PUBLIC NOTICE

The Boston Redevelopment Authority ("BRA"), pursuant to Article 80 of the Boston Zoning Code, hereby gives notice that an Expanded Project Notification Form (PNF) for Large Project Review ("PNF") was filed by Bartlett Place Land Inc., (the "Proponent") on March 1, 2013, for Bartlett Place (the "Project"), to be constructed on an approximately 8.59-acre, at 2565 Washington Street, the former Metropolitan Bay Transportation Authority Bartlett Yard Bus Depot, in the Roxbury neighborhood of Boston.

The Project is a multi-phase development which is referred to in the PNF as the First Phase and Later Phases. The PNF focuses on the First Phase of development as Later Phases are expected to be constructed over a period of five to 10 years following completion of the First Phase. The First Phase of the Project will consist of two mixed-use buildings, referred to as A and B, as well as the creation of a new approximately 15,500 square-foot public plaza. Building A is proposed to be a C-shaped structure at the corner of Washington and Bartlett Streets. The structure will contains approximately 22,153 square feet of commercial use, 16,839 square feet of retail space and 42 units of market rate rental housing. Parking on-site will be allocated approximately to allow for 17 spaces for commercial use, 12 spaces for retail use, and 42 spaces for the residences. Building B will be situated south of Building A and will also front on Washington Street. Building B will include 14,483 square feet of retail space and 60 affordable rental units totaling approximately 77,535 square feet on the upper floors of the structure. The Building will also include 13 parking spaces devoted to retail use and 30 parking spaces reserved for the Building's residents.

The Proponent is seeking the issuance of a Scoping Determination by the BRA pursuant to Section 80B-5. The BRA, in the Scoping Determination for such PNF, may waive further review pursuant to Section 80B-5.3(d), if, after reviewing public comments, the BRA finds that such PNF adequately describes the Project's impacts.

The PNF may be reviewed in the office of the Secretary of the BRA, Room 910, Boston City Hall, 9th Floor, Boston, MA 02201 between 9:00 AM and 5:00 PM, Monday through Friday, except legal holidays. Public comments on the PNF, including the comments of public agencies, should be submitted in writing to Lauren Williams, BRA, at the address stated above within 45 days of this notice.

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

Expanded Project Notification Form

Submitted Pursuant to Article 80 of the Boston Zoning Code

Bartlett Place

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

Submitted by:
Bartlett Place Land Inc.
c/o Nuestra Comunidad Development Corporation
56 Warren Street, Suite 200
Boston, MA 02119

Windale Developers, Inc.
95 Humbolt Avenue
Roxbury, MA 02121

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

In Association with:
Davis Square Architects
Michael Washington Architects
Howard/Stein-Hudson Associates, Inc.
Goulston & Storrs, LLP
Develllis Zrein, Inc.
Weston & Sampson

March 1, 2013

Epsilon
ASSOCIATES INC.

Expanded Project Notification Form

Submitted Pursuant to Article 80 of the Boston Zoning Code

Bartlett Place

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

Submitted by:
Bartlett Place Land Inc.
c/o Nuestra Comunidad Development Corporation
56 Warren Street, Suite 200
Boston, MA 02119

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

In Association with:
Windale Developers, Inc.
Davis Square Architects
Michael Washington Architects
Howard/Stein-Hudson Associates, Inc.
Goulston & Storrs, LLP
Develllis Zrein, Inc.
Weston & Sampson

March 1, 2013

Epsilon
ASSOCIATES INC.

Table of Contents

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

List of Appendices

List of Figures

List of Figures (Continued)

List of Figures (Continued)

List of Tables

List of Tables (Continued)

Section 1.0

Project Summary

1.0 PROJECT SUMMARY

1.1 Project Overview

Bartlett Place Land Inc., (the Proponent), proposes to develop Bartlett Place, an innovative mixed-use residential, retail, commercial development, located on an approximately 8.59-acre brownfield site at 2565 Washington Street in Roxbury (the Project Site). See Figures 1.1-1 and 1.1-2.The Project will create a brand new neighborhood bridging Roxbury's dynamic Dudley Square with the Fort Hill and Tommy's Rock neighborhoods.

The Project Site is a former Massachusetts Bay Transportation Authority (MBTA) bus depot that includes two former MBTA bus maintenance buildings. The MBTA closed the facility in 2005 and the Site has not been in use since that time. The Site has some soil contamination that the Proponent will remediate as part of the Project.

In 2006 following a rigorous public selection process, the MBTA selected the Proponent to redevelop the Project Site, and the Proponent officially purchased the property in 2010. Since being selected by the MBTA, the Proponent, working collaboratively with the City of Boston and local residents, has developed a master plan for the overall site that is aimed at improving the physical, social, and economic well-being of the local community. The Master Plan envisions a phased development taking place over a period of up to ten years and comprising up to 323 residential units, approximately 22,000 square feet of commercial development, and 31,000 square feet of retail.

While the master plan provides an overarching vision for the entire site, this PNF seeks approval under Article 80B Large Project Review solely for the First Phase of the project. Phase 1 consists of two mixed use buildings, totaling approximately 233,490 square feet (including structured parking) and a 0.36-acre public plaza.

The Project will offer significant benefits to the surrounding community including a public events plaza, retail and interactive arts space, and a public market. The residential component of the Project will satisfy the growing need for market-rate rental and homeownership housing, as well as homes designed for moderate-income families.

Tapping Roxbury's rich artist population, the Project will be unique in the amount and quality of its public art. The public space will feature installations by visual artists, ranging from street sculptures to murals. Creations by artists-in-residence will be on display on-site in Roxbury's Gallery Basquiat for shoppers to view or even join in on the creative process. Rotating visual arts displays and diverse performance programming encompassing music, singing, theatre and dance will enliven the local environment. Live-work space and the rich creative environment will attract artists and other creative people making Bartlett Place a distinctive location within the neighborhood and City.

G:\Projects2\MA\Boston\2144\PNF\aerial.mxd

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 1.1-1
Aerial Locus

G:\Projects2\MA\Boston\2144\PNF\usgs.mxd

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 1.1-2
USGS Locus

The Proponent is committed to creating an urban village based on sustainable ideals for a better and brighter future. The Project will be a LEED certifiable Neighborhood Development featuring walkable streets, a mix of uses, innovative energy technology and sustainable practices. In addition, the two Phase buildings are planned to be LEED Silver certifiable.

1.2 Development Team

The Proponent has enlisted a team of professional Boston-based planners, engineers, attorneys, architects and consultants to assist them with the development of the Proposed Project. The Project Team is listed below:

Project Name:	Bartlett Place
Location:	2565 Washington Street Roxbury, MA 02119
Proponent:	Bartlett Place Land, Inc. c/o Nuestra Comunidad Development Corporation 56 Warren Street, Suite 200 Roxbury, MA 02119 (617) 427-3599 David Price Marcia Thornhill Mark Matel Windale Developers, Inc. 95 Humbolt Avenue Roxbury, MA 02121 (617) 442-5454 Arnold Johnson George Chin
Architect:	Davis Square Architects 240A Elm Street Somerville, MA 02144 (617) 628-5700 Cliff Boehmer, AIA Sharon McNulty, AIA, LEED AP Ingrid Nunez, AIA

Architect	Micheal Washington Architects 801-A Tremont Street Boston, MA 02118 (617) 275-2544 Micheal Washington
Permitting Consultant:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 David Hewett, LEED AP Tyler Norod
Transportation Consultants:	Howard/Stein-Hudson Associates, Inc. 38 Chauncy Street Boston, MA 02111 (617) 482-7080 Keri Pyke, P.E., PTOE
Legal Counsel	Goulston & Storrs, LLP 400 Atlantic Avenue Boston, MA 02110 (617) 482-1776 Kevin J. Renna, Esq. Megan Goldman Watts
Civil Engineer:	Devellis Zrein, Inc. P.O. Box 307 Foxborough, MA 02035 (508) 393-8583 Imad Zrein, P.E. Catherine R. Martin, RLA
Geotechnical Engineer:	Weston & Sampson. 5 Centennial Drive Peabody, MA 01960 (978) 532-1900 Mark Mitsch

1.3 Public Benefits

The development of Bartlett Place will generate myriad public benefits for the surrounding community and the City of Boston as a whole, both during construction and continuing on into the future once completed and occupied. These public benefits include both the financial benefits that will accrue to the city as well urban design/public realm improvements that will benefit the Roxbury neighborhood and the entire city.

Brown Field Remediation

- The Project Site is currently a Brown Field site. The Proponent is committed to remediating the land in order to permanently remove the risk of contamination of the surrounding public.

Economic Development

- Investing approximately $140 million in the overall development further contributing to the overall vitality of the surrounding neighborhood;
- The creation of approximately 400 temporary construction jobs and over 200 new permanent jobs in the proposed commercial space.
- The Project will offer significant benefits to the surrounding community including a public events plaza, retail and interactive arts space, and a public market.
- Increased property tax revenue of approximately $400,000 annually is expected to be collected by the City through new residential and commercial uses;

Open Space

- Currently the Project Site is made up of almost entirely impermeable surfaces. With the completion of all planned phases of the Project, approximately 25 percent of the Project Site will be dedicated to green spaces, including:
    - An approximately 0.36-acre public events plaza;
    - Smaller tot lots;
    - An urban wild that preserves an existing stand of trees along the western edge of the Site;
    - A prominent central public walkway lined with trees and homes allowing neighbors to walk to nearby bus stops and Dudley Square;
    - A large green roof featuring space for community gardening;
    - And terraced areas suitable for walking and climbing which will become wetlands during heavy rain periods helping to serve as part of the storm water retention system.

Urban design/Sustainability

- The Proponent will create new roadways through the Site to create a new, lively pedestrian friendly residential neighborhood that is connected with the existing street network;
- Furtherance of smart growth/transit-oriented development principles by locating housing adjacent to MBTA bus routes and within walking distance to schools, shopping, and other public resources; and
- Construction of LEED ND certifiable Project designed to be environmentally friendly and sustainable. At least one if not both of the buildings in the First Phase will be designed to be LEED Silver certifiable.
- One or more green roofs will be used to help lessen the amount of stormwater runoff from the Project Site and to improve water quality.
- The Project is design to comply with the City of Boston's Stretch Energy Code.

Affordable Housing

As part of its mission to improve the social and economic needs of the Roxbury community, the Proponent is committed to the development of affordable housing options for local residents. The Project will include 60 affordable rental units on-site as part of the First Phase of development.

1.4 Schedule

Construction of the First Phase of the Proposed Project is expected to commence in the fourth quarter of 2014 and to take approximately 30 months to complete and be ready for occupancy in mid-2016. Later phases are expected to be constructed over a period of up to ten years following the completion of the First Phase.

1.5 Consistency with Zoning

1.5.1 Large Project Review

Because the Project involves new construction in excess of 50,000 square feet of Gross Floor Area, the Project is subject to Large Project Review. Under the Mayor's Executive Order dated October 10, 2000, and amended on April 3, 2001, regarding mitigation for development projects, the Mayor may appoint an Impact Advisory Group to advise the BRA on mitigation measures for projects undergoing Large Project Review. In connection with the Project's Large Project review, the Project will also be subject to: (i) Boston Civic Design Commission review; and (ii) the green building requirements of Article 37 of the Code.

1.5.2 Zoning District

The Project Site is located within the Dudley Square Economic Development Area (the "Dudley Square EDA") of the Roxbury Neighborhood District (Map 6A/6B/6C) and is designed in Section 50-12 of the Code as a Planned Development Area ("PDA") eligible parcel. Zoning relief will be required in connection with the Project, and is anticipated to be obtained via approval of the Proponent's PDA master plan and PDA development plan.

1.5.3 Uses

Pursuant to the Code's Section 50-10 and Article 50, Table A, the Project's proposed residential, educational, office and retail uses are either allowed as-of-right or conditional, whereas it appears that the Project's proposed fitness/health club use is forbidden. The Project's uses will accordingly require zoning relief.

1.5.4 Building Dimensions

Within the Dudley Square EDA, the maximum building height is 55 feet, the maximum floor area ratio is 2.0 and the minimum rear yard is 20 feet. With a maximum building height of 70 feet and an approximate floor area ratio of 2.7 (Phase 1 only), the Project will require relief from these dimensional requirements.

1.5.5 Other Requirements

The Project will be subject to BRA design review and to the Code's signage requirements.

1.6 MEPA Review

The Massachusetts Environmental Policy Act (M.G.L. c. 30, sections 61 through 62H, inclusive) (MEPA) is the Commonwealth's primary means of providing for the public review large development projects and their environmental impacts. The Project Site was acquired in 2010 from the MBTA, constituting a "land transfer" pursuant to the MEPA Regulations, thus establishing broad scope MEPA jurisdiction. Furthermore, the Project, as currently envisioned, exceeds MEPA review thresholds related to transportation. Accordingly, the Project is subject to MEPA review, and the Proponent intends to file an Environmental Notification Form to initiate MEPA review.

1.7 Legal Information

1.7.1 Legal Judgments Adverse to the Proposed Project

The Proponent is unaware of any legal judgments or actions pending that concern the Proposed Project.

1.7.2 History of Tax Arrears on Property

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

1.7.3 Evidence of Site Control/Nature of Public Easements

By deed dated October 15, 2010, recorded at the Suffolk County Registry of Deeds in Book 47050, Page 120, Bartlett Place Land, Inc., acquired fee title to the Project Site from the Massachusetts Bay Transportation Authority.

Based on the completed survey of the Project Site, there are no public easements into, through, or surrounding the Project Site.

1.8 Public Review

1.8.1 Permits and Approvals

Table 1.8-1 presents a preliminary list of local, state, and federal permits and approvals that may be required for the Proposed Project. The list is based on current information about the Proposed Project and is subject to change as the design of the Project advances. Some of the permits listed may not be required, while there may be others not listed that will be needed.

Table 1.8-1 Preliminary List of Permits and Approvals

Agency	Approval
Boston	
Boston Redevelopment Authority	Article 80B Large Project Review/Article 80C Planned Development Area Review
Boston Zoning Commission	Planned Development Area Review
Boston Civic Design Commission	Design Review
Boston Landmarks Commission	Demolition Delay Review
Boston Water and Sewer Commission	Site Plan Review/General Service Application/Water and Sewer Connection Permits
Public Improvement Commission	Specific Repairs/Discontinuances/Earth Retention (if required)
Boston Transportation Department	Construction Management Plan/Transportation Access Plan Agreement
Boston Parks Department	Approval for Demolition and Construction within 100 feet of a Park or Parkway (Lambert Avenue Playground)
Boston Public Works Department	Curb Cut Permit(s)
Joint Committee on Licenses	Flammable Storage License (if required)
Boston Public Safety Commission	Permit to Erect a Parking Structure (if required)
Boston Inspectional Services Department	Demolition/Building Permits

Table 1.8-1 Preliminary List of Permits and Approvals (Continued)

Agency	Approval
State	
Department of Environmental Protection	Notice of Demolition/Construction/Fossil Fuel (if required); Sewer Connection Permit
Massachusetts Historical Commission	State Register Review
Executive Office of Energy and Environmental Affairs	MEPA Review
Federal	
Environmental Protection Agency	NPDES Approvals

1.9 Community Outreach

The Proponent has kept constant communication with the community since the since October 2007 when they were officially designated as the developer by the MBTA. The Proponent has presented on nearly a monthly basis to the Roxbury Strategic Master Plan Oversight committee. From September 20-22 2010, the Proponent conducted a design charette to investigate density options for Bartlett Place. The community provided input and fully participated in the process.

More recently, Bartlett Place Land Inc., has hosted public events on the Project Site. Community members have been informed through email listings, community meetings, and fliers to the direct abutters of the Project. Bartlett Events was formed to engage community members and provide activity on the Site such as arts events, festivals, food trucks, music performance, etc. while the Project awaits construction. This initiative is to bring attention to Bartlett Place as a destination and provide missing community activities in Roxbury.

February 26, 2013 was the most recent meeting with the Bartlett Project Review Committee to debrief them on the upcoming Article 80 and zoning filings.

Section 2.0

Project Description

2.0 PROJECT DESCRIPTION

2.1 Project Site

The 8.59-acre, roughly rectangular Project Site is located at 2565 Washington Street in the Roxbury neighborhood of Boston. The Site was formerly a Massachusetts Bay Transportation Authority (MBTA) bus depot and maintenance yard. The MBTA closed the facility in 2005. The Site fronts on the commercially developed Washington Street for approximately 600 feet between the residential side streets of Bartlett Street to the north and Guild Street to the south. The rear (west side) of the site is bounded by Lambert Avenue, which is also residential.

The Site rises toward the west as one moves away from Washington Street, with Lambert Street approximately 25 to 35 feet higher in elevation than Washington Street. The majority of the site is impervious, being developed with existing buildings and pavement. The Site is dominated by two large, high bay industrial structures. The former "Bartlett Garage" with a footprint of 27,830 square feet is adjacent to Washington Street, and the former Bus Garage with a footprint of 62,090 square feet occupies the central part of the site. There is also a small (1,970 square-foot) trailer type structure in northeast corner of the Site. The southern and western edges of the site slope steeply up to Guild and Lambert Streets, respectively, and are vegetated with scrubby woods.

2.2 Project Description

2.2.1 Overall Program Description

The Project will be developed in phases over a period of years to eventually create a mixed-use urban village that will transform the vacant, blighted Site into a vibrant, sustainable community. At this time, only the first phase is being advanced, and this PNF seeks Article 80B approval only for Phase 1. For context, however, this section describes the eventual full buildout of the Project Site, as it is currently envisioned and outlined in the Planned Development Area (PDA) Master Plan.

The Site Master Plan for all phases of the Project includes approximately 22,000 square feet of commercial space; 31,000 square feet of retail space; 323 residential units, comprising approximately 384,000 square feet of space; a 15,500 square-foot (0.36-acre) public plaza; and a total of approximately 328 parking spaces. The Floor Area Ratio (FAR) for the entire Project is approximately 1.31. Figure 2.2-1 at the end of this Section presents the conceptual Site Master Plan. As shown on Figure 2.2-1, new roads will be created through the Project Site connecting Guild and Bartlett Streets. Parking for the proposed residential units planned for the later phases will be contained along this new roadway thereby allowing the new buildings to be pulled closer to the existing street network, and to create a pedestrian friendly streetwall that encourages walkability around the Site.

Table 2.2-1 details the building elements of the Master Plan. Building lettering corresponds with Figure 2.2-1.

Table 2.2-1 Bartlett Place Overall Master Plan Building Program

Phase	Building	Program	Gross Square Footage	Height (feet)	Floors	Residential Units
1	A	Commercial	22,153	54	5	
		Retail	16,839			
		Residential (Market Rate)	69,276			42
		Structured Parking*	16,314	N/A	1	
1	B	Retail	14,483	70	6	
		Residential (Affordable)	77,535			60
		Structured Parking*	16,890	N/A	2	
1	Plaza	Public Plaza	15,500			
2	C	Residential (Elderly Housing)	25,000	50	4	35
		Townhomes	25,000	N/A	N/A	21
3	D	Residential (Live-Work Units)	40,000	55	5	36
		Structured Parking	10,000			
4	E	Residential	25,000	48	4	35
4	F	Apartment F1	19,200	48	4	16
		Apartment F2	16,500	48	4	14
4	G	Townhomes G1		N/A	N/A	6
		Townhomes G2		N/A	N/A	10
		Townhomes G3		N/A	N/A	24
		Townhomes G4		N/A	N/A	11
		Townhomes G5		N/A	N/A	13

2.2.2 Phase 1

In First Phase of the Project, the Proponent will construct two mixed-use buildings (A and B) and an approximately 15,500 square-foot public plaza. The buildings will contain a mix of retail, commercial, and residential use. Residential use will include 60 affordable units and 42 market rate units. With a Gross Floor Area of 233,490 square feet and a lot area of approximately 85,000 square feet, the FAR for Phase 1 (Buildings A and B combined) will be approximately 2.7. Parking in Phase I will include 42 commercial/retail spaces and 72 residential spaces.

The building architecture is described later in Urban Design Section 5.5 and the site plan is shown in Figure 2.2-2 at the end of this Section.

2.2.2.1 Building A

Building A is proposed as a C-shaped structure located in the northeast corner of the Project Site at the intersection of Washington and Bartlett Streets. The building will contain approximately 22,153 square feet of commercial use, 16,839 square feet of retail space and 42 units (69,276 square feet) of market rate rental housing. It will be five stories and have a maximum height of 54 feet. Parking on-site will be allocated to allow for approximately 17 spaces for commercial use, 12 spaces for retail use, and 42 spaces for the residences. Figures 2.2-3 through Figure 2.2-9 depict floor plan and elevations for Building A, all of which are included at the end of this Section.

2.2.2.2 *Building B*

Like Building A, Building B will front directly onto Washington Street to create a new streetwall and improve the pedestrian experience. Building B will have up to six floors and reach a maximum height of 70 feet. In an effort to increase activity and improve the vibrancy of the surrounding area, Building B will include 14,483 sf of retail space. Building B will offer much needed affordable housing through the placement of 60 affordable rental units totaling approximately 77,535 square feet on the upper floors of the structure. The Building will also include 13 parking spaces devoted to retail use and 30 parking spaces reserved for the Building's residents. At the end of this Section, Figures 2.2-10 through Figure 2.2-18 depict floor plan and elevations for Building B.

2.2.3 Later Phases

Later phases are currently planned to consist of 221 units of housing totaling approximately 203,557 square feet) in a mix of 4- to 5--story (approximately 50 to 55 feet high) residential buildings and townhomes, with an additional 10,000 sf of structured parking as shown on Figure 2.2-1 and Table 2.2-1.

2.3 Consistency with Planning

2.3.1 Roxbury Strategic Master Plan

The City of Boston's Roxbury Strategic Master Plan (2004) highlights a planning agenda to serve as a framework to guide change and economic growth in Roxbury. Over the years, Roxbury residents and the City of Boston have been working tirelessly to rejuvenate the area with the goal of creating a more socially and economically healthy community. By building a mixed-use and mixed-income development at this site, the Proponent will help to realize the Plan's vision by revitalizing a significant portion of the neighborhood while providing new retail options and approximately 60 quality affordable housing options for the community.

The existing condition of the Site is a blight on the surrounding urban fabric. The Project Site is a brown field development consisting of two industrial MBTA buildings and vacant land. The Site will benefit from remediation and the construction of new streets to provide a healthier and better connected community. The Overall Project will have the significant economic benefit of bringing up to 400 construction and 200 permanent jobs to the community. In addition, the Project will provide new commercial and retail space, which will further contribute to the economic and social activity within the neighborhood.

2.3.2 Boston's Open Space Plan 2008 – 2012

The Project will have a beneficial impact on Boston's open space. As part of the Project, the Proponent will create approximately 15,500 square feet of new public space from what is currently a vacant brownfield site. A significant portion of the Project Site will be dedicated to green spaces including a new public plaza as part of the first phase of development. Furthermore, it will replace underutilized parcels with attractive new developments that will help improve and enliven the public realm and streetscape surrounding this new public space.

The Project is not expected to have any significant adverse impacts on proximate open spaces. Nearby open space includes the Lambert Avenue Playground cater-cornered from the site at the intersection of Lambert and Gould; Dudley Square Plaza, approximately 500 feet from the site in Dudley Square; and St. James Street Park approximately 600 feet east of the Project Site. The Proposed Project will not directly impact these or any other open spaces and is not expected to result in any significant increase in the use of these parks as new residents at the Project are likely to move there from other nearby housing. The Project will help improve the user experience of surrounding parks by improving the nearby environment and by enlivening the neighborhood.

2.3.3 Consistency with Metropolitan Area Planning's MetroFuture

The MetroFuture Plan is the regional plan for the Greater Boston Area produced by the Metropolitan Area Planning Council (MAPC). The plan establishes a vision for the region with regard to land use and development. The plan provides 65 goals in six categories: Sustainable Growth Patterns, Housing Choices, Community Vitality, Prosperity, Getting Around, and Energy, Air, Water and Wildlife. The Proposed Project furthers many of these goals by building on previously developed land in Boston, enhancing the pedestrian environment, developing a LEED certifiable project, and locating proximate to existing public transportation infrastructure.

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-1

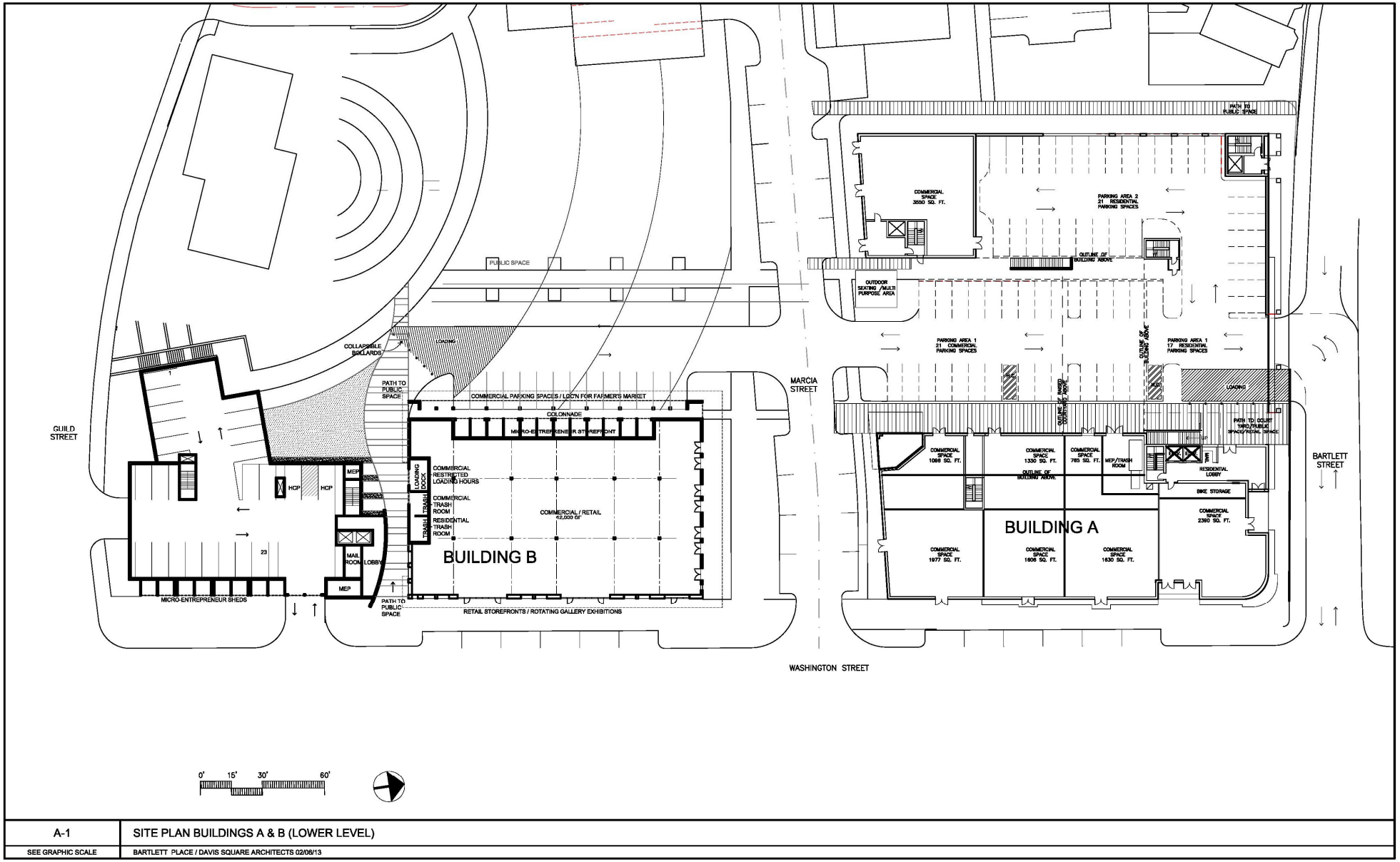
Master Plan

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-2

Site Plan – First Phase Development



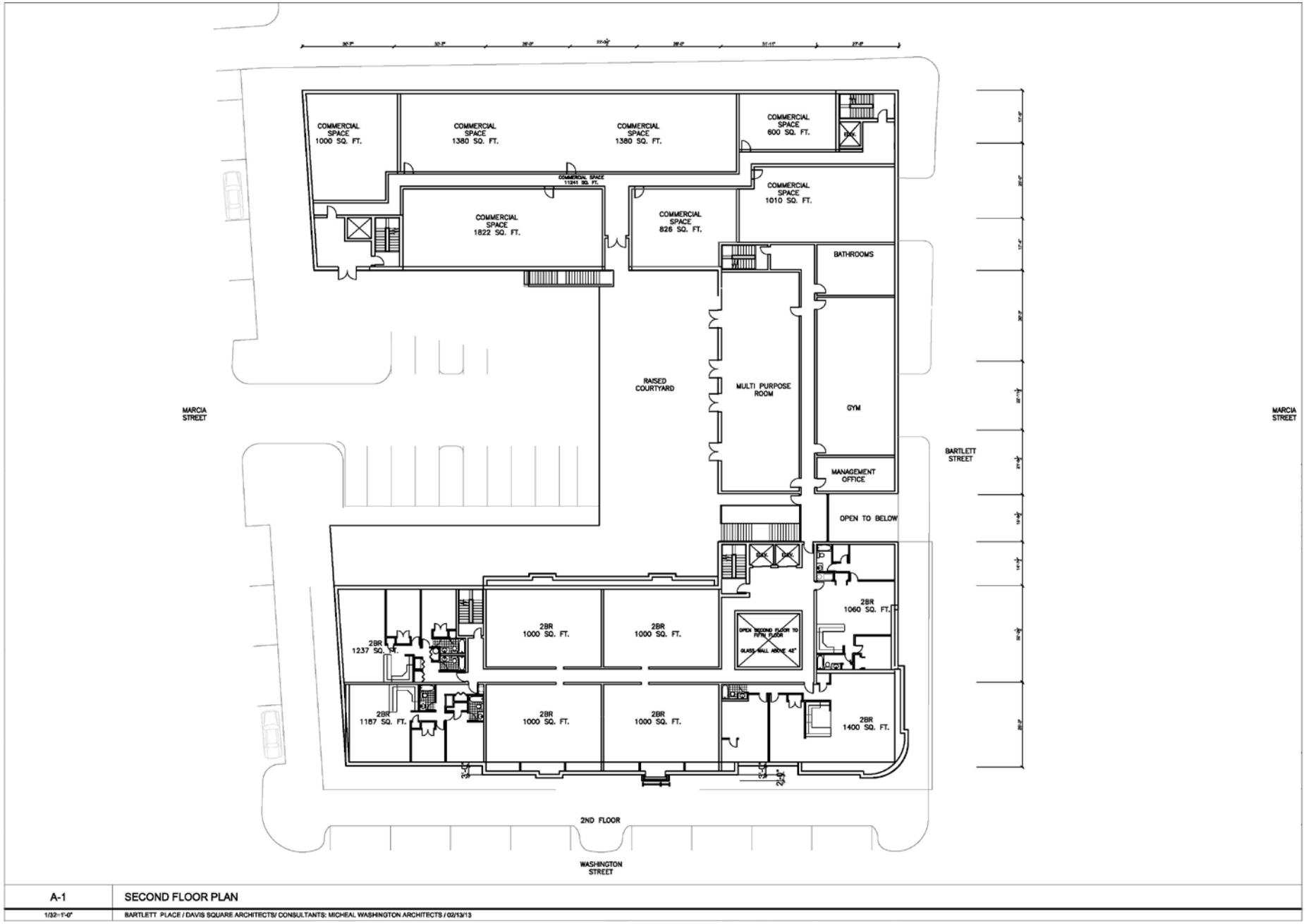
A-1	SITE PLAN BUILDINGS A & B (LOWER LEVEL)
SEE GRAPHIC SCALE	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 02/06/13

