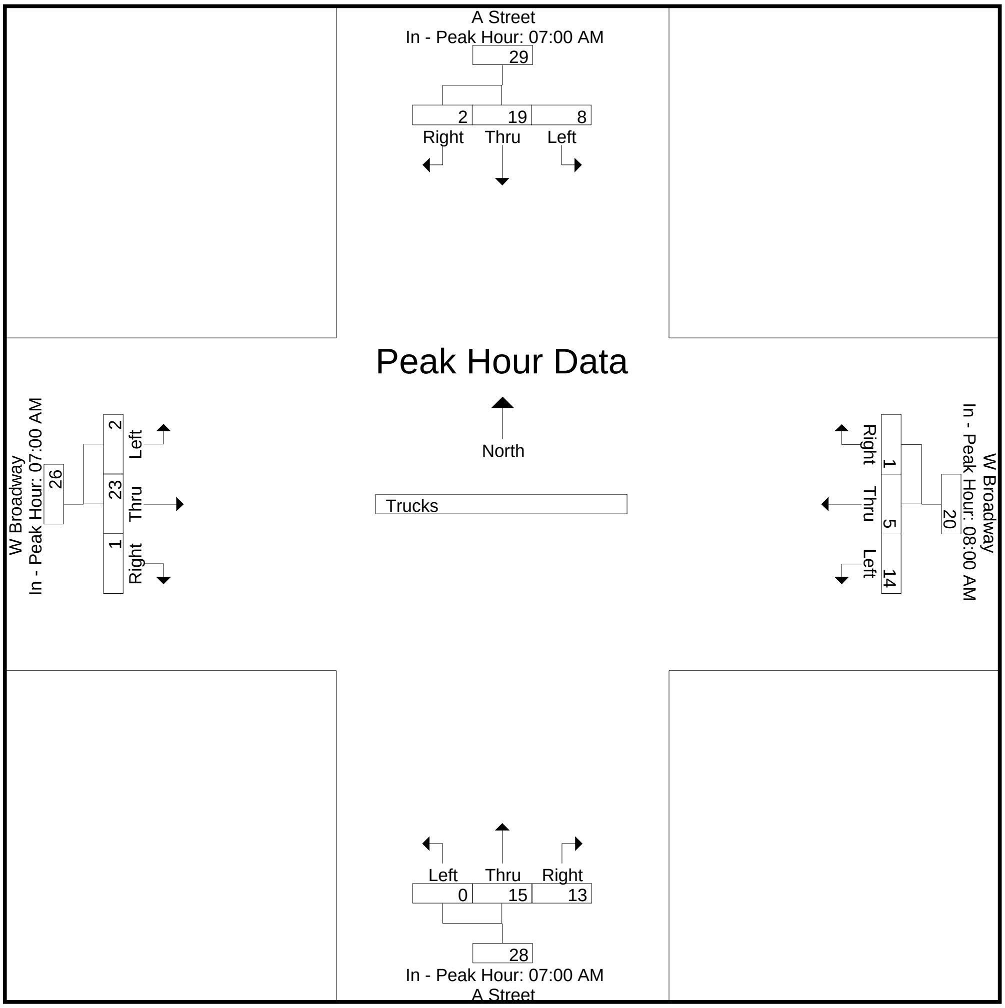
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:00 AM				07:00 AM			
+0 mins.	2	5	**1**	**8**	3	1	0	4	0	6	**5**	**11**	**1**	**8**	**1**	**10**
+15 mins.	2	**6**	0	8	**4**	1	0	5	0	**7**	0	7	0	5	0	5
+30 mins.	1	5	1	7	4	1	0	5	0	1	5	6	0	3	0	3
+45 mins.	**3**	3	0	6	3	**2**	**1**	**6**	0	1	3	4	1	7	0	8
Total Volume	8	19	2	29	14	5	1	20	0	15	13	28	2	23	1	26
% App. Total	27.6	65.5	6.9		70	25	5		0	53.6	46.4		7.7	88.5	3.8	
PHF	.667	.792	.500	.906	.875	.625	.250	.833	.000	.536	.650	.636	.500	.719	.250	.650

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013



N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Cloudy

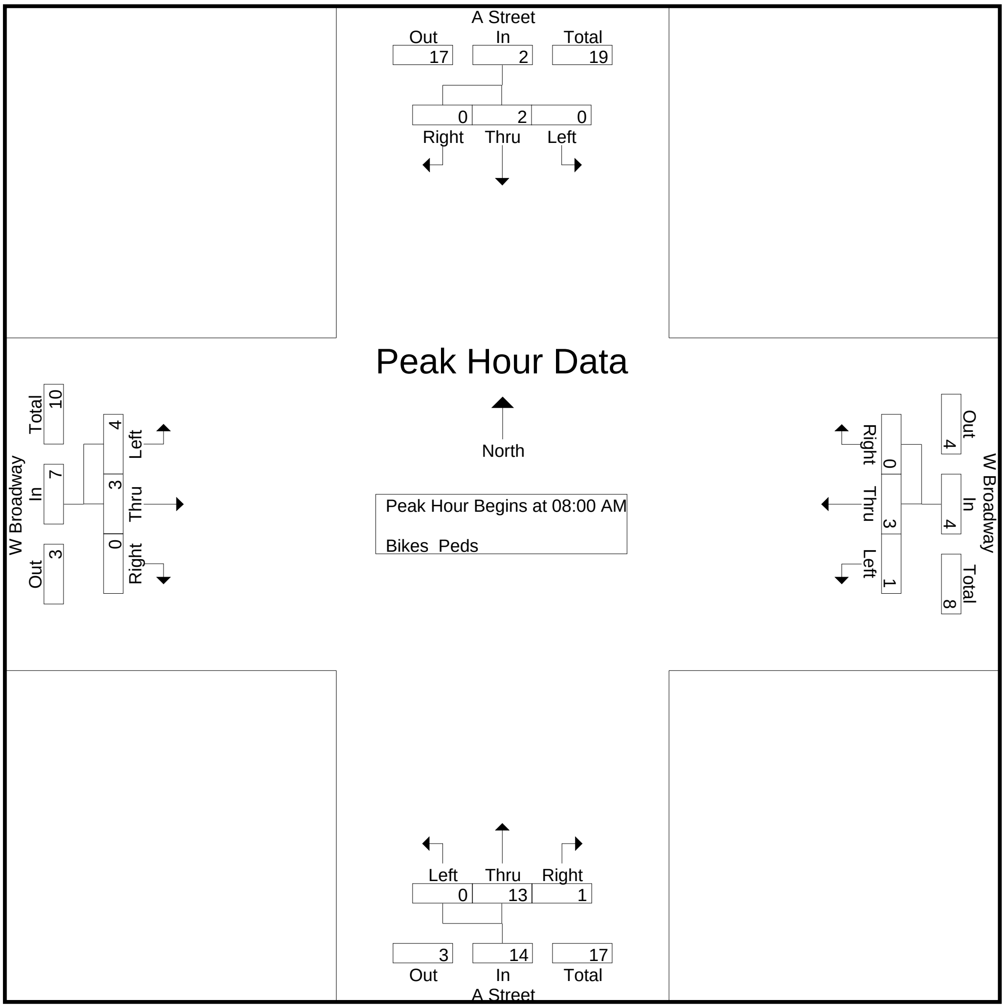
File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

Groups Printed- Bikes Peds

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	14	1	0	0	16	0	0	0	41	0	0	0	13	84	2	86
07:15 AM	0	0	0	14	0	0	1	7	0	1	0	52	1	1	0	14	87	4	91
07:30 AM	0	0	0	16	0	0	0	12	0	2	1	53	0	0	0	13	94	3	97
07:45 AM	0	1	0	29	0	0	0	17	0	0	0	69	0	0	0	17	132	1	133
Total	0	2	0	73	1	0	1	52	0	3	1	215	1	1	0	57	397	10	407
08:00 AM	0	1	0	20	0	1	0	18	0	1	0	67	0	0	0	23	128	3	131
08:15 AM	0	0	0	21	1	0	0	21	0	5	0	63	1	1	0	14	119	8	127
08:30 AM	0	1	0	17	0	1	0	19	0	2	1	59	1	2	0	24	119	8	127
08:45 AM	0	0	0	33	0	1	0	26	0	5	0	70	2	0	0	29	158	8	166
Total	0	2	0	91	1	3	0	84	0	13	1	259	4	3	0	90	524	27	551
Grand Total	0	4	0	164	2	3	1	136	0	16	2	474	5	4	0	147	921	37	958
Apprch %	0	100	0		33.3	50	16.7		0	88.9	11.1		55.6	44.4	0				
Total %	0	10.8	0		5.4	8.1	2.7		0	43.2	5.4		13.5	10.8	0		96.1	3.9	

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	**1**	0	**1**	0	**1**	0	**1**	0	1	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	**1**	0	0	1	0	**5**	0	**5**	1	1	0	2	**8**
08:30 AM	0	1	0	1	0	1	0	1	0	2	**1**	3	1	**2**	0	**3**	8
08:45 AM	0	0	0	0	0	1	0	1	0	5	0	5	**2**	0	0	2	8
Total Volume	0	2	0	2	1	3	0	4	0	13	1	14	4	3	0	7	27
% App. Total	0	100	0		25	75	0		0	92.9	7.1		57.1	42.9	0		
PHF	.000	.500	.000	.500	.250	.750	.000	1.00	.000	.650	.250	.700	.500	.375	.000	.583	.844

N/S Street : A Street	File Name : 12117005
E/W Street: West Broadway	Site Code : 12117005
City/State : Boston, MA	Start Date : 4/25/2013
Weather : Cloudy	Page No : 2



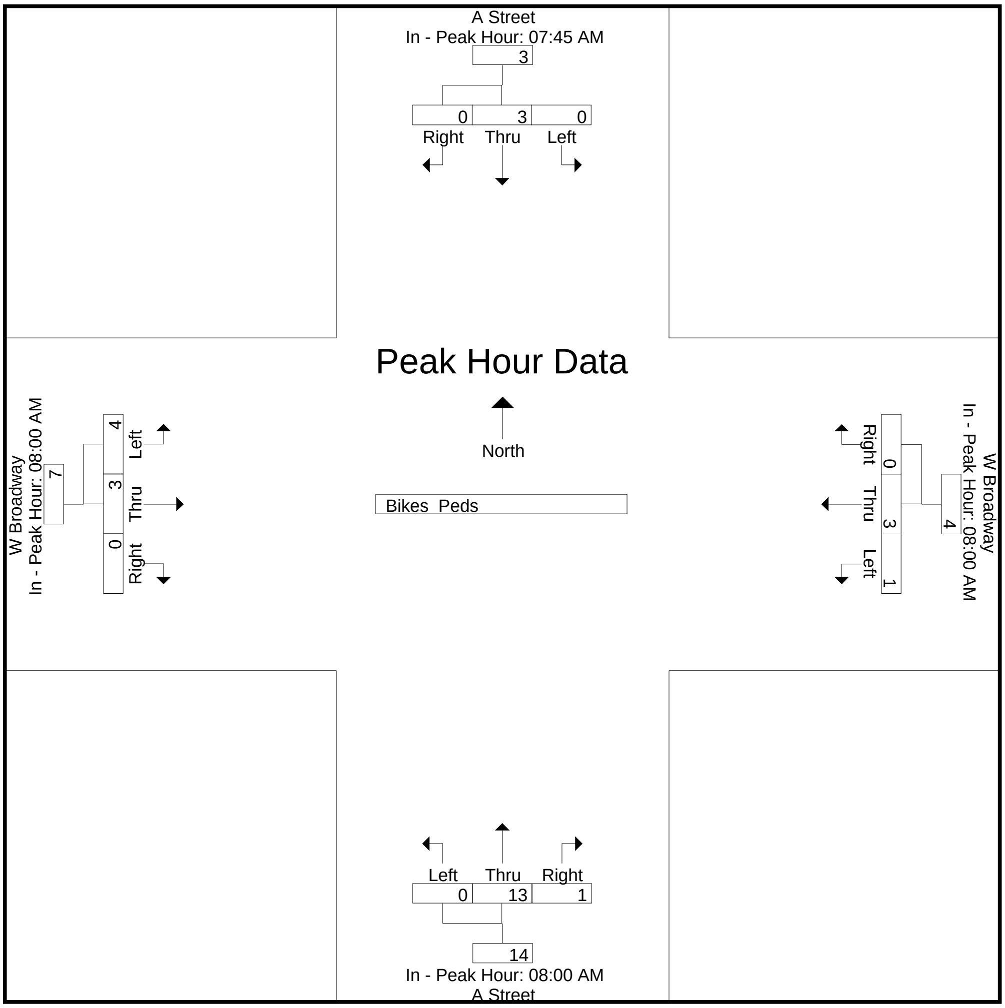
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	**1**	0	**1**	0	**1**	0	**1**	0	1	0	1	0	0	0	0
+15 mins.	0	1	0	1	**1**	0	0	1	0	**5**	0	**5**	1	1	0	2
+30 mins.	0	0	0	0	0	1	0	1	0	2	**1**	3	1	**2**	0	**3**
+45 mins.	0	1	0	1	0	1	0	1	0	5	0	5	**2**	0	0	2
Total Volume	0	3	0	3	1	3	0	4	0	13	1	14	4	3	0	7
% App. Total	0	100	0		25	75	0		0	92.9	7.1		57.1	42.9	0	
PHF	.000	.750	.000	.750	.250	.750	.000	1.000	.000	.650	.250	.700	.500	.375	.000	.583

Accurate Counts

978-664-2565

N/S Street : A Street		File Name	: 12117005
E/W Street: West Broadway		Site Code	: 12117005
City/State : Boston, MA		Start Date	: 4/25/2013
Weather : Cloudy		Page No	: 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

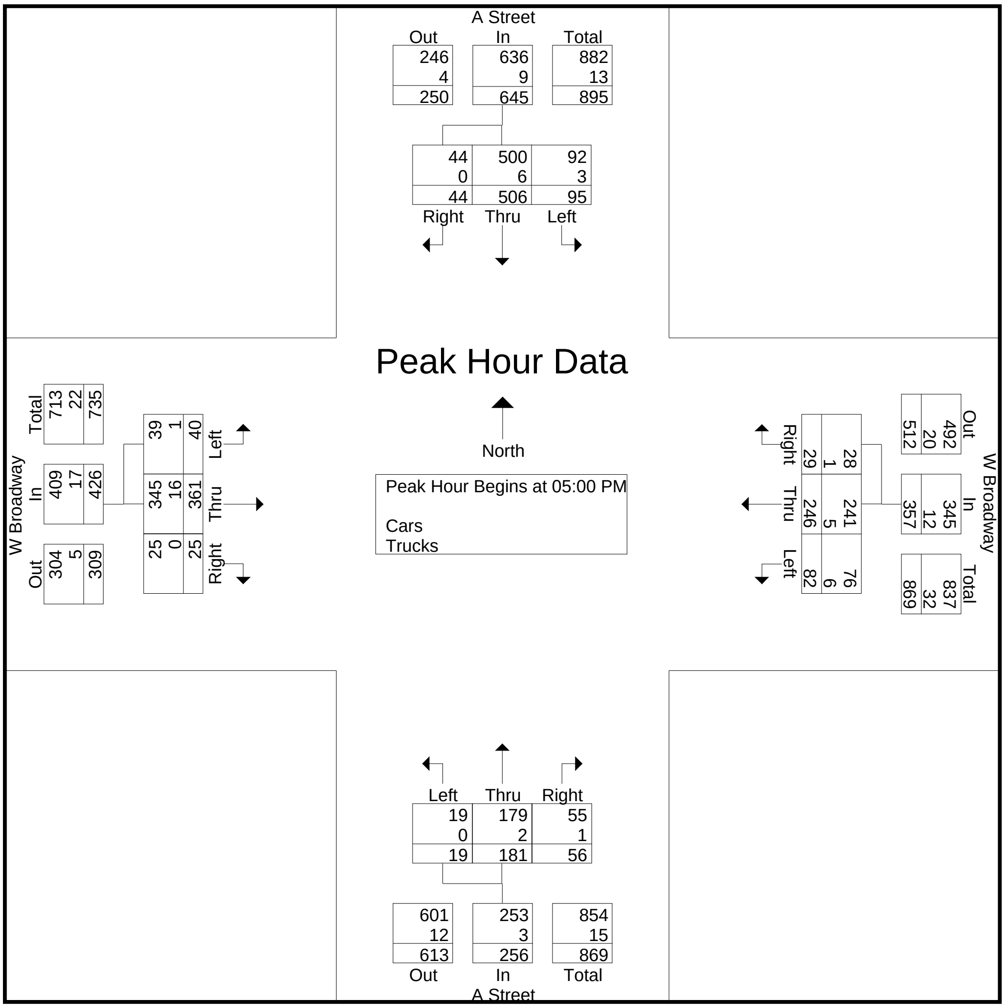
Groups Printed- Cars - Trucks

	A Street From North			**W Broadway From East**			**A Street From South**			**W Broadway From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	41	111	13	8	50	5	7	20	14	6	77	6	358
04:15 PM	22	106	8	8	44	8	2	33	11	12	71	2	327
04:30 PM	27	103	12	10	64	11	5	45	16	8	81	2	384
04:45 PM	22	121	7	13	46	14	7	54	18	4	74	3	383
Total	112	441	40	39	204	38	21	152	59	30	303	13	1452
05:00 PM	30	135	8	22	68	10	4	47	19	8	88	11	450
05:15 PM	17	130	15	17	67	4	7	52	11	13	86	3	422
05:30 PM	23	116	10	21	51	4	5	34	14	15	94	4	391
05:45 PM	25	125	11	22	60	11	3	48	12	4	93	7	421
Total	95	506	44	82	246	29	19	181	56	40	361	25	1684
Grand Total	207	947	84	121	450	67	40	333	115	70	664	38	3136
Apprch %	16.7	76.5	6.8	19	70.5	10.5	8.2	68.2	23.6	9.1	86	4.9	
Total %	6.6	30.2	2.7	3.9	14.3	2.1	1.3	10.6	3.7	2.2	21.2	1.2	
Cars	204	925	84	108	443	65	39	326	112	67	632	38	3043
% Cars	98.6	97.7	100	89.3	98.4	97	97.5	97.9	97.4	95.7	95.2	100	97
Trucks	3	22	0	13	7	2	1	7	3	3	32	0	93
% Trucks	1.4	2.3	0	10.7	1.6	3	2.5	2.1	2.6	4.3	4.8	0	3

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**30**	**135**	8	**173**	**22**	**68**	10	**100**	4	47	**19**	**70**	8	88	**11**	107	**450**
05:15 PM	17	130	**15**	162	17	67	4	88	**7**	**52**	11	70	13	86	3	102	422
05:30 PM	23	116	10	149	21	51	4	76	5	34	14	53	**15**	**94**	4	**113**	391
05:45 PM	25	125	11	161	22	60	**11**	93	3	48	12	63	4	93	7	104	421
Total Volume	95	506	44	645	82	246	29	357	19	181	56	256	40	361	25	426	1684
% App. Total	14.7	78.4	6.8		23	68.9	8.1		7.4	70.7	21.9		9.4	84.7	5.9		
PHF	.792	.937	.733	.932	.932	.904	.659	.893	.679	.870	.737	.914	.667	.960	.568	.942	.936
Cars	92	500	44	636	76	241	28	345	19	179	55	253	39	345	25	409	1643
% Cars	96.8	98.8	100	98.6	92.7	98.0	96.6	96.6	100	98.9	98.2	98.8	97.5	95.6	100	96.0	97.6
Trucks	3	6	0	9	6	5	1	12	0	2	1	3	1	16	0	17	41
% Trucks	3.2	1.2	0	1.4	7.3	2.0	3.4	3.4	0	1.1	1.8	1.2	2.5	4.4	0	4.0	2.4

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

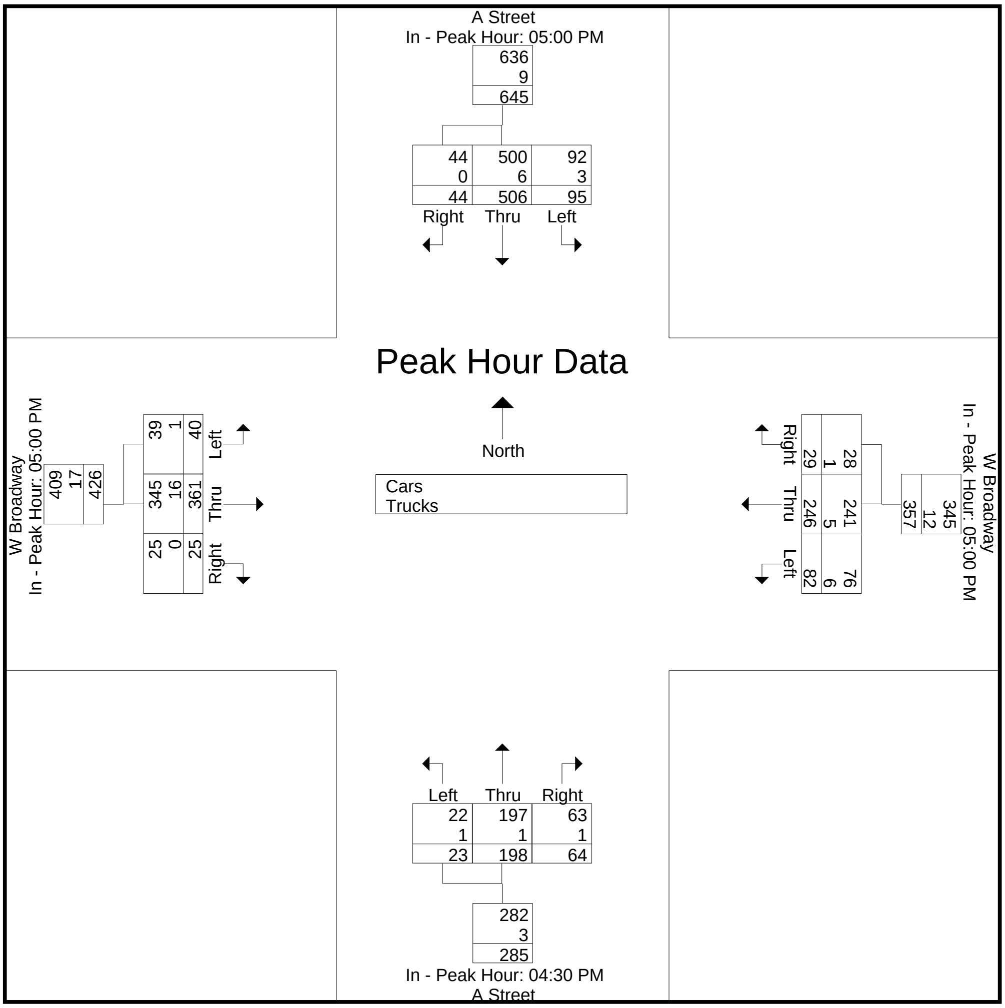
	05:00 PM				05:00 PM				04:30 PM				05:00 PM			
+0 mins.	**30**	**135**	8	**173**	**22**	**68**	10	**100**	5	45	16	66	8	88	**11**	107
+15 mins.	17	130	**15**	162	17	67	4	88	**7**	**54**	18	**79**	13	86	3	102
+30 mins.	23	116	10	149	21	51	4	76	4	47	**19**	70	**15**	**94**	4	**113**
+45 mins.	25	125	11	161	22	60	**11**	93	7	52	11	70	4	93	7	104
Total Volume	95	506	44	645	82	246	29	357	23	198	64	285	40	361	25	426
% App. Total	14.7	78.4	6.8		23	68.9	8.1		8.1	69.5	22.5		9.4	84.7	5.9	
PHF	.792	.937	.733	.932	.932	.904	.659	.893	.821	.917	.842	.902	.667	.960	.568	.942
Cars	92	500	44	636	76	241	28	345	22	197	63	282	39	345	25	409
% Cars	96.8	98.8	100	98.6	92.7	98	96.6	96.6	95.7	99.5	98.4	98.9	97.5	95.6	100	96
Trucks	3	6	0	9	6	5	1	12	1	1	1	3	1	16	0	17
% Trucks	3.2	1.2	0	1.4	7.3	2	3.4	3.4	4.3	0.5	1.6	1.1	2.5	4.4	0	4

Accurate Counts

978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 3



N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

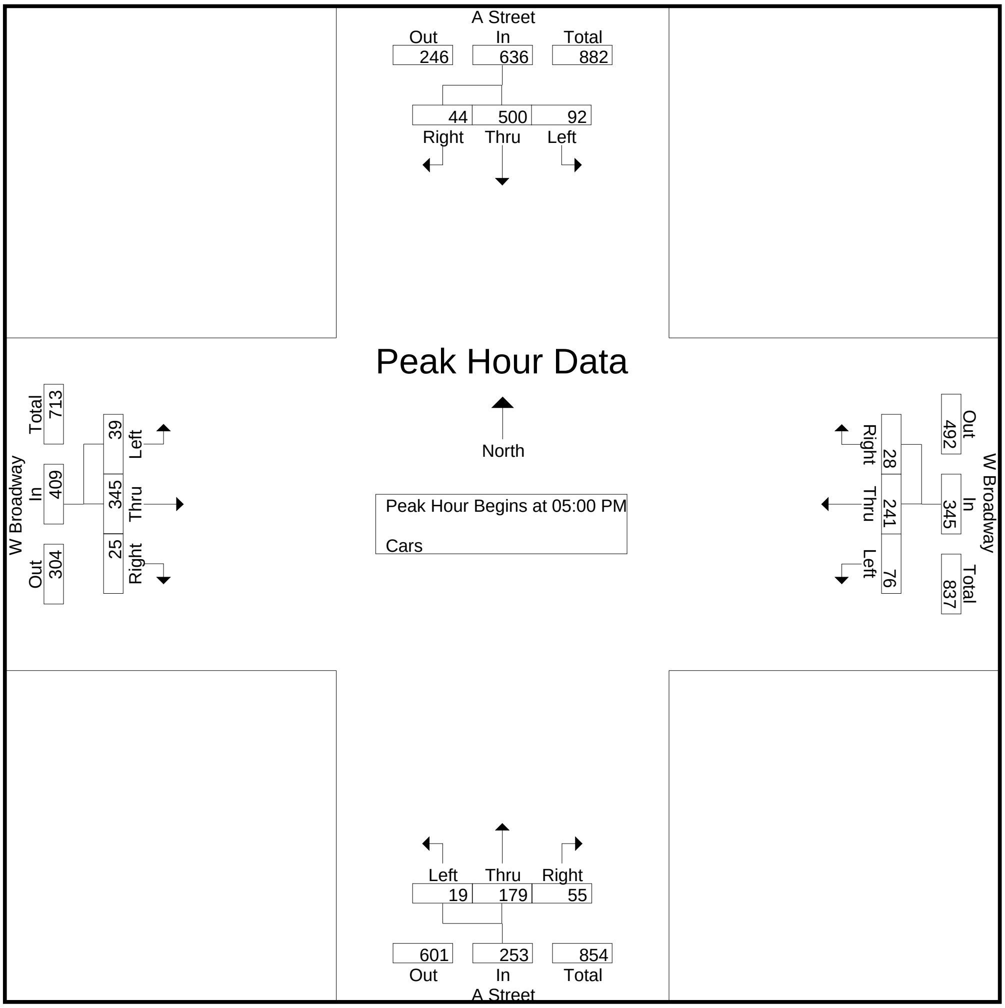
Groups Printed- Cars

	A Street From North			**W Broadway From East**			**A Street From South**			**W Broadway From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	41	107	13	7	49	5	7	19	14	5	73	6	346
04:15 PM	22	100	8	7	44	8	2	29	10	11	69	2	312
04:30 PM	27	100	12	7	64	10	4	45	15	8	76	2	370
04:45 PM	22	118	7	11	45	14	7	54	18	4	69	3	372
Total	112	425	40	32	202	37	20	147	57	28	287	13	1400
05:00 PM	28	134	8	20	66	10	4	46	19	8	85	11	439
05:15 PM	17	128	15	16	65	4	7	52	11	12	84	3	414
05:30 PM	22	115	10	20	50	3	5	33	13	15	87	4	377
05:45 PM	25	123	11	20	60	11	3	48	12	4	89	7	413
Total	92	500	44	76	241	28	19	179	55	39	345	25	1643
Grand Total	204	925	84	108	443	65	39	326	112	67	632	38	3043
Apprch %	16.8	76.3	6.9	17.5	71.9	10.6	8.2	68.3	23.5	9.1	85.8	5.2	
Total %	6.7	30.4	2.8	3.5	14.6	2.1	1.3	10.7	3.7	2.2	20.8	1.2	