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-3

Buildings A & B – Lower Level

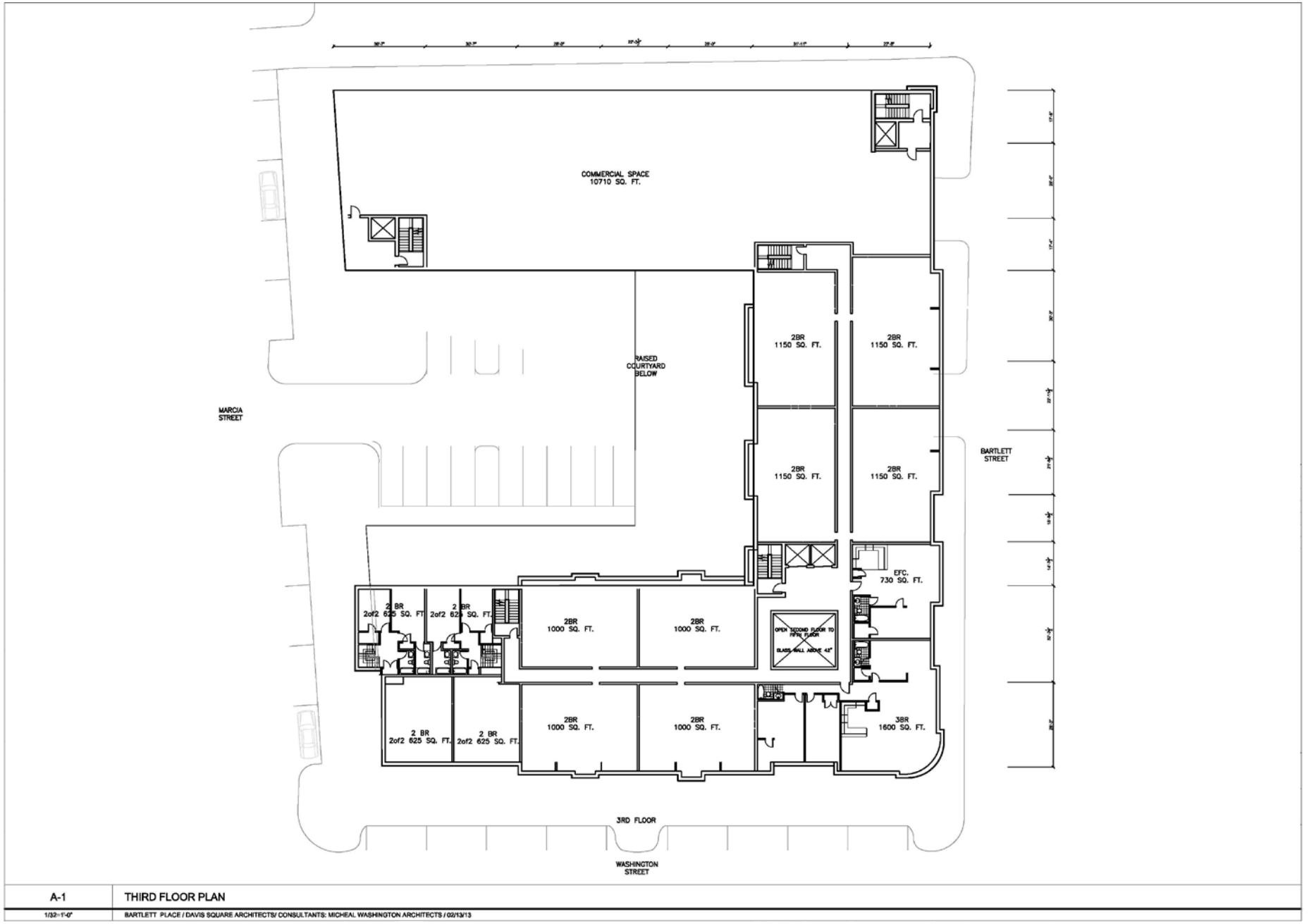


Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-4

Building A - Second Floor Plan

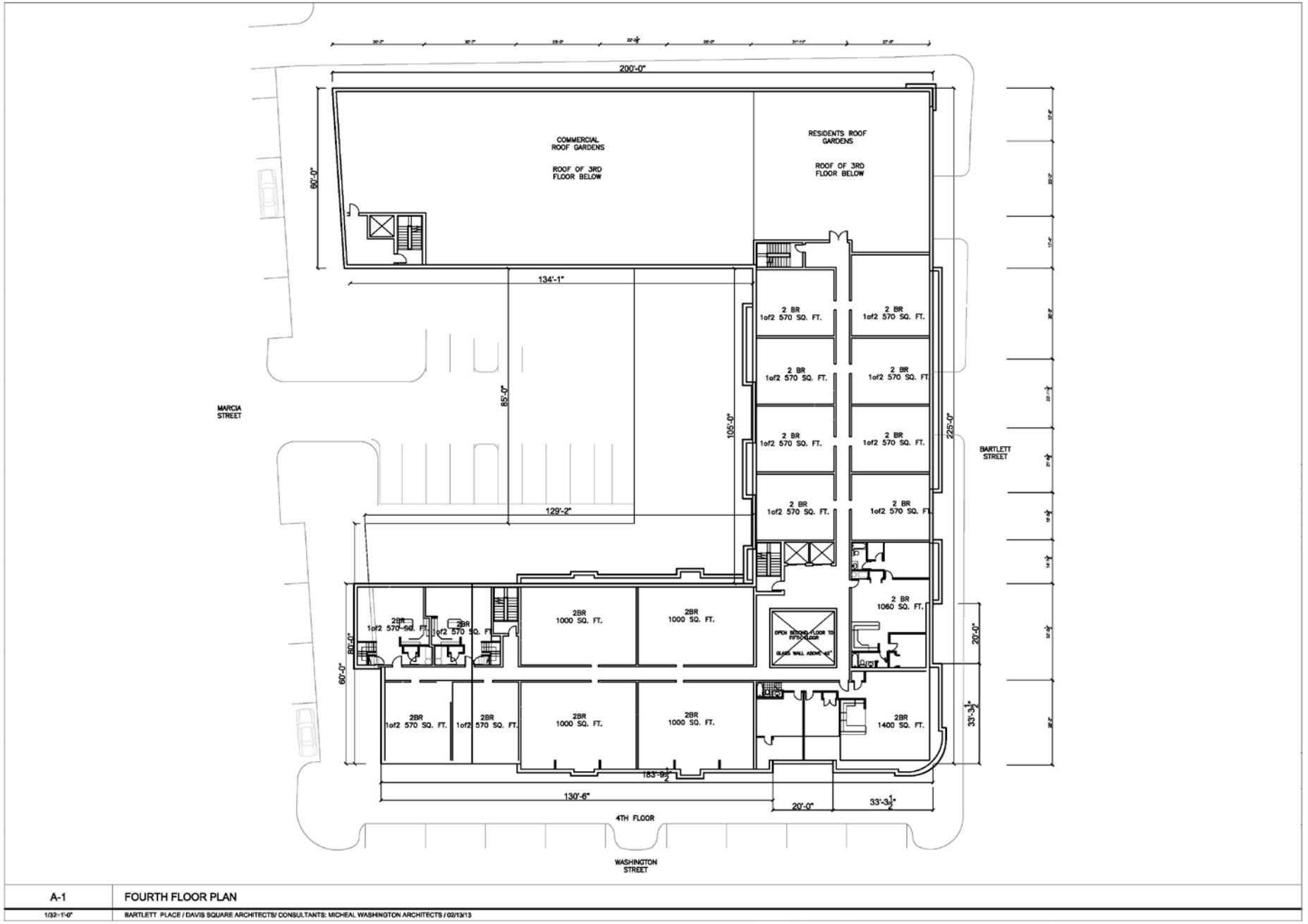


Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-5

Building A - Third Floor Plan

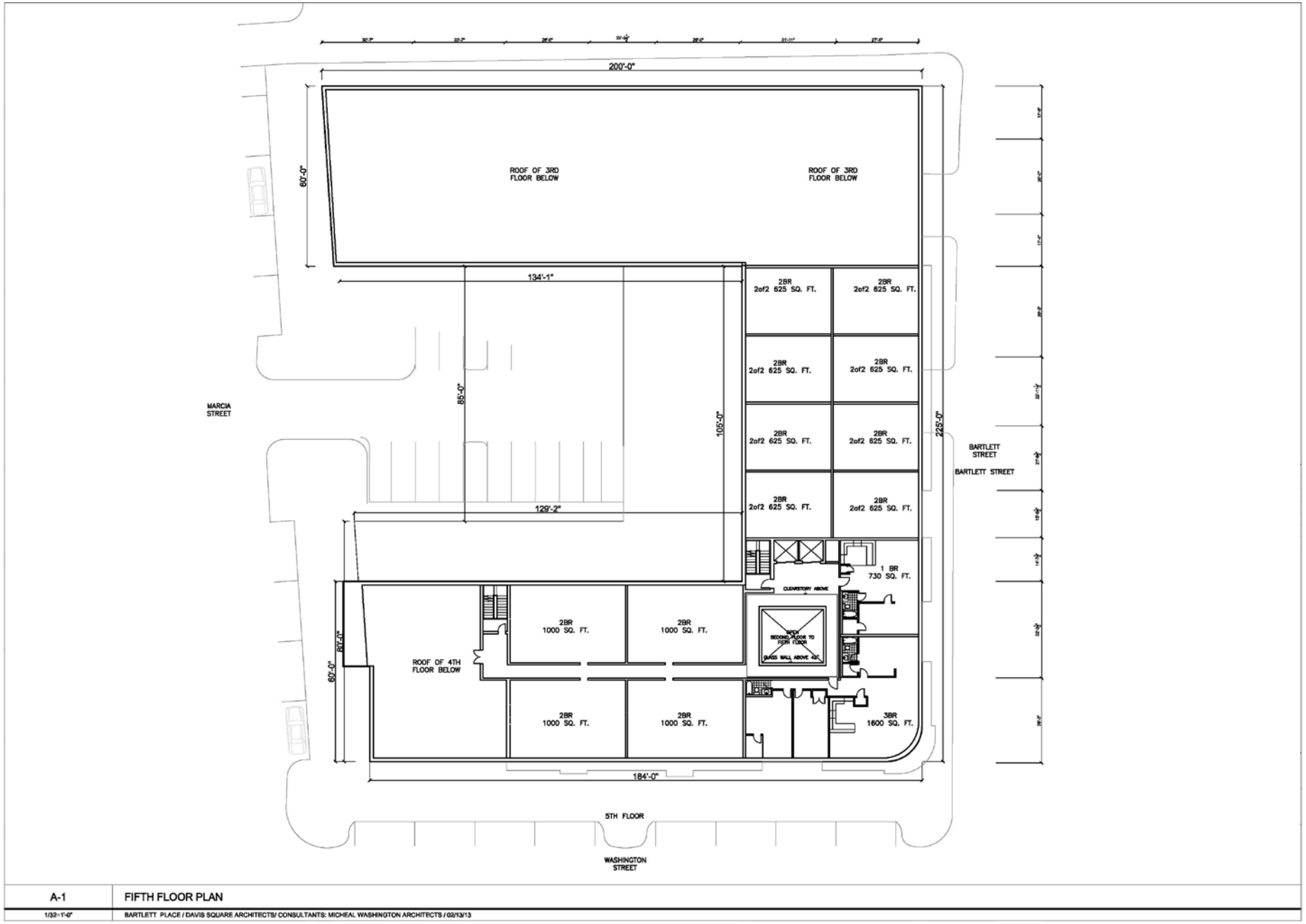


Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-6

Building A - Fourth Floor Plan



Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-7

Building A - Fifth Floor Plan

Bartlett Place Boston, MA

Figure 2.2-8

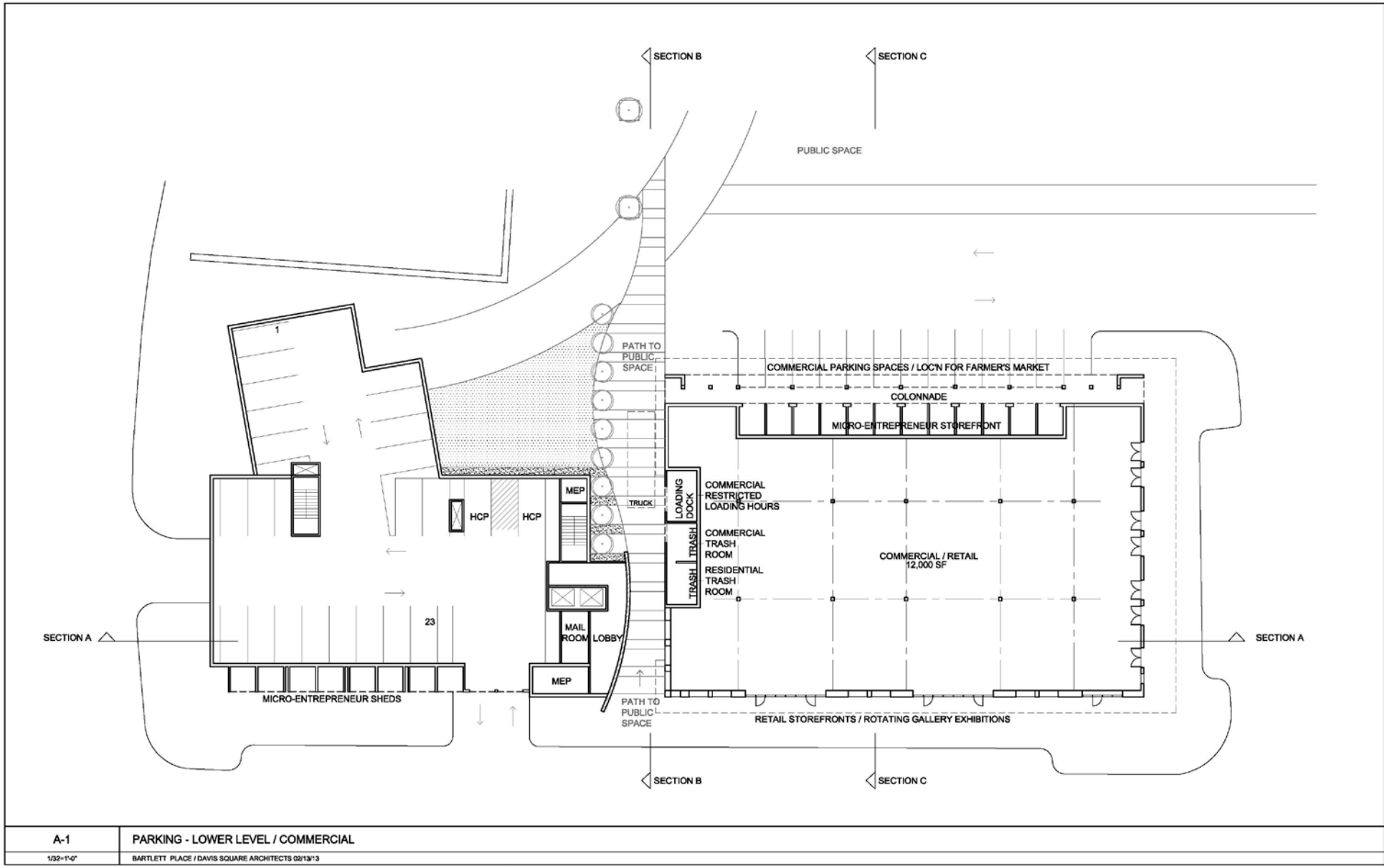
Building A – Elevation from Marcia, Washington and Bartlett Streets

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-9

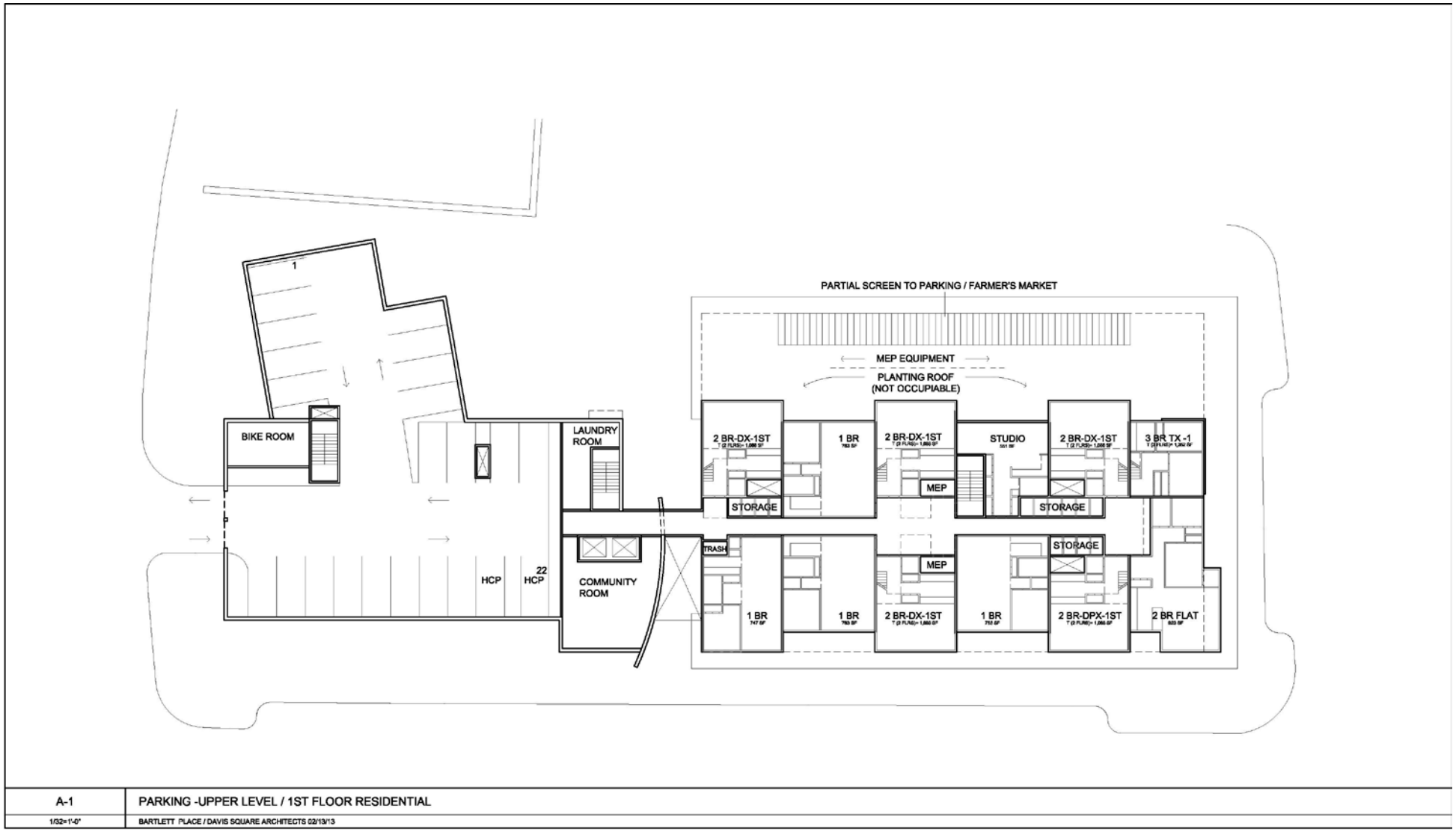
Building A – Courtyard Elevations



Bartlett Place Boston, MA

Figure 2.2-10

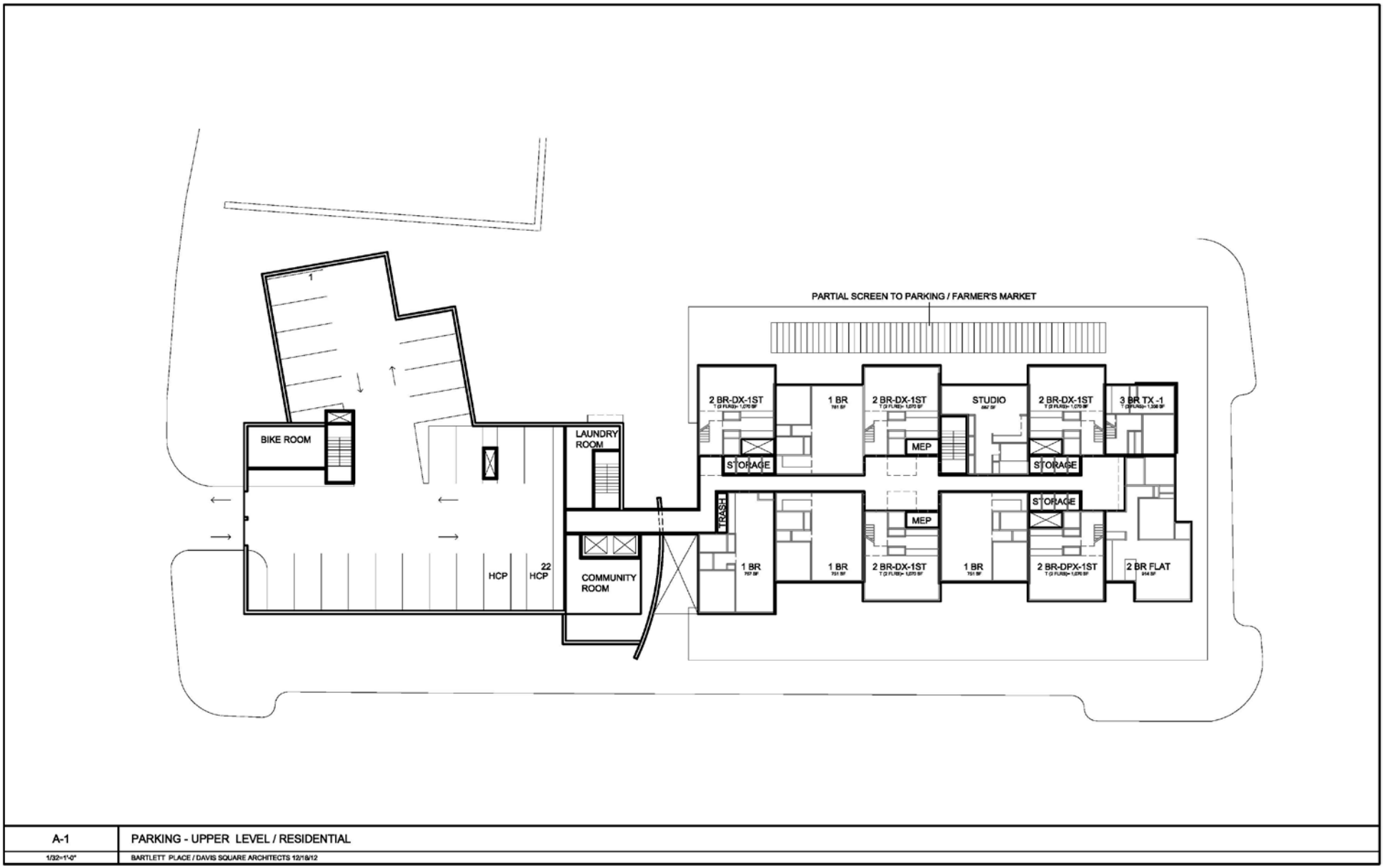
Building B - Parking & Lower Level/Commercial



Bartlett Place Boston, MA

Figure 2.2-11

Building B - Parking Upper Level/1st Floor of Residential

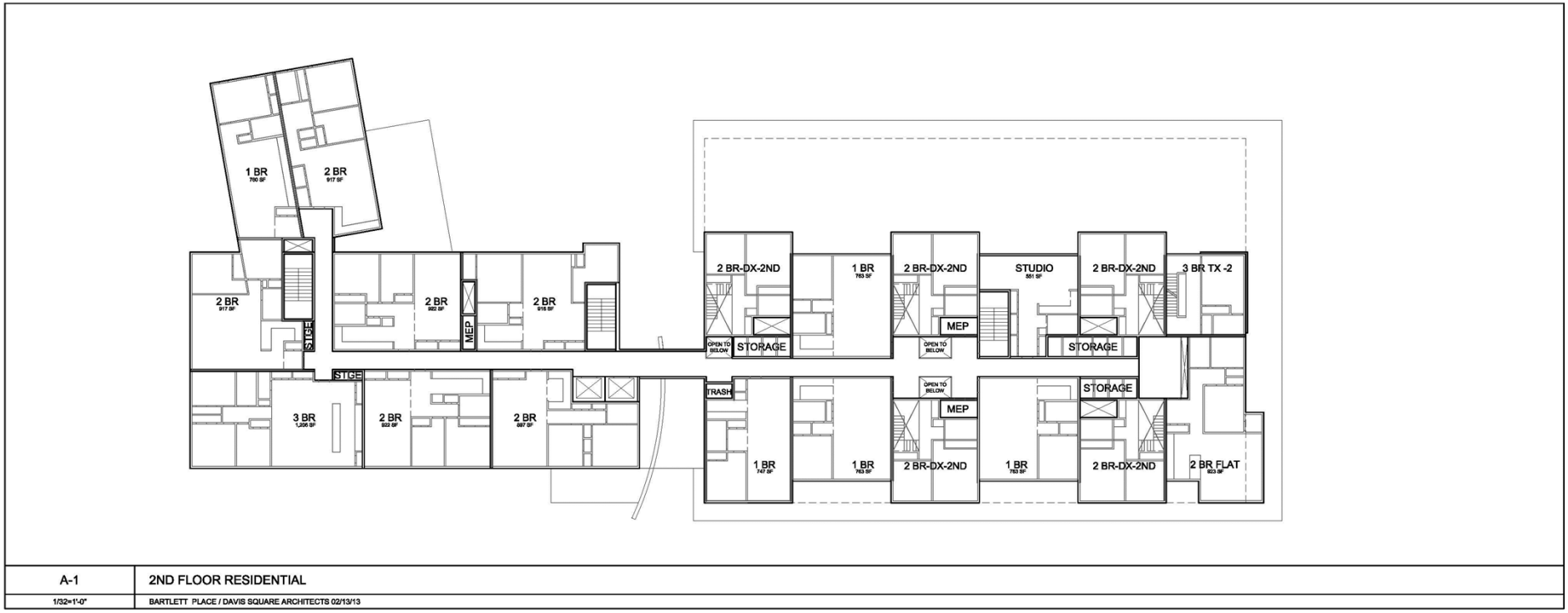


Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-12

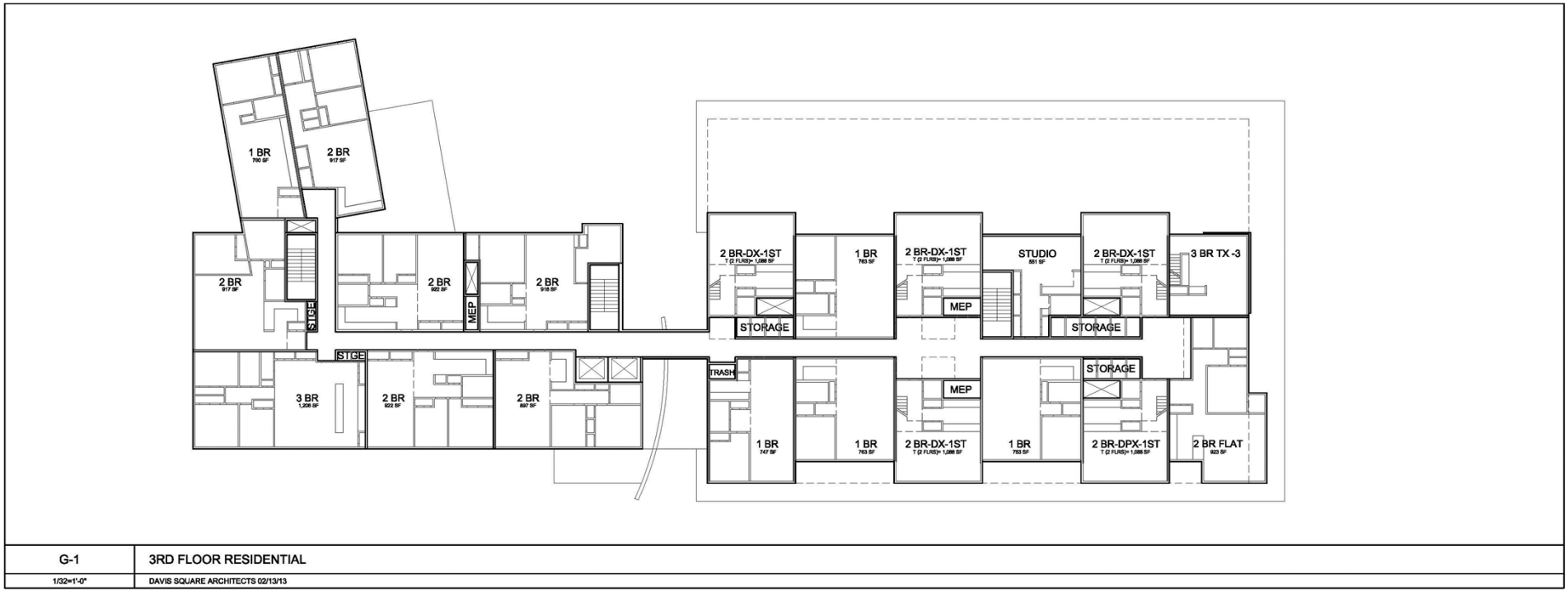
Building B - Parking & Upper Level/Residential