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**28**	**134**	8	**170**	**20**	**66**	10	**96**	4	46	**19**	69	8	85	**11**	104	**439**
05:15 PM	17	128	**15**	160	16	65	4	85	**7**	**52**	11	**70**	12	84	3	99	414
05:30 PM	22	115	10	147	20	50	3	73	5	33	13	51	**15**	87	4	**106**	377
05:45 PM	25	123	11	159	20	60	**11**	91	3	48	12	63	4	**89**	7	100	413
Total Volume	92	500	44	636	76	241	28	345	19	179	55	253	39	345	25	409	1643
% App. Total	14.5	78.6	6.9		22	69.9	8.1		7.5	70.8	21.7		9.5	84.4	6.1		
PHF	.821	.933	.733	.935	.950	.913	.636	.898	.679	.861	.724	.904	.650	.969	.568	.965	.936

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013

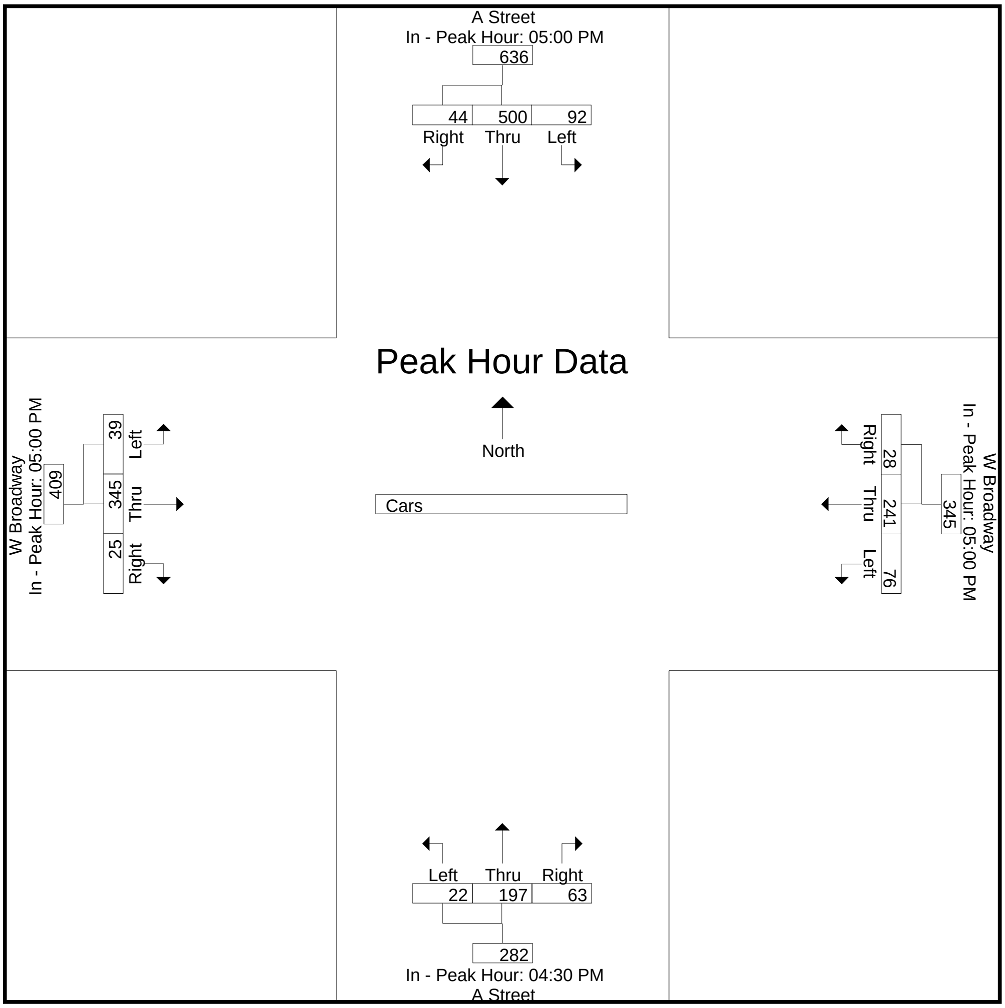


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:30 PM				05:00 PM			
+0 mins.	**28**	**134**	8	**170**	**20**	**66**	10	**96**	4	45	15	64	8	85	**11**	104
+15 mins.	17	128	**15**	160	16	65	4	85	**7**	**54**	18	**79**	12	84	3	99
+30 mins.	22	115	10	147	20	50	3	73	4	46	**19**	69	**15**	87	4	**106**
+45 mins.	25	123	11	159	20	60	**11**	91	7	52	11	70	4	**89**	7	100
Total Volume	92	500	44	636	76	241	28	345	22	197	63	282	39	345	25	409
% App. Total	14.5	78.6	6.9		22	69.9	8.1		7.8	69.9	22.3		9.5	84.4	6.1	
PHF	.821	.933	.733	.935	.950	.913	.636	.898	.786	.912	.829	.892	.650	.969	.568	.965

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

Groups Printed- Trucks

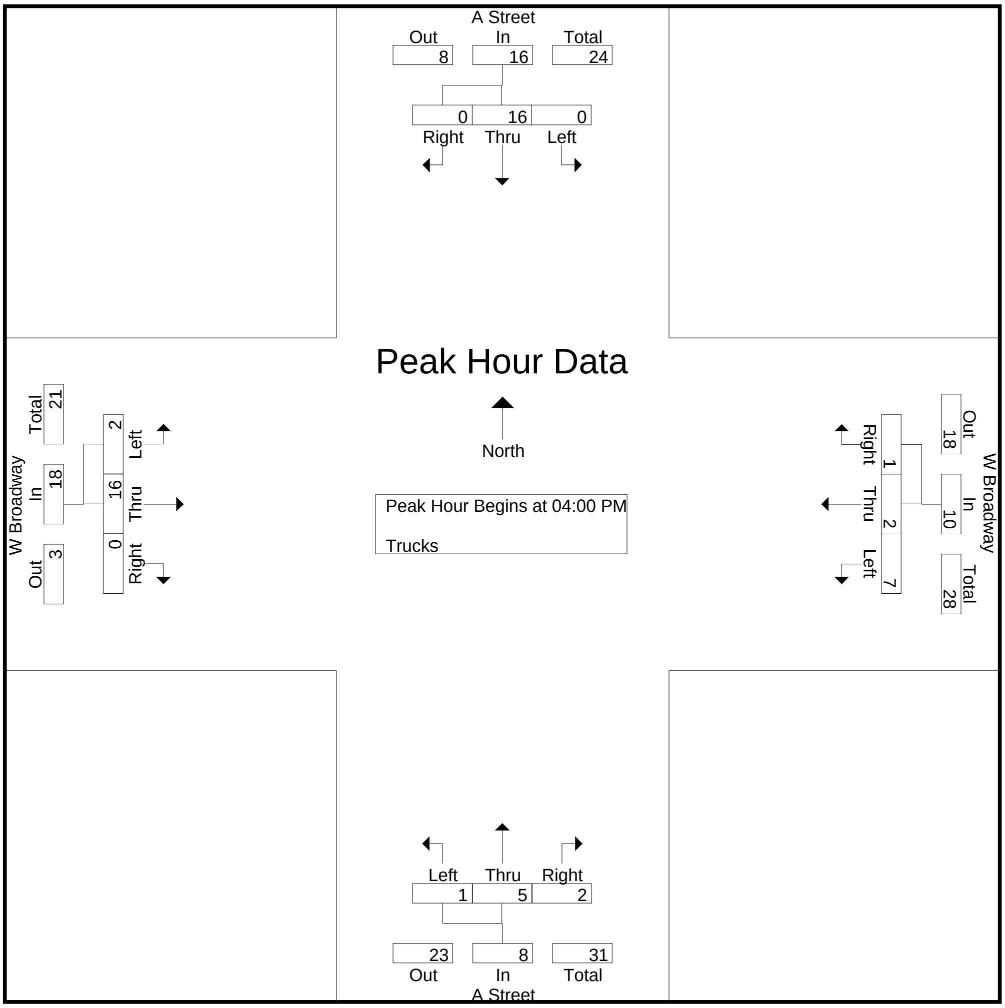
	A Street From North			W Broadway From East			A Street From South			W Broadway From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	4	0	1	1	0	0	1	0	1	4	0	12
04:15 PM	0	6	0	1	0	0	0	4	1	1	2	0	15
04:30 PM	0	3	0	3	0	1	1	0	1	0	5	0	14
04:45 PM	0	3	0	2	1	0	0	0	0	0	5	0	11
Total	0	16	0	7	2	1	1	5	2	2	16	0	52
05:00 PM	2	1	0	2	2	0	0	1	0	0	3	0	11
05:15 PM	0	2	0	1	2	0	0	0	0	1	2	0	8
05:30 PM	1	1	0	1	1	1	0	1	1	0	7	0	14
05:45 PM	0	2	0	2	0	0	0	0	0	0	4	0	8
Total	3	6	0	6	5	1	0	2	1	1	16	0	41
Grand Total	3	22	0	13	7	2	1	7	3	3	32	0	93
Apprch %	12	88	0	59.1	31.8	9.1	9.1	63.6	27.3	8.6	91.4	0	
Total %	3.2	23.7	0	14	7.5	2.2	1.1	7.5	3.2	3.2	34.4	0	

	A Street From North				W Broadway From East				A Street From South				W Broadway From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	4	0	4	1	**1**	0	2	0	1	0	1	**1**	4	0	**5**	12
04:15 PM	0	**6**	0	**6**	1	0	0	1	0	**4**	**1**	**5**	1	2	0	3	**15**
04:30 PM	0	3	0	3	**3**	0	**1**	**4**	**1**	0	1	2	0	**5**	0	5	14
04:45 PM	0	3	0	3	2	1	0	3	0	0	0	0	0	5	0	5	11
Total Volume	0	16	0	16	7	2	1	10	1	5	2	8	2	16	0	18	52
% App. Total	0	100	0		70	20	10		12.5	62.5	25		11.1	88.9	0		
PHF	.000	.667	.000	.667	.583	.500	.250	.625	.250	.313	.500	.400	.500	.800	.000	.900	.867

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

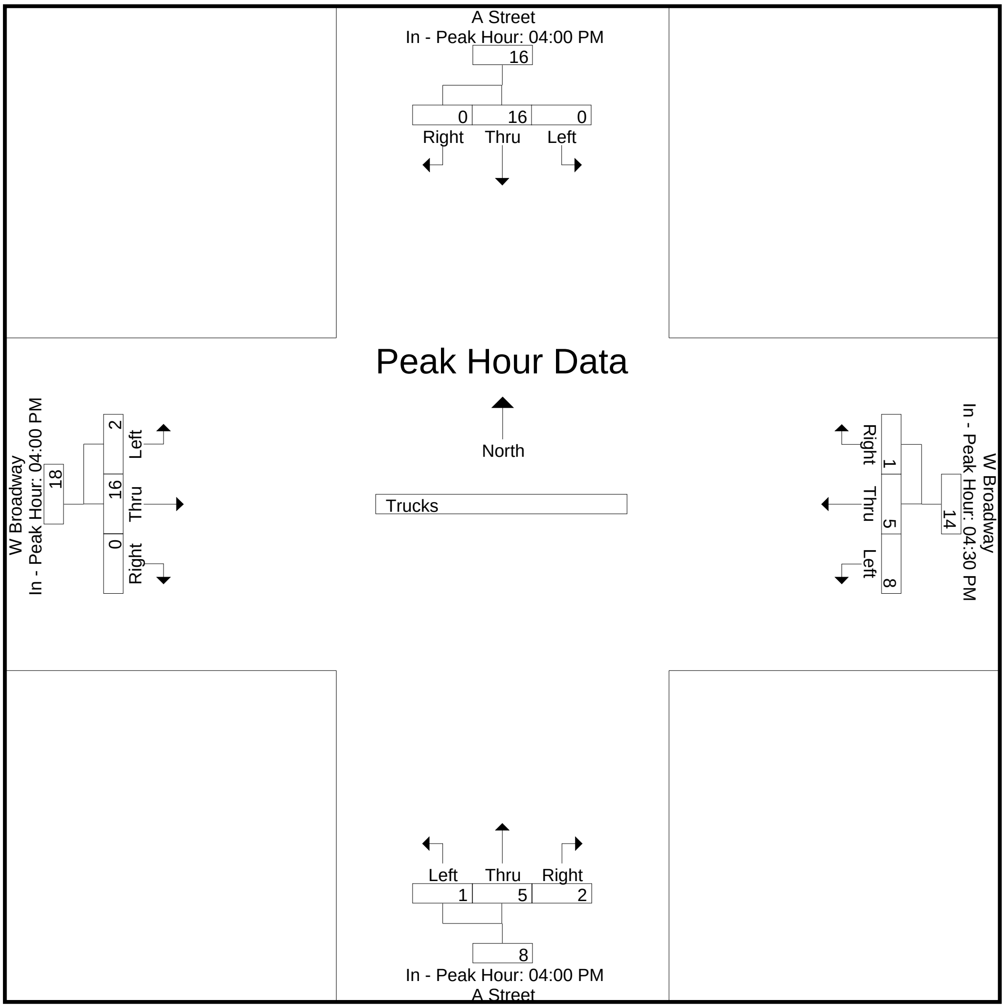
	04:00 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	0	4	0	4	**3**	0	**1**	**4**	0	1	0	1	**1**	4	0	**5**
+15 mins.	0	**6**	0	**6**	2	1	0	3	0	**4**	**1**	**5**	1	2	0	3
+30 mins.	0	3	0	3	2	**2**	0	4	**1**	0	1	2	0	**5**	0	5
+45 mins.	0	3	0	3	1	2	0	3	0	0	0	0	0	5	0	5
Total Volume	0	16	0	16	8	5	1	14	1	5	2	8	2	16	0	18
% App. Total	0	100	0		57.1	35.7	7.1		12.5	62.5	25		11.1	88.9	0	
PHF	.000	.667	.000	.667	.667	.625	.250	.875	.250	.313	.500	.400	.500	.800	.000	.900

Accurate Counts

978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 1

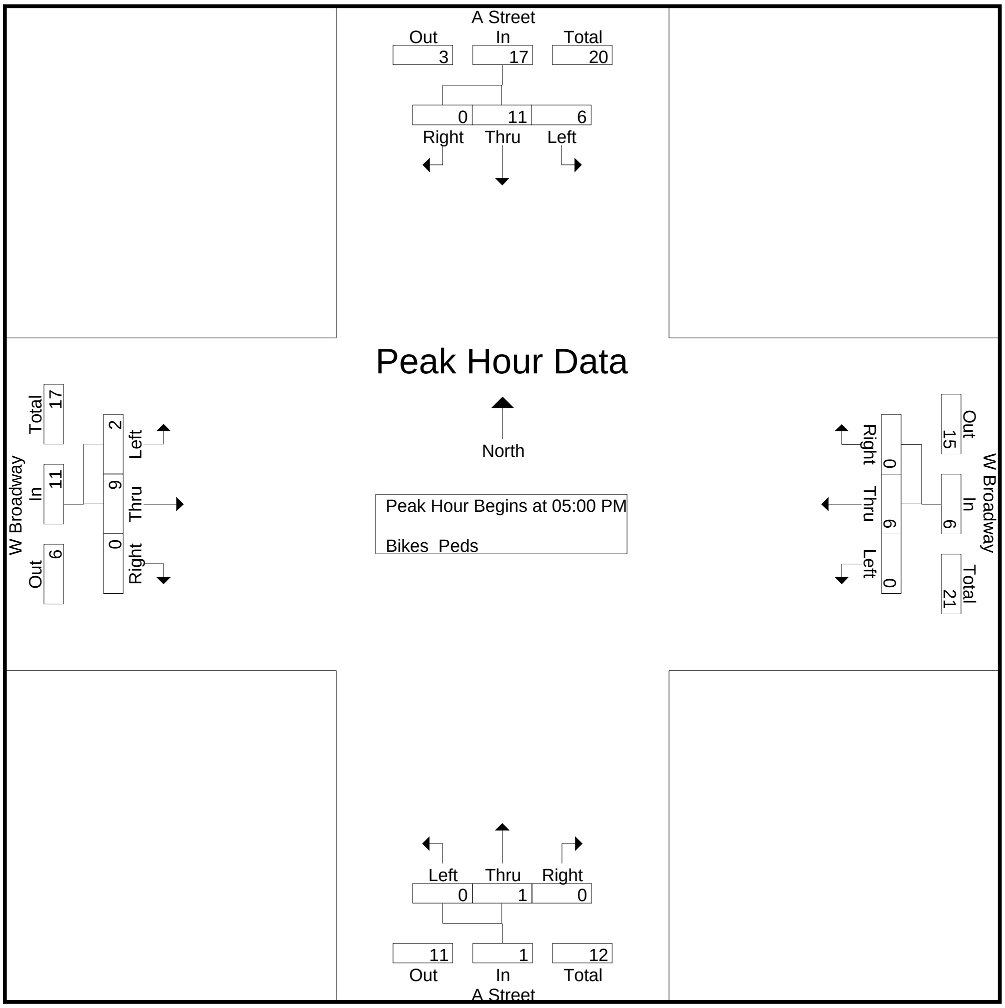
Groups Printed- Bikes Peds

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	20	0	0	0	7	0	1	0	29	0	0	0	5	61	1	62
04:15 PM	0	3	0	30	0	0	1	6	0	0	0	38	0	0	0	11	85	4	89
04:30 PM	1	1	0	16	0	0	0	2	0	0	0	48	0	0	0	18	84	2	86
04:45 PM	1	0	1	24	0	1	1	7	0	0	0	48	0	0	0	13	92	4	96
Total	2	4	1	90	0	1	2	22	0	1	0	163	0	0	0	47	322	11	333
05:00 PM	3	0	0	32	0	4	0	12	0	0	0	73	0	4	0	21	138	11	149
05:15 PM	0	6	0	44	0	0	0	18	0	1	0	92	1	2	0	26	180	10	190
05:30 PM	3	1	0	39	0	2	0	12	0	0	0	69	1	2	0	21	141	9	150
05:45 PM	0	4	0	32	0	0	0	10	0	0	0	86	0	1	0	19	147	5	152
Total	6	11	0	147	0	6	0	52	0	1	0	320	2	9	0	87	606	35	641
Grand Total	8	15	1	237	0	7	2	74	0	2	0	483	2	9	0	134	928	46	974
Apprch %	33.3	62.5	4.2		0	77.8	22.2		0	100	0		18.2	81.8	0				
Total %	17.4	32.6	2.2		0	15.2	4.3		0	4.3	0		4.3	19.6	0		95.3	4.7	

	A Street From North				**W Broadway From East**				**A Street From South**				**W Broadway From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**3**	0	0	3	0	**4**	0	**4**	0	0	0	0	0	**4**	0	**4**	**11**
05:15 PM	0	**6**	0	**6**	0	0	0	0	0	**1**	0	**1**	**1**	2	0	3	10
05:30 PM	3	1	0	4	0	2	0	2	0	0	0	0	1	2	0	3	9
05:45 PM	0	4	0	4	0	0	0	0	0	0	0	0	0	1	0	1	5
Total Volume	6	11	0	17	0	6	0	6	0	1	0	1	2	9	0	11	35
% App. Total	35.3	64.7	0		0	100	0		0	100	0		18.2	81.8	0		
PHF	.500	.458	.000	.708	.000	.375	.000	.375	.000	.250	.000	.250	.500	.563	.000	.688	.795

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 2



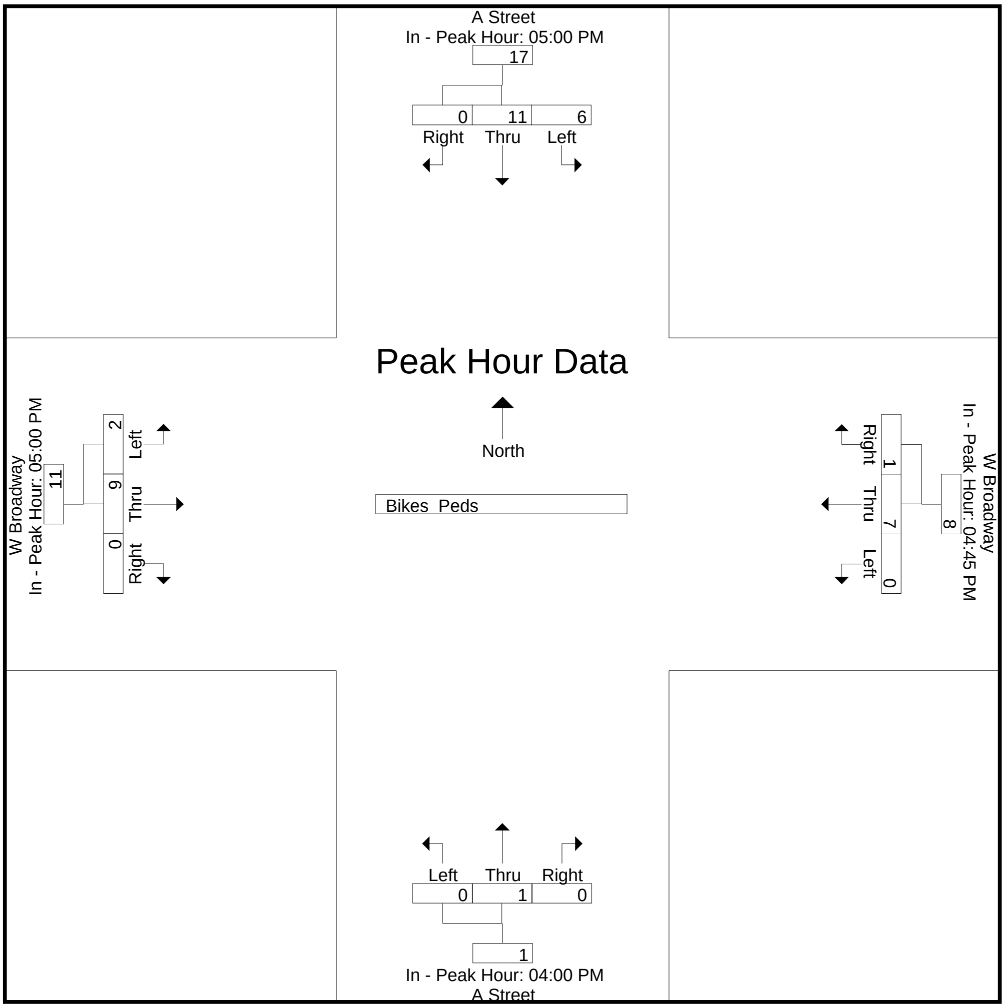
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	**3**	0	0	3	0	1	**1**	2	0	**1**	0	**1**	0	**4**	0	**4**
+15 mins.	0	**6**	0	**6**	0	**4**	0	**4**	0	0	0	0	**1**	2	0	3
+30 mins.	3	1	0	4	0	0	0	0	0	0	0	0	1	2	0	3
+45 mins.	0	4	0	4	0	2	0	2	0	0	0	0	0	1	0	1
Total Volume	6	11	0	17	0	7	1	8	0	1	0	1	2	9	0	11
% App. Total	35.3	64.7	0		0	87.5	12.5		0	100	0		18.2	81.8	0	
PHF	.500	.458	.000	.708	.000	.438	.250	.500	.000	.250	.000	.250	.500	.563	.000	.688

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street: West Broadway
City/State : Boston, MA
Weather : Clear

File Name : 12117005
Site Code : 12117005
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street	File Name : 12117004
E/W Street : West 3rd Street	Site Code : 12117004
City/State : Boston, MA	Start Date : 4/25/2013
Weather : Cloudy	Page No : 1

Groups Printed- Cars - Trucks

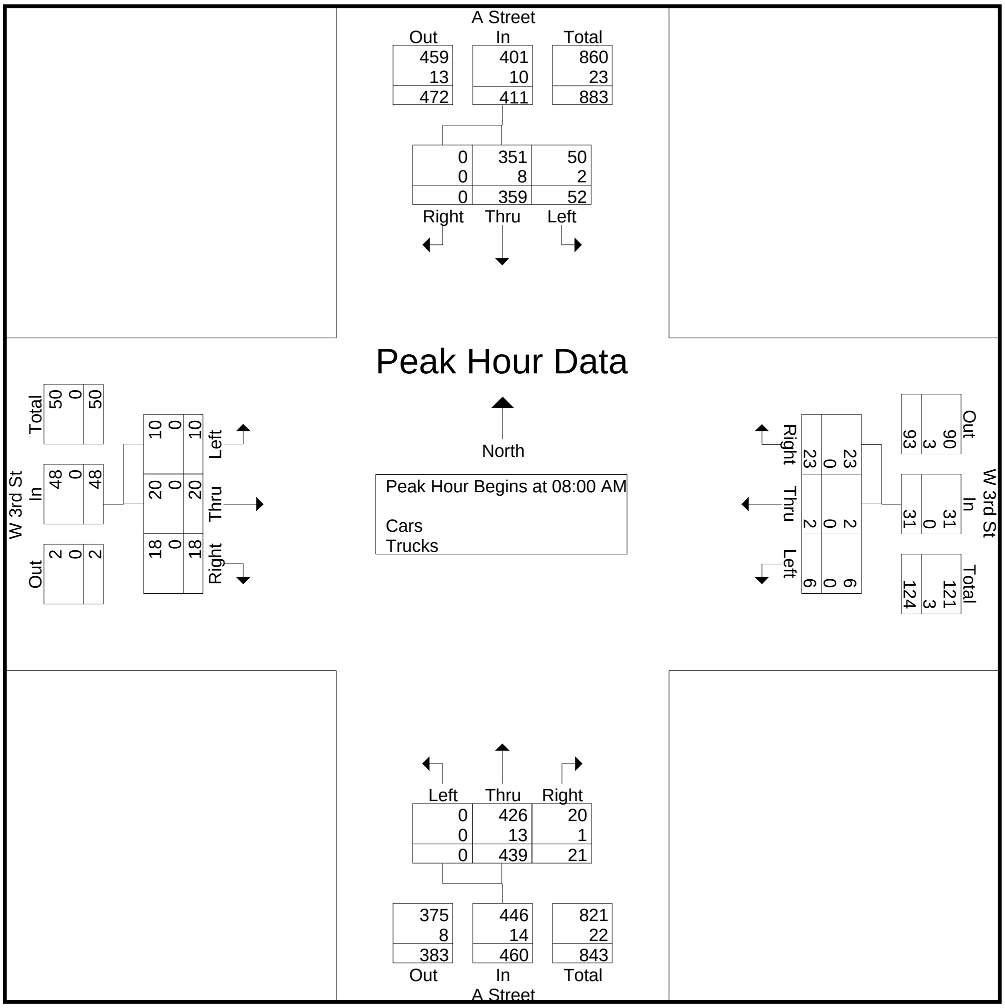
	A Street From North			**W 3rd St From East**			**A Street From South**			**W 3rd St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	5	68	0	0	0	3	0	90	5	1	6	3	181
07:15 AM	2	76	0	0	0	6	0	74	3	2	3	3	169
07:30 AM	11	83	0	2	0	4	0	78	0	3	5	8	194
07:45 AM	10	96	0	2	0	7	0	96	4	1	4	3	223
Total	28	323	0	4	0	20	0	338	12	7	18	17	767
08:00 AM	10	106	0	4	0	7	0	102	5	3	7	3	247
08:15 AM	11	77	0	0	0	5	0	96	10	3	3	6	211
08:30 AM	20	93	0	2	2	5	0	121	3	2	7	3	258
08:45 AM	11	83	0	0	0	6	0	120	3	2	3	6	234
Total	52	359	0	6	2	23	0	439	21	10	20	18	950
Grand Total	80	682	0	10	2	43	0	777	33	17	38	35	1717
Apprch %	10.5	89.5	0	18.2	3.6	78.2	0	95.9	4.1	18.9	42.2	38.9	
Total %	4.7	39.7	0	0.6	0.1	2.5	0	45.3	1.9	1	2.2	2	
Cars	78	655	0	9	2	42	0	753	30	17	38	35	1659
% Cars	97.5	96	0	90	100	97.7	0	96.9	90.9	100	100	100	96.6
Trucks	2	27	0	1	0	1	0	24	3	0	0	0	58
% Trucks	2.5	4	0	10	0	2.3	0	3.1	9.1	0	0	0	3.4