A-1	2ND FLOOR RESIDENTIAL
1/32=1'-0"	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 02/13/13

Figure 2.2-13

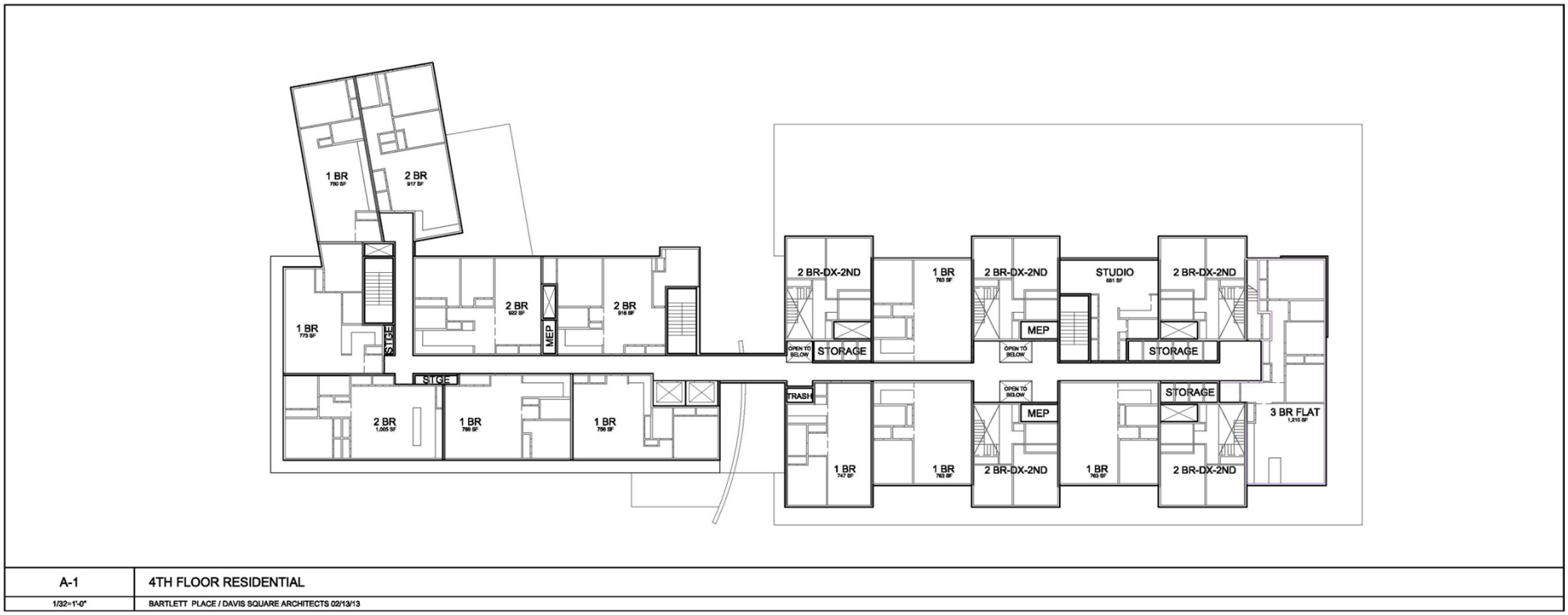
Building B - 2nd Floor Residential



G-1	3RD FLOOR RESIDENTIAL
1/32=1'-0"	DAVIS SQUARE ARCHITECTS 02/13/13

Figure 2.2-14

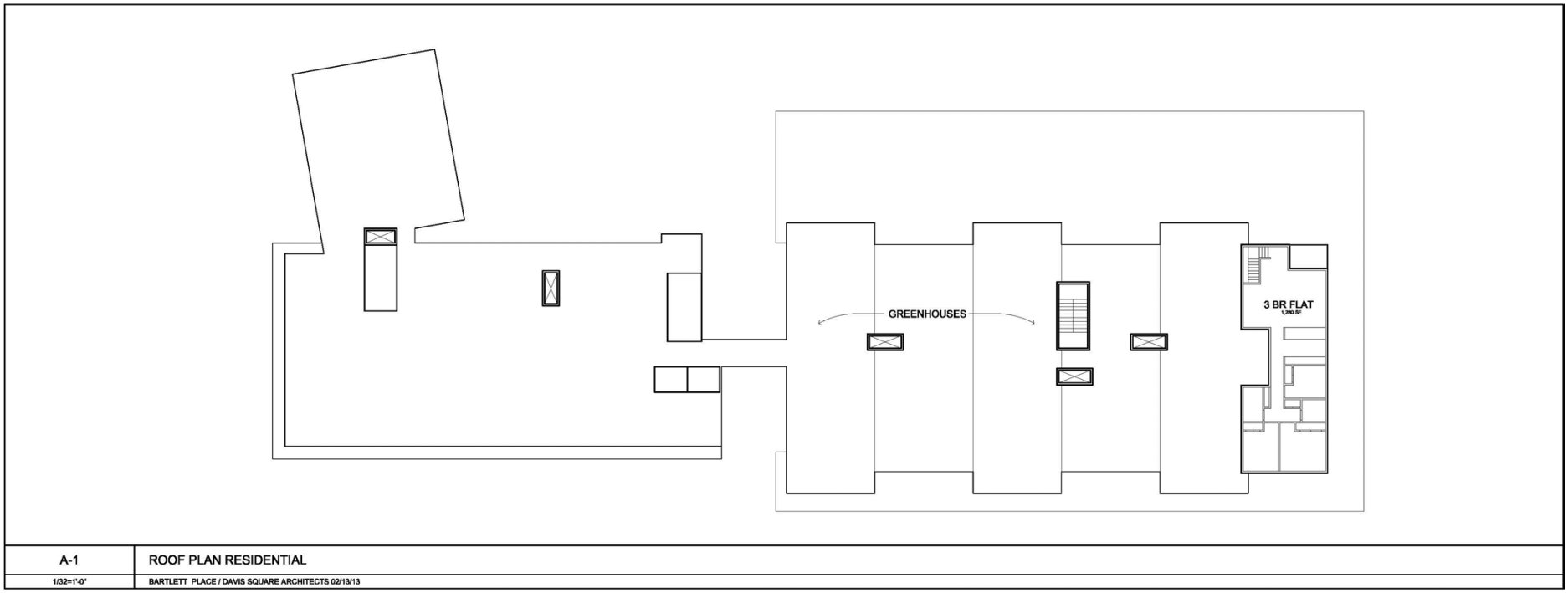
Building B - 3rd Floor Residential

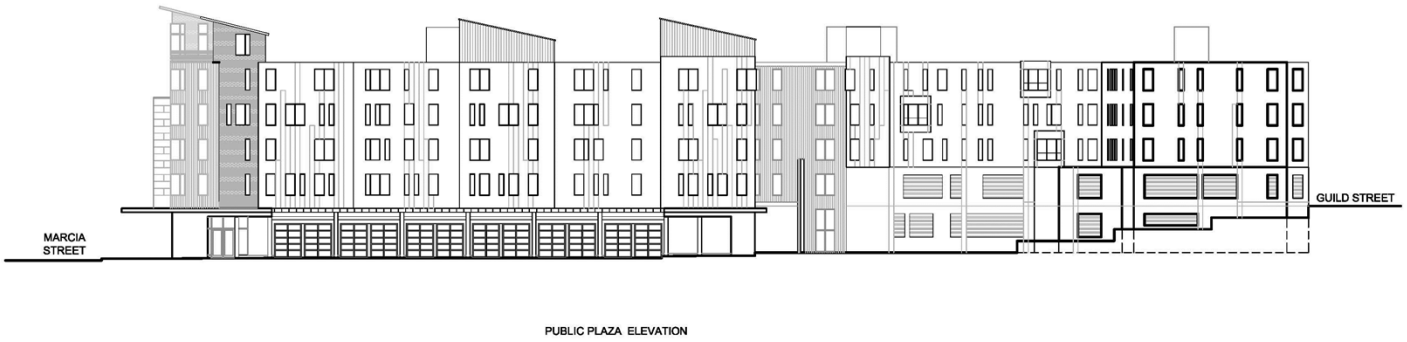


A-1	4TH FLOOR RESIDENTIAL
1/32=1'-0"	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 02/13/13

Figure 2.2-15

Building B - 4th Floor Residential


GREENHOUSES
3 BR FLAT
1,280 SF
A-1
ROOF PLAN RESIDENTIAL
1/32=1'-0"
BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 02/13/13



F-1	PUBLIC PLAZA ELEVATION
1/32=1'-0"	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 01/14/13

A-1	WASHINGTON STREET ELEVATION
1/32=1'-0"	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 01/14/13

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-17

Building B - Washington & Marcia Street Elevations

F-1	GUILD STREET ELEVATION
1/32=1'-0"	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 01/14/13

A-1	MARCIA STREET ELEVATION
1/32=1'-0"	BARTLETT PLACE / DAVIS SQUARE ARCHITECTS 01/14/13

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 2.2-18

Building B - Marcia & Guild Street Elevations

Section 3.0

Transportation

3.0 TRANSPORTATION

3.1 Introduction

In accordance with the City of Boston's *Transportation Access Plan Guidelines* and the *Boston Redevelopment Authority's (BRA's Article 80) Development Review Guidelines*, this chapter describes roadway, pedestrian, and bicycle conditions; transportation issues; parking and loading; proposed mitigation; and transportation goals for Bartlett Place ("the Project"). The Project Site is located on the former MBTA Bartlett Yard Site near Dudley Square in Boston's Roxbury neighborhood, as shown in Figure 3-1.

3.1.1 Project Description

The Project Site is bound by Bartlett Street to the north, Washington Street to the east, Guild Street to the south and Lambert Avenue to the west. The Project will involve the demolition of two existing buildings and the construction of a new mixed-use development. The overall Project development of the entire Site will comprise approximately 323 residential units, 31,322 square feet of retail, and 22,153 square feet of commercial/light industrial space. The Project will be built in multiple phases. Table 3-1 summarizes the land use assumptions used in the transportation analysis for Phase I, Later Phases, and the total development.

Table 3-1 Proposed Development Program

Land Use	First Phase (approximate)	Later Phases (approximate)	Total Development Program (approximate)
Retail	16,839 sf		16,839 sf
Residential Housing	102 units	221 units	323 units
University/College	11,224 sf		11,224 sf
Grocery	14,483 sf		14,483 sf
Office	5,464 sf		5,464 sf
Gym	5,465 sf		5,465 sf
Parking Spaces	114	128	242
Bicycle Storage	115	180	295

A total of 242 parking spaces will be provided on-site.

Bartlett Place Boston, Massachusetts

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Figure 3-1
Locus Map

Vehicular access to the Site is currently provided via one curb cut; a 35-foot curb cut on Washington Street between Bartlett Street and Guild Street, which is gated. Access to the Site will be provided via three new driveways during Phase 1; two on Washington Street and one on Bartlett Street. At Full Build-out, there will be four additional new driveways including two on Guild Street, and two on Bartlett Street. All new access driveways are two-way. See Figure 3-14 for Phase 1 site plan and circulation and Figure 3-13 for Full Build-out site plan and circulation.

All loading, trash pick-up, and move-in/move-out activities will occur on-site. Building A loading will occur just north of Building A adjacent to Bartlett Street Access/Egress. Building B loading will occur in the path to public space west of the building. See Figure 3-14 for loading locations.

Pedestrian access to the Site will be provided at all proposed vehicular access driveways and along a network of sidewalks within the Project.

3.1.2 Methodology

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

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

- The second evaluates future transportation conditions and assesses potential traffic impacts associated with the Project and other neighboring projects. Long-term impacts are evaluated for the year 2017 and 2022, based on a five and ten-year horizon, respectively, from the 2012 base year. Expected roadway, parking, transit, pedestrian, and loading capacities and deficiencies are identified. This analysis includes the following scenarios:

  - The No-Build Scenario (2017) includes the general background growth and growth associated with several proposed and planned projects that are close enough or large enough to impact the vicinity of the Site; and

  - The First Phase Build Scenario (2017) includes specific travel demand forecasts for the First Phase of the development.

  - The Full Build Scenario (2022) includes specific travel demand forecasts for the completed development.

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

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

3.1.3 Study Area

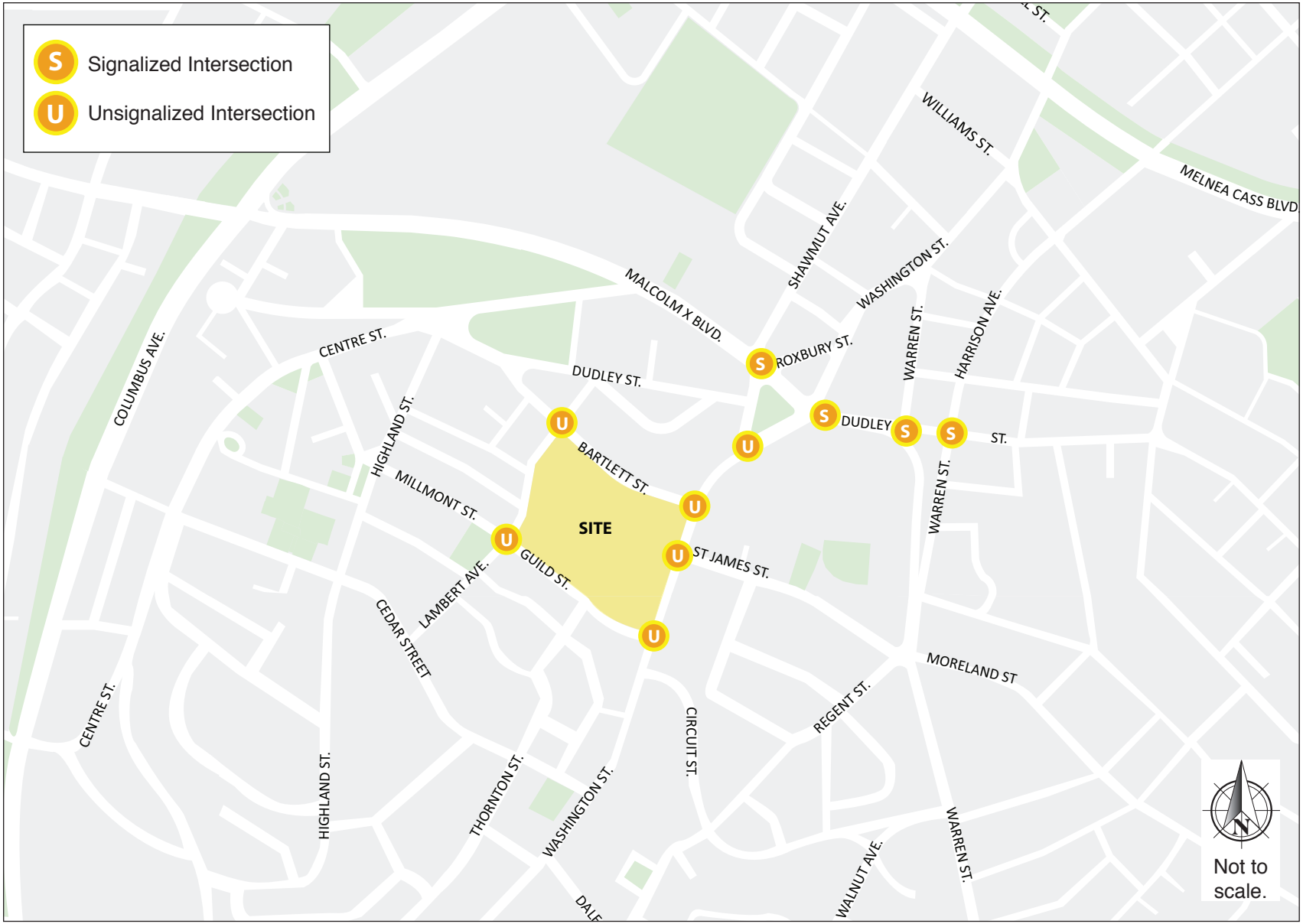
The study area is generally bound by Bartlett Street to the north, Washington Street to the east, Guild Street to the south and Lambert Avenue to the west. The study area for which a detailed transportation analysis was performed is depicted in Figure 3-2 and includes the following intersections:

- Roxbury Street/Malcolm X Boulevard/Shawmut Avenue (signalized);
- Malcolm X Boulevard/Dudley Street/Washington Street (signalized);
- Dudley Street/Warren Street (signalized);
- Dudley Street/Harrison Avenue (signalized);
- Shawmut Avenue/Washington Street (unsignalized);
- Bartlett Street/Washington Street (unsignalized);
- St. James Street/Washington Street (unsignalized);
- Guild Street/Washington Street (unsignalized);
- Millmont Street/Guild Street/Lambert Avenue (unsignalized); and
- Bartlett Street/Lambert Avenue (unsignalized).

3.2 Existing Conditions

3.2.1 Roadway Network

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



Bartlett Place Boston, Massachusetts

Figure 3-2
Study Area

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Roxbury Street, a local road runs east-west for from Malcolm X Boulevard to Washington Street. East of Washington Street, the Roxbury Street alignment becomes Zeigler Street. Roxbury Street is one-way westbound and is approximately 34 feet wide. There is a single travel lane and on-street parking is available on both sides of the street. Sidewalks are provided on both sides of the street and are seven feet wide on the north side and eight feet wide on the south side.

Malcolm X Boulevard, an urban minor arterial, runs east-west from Columbus Avenue in Roxbury to Washington Street. The Malcolm X Boulevard alignment continues in both directions as Tremont Street west of Columbus Avenue and Dudley Street east of Washington Street. Malcolm X Boulevard is varies from approximately 65 to 68 feet wide and is composed of two lanes lane in each direction separated by an eight foot median. Sidewalks are provided on both sides of the street and are approximately seven feet wide.

Shawmut Avenue, an urban minor arterial, runs north-south from Oak Street in Boston to Washington Street. North of Malcolm X Boulevard, Shawmut Avenue is one-way southbound and is approximately 60 feet wide. There are two travel lanes and on-street parking available on both sides of the street. Near the intersection with Malcolm X Boulevard, on-street parking is prohibited during peak hours with three travel lanes. South of Malcolm X Boulevard, Shawmut Avenue consists of two 11-foot travel lanes in each direction, which merges into one 20-foot wide lane in each direction at the intersection of Washington Street. There is no on-street parking provided south of Malcolm X Boulevard. Sidewalks are seven feet wide and provided on both sides of the street.

Dudley Street, an urban minor arterial, runs east-west from Washington Street to Columbia Road in Uphams Corner. The Dudley Street alignment continues in both directions as Malcolm X Boulevard west of Washington Street and Stoughton Street east of Columbia Road. Dudley Street is two-way and includes two lanes in each direction west of Warren Street, additional turn lanes at Warren Street, and one lane in each direction east of Warren Street. Parking is provided on both sides of Dudley Street as are seven to eight foot sidewalks.

Washington Street, an urban principal arterial, runs north-south from Court Street/State Street in downtown Boston, through Roxbury, Jamaica Plain, Roslindale, and West Roxbury. Eventually, Washington Street becomes Route 1A in Dedham, Massachusetts. Washington Street is one way southbound from Palmer/Warren Street to Dudley Street. South of Dudley Street, Washington consists of one travel lane in each direction varying in width from 11 to 20 feet wide. Sidewalks are eight feet wide and provided on both sides of the street. On-street parking is allowed near the study area.

Warren Street, an urban minor arterial, runs north-south from Washington Street to Blue Hill Avenue. Warren Street is a two way roadway from Blue Hill Avenue to Dudley Street. North of Dudley Street, Warren Street is one way northbound. In the vicinity of the study area, Warren Street is approximately 39 feet wide and consists of two travel lanes with on-

street parking on both sides. Sidewalks are approximately seven feet wide and are provided along both sides of the street. On-street parking is allowed intermittently on both sides of the street within the study area.

Harrison Avenue, an urban minor arterial, runs north-south from Avenue de Lafayette in Boston to Washington Street in Roxbury. South of Dudley Street, Harrison Avenue consists of one lane in each direction with parking on both sides. North of Dudley Street, Harrison Avenue consists of two lanes in each direction. Sidewalks vary in width from 6 to 10 feet and are provided on both sides of the road in the vicinity of the study area.

Bartlett Street, a local road, runs east from Dudley Street to Washington Street. Bartlett Street is one-way eastbound approximately 16 feet wide. Unrestricted on-street parking and varying sidewalks widths from five to eight feet are provided on both sides of the roadway.

St. James Street, a local road, runs east-west from Washington Street to Warren Street. St. James Street is a one-way westbound roadway. Within the study area, St. James Street is approximately 39 feet wide and consists of one travel lane with on-street parking provided on the north side of the street. Sidewalks are provided on both sides of the street and are approximately six feet wide. At intersection seven St. James Street/Washington Street, it was observed that St. James Street acts as two lanes, a left and right turn lane.

Guild Street, a local road, runs east-west from Washington Street to Lambert Avenue. Guild Street varies in width from 24 to 28 feet wide and consists of one travel lane in each direction. On-street parking is unrestricted along both sides of Guild Street. Sidewalks are provided along both sides of the street and vary in width between five to six feet wide.

Millmont Street, a local road, runs east-west from Lambert Avenue to Highland Street in Roxbury. Millmont Street is approximately 26 feet wide and consists of one travel lane in each direction and on-street parking on both sides of the street. Sidewalks are provided on both sides of the street and vary from six feet on the north side to five feet on the south side.

Lambert Avenue, a local road, runs north-south from Cedar Street to Dudley Street. Lambert Avenue is approximately 19 feet wide and consists of one northbound travel lane. On-street parking is permitted intermittently along both sides of Lambert Avenue and in the vicinity of the Project Site, on-street parking is unrestricted on the east side and prohibited on the west side of Lambert Avenue. Sidewalks are provided along both sides of the street and are approximately four feet wide.

3.2.2 Intersection Conditions

3.2.2.1 Signalized Intersections

Roxbury Street/Malcolm X Boulevard/Shawmut Avenue is a four-way signalized intersection. The Malcolm X Boulevard eastbound approach consists of 12-foot shared bear left /through lane and an 18-foot shared through/right turn lane with adjacent, on-street parking. The Malcolm X Boulevard westbound approach consists of a 13-foot shared left turn/through lane and a 10-foot shared through/hard right lane with adjacent on-street parking. The Malcolm X Boulevard eastbound and westbound travel lanes are separated by a six foot wide raised median. The Shawmut Avenue northbound approach consists of an 11-foot left turn lane and an 11-foot shared bear right/right turn lane. The Shawmut Avenue southbound approach is 30 feet wide and consists of a shared hard left/bear left turn lane, a through lane, and a right turn lane with 80 feet of storage. Right turn on red is prohibited at both Shawmut Avenue approaches. Northeast of the intersection, Roxbury Street is one-way northbound with on-street parking along with sides.

West of the intersection, there are MBTA bus stops on each side of the Malcolm X Boulevard. Crosswalks widths vary from 10 to 11 feet wide and are provided across all approaches. The crosswalks vary in length from 32 to 98 feet long. Handicapped-accessible ramps are provided at every corner. There are sidewalks provided on both sides of Malcolm X Boulevard, Shawmut Avenue, and Roxbury Street. Sidewalks are approximately seven feet wide. Pedestrian signals and push buttons are provided at every intersection approach. Sidewalks, pavement, and pavement markings are in fair condition.

Malcolm X Boulevard/Dudley Street/Washington Street is a four-way, signalized intersection. The Malcolm X Boulevard eastbound approach consists of a 12-foot through lane and an 18-foot shared through/right turn lane. Right turn on red is prohibited at this approach. The Malcolm X Boulevard eastbound and westbound travel lanes are separated by a six foot wide raised median. The Dudley Street westbound approach consists of a 12-foot shared left turn/through lane and a 14-foot through lane with adjacent on-street parking. The Dudley Street eastbound and westbound travel lanes are separated by a four foot wide raised median that ends before the crosswalk. U-turns are prohibited at both the Malcolm X Boulevard eastbound and the Dudley Street westbound approaches. The Washington Street northbound approach consists of an 11-foot shared left turn/right turn lane and a 12-foot right turn lane. The Washington Street one-way, southbound approach consists of a 13-foot left turn lane and an 11-foot shared through/right turn lane with adjacent, on-street parking. Right turn on red is prohibited at both Washington Street approaches. There is a driveway located just east of the intersection on the south side of Dudley Street. There is an MBTA bus stop located on the Washington Street northbound approach. East of the intersection, on the north side of Dudley Street, is an entrance to Dudley Station.

Crosswalks are provided across all intersection approaches. There are apex handicapped-accessible ramps at every corner except for the southeast corner of Dudley Street and Washington Street where there is a handicapped-accessible ramp for each crosswalk. Crosswalks are approximately 10 feet wide and range in length from 41 to 87 feet. Sidewalks are provided on both sides of Malcolm X Boulevard, Washington Street, and Dudley Street. Sidewalks along Malcolm X Boulevard and Dudley Street vary from seven to nine feet in width. Sidewalks along Washington Street vary from seven to sixteen feet in width, in the vicinity of the intersection. Pedestrian signal indications and push buttons are provided at every corner. Pavement and pavement markings are in fair condition.

Dudley Street/Warren Street is a three-way, signalized intersection. The Dudley Street eastbound approach consists of a 10-foot left turn lane, 11 and 14-foot through lanes, and a 20-foot right turn lane. The Dudley Street eastbound and westbound travel lanes are separated by a six-foot wide raised median at this approach. The through lanes and right turn lane are separated by a splitter island. The Dudley Street westbound approach consists of two approximately 10-foot lanes, one through lane and one shared through/right turn lane. The Warren Street northbound approach consists of a 15-foot shared left turn/through lane, a 14-foot through lane, and a 20-foot right turn lane with adjacent on-street parking. There is a splitter island separated the two through lanes from the right-turn lane. The Warren Street northbound and southbound travel lanes are separated by a raised median that varies in width. Warren Street, north of the intersection, is one-way northbound and consists of two travel lanes with two hour on-street parking on both sides.

There are 10-foot wide crosswalks provided across all approaches. The crosswalks vary in length from 20-69 feet. There are no handicapped-accessible ramps provided at the crosswalks. Sidewalks are provided along both sides of Dudley and Warren streets and vary in width from six to nine feet. Pedestrian signal indications and push buttons are provided at every approach. Pavement, pavement markings, and sidewalks are in poor condition.

Dudley Street/Harrison Avenue is a four-way, signalized intersection. The Dudley Street eastbound approach consists of a 10-foot left turn lane and 12-foot shared through/right turn lane. The Dudley Street westbound approach is approximately 21 feet wide. It was observed in the field that this approach behaves as one shared left turn/through lane and one shared through/right turn lane with 110 feet of storage. The Harrison Avenue northbound approach consists of one approximately 12-foot shared left turn/through lane with a share the road symbol and an eight-foot right-turn lane. The Harrison Avenue southbound approach is approximately 20 feet wide and consists of a shared left-turn/through lane and a right-turn lane. The Harrison Avenue southbound receiving approach has a five foot bike lane.

There is a Boston Fire Department driveway located just east of the intersection on the north side of Dudley Street. Crosswalks approximately 11 feet wide are provided across all intersection approaches. The crosswalks range in length from 50-55 feet. There is one

handicapped-accessible ramp provided on each corner. Sidewalks are provided along both sides of Dudley Street and Harrison Avenue. In the vicinity of the intersection, sidewalks on Dudley Street and Harrison Avenue vary from 6-10 feet wide. There are pedestrian signals provided, however there are no push buttons at any intersection approach. Pavement and pavement markings are in poor condition.

3.2.2.2 Unsignalized Intersections

Shawmut Avenue/Washington Street is a four-way, unsignalized intersection. The Shawmut Avenue eastbound approach consists of one 20-foot right-turn lane. Left-turns are prohibited at this intersection approach. There is a small 10-foot wide island separating the eastbound approach lanes from the westbound receiving lanes. The Boston Police driveway westbound approach is a one-way exit and 23 feet wide that behaves like an all-purpose lane. The Shawmut Avenue eastbound approach is stop-controlled and prohibits U-turns. The Washington Street northbound approach consists of two approximately 11-foot travel lanes; one shared left/through lane and one through lane. The Washington Street southbound approach consists of one 11-foot shared right-turn/through lane.

Crosswalks are provided across the western and northern legs of the intersection. Crosswalks vary in length from 28-36 feet long. Sidewalks are provided on both sides of Shawmut Avenue and Washington Street. Sidewalks vary in width from six to eight feet. Sidewalks, pavement, and pavement markings are all in good condition.

Bartlett Street/Washington Street is a three-way, unsignalized intersection. The Bartlett Street eastbound approach is one-way and 26 feet wide. The Washington Street northbound approach consists of two 10-foot through lanes. The Washington Street southbound approach consists of two 10-foot through lanes. An 11-foot wide crosswalk is provided across Bartlett Street. The crosswalk is approximately 26 feet long. Handicapped-accessible ramps are provided at both ends of the crosswalk. Sidewalks are provided on both sides of Bartlett Street and Washington Street. Sidewalks on Bartlett Street are approximately five to eight feet wide. Sidewalks on Washington Street are 10 and 8 feet wide on the east and west sides, respectively. Sidewalks, pavement, and crosswalks are in fair condition, but the pavement markings are in poor condition.

St. James Street/Washington Street is a three-way, unsignalized intersection. On the west side of the intersection, there is a gated and locked Site driveway approximately 40 feet wide. The St. James Street westbound approach is one-way and 39 feet wide. There is on-street parking along the north side of the street. Field observations noted that this intersection behaves as two lanes; a left-turn lane and a right-turn lane. St. James Street also

approaches the intersections on a downhill slope. The Washington Street northbound and southbound approaches consist of two 10-foot through lanes. Another Site driveway is located 21 feet north of the intersection on the west side of Washington Street.

There is an MBTA bus stop north of the intersection, on the west side of Washington Street and south of the intersection, on the east side of Washington Street. An 11-foot wide crosswalk is provided across St. James Street. Handicapped-accessible ramps are provided at both ends of the crosswalk. Sidewalks are provided on both sides of St. James Street and Washington Street. Sidewalks range in with from 6-12 feet. Sidewalks, pavement, and the crosswalk are in good condition.

Guild Street/Washington Street is three-way, unsignalized intersection. The Guild Street eastbound approach is approximately 28 feet wide and unmarked. Field observations revealed that it behaves as one shared left-turn/right-turn lane and one receiving lane. The Washington Street northbound approach consists of one 19-foot shared left-turn/through lane. The Washington Street southbound approach is approximately 20 feet wide and acts as one through lane and one right-turn lane. A gated Site driveway is located 23 feet north of the intersection, on the west side of Washington Street. The driveway is approximately 27 feet wide.

MBTA bus stops are located on both sides of Washington Street just south of the intersection. A crosswalk is provided across the Guild Street eastbound approach. Handicapped-accessible ramps are provided on both sides of the crosswalk. Sidewalks are provided along both sides of Guild and Washington Street. Sidewalks along Guild Street range in width from five to seven feet. Sidewalks along Washington Street range in width from five to nine feet.

Millmont Street/Guild Street/Lambert Avenue is an unsignalized intersection with three approaches. The Millmont Street eastbound approach consists of one 11-foot shared left-turn/through lane with on-street parking on both sides. The Guild Street westbound approach consists of one 10-foot right-turn lane with on-street parking on both sides. The Lambert Avenue northbound approach consists of one 11-foot shared through/right-turn lane with adjacent on-street parking on the east side of the roadway. This intersection is an all-way stop. No crosswalks are provided however apex handicapped –accessible ramps are provided at each corner of the intersection. Sidewalks are provided on both sides of Millmont Street, Lambert Avenue, and Guild Street and are approximately five to six feet wide and in fair to poor condition. Pavement is in fair condition. All streets at this intersection are free of pavement markings.

Bartlett Street/Lambert Avenue is an unsignalized intersection with two approaches. The Lambert Street westbound approach consists of one 11-foot shared through/right-turn lane with on-street parking provided on the south side of the street. The Bartlett Street northbound approach consists of one eight foot shared left-turn/through lane with adjacent parking on both sides of the roadway. Both of these two approaches are stop-controlled.

There are no crosswalks provided at this intersection, however one handicapped-accessible ramp is provided on every corner. There are sidewalks provided on both sides of Bartlett Street and Lambert Avenue. Sidewalks are approximately four to seven feet wide and in fair condition. Pavement is in fair to poor condition. Both roads are free of pavement markings.

3.2.3 Traffic Conditions

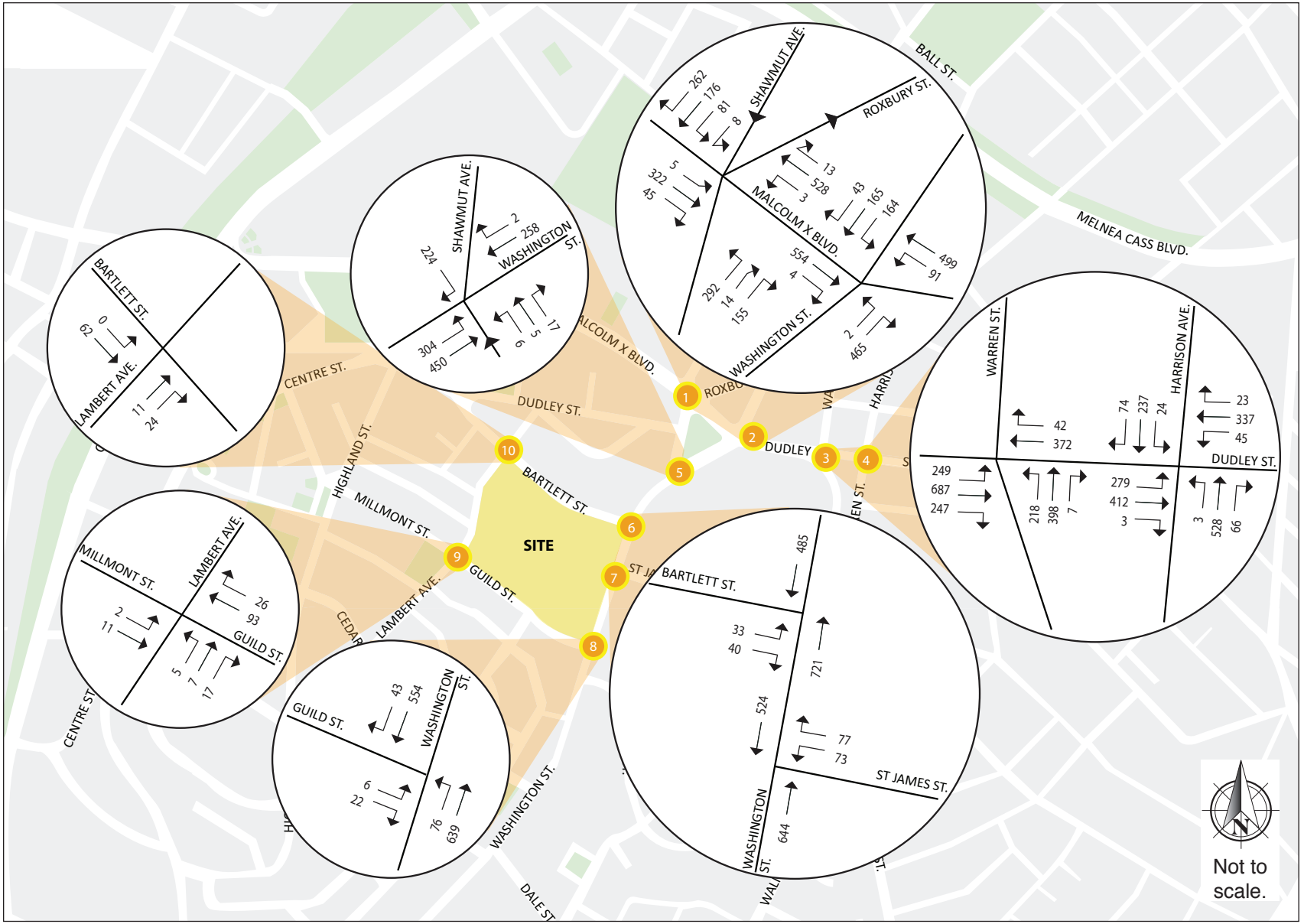
Turning movement as well as bicycle and pedestrian counts were collected during the weekday morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods on Wednesday, October 3, 2012, for all intersections along Dudley Street/Malcolm X Boulevard and Wednesday, November 28, 2012 for all other intersections. Based on these counts, the weekday peak hours were identified as 7:30–8:30 a.m. and 4:15–5:15 p.m.

Figure 3-3 and Figure 3-4 show the existing peak hour traffic volumes for the study area intersections. Complete traffic count data are provided in Appendix A.

3.2.3.1 Existing Traffic Operations

The study team conducted an intersection Level of Service (LOS) analysis to evaluate the level of congestion and to measure delay at each intersection location. All signalized and unsignalized levels of service were analyzed using Synchro 6, developed by Trafficware. Synchro 6 evaluates the effects closely-spaced intersections may have on each other, based on the traffic operational analysis methodology of the Transportation Research Board's 2000 *Highway Capacity Manual* (HCM). HCM methods determine the LOS, delay (in seconds), volume-to-capacity (v/c) ratio, and 95th percentile queue length (in feet), based on geometry and available traffic data for each intersection. Field observations were performed to establish intersection geometry (i.e., number of turning lanes, lane length, and lane width). Signal timing and phasing used in this analysis were obtained from BTD and through field observations conducted by the study team.

LOS designations, derived from the HCM, are based on average delay per vehicle for all vehicles entering an intersection. Table 3-2 displays the intersection level of service criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst (unacceptable) condition, with significant traffic delay. LOS D or better is typically considered acceptable in an urban area.

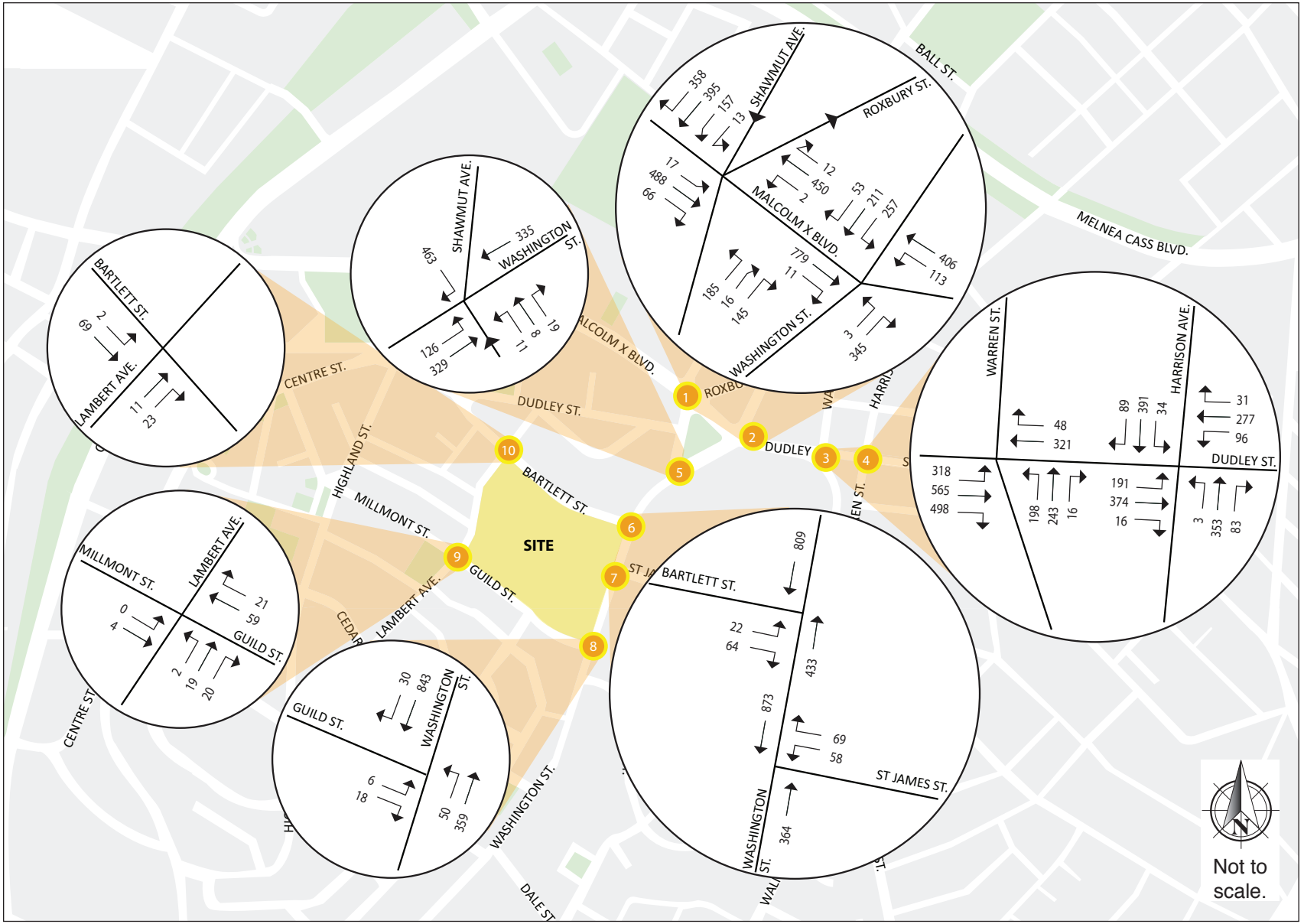


Bartlett Place Boston, Massachusetts

Figure 3-3

Existing Conditions (2012) Traffic Volumes, a.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®



Bartlett Place Boston, Massachusetts

Figure 3-4

Existing Conditions (2012) Traffic Volumes, p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Table 3-2 Intersection Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

The *v/c ratio* is a measure of congestion at an intersection approach. A v/c ratio of 1 or greater indicates that the traffic volume on the intersection approach exceeds capacity.

The *95th percentile queue length* represents the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line during 95 percent of all signal cycles. The 95th percentile queue will not be seen during each cycle. The queue would be this long only 5 percent of the time. These queues would typically not be seen during off-peak hours.

Existing Conditions signal timing and phasing information was provided by the Boston Transportation Department (BTD). To evaluate existing intersection operations, the study team calibrated the level of service analysis based on field observations of actual queues and delays. Uncalibrated, the analysis can show exaggerated queues and delays. Table 3-3 and Table 3-4 summarize the existing weekday a.m. peak hour and p.m. peak hour capacity analysis results for the Project. Detailed Synchro reports are provided in Appendix A.

Table 3-3 Existing Conditions (2012) Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**C**	**29.8**		
Malcolm X EB left/thru l thru/right	B	19.6	0.29	178
Malcolm X WB left/thru l thru/right	C	22.9	0.45	#327
Shawmut NB left	E	64.1	0.93	#323
Shawmut NB right l hard right	C	25.5	0.43	87
Shawmut SB left	C	22.0	0.26	68
Shawmut SB thru	C	23.9	0.37	132
Shawmut SB right	C	31.8	0.63	216

Table 3-3 Existing Conditions (2012) Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**123.1**		
Malcolm X EB thru l thru/right	D	44.3	0.58	#398
Dudley WB left/thru l thru	F	179.6	1.19	#538
Washington NB left/thru/right	F	153.7	1.06	#410
Washington NB right	F	124.4	1.06	#404
Washington SB left	E	79.1	0.84	#255
Washington SB thru/right	F	170.0	0.91	#319
Dudley Street/Warren Street	**C**	**30.9**		
Dudley EB left	F	105.9	1.09	#368
Dudley EB thru l thru	B	16.7	0.44	280
Dudley EB right	A	0.80	0.21	18
Dudley WB thru l thru/right	C	23.0	0.52	m#227
Warren NB left/thru l thru	D	35.5	0.72	263
Warren NB right	B	16.7	0.03	7
Dudley Street/Harrison Avenue	**F**	**122.3**		
Dudley EB left	B	14.8	0.62	114
Dudley EB thru/right	A	7.3	0.54	81
Dudley WB left/thru l thru/right	C	27.8	0.53	163
Harrison NB left/thru/right	F	357.2	1.13	#709
Harrison SB left	C	33.9	0.33	33
Harrison SB thru/right	D	44.9	0.63	263
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	B	13.1	0.39	46
Driveway WB left/thru/right	F	127.4	0.72	86
Washington NB left/thru	A	6.1	0.30	31
Washington SB thru/right	A	0.0	0.18	0
Unsignalized Intersections				
Bartlett Street/Washington Street				
Bartlett EB left/right	C	24.1	0.38	43
Washington NB thru	A	0.0	0.48	0
Washington SB thru	A	0.0	0.30	0
St. James Street/Washington Street				
St. James WB left/right	F	68.9	0.85	169
Washington NB thru	A	0.0	0.43	0
Washington SB thru	A	0.0	0.34	0

Table 3-3 Existing Conditions (2012) Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Guild Street/Washington Street				
Guild EB left/right	C	23.0	0.19	17
Washington NB left/thru	A	2.7	0.11	9
Washington SB thru	A	0.0	0.34	0
Washington SB right	A	0.0	0.03	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.4	0.04	–
Guild WB thru/right	A	7.8	0.18	–
Lambert NB left/thru/right	A	7.4	0.06	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.7	0.11	–
Lambert NB thru/right	A	7.3	0.07	–

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Grey shading indicates undesirable LOS.

Table 3-4 Existing Conditions (2012) Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**C**	**33.2**		
Malcolm X EB left/thru l thru/right	C	27.4	0.57	#373
Malcolm X WB left/thru l thru/right	C	26.4	0.47	#277
Shawmut NB left	F	100.5	1.04	#250
Shawmut NB right l hard right	C	20.5	0.34	79
Shawmut SB left	C	20.7	0.35	127
Shawmut SB thru	C	27.3	0.65	317
Shawmut SB right	C	31.1	0.71	313
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**140.4**		
Malcolm X EB thru l thru/right	E	67.4	0.60	#469
Dudley WB left/thru l thru	D	46.3	1.36dl	#421

Table 3-4 Existing Conditions (2012) Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Washington NB left/thru/right	F	295.1	1.38	#387
Washington NB right	F	240.4	1.36	#350
Washington SB left	F	189.2	1.26	#452
Washington SB thru/right	F	286.3	1.27	#434
Dudley Street/Warren Street	**C**	**31.2**		
Dudley EB left	F	116.1	1.14	#448
Dudley EB thru l thru	B	16.0	0.37	225
Dudley EB right	A	1.2	0.39	21
Dudley WB thru l thru/right	C	25.4	0.39	m#187
Warren NB left/thru l thru	C	29.8	0.51	193
Warren NB right	B	12.7	0.04	13
Dudley Street/Harrison Avenue	**E**	**80.0**		
Dudley EB left	C	21.0	0.56	76
Dudley EB thru/right	B	12.7	0.61	68
Dudley WB left/thru l thru/right	D	42.8	0.77	202
Harrison NB left/thru/right	F	112.2	0.78	395
Harrison SB left	C	22.0	0.19	39
Harrison SB thru/right	F	170.6	0.86	#505
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	E	42.4	0.91	286
Driveway WB left/thru/right	F	>50.0	4.44	–
Washington NB left/thru	A	3.6	0.14	12
Washington SB thru/right	A	0.0	0.24	0
Bartlett Street/Washington Street				
Bartlett EB left/right	E	44.6	0.55	73
Washington NB thru	A	0.0	0.29	0
Washington SB thru	A	0.0	0.56	0
St. James Street/Washington Street				
St. James WB left/right	F	51.3	0.69	112
Washington NB thru	A	0.0	0.24	0
Washington SB thru	A	0.0	0.59	0

Table 3-4 Existing Conditions (2012) Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Guild Street/Washington Street				
Guild EB left/right	D	25.7	0.16	13
Washington NB left/thru	A	2.8	0.10	8
Washington SB thru	A	0.0	0.57	0
Washington SB right	A	0.0	0.02	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.2	0.01	–
Guild WB thru/right	A	7.3	0.11	–
Lambert NB left/thru/right	A	7.2	0.07	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.6	0.10	–
Lambert NB thru/right	A	7.0	0.08	–

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
Grey shading indicates undesirable LOS.

Of the four signalized intersections, two operate at an acceptable overall LOS (LOS D or better) during both peak hours. Two signalized intersections (Malcolm X Boulevard/Dudley Street/Washington Street and Dudley Street/Harrison Avenue) operate below LOS D, in both peak hours, while all other intersections operate at LOS C or better.

The intersection of Roxbury Street/Malcolm X Boulevard/Shawmut Avenue operates at an overall LOS C during both the a.m. and p.m. peak hours. The Shawmut Avenue northbound left-turn lane operates at LOS E and F in the a.m. and p.m. peak hours, respectively. This is due to the high volume of southbound traffic on Shawmut Avenue.

The intersection of Malcolm X Boulevard/Dudley Street/Washington Street operates at an overall LOS F during both the a.m. and p.m. peak hours. Of the four approaches to this intersection, only the Malcolm X Boulevard eastbound operates at an acceptable LOS (LOS D) in the a.m peak hour, and only the Dudley Street westbound approach operates at an acceptable LOS (LOS D) in the p.m. peak hour. All other approaches operate at LOS E or F due to the overall high volume of traffic at the intersection and the high volume of left turns from the Washington Street southbound approach (approximately 250 vehicles per hour in the p.m. peak)

The intersection of Dudley Street/Warren Street operates at an overall LOS C during both the a.m. and the p.m. peak hours. The eastbound left turn lane on Dudley Street operates at LOS F during both peak hours due to the high volume of left turning vehicles (approximately 300 vehicles per hour in the p.m. peak) and insufficient green time given to the left turn arrow.

The intersection of Dudley Street/Harrison Avenue operates at an overall LOS F in the a.m. peak hour and LOS E in the p.m. peak hour. The Harrison Avenue northbound approach operates at a LOS F in the a.m., while the Harrison Avenue northbound approach and southbound thru/right approach operate at LOS F during the p.m. peak hour.

Of the six unsignalized intersections, three operate at an acceptable LOS on all approaches: Guild Street/Washington Street, Millmont Street/Guild Street/Lambert Avenue, and Bartlett Street/Lambert Avenue.

At the intersection of Shawmut Avenue/Washington Street, the westbound exit-only Police Department driveway operates at LOS F during both peak hours. This level of operation is typical for a stop-controlled approach that intersects a major arterial roadway, such as Washington Street. Field observations indicate that the actual delays and queue lengths are less than those reported by the Synchro analysis software. The Shawmut Avenue eastbound approach operates at LOS E during the p.m. peak hour due to the high volume of eastbound traffic (463 vehicles per hour).

At the intersection of Bartlett Street/Washington Street, the Bartlett Street eastbound approach operates at a LOS E during the p.m. peak hour. This level of operation is typical for a stop-controlled approach that intersects a major arterial roadway, such as Washington Street.

At the intersection of St. James Street/Washington Street, the St. James Street westbound approach operates at a LOS F during both peak hours. Again, this level of operation is typical for a stop-controlled approach that intersects a major arterial roadway, such as Washington Street. Actual delays and queue lengths are likely less than those reported by the Synchro analysis software.

3.2.3.2 Crash Data

HSH compiled motor vehicle crash data from the MassDOT Crash Records System for the most recent three-year period for which they are available (2008–2010). This data describes reported vehicular crashes in the study area and is based on information compiled by MassDOT. Crash rates are determined based on the number of crashes per million entering vehicles (MEV) in an intersection. The crash rate is based on two factors: traffic

volumes and crashes, and compares the relationship between them. Table 3-5 summarizes the data for the 10 study area intersections; detailed crash data and crash rate worksheets are included in Appendix A.

Thirty-nine crashes occurred at the study area intersections over the three-year period, with no reported fatalities. Many of the crashes (38 percent) were either rear-end or angle crashes. Of the crashes reported in the study area, many (38 percent) occurred on weekends. A substantial portion (30 percent) occurred during weekday daylight hours on a dry roadway surface.

The intersection of Dudley Street/Harrison Avenue had the highest incidence of crashes among the study area intersections with 24 crashes during the three-year period. Crashes at this intersection in 2010 represent a significant portion (38 percent) of the total number of crashes over the three-year period for all the study area intersections. Of all the crashes at this intersection, eight (33 percent) were angle type, three (13 percent) were rear-end type, and ten (42 percent) were unknown/other crashes. A review of the crash data indicates that the majority of crashes could have been caused by vehicles running red lights or making permitted left turns through opposing traffic. Due to the single year of high-frequency crashes, the crash rate at the intersection of Dudley Street/Harrison Avenue is higher than the District 6 average of 0.77 crashes per MEV at 1.02 crashes per MEV.

The crash rates at all other signalized and unsignalized study area intersections are below the District 6 averages.