	A Street From North				**W 3rd St From East**				**A Street From South**				**W 3rd St From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	10	**106**	0	**116**	**4**	0	**7**	**11**	0	102	5	107	**3**	**7**	3	**13**	247
08:15 AM	11	77	0	88	0	0	5	5	0	96	**10**	106	3	3	**6**	12	211
08:30 AM	**20**	93	0	113	2	**2**	5	9	0	**121**	3	**124**	2	7	3	12	**258**
08:45 AM	11	83	0	94	0	0	6	6	0	120	3	123	2	3	6	11	234
Total Volume	52	359	0	411	6	2	23	31	0	439	21	460	10	20	18	48	950
% App. Total	12.7	87.3	0		19.4	6.5	74.2		0	95.4	4.6		20.8	41.7	37.5		
PHF	.650	.847	.000	.886	.375	.250	.821	.705	.000	.907	.525	.927	.833	.714	.750	.923	.921
Cars	50	351	0	401	6	2	23	31	0	426	20	446	10	20	18	48	926
% Cars	96.2	97.8	0	97.6	100	100	100	100	0	97.0	95.2	97.0	100	100	100	100	97.5
Trucks	2	8	0	10	0	0	0	0	0	13	1	14	0	0	0	0	24
% Trucks	3.8	2.2	0	2.4	0	0	0	0	0	3.0	4.8	3.0	0	0	0	0	2.5

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 3rd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117004
Site Code : 12117004
Start Date : 4/25/2013
Page No : 2



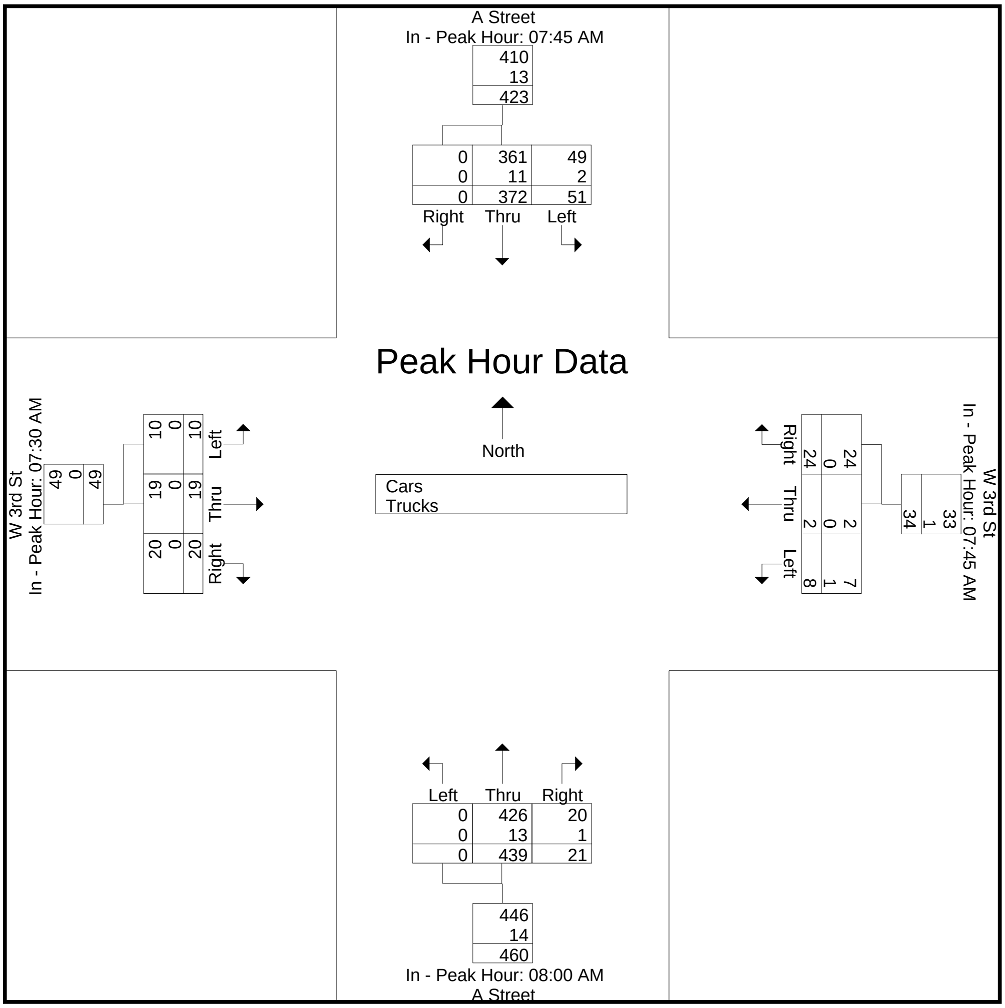
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	10	96	0	106	2	0	**7**	9	0	102	5	107	**3**	5	**8**	**16**
+15 mins.	10	**106**	0	**116**	**4**	0	7	**11**	0	96	**10**	106	1	4	3	8
+30 mins.	11	77	0	88	0	0	5	5	0	**121**	3	**124**	3	**7**	3	13
+45 mins.	**20**	93	0	113	2	**2**	5	9	0	120	3	123	3	3	6	12
Total Volume	51	372	0	423	8	2	24	34	0	439	21	460	10	19	20	49
% App. Total	12.1	87.9	0		23.5	5.9	70.6		0	95.4	4.6		20.4	38.8	40.8	
PHF	.638	.877	.000	.912	.500	.250	.857	.773	.000	.907	.525	.927	.833	.679	.625	.766
Cars	49	361	0	410	7	2	24	33	0	426	20	446	10	19	20	49
% Cars	96.1	97	0	96.9	87.5	100	100	97.1	0	97	95.2	97	100	100	100	100
Trucks	2	11	0	13	1	0	0	1	0	13	1	14	0	0	0	0
% Trucks	3.9	3	0	3.1	12.5	0	0	2.9	0	3	4.8	3	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 3rd Street
City/State : Boston, MA
Weather : Cloudy

File Name : 12117004
Site Code : 12117004
Start Date : 4/25/2013
Page No : 3



Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 3rd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117004
Site Code : 12117004
Start Date : 4/25/2013
Page No : 1

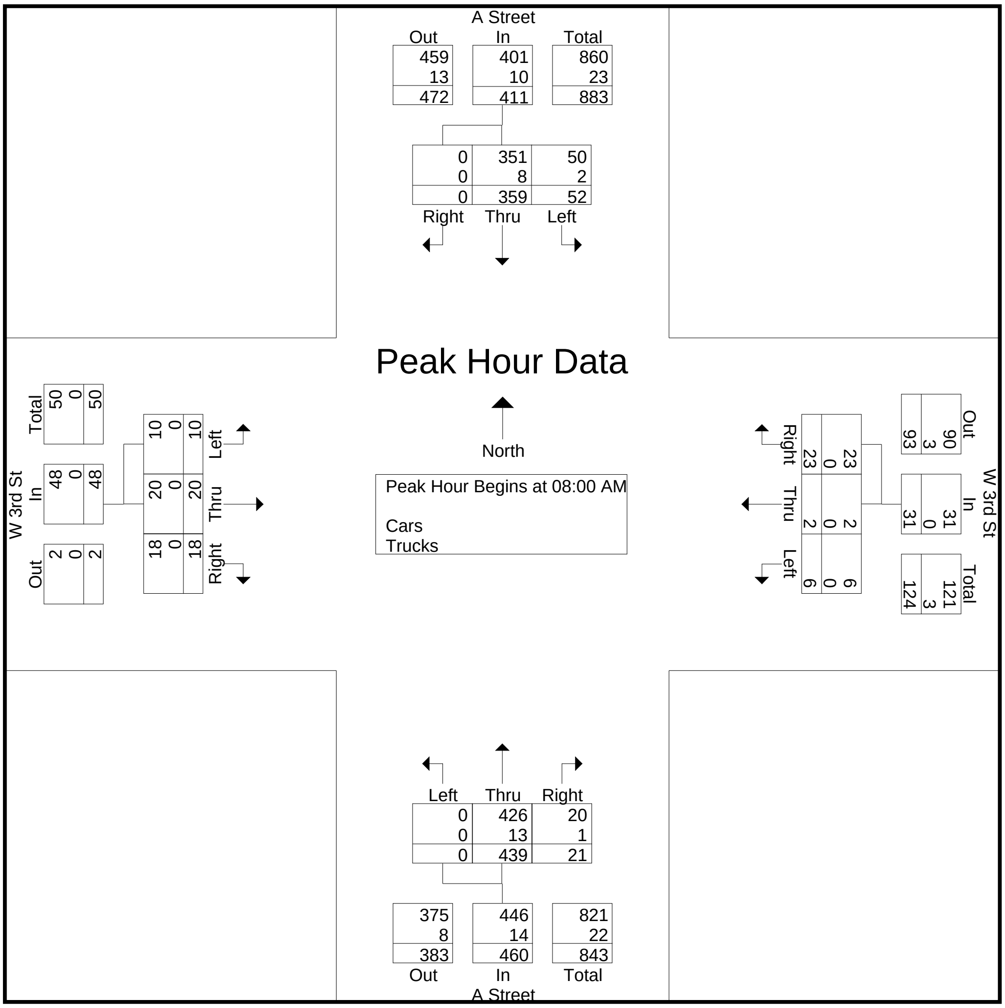
Groups Printed- Cars - Trucks

	A Street From North			**W 3rd St From East**			**A Street From South**			**W 3rd St From West**			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	32	159	0	1	0	2	0	32	4	0	4	1	235
04:15 PM	11	142	0	2	0	4	0	46	2	1	4	6	218
04:30 PM	15	114	0	1	0	3	0	62	7	1	10	6	219
04:45 PM	15	158	0	1	0	2	0	65	4	0	5	4	254
Total	73	573	0	5	0	11	0	205	17	2	23	17	926
05:00 PM	18	175	0	0	0	4	0	57	4	1	7	5	271
05:15 PM	22	160	0	3	0	3	0	51	7	1	7	2	256
05:30 PM	26	142	0	0	1	1	0	57	7	1	5	3	243
05:45 PM	10	161	0	0	0	3	0	56	5	0	9	4	248
Total	76	638	0	3	1	11	0	221	23	3	28	14	1018
Grand Total	149	1211	0	8	1	22	0	426	40	5	51	31	1944
Apprch %	11	89	0	25.8	3.2	71	0	91.4	8.6	5.7	58.6	35.6	
Total %	7.7	62.3	0	0.4	0.1	1.1	0	21.9	2.1	0.3	2.6	1.6	
Cars	149	1195	0	8	1	22	0	420	39	5	50	31	1920
% Cars	100	98.7	0	100	100	100	0	98.6	97.5	100	98	100	98.8
Trucks	0	16	0	0	0	0	0	6	1	0	1	0	24
% Trucks	0	1.3	0	0	0	0	0	1.4	2.5	0	2	0	1.2

	A Street From North				**W 3rd St From East**				**A Street From South**				**W 3rd St From West**				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	10	**106**	0	**116**	**4**	0	**7**	**11**	0	102	5	107	**3**	**7**	3	**13**	247
08:15 AM	11	77	0	88	0	0	5	5	0	96	**10**	106	3	3	**6**	12	211
08:30 AM	**20**	93	0	113	2	**2**	5	9	0	**121**	3	**124**	2	7	3	12	**258**
08:45 AM	11	83	0	94	0	0	6	6	0	120	3	123	2	3	6	11	234
Total Volume	52	359	0	411	6	2	23	31	0	439	21	460	10	20	18	48	950
% App. Total	12.7	87.3	0		19.4	6.5	74.2		0	95.4	4.6		20.8	41.7	37.5		
PHF	.650	.847	.000	.886	.375	.250	.821	.705	.000	.907	.525	.927	.833	.714	.750	.923	.921
Cars	50	351	0	401	6	2	23	31	0	426	20	446	10	20	18	48	926
% Cars	96.2	97.8	0	97.6	100	100	100	100	0	97.0	95.2	97.0	100	100	100	100	97.5
Trucks	2	8	0	10	0	0	0	0	0	13	1	14	0	0	0	0	24
% Trucks	3.8	2.2	0	2.4	0	0	0	0	0	3.0	4.8	3.0	0	0	0	0	2.5

N/S Street : A Street
E/W Street : West 3rd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117004
Site Code : 12117004
Start Date : 4/25/2013
Page No : 2



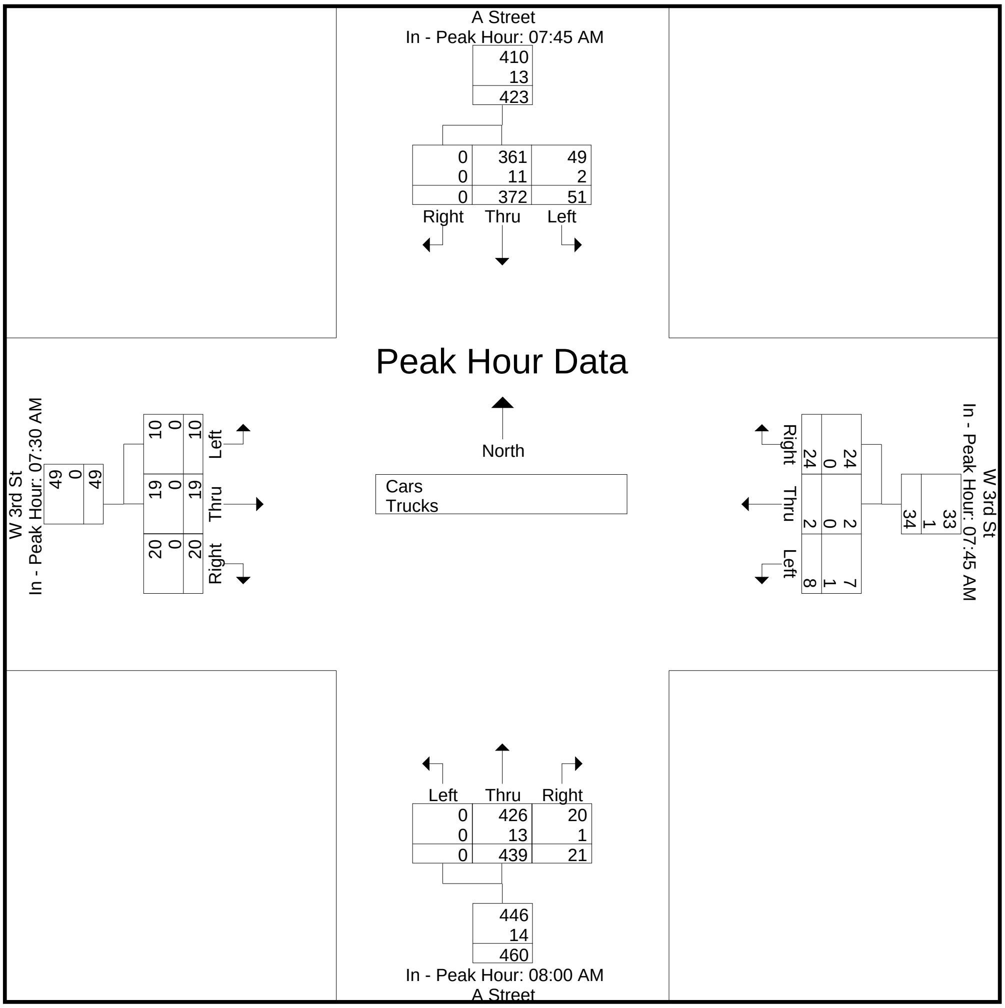
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	10	96	0	106	2	0	**7**	9	0	102	5	107	**3**	5	**8**	**16**
+15 mins.	10	**106**	0	**116**	**4**	0	7	**11**	0	96	**10**	106	1	4	3	8
+30 mins.	11	77	0	88	0	0	5	5	0	**121**	3	**124**	3	**7**	3	13
+45 mins.	**20**	93	0	113	2	**2**	5	9	0	120	3	123	3	3	6	12
Total Volume	51	372	0	423	8	2	24	34	0	439	21	460	10	19	20	49
% App. Total	12.1	87.9	0		23.5	5.9	70.6		0	95.4	4.6		20.4	38.8	40.8	
PHF	.638	.877	.000	.912	.500	.250	.857	.773	.000	.907	.525	.927	.833	.679	.625	.766
Cars	49	361	0	410	7	2	24	33	0	426	20	446	10	19	20	49
% Cars	96.1	97	0	96.9	87.5	100	100	97.1	0	97	95.2	97	100	100	100	100
Trucks	2	11	0	13	1	0	0	1	0	13	1	14	0	0	0	0
% Trucks	3.9	3	0	3.1	12.5	0	0	2.9	0	3	4.8	3	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : A Street
E/W Street : West 3rd Street
City/State : Boston, MA
Weather : Clear

File Name : 12117004
Site Code : 12117004
Start Date : 4/25/2013
Page No : 3



N/S: A Street
E/W: Athens Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 133548 C
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	A Street From North				Athens Street From East				A Street From South				Athens Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	7	85	0	0	0	0	0	0	0	65	1	0	0	0	0	0	158
07:15 AM	3	82	3	1	0	0	0	0	0	85	0	0	1	0	0	0	175
07:30 AM	1	77	0	0	0	0	0	0	2	79	1	0	0	0	0	0	160
07:45 AM	2	106	0	0	0	1	0	0	0	100	2	0	0	0	0	0	211
Total	13	350	3	1	0	1	0	0	2	329	4	0	1	0	0	0	704
08:00 AM	2	102	0	0	0	0	0	0	0	103	2	0	0	0	1	0	210
08:15 AM	1	102	0	0	0	0	0	0	0	109	1	0	1	0	0	0	214
08:30 AM	2	91	0	0	0	0	0	0	1	103	1	0	0	0	0	0	198
08:45 AM	1	93	0	0	0	0	0	0	0	126	1	0	0	0	0	0	221
Total	6	388	0	0	0	0	0	0	1	441	5	0	1	0	1	0	843
Grand Total	19	738	3	1	0	1	0	0	3	770	9	0	2	0	1	0	1547
Apprch %	2.5	97	0.4	0.1	0	100	0	0	0.4	98.5	1.2	0	66.7	0	33.3	0	
Total %	1.2	47.7	0.2	0.1	0	0.1	0	0	0.2	49.8	0.6	0	0.1	0	0.1	0	
Cars	16	670	3	1	0	1	0	0	3	720	9	0	2	0	1	0	1426
% Cars	84.2	90.8	100	100	0	100	0	0	100	93.5	100	0	100	0	100	0	92.2
Heavy Vehicles	3	68	0	0	0	0	0	0	0	50	0	0	0	0	0	0	121
% Heavy Vehicles	15.8	9.2	0	0	0	0	0	0	0	6.5	0	0	0	0	0	0	7.8

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	A Street From North					Athens Street From East					A Street From South					Athens Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
08:00 AM	2	102	0	0	104	0	0	0	0	0	0	103	2	0	105	0	0	1	0	1	210
08:15 AM	1	102	0	0	103	0	0	0	0	0	0	109	1	0	110	1	0	0	0	1	214
08:30 AM	2	91	0	0	93	0	0	0	0	0	1	103	1	0	105	0	0	0	0	0	198
08:45 AM	1	93	0	0	94	0	0	0	0	0	0	126	1	0	127	0	0	0	0	0	221
Total Volume	6	388	0	0	394	0	0	0	0	0	1	441	5	0	447	1	0	1	0	2	843
% App. Total	1.5	98.5	0	0		0	0	0	0		0.2	98.7	1.1	0		50	0	50	0		
PHF	.750	.951	.000	.000	.947	.000	.000	.000	.000	.000	.250	.875	.625	.000	.880	.250	.000	.250	.000	.500	.954
Cars	4	348	0	0	352	0	0	0	0	0	1	412	5	0	418	1	0	1	0	2	772
% Cars	66.7	89.7	0	0	89.3	0	0	0	0	0	100	93.4	100	0	93.5	100	0	100	0	100	91.6
Heavy Vehicles	2	40	0	0	42	0	0	0	0	0	0	29	0	0	29	0	0	0	0	0	71
% Heavy Vehicles	33.3	10.3	0	0	10.7	0	0	0	0	0	0	6.6	0	0	6.5	0	0	0	0	0	8.4

N/S: A Street
E/W: Athens Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 133548 C
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Cars

	A Street From North				Athens Street From East				A Street From South				Athens Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	7	77	0	0	0	0	0	0	0	58	1	0	0	0	0	0	143
07:15 AM	2	79	3	1	0	0	0	0	0	80	0	0	1	0	0	0	166
07:30 AM	1	72	0	0	0	0	0	0	2	76	1	0	0	0	0	0	152
07:45 AM	2	94	0	0	0	1	0	0	0	94	2	0	0	0	0	0	193
Total	12	322	3	1	0	1	0	0	2	308	4	0	1	0	0	0	654
08:00 AM	1	92	0	0	0	0	0	0	0	97	2	0	0	0	1	0	193
08:15 AM	0	94	0	0	0	0	0	0	0	103	1	0	1	0	0	0	199
08:30 AM	2	79	0	0	0	0	0	0	1	98	1	0	0	0	0	0	181
08:45 AM	1	83	0	0	0	0	0	0	0	114	1	0	0	0	0	0	199
Total	4	348	0	0	0	0	0	0	1	412	5	0	1	0	1	0	772
Grand Total	16	670	3	1	0	1	0	0	3	720	9	0	2	0	1	0	1426
Apprch %	2.3	97.1	0.4	0.1	0	100	0	0	0.4	98.4	1.2	0	66.7	0	33.3	0	
Total %	1.1	47	0.2	0.1	0	0.1	0	0	0.2	50.5	0.6	0	0.1	0	0.1	0	

	A Street From North					Athens Street From East					A Street From South					Athens Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	92	0	0	93	0	0	0	0	0	0	97	2	0	99	0	0	1	0	1	193
08:15 AM	0	94	0	0	94	0	0	0	0	0	0	103	1	0	104	1	0	0	0	1	199
08:30 AM	2	79	0	0	81	0	0	0	0	0	1	98	1	0	100	0	0	0	0	0	181
08:45 AM	1	83	0	0	84	0	0	0	0	0	0	114	1	0	115	0	0	0	0	0	199
Total Volume	4	348	0	0	352	0	0	0	0	0	1	412	5	0	418	1	0	1	0	2	772
% App. Total	1.1	98.9	0	0		0	0	0	0		0.2	98.6	1.2	0		50	0	50	0		
PHF	.500	.926	.000	.000	.936	.000	.000	.000	.000	.000	.250	.904	.625	.000	.909	.250	.000	.250	.000	.500	.970

N/S: A Street
E/W: Athens Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
DATA
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 133548 C
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Heavy Vehicles

	A Street From North				**Athens Street From East**				**A Street From South**				**Athens Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	8	0	0	0	0	0	0	0	7	0	0	0	0	0	0	15
07:15 AM	1	3	0	0	0	0	0	0	0	5	0	0	0	0	0	0	9
07:30 AM	0	5	0	0	0	0	0	0	0	3	0	0	0	0	0	0	8
07:45 AM	0	12	0	0	0	0	0	0	0	6	0	0	0	0	0	0	18
Total	1	28	0	0	0	0	0	0	0	21	0	0	0	0	0	0	50
08:00 AM	1	10	0	0	0	0	0	0	0	6	0	0	0	0	0	0	17
08:15 AM	1	8	0	0	0	0	0	0	0	6	0	0	0	0	0	0	15
08:30 AM	0	12	0	0	0	0	0	0	0	5	0	0	0	0	0	0	17
08:45 AM	0	10	0	0	0	0	0	0	0	12	0	0	0	0	0	0	22
Total	2	40	0	0	0	0	0	0	0	29	0	0	0	0	0	0	71
Grand Total	3	68	0	0	0	0	0	0	0	50	0	0	0	0	0	0	121
Apprch %	4.2	95.8	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
Total %	2.5	56.2	0	0	0	0	0	0	0	41.3	0	0	0	0	0	0	

	A Street From North					**Athens Street From East**					**A Street From South**					**Athens Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	10	0	0	11	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	17
08:15 AM	1	8	0	0	9	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	15
08:30 AM	0	12	0	0	12	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	17
08:45 AM	0	10	0	0	10	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	22
Total Volume	2	40	0	0	42	0	0	0	0	0	0	29	0	0	29	0	0	0	0	0	71
% App. Total	4.8	95.2	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.500	.833	.000	.000	.875	.000	.000	.000	.000	.000	.000	.604	.000	.000	.604	.000	.000	.000	.000	.000	.807

N/S: A Street
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Groups Printed- Peds and Bikes

	A Street From North				Athens Street From East				A Street From South				Athens Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	1	0	0	0	0	0	6	0	4	0	0	1	0	0	4	16
07:15 AM	0	0	0	0	0	0	0	6	0	1	0	1	1	0	0	7	16
07:30 AM	0	1	0	1	0	0	0	5	0	5	0	2	0	0	0	16	30
07:45 AM	0	2	0	0	0	0	0	7	0	6	0	0	0	0	0	18	33
Total	0	4	0	1	0	0	0	24	0	16	0	3	2	0	0	45	95
08:00 AM	0	2	0	1	0	0	0	6	0	6	0	1	0	0	0	23	39
08:15 AM	0	1	0	2	0	0	0	12	0	11	0	1	0	0	0	36	63
08:30 AM	0	1	0	0	0	0	0	23	0	10	0	0	0	0	0	27	61
08:45 AM	0	0	0	2	0	0	0	29	0	4	0	3	0	0	1	37	76
Total	0	4	0	5	0	0	0	70	0	31	0	5	0	0	1	123	239
Grand Total	0	8	0	6	0	0	0	94	0	47	0	8	2	0	1	168	334
Apprch %	0	57.1	0	42.9	0	0	0	100	0	85.5	0	14.5	1.2	0	0.6	98.2	
Total %	0	2.4	0	1.8	0	0	0	28.1	0	14.1	0	2.4	0.6	0	0.3	50.3	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	A Street From North					Athens Street From East					A Street From South					Athens 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
08:00 AM	0	2	0	1	3	0	0	0	6	6	0	6	0	1	7	0	0	0	23	23	39
08:15 AM	0	1	0	2	3	0	0	0	12	12	0	11	0	1	12	0	0	0	36	36	63
08:30 AM	0	1	0	0	1	0	0	0	23	23	0	10	0	0	10	0	0	0	27	27	61
08:45 AM	0	0	0	2	2	0	0	0	29	29	0	4	0	3	7	0	0	1	37	38	76
Total Volume	0	4	0	5	9	0	0	0	70	70	0	31	0	5	36	0	0	1	123	124	239
% App. Total	0	44.4	0	55.6		0	0	0	100		0	86.1	0	13.9		0	0	0.8	99.2		
PHF	.000	.500	.000	.625	.750	.000	.000	.000	.603	.603	.000	.705	.000	.417	.750	.000	.000	.250	.831	.816	.786