Table 3-5 Crash Data

Intersection	2008	2009	2010	Total Crashes	Crash Rate	Dist. 6 Crash Rate
Signalized						
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	2	4	1	7	0.25	0.77
Malcolm X Boulevard/Dudley Street/Washington Street	3	0	0	3	0.11	
Dudley Street/Warren Street	0	0	1	1	0.04	
Dudley Street/Harrison Avenue	5	4	15	24	1.02	
Shawmut Avenue/Washington Street	1	2	0	3	0.20	0.57
Bartlett Street/Washington Street	1	0	0	1	0.06	
St. James Street/Washington Street	0	0	0	0	0.00	
Guild Street/Washington Street	0	0	0	0	0.00	
Millmont Street/Guild Street/Lambert Avenue	0	0	0	0	0.00	
Bartlett Street/Lambert Avenue	0	0	0	0	0.00	

Source: MassDOT, Crash Records System, queried on December 19, 2012

3.2.4 Existing Parking Conditions

3.2.4.1 On-street Parking

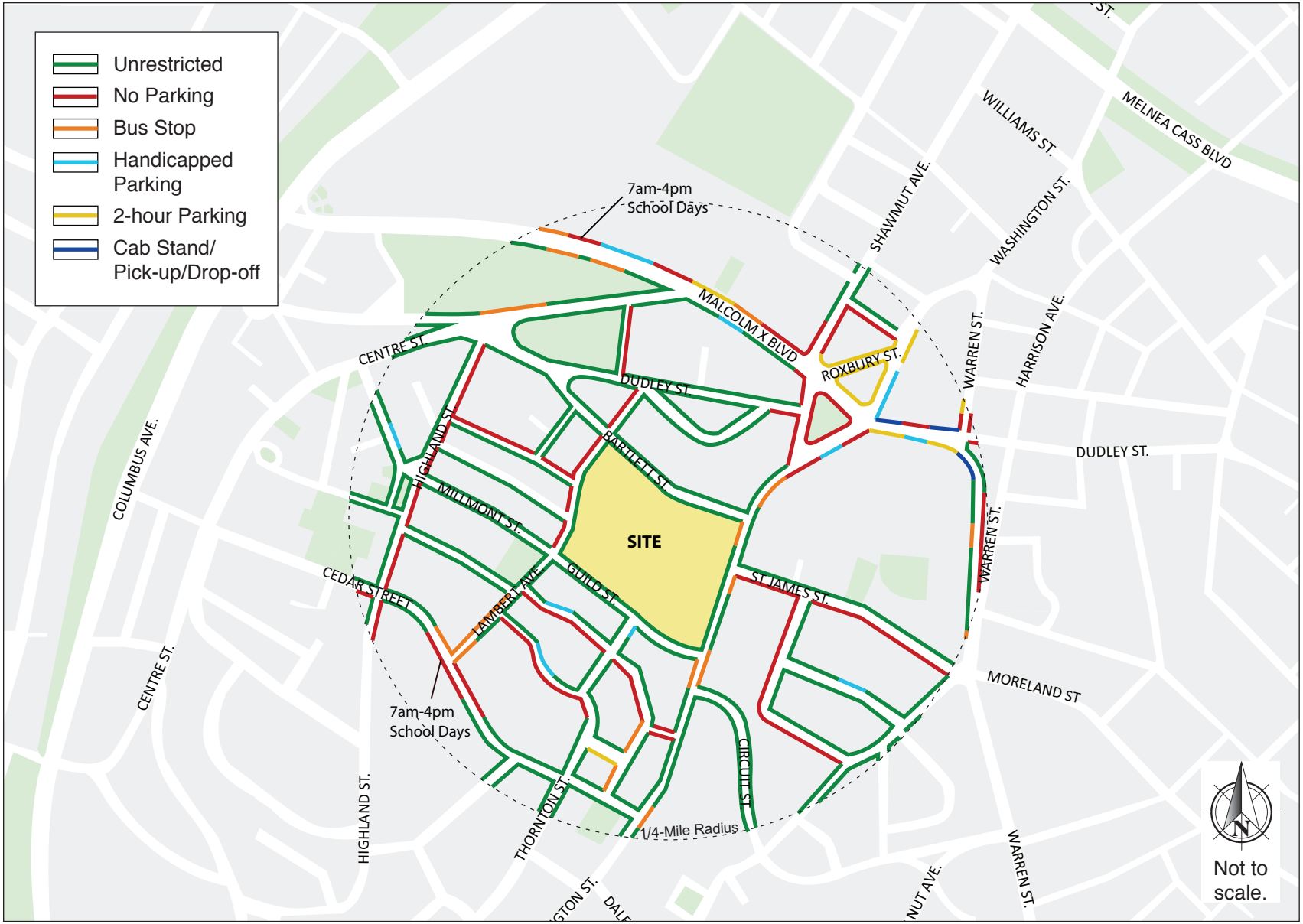
On-street parking is provided along the roadways throughout the area adjacent to the Project Site. Figure 3-5 presents an inventory of existing curb use and parking restrictions in the vicinity of the Project Site. On-street parking adjacent to the Site consists of mainly unrestricted parking and no-stopping zones, on both sides of the street.

3.2.4.2 Off-street Parking

There are no public parking garages within a quarter mile of the Project Site. The surrounding garages in the area are private and designated for employees of the surrounding medical facilities. There are two parking garages near Ruggles Station, which is outside of the quarter-mile radius from the Project.

3.2.5 Public Transportation in the Study Area

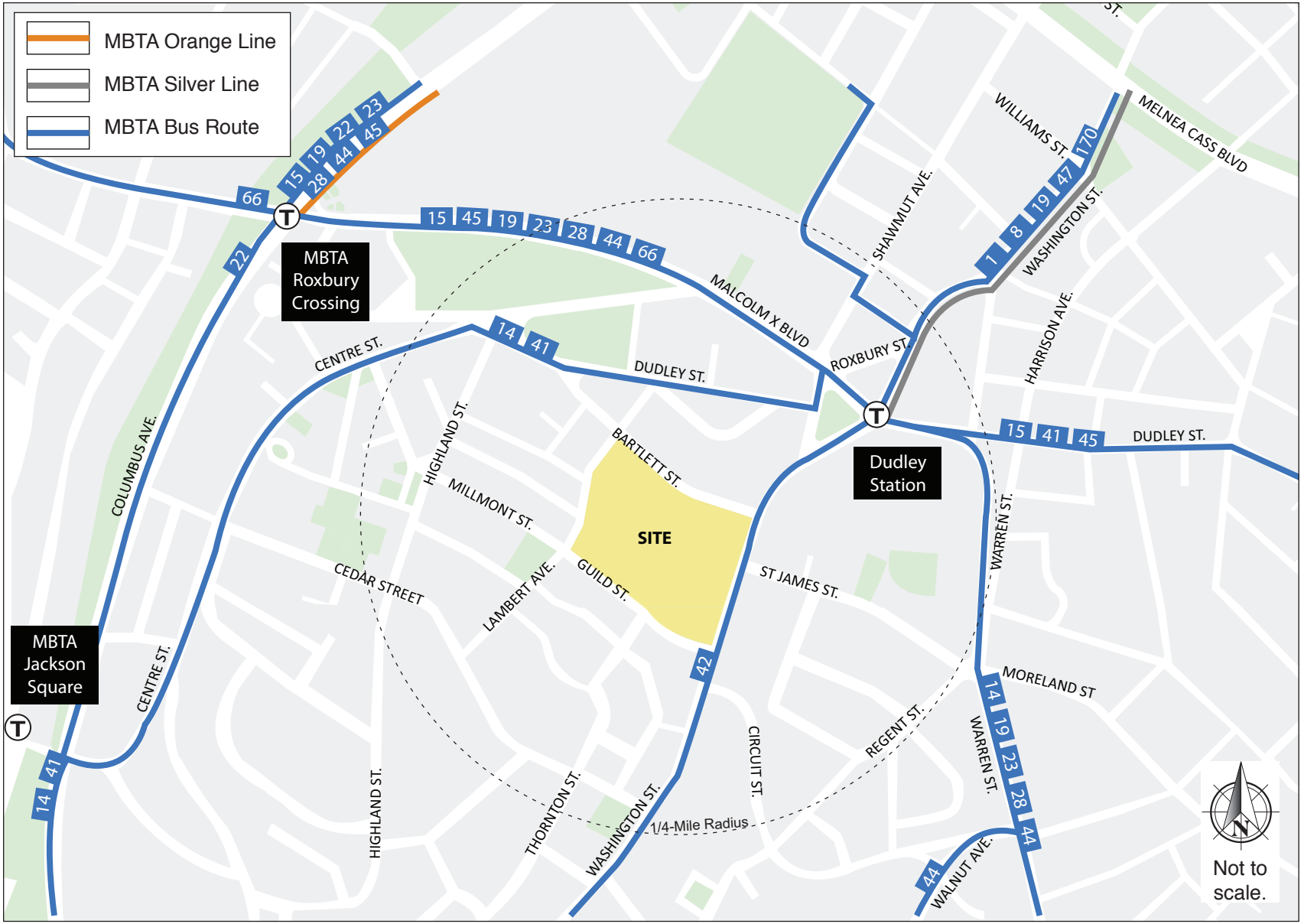
The Project Site is located within convenient walking distance to a variety of public transit services provided by the MBTA. Dudley Station, which is located between Washington Street and Warren Street, is a hub to several local bus services and provides Silver Line bus rapid transit (BRT) services. Ruggles Station, located at the intersection of Ruggles and Tremont Streets, provides orange line, commuter rail, and local bus services. Privately operated bus services run along the corridor as well. Public transportation within the Project are presented in Figure 3-6 and summarized in Table 3-6.



Bartlett Place Boston, Massachusetts

Figure 3-5
Existing On-Street Parking

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®



Bartlett Place Boston, Massachusetts

Figure 3-6
Public Transportation

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Table 3-6 MBTA Transit Service in the Study Area

Transit line/ Bus Route	Route Description	AM Peak Headway (minutes)	PM Peak Headway (minutes)
Rapid Transit			
Orange Line	Forest Hills Station – Oak Grove Station	4/5	4/5
Bus Service			
1	Harvard/Holyoke Gate – Dudley Station	8/9	7/8
8	Harbor Point/U Mass – Kenmore Station	13/14	20
14	Roslindale Square - Heath Street via Dudley Station	35	35
15	Kane Square or Fields Corner Station		
19	Fields Corner Station –Ruggles or Kenmore Station	12	20
22	Ashmont Station – Ruggles Station via Jackson Square Station	8	9
23	Ashmont Station – Ruggles Station via Washington Street	5/6	7/8
28	Mattapan Station – Ruggles Station via Dudley Station	6/7	8
41	Centre & Eliot Streets – JFK/UMASS Station via Dudley Station, Centre Street, and Jackson Square Station	22	24
44	Jackson Square Station – Ruggles Station via Seaver Street and Humboldt Avenue	12	14
45	Franklin Park Zoo – Ruggles Station via Blue Hill Avenue	10	12
47	Central Square, Cambridge – Broadway Station	20/22	10/22
66	Harvard Square – Dudley Square	8/9	9/10
170	Oak Park – Dudley Station (Limited Service)	X	X
SL4	Dudley Station – South Station	4	4/5
SL5	Dudley Station – Downtown Crossing	15	15

X = Irregular Headways
Source: *mbta.com*, Ridership and Service Statistics, Thirteenth Edition 2010. Headways are approximate.

3.2.5.1 Commuter Rail

The MBTA offers three commuter rail lines that run through Ruggles Station: the Providence/Stoughton line, the Franklin line, and the Needham line. These trains provide access from Boston to the southern and southwestern regions of Massachusetts and Rhode Island.

During the weekday, the Providence/Stoughton Lines has ten inbound trains and 25 outbound trains that stop at Ruggles Station. Inbound trains run between 6:11 a.m. and 2:29 p.m. Outbound trains run between 6:33 a.m. to 12:07 p.m.

The Franklin Line has seven inbound trains and twelve outbound trains that stop at Ruggles Station. Inbound trains run between 7:00 a.m. and 12:57 p.m. Outbound trains run between 12:53 p.m. to 11:58 p.m.

The Needham Line has twelve inbound trains and twelve outbound trains that stop at Ruggles Station. Inbound trains run between 6:41 a.m. and 10:39 p.m. Outbound trains run between 12:08 p.m. to 10:38 p.m.

3.2.5.2 Rapid Transit

The MBTA's Orange Line Subway provides service from Forest Hills Station in Jamaica Plain, Boston to Oak Grove Station in Malden, Massachusetts. The Ruggles Station provides inbound and outbound service approximately every 5-10 minutes Monday through Friday and 8-10 minutes on Saturday and Sunday.

The MBTA Silver Line BRT services Dudley Square Station, Downtown Crossing and South Station via Washington Street; and local bus stops are located along the corridor and its adjacent roadway network. The Silver Line #4 service operates from Dudley Station to South Station at Essex Street via Washington Street, and provides peak hour headway of approximately ten minutes. The Silver Line #5 service operates from Dudley Station to Downtown Crossing at Temple Street via Washington Street, and provides peak hour headway of approximately seven minutes.

3.2.5.3 Bus

With Dudley Station acting as a public transportation hub in the Boston Metro area, several local bus services provide connections to Cambridge, Kenmore Square, Ruggles Station, and other local and regional destinations.

Local bus routes provide connections to MBTA subway stations, such as the Red Line (Broadway, Andrew, and JFK/UMass) and the Orange Line (Massachusetts Avenue, Back Bay, and Ruggles).

3.2.6 Pedestrian and Bicycles

Pedestrian activity in and around the Project Site is generally moderate due to its proximity to the public transportation. Sidewalks are provided on both sides of all roadways within the study area. As is common in urban settings, the effective widths of sidewalks in the study area are narrowed due to the presence of light posts, parking meters, street trees, and other obstacles located along the sidewalk path.

Crosswalks, handicap accessible ramps, and concurrent pedestrian phases are provided at all study area intersections and the midblock pedestrian crossing. Figure 3-7 illustrates existing pedestrian volumes during the a.m. and p.m. peak hours.

Numerous recreational and bicycle paths are located near the Project. The Paul Dudley White Bicycle Path, which runs along the Charles River from downtown Boston to Watertown Square, can be accessed from Massachusetts Avenue a little more than a mile from the Site as well as the bicycle paths that parallels the Muddy River from Fenway to Jamaica Plain. Adjacent to Melnea Cass Boulevard is the South Bay Harbor Trail, which is a mixed-use path that extends from Columbus Avenue towards the Southeast Expressway (Interstate 93), and connects with the Boston Harborwalk in Rolling Bridge Park on Fort Point Channel. The Southwest Corridor Park, an approximate five mile mixed-use path for pedestrians and bicyclist also intersects with the South Bay Harbor Trail at Columbus Avenue. The Pierre Lallement Southwest Corridor Bicycle Path, which runs adjacent to the Orange Line from Back Bay Station to Forest Hills Station, crosses Massachusetts Avenue more than a half mile from the Site.

Bicycle activity around the Site is generally light on all adjacent Project roadways.

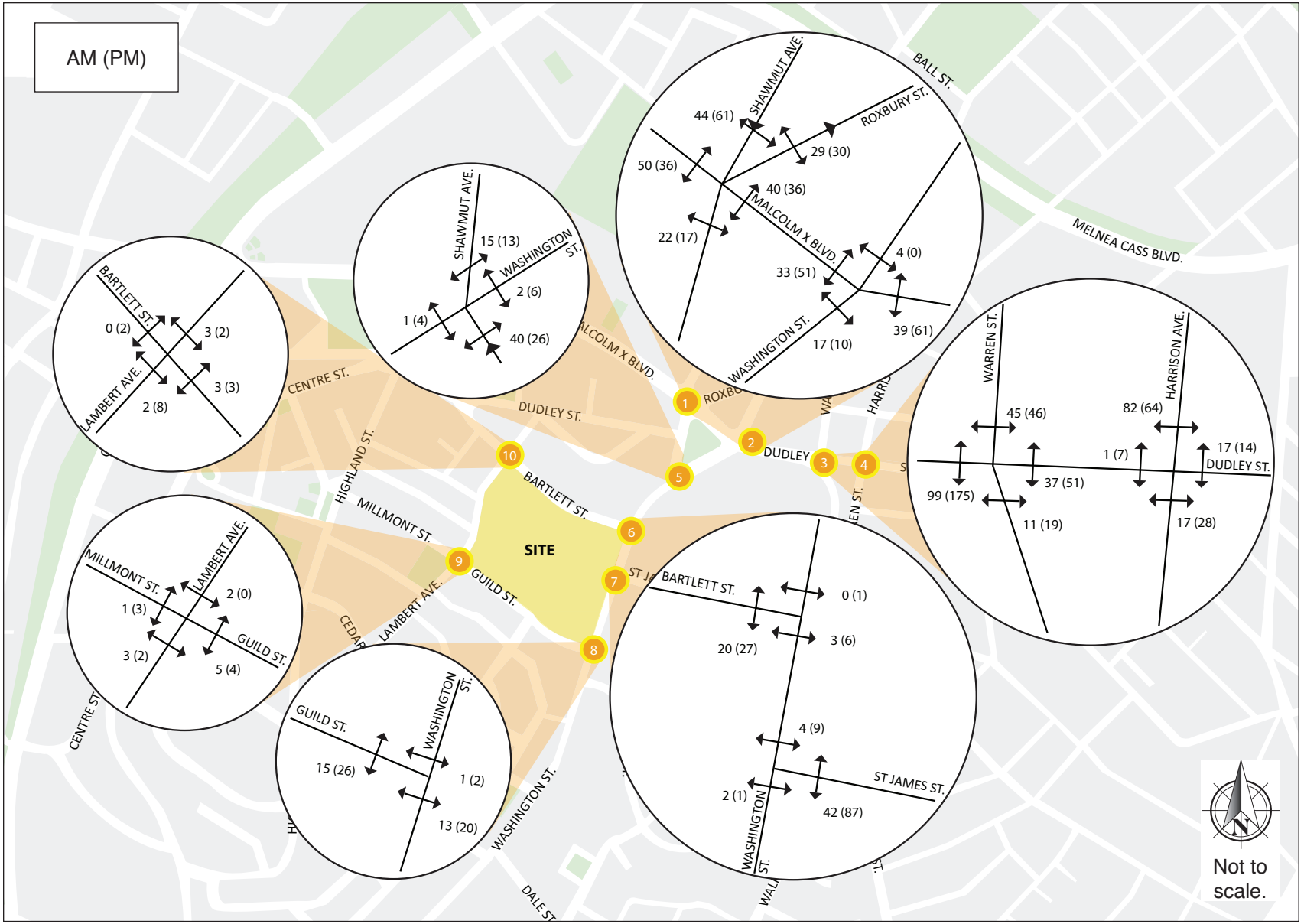
In addition, local roads around the Project Site such as Dudley Street, Warren Street, Walnut Avenue, and Centre Street are designated for intermediate cyclists according to the *Boston Bike Map 2010 - 2011,* published by the City of Boston. One difficulty presented by the Site is that on Washington Street and outside of the immediate project area, cyclists have to travel on roads designated for advanced cyclists, such as Malcolm X Boulevard, Massachusetts Avenue, Huntington Avenue, and Boylston Street, to access bicycle paths.

No bicycle racks are currently provided at the existing Project Site. Existing peak hour bicycle volumes are shown in Figure 3-8.

3.2.7 Hubway and Car Sharing

Hubway is a bicycle sharing system in Metro Boston, which was launched in July 2011 with approximately 60 stations and 600 bicycles. Near the Project Site, there is a Hubway station at the corner of Washington Street/Lenox Street that has approximately fifteen bicycles. There are also three other Hubway stations within a half-mile from the Site with about 15 bicycles each.

Car sharing is predominately provided by Zipcar in the Boston area and supplies easy access to vehicular transportation for those who do not own cars. Vehicles are rented on an hourly or daily basis with all vehicle costs (gas, maintenance, insurance, and parking) included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. Approximately 16 Zipcars are located at three locations close to the Project Site.



Bartlett Place Boston, Massachusetts

Figure 3-7

Existing Conditions (2012) Pedestrian Volumes, a.m. and p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Bartlett Place Boston, Massachusetts

Figure 3-8

Existing Conditions (2012) Bicycle Volumes, a.m. and p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Figure 3-9 presents both Hubway and Zipcar facilities within walking distance to the Project Site.

3.2.8 Loading and Service

There is no existing loading for the Project.

3.3 Evaluation of Long-term Impacts

This section presents a description and evaluation of the 2017 No-Build and Build Conditions. The methodology is consistent with the City of Boston's *Transportation Access Guidelines*.

3.3.1 No-Build Conditions

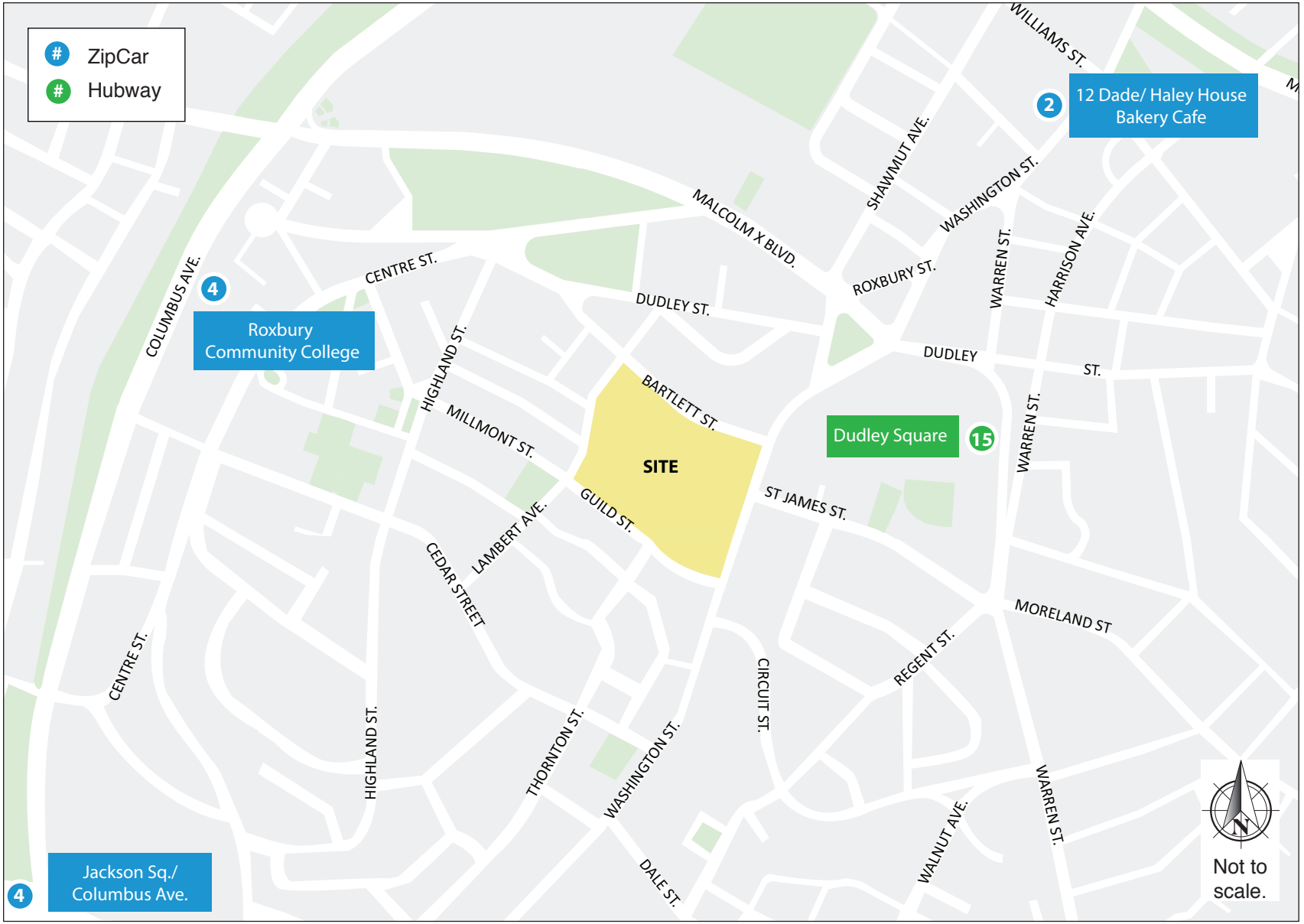
No-Build traffic conditions are independent of the Project and include all existing traffic and any new traffic resulting from both background growth and any identified development projects in the area. The No-Build Condition is used to evaluate the cumulative impacts of the anticipated future traffic increases, while providing a baseline of comparison for the Project.

3.3.1.1 Background Traffic Growth

Two procedures are generally used in combination to determine background traffic growth. The first procedure is to estimate traffic generated by planned new major developments and anticipated roadway changes. In collaboration with the Boston Redevelopment Authority (BRA), the study team identified multiple development projects in the immediate area that would be constructed within the five-year planning horizon, which are described below and located in Figure 3-10:

A. *2-14 Taber Street* – This project is constructing a three-story building with 23,559 square feet of office and retail. Phase one will construct 7,853 square feet of retail space on the ground floor and phase two will consist of construction of the second and third floors with 15,706 square feet of office space.

B. *Dudley Greenville Rental Housing* - Dudley Greenville will consist of two buildings containing 43 affordable residential rental units and 3,000 square feet of retail space on Dudley Street, near Dudley Square in Boston. This development will build on two parcels of land near the heart of Dudley Square that have remained undeveloped for several years.

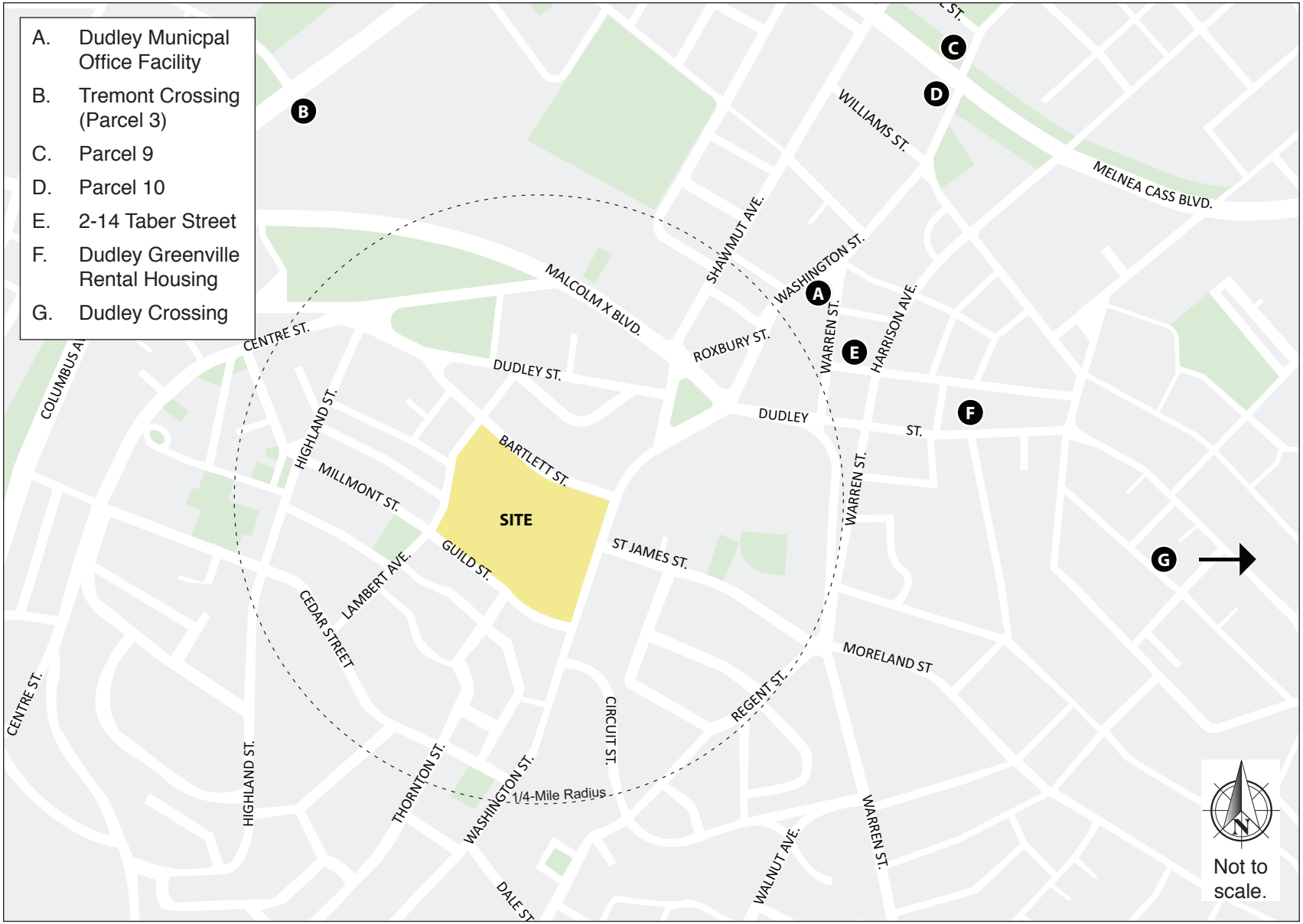


Bartlett Place Boston, Massachusetts

Figure 3-9

Area Hubway and Zipcar Locations

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®



Bartlett Place Boston, Massachusetts

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Figure 3-10
Area Development Projects

C. Dudley Municipal Building New 200,000 square foot headquarters building for Boston Public Schools, which will house over 500 employees. It will include 20,000 square feet of street-level retail space, as well as open space to showcase student work, school events, and host community gatherings. Trip generation and distribution were obtained from the transportation component of the Environmental Notification Form, prepared by Epsilon Associates, Inc. on April 30, 2012.

D. Tremont Crossing (P-3) Proposal calls for 550,000 square feet of retail, 200,000 square feet of office, 240 residential units, 58,000 square feet of cultural space, and 1,700 parking spaces. Trip generation and distribution were obtained from the transportation component of the Project Notification Form, prepared by BSC Group on April 17, 2012.

E. Parcel 9 This project is proposing to construct a new five-story building with 9,095 square feet of retail, 55 residential units, and 145 hotel rooms. Trip generation and distribution were obtained from the transportation component of the Project Notification Form, prepared by Howard/Stein-Hudson Associates, Inc.

F. Parcel 10 This project includes a mixed-use redevelopment of the site into a new 40,000 square feet building of relocated retail (Tropical Foods Grocery Store); construction of a new approximately 64,100 square feet mixed-use building (14,600 square feet of retail, 11,160 square feet of office, and 36 residential units); and renovation and conversion of the existing Tropical Foods building into approximately 11,000 square feet of retail space and 30 residential units. Trip generation and distribution were obtained from the transportation component of the Project Notification Form, prepared by Howard/Stein-Hudson Associates, Inc.

G. Dudley Crossing the project proposes for eight units in a new building on Hampton Street and the rehabilitation of two existing buildings on Dudley, Hampton, and Dunmore streets for a total of 39 units and 3,209 square feet of commercial space.

The second part of the procedure is to apply a general growth rate to account for other smaller planned/approved development projects and changes in demographics, auto usage, and auto ownership. For this study a background growth rate of approximately 0.5 percent per year was selected. No traffic improvements that would affect the analysis are planned within the study area by the Build year (2017).