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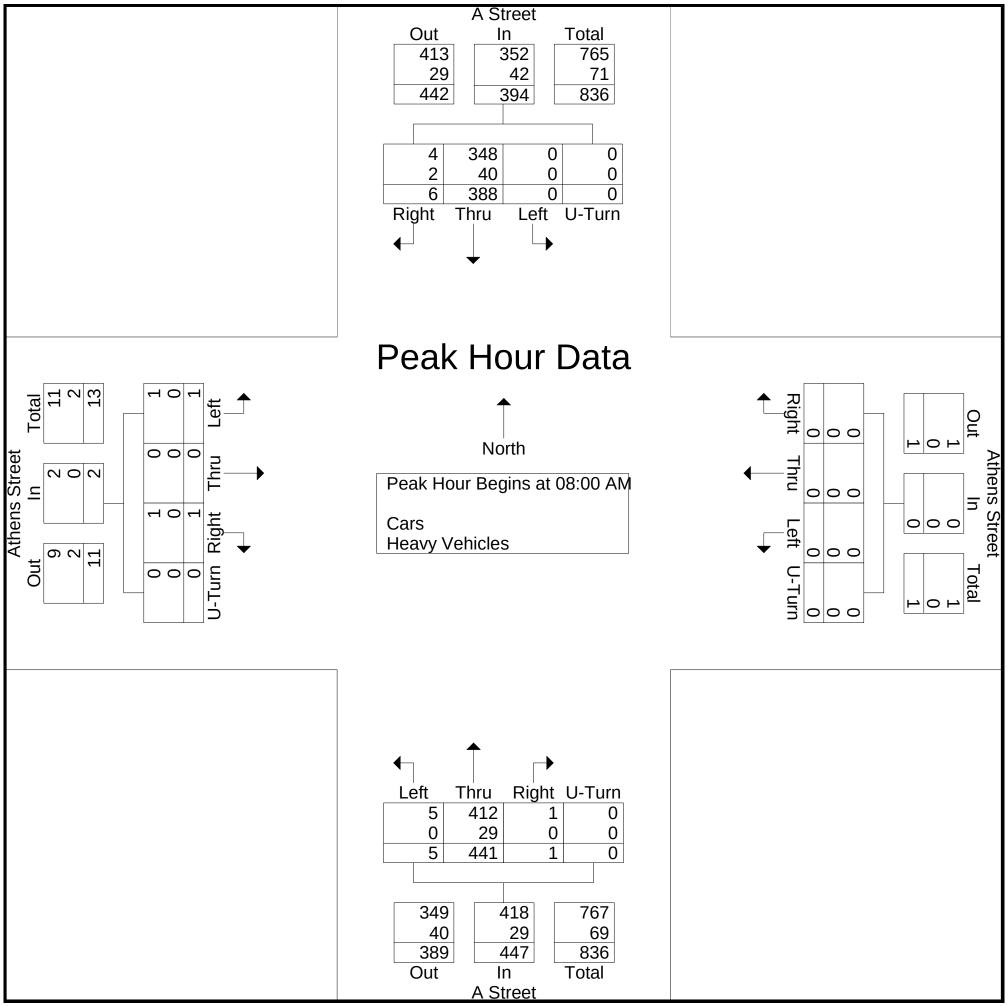
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	A Street From North					Athens Street From East					A Street From South					Athens Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
08:00 AM	2	102	0	0	104	0	0	0	0	0	0	103	2	0	105	0	0	1	0	1	210
08:15 AM	1	102	0	0	103	0	0	0	0	0	0	109	1	0	110	1	0	0	0	1	214
08:30 AM	2	91	0	0	93	0	0	0	0	0	1	103	1	0	105	0	0	0	0	0	198
08:45 AM	1	93	0	0	94	0	0	0	0	0	0	126	1	0	127	0	0	0	0	0	221
Total Volume	6	388	0	0	394	0	0	0	0	0	1	441	5	0	447	1	0	1	0	2	843
% App. Total	1.5	98.5	0	0		0	0	0	0		0.2	98.7	1.1	0		50	0	50	0		
PHF	.750	.951	.000	.000	.947	.000	.000	.000	.000	.000	.250	.875	.625	.000	.880	.250	.000	.250	.000	.500	.954
Cars	4	348	0	0	352	0	0	0	0	0	1	412	5	0	418	1	0	1	0	2	772
% Cars	66.7	89.7	0	0	89.3	0	0	0	0	0	100	93.4	100	0	93.5	100	0	100	0	100	91.6
Heavy Vehicles	2	40	0	0	42	0	0	0	0	0	0	29	0	0	29	0	0	0	0	0	71
% Heavy Vehicles	33.3	10.3	0	0	10.7	0	0	0	0	0	0	6.6	0	0	6.5	0	0	0	0	0	8.4



N/S: A Street
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Email: datarequests@pdillc.com

File Name : 133548 CC
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	A Street From North				**Athens Street From East**				**A Street From South**				**Athens Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	1	159	0	0	0	0	0	0	0	74	2	0	0	0	0	0	236
04:15 PM	4	159	0	0	0	0	0	0	0	59	2	0	0	0	0	0	224
04:30 PM	4	154	0	0	1	0	0	0	1	70	2	0	0	0	0	0	232
04:45 PM	1	163	0	0	0	0	0	0	0	75	0	0	0	0	0	0	239
Total	10	635	0	0	1	0	0	0	1	278	6	0	0	0	0	0	931
05:00 PM	1	150	0	0	1	0	0	0	0	82	1	0	0	0	0	0	235
05:15 PM	0	153	0	0	0	0	0	0	0	83	2	0	1	0	0	0	239
05:30 PM	1	160	0	0	0	0	0	0	0	72	5	0	1	0	0	0	239
05:45 PM	2	168	0	0	0	0	0	0	1	92	2	0	0	0	0	0	265
Total	4	631	0	0	1	0	0	0	1	329	10	0	2	0	0	0	978
Grand Total	14	1266	0	0	2	0	0	0	2	607	16	0	2	0	0	0	1909
Apprch %	1.1	98.9	0	0	100	0	0	0	0.3	97.1	2.6	0	100	0	0	0	
Total %	0.7	66.3	0	0	0.1	0	0	0	0.1	31.8	0.8	0	0.1	0	0	0	
Cars	14	1240	0	0	1	0	0	0	1	595	16	0	2	0	0	0	1869
% Cars	100	97.9	0	0	50	0	0	0	50	98	100	0	100	0	0	0	97.9
Heavy Vehicles	0	26	0	0	1	0	0	0	1	12	0	0	0	0	0	0	40
% Heavy Vehicles	0	2.1	0	0	50	0	0	0	50	2	0	0	0	0	0	0	2.1

	A Street From North					**Athens Street From East**					**A Street From South**					**Athens Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	150	0	0	151	1	0	0	0	1	0	82	1	0	83	0	0	0	0	0	235
05:15 PM	0	153	0	0	153	0	0	0	0	0	0	83	2	0	85	1	0	0	0	1	239
05:30 PM	1	160	0	0	161	0	0	0	0	0	0	72	5	0	77	1	0	0	0	1	239
05:45 PM	2	168	0	0	170	0	0	0	0	0	1	92	2	0	95	0	0	0	0	0	265
Total Volume	4	631	0	0	635	1	0	0	0	1	1	329	10	0	340	2	0	0	0	2	978
% App. Total	0.6	99.4	0	0		100	0	0	0		0.3	96.8	2.9	0		100	0	0	0		
PHF	.500	.939	.000	.000	.934	.250	.000	.000	.000	.250	.250	.894	.500	.000	.895	.500	.000	.000	.000	.500	.923
Cars	4	617	0	0	621	1	0	0	0	1	1	321	10	0	332	2	0	0	0	2	956
% Cars	100	97.8	0	0	97.8	100	0	0	0	100	100	97.6	100	0	97.6	100	0	0	0	100	97.8
Heavy Vehicles	0	14	0	0	14	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	22
% Heavy Vehicles	0	2.2	0	0	2.2	0	0	0	0	0	0	2.4	0	0	2.4	0	0	0	0	0	2.2

N/S: A Street
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Client: Howard Stein-Hudson/ M. Santos

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Site Code : 13100
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Page No : 1

Groups Printed- Cars

	A Street From North				Athens Street From East				A Street From South				Athens Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	1	152	0	0	0	0	0	0	0	72	2	0	0	0	0	0	227
04:15 PM	4	157	0	0	0	0	0	0	0	58	2	0	0	0	0	0	221
04:30 PM	4	152	0	0	0	0	0	0	0	70	2	0	0	0	0	0	228
04:45 PM	1	162	0	0	0	0	0	0	0	74	0	0	0	0	0	0	237
Total	10	623	0	0	0	0	0	0	0	274	6	0	0	0	0	0	913
05:00 PM	1	147	0	0	1	0	0	0	0	78	1	0	0	0	0	0	228
05:15 PM	0	150	0	0	0	0	0	0	0	82	2	0	1	0	0	0	235
05:30 PM	1	157	0	0	0	0	0	0	0	70	5	0	1	0	0	0	234
05:45 PM	2	163	0	0	0	0	0	0	1	91	2	0	0	0	0	0	259
Total	4	617	0	0	1	0	0	0	1	321	10	0	2	0	0	0	956
Grand Total	14	1240	0	0	1	0	0	0	1	595	16	0	2	0	0	0	1869
Apprch %	1.1	98.9	0	0	100	0	0	0	0.2	97.2	2.6	0	100	0	0	0	
Total %	0.7	66.3	0	0	0.1	0	0	0	0.1	31.8	0.9	0	0.1	0	0	0	

	A Street From North					Athens Street From East					A Street From South					Athens Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	147	0	0	148	1	0	0	0	1	0	78	1	0	79	0	0	0	0	0	228
05:15 PM	0	150	0	0	150	0	0	0	0	0	0	82	2	0	84	1	0	0	0	1	235
05:30 PM	1	157	0	0	158	0	0	0	0	0	0	70	5	0	75	1	0	0	0	1	234
05:45 PM	2	163	0	0	165	0	0	0	0	0	1	91	2	0	94	0	0	0	0	0	259
Total Volume	4	617	0	0	621	1	0	0	0	1	1	321	10	0	332	2	0	0	0	2	956
% App. Total	0.6	99.4	0	0		100	0	0	0		0.3	96.7	3	0		100	0	0	0		
PHF	.500	.946	.000	.000	.941	.250	.000	.000	.000	.250	.250	.882	.500	.000	.883	.500	.000	.000	.000	.500	.923

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Groups Printed- Heavy Vehicles

	A Street From North				**Athens Street From East**				**A Street From South**				**Athens Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	7	0	0	0	0	0	0	0	2	0	0	0	0	0	0	9
04:15 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
04:30 PM	0	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	4
04:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Total	0	12	0	0	1	0	0	0	1	4	0	0	0	0	0	0	18
05:00 PM	0	3	0	0	0	0	0	0	0	4	0	0	0	0	0	0	7
05:15 PM	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4
05:30 PM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5
05:45 PM	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	6
Total	0	14	0	0	0	0	0	0	0	8	0	0	0	0	0	0	22
Grand Total	0	26	0	0	1	0	0	0	1	12	0	0	0	0	0	0	40
Apprch %	0	100	0	0	100	0	0	0	7.7	92.3	0	0	0	0	0	0	
Total %	0	65	0	0	2.5	0	0	0	2.5	30	0	0	0	0	0	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

	A Street From North					**Athens Street From East**					**A Street From South**					**Athens Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
05:00 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
05:15 PM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
05:30 PM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
05:45 PM	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	6
Total Volume	0	14	0	0	14	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	22
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.700	.000	.000	.700	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.786

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Groups Printed- Peds and Bikes

	A Street From North				**Athens Street From East**				**A Street From South**				**Athens Street From West**				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	5	0	0	0	0	0	13	0	3	0	1	0	0	0	9	31
04:15 PM	0	4	0	1	0	0	0	14	0	3	0	1	0	0	0	18	41
04:30 PM	0	3	0	1	0	0	0	9	0	0	0	1	0	0	0	11	25
04:45 PM	0	9	0	1	0	0	0	11	0	1	0	2	0	0	0	8	32
Total	0	21	0	3	0	0	0	47	0	7	0	5	0	0	0	46	129
05:00 PM	0	12	0	2	0	0	0	21	0	0	0	1	0	0	0	33	69
05:15 PM	0	10	0	1	0	0	0	26	0	1	0	1	0	0	0	24	63
05:30 PM	0	6	0	2	0	0	0	26	0	1	0	4	0	0	0	31	70
05:45 PM	0	15	0	3	0	0	0	23	0	4	0	0	0	0	0	27	72
Total	0	43	0	8	0	0	0	96	0	6	0	6	0	0	0	115	274
Grand Total	0	64	0	11	0	0	0	143	0	13	0	11	0	0	0	161	403
Apprch %	0	85.3	0	14.7	0	0	0	100	0	54.2	0	45.8	0	0	0	100	
Total %	0	15.9	0	2.7	0	0	0	35.5	0	3.2	0	2.7	0	0	0	40	

	A Street From North					**Athens Street From East**					**A Street From South**					**Athens 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 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	12	0	2	14	0	0	0	21	21	0	0	0	1	1	0	0	0	33	33	69
05:15 PM	0	10	0	1	11	0	0	0	26	26	0	1	0	1	2	0	0	0	24	24	63
05:30 PM	0	6	0	2	8	0	0	0	26	26	0	1	0	4	5	0	0	0	31	31	70
05:45 PM	0	15	0	3	18	0	0	0	23	23	0	4	0	0	4	0	0	0	27	27	72
Total Volume	0	43	0	8	51	0	0	0	96	96	0	6	0	6	12	0	0	0	115	115	274
% App. Total	0	84.3	0	15.7		0	0	0	100		0	50	0	50		0	0	0	100		
PHF	.000	.717	.000	.667	.708	.000	.000	.000	.923	.923	.000	.375	.000	.375	.600	.000	.000	.000	.871	.871	.951

N/S: A Street
E/W: Athens Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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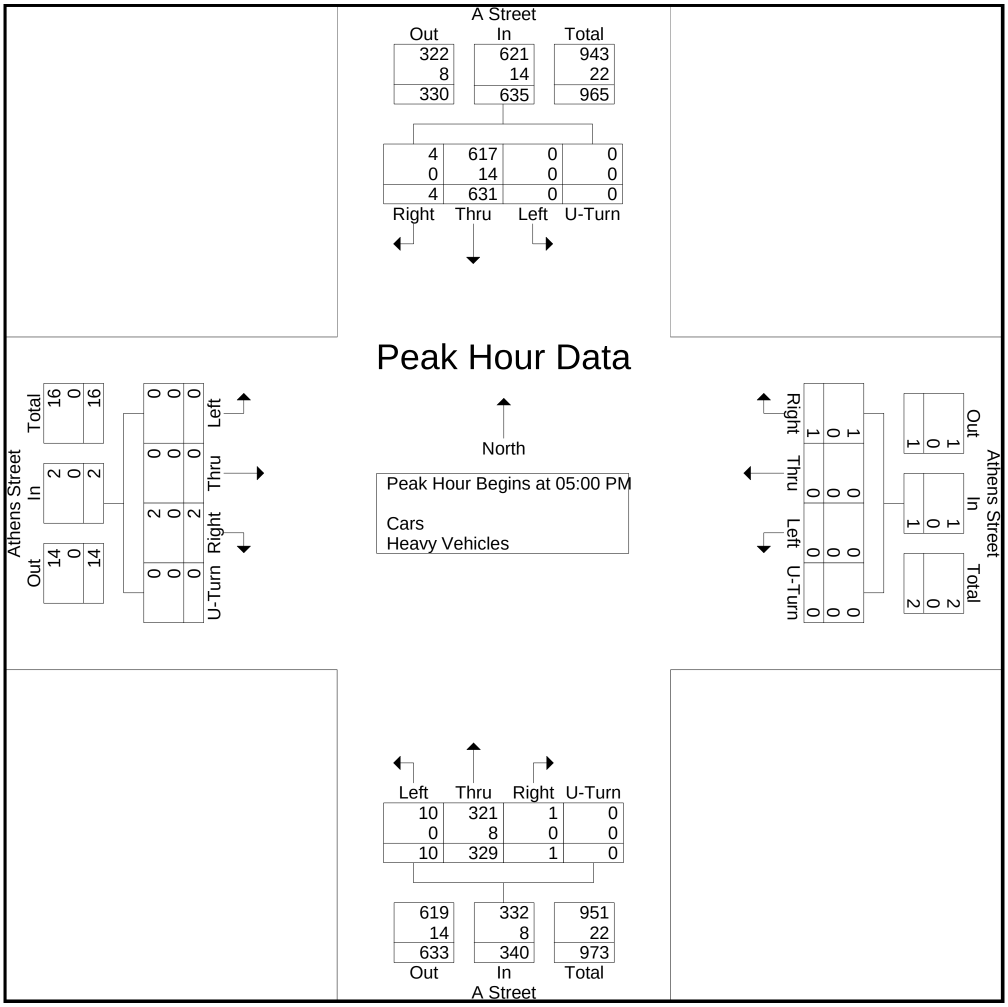
	A Street From North					Athens Street From East					A Street From South					Athens Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	150	0	0	151	1	0	0	0	1	0	82	1	0	83	0	0	0	0	0	235
05:15 PM	0	153	0	0	153	0	0	0	0	0	0	83	2	0	85	1	0	0	0	1	239
05:30 PM	1	160	0	0	161	0	0	0	0	0	0	72	5	0	77	1	0	0	0	1	239
05:45 PM	2	168	0	0	170	0	0	0	0	0	1	92	2	0	95	0	0	0	0	0	265
Total Volume	4	631	0	0	635	1	0	0	0	1	1	329	10	0	340	2	0	0	0	2	978
% App. Total	0.6	99.4	0	0		100	0	0	0		0.3	96.8	2.9	0		100	0	0	0		
PHF	.500	.939	.000	.000	.934	.250	.000	.000	.000	.250	.250	.894	.500	.000	.895	.500	.000	.000	.000	.500	.923
Cars	4	617	0	0	621	1	0	0	0	1	1	321	10	0	332	2	0	0	0	2	956
% Cars	100	97.8	0	0	97.8	100	0	0	0	100	100	97.6	100	0	97.6	100	0	0	0	100	97.8
Heavy Vehicles	0	14	0	0	14	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	22
% Heavy Vehicles	0	2.2	0	0	2.2	0	0	0	0	0	0	2.4	0	0	2.4	0	0	0	0	0	2.2



N/S: B Street
E/W: W. 3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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File Name : 133548 A
Site Code : 13100
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Groups Printed- Cars - Heavy Vehicles

	B Street **From North**				**W. 3rd Street** **From East**				**B Street** **From South**				**W. 3rd Street** **From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	5	2	0	0	0	0	0	4	0	3	0	5	13	0	0	32
07:15 AM	1	18	3	0	0	0	0	0	3	0	4	0	1	11	0	0	41
07:30 AM	0	12	3	0	0	0	0	0	4	0	9	0	1	19	0	0	48
07:45 AM	1	7	3	0	0	0	0	0	2	0	17	0	7	21	0	1	59
Total	2	42	11	0	0	0	0	0	13	0	33	0	14	64	0	1	180
08:00 AM	1	12	2	0	0	0	0	0	7	0	12	0	3	17	0	0	54
08:15 AM	2	11	4	0	0	0	0	0	9	1	11	0	5	15	0	0	58
08:30 AM	3	19	3	0	0	0	0	0	10	0	5	0	3	16	0	0	59
08:45 AM	0	11	8	0	0	0	0	0	8	0	9	0	6	22	0	0	64
Total	6	53	17	0	0	0	0	0	34	1	37	0	17	70	0	0	235
Grand Total	8	95	28	0	0	0	0	0	47	1	70	0	31	134	0	1	415
Apprch %	6.1	72.5	21.4	0	0	0	0	0	39.8	0.8	59.3	0	18.7	80.7	0	0.6	
Total %	1.9	22.9	6.7	0	0	0	0	0	11.3	0.2	16.9	0	7.5	32.3	0	0.2	
Cars	7	89	26	0	0	0	0	0	44	1	66	0	27	128	0	1	389
% Cars	87.5	93.7	92.9	0	0	0	0	0	93.6	100	94.3	0	87.1	95.5	0	100	93.7
Heavy Vehicles	1	6	2	0	0	0	0	0	3	0	4	0	4	6	0	0	26
% Heavy Vehicles	12.5	6.3	7.1	0	0	0	0	0	6.4	0	5.7	0	12.9	4.5	0	0	6.3

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	B Street **From North**					**W. 3rd Street** **From East**					**B Street** **From South**					**W. 3rd Street** **From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
08:00 AM	1	12	2	0	15	0	0	0	0	0	7	0	12	0	19	3	17	0	0	20	54
08:15 AM	2	11	4	0	17	0	0	0	0	0	9	1	11	0	21	5	15	0	0	20	58
08:30 AM	3	19	3	0	25	0	0	0	0	0	10	0	5	0	15	3	16	0	0	19	59
08:45 AM	0	11	8	0	19	0	0	0	0	0	8	0	9	0	17	6	22	0	0	28	64
Total Volume	6	53	17	0	76	0	0	0	0	0	34	1	37	0	72	17	70	0	0	87	235
% App. Total	7.9	69.7	22.4	0		0	0	0	0		47.2	1.4	51.4	0		19.5	80.5	0	0		
PHF	.500	.697	.531	.000	.760	.000	.000	.000	.000	.000	.850	.250	.771	.000	.857	.708	.795	.000	.000	.777	.918
Cars	5	51	17	0	73	0	0	0	0	0	32	1	35	0	68	14	69	0	0	83	224
% Cars	83.3	96.2	100	0	96.1	0	0	0	0	0	94.1	100	94.6	0	94.4	82.4	98.6	0	0	95.4	95.3
Heavy Vehicles	1	2	0	0	3	0	0	0	0	0	2	0	2	0	4	3	1	0	0	4	11
% Heavy Vehicles	16.7	3.8	0	0	3.9	0	0	0	0	0	5.9	0	5.4	0	5.6	17.6	1.4	0	0	4.6	4.7

N/S: B Street
E/W: W. 3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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Site Code : 13100
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Page No : 1

Groups Printed- Cars

	B Street From North				**W. 3rd Street From East**				**B Street From South**				**W. 3rd Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	5	2	0	0	0	0	0	4	0	3	0	5	12	0	0	31
07:15 AM	1	18	2	0	0	0	0	0	3	0	2	0	1	11	0	0	38
07:30 AM	0	10	2	0	0	0	0	0	3	0	9	0	1	15	0	0	40
07:45 AM	1	5	3	0	0	0	0	0	2	0	17	0	6	21	0	1	56
Total	2	38	9	0	0	0	0	0	12	0	31	0	13	59	0	1	165
08:00 AM	1	12	2	0	0	0	0	0	7	0	11	0	3	17	0	0	53
08:15 AM	1	11	4	0	0	0	0	0	8	1	11	0	3	15	0	0	54
08:30 AM	3	17	3	0	0	0	0	0	9	0	5	0	3	15	0	0	55
08:45 AM	0	11	8	0	0	0	0	0	8	0	8	0	5	22	0	0	62
Total	5	51	17	0	0	0	0	0	32	1	35	0	14	69	0	0	224
Grand Total	7	89	26	0	0	0	0	0	44	1	66	0	27	128	0	1	389
Apprch %	5.7	73	21.3	0	0	0	0	0	39.6	0.9	59.5	0	17.3	82.1	0	0.6	
Total %	1.8	22.9	6.7	0	0	0	0	0	11.3	0.3	17	0	6.9	32.9	0	0.3	

	B Street From North					**W. 3rd Street From East**					**B Street From South**					**W. 3rd Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	12	2	0	15	0	0	0	0	0	7	0	11	0	18	3	17	0	0	20	53
08:15 AM	1	11	4	0	16	0	0	0	0	0	8	1	11	0	20	3	15	0	0	18	54
08:30 AM	3	17	3	0	23	0	0	0	0	0	9	0	5	0	14	3	15	0	0	18	55
08:45 AM	0	11	8	0	19	0	0	0	0	0	8	0	8	0	16	5	22	0	0	27	62
Total Volume	5	51	17	0	73	0	0	0	0	0	32	1	35	0	68	14	69	0	0	83	224
% App. Total	6.8	69.9	23.3	0		0	0	0	0		47.1	1.5	51.5	0		16.9	83.1	0	0		
PHF	.417	.750	.531	.000	.793	.000	.000	.000	.000	.000	.889	.250	.795	.000	.850	.700	.784	.000	.000	.769	.903

N/S: B Street
E/W: W. 3rd Street
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Page No : 1

Groups Printed- Heavy Vehicles

	B Street From North				W. 3rd Street From East				B Street From South				W. 3rd Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	3
07:30 AM	0	2	1	0	0	0	0	0	1	0	0	0	0	4	0	0	8
07:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3
Total	0	4	2	0	0	0	0	0	1	0	2	0	1	5	0	0	15
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
08:15 AM	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	4
08:30 AM	0	2	0	0	0	0	0	0	1	0	0	0	0	1	0	0	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
Total	1	2	0	0	0	0	0	0	2	0	2	0	3	1	0	0	11
Grand Total	1	6	2	0	0	0	0	0	3	0	4	0	4	6	0	0	26
Apprch %	11.1	66.7	22.2	0	0	0	0	0	42.9	0	57.1	0	40	60	0	0	
Total %	3.8	23.1	7.7	0	0	0	0	0	11.5	0	15.4	0	15.4	23.1	0	0	

	B Street From North					W. 3rd Street From East					B Street From South					W. 3rd Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	0	2	1	0	3	0	0	0	0	0	1	0	0	0	1	0	4	0	0	4	8
07:45 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
08:15 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2	0	0	0	2	4
Total Volume	1	4	1	0	6	0	0	0	0	0	2	0	1	0	3	3	4	0	0	7	16
% App. Total	16.7	66.7	16.7	0		0	0	0	0		66.7	0	33.3	0		42.9	57.1	0	0		
PHF	.250	.500	.250	.000	.500	.000	.000	.000	.000	.000	.500	.000	.250	.000	.750	.375	.250	.000	.000	.438	.500

N/S: B Street
E/W: W. 3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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Groups Printed- Peds and Bikes

	B Street From North				W. 3rd Street From East				B Street From South				W. 3rd 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	7	0	0	0	8	0	0	1	2	0	0	0	6	24
07:15 AM	0	0	0	6	0	0	0	2	0	0	1	4	0	0	0	2	15
07:30 AM	0	0	0	7	0	1	0	5	0	0	0	2	0	2	0	2	19
07:45 AM	0	0	0	5	0	0	0	4	0	0	1	6	0	0	0	3	19
Total	0	0	0	25	0	1	0	19	0	0	3	14	0	2	0	13	77
08:00 AM	0	0	0	12	0	0	0	7	0	0	0	7	0	0	0	9	35
08:15 AM	0	2	0	9	0	0	0	7	1	1	0	16	0	1	0	9	46
08:30 AM	0	2	0	7	0	0	0	6	0	0	1	7	0	0	0	3	26
08:45 AM	0	0	0	3	0	0	0	4	0	0	1	7	0	0	0	3	18
Total	0	4	0	31	0	0	0	24	1	1	2	37	0	1	0	24	125
Grand Total	0	4	0	56	0	1	0	43	1	1	5	51	0	3	0	37	202
Apprch %	0	6.7	0	93.3	0	2.3	0	97.7	1.7	1.7	8.6	87.9	0	7.5	0	92.5	
Total %	0	2	0	27.7	0	0.5	0	21.3	0.5	0.5	2.5	25.2	0	1.5	0	18.3	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

	B Street From North					W. 3rd Street From East					B Street From South					W. 3rd 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
07:45 AM	0	0	0	5	5	0	0	0	4	4	0	0	1	6	7	0	0	0	3	3	19
08:00 AM	0	0	0	12	12	0	0	0	7	7	0	0	0	7	7	0	0	0	9	9	35
08:15 AM	0	2	0	9	11	0	0	0	7	7	1	1	0	16	18	0	1	0	9	10	46
08:30 AM	0	2	0	7	9	0	0	0	6	6	0	0	1	7	8	0	0	0	3	3	26
Total Volume	0	4	0	33	37	0	0	0	24	24	1	1	2	36	40	0	1	0	24	25	126
% App. Total	0	10.8	0	89.2		0	0	0	100		2.5	2.5	5	90		0	4	0	96		
PHF	.000	.500	.000	.688	.771	.000	.000	.000	.857	.857	.250	.250	.500	.563	.556	.000	.250	.000	.667	.625	.685

N/S: B Street
E/W: W. 3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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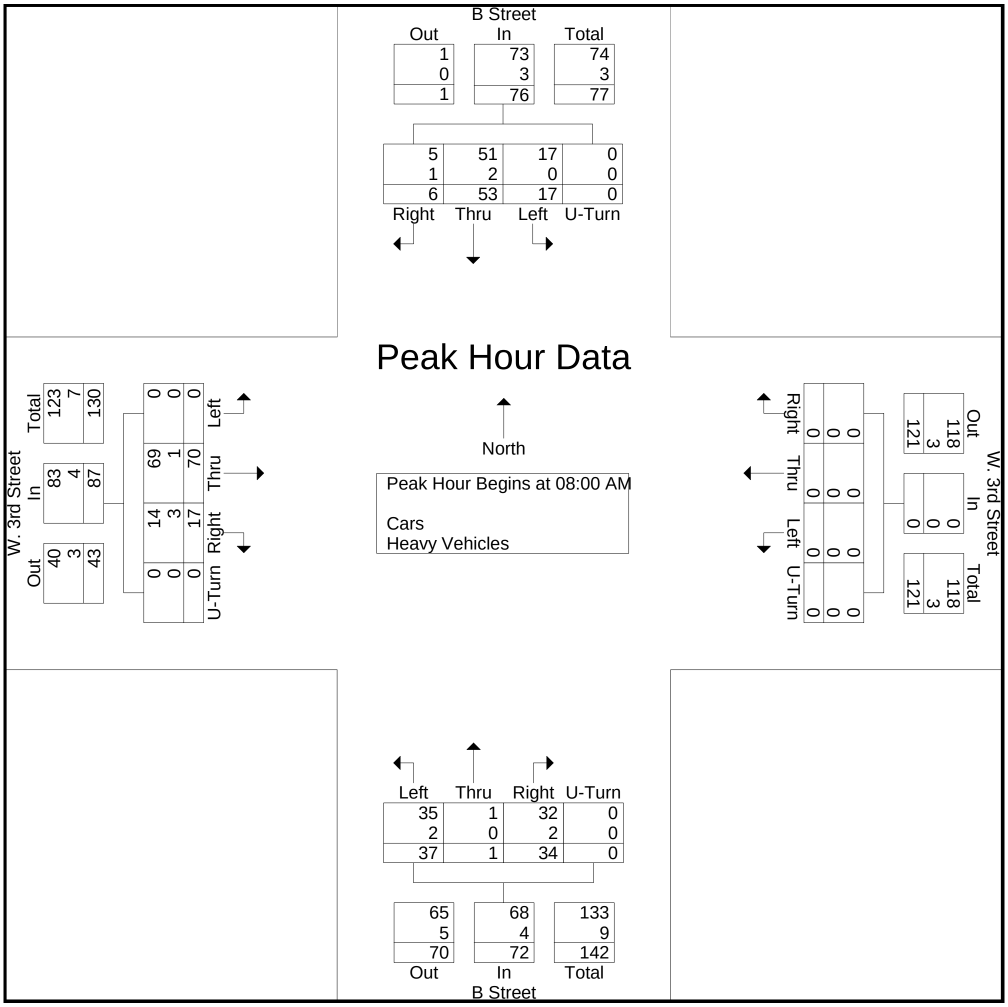
	B Street From North					W. 3rd Street From East					B Street From South					W. 3rd Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

08:00 AM	1	12	2	0	15	0	0	0	0	0	7	0	12	0	19	3	17	0	0	20	54
08:15 AM	2	11	4	0	17	0	0	0	0	0	9	1	11	0	21	5	15	0	0	20	58
08:30 AM	3	19	3	0	25	0	0	0	0	0	10	0	5	0	15	3	16	0	0	19	59
08:45 AM	0	11	8	0	19	0	0	0	0	0	8	0	9	0	17	6	22	0	0	28	64
Total Volume	6	53	17	0	76	0	0	0	0	0	34	1	37	0	72	17	70	0	0	87	235
% App. Total	7.9	69.7	22.4	0		0	0	0	0		47.2	1.4	51.4	0		19.5	80.5	0	0		
PHF	.500	.697	.531	.000	.760	.000	.000	.000	.000	.000	.850	.250	.771	.000	.857	.708	.795	.000	.000	.777	.918
Cars	5	51	17	0	73	0	0	0	0	0	32	1	35	0	68	14	69	0	0	83	224
% Cars	83.3	96.2	100	0	96.1	0	0	0	0	0	94.1	100	94.6	0	94.4	82.4	98.6	0	0	95.4	95.3
Heavy Vehicles	1	2	0	0	3	0	0	0	0	0	2	0	2	0	4	3	1	0	0	4	11
% Heavy Vehicles	16.7	3.8	0	0	3.9	0	0	0	0	0	5.9	0	5.4	0	5.6	17.6	1.4	0	0	4.6	4.7



N/S: B Street
E/W: W.3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
DATA
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 133548 AA
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	B Street From North				**W. 3rd Street From East**				**B Street From South**				**W. 3rd Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	13	5	0	0	0	1	0	8	1	4	0	6	25	0	0	63
04:15 PM	1	12	1	0	0	0	0	0	5	1	1	0	8	30	0	0	59
04:30 PM	2	9	1	0	0	0	0	0	8	0	2	0	6	43	0	0	71
04:45 PM	3	7	5	0	0	0	0	0	8	0	5	0	7	23	0	0	58
Total	6	41	12	0	0	0	1	0	29	2	12	0	27	121	0	0	251
05:00 PM	0	21	5	0	0	0	0	0	7	0	5	0	10	24	0	0	72
05:15 PM	1	7	2	0	0	0	0	0	7	0	2	0	13	28	0	0	60
05:30 PM	0	11	3	0	0	0	0	0	10	0	5	0	7	23	0	0	59
05:45 PM	2	17	1	0	0	0	0	0	9	0	2	0	10	36	0	0	77
Total	3	56	11	0	0	0	0	0	33	0	14	0	40	111	0	0	268
Grand Total	9	97	23	0	0	0	1	0	62	2	26	0	67	232	0	0	519
Apprch %	7	75.2	17.8	0	0	0	100	0	68.9	2.2	28.9	0	22.4	77.6	0	0	
Total %	1.7	18.7	4.4	0	0	0	0.2	0	11.9	0.4	5	0	12.9	44.7	0	0	
Cars	9	96	23	0	0	0	1	0	60	2	26	0	66	228	0	0	511
% Cars	100	99	100	0	0	0	100	0	96.8	100	100	0	98.5	98.3	0	0	98.5
Heavy Vehicles	0	1	0	0	0	0	0	0	2	0	0	0	1	4	0	0	8
% Heavy Vehicles	0	1	0	0	0	0	0	0	3.2	0	0	0	1.5	1.7	0	0	1.5

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

	B Street From North					**W. 3rd Street From East**					**B Street From South**					**W. 3rd Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
05:00 PM	0	21	5	0	26	0	0	0	0	0	7	0	5	0	12	10	24	0	0	34	72
05:15 PM	1	7	2	0	10	0	0	0	0	0	7	0	2	0	9	13	28	0	0	41	60
05:30 PM	0	11	3	0	14	0	0	0	0	0	10	0	5	0	15	7	23	0	0	30	59
05:45 PM	2	17	1	0	20	0	0	0	0	0	9	0	2	0	11	10	36	0	0	46	77
Total Volume	3	56	11	0	70	0	0	0	0	0	33	0	14	0	47	40	111	0	0	151	268
% App. Total	4.3	80	15.7	0		0	0	0	0		70.2	0	29.8	0		26.5	73.5	0	0		
PHF	.375	.667	.550	.000	.673	.000	.000	.000	.000	.000	.825	.000	.700	.000	.783	.769	.771	.000	.000	.821	.870
Cars	3	55	11	0	69	0	0	0	0	0	33	0	14	0	47	39	108	0	0	147	263
% Cars	100	98.2	100	0	98.6	0	0	0	0	0	100	0	100	0	100	97.5	97.3	0	0	97.4	98.1
Heavy Vehicles	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	5
% Heavy Vehicles	0	1.8	0	0	1.4	0	0	0	0	0	0	0	0	0	0	2.5	2.7	0	0	2.6	1.9

N/S: B Street
E/W: W.3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
DATA
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Email: datarequests@pdillc.com

File Name : 133548 AA
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Cars

	B Street From North				**W. 3rd Street From East**				**B Street From South**				**W. 3rd Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	13	5	0	0	0	1	0	8	1	4	0	6	24	0	0	62
04:15 PM	1	12	1	0	0	0	0	0	5	1	1	0	8	30	0	0	59
04:30 PM	2	9	1	0	0	0	0	0	7	0	2	0	6	43	0	0	70
04:45 PM	3	7	5	0	0	0	0	0	7	0	5	0	7	23	0	0	57
Total	6	41	12	0	0	0	1	0	27	2	12	0	27	120	0	0	248
05:00 PM	0	20	5	0	0	0	0	0	7	0	5	0	10	23	0	0	70
05:15 PM	1	7	2	0	0	0	0	0	7	0	2	0	12	28	0	0	59
05:30 PM	0	11	3	0	0	0	0	0	10	0	5	0	7	22	0	0	58
05:45 PM	2	17	1	0	0	0	0	0	9	0	2	0	10	35	0	0	76
Total	3	55	11	0	0	0	0	0	33	0	14	0	39	108	0	0	263
Grand Total	9	96	23	0	0	0	1	0	60	2	26	0	66	228	0	0	511
Apprch %	7	75	18	0	0	0	100	0	68.2	2.3	29.5	0	22.4	77.6	0	0	
Total %	1.8	18.8	4.5	0	0	0	0.2	0	11.7	0.4	5.1	0	12.9	44.6	0	0	

	B Street From North					**W. 3rd Street From East**					**B Street From South**					**W. 3rd Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	20	5	0	25	0	0	0	0	0	7	0	5	0	12	10	23	0	0	33	70
05:15 PM	1	7	2	0	10	0	0	0	0	0	7	0	2	0	9	12	28	0	0	40	59
05:30 PM	0	11	3	0	14	0	0	0	0	0	10	0	5	0	15	7	22	0	0	29	58
05:45 PM	2	17	1	0	20	0	0	0	0	0	9	0	2	0	11	10	35	0	0	45	76
Total Volume	3	55	11	0	69	0	0	0	0	0	33	0	14	0	47	39	108	0	0	147	263
% App. Total	4.3	79.7	15.9	0		0	0	0	0		70.2	0	29.8	0		26.5	73.5	0	0		
PHF	.375	.688	.550	.000	.690	.000	.000	.000	.000	.000	.825	.000	.700	.000	.783	.813	.771	.000	.000	.817	.865

N/S: B Street
E/W: W.3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

File Name : 133548 AA
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Heavy Vehicles

	B Street From North				**W. 3rd Street From East**				**B Street From South**				**W. 3rd Street From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	3
05:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	0	5
Grand Total	0	1	0	0	0	0	0	0	2	0	0	0	1	4	0	0	8
Apprch %	0	100	0	0	0	0	0	0	100	0	0	0	20	80	0	0	
Total %	0	12.5	0	0	0	0	0	0	25	0	0	0	12.5	50	0	0	

	B Street From North					**W. 3rd Street From East**					**B Street From South**					**W. 3rd Street From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 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	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total Volume	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	1	1	0	0	2	5
% App. Total	0	100	0	0		0	0	0	0		100	0	0	0		50	50	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.500	.000	.000	.000	.500	.250	.250	.000	.000	.500	.625

N/S: B Street
E/W: W.3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

File Name : 133548 AA
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Peds and Bikes

	B Street				**W. 3rd Street**				**B Street**				**W. 3rd Street**				
	From North				**From East**				**From South**				**From West**				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	2	0	0	0	1	0	0	0	1	0	2	0	4	10
04:15 PM	0	1	0	3	0	1	0	3	0	0	0	3	0	0	0	3	14
04:30 PM	0	0	0	1	0	0	0	2	0	0	0	6	0	0	0	2	11
04:45 PM	0	1	0	0	0	0	0	2	1	0	0	1	0	0	0	2	7
Total	0	2	0	6	0	1	0	8	1	0	0	11	0	2	0	11	42
05:00 PM	0	1	0	3	0	0	0	0	0	0	0	6	1	3	0	5	19
05:15 PM	0	0	0	4	0	0	0	8	0	0	0	1	0	1	0	3	17
05:30 PM	0	0	0	6	0	0	0	10	0	0	0	3	0	2	0	1	22
05:45 PM	0	0	0	2	0	0	0	5	0	0	0	3	0	4	0	4	18
Total	0	1	0	15	0	0	0	23	0	0	0	13	1	10	0	13	76
Grand Total	0	3	0	21	0	1	0	31	1	0	0	24	1	12	0	24	118
Apprch %	0	12.5	0	87.5	0	3.1	0	96.9	4	0	0	96	2.7	32.4	0	64.9	
Total %	0	2.5	0	17.8	0	0.8	0	26.3	0.8	0	0	20.3	0.8	10.2	0	20.3	

	B Street					**W. 3rd Street**					**B Street**					**W. 3rd Street**					
	From North					**From East**					**From South**					**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 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	1	0	3	4	0	0	0	0	0	0	0	0	6	6	1	3	0	5	9	19
05:15 PM	0	0	0	4	4	0	0	0	8	8	0	0	0	1	1	0	1	0	3	4	17
05:30 PM	0	0	0	6	6	0	0	0	10	10	0	0	0	3	3	0	2	0	1	3	22
05:45 PM	0	0	0	2	2	0	0	0	5	5	0	0	0	3	3	0	4	0	4	8	18
Total Volume	0	1	0	15	16	0	0	0	23	23	0	0	0	13	13	1	10	0	13	24	76
% App. Total	0	6.2	0	93.8		0	0	0	100		0	0	0	100		4.2	41.7	0	54.2		
PHF	.000	.250	.000	.625	.667	.000	.000	.000	.575	.575	.000	.000	.000	.542	.542	.250	.625	.000	.650	.667	.864

N/S: B Street
E/W: W.3rd Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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Email: datarequests@pdillc.com

File Name : 133548 AA
Site Code : 13100
Start Date : 9/26/2013
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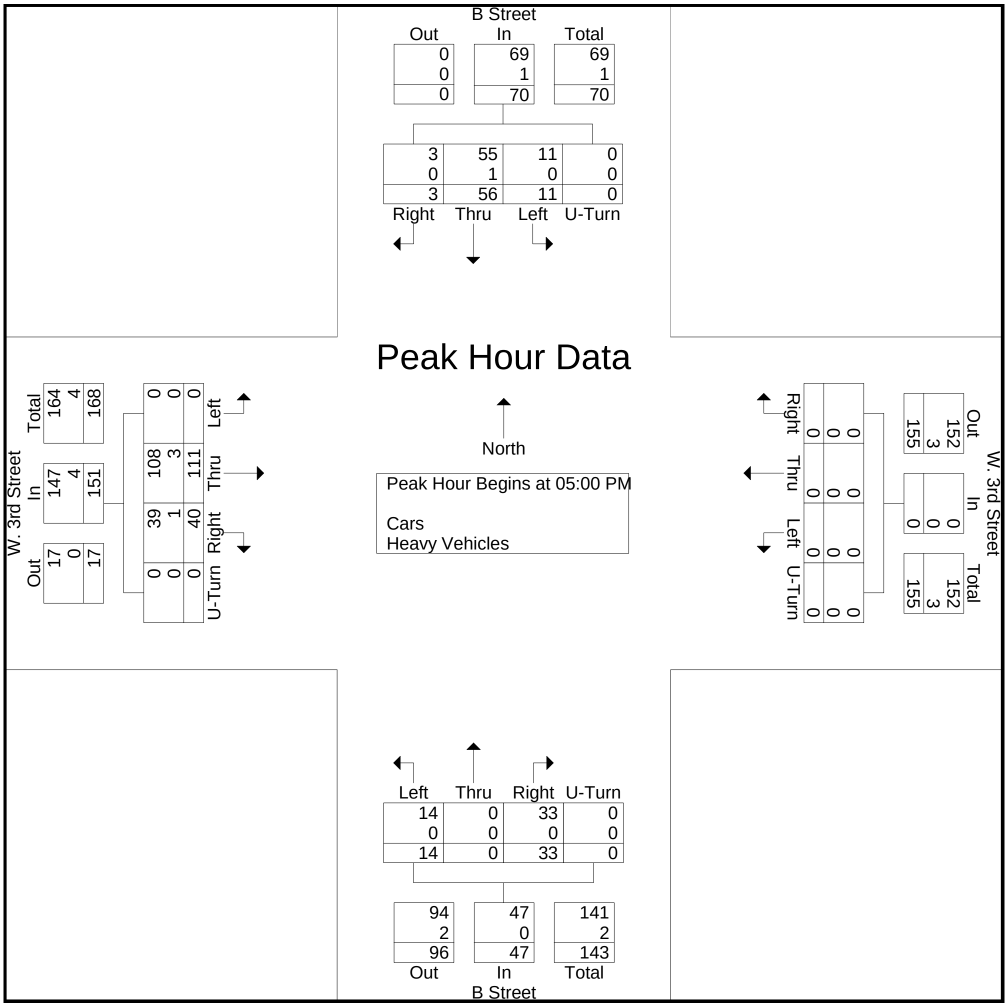
	B Street From North					W. 3rd Street From East					B Street From South					W. 3rd Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	21	5	0	26	0	0	0	0	0	7	0	5	0	12	10	24	0	0	34	72
05:15 PM	1	7	2	0	10	0	0	0	0	0	7	0	2	0	9	13	28	0	0	41	60
05:30 PM	0	11	3	0	14	0	0	0	0	0	10	0	5	0	15	7	23	0	0	30	59
05:45 PM	2	17	1	0	20	0	0	0	0	0	9	0	2	0	11	10	36	0	0	46	77
Total Volume	3	56	11	0	70	0	0	0	0	0	33	0	14	0	47	40	111	0	0	151	268
% App. Total	4.3	80	15.7	0		0	0	0	0		70.2	0	29.8	0		26.5	73.5	0	0		
PHF	.375	.667	.550	.000	.673	.000	.000	.000	.000	.000	.825	.000	.700	.000	.783	.769	.771	.000	.000	.821	.870
Cars	3	55	11	0	69	0	0	0	0	0	33	0	14	0	47	39	108	0	0	147	263
% Cars	100	98.2	100	0	98.6	0	0	0	0	0	100	0	100	0	100	97.5	97.3	0	0	97.4	98.1
Heavy Vehicles	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4	5
% Heavy Vehicles	0	1.8	0	0	1.4	0	0	0	0	0	0	0	0	0	0	2.5	2.7	0	0	2.6	1.9



N/S: B Street
E/W: West Broadway
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

File Name : 133548 B
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	B Street From North				West Broadway From East				B Street From South				West Broadway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	6	5	1	0	2	99	12	0	25	6	7	0	7	83	3	0	256
07:15 AM	4	13	4	0	3	130	14	1	14	3	5	0	7	76	4	0	278
07:30 AM	8	2	3	0	8	126	17	0	27	5	5	0	9	83	4	0	297
07:45 AM	8	4	2	0	12	123	31	1	32	6	3	0	11	80	3	0	316
Total	26	24	10	0	25	478	74	2	98	20	20	0	34	322	14	0	1147
08:00 AM	8	6	6	0	8	121	23	0	24	8	5	0	6	91	2	0	308
08:15 AM	9	4	4	0	4	120	22	0	30	9	2	0	12	84	4	0	304
08:30 AM	6	16	5	0	4	104	26	0	31	6	9	0	5	80	6	0	298
08:45 AM	3	9	4	0	7	92	21	0	22	5	9	0	9	101	6	0	288
Total	26	35	19	0	23	437	92	0	107	28	25	0	32	356	18	0	1198
Grand Total	52	59	29	0	48	915	166	2	205	48	45	0	66	678	32	0	2345
Apprch %	37.1	42.1	20.7	0	4.2	80.9	14.7	0.2	68.8	16.1	15.1	0	8.5	87.4	4.1	0	
Total %	2.2	2.5	1.2	0	2	39	7.1	0.1	8.7	2	1.9	0	2.8	28.9	1.4	0	
Cars	47	55	29	0	46	861	153	2	184	46	42	0	52	597	27	0	2141
% Cars	90.4	93.2	100	0	95.8	94.1	92.2	100	89.8	95.8	93.3	0	78.8	88.1	84.4	0	91.3
Heavy Vehicles	5	4	0	0	2	54	13	0	21	2	3	0	14	81	5	0	204
% Heavy Vehicles	9.6	6.8	0	0	4.2	5.9	7.8	0	10.2	4.2	6.7	0	21.2	11.9	15.6	0	8.7

	B Street From North					West Broadway From East					B Street From South					West Broadway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	8	4	2	0	14	12	123	31	1	167	32	6	3	0	41	11	80	3	0	94	316
08:00 AM	8	6	6	0	20	8	121	23	0	152	24	8	5	0	37	6	91	2	0	99	308
08:15 AM	9	4	4	0	17	4	120	22	0	146	30	9	2	0	41	12	84	4	0	100	304
08:30 AM	6	16	5	0	27	4	104	26	0	134	31	6	9	0	46	5	80	6	0	91	298
Total Volume	31	30	17	0	78	28	468	102	1	599	117	29	19	0	165	34	335	15	0	384	1226
% App. Total	39.7	38.5	21.8	0		4.7	78.1	17	0.2		70.9	17.6	11.5	0		8.9	87.2	3.9	0		
PHF	.861	.469	.708	.000	.722	.583	.951	.823	.250	.897	.914	.806	.528	.000	.897	.708	.920	.625	.000	.960	.970
Cars	27	26	17	0	70	27	446	91	1	565	106	27	19	0	152	27	296	13	0	336	1123
% Cars	87.1	86.7	100	0	89.7	96.4	95.3	89.2	100	94.3	90.6	93.1	100	0	92.1	79.4	88.4	86.7	0	87.5	91.6
Heavy Vehicles	4	4	0	0	8	1	22	11	0	34	11	2	0	0	13	7	39	2	0	48	103
% Heavy Vehicles	12.9	13.3	0	0	10.3	3.6	4.7	10.8	0	5.7	9.4	6.9	0	0	7.9	20.6	11.6	13.3	0	12.5	8.4

N/S: B Street
E/W: West Broadway
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
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File Name : 133548 B
Site Code : 13100
Start Date : 9/26/2013
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Groups Printed- Cars

	B Street From North				West Broadway From East				B Street From South				West Broadway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	6	5	1	0	2	93	12	0	23	6	6	0	5	74	2	0	235
07:15 AM	4	13	4	0	2	121	14	1	10	3	5	0	5	66	4	0	252
07:30 AM	7	2	3	0	8	118	16	0	24	5	4	0	8	75	3	0	273
07:45 AM	6	3	2	0	12	117	29	1	32	6	3	0	9	72	3	0	295
Total	23	23	10	0	24	449	71	2	89	20	18	0	27	287	12	0	1055
08:00 AM	8	5	6	0	7	115	21	0	22	7	5	0	5	80	2	0	283
08:15 AM	7	4	4	0	4	116	20	0	23	9	2	0	10	75	3	0	277
08:30 AM	6	14	5	0	4	98	21	0	29	5	9	0	3	69	5	0	268
08:45 AM	3	9	4	0	7	83	20	0	21	5	8	0	7	86	5	0	258
Total	24	32	19	0	22	412	82	0	95	26	24	0	25	310	15	0	1086
Grand Total	47	55	29	0	46	861	153	2	184	46	42	0	52	597	27	0	2141
Apprch %	35.9	42	22.1	0	4.3	81.1	14.4	0.2	67.6	16.9	15.4	0	7.7	88.3	4	0	
Total %	2.2	2.6	1.4	0	2.1	40.2	7.1	0.1	8.6	2.1	2	0	2.4	27.9	1.3	0	

	B Street From North					West Broadway From East					B Street From South					West Broadway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	7	2	3	0	12	8	118	16	0	142	24	5	4	0	33	8	75	3	0	86	273
07:45 AM	6	3	2	0	11	12	117	29	1	159	32	6	3	0	41	9	72	3	0	84	295
08:00 AM	8	5	6	0	19	7	115	21	0	143	22	7	5	0	34	5	80	2	0	87	283
08:15 AM	7	4	4	0	15	4	116	20	0	140	23	9	2	0	34	10	75	3	0	88	277
Total Volume	28	14	15	0	57	31	466	86	1	584	101	27	14	0	142	32	302	11	0	345	1128
% App. Total	49.1	24.6	26.3	0		5.3	79.8	14.7	0.2		71.1	19	9.9	0		9.3	87.5	3.2	0		
PHF	.875	.700	.625	.000	.750	.646	.987	.741	.250	.918	.789	.750	.700	.000	.866	.800	.944	.917	.000	.980	.956

N/S: B Street
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Page No : 1

Groups Printed- Heavy Vehicles

	B Street From North				**West Broadway From East**				**B Street From South**				**West Broadway From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	6	0	0	2	0	1	0	2	9	1	0	21
07:15 AM	0	0	0	0	1	9	0	0	4	0	0	0	2	10	0	0	26
07:30 AM	1	0	0	0	0	8	1	0	3	0	1	0	1	8	1	0	24
07:45 AM	2	1	0	0	0	6	2	0	0	0	0	0	2	8	0	0	21
Total	3	1	0	0	1	29	3	0	9	0	2	0	7	35	2	0	92
08:00 AM	0	1	0	0	1	6	2	0	2	1	0	0	1	11	0	0	25
08:15 AM	2	0	0	0	0	4	2	0	7	0	0	0	2	9	1	0	27
08:30 AM	0	2	0	0	0	6	5	0	2	1	0	0	2	11	1	0	30
08:45 AM	0	0	0	0	0	9	1	0	1	0	1	0	2	15	1	0	30
Total	2	3	0	0	1	25	10	0	12	2	1	0	7	46	3	0	112
Grand Total	5	4	0	0	2	54	13	0	21	2	3	0	14	81	5	0	204
Apprch %	55.6	44.4	0	0	2.9	78.3	18.8	0	80.8	7.7	11.5	0	14	81	5	0	
Total %	2.5	2	0	0	1	26.5	6.4	0	10.3	1	1.5	0	6.9	39.7	2.5	0	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	B Street From North					**West Broadway From East**					**B Street From South**					**West Broadway From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
08:00 AM	0	1	0	0	1	1	6	2	0	9	2	1	0	0	3	1	11	0	0	12	25
08:15 AM	2	0	0	0	2	0	4	2	0	6	7	0	0	0	7	2	9	1	0	12	27
08:30 AM	0	2	0	0	2	0	6	5	0	11	2	1	0	0	3	2	11	1	0	14	30
08:45 AM	0	0	0	0	0	0	9	1	0	10	1	0	1	0	2	2	15	1	0	18	30
Total Volume	2	3	0	0	5	1	25	10	0	36	12	2	1	0	15	7	46	3	0	56	112
% App. Total	40	60	0	0		2.8	69.4	27.8	0		80	13.3	6.7	0		12.5	82.1	5.4	0		
PHF	.250	.375	.000	.000	.625	.250	.694	.500	.000	.818	.429	.500	.250	.000	.536	.875	.767	.750	.000	.778	.933

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Groups Printed- Peds and Bikes

	B Street From North				**West Broadway From East**				**B Street From South**				**West Broadway 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	18	1	2	0	0	0	0	0	35	0	0	0	8	64
07:15 AM	0	0	0	13	0	0	0	1	0	0	0	27	0	1	0	5	47
07:30 AM	0	0	0	28	0	0	0	4	0	0	0	51	0	0	0	4	87
07:45 AM	1	0	0	30	1	1	0	0	0	0	0	44	0	0	0	10	87
Total	1	0	0	89	2	3	0	5	0	0	0	157	0	1	0	27	285
08:00 AM	0	0	0	47	0	4	0	5	0	0	0	91	0	0	0	13	160
08:15 AM	1	0	0	45	0	0	0	2	0	0	0	81	0	1	0	16	146
08:30 AM	1	0	0	26	0	3	0	5	0	0	1	56	0	4	0	10	106
08:45 AM	0	1	0	29	0	2	0	7	0	1	0	43	0	1	0	10	94
Total	2	1	0	147	0	9	0	19	0	1	1	271	0	6	0	49	506
Grand Total	3	1	0	236	2	12	0	24	0	1	1	428	0	7	0	76	791
Apprch %	1.2	0.4	0	98.3	5.3	31.6	0	63.2	0	0.2	0.2	99.5	0	8.4	0	91.6	
Total %	0.4	0.1	0	29.8	0.3	1.5	0	3	0	0.1	0.1	54.1	0	0.9	0	9.6	

	B Street From North					**West Broadway From East**					**B Street From South**					**West Broadway 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 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	47	47	0	4	0	5	9	0	0	0	91	91	0	0	0	13	13	160
08:15 AM	1	0	0	45	46	0	0	0	2	2	0	0	0	81	81	0	1	0	16	17	146
08:30 AM	1	0	0	26	27	0	3	0	5	8	0	0	1	56	57	0	4	0	10	14	106
08:45 AM	0	1	0	29	30	0	2	0	7	9	0	1	0	43	44	0	1	0	10	11	94
Total Volume	2	1	0	147	150	0	9	0	19	28	0	1	1	271	273	0	6	0	49	55	506
% App. Total	1.3	0.7	0	98		0	32.1	0	67.9		0	0.4	0.4	99.3		0	10.9	0	89.1		
PHF	.500	.250	.000	.782	.798	.000	.563	.000	.679	.778	.000	.250	.250	.745	.750	.000	.375	.000	.766	.809	.791