3.3.1.2 No-Build Conditions Traffic Operations

The 2017 No-Build morning and evening peak-hour traffic volumes, accounting for the background growth rate and other projects, are presented in Figure 3-11 and Figure 3-12. Capacity analysis was conducted using the methodology described for Existing Conditions and is presented in Table 3-7 and 3-8 for the morning and evening peak hours, respectively. Detailed Synchro reports are provided in Appendix A.

Bartlett Place Boston, Massachusetts

Figure 3-11

No-Build Conditions (2022) Traffic Volumes, a.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Bartlett Place Boston, Massachusetts

Figure 3-12

No-Build Conditions (2022) Traffic Volumes, p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Table 3-7 No-Build Conditions (2017) Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**C**	**30.6**		
Malcolm X EB left/thru l thru/right	C	21.3	0.34	195
Malcolm X WB left/thru l thru/right	C	25.0	0.50	#358
Shawmut NB left	E	66.7	0.95	#359
Shawmut NB right l hard right	C	24.5	0.43	93
Shawmut SB left	C	21.0	0.26	71
Shawmut SB thru	C	22.8	0.37	141
Shawmut SB right	C	30.7	0.64	237
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**154.8**		
Malcolm X EB thru l thru/right	D	51.2	0.62	#438
Dudley WB left/thru l thru	F	222.8	1.26	#571
Washington NB left/thru/right	F	193.6	1.13	#443
Washington NB right	F	147.9	1.12	#436
Washington SB left	F	84.7	0.89	#290
Washington SB thru/right	F	255.4	0.97	#367
Dudley Street/Warren Street	**D**	**37.7**		
Dudley EB left	F	151.1	1.22	#419
Dudley EB thru l thru	B	17.2	0.47	303
Dudley EB right	A	0.80	0.23	18
Dudley WB thru l thru/right	C	24.0	0.56	m#253
Warren NB left/thru l thru	D	38.0	0.78	292
Warren NB right	B	17.4	0.03	7
Dudley Street/Harrison Avenue	**F**	**134.3**		
Dudley EB left	B	18.5	0.67	124
Dudley EB thru/right	A	7.9	0.58	99
Dudley WB left/thru l thru/right	C	29.0	0.57	176
Harrison NB left/thru/right	F	393.3	1.18	#755
Harrison SB left	D	37.0	0.37	34
Harrison SB thru/right	D	54.1	0.66	280

Table 3-7 No-Build Conditions (2017) Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	B	14.0	0.43	54
Driveway WB left/thru/right	F	239.8	1.01	117
Washington NB left/thru	A	6.6	0.33	36
Washington SB thru/right	A	0.0	0.20	0
Bartlett Street/Washington Street				
Bartlett EB left/right	D	28.6	0.45	54
Washington NB thru	A	0.0	0.51	0
Washington SB thru	A	0.0	0.32	0
St. James Street/Washington Street				
St. James WB left/right	F	109.3	1.00	225
Washington NB thru	A	0.0	0.45	0
Washington SB thru	A	0.0	0.36	0
Guild Street/Washington Street				
Guild EB left/right	D	25.7	0.22	20
Washington NB left/thru	A	3.0	0.12	10
Washington SB thru	A	0.0	0.37	0
Washington SB right	A	0.0	0.04	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.4	0.04	–
Guild WB thru/right	A	7.9	0.19	–
Lambert NB left/thru/right	A	7.4	0.06	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.7	0.12	–
Lambert NB thru/right	A	7.3	0.07	–

# = 95# = 95thpercentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
* Defacto lane-operates as a 25 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from Existing Conditions

Table 3-8 No-Build Conditions (2017) Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**D**	**40.7**		
Malcolm X EB left/thru l thru/right	C	31.1	0.68	#444
Malcolm X WB left/thru l thru/right	C	29.1	0.56	#335
Shawmut NB left	F	162.5	1.22	#286
Shawmut NB right l hard right	C	21.8	0.38	90
Shawmut SB left	C	21.5	0.38	137
Shawmut SB thru	C	29.0	0.69	348
Shawmut SB right	C	34.4	0.77	351
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**183.1**		
Malcolm X EB thru l thru/right	F	103.7	0.67	#551
Dudley WB left/thru l thru	D	57.3	1.60dl	#467
Washington NB left/thru/right	F	374.7	1.54	#434
Washington NB right	F	312.2	1.52	#397
Washington SB left	F	212.1	1.32	#478
Washington SB thru/right	F	384.8	1.34	#466
Dudley Street/Warren Street	**E**	**57.8**		
Dudley EB left	F	271.4	1.52	#585
Dudley EB thru l thru	B	16.8	0.42	260
Dudley EB right	A	1.3	0.43	22
Dudley WB thru l thru/right	C	32.0	0.44	m#191
Warren NB left/thru l thru	C	31.2	0.59	225
Warren NB right	B	13.6	0.05	15
Dudley Street/Harrison Avenue	**F**	**122.9**		
Dudley EB left	C	29.5	0.64	95
Dudley EB thru/right	B	15.3	0.69	81
Dudley WB left/thru l thru/right	E	67.4	0.84	#240
Harrison NB left/thru/right	F	175.8	0.87	#489
Harrison SB left	C	22.7	0.21	41
Harrison SB thru/right	F	261.7	0.98	#620

Table 3-8 No-Build Conditions (2017) Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	F	102.9	1.12	498
Driveway WB left/thru/right	F	-	-	-
Washington NB left/thru	A	4.3	0.18	16
Washington SB thru/right	A	0.0	0.29	0
Bartlett Street/Washington Street				
Bartlett EB left/right	F	80.9	0.76	115
Washington NB thru	A	0.0	0.32	0
Washington SB thru	A	0.0	0.64	0
St. James Street/Washington Street				
St. James WB left/right	F	116.5	0.97	188
Washington NB thru	A	0.0	0.28	0
Washington SB thru	A	0.0	0.67	0
Guild Street/Washington Street				
Guild EB left/right	D	33.9	0.21	13
Washington NB left/thru	A	3.4	0.12	10
Washington SB thru	A	0.0	0.65	0
Washington SB right	A	0.0	0.02	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.2	0.01	–
Guild WB thru/right	A	7.4	0.12	–
Lambert NB left/thru/right	A	7.2	0.07	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.6	0.10	–
Lambert NB thru/right	A	7.2	0.06	–

# = 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
* Defacto lane-operates as a 25 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from Existing Conditions

At the intersection of Roxbury Street/Malcolm X Boulevard/Shawmut Avenue during the p.m. peak hour, the overall intersection LOS worsens from LOS C during Existing conditions to LOS D under No-Build conditions. The Malcolm X Boulevard eastbound approach worsens from an LOS B in Existing conditions to an LOS C under No-Build conditions during the a.m. peak.

At the intersection of Malcolm X Boulevard/Dudley Street/Washington Street during the a.m. peak hour, the Washington Street southbound approach worsens from an LOS E during Existing conditions to an LOS F under No-Build conditions. The Malcolm X Boulevard eastbound approach worsens from an LOS E in Existing conditions to an LOS F under No-Build conditions during the p.m. peak.

At the intersection of Dudley Street/Warren Street during the a.m. peak hour, the overall intersection LOS worsens from LOS C during Existing conditions to LOS D under No-Build conditions. During the p.m. peak hour, the overall intersection LOS worsens from LOS C during existing conditions to LOS F under No-Build conditions.

At the intersection of Dudley Street/Harrison Avenue during the p.m. peak hour, the overall intersection LOS worsens from LOS E during Existing conditions to LOS F under No-Build conditions. The Harrison Avenue southbound approach worsens from LOS C during existing conditions to an LOS D during the a.m. peak hour. The Dudley Street westbound approach worsens from LOS D during Existing conditions to LOS E under No-Build conditions during the p.m. peak.

At the intersection of Shawmut Avenue/Washington Street, the Shawmut Avenue eastbound approach LOS worsens from LOS E during existing conditions to LOS F under No-Build conditions during the p.m. peak.

At the intersection of Bartlett Street/Washington Street, the Bartlett Street eastbound approach LOS worsens from LOS C during Existing conditions to LOS D under No-Build conditions during the a.m. peak.

At the intersection of Guild Street/Washington Street, the Guild Street eastbound approach LOS worsens from LOS C during existing conditions to LOS D under No-Build conditions during the a.m. peak.

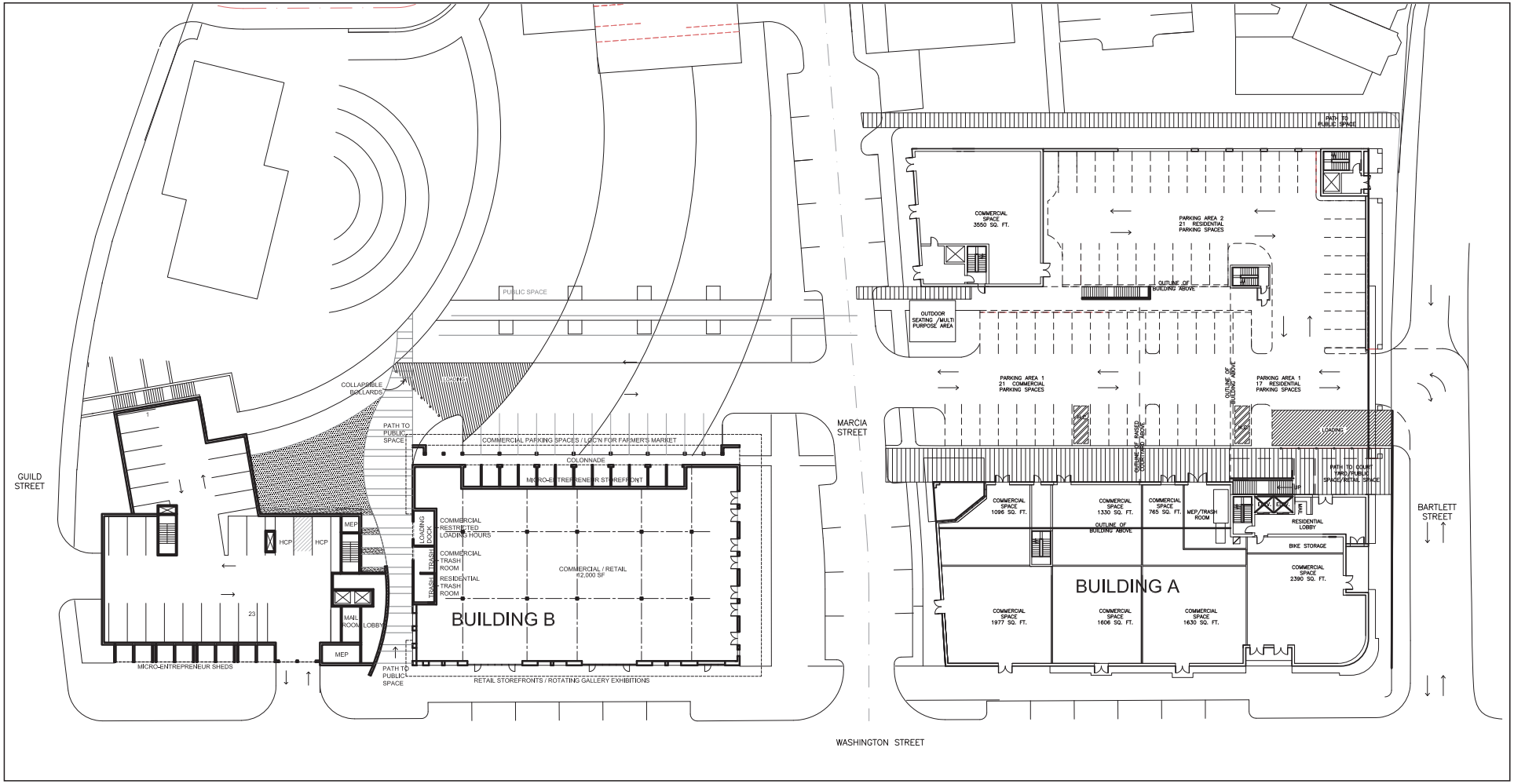
3.3.2 Build Conditions – First Phase

As summarized in Section 2.1.1 Project Description, the Project has multiple phases. The First Phase will result in the construction of approximately 102 residential units, 11,224 square feet of institutional, 31,322 square feet of specialty retail, 5,464 square feet of office, 114 parking spaces, and 115 bicycle parking spaces. The site access and circulation plan is shown in Figures 3-13 and 3-14.

Bartlett Place Boston, Massachusetts

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Figure 3-13
Site Access Plan and Circulation



Not to scale.

Bartlett Place Boston, Massachusetts

Figure 3-14

Phase 1 Site Plan and Circulation

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

3.3.2.1 Site Access and Circulation

Vehicular access to the Site is currently provided via one curb cut on Washington Street, approximately 19 feet wide, which is gated. The gated driveway provides access to the two vacant buildings and its surface parking lot. Access to the Site for the First Phase will be provided by four new curb cuts. Along Washington Street there are two curb cuts proposed. The southern curb cut accessing the first floor parking garage and the northern curb cut accesses Marcia Street, between Buildings A and B. The curb cut on Guild Street will provide access to the second floor of the parking garage. The Bartlett Street curb cut accesses parking just north of Building A.

All loading, trash pick-up, and move-in/move-out activities will occur on-site.

3.3.2.2 Trip Generation and Mode Split

For the First Phase, trip generation for the proposed land uses was derived from the Institute of Transportation Engineers' (ITE) publication *Trip Generation* 9th edition, using the following Land Use Codes (LUC):

- LUC 220 –Apartment;
- LUC 492 – Health/Fitness Club;
- LUC 540 – Junior/Community College;
- LUC 715 – Single Tenant Office Building; and
- LUC 826 – Specialty Retail Center.

BTD publishes transit, walk/bike, and vehicle mode split rates for different areas of Boston; the Project is located within designated Area 15. Mode split assumptions are based on BTD's Area 15 data, local vehicle occupancy rates from 2009 *National Household Travel Survey,* and the 2010 U.S. Census. Based on the land use trip rates, mode split assumptions, and local vehicle occupancy rates, the resulting transit, walk/bike, and vehicle trips were identified. The Project-generated trips are summarized in Table 3-9, with detailed trip generation information provided in Appendix A.

Table 3-9 Trip Generation Summary, First Phase

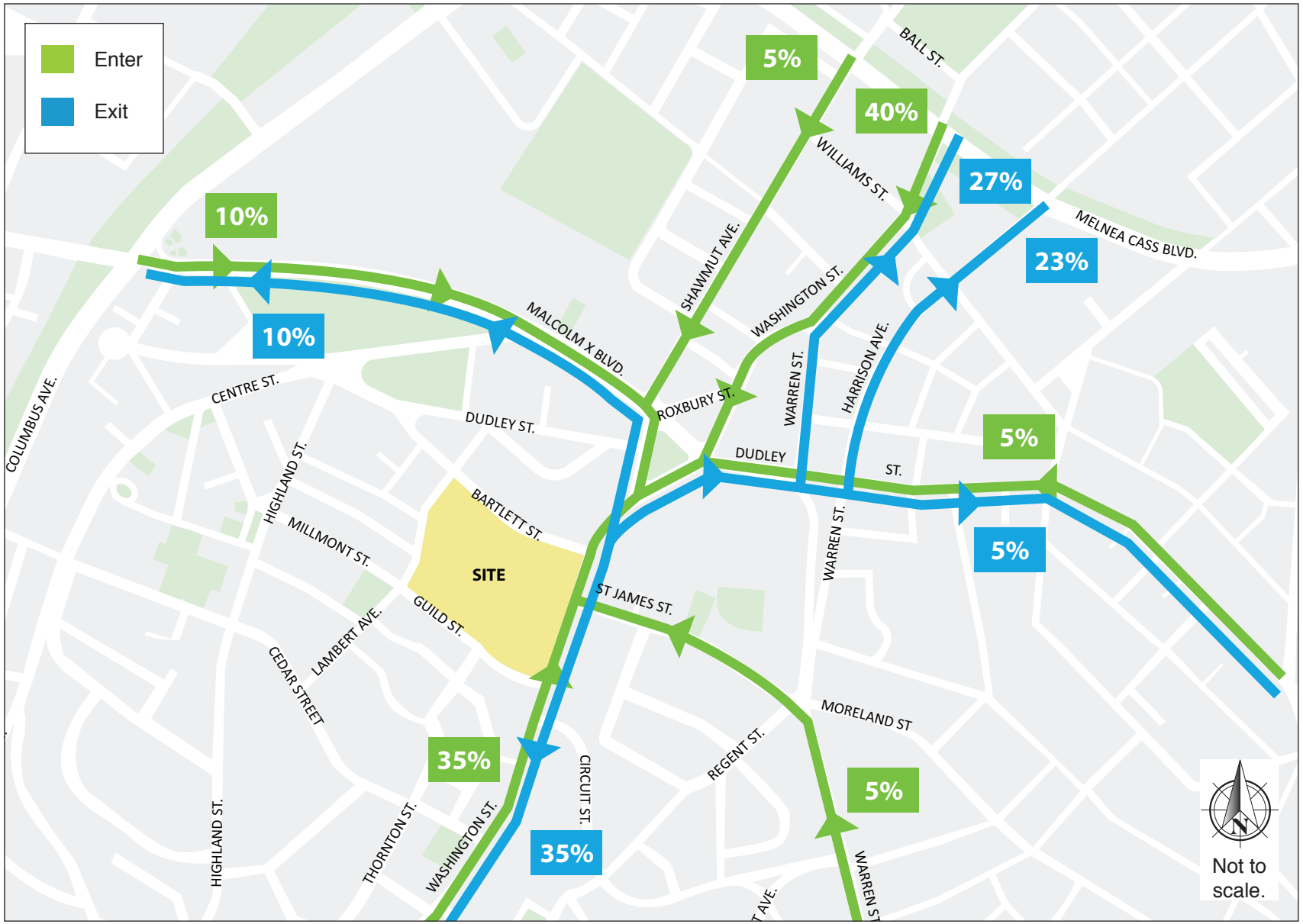
	Direction	Transit Trips	Walk/Bike Trips	Auto Trips
Daily	In	233	390	667
	Out	233	390	667
	Total	466	780	1,335
a.m. Peak Hour	In	44	61	101
	Out	63	63	84
	Total	107	124	185
p.m. Peak Hour	In	35	38	47
	Out	29	38	66
	Total	64	76	113

3.3.2.3 Trip Distribution

Vehicular trip distribution for the non-residential land uses was conducted on a gravity model based on traffic data. Vehicular trip distribution for the residential land uses was developed based on the U.S. Census bureau data. Non-residential and residential land use distributions for the Project are shown in Figures 3-15 and 3-16.

3.3.2.4 Build Conditions Traffic Operations

The First Phase project-generated trips for the weekday a.m. and p.m. peak hours are shown in Figure 3-17 and Figure 3-18, respectively. The capacity analysis for the First Phase Build Conditions, which was conducted using the methodology described for Existing and No-Build Conditions, appears in Table 3-10 and Table 3-11. The 2017 First Phase project generation trips and morning and evening peak-hour traffic volumes are presented in Figure 3-19 and Figure 3-20.

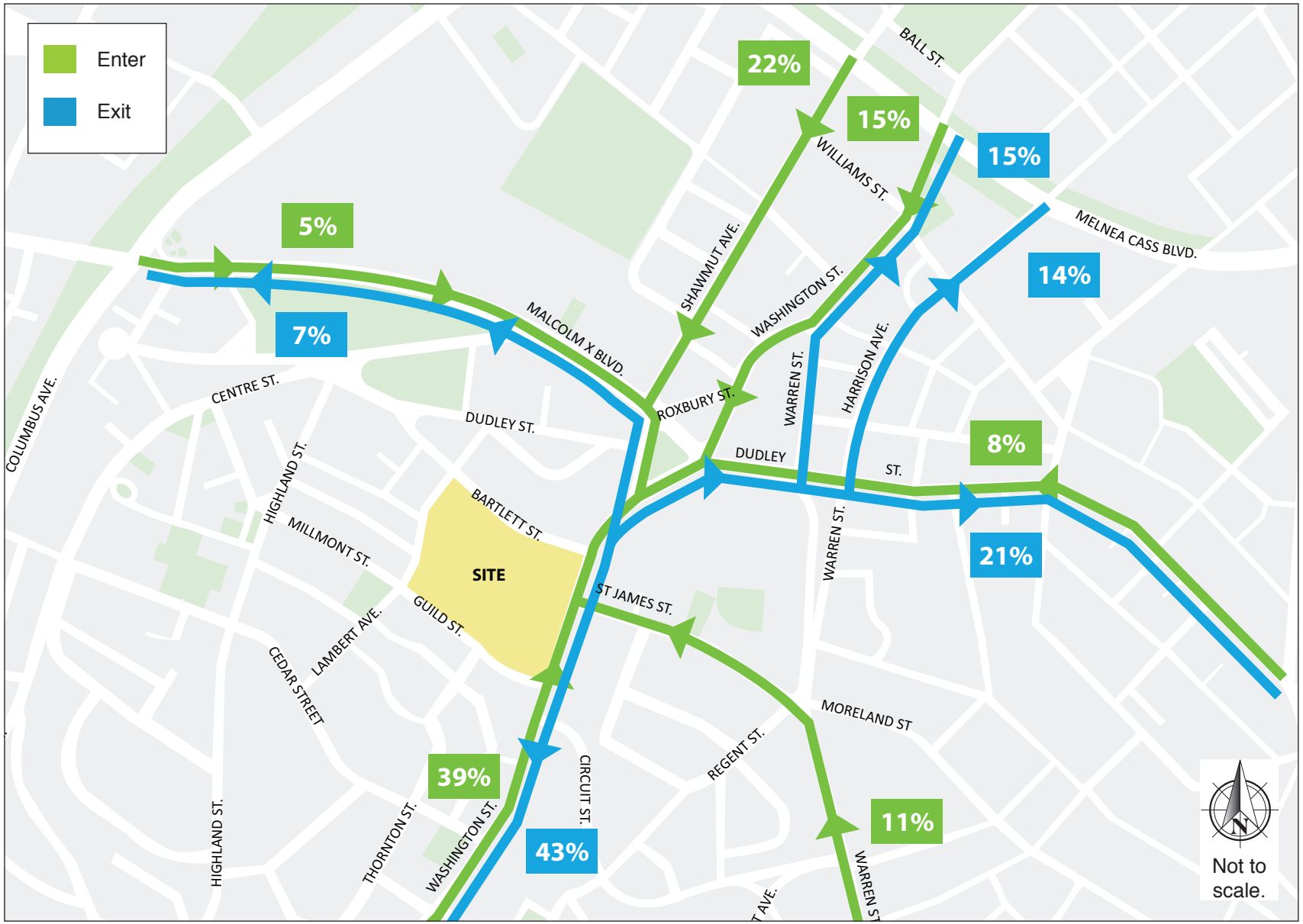


Bartlett Place Boston, Massachusetts

Figure 3-15

Residential Vehicular Trip Distribution, a.m. and p.m. Peak Hours

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

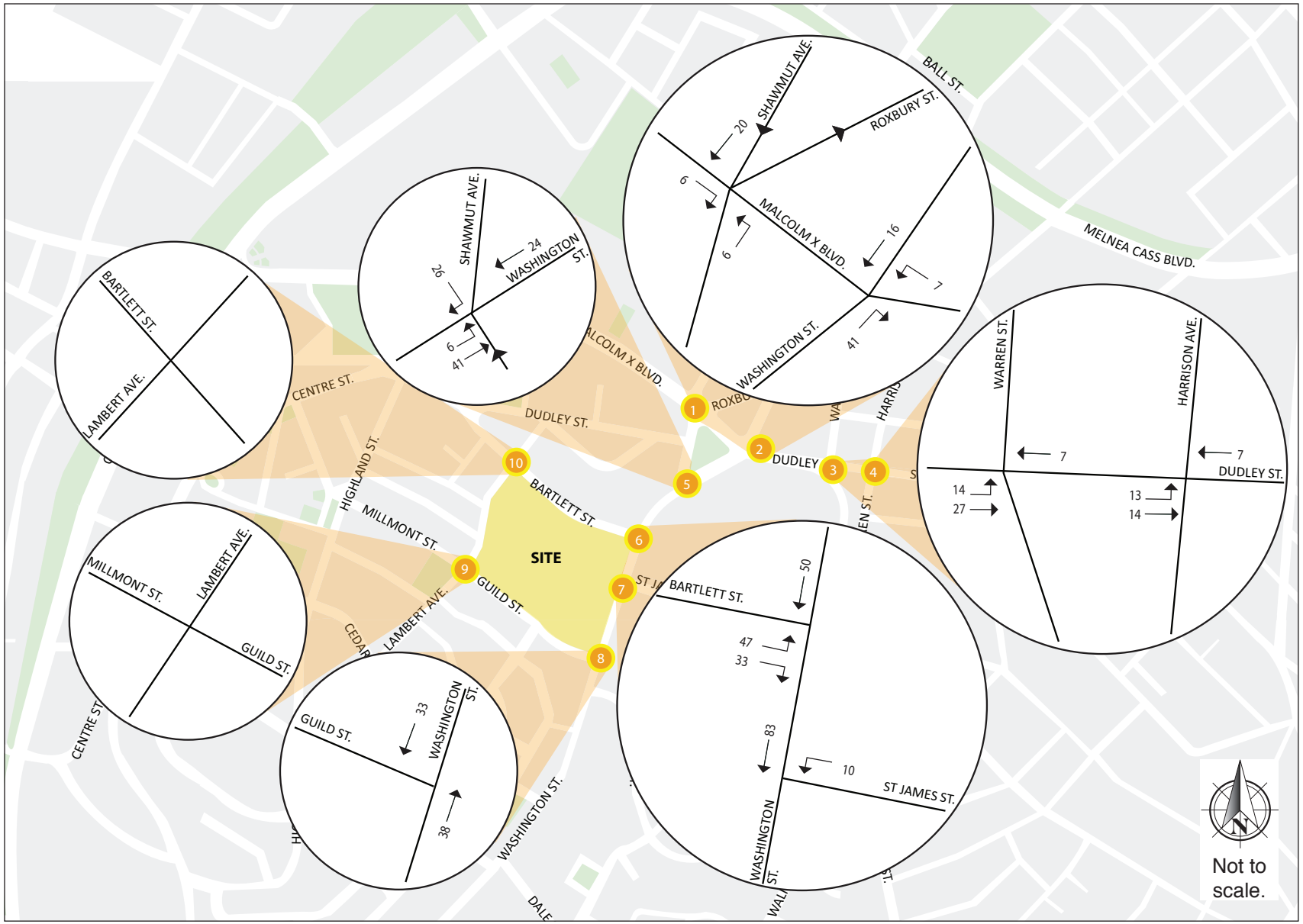


Bartlett Place Boston, Massachusetts

Figure 3-16

Non-Residential Vehicular Trip Distribution, a.m. and p.m. Peak Hours

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®



Bartlett Place Boston, Massachusetts

Figure 3-17

Phase 1 (2017) Project Generated Trips, a.m. Peak Hour

Bartlett Place Boston, Massachusetts

Figure 3-18

Phase 1 (2017) Project Generated Trips, p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Table 3-10 First Phase Build Conditions (2017) Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**C**	**30.8**		
Malcolm X EB left/thru l thru/right	C	21.4	0.34	193
Malcolm X WB left/thru l thru/right	C	25.1	0.50	#345
Shawmut NB left	E	69.2	0.96	#365
Shawmut NB right l hard right	C	23.8	0.41	90
Shawmut SB left	C	20.6	0.25	70
Shawmut SB thru	C	23.0	0.39	153
Shawmut SB right	C	29.4	0.61	230
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**158.3**		
Malcolm X EB thru l thru/right	D	47.9	0.61	#424
Dudley WB left/thru l thru	F	207.0	1.23	#562
Washington NB left/thru/right	F	220.1	1.20	#473
Washington NB right	F	168.3	1.19	#467
Washington SB left	F	81.9	0.87	#282
Washington SB thru/right	F	271.7	1.01	#389
Dudley Street/Warren Street	**D**	**39.0**		
Dudley EB left	F	163.3	1.25	#432
Dudley EB thru l thru	B	17.4	0.47	307
Dudley EB right	A	0.8	0.22	18
Dudley WB thru l thru/right	C	23.8	0.55	m#250
Warren NB left/thru l thru	D	37.2	0.76	283
Warren NB right	B	17.4	0.03	7
Dudley Street/Harrison Avenue	**F**	**126.2**		
Dudley EB left	B	19.3	0.68	126
Dudley EB thru/right	A	8.0	0.59	99
Dudley WB left/thru l thru/right	C	28.9	0.57	175
Harrison NB left/thru/right	F	374.1	1.15	#732
Harrison SB left	D	35.7	0.36	34
Harrison SB thru/right	D	48.7	0.64	271

Table 3-10 First Phase Build Conditions (2017) Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	C	15.2	0.48	66
Driveway WB left/thru/right	F	393.4	1.31	137
ıington NB left/thru	A	6.9	0.33	37
Washington SB thru/right	A	0.0	0.21	0
Bartlett Street/Washington Street				
Bartlett EB left/right	F	97.2	0.98	229
Washington NB thru	A	0.0	0.50	0
Washington SB thru	A	0.0	0.34	0
St. James Street/Washington Street				
St. James WB left/right	F	155.9	1.14	276
Washington NB thru	A	0.0	0.44	0
Washington SB thru	A	0.0	0.40	0
Guild Street/Washington Street				
Guild EB left/right	D	26.9	0.23	22
Washington NB left/thru	A	3.0	0.12	10
# Washington SB thru	A	0.0	0.38	0
= Washington SB right	A	0.0	0.03	0
Millmont Street/Guild Street/Lambert Avenue				
95th Millmont EB left/thru	A	7.4	0.04	–
Guild WB thru/right	A	7.8	0.18	–
# Lambert NB left/thru/right	A	7.4	0.06	–
Bartlett Street/Lambert Avenue				
95th Bartlett EB left/thru	A	7.7	0.11	–
Lambert NB thru/right	A	7.3	0.07	–

th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
* Defacto lane-operates as a 25 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from No-Build Conditions

Table 3-11 First Phase Build Conditions (2017) Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**D**	**39.6**		
Malcolm X EB left/thru l thru/right	C	29.8	0.65	#429
Malcolm X WB left/thru l thru/right	C	28.4	0.53	#321
Shawmut NB left	F	155.8	1.20	#284
Shawmut NB right l hard right	C	21.3	0.37	87
Shawmut SB left	C	21.0	0.37	133
Shawmut SB thru	C	28.7	0.69	346
Shawmut SB right	C	33.3	0.75	340
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**186.9**		
Malcolm X EB thru l thru/right	F	94.2	0.65	#531
Dudley WB left/thru l thru	D	53.0	1.60dl	#457
Washington NB left/thru/right	F	413.7	1.63	#462
Washington NB right	F	348.0	1.61	#421
Washington SB left	F	198.9	1.29	#463
Washington SB thru/right	F	381.4	1.36	#474
Dudley Street/Warren Street	**E**	**58.5**		
Dudley EB left	F	274.4	1.52	#590
Dudley EB thru l thru	B	16.8	0.42	262
Dudley EB right	A	1.3	0.42	22
Dudley WB thru l thru/right	C	30.5	0.43	m#194
Warren NB left/thru l thru	C	31.0	0.57	219
Warren NB right	B	13.8	0.04	14
Dudley Street/Harrison Avenue	**F**	**109.9**		
Dudley EB left	C	29.6	0.64	96
Dudley EB thru/right	B	15.3	0.69	89
Dudley WB left/thru l thru/right	E	59.6	0.82	#232
Harrison NB left/thru/right	F	144.8	0.82	#460
Harrison SB left	C	22.3	0.20	39
Harrison SB thru/right	F	245.8	0.96	#598

Table 3-11 First Phase Build Conditions (2017) Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	F	105.9	1.13	505
Driveway WB left/thru/right	F	-	-	-
Washington NB left/thru	A	4.3	0.18	16
Washington SB thru/right	A	0.0	0.30	0
Bartlett Street/Washington Street				
Bartlett EB left/right	F	312.8	1.47	327
Washington NB thru	A	0.0	0.32	0
Washington SB thru	A	0.0	0.64	0
St. James Street/Washington Street				
St. James WB left/right	F	132.4	1.02	199
Washington NB thru	A	0.0	0.27	0
Washington SB thru	A	0.0	0.69	0
Guild Street/Washington Street				
Guild EB left/right	D	34.2	0.21	19
Washington NB left/thru	A	3.3	0.12	10
Washington SB thru	A	0.0	0.65	0
Washington SB right	A	0.0	0.02	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.2	0.01	–
Guild WB thru/right	A	7.4	0.11	–
Lambert NB left/thru/right	A	7.2	0.07	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.6	0.10	–
Lambert NB thru/right	A	7.2	0.06	–

# =95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
* Defacto lane-operates as a 25 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from No-Build Conditions

Bartlett Place Boston, Massachusetts

Figure 3-19

Phase 1 (2017) Traffic Volumes, a.m. Peak Hour

Bartlett Place Boston, Massachusetts

Figure 3-20

Phase 1 (2017) Traffic Volumes, p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

At the intersection of Shawmut Avenue/Washington Street, the Shawmut eastbound approach LOS worsens from LOS B during No-Build Conditions to LOS C under the Phase 1 Build conditions during the a.m. peak hour.