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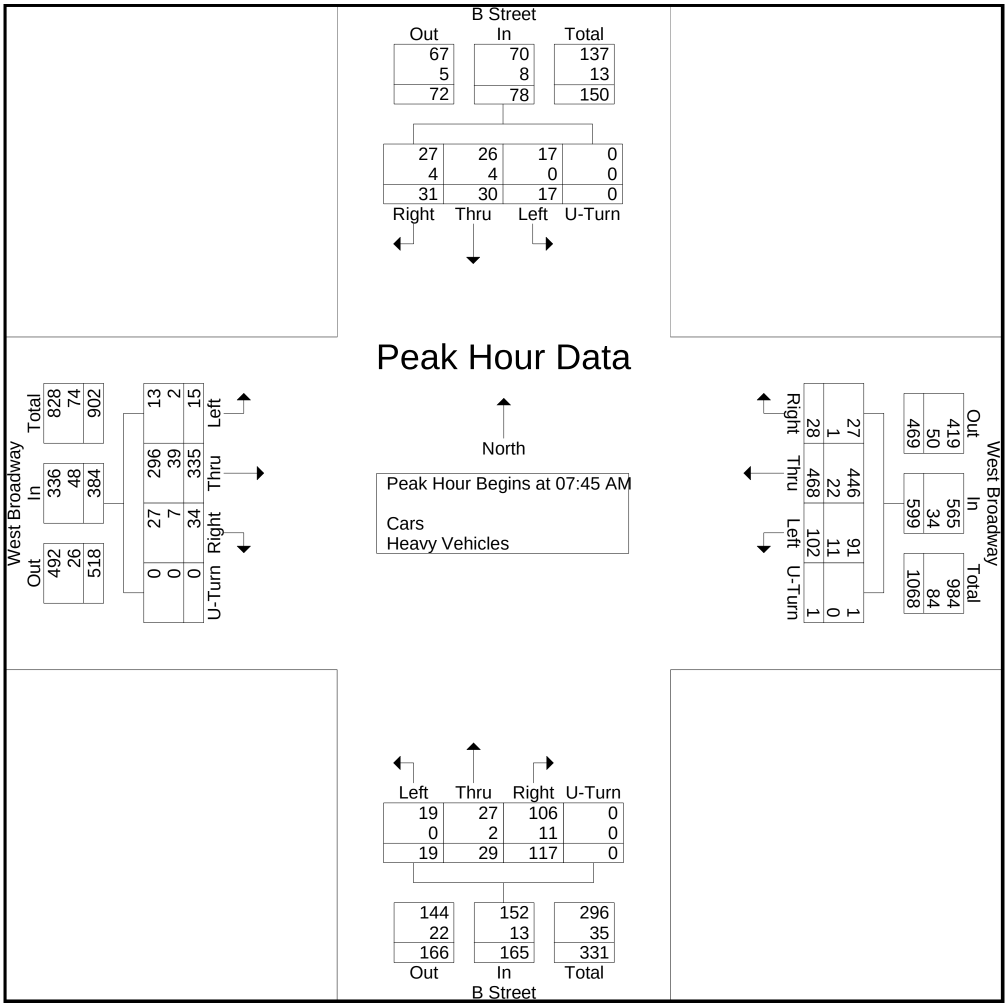
	B Street From North					West Broadway From East					B Street From South					West Broadway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	8	4	2	0	14	12	123	31	1	167	32	6	3	0	41	11	80	3	0	94	316
08:00 AM	8	6	6	0	20	8	121	23	0	152	24	8	5	0	37	6	91	2	0	99	308
08:15 AM	9	4	4	0	17	4	120	22	0	146	30	9	2	0	41	12	84	4	0	100	304
08:30 AM	6	16	5	0	27	4	104	26	0	134	31	6	9	0	46	5	80	6	0	91	298
Total Volume	31	30	17	0	78	28	468	102	1	599	117	29	19	0	165	34	335	15	0	384	1226
% App. Total	39.7	38.5	21.8	0		4.7	78.1	17	0.2		70.9	17.6	11.5	0		8.9	87.2	3.9	0		
PHF	.861	.469	.708	.000	.722	.583	.951	.823	.250	.897	.914	.806	.528	.000	.897	.708	.920	.625	.000	.960	.970
Cars	27	26	17	0	70	27	446	91	1	565	106	27	19	0	152	27	296	13	0	336	1123
% Cars	87.1	86.7	100	0	89.7	96.4	95.3	89.2	100	94.3	90.6	93.1	100	0	92.1	79.4	88.4	86.7	0	87.5	91.6
Heavy Vehicles	4	4	0	0	8	1	22	11	0	34	11	2	0	0	13	7	39	2	0	48	103
% Heavy Vehicles	12.9	13.3	0	0	10.3	3.6	4.7	10.8	0	5.7	9.4	6.9	0	0	7.9	20.6	11.6	13.3	0	12.5	8.4



N/S: B Street
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City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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Site Code : 13100
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Groups Printed- Cars - Heavy Vehicles

	B Street From North				**West Broadway From East**				**B Street From South**				**West Broadway From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	7	10	2	0	1	59	8	0	18	6	4	0	10	103	4	0	232
04:15 PM	5	10	7	0	1	75	14	0	16	1	5	0	14	106	7	1	262
04:30 PM	4	7	3	0	3	67	11	0	25	4	5	0	9	128	3	0	269
04:45 PM	3	4	4	0	2	91	8	1	22	4	1	0	14	122	5	0	281
Total	19	31	16	0	7	292	41	1	81	15	15	0	47	459	19	1	1044
05:00 PM	12	13	8	0	3	73	10	0	27	5	2	0	7	130	8	0	298
05:15 PM	6	7	7	0	3	59	23	0	34	2	4	0	12	104	5	1	267
05:30 PM	4	5	7	0	6	74	15	0	25	3	6	0	6	127	10	1	289
05:45 PM	12	8	10	0	2	66	13	2	30	6	6	0	13	126	5	2	301
Total	34	33	32	0	14	272	61	2	116	16	18	0	38	487	28	4	1155
Grand Total	53	64	48	0	21	564	102	3	197	31	33	0	85	946	47	5	2199
Apprch %	32.1	38.8	29.1	0	3	81.7	14.8	0.4	75.5	11.9	12.6	0	7.8	87.3	4.3	0.5	
Total %	2.4	2.9	2.2	0	1	25.6	4.6	0.1	9	1.4	1.5	0	3.9	43	2.1	0.2	
Cars	53	64	47	0	21	541	98	3	192	30	31	0	76	900	47	5	2108
% Cars	100	100	97.9	0	100	95.9	96.1	100	97.5	96.8	93.9	0	89.4	95.1	100	100	95.9
Heavy Vehicles	0	0	1	0	0	23	4	0	5	1	2	0	9	46	0	0	91
% Heavy Vehicles	0	0	2.1	0	0	4.1	3.9	0	2.5	3.2	6.1	0	10.6	4.9	0	0	4.1

	B Street From North					**West Broadway From East**					**B Street From South**					**West Broadway From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	12	13	8	0	33	3	73	10	0	86	27	5	2	0	34	7	130	8	0	145	298
05:15 PM	6	7	7	0	20	3	59	23	0	85	34	2	4	0	40	12	104	5	1	122	267
05:30 PM	4	5	7	0	16	6	74	15	0	95	25	3	6	0	34	6	127	10	1	144	289
05:45 PM	12	8	10	0	30	2	66	13	2	83	30	6	6	0	42	13	126	5	2	146	301
Total Volume	34	33	32	0	99	14	272	61	2	349	116	16	18	0	150	38	487	28	4	557	1155
% App. Total	34.3	33.3	32.3	0		4	77.9	17.5	0.6		77.3	10.7	12	0		6.8	87.4	5	0.7		
PHF	.708	.635	.800	.000	.750	.583	.919	.663	.250	.918	.853	.667	.750	.000	.893	.731	.937	.700	.500	.954	.959
Cars	34	33	31	0	98	14	261	59	2	336	114	16	18	0	148	34	468	28	4	534	1116
% Cars	100	100	96.9	0	99.0	100	96.0	96.7	100	96.3	98.3	100	100	0	98.7	89.5	96.1	100	100	95.9	96.6
Heavy Vehicles	0	0	1	0	1	0	11	2	0	13	2	0	0	0	2	4	19	0	0	23	39
% Heavy Vehicles	0	0	3.1	0	1.0	0	4.0	3.3	0	3.7	1.7	0	0	0	1.3	10.5	3.9	0	0	4.1	3.4

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Groups Printed- Cars

	B Street From North				**West Broadway From East**				**B Street From South**				**West Broadway From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	7	10	2	0	1	56	7	0	17	6	3	0	9	96	4	0	218
04:15 PM	5	10	7	0	1	71	14	0	16	1	5	0	13	99	7	1	250
04:30 PM	4	7	3	0	3	65	11	0	23	4	4	0	7	119	3	0	253
04:45 PM	3	4	4	0	2	88	7	1	22	3	1	0	13	118	5	0	271
Total	19	31	16	0	7	280	39	1	78	14	13	0	42	432	19	1	992
05:00 PM	12	13	8	0	3	69	10	0	26	5	2	0	6	124	8	0	286
05:15 PM	6	7	6	0	3	57	23	0	33	2	4	0	11	98	5	1	256
05:30 PM	4	5	7	0	6	71	15	0	25	3	6	0	6	124	10	1	283
05:45 PM	12	8	10	0	2	64	11	2	30	6	6	0	11	122	5	2	291
Total	34	33	31	0	14	261	59	2	114	16	18	0	34	468	28	4	1116
Grand Total	53	64	47	0	21	541	98	3	192	30	31	0	76	900	47	5	2108
Apprch %	32.3	39	28.7	0	3.2	81.6	14.8	0.5	75.9	11.9	12.3	0	7.4	87.5	4.6	0.5	
Total %	2.5	3	2.2	0	1	25.7	4.6	0.1	9.1	1.4	1.5	0	3.6	42.7	2.2	0.2	

	B Street From North					**West Broadway From East**					**B Street From South**					**West Broadway From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	12	13	8	0	33	3	69	10	0	82	26	5	2	0	33	6	124	8	0	138	286
05:15 PM	6	7	6	0	19	3	57	23	0	83	33	2	4	0	39	11	98	5	1	115	256
05:30 PM	4	5	7	0	16	6	71	15	0	92	25	3	6	0	34	6	124	10	1	141	283
05:45 PM	12	8	10	0	30	2	64	11	2	79	30	6	6	0	42	11	122	5	2	140	291
Total Volume	34	33	31	0	98	14	261	59	2	336	114	16	18	0	148	34	468	28	4	534	1116
% App. Total	34.7	33.7	31.6	0		4.2	77.7	17.6	0.6		77	10.8	12.2	0		6.4	87.6	5.2	0.7		
PHF	.708	.635	.775	.000	.742	.583	.919	.641	.250	.913	.864	.667	.750	.000	.881	.773	.944	.700	.500	.947	.959

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File Name : 133548 BB
Site Code : 13100
Start Date : 9/26/2013
Page No : 1

Groups Printed- Heavy Vehicles

	B Street **From North**				**West Broadway** **From East**				**B Street** **From South**				**West Broadway** **From West**				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	0	3	1	0	1	0	1	0	1	7	0	0	14
04:15 PM	0	0	0	0	0	4	0	0	0	0	0	0	1	7	0	0	12
04:30 PM	0	0	0	0	0	2	0	0	2	0	1	0	2	9	0	0	16
04:45 PM	0	0	0	0	0	3	1	0	0	1	0	0	1	4	0	0	10
Total	0	0	0	0	0	12	2	0	3	1	2	0	5	27	0	0	52
05:00 PM	0	0	0	0	0	4	0	0	1	0	0	0	1	6	0	0	12
05:15 PM	0	0	1	0	0	2	0	0	1	0	0	0	1	6	0	0	11
05:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6
05:45 PM	0	0	0	0	0	2	2	0	0	0	0	0	2	4	0	0	10
Total	0	0	1	0	0	11	2	0	2	0	0	0	4	19	0	0	39
Grand Total	0	0	1	0	0	23	4	0	5	1	2	0	9	46	0	0	91
Apprch %	0	0	100	0	0	85.2	14.8	0	62.5	12.5	25	0	16.4	83.6	0	0	
Total %	0	0	1.1	0	0	25.3	4.4	0	5.5	1.1	2.2	0	9.9	50.5	0	0	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

	B Street **From North**					**West Broadway** **From East**					**B Street** **From South**					**West Broadway** **From West**					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	3	1	0	4	1	0	1	0	2	1	7	0	0	8	14
04:15 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	7	0	0	8	12
04:30 PM	0	0	0	0	0	0	2	0	0	2	2	0	1	0	3	2	9	0	0	11	16
04:45 PM	0	0	0	0	0	0	3	1	0	4	0	1	0	0	1	1	4	0	0	5	10
Total Volume	0	0	0	0	0	0	12	2	0	14	3	1	2	0	6	5	27	0	0	32	52
% App. Total	0	0	0	0		0	85.7	14.3	0		50	16.7	33.3	0		15.6	84.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.500	.000	.875	.375	.250	.500	.000	.500	.625	.750	.000	.000	.727	.813

N/S: B Street
E/W: West Broadway
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
DATA
INDUSTRIES, LLC
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File Name : 133548 BB
Site Code : 13100
Start Date : 9/26/2013
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Groups Printed- Peds and Bikes

	B Street From North				West Broadway From East				B Street From South				West Broadway From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	13	0	2	0	3	0	0	0	37	0	1	0	1	57
04:15 PM	0	1	0	17	0	1	0	1	0	0	0	33	0	0	0	4	57
04:30 PM	0	0	0	22	0	2	0	2	0	0	0	37	0	1	0	5	69
04:45 PM	0	0	0	25	0	3	0	7	0	0	0	59	0	0	0	9	103
Total	0	1	0	77	0	8	0	13	0	0	0	166	0	2	0	19	286
05:00 PM	0	1	0	18	0	2	0	6	0	0	0	69	0	1	0	9	106
05:15 PM	0	0	0	34	0	0	0	2	0	0	0	75	0	1	0	6	118
05:30 PM	0	0	0	25	0	0	0	5	0	0	0	86	0	3	0	7	126
05:45 PM	0	1	0	37	0	3	0	4	0	0	0	49	0	1	0	11	106
Total	0	2	0	114	0	5	0	17	0	0	0	279	0	6	0	33	456
Grand Total	0	3	0	191	0	13	0	30	0	0	0	445	0	8	0	52	742
Apprch %	0	1.5	0	98.5	0	30.2	0	69.8	0	0	0	100	0	13.3	0	86.7	
Total %	0	0.4	0	25.7	0	1.8	0	4	0	0	0	60	0	1.1	0	7	

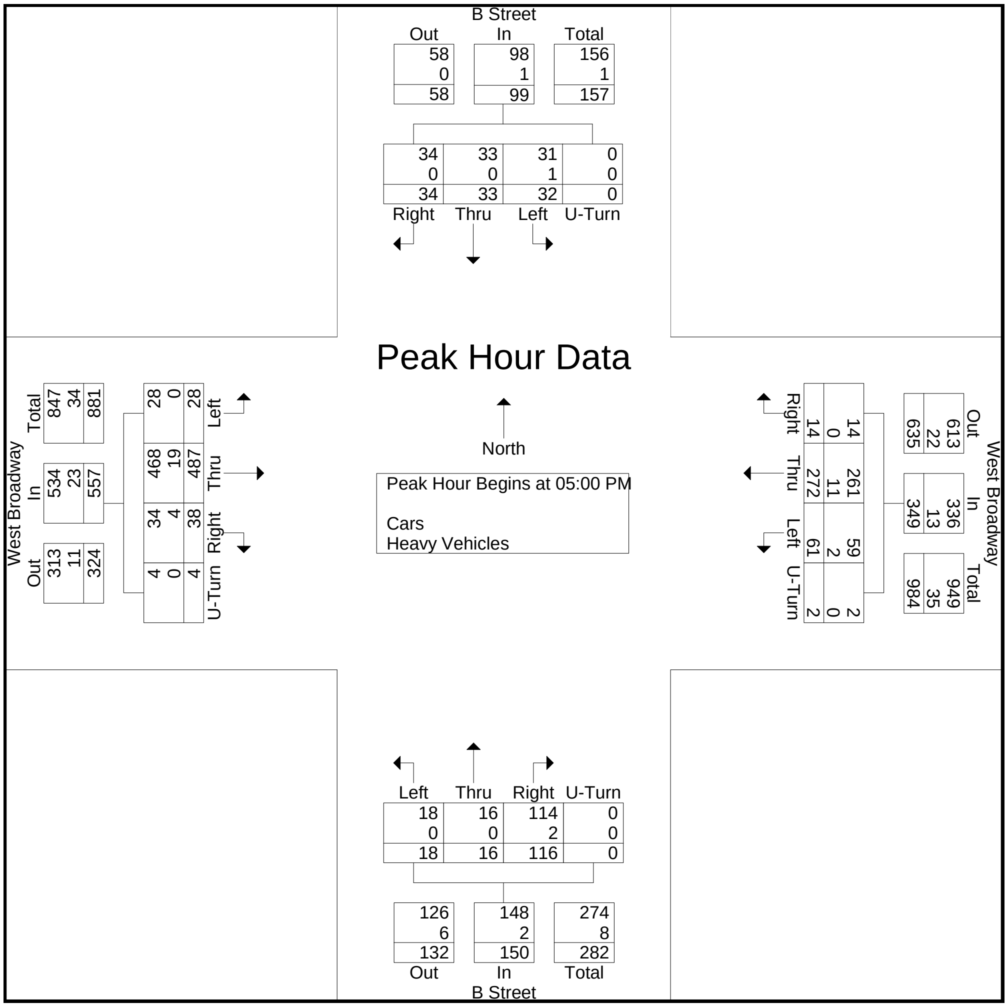
	B Street From North					West Broadway From East					B Street From South					West Broadway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	1	0	18	19	0	2	0	6	8	0	0	0	69	69	0	1	0	9	10	106
05:15 PM	0	0	0	34	34	0	0	0	2	2	0	0	0	75	75	0	1	0	6	7	118
05:30 PM	0	0	0	25	25	0	0	0	5	5	0	0	0	86	86	0	3	0	7	10	126
05:45 PM	0	1	0	37	38	0	3	0	4	7	0	0	0	49	49	0	1	0	11	12	106
Total Volume	0	2	0	114	116	0	5	0	17	22	0	0	0	279	279	0	6	0	33	39	456
% App. Total	0	1.7	0	98.3		0	22.7	0	77.3		0	0	0	100		0	15.4	0	84.6		
PHF	.000	.500	.000	.770	.763	.000	.417	.000	.708	.688	.000	.000	.000	.811	.811	.000	.500	.000	.750	.813	.905

N/S: B Street
E/W: West Broadway
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

	B Street From North					West Broadway From East					B Street From South					West Broadway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
05:00 PM	12	13	8	0	33	3	73	10	0	86	27	5	2	0	34	7	130	8	0	145	298
05:15 PM	6	7	7	0	20	3	59	23	0	85	34	2	4	0	40	12	104	5	1	122	267
05:30 PM	4	5	7	0	16	6	74	15	0	95	25	3	6	0	34	6	127	10	1	144	289
05:45 PM	12	8	10	0	30	2	66	13	2	83	30	6	6	0	42	13	126	5	2	146	301
Total Volume	34	33	32	0	99	14	272	61	2	349	116	16	18	0	150	38	487	28	4	557	1155
% App. Total	34.3	33.3	32.3	0		4	77.9	17.5	0.6		77.3	10.7	12	0		6.8	87.4	5	0.7		
PHF	.708	.635	.800	.000	.750	.583	.919	.663	.250	.918	.853	.667	.750	.000	.893	.731	.937	.700	.500	.954	.959
Cars	34	33	31	0	98	14	261	59	2	336	114	16	18	0	148	34	468	28	4	534	1116
% Cars	100	100	96.9	0	99.0	100	96.0	96.7	100	96.3	98.3	100	100	0	98.7	89.5	96.1	100	100	95.9	96.6
Heavy Vehicles	0	0	1	0	1	0	11	2	0	13	2	0	0	0	2	4	19	0	0	23	39
% Heavy Vehicles	0	0	3.1	0	1.0	0	4.0	3.3	0	3.7	1.7	0	0	0	1.3	10.5	3.9	0	0	4.1	3.4



TRIP GENERATION CALCULATIONS

South Boston Apartments

Detailed Trip Generation Estimation

Howard/Stein-Hudson Associates
June 18, 2013

Component	Size	Category	Trip Rates (Trips/ksf or unit)	Unadjusted Vehicle Trips	Capture Rate	Less capture trips	Assumed national vehicle occupancy rate[1]	**Converted to Person trips**	Transit Share[2]	**Transit Trips**	Walk/Bike/ Other Share[2]	**Walk/ Bike/ Other Trips**	Vehicle Share[2]	Vehicle Person Trips	Assumed local vehicle occupancy rate[3]	**Total Adjusted Vehicle Trips**
Daily																
Residential -- Apartments	180	Total	6.75	1214		1214	1.2	**1,457**	23%	**335**	24%	**350**	53%	772	1.1	**702**
	Units	In	3.37	607		607	1.2	**729**	23%	**168**	24%	**175**	53%	386	1.1	**351**
		Out	3.37	607		607	1.2	**729**	23%	**168**	24%	**175**	53%	386	1.1	**351**
Retail [5]	1.00	Total	64.03	64	25%	48	1.8	**86**	15%	**13**	24%	**20**	61%	53	1.8	**29**
	KSF	In	32.02	32	25%	24	1.8	**43**	15%	**6**	24%	**10**	61%	26	1.8	**15**
		Out	32.02	32	25%	24	1.8	**43**	15%	**7**	24%	**10**	61%	26	1.8	**15**
Total		Total		1,278		1,262		1,544		348		370		825		**731**
		In		639		631		772		174		185		413		**366**
		Out		639		631		772		174		184		413		**366**
AM Peak Hour																
Residential -- Apartments	180	Total	0.51	92		92	1.2	**110**		**29**		**31**		50	1.1	**45**
	Units	In	0.10	18		18	1.2	**22**	29%	**6**	22%	**5**	49%	11	1.1	**10**
		Out	0.41	74		74	1.2	**88**	26%	**23**	30%	**26**	44%	39	1.1	**35**
Retail [5]	1.00	Total	3.81	4	25%	3	1.8	**5**		**1**		**1**		3	1.8	**2**
	KSF	In	1.83	2	25%	1	1.8	**3**	29%	**1**	22%	**1**	49%	1	1.8	**1**
		Out	1.98	2	25%	1	1.8	**3**	14%	**0**	27%	**1**	59%	2	1.8	**1**
Total		Total		96		95		115		30		33		52		**47**
		In		20		20		25		7		5		12		**11**
		Out		75		75		91		23		27		40		**36**
PM Peak Hour																
Residential -- Apartments	180	Total	0.65	117		117	1.2	**140**		**38**		**38**		64	1.1	**58**
	Units	In	0.42	76		76	1.2	**91**	26%	**24**	30%	**27**	44%	40	1.1	**36**
		Out	0.23	41		41	1.2	**49**	29%	**14**	22%	**11**	49%	24	1.1	**22**
Retail [5]	1.00	Total	6.82	7	25%	5	1.8	**9**		**2**		**2**		5	1.8	**3**
	KSF	In	3.82	3	25%	3	1.8	**5**	25%	**1**	30%	**1**	45%	2	1.8	**1**
		Out	3.00	3	25%	3	1.8	**5**	15%	**1**	20%	**1**	65%	3	1.8	**2**
Total		Total		123		122		149		40		40		69		**61**
		In		79		78		96		25		29		42		**38**
		Out		44		43		54		15		12		27		**23**

Notes:

1. 2001 National vehicle occupancy rates - 1.2: Home to work; 1.8: Retail
2. Mode shares based on 2000 Census data and BTD Data for Area 8
3. Local vehicle occupancy rates based on 2000 Census data and 2001 National VOR.
4. ITE Trip Generation Equation, 9th Edition, LUC 220 (Apartment), fitted equation
5. ITE Trip Generation Rate, 9th Edition, LUC 814 (Variety Store), average rate

INTERSECTION CAPACITY ANALYSIS WORKSHEETS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰		↱	↰	↱			↰			↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	13	16	16	16	16	16	16	16	16
Storage Length (ft)	0		0	40		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50		50	50			50	
Trailing Detector (ft)	0		0	0	0		0	0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1773	0	1777	1776	2035	0	0	2097	0	0	2001	0
Flt Permitted	0.532			0.950				0.971				
Satd. Flow (perm)	981	0	1703	1738	2035	0	0	2040	0	0	2001	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			20		37						32	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		133			366			108			244	
Travel Time (s)		3.0			8.3			2.5			5.5	
Volume (vph)	41	0	10	131	148	47	23	426	0	0	282	58
Confl. Peds. (#/hr)	11		13	13		11	35		72	72		35
Confl. Bikes (#/hr)						2			13			3
Peak Hour Factor	0.73	0.92	0.50	0.73	0.74	0.69	0.82	0.85	0.92	0.92	0.88	0.81
Heavy Vehicles (%)	12%	0%	0%	5%	1%	0%	9%	2%	0%	0%	2%	12%
Adj. Flow (vph)	56	0	20	179	200	68	28	501	0	0	320	72
Lane Group Flow (vph)	56	0	20	179	268	0	0	529	0	0	392	0
Turn Type	D.Pm		custom	Split			custom					
Protected Phases				2	2							
Permitted Phases	2		2				1	1			1	
Detector Phases	2		2	2	2		1	1			1	
Minimum Initial (s)	8.0		8.0	8.0	8.0		4.0	4.0			4.0	
Minimum Split (s)	21.0		21.0	21.0	21.0		29.0	29.0			29.0	
Total Split (s)	21.0	0.0	21.0	21.0	21.0	0.0	29.0	29.0	0.0	0.0	29.0	0.0
Total Split (%)	42.0%	0.0%	42.0%	42.0%	42.0%	0.0%	58.0%	58.0%	0.0%	0.0%	58.0%	0.0%
Maximum Green (s)	16.0		16.0	16.0	16.0		25.0	25.0			25.0	
Yellow Time (s)	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		1.0	1.0			1.0	
Lead/Lag	Lag		Lag	Lag	Lag		Lead	Lead			Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	None		None	None	None		C-Max	C-Max			C-Max	
Walk Time (s)	7.0		7.0	7.0	7.0		17.0	17.0			17.0	
Flash Dont Walk (s)	8.0		8.0	8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	36		36	36	36		8	8			8	
Act Effct Green (s)	12.3		12.3	12.3	12.3			29.7			29.7	
Actuated g/C Ratio	0.25		0.25	0.25	0.25			0.59			0.59	
v/c Ratio	0.23		0.05	0.41	0.51			0.44			0.33	
Control Delay	16.2		6.5	17.8	16.7			6.5			6.3	
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0	
Total Delay	16.2		6.5	17.8	16.7			6.5			6.3	
LOS	B		A	B	B			A			A	
Approach Delay					17.2			6.5			6.3	
Approach LOS					B			A			A	
Queue Length 50th (ft)	13		0	45	59			71			41	
Queue Length 95th (ft)	25		4	59	74			180			102	
Internal Link Dist (ft)		53			286			28			164	
Turn Bay Length (ft)				40								
Base Capacity (vph)	334		592	604	716			1212			1202	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		0	0	0			0			0	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	0.17		0.03	0.30	0.37			0.44			0.33	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 8 (16%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 10.1 Intersection LOS: B
Intersection Capacity Utilization 69.3% ICU Level of Service C
Analysis Period (min) 15

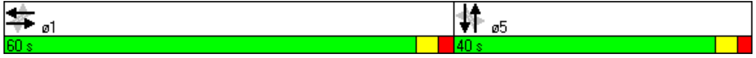
Splits and Phases: 1: West 2nd Street & A Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1667	0	0	1748	0	0	1706	0	1719	1696	0
Flt Permitted		0.821			0.863			0.959		0.311		
Satd. Flow (perm)	0	1364	0	0	1467	0	0	1631	0	563	1696	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8			11			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			549			290			178	
Travel Time (s)		11.9			12.5			6.6			4.0	
Volume (vph)	61	289	26	86	404	45	24	336	69	62	292	36
Confl. Peds. (#/hr)	87		258	258		87	78		75	75		78
Confl. Bikes (#/hr)			3			2			8			3
Peak Hour Factor	0.76	0.90	0.81	0.86	0.91	0.80	0.75	0.90	0.86	0.74	0.99	0.60
Heavy Vehicles (%)	5%	7%	12%	16%	1%	0%	0%	4%	7%	5%	5%	3%
Adj. Flow (vph)	80	321	32	100	444	56	32	373	80	84	295	60
Lane Group Flow (vph)	0	433	0	0	600	0	0	485	0	84	355	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phases	1	1		1	1		5	5		5	5	
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		22.0	22.0		22.0	22.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	60.0%	60.0%	0.0%	60.0%	60.0%	0.0%	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	115	115		115	115		51	51		51	51	
Act Effct Green (s)		56.0			56.0			36.0		36.0	36.0	
Actuated g/C Ratio		0.56			0.56			0.36		0.36	0.36	
v/c Ratio		0.56			0.73			0.82		0.41	0.57	
Control Delay		17.5			22.5			41.2		31.9	28.9	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		17.5			22.5			41.2		31.9	28.9	
LOS		B			C			D		C	C	
Approach Delay		17.5			22.5			41.2			29.4	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)		165			264			271		36	155	
Queue Length 95th (ft)		258			409			#443		70	294	
Internal Link Dist (ft)		443			469			210			98	
Turn Bay Length (ft)												
Base Capacity (vph)		767			825			594		203	618	
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		0.56			0.73			0.82		0.41	0.57	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 24 (24%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 27.6 Intersection LOS: C
Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: West Broadway & A Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰↑↱			↑↱			↰↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	21	15	8	0	24	0	415	22	51	372	0
Peak Hour Factor	0.75	0.75	0.63	0.50	0.92	0.86	0.92	0.86	0.55	0.64	0.88	0.92
Hourly flow rate (vph)	12	28	24	16	0	28	0	483	40	80	423	0
Pedestrians		60			63			8			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			5			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								364			108	
pX, platoon unblocked	0.86	0.86	0.91	0.86	0.86	0.81	0.91			0.81		
vC, conflicting volume	1179	1228	491	1193	1208	572	483			586		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1054	1112	442	1072	1088	474	433			491		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	91	81	96	85	100	94	100			90		
cM capacity (veh/h)	134	147	534	107	152	456	986			819		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	64	44	523	502
Volume Left	12	16	0	80
Volume Right	24	28	40	0
cSH	196	208	1700	819
Volume to Capacity	0.32	0.21	0.31	0.10
Queue Length 95th (ft)	33	19	0	8
Control Delay (s)	31.9	26.8	0.0	2.6
Lane LOS	D	D		A
Approach Delay (s)	31.9	26.8	0.0	2.6
Approach LOS	D	D		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