At the intersection of Bartlett Street/Washington Street, the Bartlett eastbound approach LOS worsens from LOS D during No-Build conditions to LOS F under Phase 1 build conditions during the a.m. peak hour.

3.3.2.5 Parking Supply and Demand

With 114 combined surface and garage parking spaces for 102 residential units, the resulting parking ratio is 0.75 spaces per 1,000 square feet for non-residential and 1.0 per residential unit. BTD has set parking space goals and guidelines throughout the City to establish the amount of parking supply provided with new developments. BTD's maximum parking ratio guidelines for residential use in Roxbury near an MBTA Station is 0.75-1.00 spaces per unit. Distance "near MBTA Station" is defined as within 10 minute walking distance; the Site fits that definition, as it is within a 1/4 mile (a 5-10 minute walk) from the MBTA Roxbury Crossing Station.

3.3.2.6 Public Transportation

As shown in Table 3-9, the Project will generate an estimated 466 daily transit trips; with 108 transit trips during the a.m. peak hour and 64 new trips during the p.m. peak hour. The small number of project-generated transit trips is not expected to affect transit service adversely in the study area. The Proponent is committed to promoting transit use among Project residents and visitors, as discussed under Section 3.3.2.9 Transportation Demand Management.

3.3.2.7 Pedestrian Access and Circulation

On a daily basis, the Project will generate an estimated 780 pedestrian and bicycle trips in addition to the 466 new transit trips that will require a walk to or from the Site. This results in an additional 1,246 new pedestrian or bicycle trips per day. Approximately 124 pedestrian and bicycle trips in and out of the Site will occur during the a.m. peak hour, and 76 pedestrian or bicycle trips in and out will occur during the p.m. peak hour, plus 108 and 64 transit trips, respectively. Pedestrian and bicycle trip generation is summarized in Table 3-9, with detailed trip generation data provided in Appendix A. The Proponent is committed to promoting bicycle use among Project residents, workers, and visitors, as discussed under Section 3.3.2.9 Transportation Demand Management.

3.3.2.8 Bicycle Accommodations

Secure bicycle storage will be made available for building residents and tenants within the parking garage area and/or within the proposed building per City of Boston *Bicycle Parking Guidelines*, which require a minimum of one bicycle parking space per residential unit. Additional bicycle racks for workers, visitors, and guests will also be provided near main entrances to the new buildings.

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

3.3.2.9 Loading and Service

All loading, trash pick-up, and move-in/move-out activities for the Project will occur on-site in the surface parking lot (see Figure 3-13).

Building A loading will occur in the northeast corner of Building A adjacent to Bartlett Street Access/Egress. Building B loading will occur west of Building B. Collapsible Bollards separate the parking lot from the public path north of Building B. When trash pick-up and/or loading needs to occur for Building B, the bollards will be removed and the truck will access the trash and loading dock west of the building along the path to public space. This will be accessed by the parking lot north of Building A. See Figure 3-13 for loading locations.

With the exception of trash pick-up and move-in/move-out activities, most residential deliveries are made via smaller vehicles - cars, vans, or small panel trucks.

A Transportation Coordinator will be appointed by the Project to manage loading activity and to coordinate residential move-in/move-out activities. Where possible, these activities will be scheduled during off-peak hours. Permanent "No Idling" signs will be posted in the loading and parking areas.

3.3.2.10 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) at the completion of the 2017 First Phase. These measures support the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak periods. TDM will be facilitated by the nature of the Project and its proximity to public transit.

The Proponent will emphasize the Site's convenient transit and pedestrian access in marketing the Project to future residents and tenants. On-site management will provide transit information (schedules, maps, fare information) in the building lobbies for residents, workers, and visitors.

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

- Bicycle Storage – The Proponent will provide secure bicycle storage for residents, workers, and visitors in accordance with the *City of Boston Bicycle Parking Guidelines* and will investigate the possibility of sponsoring a shared-bicycle location near the Site.

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

- Electric Vehicle Charging – The Proponent will explore the feasibility of providing electric vehicle charging stations on-site.

- Project Web Site – The Proponent will include public transportation information for residents and visitors will be included on the Project's Web Site.

- Shared-Car Service -- The Proponent will also evaluate the feasibility of providing shared cars on-site (e.g., Zipcar), as there are no spaces provided within a one-half mile radius.

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

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

3.3.3 Build Condition – Full Build-out

As summarized in Section 3.1.1 Project Description, the Project has multiple phases. There is a First Phase as well as Later Phases which will ultimately lead to the Project's full build-out. At full build out the Project will include approximately an additional 221 residential units, 128 parking spaces, and 180 bicycle parking spaces. The site access and circulation plan is shown in Figure 3-13.

3.3.3.1 Site Access and Circulation

Vehicular access for the full build out will add three additional curb cuts to the Project Site. An additional driveway is provided on Guild Street west of the parking garage access.Two additional driveways on will be added on Bartlett Street accessing the residences, all west of the existing First Phase driveway.

All loading, trash pick-up, and move-in/move-out activities will occur on-site from the surface parking lot.

3.3.3.2 Trip Generation and Mode Split

For the full build out, trip generation for the proposed additional land uses was derived from the Institute of Transportation Engineers' (ITE) publication *Trip Generation* 9th edition, using the *LUC 230 – Residential Condominiums/Townhouse*

Table 3-12 Trip Generation Summary, Full Build-out

	Direction	Transit Trips	Walk/Bike Trips	Auto Trips
Daily	In	366	595	1,046
	Out	366	595	1,046
	Total	732	1,190	2,092
a.m. Peak Hour	In	50	67	112
	Out	93	91	121
	Total	143	158	233
p.m. Peak Hour	In	62	63	83
	Out	39	52	86
	Total	101	115	169

3.3.3.3 Trip Distribution

Vehicular trip distribution for the new residential land uses was conducted based on the U.S. census bureau data, same as the First Phase. Residential land use distributions for the Project are shown in Figure 3-14.

3.3.3.4 Build Conditions Traffic Operations

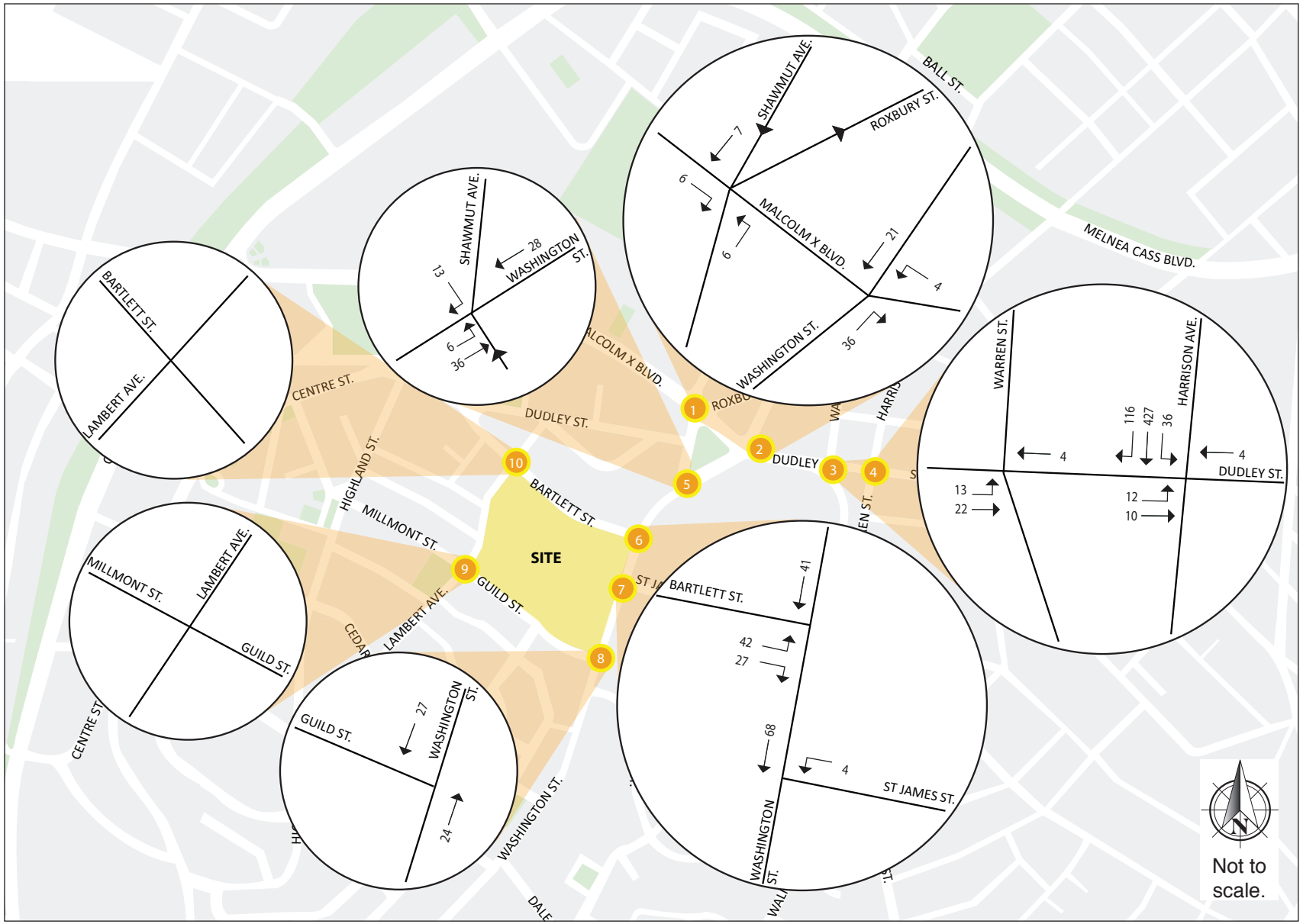
The Full Build-out project-generated trips for the a.m. and p.m. peak hours are shown in Figure 3-21 and Figure 3-22, respectively. The capacity analysis for the Full Build-out Condition, which was conducted using the methodology described for Existing, No-Build, and First Phase Conditions is summarized in in Table 3-13 and Table 3-14. The 2022 Full Build-out project generated trips and morning and evening peak hour traffic volumes are presented in Figure 3-21 through Figure 3-24.

Bartlett Place Boston, Massachusetts

Figure 3-21

Full Build-out Condition (2022) Project Genereated Trips, a.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®



Bartlett Place Boston, Massachusetts

Figure 3-22

Full Build-out Condition (2022) Project Genereated Trips, p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Table 3-13 Full Build-out Conditions (2022) Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**C**	**31.4**		
Malcolm X EB left/thru l thru/right	C	22.4	0.37	#201
Malcolm X WB left/thru l thru/right	C	26.7	0.53	#358
Shawmut NB left	E	70.6	0.97	#387
Shawmut NB right l hard right	C	23.1	0.41	93
Shawmut SB left	C	20.0	0.24	71
Shawmut SB thru	C	22.3	0.39	157
Shawmut SB right	C	28.3	0.60	237
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**176.1**		
Malcolm X EB thru l thru/right	D	50.7	0..62	#438
Dudley WB left/thru l thru	F	226.2	1.26	#578
Washington NB left/thru/right	F	249.4	1.27	#505
Washington NB right	F	196.2	1.26	#498
Washington SB left	F	85.2	0.89	#290
Washington SB thru/right	F	302.3	1.05	#410
Dudley Street/Warren Street	**D**	**42.9**		
Dudley EB left	F	190.1	1.32	#458
Dudley EB thru l thru	B	17.8	0.49	323
Dudley EB right	A	0.8	0.23	18
Dudley WB thru l thru/right	C	24.3	0.57	m#258
Warren NB left/thru l thru	D	38.0	0.78	292
Warren NB right	B	17.4	0.03	7
Dudley Street/Harrison Avenue	**F**	**132.7**		
Dudley EB left	C	22.8	0.73	#135
Dudley EB thru/right	A	8.2	0.60	93
Dudley WB left/thru l thru/right	C	29.4	0.58	180
Harrison NB left/thru/right	F	393.3	1.18	#755
Harrison SB left	D	37.0	0.37	34
Harrison SB thru/right	D	54.1	0.66	280

Table 3-13 Full Build-out Conditions (2022) Capacity Analysis Summary, a.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	C	15.9	0.51	72
Driveway WB left/thru/right	F	575.5	1.67	158
Washington NB left/thru	A	7.3	0.35	40
Washington SB thru/right	A	0.0	0.22	0
Bartlett Street/Washington Street				
Bartlett EB left/right	F	208.1	1.30	389
Washington NB thru	A	0.0	0.51	0
Washington SB thru	A	0.0	0.36	0
St. James Street/Washington Street				
St. James WB left/right	F	202.8	1.26	319
Washington NB thru	A	0.0	0.45	0
Washington SB thru	A	0.0	0.43	0
Guild Street/Washington Street				
Guild EB left/right	D	29.0	0.25	24
Washington NB left/thru	A	3.2	0.13	11
Washington SB thru	A	0.0	0.40	0
Washington SB right	A	0.0	0.04	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.4	0.04	–
Guild WB thru/right	A	7.9	0.19	–
Lambert NB left/thru/right	A	7.4	0.06	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.7	0.12	–
Lambert NB thru/right	A	7.3	0.07	–

ity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
* Defacto lane-operates as a 25 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from No-Build Conditions

Table 3-14 Full Build-out Conditions (2022) Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Roxbury Street/Malcolm X Boulevard/Shawmut Avenue	**D**	**43.5**		
Malcolm X EB left/thru l thru/right	C	31.3	0.69	#450
Malcolm X WB left/thru l thru/right	C	29.3	0.56	#336
Shawmut NB left	F	189.2	1.29	#298
Shawmut NB right l hard right	C	21.8	0.38	90
Shawmut SB left	C	21.5	0.38	137
Shawmut SB thru	C	29.4	0.70	356
Shawmut SB right	C	34.4	0.77	351
Malcolm X Boulevard/Dudley Street/Washington Street	**F**	**206.7**		
Malcolm X EB thru l thru/right	F	103.7	0.67	#551
Dudley WB left/thru l thru	E	58.3	1.64dl	#471
Washington NB left/thru/right	F	438.0	1.68	#476
Washington NB right	F	375.5	1.66	#436
Washington SB left	F	212.1	1.32	#478
Washington SB thru/right	F	440.5	1.44	#508
Dudley Street/Warren Street	**E**	**62.1**		
Dudley EB left	F	293.8	1.57	#609
Dudley EB thru l thru	B	17.0	0.43	271
Dudley EB right	A	1.3	0.43	22
Dudley WB thru l thru/right	C	22.9	0.44	m#191
Warren NB left/thru l thru	C	31.2	0.59	225
Warren NB right	B	13.6	0.05	15
Dudley Street/Harrison Avenue	**F**	**123.8**		
Dudley EB left	C	34.8	0.67	105
Dudley EB thru/right	B	16.1	0.71	92
Dudley WB left/thru l thru/right	E	73.5	0.85	#244
Harrison NB left/thru/right	F	175.8	0.87	#489
Harrison SB left	C	22.7	0.21	41
Harrison SB thru/right	F	261.7	0.98	#620

Table 3-14 Full Build-out Conditions (2022) Capacity Analysis Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Shawmut Avenue/Washington Street				
Shawmut EB right	F	137.4	1.21	594
Driveway WB left/thru/right	F	-	-	-
Washington NB left/thru	A	4.5	0.19	18
Washington SB thru/right	A	0.0	0.31	0
Bartlett Street/Washington Street				
Bartlett EB left/right	F	437.1	1.76	394
Washington NB thru	A	0.0	0.32	0
Washington SB thru	A	0.0	0.67	0
St. James Street/Washington Street				
St. James WB left/right	F	178.0	1.14	233
Washington NB thru	A	0.0	0.28	0
Washington SB thru	A	0.0	0.71	0
Guild Street/Washington Street				
Guild EB left/right	E	37.6	0.23	21
Washington NB left/thru	A	3.6	0.13	11
Washington SB thru	A	0.0	0.66	0
Washington SB right	A	0.0	0.02	0
Millmont Street/Guild Street/Lambert Avenue				
Millmont EB left/thru	A	7.2	0.01	–
Guild WB thru/right	A	7.4	0.12	–
Lambert NB left/thru/right	A	7.2	0.07	–
Bartlett Street/Lambert Avenue				
Bartlett EB left/thru	A	7.6	0.10	–
Lambert NB thru/right	A	7.2	0.06	–

# =95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
m = Volume for 95th percentile queue is metered by upstream signal.
* Defacto lane-operates as a 25 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from No-Build Conditions

Bartlett Place Boston, Massachusetts

Figure 3-23

Full Build-out Conditions (2022) Traffic Volumes, a.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

Bartlett Place Boston, Massachusetts

Figure 3-24

Full Build-out Conditions (2022) Traffic Volumes, p.m. Peak Hour

Howard/Stein-Hudson Associates, Inc.
CREATIVE SOLUTIONS • EFFECTIVE PARTNERING ®

At the intersection of Malcolm X Boulevard/Dudley Street/Washington Street during the p.m. peak hour, the Dudley Street westbound approach LOS worsens from LOS D during No-Build conditions to an LOS E under Full Build conditions.

At the intersection of Dudley Street/Harrison Avenue, the Dudley Street eastbound left-turning approach LOS worsens from LOS B during No-Build conditions to an LOS C under Full Build conditions during the a.m. peak hour.

At the intersection of Shawmut Avenue/Washington Street during the a.m. peak hour, the Shawmut Avenue eastbound approach LOS worsens from LOS B during No-Build conditions to an LOS C under Full Build conditions.

At the intersection of Bartlett Street/Washington Street, the Bartlett Street eastbound approach LOS worsens from LOS D during No-Build conditions to LOS F under Full Build conditions during the a.m. peak hour.

At the intersection of Guild Street/Washington Street, the Guild Street eastbound approach LOS worsens from LOS D during No-Build conditions to LOS E under Full Build conditions during the p.m. peak.

3.3.3.5 Parking Supply and Demand

With 242 combined surface and garage parking spaces for 323 residential units and retail, the resulting parking ratio is 0.75 spaces per 1,000 square feet for non-residential, 1.0 per market-rate residential unit, 0.5 per affordable residential unit, and 0.25 per senior residential unit. The Boston Transportation Department (BTD) has set parking space goals and guidelines throughout the City to establish the amount of parking supply provided with new developments. BTD's maximum parking ratio guidelines for residential use in Roxbury near an MBTA Station is 0.75-1.00 spaces per unit. Distance "near MBTA Station" is defined as within 10 minute walking distance; the Site fits that definition, as it is within one-quarter mile (a 5-10 minute walk) from the MBTA Roxbury Crossing Station.

3.3.3.6 Public Transportation

As shown in Table 3-12, the Project will generate an estimated 616 daily transit trips; with 308 transit trips during the a.m. peak hour and 308 trips during the p.m. peak hour. The number of project-generated transit trips is not expected to affect transit service adversely in the study area. The Proponent is committed to promoting transit use among Project residents and visitors, as discussed under the Transportation Demand Management section below.

3.3.3.7 Pedestrian Access and Circulation

On a daily basis, the Project will generate an estimated 1,190 pedestrian and bicycle trips in addition to the 732 transit trips that will require a walk to or from the Site. This results in an additional 1,922 pedestrian or bicycle trips per day. Approximately 158 pedestrian and bicycle trips in and out of the Site will occur during the a.m. peak hour, and 115 pedestrian or bicycle trips in and out will occur during the p.m. peak hour, respectively. Approximately 143 and 101 transit trips will be generated in and out of the Site occurring during the a.m. and p.m. peak hour, respectively. Pedestrian and bicycle trip generation is summarized in Table 3-12, with detailed trip generation data provided in Appendix A. The Proponent is committed to promoting bicycle use among Project residents, workers, and visitors, as discussed under section 3.6 Transportation Demand Management.

3.3.3.8 Bicycle Accommodations

Secure bicycle storage will be made available for building residents and tenants within the parking garage area and/or within the proposed building per City of Boston *Bicycle Parking Guidelines*, which require a minimum of one bicycle parking space per residential unit. Additional bicycle racks for workers, visitors, and guests will also be provided near main entrances to the new building.

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

3.3.3.9 Loading and Service

All loading, trash pick-up, and move-in/move-out activities for the Project will occur on-site in the surface parking lot (see Figures 3-13 and 3-14).

With the exception of trash pick-up and move-in/move-out activities, most residential deliveries are made via smaller vehicles - cars, vans, or small panel trucks.

A Transportation Coordinator will be appointed by the Project to manage loading activity and to coordinate residential move-in/move-out activities. Where possible, these activities will be scheduled during off-peak hours. Permanent "No Idling" signs will be posted in the loading and parking areas.

3.4 Traffic Mitigation Measures

'While the Project will generate new vehicle trips, no off-site geometric or traffic signal mitigation measures are proposed at this time. Geometric and safety improvements are proposed for the Site driveways and within the surface parking lot. The proponent is committed to implementing appropriate transportation demand management measures, as discussed in Section 3.6.

3.5 Evaluation of Short-term Construction Impacts

Details of the overall construction schedule, working hours, number of construction workers, worker transportation, and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (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 incorporated into the CMP:

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

Additional information on the Project's construction-period impacts is presented in Section 4.11 of this Expanded PNF.

3.6 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) at the completion of the 2017 First Phase. The Proponent will revisit these measures at the completion of the 2022 Full Build-out. These measures support the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak periods. TDM will be facilitated by the nature of the Project and its proximity to public transit.

The Proponent will emphasize the Site's convenient transit and pedestrian access in marketing the Project to future residents and tenants. On-site management will provide transit information (schedules, maps, fare information) in the building lobbies for residents, workers, and visitors.

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

- Bicycle Storage – The Proponent will provide secure bicycle storage for residents, workers, and visitors in accordance with the *City of Boston Bicycle Parking Guidelines* and will investigate the possibility of sponsoring a shared-bicycle location near the Site.

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

- Electric Vehicle Charging – The Proponent will explore the feasibility of providing electric vehicle charging stations on-site.

- Project Web Site – The Proponent will include public transportation information for residents and visitors will be included on the Project's Web Site.

- Shared-Car Service -- The Proponent will also evaluate the feasibility of providing shared cars on-site (e.g., Zipcar), as there are no spaces provided within a one-half mile radius.

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

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

Section 4.0

Environmental Component

4.0 ENVIRONMENTAL COMPONENT

This chapter describes the Proposed Project's expected environmental impacts and the mitigation measures that will be undertaken to avoid and minimize those impacts to the greatest extent practicable. Overall, through the expected remediation of contaminated soils, the reduction of stormwater runoff, the construction of LEED certifiable buildings, and the creation of new open space, the Project is expected to have a positive environmental impact. Unavoidable adverse impacts such as increased shadows and potential wind impacts are minimal due in part to the Project's relatively low scale for an urban development.

4.1 Wind

The Proponent retained Rowan Williams Davies & Irwin Inc. (RWDI) to study the potential wind conditions around the Project Site. RWDI are expert wind consultants with extensive experience working on a variety of projects throughout Boston. A copy of RWDI's report is included as an appendix to this PNF.

RWDI provided an analysis of the potential wind impact of the First Phase of the Project on the surrounding area. Due to the proposed buildings' limited height, the Project is not expected to cause any significant wind impact on or around the development when compared to the existing conditions. Suitable wind conditions are predicted at sidewalks, building entrances, parking lots and driveways throughout the year, as well as at the public plaza during the summer and fall seasons when this space will typically be in use. For entrances at building corners and walkways underneath the buildings, higher-than-desired winds speeds may be experienced; however, improved wind conditions could be achieved through wind mitigation measures if needed.

4.2 Shadow

4.2.1 Introduction and Methodology

To assess the shadow impacts associated with the Project, a shadow impact analysis was conducted for the hours of 9:00 am, 12:00 noon, and 3:00 pm during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and the winter solstice (December 21). Impacts at 6:00 pm during the summer and autumn were also examined. The study used the applicable Altitude and Azimuth data for Boston presented in Appendix B of the BRA's 2006 *Development Review Guidelines*.

The analysis presents the existing shadow and new shadow that would be created by the Project, illustrating the incremental impact of the Project. The study focuses on nearby open spaces and the sidewalks adjacent to and in the vicinity of the Project Site. Results of the shadow impact study are discussed in the following sections, and are supported by Figures 4.2-1 through 4.2-4.

New Shadow will generally be limited to the immediately surrounding streets and sidewalks. St. James Street Park and most nearby bus stops will not be impacted by new shadow from the Project during any of the time periods studied.

Vernal Equinox (March 21)

No material shadow is cast at any time of day onto any of the area's existing open spaces. In general, the majority of the net new shadow impacts fall onto public streets and/or the Project Site.

At 9:00 am during the vernal equinox, shadow from the Project will be cast in a westerly direction. The majority of new shadow will be cast across the Project Site and minor portions of Bartlett Street. No new shadow will impact nearby existing public open space or surrounding bus stops.