3: Athens Street & A Street

2013 Existing AM Peak Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					✣			✣			✣	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	1	0	6	415	1	0	401	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.25	0.92	0.75	0.95	0.25	0.25	0.95	0.88
Hourly flow rate (vph)	0	0	0	0	4	0	8	437	4	0	422	8
Pedestrians		104			48			2			3	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			4			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								178			294	
pX, platoon unblocked	0.78	0.78	0.99	0.78	0.78	0.78	0.99			0.78		
vC, conflicting volume	990	1035	532	931	1037	490	534			489		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	976	1033	529	900	1036	345	531			344		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	100	99			100		
cM capacity (veh/h)	172	175	549	189	174	524	1040			917		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	449	430
Volume Left	0	8	0
Volume Right	0	4	8
cSH	174	1040	917
Volume to Capacity	0.02	0.01	0.00
Queue Length 95th (ft)	2	1	0
Control Delay (s)	26.2	0.2	0.0
Lane LOS	D	A	
Approach Delay (s)	26.2	0.2	0.0
Approach LOS	D		

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		37.7%	ICU Level of Service	A
Analysis Period (min)		15		

5: West 3rd Street & B Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱						↰↑↱			↰↑↱	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	69	18	0	0	0	45	0	28	12	49	7
Peak Hour Factor	0.92	0.82	0.64	0.92	0.92	0.92	0.66	0.92	0.70	0.75	0.64	0.58
Hourly flow rate (vph)	0	84	28	0	0	0	68	0	40	16	77	12

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	112	108	105
Volume Left (vph)	0	68	16
Volume Right (vph)	28	40	12
Hadj (s)	-0.07	-0.03	0.09
Departure Headway (s)	4.3	4.2	4.4
Degree Utilization, x	0.13	0.13	0.13
Capacity (veh/h)	796	817	800
Control Delay (s)	8.0	7.9	8.0
Approach Delay (s)	8.0	7.9	8.0
Approach LOS	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	335	34	103	468	28	19	29	117	17	30	31
Peak Hour Factor	0.63	0.92	0.71	0.82	0.95	0.58	0.53	0.81	0.91	0.71	0.47	0.86
Hourly flow rate (vph)	24	364	48	126	493	48	36	36	129	24	64	36
Pedestrians		49			12			272			148	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			23			12	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		549										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	689			684			1593	1648	672	1510	1648	714
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	689			669			1621	1679	657	1534	1678	714
tC, single (s)	4.2			4.2			7.1	6.6	6.3	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.5	4.1	3.4	3.5	4.1	3.4
p0 queue free %	97			81			0	23	61	0	0	90
cM capacity (veh/h)	751			650			0	47	331	12	45	348

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	436	667	200	124
Volume Left	24	126	36	24
Volume Right	48	48	129	36
cSH	751	650	0	36
Volume to Capacity	0.03	0.19	Err	3.47
Queue Length 95th (ft)	2	18	Err	Err
Control Delay (s)	0.9	5.0	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	0.9	5.0	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰		↱	↰	↱			↰			↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	13	16	16	16	16	16	16	16	16
Storage Length (ft)	0		0	40		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50		50	50			50	
Trailing Detector (ft)	0		0	0	0		0	0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1986	0	1777	1847	2012	0	0	2149	0	0	2029	0
Flt Permitted	0.445			0.950				0.966				
Satd. Flow (perm)	895	0	1666	1767	2012	0	0	2079	0	0	2029	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			4		12						27	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			366			120			244	
Travel Time (s)		6.1			8.3			2.7			5.5	
Volume (vph)	50	0	3	118	143	27	6	228	0	0	594	142
Confl. Peds. (#/hr)	19		12	12		19	42		79	79		42
Confl. Bikes (#/hr)						3			5			23
Peak Hour Factor	0.80	0.92	0.75	0.77	0.83	0.58	0.50	0.88	0.92	0.92	0.96	0.89
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	0%	0%	2%	2%	1%	5%
Adj. Flow (vph)	62	0	4	153	172	47	12	259	0	0	619	160
Lane Group Flow (vph)	62	0	4	153	219	0	0	271	0	0	779	0
Turn Type	D.Pm		custom	Split			custom					
Protected Phases				2	2							
Permitted Phases	2		2				1	1			1	
Detector Phases	2		2	2	2		1	1			1	
Minimum Initial (s)	8.0		8.0	8.0	8.0		4.0	4.0			4.0	
Minimum Split (s)	29.0		29.0	29.0	29.0		78.0	78.0			78.0	
Total Split (s)	30.0	0.0	30.0	30.0	30.0	0.0	78.0	78.0	0.0	0.0	78.0	0.0
Total Split (%)	27.8%	0.0%	27.8%	27.8%	27.8%	0.0%	72.2%	72.2%	0.0%	0.0%	72.2%	0.0%
Maximum Green (s)	25.0		25.0	25.0	25.0		74.0	74.0			74.0	
Yellow Time (s)	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		1.0	1.0			1.0	
Lead/Lag	Lag		Lag	Lag	Lag		Lead	Lead			Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	None		None	None	None		C-Max	C-Max			C-Max	
Walk Time (s)	7.0		7.0	7.0	7.0		66.0	66.0			66.0	
Flash Dont Walk (s)	8.0		8.0	8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	40		40	40	40		10	10			10	
Act Effct Green (s)	17.1		17.1	17.1	17.1			82.9			82.9	
Actuated g/C Ratio	0.16		0.16	0.16	0.16			0.77			0.77	
v/c Ratio	0.44		0.01	0.52	0.67			0.17			0.50	
Control Delay	49.4		22.0	47.3	49.8			4.1			6.4	
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0	
Total Delay	49.4		22.0	47.3	49.8			4.1			6.4	
LOS	D		C	D	D			A			A	
Approach Delay					48.8			4.1			6.4	
Approach LOS					D			A			A	
Queue Length 50th (ft)	39		0	99	137			41			158	
Queue Length 95th (ft)	68		7	128	183			82			301	
Internal Link Dist (ft)		187			286			40			164	
Turn Bay Length (ft)				40								
Base Capacity (vph)	215		404	445	493			1596			1564	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		4	4	0			0			29	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	0.29		0.01	0.35	0.44			0.17			0.51	

Intersection Summary

Area Type: Other

Cycle Length: 108

Actuated Cycle Length: 108

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

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 18.4 Intersection LOS: B

Intersection Capacity Utilization 89.2% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: West 2nd Street & A Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1700	0	0	1696	0	0	1734	0	1752	1803	0
Flt Permitted		0.904			0.762			0.902		0.522		
Satd. Flow (perm)	0	1516	0	0	1306	0	0	1570	0	891	1803	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			8			23			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		510			554			291			182	
Travel Time (s)		11.6			12.6			6.6			4.1	
Volume (vph)	40	361	25	82	246	29	19	181	56	95	506	44
Confl. Peds. (#/hr)	147		320	320		147	87		52	52		87
Confl. Bikes (#/hr)			9			6			1			11
Peak Hour Factor	0.67	0.96	0.57	0.93	0.90	0.66	0.68	0.87	0.74	0.79	0.94	0.73
Heavy Vehicles (%)	3%	4%	0%	7%	2%	3%	0%	1%	2%	3%	1%	0%
Adj. Flow (vph)	60	376	44	88	273	44	28	208	76	120	538	60
Lane Group Flow (vph)	0	480	0	0	405	0	0	312	0	120	598	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phases	1	1		1	1		5	5		5	5	
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (s)	46.0	46.0	0.0	46.0	46.0	0.0	54.0	54.0	0.0	54.0	54.0	0.0
Total Split (%)	46.0%	46.0%	0.0%	46.0%	46.0%	0.0%	54.0%	54.0%	0.0%	54.0%	54.0%	0.0%
Maximum Green (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	156	156		156	156		46	46		46	46	
Act Effct Green (s)		42.0			42.0			50.0		50.0	50.0	
Actuated g/C Ratio		0.42			0.42			0.50		0.50	0.50	
v/c Ratio		0.75			0.73			0.39		0.27	0.66	
Control Delay		33.1			33.2			16.1		16.5	22.8	
Queue Delay		0.0			0.0			0.0		0.0	4.3	
Total Delay		33.1			33.2			16.1		16.5	27.0	
LOS		C			C			B		B	C	
Approach Delay		33.1			33.2			16.1			25.3	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		250			207			109		42	269	
Queue Length 95th (ft)		381			331			166		69	392	
Internal Link Dist (ft)		430			474			211			102	
Turn Bay Length (ft)												
Base Capacity (vph)		640			553			797		446	906	
Starvation Cap Reductn		0			0			0		0	228	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.75			0.73			0.39		0.27	0.88	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

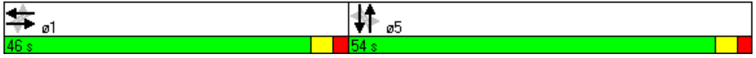
Maximum v/c Ratio: 0.75

Intersection Signal Delay: 27.4 Intersection LOS: C

Intersection Capacity Utilization 81.3% ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: West Broadway & A Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			↱			↰	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	28	14	3	0	11	0	221	23	76	638	0
Peak Hour Factor	0.75	0.78	0.70	0.25	0.92	0.69	0.92	0.97	0.82	0.73	0.91	0.92
Hourly flow rate (vph)	4	36	20	12	0	16	0	228	28	104	701	0
Pedestrians		63			82			2			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			7			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								358			120	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1238	1310	766	1273	1296	332	764			338		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1278	1363	727	1319	1346	332	724			338		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	65	94	81	100	98	100			91		
cM capacity (veh/h)	96	102	346	63	105	661	719			1148		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	28	256	805
Volume Left	4	12	0	104
Volume Right	20	16	28	0
cSH	133	131	1700	1148
Volume to Capacity	0.45	0.21	0.15	0.09
Queue Length 95th (ft)	50	19	0	7
Control Delay (s)	52.5	39.9	0.0	2.2
Lane LOS	F	E		A
Approach Delay (s)	52.5	39.9	0.0	2.2
Approach LOS	F	E		

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	1	10	329	1	0	631	4
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.50	0.89	0.25	0.25	0.94	0.50
Hourly flow rate (vph)	0	0	0	0	0	4	20	370	4	0	671	8
Pedestrians		115			96			6			8	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			8			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								182			296	
pX, platoon unblocked	0.92	0.92	0.88	0.92	0.92	0.93	0.88			0.93		
vC, conflicting volume	1214	1300	796	1189	1302	476	794			470		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1111	1204	769	1084	1207	433	767			427		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	97			100		
cM capacity (veh/h)	157	153	355	152	152	530	755			973		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	394	679
Volume Left	0	20	0
Volume Right	4	4	8
cSH	530	755	973
Volume to Capacity	0.01	0.03	0.00
Queue Length 95th (ft)	1	2	0
Control Delay (s)	11.8	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱						✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	111	40	0	0	0	14	0	33	11	56	3
Peak Hour Factor	0.25	0.77	0.77	0.92	0.92	0.92	0.70	0.25	0.83	0.55	0.67	0.38
Hourly flow rate (vph)	0	144	52	0	0	0	20	0	40	20	84	8

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	196	60	111
Volume Left (vph)	0	20	20
Volume Right (vph)	52	40	8
Hadj (s)	-0.11	-0.33	0.02
Departure Headway (s)	4.2	4.1	4.4
Degree Utilization, x	0.23	0.07	0.14
Capacity (veh/h)	830	819	768
Control Delay (s)	8.4	7.4	8.1
Approach Delay (s)	8.4	7.4	8.1
Approach LOS	A	A	A

Intersection Summary			
Delay	8.2		
HCM Level of Service	A		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	32	487	38	63	272	14	18	16	116	32	33	34
Peak Hour Factor	0.70	0.94	0.73	0.66	0.92	0.58	0.75	0.67	0.85	0.80	0.63	0.71
Hourly flow rate (vph)	46	518	52	95	296	24	24	24	136	40	52	48
Pedestrians		33			17			279			114	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			23			10	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		554										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	434			849			1520	1539	840	1414	1553	455
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434			816			1634	1657	805	1504	1674	455
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			81			0	45	42	0	0	91
cM capacity (veh/h)	1029			508			0	44	237	12	43	537

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	616	415	184	140
Volume Left	46	95	24	40
Volume Right	52	24	136	48
cSH	1029	508	0	30
Volume to Capacity	0.04	0.19	Err	4.73
Queue Length 95th (ft)	3	17	Err	Err
Control Delay (s)	1.2	5.6	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	1.2	5.6	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

1: West 2nd Street & A Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰		↱	↰	↱			↰			↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	13	16	16	16	16	16	16	16	16
Storage Length (ft)	0		0	40		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50		50	50			50	
Trailing Detector (ft)	0		0	0	0		0	0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1773	0	1777	1776	2040	0	0	2101	0	0	2026	0
Flt Permitted	0.595			0.950				0.976				
Satd. Flow (perm)	1096	0	1703	1738	2040	0	0	2054	0	0	2026	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			12		34						24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		133			366			108			244	
Travel Time (s)		3.0			8.3			2.5			5.5	
Volume (vph)	51	0	11	138	156	49	24	590	0	0	369	61
Confl. Peds. (#/hr)	11		13	13		11	35		72	72		35
Confl. Bikes (#/hr)						2			13			3
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 (%)	12%	0%	0%	5%	1%	0%	9%	2%	0%	0%	2%	12%
Adj. Flow (vph)	55	0	12	150	170	53	26	641	0	0	401	66
Lane Group Flow (vph)	55	0	12	150	223	0	0	667	0	0	467	0
Turn Type	D.Pm		custom	Split			custom					
Protected Phases				2	2							
Permitted Phases	2		2				1	1			1	
Detector Phases	2		2	2	2		1	1			1	
Minimum Initial (s)	8.0		8.0	8.0	8.0		4.0	4.0			4.0	
Minimum Split (s)	21.0		21.0	21.0	21.0		29.0	29.0			29.0	
Total Split (s)	21.0	0.0	21.0	21.0	21.0	0.0	29.0	29.0	0.0	0.0	29.0	0.0
Total Split (%)	42.0%	0.0%	42.0%	42.0%	42.0%	0.0%	58.0%	58.0%	0.0%	0.0%	58.0%	0.0%
Maximum Green (s)	16.0		16.0	16.0	16.0		25.0	25.0			25.0	
Yellow Time (s)	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		1.0	1.0			1.0	
Lead/Lag	Lag		Lag	Lag	Lag		Lead	Lead			Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	None		None	None	None		C-Max	C-Max			C-Max	
Walk Time (s)	7.0		7.0	7.0	7.0		17.0	17.0			17.0	
Flash Dont Walk (s)	8.0		8.0	8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	36		36	36	36		8	8			8	
Act Effct Green (s)	11.6		11.6	11.6	11.6			30.4			30.4	
Actuated g/C Ratio	0.23		0.23	0.23	0.23			0.61			0.61	
v/c Ratio	0.22		0.03	0.36	0.45			0.53			0.38	
Control Delay	16.4		7.5	17.8	16.1			6.2			6.5	
Queue Delay	0.0		0.0	0.1	0.0			0.0			0.0	
Total Delay	16.4		7.5	17.9	16.1			6.2			6.5	
LOS	B		A	B	B			A			A	
Approach Delay					16.8			6.2			6.5	
Approach LOS					B			A			A	
Queue Length 50th (ft)	13		0	38	48			72			50	
Queue Length 95th (ft)	32		8	67	83			m163			127	
Internal Link Dist (ft)		53			286			28			164	
Turn Bay Length (ft)				40								
Base Capacity (vph)	373		587	604	716			1249			1241	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		39	40	0			0			0	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	0.15		0.02	0.27	0.31			0.53			0.38	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 8 (16%), Referenced to phase 1:NBSB, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 9.2   Intersection LOS: A

Intersection Capacity Utilization 79.0%   ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 1: West 2nd Street & A Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1688	0	0	1758	0	0	1707	0	1719	1610	0
Flt Permitted		0.576			0.837			0.807		0.305		
Satd. Flow (perm)	0	966	0	0	1450	0	0	1382	0	552	1610	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			7			11			24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			549			290			178	
Travel Time (s)		11.9			12.5			6.6			4.0	
Volume (vph)	206	304	27	90	427	47	25	353	73	66	307	130
Confl. Peds. (#/hr)	87		258	258		87	78		75	75		78
Confl. Bikes (#/hr)			3			2			8			3
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%	7%	12%	16%	1%	0%	0%	4%	7%	5%	5%	3%
Adj. Flow (vph)	224	330	29	98	464	51	27	384	79	72	334	141
Lane Group Flow (vph)	0	583	0	0	613	0	0	490	0	72	475	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phases	1	1		1	1		5	5		5	5	
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		22.0	22.0		22.0	22.0	
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	60.0%	60.0%	0.0%	60.0%	60.0%	0.0%	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	115	115		115	115		51	51		51	51	
Act Effct Green (s)		56.0			56.0			36.0		36.0	36.0	
Actuated g/C Ratio		0.56			0.56			0.36		0.36	0.36	
v/c Ratio		1.07			0.75			0.97		0.36	0.80	
Control Delay		83.9			23.8			65.7		30.9	38.3	
Queue Delay		0.0			0.0			0.0		0.0	0.6	
Total Delay		83.9			23.8			65.7		30.9	38.9	
LOS		F			C			E		C	D	
Approach Delay		83.9			23.8			65.7			37.8	
Approach LOS		F			C			E			D	
Queue Length 50th (ft)		~416			277			298		31	217	
Queue Length 95th (ft)		#628			430			#512		83	#419	
Internal Link Dist (ft)		443			469			210			98	
Turn Bay Length (ft)												
Base Capacity (vph)		543			815			505		199	595	
Starvation Cap Reductn		0			0			0		0	15	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		1.07			0.75			0.97		0.36	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 24 (24%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 52.1 Intersection LOS: D

Intersection Capacity Utilization 111.0% ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: West Broadway & A Street

2: West 3rd Street & A Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			↱			↰	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	22	36	8	0	25	0	578	23	54	464	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	24	39	9	0	27	0	628	25	59	504	0
Pedestrians		60			63			8			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			5			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								364			108	
pX, platoon unblocked	0.84	0.84	0.88	0.84	0.84	0.78	0.88			0.78		
vC, conflicting volume	1356	1398	572	1385	1386	710	564			716		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1217	1267	516	1251	1252	629	507			637		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	90	80	92	88	100	92	100			92		
cM capacity (veh/h)	101	118	470	75	120	358	897			694		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	73	36	653	563
Volume Left	10	9	0	59
Volume Right	39	27	25	0
cSH	190	188	1700	694
Volume to Capacity	0.38	0.19	0.38	0.08
Queue Length 95th (ft)	42	17	0	7
Control Delay (s)	35.3	28.7	0.0	2.3
Lane LOS	E	D		A
Approach Delay (s)	35.3	28.7	0.0	2.3
Approach LOS	E	D		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

3: Athens Street & A Street

2019 No Build AM Peak Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	1	0	6	578	1	0	514	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	1	0	7	628	1	0	559	8
Pedestrians		104			48			2			3	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			4			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								178			294	
pX, platoon unblocked	0.81	0.81	0.92	0.81	0.81	0.76	0.92			0.76		
vC, conflicting volume	1312	1357	668	1254	1360	680	670			677		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1230	1286	638	1159	1290	580	640			577		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	99	100	99			100		
cM capacity (veh/h)	120	127	439	130	127	378	874			737		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	636	566
Volume Left	0	7	0
Volume Right	0	1	8
cSH	127	874	737
Volume to Capacity	0.01	0.01	0.00
Queue Length 95th (ft)	1	1	0
Control Delay (s)	33.7	0.2	0.0
Lane LOS	D	A	
Approach Delay (s)	33.7	0.2	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱						✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	73	19	0	0	0	47	0	29	13	51	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	79	21	0	0	0	51	0	32	14	55	8

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	100	83	77
Volume Left (vph)	0	51	14
Volume Right (vph)	21	32	8
Hadj (s)	-0.05	-0.04	0.10
Departure Headway (s)	4.2	4.2	4.3
Degree Utilization, x	0.12	0.10	0.09
Capacity (veh/h)	825	832	811
Control Delay (s)	7.8	7.6	7.7
Approach Delay (s)	7.8	7.6	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	7.7		
HCM Level of Service	A		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

6: West Broadway & B Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	353	36	108	494	29	20	30	123	18	32	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	384	39	117	537	32	22	33	134	20	35	36
Pedestrians		49			12			272			148	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			23			12	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		549										
pX, platoon unblocked												
vC, conflicting volume	716			695			1600	1661	687	1536	1665	750
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	716			695			1600	1661	687	1536	1665	750
tC, single (s)	4.2			4.2			7.1	6.6	6.3	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.5	4.1	3.4	3.5	4.1	3.4
p0 queue free %	98			82			0	37	60	0	30	89
cM capacity (veh/h)	733			665			17	52	333	17	50	331

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	440	686	188	90
Volume Left	17	117	22	20
Volume Right	39	32	134	36
cSH	733	665	81	46
Volume to Capacity	0.02	0.18	2.31	1.98
Queue Length 95th (ft)	2	16	435	231
Control Delay (s)	0.7	4.5	710.0	647.9
Lane LOS	A	A	F	F
Approach Delay (s)	0.7	4.5	710.0	647.9
Approach LOS			F	F

Intersection Summary			
Average Delay	139.1		
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰		↱	↰	↱			↰			↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	13	16	16	16	16	16	16	16	16
Storage Length (ft)	0		0	40		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50		50	50			50	
Trailing Detector (ft)	0		0	0	0		0	0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1986	0	1777	1847	2039	0	0	2151	0	0	2058	0
Flt Permitted	0.493			0.950				0.979				
Satd. Flow (perm)	987	0	1666	1767	2039	0	0	2108	0	0	2058	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			3		8						18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			366			120			244	
Travel Time (s)		6.1			8.3			2.7			5.5	
Volume (vph)	65	0	3	124	150	28	6	286	0	0	861	149
Confl. Peds. (#/hr)	19		12	12		19	42		79	79		42
Confl. Bikes (#/hr)						3			5			23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	0%	0%	2%	2%	1%	5%
Adj. Flow (vph)	71	0	3	135	163	30	7	311	0	0	936	162
Lane Group Flow (vph)	71	0	3	135	193	0	0	318	0	0	1098	0
Turn Type	D.Pm		custom	Split			custom					
Protected Phases				2	2							
Permitted Phases	2		2				1	1			1	
Detector Phases	2		2	2	2		1	1			1	
Minimum Initial (s)	8.0		8.0	8.0	8.0		4.0	4.0			4.0	
Minimum Split (s)	29.0		29.0	29.0	29.0		78.0	78.0			78.0	
Total Split (s)	30.0	0.0	30.0	30.0	30.0	0.0	78.0	78.0	0.0	0.0	78.0	0.0
Total Split (%)	27.8%	0.0%	27.8%	27.8%	27.8%	0.0%	72.2%	72.2%	0.0%	0.0%	72.2%	0.0%
Maximum Green (s)	25.0		25.0	25.0	25.0		74.0	74.0			74.0	
Yellow Time (s)	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		1.0	1.0			1.0	
Lead/Lag	Lag		Lag	Lag	Lag		Lead	Lead			Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	None		None	None	None		C-Max	C-Max			C-Max	
Walk Time (s)	7.0		7.0	7.0	7.0		66.0	66.0			66.0	
Flash Dont Walk (s)	8.0		8.0	8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	40		40	40	40		10	10			10	
Act Effct Green (s)	15.9		15.9	15.9	15.9			84.1			84.1	
Actuated g/C Ratio	0.15		0.15	0.15	0.15			0.78			0.78	
v/c Ratio	0.49		0.01	0.50	0.63			0.19			0.68	
Control Delay	52.6		23.7	47.8	50.0			3.9			9.0	
Queue Delay	0.0		0.0	0.2	0.0			0.0			0.7	
Total Delay	52.6		23.7	47.9	50.0			3.9			9.8	
LOS	D		C	D	D			A			A	
Approach Delay					49.2			3.9			9.8	
Approach LOS					D			A			A	
Queue Length 50th (ft)	46		0	87	122			47			289	
Queue Length 95th (ft)	88		8	140	185			92			544	
Internal Link Dist (ft)		187			286			40			164	
Turn Bay Length (ft)				40								
Base Capacity (vph)	238		403	445	497			1641			1607	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		39	43	0			0			218	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	0.30		0.01	0.34	0.39			0.19			0.79	

Intersection Summary

Area Type: Other
Cycle Length: 108
Actuated Cycle Length: 108
Offset: 1 (1%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 17.5 Intersection LOS: B
Intersection Capacity Utilization 89.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: West 2nd Street & A Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1746	0	0	1728	0	0	1749	0	1752	1599	0
Flt Permitted		0.828			0.734			0.471		0.536		
Satd. Flow (perm)	0	1419	0	0	1282	0	0	827	0	911	1599	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			5			20			43	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		510			554			291			182	
Travel Time (s)		11.6			12.6			6.6			4.1	
Volume (vph)	88	379	26	86	261	30	20	190	59	102	532	315
Confl. Peds. (#/hr)	147		320	320		147	87		52	52		87
Confl. Bikes (#/hr)			9			6			1			11
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 (%)	3%	4%	0%	7%	2%	3%	0%	1%	2%	3%	1%	0%
Adj. Flow (vph)	96	412	28	93	284	33	22	207	64	111	578	342
Lane Group Flow (vph)	0	536	0	0	410	0	0	293	0	111	920	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phases	1	1		1	1		5	5		5	5	
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (s)	46.0	46.0	0.0	46.0	46.0	0.0	54.0	54.0	0.0	54.0	54.0	0.0
Total Split (%)	46.0%	46.0%	0.0%	46.0%	46.0%	0.0%	54.0%	54.0%	0.0%	54.0%	54.0%	0.0%
Maximum Green (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	156	156		156	156		46	46		46	46	
Act Effct Green (s)		42.0			42.0			50.0		50.0	50.0	
Actuated g/C Ratio		0.42			0.42			0.50		0.50	0.50	
v/c Ratio		0.90			0.76			0.69		0.24	1.12	
Control Delay		46.9			35.2			28.1		16.0	95.1	
Queue Delay		0.0			0.0			0.0		0.0	65.4	
Total Delay		46.9			35.2			28.1		16.0	160.5	
LOS		D			D			C		B	F	
Approach Delay		46.9			35.2			28.1			145.0	
Approach LOS		D			D			C			F	
Queue Length 50th (ft)		309			215			128		39	~668	
Queue Length 95th (ft)		#522			#353			242		75	#908	
Internal Link Dist (ft)		430			474			211			102	
Turn Bay Length (ft)												
Base Capacity (vph)		598			541			424		456	821	
Starvation Cap Reductn		0			0			0		0	97	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.90			0.76			0.69		0.24	1.27	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 86.9 Intersection LOS: F

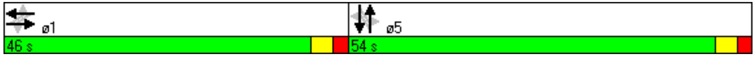
Intersection Capacity Utilization 89.3% ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: West Broadway & A Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			↱			↰	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	29	49	3	0	12	0	278	24	80	908	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	32	53	3	0	13	0	302	26	87	987	0
Pedestrians		63			82			2			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			7			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								358			120	
pX, platoon unblocked	0.72	0.72	0.72	0.72	0.72		0.72					
vC, conflicting volume	1560	1634	1052	1629	1621	405	1050			410		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1773	1875	1072	1868	1857	405	1069			410		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	26	71	65	100	98	100			92		
cM capacity (veh/h)	37	43	185	9	44	601	453			1080		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	88	16	328	1074
Volume Left	3	3	0	87
Volume Right	53	13	26	0
cSH	79	44	1700	1080
Volume to Capacity	1.11	0.37	0.19	0.08
Queue Length 95th (ft)	158	32	0	7
Control Delay (s)	229.1	128.2	0.0	2.2
Lane LOS	F	F		A
Approach Delay (s)	229.1	128.2	0.0	2.2
Approach LOS	F	F		