As the day progresses, the shadows become shorter, falling to the north. At 12:00 pm, shadow from the Project will be cast across a minor portion of roadway and sidewalks along Bartlett Street and along the Project Site. No new shadow will impact nearby existing public open space or surrounding bus stops.

At 3:00 pm shadow will extend to the east. New shadow from the Project will fall on portions of roadway and sidewalks along Bartlett and Washington Streets as well as the Project Site. New shadow is expected to fall on the MBTA bus stop near the corner of Washington and Bartlett Streets. No new shadows will affect any nearby existing public open space.

Summer Solstice (June 21)

At 9:00 am during the summer solstice, shadow will be cast in a westerly direction. New shadow from the Project will be cast across small portions of the Project Site. No new shadows will impact nearby bus stops or existing public open space.

As the day progresses, the shadows become shorter and swings to the north. At noon, much of the new shadow from the Project will fall within the Project Site. No new shadows will impact existing public open space or nearby bus stops.

At 3:00 pm, shadow will extend to the northeast. New shadow from the Project will fall on a small portion of the roadway and sidewalks of Washington and Bartlett Streets adjacent to the Project Site. New shadow may affect one bus stop near Washington and Bartlett Street. No new shadow will impact any existing public open space.

At 6:00 pm, shadow will be cast to the east. New shadow from the Project will be cast across portions of Washington Street and along portions of the Project Site. Minimal new shadow may fall on the bus stop at the corner of Washington and Bartlett Streets as well as at the corner of Washington and St. James Streets. No new shadows are expected to impact any nearby existing public open space.

Autumnal Equinox (September 21)

At 9:00 am during the autumnal equinox, shadow will be cast west across portions of the Project Site and a small part of Bartlett Street. No new shadows are expected to impact any nearby existing public open space or bus stops.

At noon, new shadow from the Proposed Project will be cast to the north across a small portion of the roadway and sidewalks of Bartlett Street. New shadow from the Project will also fall on minor portions of the Project Site. No new shadows are expected to impact any nearby existing public open space or bus stops.

In the afternoon (3:00 pm), new shadow will extend to the east. New shadow from the Project will be cast across portions of roadway and sidewalks of Washington and Bartlett Streets. New shadow may extend onto the bus stop near the intersection of Washington and Bartlett Street. No new shadow will impact any nearby existing public open space.

By 6:00 pm, much of the area is in existing shadow. New shadow from the Project will be cast to the east. The new shadows will also extend over portions of roadway and sidewalks along Washington, St. James and Bartlett Streets as well as the Project Site. New shadow may affect the bus stops near the intersection of Washington and Bartlett Streets as well as at the intersection of Washington and St. James Streets. No new shadow will impact nearby existing public open space.

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 shadows to elongate.

At 9:00 am, the morning sun will cast new shadow from the Project to the north, falling on small portions of Bartlett Street as well as along the Project Site and surrounding buildings. No new shadows are expected to impact any nearby existing public open space or bus stops.

At noon, shadow will extend to the north. New shadow will fall across small portions of the roadways and sidewalks of Bartlett Street as well as across portions of the Project Site. New shadow may fall on the 64 bus route stop along Guest Street. No new shadows are expected to impact any nearby existing public open space or bus stops.

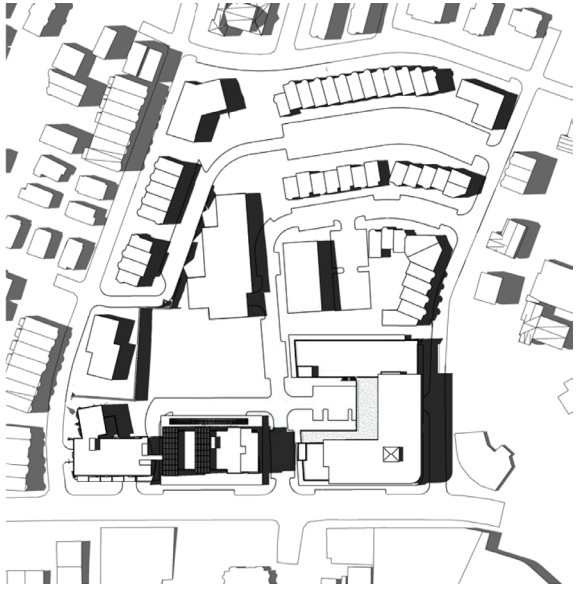
At 3:00 pm, shadows elongate and extend northeast. The Project will cast shadow along the roadways and sidewalks of Washington and Bartlett Streets. New shadow may fall on the bus stops at the intersections of Washington and Bartlett Streets as well as at the intersection of Washington and St. James Streets. No new shadows are expected to impact any nearby existing public open space.

4.2.2 Conclusions

Given that the Project consists of structures of a relatively low scale for an urban environment, shadow impacts associated with the Project are minimal. Typical of a densely built urban area, some new shadow will be cast on the surrounding streetscapes and may also be periodically cast on two local bus stops along Washington Street. No new shadow from the Project will fall on any of the surrounding area's existing open spaces.

9:00 a.m.

3:00 p.m.



12:00 p.m.

North

New Development

Existing Context

Bartlett Place Boston, MA

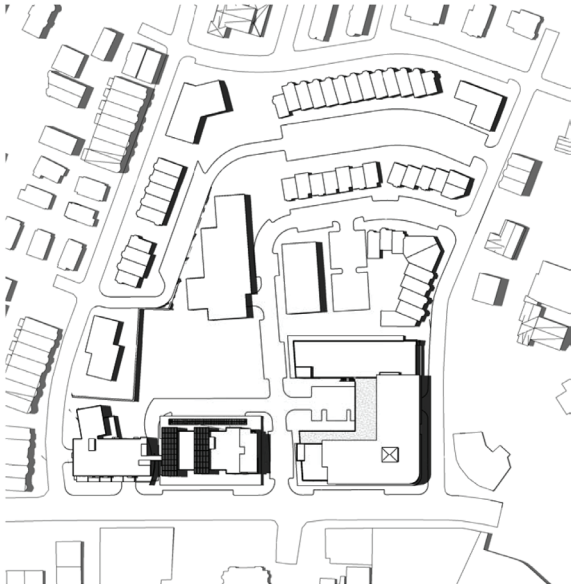
Epsilon ASSOCIATES INC.

Figure 4.2-1

Shadow Analysis (March 21st)

9:00 a.m.

3:00 p.m.



12:00 p.m.

6:00 p.m.

North

New Development

Existing Context

Bartlett Place Boston, MA

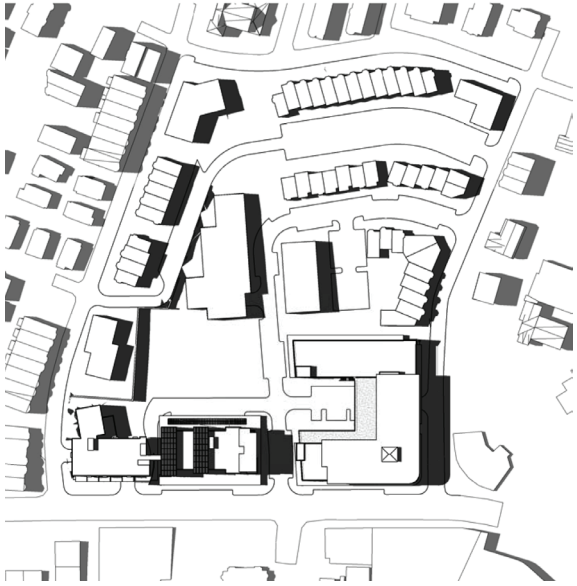
Epsilon ASSOCIATES INC.

Figure 4.2-2

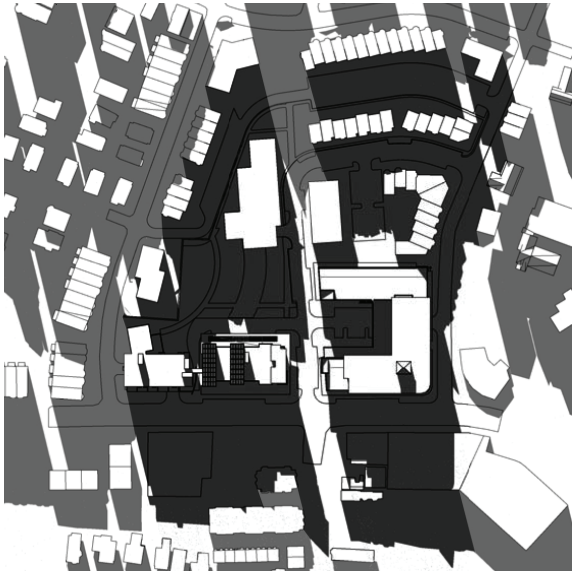
Shadow Analysis (June 21st)

9:00 a.m.

3:00 p.m.



12:00 p.m.



6:00 p.m.

North

New Development

Existing Context

Bartlett Place Boston, MA

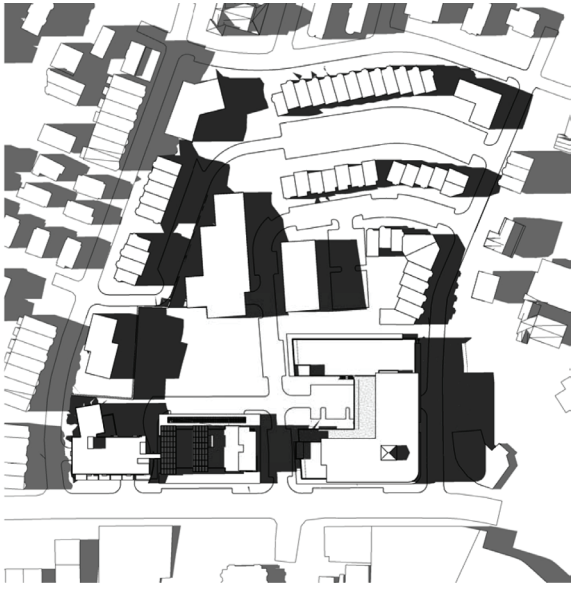
Epsilon ASSOCIATES INC.

Figure 4.2-3

Shadow Analysis (September 21st)

9:00 a.m.

3:00 p.m.



12:00 p.m.

North

New Development

Existing Context

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 4.2-4

Shadow Analysis (December 21st)

4.3 Daylight

4.3.1 Introduction

The purpose of a 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 proposed project. A daylight analysis for the Proposed Project considers the existing, proposed and as-of-right conditions and daylight obstruction values of the surrounding area.

Because the Project site currently consists of low-rise buildings and parking lots, the proposed Project will increase daylight obstruction; however, the resulting conditions will be typical of the area, and daylight obstruction will not be significant.

4.3.2 Methodology

The daylight analysis was performed utilizing 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 zero 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 Area Context. Viewpoints along Washington and Bartlett Streets were chosen to evaluate daylight obstruction for the proposed and existing conditions. Four area context points were considered in order to provide a basis of comparison to existing conditions in the surrounding area. The viewpoints and area context viewpoints were taken in the following locations and are shown on Figure 4.3-1:

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

- **Viewpoint 1** – View from Washington Street facing west toward the Project Site.
- **Viewpoint 2 –** View from Bartlett Street facing south at the Project Site.
- **Viewpoint 3 –** View from Guild Street facing north toward the Project Site.
- **Area Context Viewpoint 1 (AC1) –** View from Washington Street looking east at 2500 Washington Street.
- **Area Context Viewpoint 2 (AC2)** – View from Lambert Avenue looking northwest at 15-17 Lambert Avenue.
- **Area Context Viewpoint 3 (AC3)** – View from Bartlett Street looking south at 58-60 Bartlett Street.
- **Area Context Viewpoint 4 (AC4)** – View from Guild Street looking south at 40-52 Guild Street.

4.3.3 Results

The results for each viewpoint under each alternative condition are shown in Table 4.3-1. Figures 4.3-2 through 4.3-4 present the BRADA results.

Table 4.3-1 Daylight Obstruction Values

Viewpoint Locations		Existing Conditions	Building A	Building B
Viewpoint 1	Washington Street looking west at the Project Site	14.4%	63.3%	47.2%
Viewpoint 2	Bartlett Street looking south at the Project Site	1.5%	78.1%	N/A
Viewpoint 3	Guild Street looking north at the Project Site	0%*	N/A	42.7%
Area Context Points				
AC1	Washington Street looking east at 2500 Washington Street	23.1%	N/A	N/A
AC2	Lambert Avenue looking northwest at 15-17 Lambert Avenue	32.9%	N/A	N/A
AC3	Bartlett Street looking south at 58-60 Bartlett Street	31.6%	N/A	N/A
AC4	Guild Street looking south at 40-52 Guild Street	67.2%	N/A	N/A

*The view from Guild Street looking north is currently obscured by trees on the Project Site. Therefore this view for the existing conditions does not have an accurate daylight obstruction values as trees are not factored into the analysis.

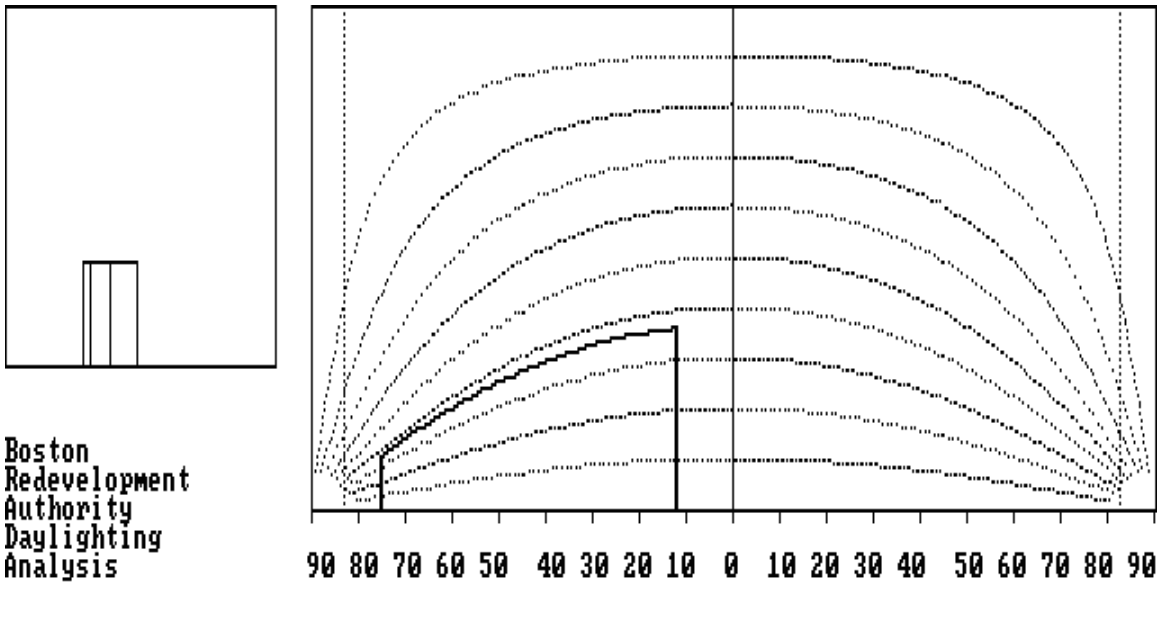
Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

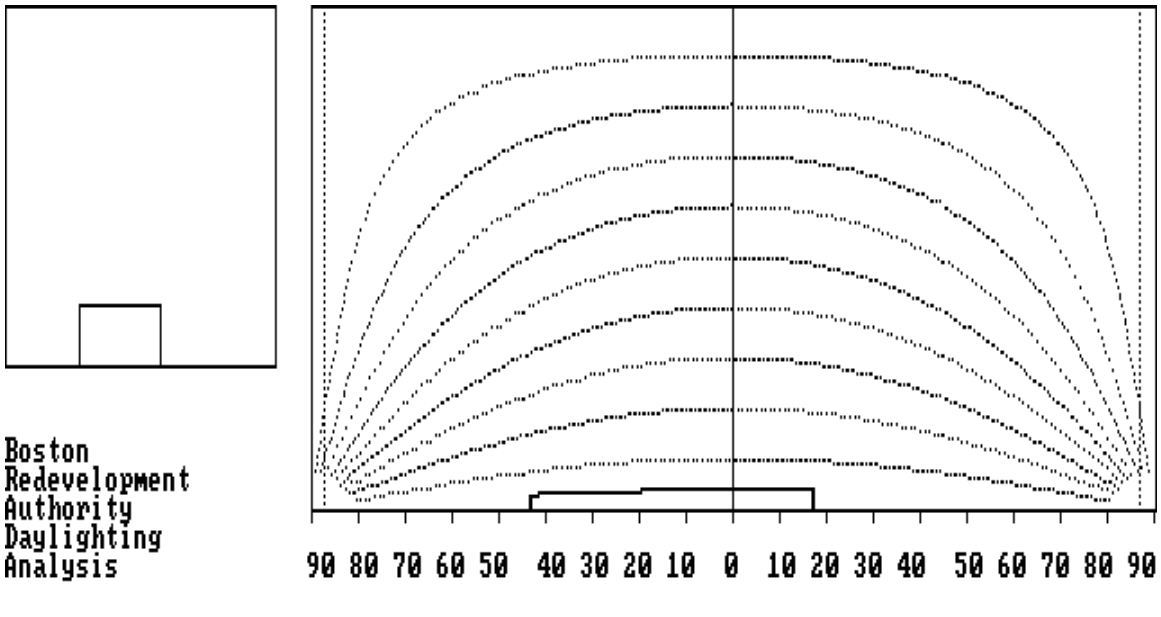
Figure 4.3-1

Viewpoint and Area Context Locations

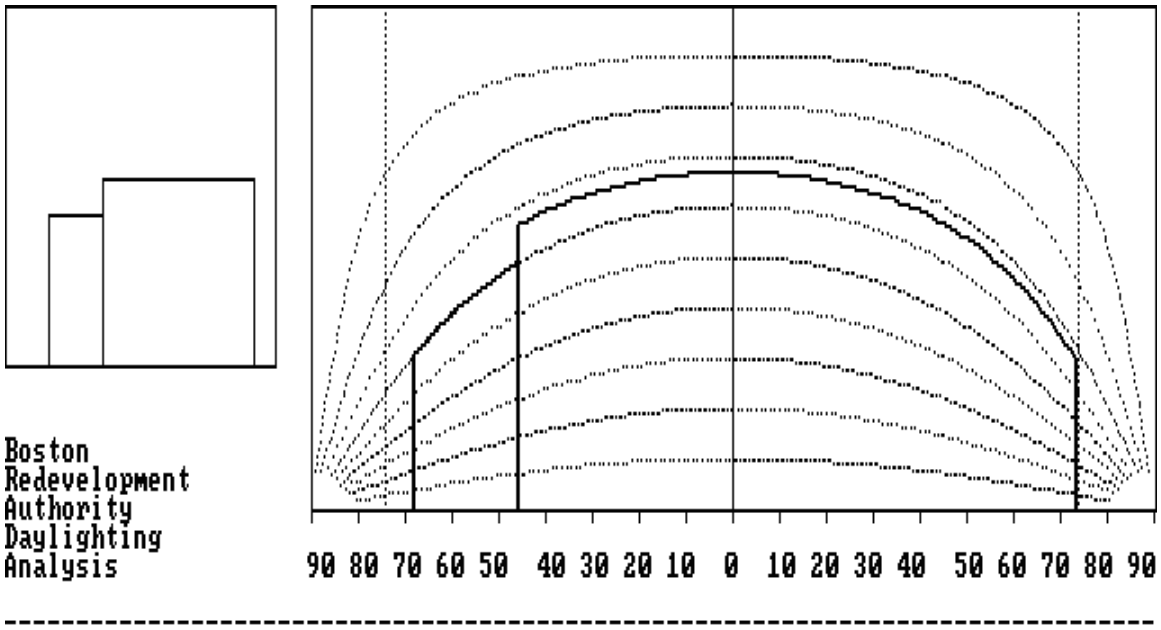
View from Washington Street facing west toward the Project Site.



View from Bartlett Street facing south toward the Project Site.

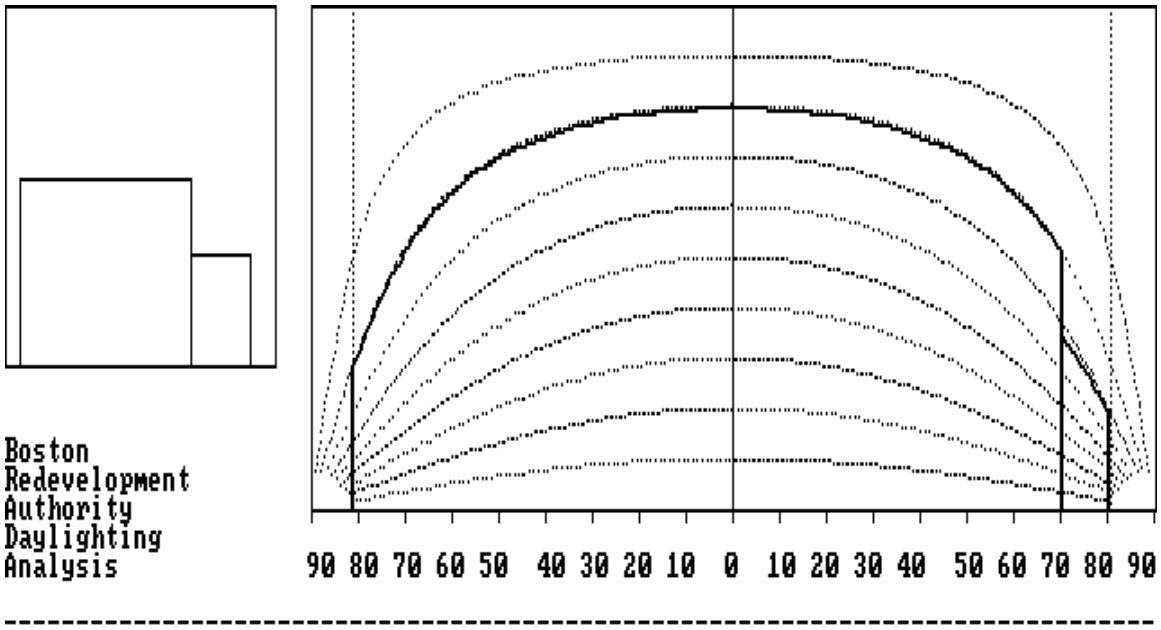


Building A looking west from Washington Street.



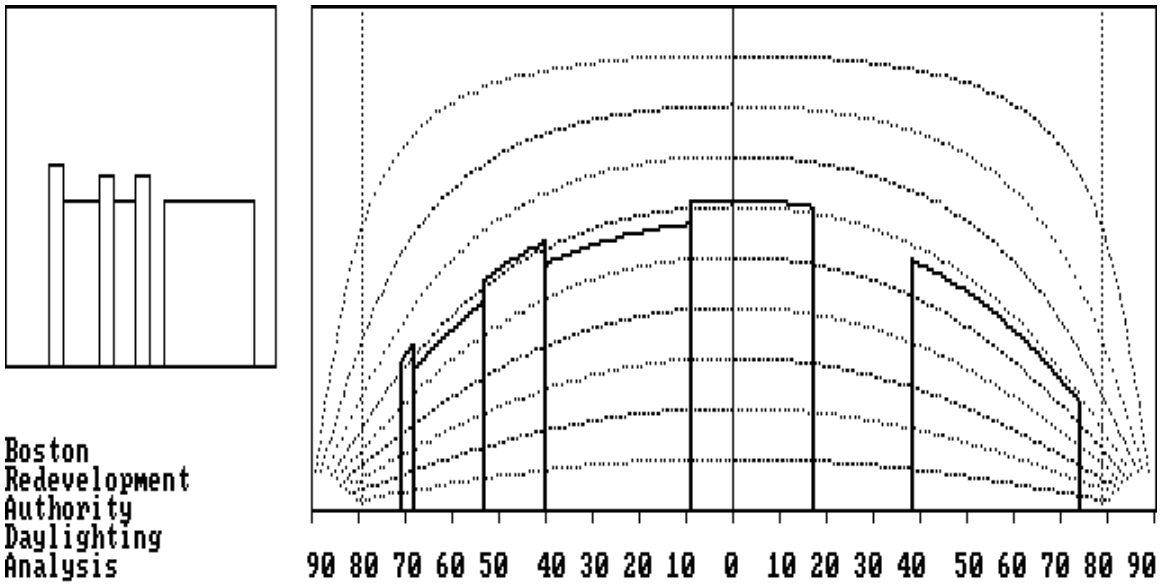
Obstruction of daylight by the building is 63.3 %
Press any key to continue ...

Building A looking south from Bartlett Street.



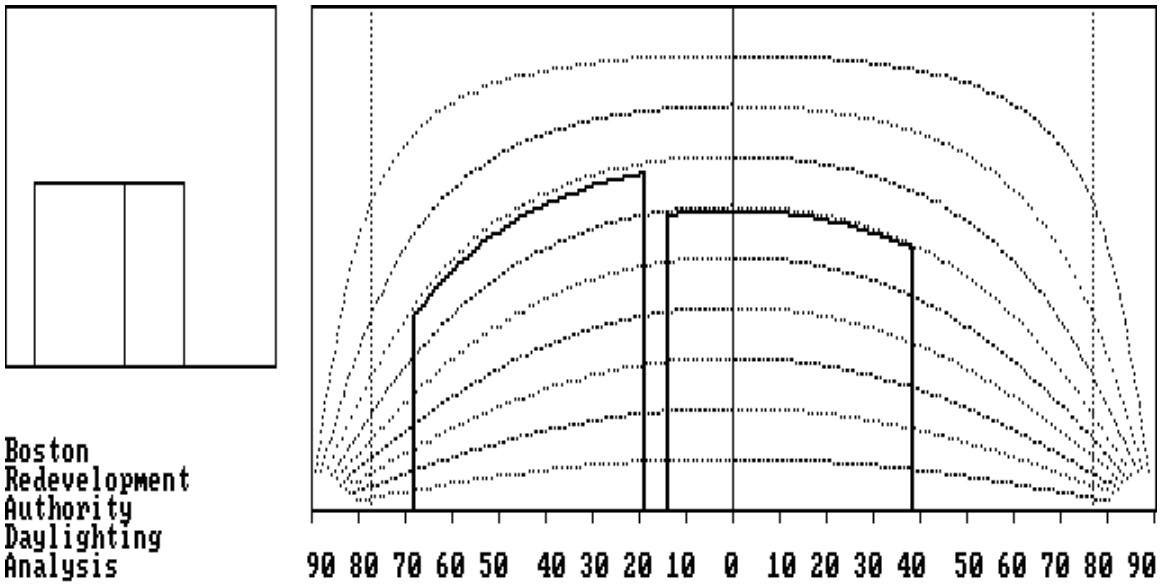
Obstruction of daylight by the building is 78.1 %
Press any key to continue ...

Building B looking west from Washington Street.



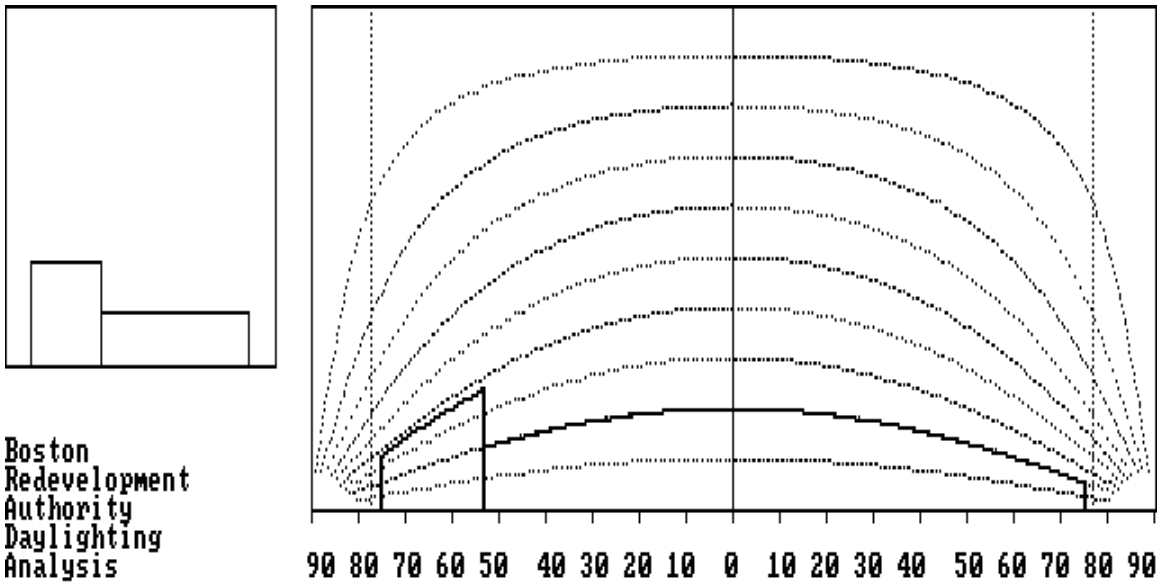
Obstruction of daylight by the building is 47.2 %
Press any key to continue ...

Building B looking north from Guild Street.