Intersection Summary			
Average Delay	16.4		
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

3: Athens Street & A Street

2019 No Build PM Peak Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					✣			✣			✣	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	1	11	392	1	0	934	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	1	12	426	1	0	1015	4
Pedestrians		115			96			6			8	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			8			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								182			296	
pX, platoon unblocked	0.77	0.77	0.73	0.77	0.77	0.93	0.73			0.93		
vC, conflicting volume	1592	1679	1138	1570	1681	531	1135			523		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1625	1739	1189	1596	1741	493	1184			485		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	97			100		
cM capacity (veh/h)	58	61	169	56	61	491	438			927		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	439	1020
Volume Left	0	12	0
Volume Right	1	1	4
cSH	491	438	927
Volume to Capacity	0.00	0.03	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	12.4	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	12.4	0.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: West 3rd Street & B Street

13100 :: 45 West 3rd Street
2019 No Build PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↳						✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	117	42	0	0	0	15	0	35	12	59	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	46	0	0	0	16	0	38	13	64	3

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	173	54	80
Volume Left (vph)	0	16	13
Volume Right (vph)	46	38	3
Hadj (s)	-0.11	-0.36	0.04
Departure Headway (s)	4.1	4.0	4.4
Degree Utilization, x	0.20	0.06	0.10
Capacity (veh/h)	853	849	790
Control Delay (s)	8.1	7.3	7.8
Approach Delay (s)	8.1	7.3	7.8
Approach LOS	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	34	514	40	66	288	15	19	17	122	34	35	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	559	43	72	313	16	21	18	133	37	38	39
Pedestrians		33			17			279			114	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			23			10	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		554										
pX, platoon unblocked				0.79			0.79	0.79	0.79	0.79	0.79	
vC, conflicting volume	443			881			1489	1520	876	1392	1534	468
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	443			849			1620	1660	843	1497	1677	468
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			85			0	58	39	0	12	93
cM capacity (veh/h)	1020			475			8	44	217	13	43	527

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	639	401	172	114
Volume Left	37	72	21	37
Volume Right	43	16	133	39
cSH	1020	475	48	29
Volume to Capacity	0.04	0.15	3.61	3.88
Queue Length 95th (ft)	3	13	Err	Err
Control Delay (s)	1.0	4.6	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	1.0	4.6	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	2157.4		
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
13100:: 45 West 3rd Street
1: West 2nd Street & A Street
2019 Build AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰		↱	↰	↱			↰			↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	13	16	16	16	16	16	16	16	16
Storage Length (ft)	0		0	40		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50		50	50			50	
Trailing Detector (ft)	0		0	0	0		0	0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1773	0	1777	1776	2040	0	0	2101	0	0	2027	0
Flt Permitted	0.595			0.950				0.976				
Satd. Flow (perm)	1096	0	1703	1738	2040	0	0	2054	0	0	2027	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			12		34						23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		133			366			108			244	
Travel Time (s)		3.0			8.3			2.5			5.5	
Volume (vph)	51	0	11	138	156	49	24	596	0	0	373	61
Confl. Peds. (#/hr)	11		13	13		11	35		72	72		35
Confl. Bikes (#/hr)						2			13			3
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 (%)	12%	0%	0%	5%	1%	0%	9%	2%	0%	0%	2%	12%
Adj. Flow (vph)	55	0	12	150	170	53	26	648	0	0	405	66
Lane Group Flow (vph)	55	0	12	150	223	0	0	674	0	0	471	0
Turn Type	D.Pm		custom	Split			custom					
Protected Phases				2	2							
Permitted Phases	2		2				1	1			1	
Detector Phases	2		2	2	2		1	1			1	
Minimum Initial (s)	8.0		8.0	8.0	8.0		4.0	4.0			4.0	
Minimum Split (s)	21.0		21.0	21.0	21.0		29.0	29.0			29.0	
Total Split (s)	21.0	0.0	21.0	21.0	21.0	0.0	29.0	29.0	0.0	0.0	29.0	0.0
Total Split (%)	42.0%	0.0%	42.0%	42.0%	42.0%	0.0%	58.0%	58.0%	0.0%	0.0%	58.0%	0.0%
Maximum Green (s)	16.0		16.0	16.0	16.0		25.0	25.0			25.0	
Yellow Time (s)	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		1.0	1.0			1.0	
Lead/Lag	Lag		Lag	Lag	Lag		Lead	Lead			Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	None		None	None	None		C-Max	C-Max			C-Max	
Walk Time (s)	7.0		7.0	7.0	7.0		17.0	17.0			17.0	
Flash Dont Walk (s)	8.0		8.0	8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	36		36	36	36		8	8			8	
Act Effct Green (s)	11.6		11.6	11.6	11.6			30.4			30.4	
Actuated g/C Ratio	0.23		0.23	0.23	0.23			0.61			0.61	
v/c Ratio	0.22		0.03	0.36	0.45			0.54			0.38	
Control Delay	16.4		7.5	17.8	16.1			6.8			6.5	
Queue Delay	0.0		0.0	0.1	0.0			0.0			0.0	
Total Delay	16.4		7.5	17.9	16.1			6.8			6.5	
LOS	B		A	B	B			A			A	
Approach Delay					16.8			6.8			6.5	
Approach LOS					B			A			A	
Queue Length 50th (ft)	13		0	38	48			106			51	
Queue Length 95th (ft)	32		8	67	83			m187			129	
Internal Link Dist (ft)		53			286			28			164	
Turn Bay Length (ft)				40								
Base Capacity (vph)	373		587	604	716			1249			1242	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		45	47	0			0			0	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	0.15		0.02	0.27	0.31			0.54			0.38	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 8 (16%), Referenced to phase 1:NBSB, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 9.4 Intersection LOS: A

Intersection Capacity Utilization 79.3% ICU Level of Service D

Analysis Period (min) 15

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

Splits and Phases: 1: West 2nd Street & A Street

4: West Broadway & A Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1688	0	0	1758	0	0	1708	0	1719	1604	0
Flt Permitted		0.564			0.834			0.841		0.330		
Satd. Flow (perm)	0	971	0	0	1447	0	0	1441	0	597	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			7			11			27	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		523			549			290			178	
Travel Time (s)		11.9			12.5			6.6			4.0	
Volume (vph)	207	304	27	90	427	47	25	356	73	66	317	143
Confl. Peds. (#/hr)	87		258	258		87	78		75	75		78
Confl. Bikes (#/hr)			3			2			8			3
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%	7%	12%	16%	1%	0%	0%	4%	7%	5%	5%	3%
Adj. Flow (vph)	225	330	29	98	464	51	27	387	79	72	345	155
Lane Group Flow (vph)	0	584	0	0	613	0	0	493	0	72	500	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phases	1	1		1	1		5	5		5	5	
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		22.0	22.0		22.0	22.0	
Total Split (s)	57.0	57.0	0.0	57.0	57.0	0.0	43.0	43.0	0.0	43.0	43.0	0.0
Total Split (%)	57.0%	57.0%	0.0%	57.0%	57.0%	0.0%	43.0%	43.0%	0.0%	43.0%	43.0%	0.0%
Maximum Green (s)	52.0	52.0		52.0	52.0		38.0	38.0		38.0	38.0	
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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	115	115		115	115		51	51		51	51	
Act Effct Green (s)		53.0			53.0			39.0		39.0	39.0	
Actuated g/C Ratio		0.53			0.53			0.39		0.39	0.39	
v/c Ratio		1.13			0.80			0.87		0.31	0.78	
Control Delay		105.5			28.4			45.0		26.6	34.8	
Queue Delay		0.0			0.0			0.0		0.0	1.2	
Total Delay		105.5			28.4			45.0		26.6	36.0	
LOS		F			C			D		C	D	
Approach Delay		105.5			28.4			45.0			34.8	
Approach LOS		F			C			D			C	
Queue Length 50th (ft)		~435			299			279		30	227	
Queue Length 95th (ft)		#649			#467			#473		79	#420	
Internal Link Dist (ft)		443			469			210			98	
Turn Bay Length (ft)												
Base Capacity (vph)		517			770			569		233	642	
Starvation Cap Reductn		0			0			0		0	38	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		1.13			0.80			0.87		0.31	0.83	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 24 (24%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 53.6 Intersection LOS: D
Intersection Capacity Utilization 111.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: West Broadway & A Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			↱			↰	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	22	36	31	0	31	0	578	27	58	464	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	24	39	34	0	34	0	628	29	63	504	0
Pedestrians		60			63			8			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			5			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								364			108	
pX, platoon unblocked	0.84	0.84	0.88	0.84	0.84	0.78	0.88			0.78		
vC, conflicting volume	1373	1411	572	1395	1396	712	564			721		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1236	1281	516	1262	1263	630	507			641		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	90	79	92	54	100	91	100			91		
cM capacity (veh/h)	95	114	469	73	117	356	896			689		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	73	67	658	567
Volume Left	10	34	0	63
Volume Right	39	34	29	0
cSH	184	121	1700	689
Volume to Capacity	0.39	0.56	0.39	0.09
Queue Length 95th (ft)	44	67	0	8
Control Delay (s)	36.7	66.7	0.0	2.4
Lane LOS	E	F		A
Approach Delay (s)	36.7	66.7	0.0	2.4
Approach LOS	E	F		

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					✣			✣			✣	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	1	0	6	582	1	0	537	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	1	0	7	633	1	0	584	8
Pedestrians		104			48			2			3	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			4			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								178			294	
pX, platoon unblocked	0.80	0.80	0.92	0.80	0.80	0.76	0.92			0.76		
vC, conflicting volume	1341	1386	694	1284	1390	684	695			682		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1267	1323	665	1195	1327	585	667			582		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	99	100	99			100		
cM capacity (veh/h)	113	121	423	122	120	375	853			732		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	640	591
Volume Left	0	7	0
Volume Right	0	1	8
cSH	120	853	732
Volume to Capacity	0.01	0.01	0.00
Queue Length 95th (ft)	1	1	0
Control Delay (s)	35.3	0.2	0.0
Lane LOS	E	A	
Approach Delay (s)	35.3	0.2	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱						✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	74	20	0	0	0	47	0	29	13	51	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	80	22	0	0	0	51	0	32	14	55	8

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	102	83	77
Volume Left (vph)	0	51	14
Volume Right (vph)	22	32	8
Hadj (s)	-0.05	-0.04	0.10
Departure Headway (s)	4.2	4.2	4.3
Degree Utilization, x	0.12	0.10	0.09
Capacity (veh/h)	825	831	810
Control Delay (s)	7.8	7.6	7.7
Approach Delay (s)	7.8	7.6	7.7
Approach LOS	A	A	A

Intersection Summary			
Delay	7.7		
HCM Level of Service	A		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	353	36	108	494	29	20	30	123	18	32	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	384	39	117	537	32	22	33	134	20	35	36
Pedestrians		49			12			272			148	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		4			1			23			12	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		549										
pX, platoon unblocked												
vC, conflicting volume	716			695			1600	1661	687	1536	1665	750
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	716			695			1600	1661	687	1536	1665	750
tC, single (s)	4.2			4.2			7.1	6.6	6.3	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.5	4.1	3.4	3.5	4.1	3.4
p0 queue free %	98			82			0	37	60	0	30	89
cM capacity (veh/h)	733			665			17	52	333	17	50	331

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	440	686	188	90
Volume Left	17	117	22	20
Volume Right	39	32	134	36
cSH	733	665	81	46
Volume to Capacity	0.02	0.18	2.31	1.98
Queue Length 95th (ft)	2	16	435	231
Control Delay (s)	0.7	4.5	710.0	647.9
Lane LOS	A	A	F	F
Approach Delay (s)	0.7	4.5	710.0	647.9
Approach LOS			F	F

Intersection Summary			
Average Delay	139.1		
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰		↱	↰	↱			↰			↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	13	16	16	16	16	16	16	16	16
Storage Length (ft)	0		0	40		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50		50	50			50	
Trailing Detector (ft)	0		0	0	0		0	0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1986	0	1777	1847	2039	0	0	2151	0	0	2059	0
Flt Permitted	0.493			0.950				0.959				
Satd. Flow (perm)	987	0	1666	1767	2039	0	0	2065	0	0	2059	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			3		8						18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		267			366			120			244	
Travel Time (s)		6.1			8.3			2.7			5.5	
Volume (vph)	65	0	3	124	150	28	6	290	0	0	876	149
Confl. Peds. (#/hr)	19		12	12		19	42		79	79		42
Confl. Bikes (#/hr)						3			5			23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	0%	0%	2%	2%	1%	5%
Adj. Flow (vph)	71	0	3	135	163	30	7	315	0	0	952	162
Lane Group Flow (vph)	71	0	3	135	193	0	0	322	0	0	1114	0
Turn Type	D.Pm		custom	Split			custom					
Protected Phases				2	2							
Permitted Phases	2		2				1	1			1	
Detector Phases	2		2	2	2		1	1			1	
Minimum Initial (s)	8.0		8.0	8.0	8.0		4.0	4.0			4.0	
Minimum Split (s)	29.0		29.0	29.0	29.0		78.0	78.0			78.0	
Total Split (s)	30.0	0.0	30.0	30.0	30.0	0.0	78.0	78.0	0.0	0.0	78.0	0.0
Total Split (%)	27.8%	0.0%	27.8%	27.8%	27.8%	0.0%	72.2%	72.2%	0.0%	0.0%	72.2%	0.0%
Maximum Green (s)	25.0		25.0	25.0	25.0		74.0	74.0			74.0	
Yellow Time (s)	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		1.0	1.0			1.0	
Lead/Lag	Lag		Lag	Lag	Lag		Lead	Lead			Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode	None		None	None	None		C-Max	C-Max			C-Max	
Walk Time (s)	7.0		7.0	7.0	7.0		66.0	66.0			66.0	
Flash Dont Walk (s)	8.0		8.0	8.0	8.0		8.0	8.0			8.0	
Pedestrian Calls (#/hr)	40		40	40	40		10	10			10	
Act Effct Green (s)	15.9		15.9	15.9	15.9			84.1			84.1	
Actuated g/C Ratio	0.15		0.15	0.15	0.15			0.78			0.78	
v/c Ratio	0.49		0.01	0.50	0.63			0.20			0.69	
Control Delay	52.6		23.7	47.8	50.0			3.9			9.3	
Queue Delay	0.0		0.0	0.2	0.0			0.0			0.8	
Total Delay	52.6		23.7	47.9	50.0			3.9			10.1	
LOS	D		C	D	D			A			B	
Approach Delay					49.2			3.9			10.1	
Approach LOS					D			A			B	
Queue Length 50th (ft)	46		0	87	122			48			298	
Queue Length 95th (ft)	88		8	140	185			94			562	
Internal Link Dist (ft)		187			286			40			164	
Turn Bay Length (ft)				40								
Base Capacity (vph)	238		403	445	497			1608			1607	
Starvation Cap Reductn	0		0	0	0			0			0	
Spillback Cap Reductn	0		41	45	0			0			226	
Storage Cap Reductn	0		0	0	0			0			0	
Reduced v/c Ratio	0.30		0.01	0.34	0.39			0.20			0.81	

Intersection Summary

Area Type: Other

Cycle Length: 108

Actuated Cycle Length: 108

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

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 17.7 Intersection LOS: B

Intersection Capacity Utilization 89.4% ICU Level of Service E

Analysis Period (min) 15

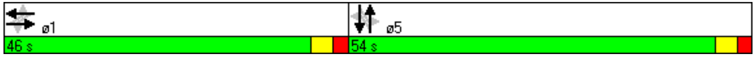
Splits and Phases: 1: West 2nd Street & A Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1746	0	0	1728	0	0	1754	0	1752	1597	0
Flt Permitted		0.820			0.734			0.441		0.526		
Satd. Flow (perm)	0	1405	0	0	1282	0	0	777	0	896	1597	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			5			19			43	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		510			554			291			182	
Travel Time (s)		11.6			12.6			6.6			4.1	
Volume (vph)	92	379	26	86	261	30	20	202	59	102	539	324
Confl. Peds. (#/hr)	147		320	320		147	87		52	52		87
Confl. Bikes (#/hr)			9			6			1			11
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 (%)	3%	4%	0%	7%	2%	3%	0%	1%	2%	3%	1%	0%
Adj. Flow (vph)	100	412	28	93	284	33	22	220	64	111	586	352
Lane Group Flow (vph)	0	540	0	0	410	0	0	306	0	111	938	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phases	1	1		1	1		5	5		5	5	
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
Total Split (s)	46.0	46.0	0.0	46.0	46.0	0.0	54.0	54.0	0.0	54.0	54.0	0.0
Total Split (%)	46.0%	46.0%	0.0%	46.0%	46.0%	0.0%	54.0%	54.0%	0.0%	54.0%	54.0%	0.0%
Maximum Green (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
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	
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		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	156	156		156	156		46	46		46	46	
Act Effct Green (s)		42.0			42.0			50.0		50.0	50.0	
Actuated g/C Ratio		0.42			0.42			0.50		0.50	0.50	
v/c Ratio		0.91			0.76			0.77		0.25	1.14	
Control Delay		49.4			35.2			34.4		16.1	104.1	
Queue Delay		0.0			0.0			0.0		0.0	65.0	
Total Delay		49.4			35.2			34.4		16.1	169.1	
LOS		D			D			C		B	F	
Approach Delay		49.4			35.2			34.4			152.9	
Approach LOS		D			D			C			F	
Queue Length 50th (ft)		315			215			143		39	~693	
Queue Length 95th (ft)		#530			#353			#304		76	#935	
Internal Link Dist (ft)		430			474			211			102	
Turn Bay Length (ft)												
Base Capacity (vph)		592			541			398		448	820	
Starvation Cap Reductn		0			0			0		0	94	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.91			0.76			0.77		0.25	1.29	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 92.0 Intersection LOS: F
Intersection Capacity Utilization 90.8% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: West Broadway & A Street



	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			↱			↰	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	29	49	19	0	16	0	278	40	95	908	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	32	53	21	0	17	0	302	43	103	987	0
Pedestrians		63			82			2			8	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		5			7			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								358			120	
pX, platoon unblocked	0.71	0.71	0.71	0.71	0.71		0.71					
vC, conflicting volume	1606	1684	1052	1670	1662	414	1050			428		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1849	1959	1073	1940	1928	414	1070			428		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	14	71	0	100	97	100			90		
cM capacity (veh/h)	32	37	182	6	38	595	446			1064		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	88	38	346	1090
Volume Left	3	21	0	103
Volume Right	53	17	43	0
cSH	70	10	1700	1064
Volume to Capacity	1.26	3.78	0.20	0.10
Queue Length 95th (ft)	174	Err	0	8
Control Delay (s)	294.1	Err	0.0	2.7
Lane LOS	F	F		A
Approach Delay (s)	294.1	Err	0.0	2.7
Approach LOS	F	F		

Intersection Summary			
Average Delay	262.0		
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					✥			✥			✥	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	1	11	408	1	0	950	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	1	12	443	1	0	1033	4
Pedestrians		115			96			6			8	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			8			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								182			296	
pX, platoon unblocked	0.77	0.77	0.73	0.77	0.77	0.92	0.73			0.92		
vC, conflicting volume	1627	1714	1156	1605	1716	548	1152			541		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1659	1773	1214	1630	1775	508	1209			500		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	97			100		
cM capacity (veh/h)	55	58	161	53	57	478	424			908		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	457	1037
Volume Left	0	12	0
Volume Right	1	1	4
cSH	478	424	908
Volume to Capacity	0.00	0.03	0.00
Queue Length 95th (ft)	0	2	0
Control Delay (s)	12.6	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱						✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	117	43	0	0	0	16	0	35	12	59	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	47	0	0	0	17	0	38	13	64	3

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	174	55	80
Volume Left (vph)	0	17	13
Volume Right (vph)	47	38	3
Hadj (s)	-0.11	-0.35	0.04
Departure Headway (s)	4.1	4.0	4.4
Degree Utilization, x	0.20	0.06	0.10
Capacity (veh/h)	853	846	789
Control Delay (s)	8.1	7.3	7.9
Approach Delay (s)	8.1	7.3	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	7.9		
HCM Level of Service	A		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

6: West Broadway & B Street

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	34	514	40	66	288	16	19	17	122	35	35	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	559	43	72	313	17	21	18	133	38	38	39
Pedestrians		33			17			279			114	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			1			23			10	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		554										
pX, platoon unblocked				0.79			0.79	0.79	0.79	0.79	0.79	
vC, conflicting volume	444			881			1490	1521	876	1392	1534	469
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			849			1622	1662	843	1498	1679	469
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			85			0	58	39	0	11	93
cM capacity (veh/h)	1019			474			8	44	217	13	43	527

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	639	402	172	115
Volume Left	37	72	21	38
Volume Right	43	17	133	39
cSH	1019	474	47	29
Volume to Capacity	0.04	0.15	3.67	4.00
Queue Length 95th (ft)	3	13	Err	Err
Control Delay (s)	1.0	4.6	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	1.0	4.6	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	2162.0		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix C

Air Quality

AIR QUALITY APPENDIX

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale 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 2018 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 370 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.

East Berkeley 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**	**2018**	**Units**
Idle	46.840	42.335	g/hr
2.5 mph	18.736	16.934	g/mile
10 mph	10.195	9.284	g/mile
15 mph	9.193	8.380	g/mile
30 mph	8.237	7.521	g/mile

Note: Winter CO emission factors are higher than Summer and are conservatively used

45 W. Third Street, Boston, MA
Background Concentrations

Background Concentrations								
POLLUTANT	AVERAGING TIME	2010	2011	2012	Units	ppb or ppm to µg/m³ Conversion Factor	Background Concentration (µg/m³)	Location
SO_2 (1)(7)(8)	1-Hour	24.3	35.9	21.3	ppb	2.6	93.3	Harrison Ave., Boston
	3-Hour	24	21	28	ppb	2.6	72.8	Harrison Ave., Boston
	24-Hour	8.8	12.9	7.9	ppb	2.6	33.5	Harrison Ave., Boston
	Annual	1.6	1.26	1.12	ppb	2.6	4.2	Harrison Ave., Boston
PM-10	24-Hour	50	42	72	µg/m³	1	72.0	Harrison Ave., Boston
	Annual	14.1	14.8	14.1	µg/m³	1	14.8	Harrison Ave., Boston
PM-2.5	24-Hour (4)	22.5	20.9	20.6	µg/m³	1	21.3	Harrison Ave., Boston
	Annual (5)	8.25	8.48	8.27	µg/m³	1	8.3	Harrison Ave., Boston
NO_2 (3)	1-Hour (6)	62	74	67	ppb	1.88	139.1	Harrison Ave., Boston
	Annual	17.05	18.49	15.8	ppb	1.88	34.8	Harrison Ave., Boston
CO (2)	1-Hour	2.9	2.5	2.3	ppm	1140	3306	Harrison Ave., Boston
	8-Hour	2.1	1.9	1.9	ppm	1140	2394	Harrison Ave., Boston

Notes: From 2007-2011 MA DEP Annual Data Summaries

[1] SO_2 reported in ppm or ppb. Converted to µg/m^3 using factor of 1 ppb = 2.6 µg/m^3.

[2] CO reported in ppm. Converted to µg/m^3 using factor of 1 ppm = 1140 µg/m^3.

[3] NO_2 reported in ppm or ppb. Converted to µg/m^3 using factor of 1 ppb = 1.88 µg/m^3.

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

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

[6] Maximum annual 1-hr concentrations.

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

[8] The 2010 - 2012 SO_2 3-hr value is not reported. Years 2007-2009 used instead.

Model Input/Output Files

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

Appendix D

Climate Change Resilience Checklist

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

A.1 - Project Information

Project Name:	45 West Third Street
Project Address Primary:	45 West Third Street
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Daniel St. Clair/Managing Director/Spaulding & Slye Investments/617-531-4244

A.2 - Team Description

Owner / Developer:	SSI West Third Boston LLC
Architect:	Hacin + Associates
Engineer (building systems):	Allied Engineering, Inc
Sustainability / LEED:	Soden Sustainability
Permitting:	Epsilon Associates
Construction Management:	
Climate Change Expert:	Epsilon Associates

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	Residential, Retail/Commercial
List the First Floor Uses:	*Retail/Commercial, parking*

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

[✓ Wood Frame]	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	*42,509 SF*	Building Area:	*144,500 SF*
Building Height:	*65 Ft.*	Number of Stories:	*6 Flrs.*
First Floor Elevation (reference Boston City Base):	*24.5 Elev.*	Are there below grade spaces/levels, if yes how many:	*[✓ No] /* *Number of Levels*

A.5 - Green Building

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

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

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

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

A.6 - Building Energy

What are the base and peak operating energy loads for the building?

Electric:	*749 (kW)*	Heating:	*1,900,000 (MMBtu/hr)*
What is the planned building Energy Use Intensity:	*1.9 (kbut/SF or kWh/SF)*	Cooling:	*200 (Tons/hr)*

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

Electric:	*7 (kW)*	Heating:	*60,000 (MMBtu/hr)*
		Cooling:	*5 (Tons/hr)*

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

Electrical Generation:	*27 (kW)*		Fuel Source:	*Natural Gas*
System Type and Number of Units:	[✓ Combustion Engine]	Gas Turbine	Combine Heat and Power	*1 (Units)*

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	[✓ 50 Years]	75 Years

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

Select most appropriate:	10 Years	[✓ 25 Years]	50 Years	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	[✓ 50 Years]	75 Years

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

0/100 Deg.

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

95 Deg.	*5 Days*	*6 Events / yr.*

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

30-90 Days	*0.2 Events / yr.*

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

45 Inches / yr.	*4 Inches*	*0.5 Events / yr.*

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

130 Peak Wind	*10 Hours*	*0.25 Events / yr.*

B.2 - Mitigation Strategies

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

Building energy use below code:	*20%*
How is performance determined:	Energy Model

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

Select all appropriate:	[✓ High performance building envelop]	High performance lighting & controls	Building day lighting	[✓ EnergyStar equip. / appliances]
	[✓ High performance HVAC equipment]	[✓ Energy recovery ventilation]	No active cooling	No active heating
Describe any added measures:	50% residential units, mechanical ventilation, all vent. ERU			

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

Roof:	*R = 25*	Walls / Curtain Wall Assembly:	*R = 13, R8.4 for continuous ventilation*
Foundation:	*R = 15*	Basement / Slab:	*R =N/A*
Windows:	*R = / U =0.4*	Doors:	*R = / U =0.7*

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

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

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

Select all appropriate:	Connected to local	Building will be	Connected to	Distributed

	distributed electrical	Smart Grid ready	distributed steam, hot, chilled water	thermal energy ready

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

	Yes / [✓ No]		If yes, for how long:	Days
If Yes, is building “Islandable?				
If Yes, describe strategies:				

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

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

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

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

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

Select all appropriate:	On-site retention systems & ponds	Infiltration galleries & areas	vegetated water capture systems	[✓ Vegetated roofs]
Describe other strategies:	Subsurface recharge system			

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

Select all appropriate:	Hardened building structure & elements	[✓ Buried utilities & hardened infrastructure]	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

Yes / [✓ No]

Describe site conditions?

Site Elevation – Low/High Points: *23-26 Boston City Base Elev.(Ft.)*

Building Proximity to Water: *1,225 Ft.*

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

Coastal Zone: *[✓ Yes] / No*

Velocity Zone: *Yes / [✓ No]*

Flood Zone: *Yes / [✓ No]*

Area Prone to Flooding: *Yes / [✓ No]*

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

2013 FEMA Prelim. FIRMs: *Yes / [✓ No]*

Future floodplain delineation updates: *Yes / [✓ No]*

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

0 Ft.

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

Sea Level Rise: *3 Ft.*

Frequency of storms: *0.25 per year*

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation: *24.5 Boston City Base Elev.(Ft.)*

First Floor Elevation: *24.5 Boston City Base Elev. (Ft.)*

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

N/A Yes / No

If Yes, to what elevation: *Boston City Base Elev. (Ft.)*

If Yes, describe:

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

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

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

Yes / [✓ No]

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

[✓ Yes] / No

If yes, to what height above 100 Year Floodplain: *Boston City Base Elev. 12.5 (Ft.)*

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

Yes / [✓ No]

If Yes, describe:

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

Yes / [✓ No]

If Yes, for how long: *days*

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

C.4 - Building Resilience and Adaptability

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

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

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

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

Select appropriate:	*Yes / [✓ No]*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

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

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:	There may be the ability to add storage tanks in the future with the loss of parking			

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov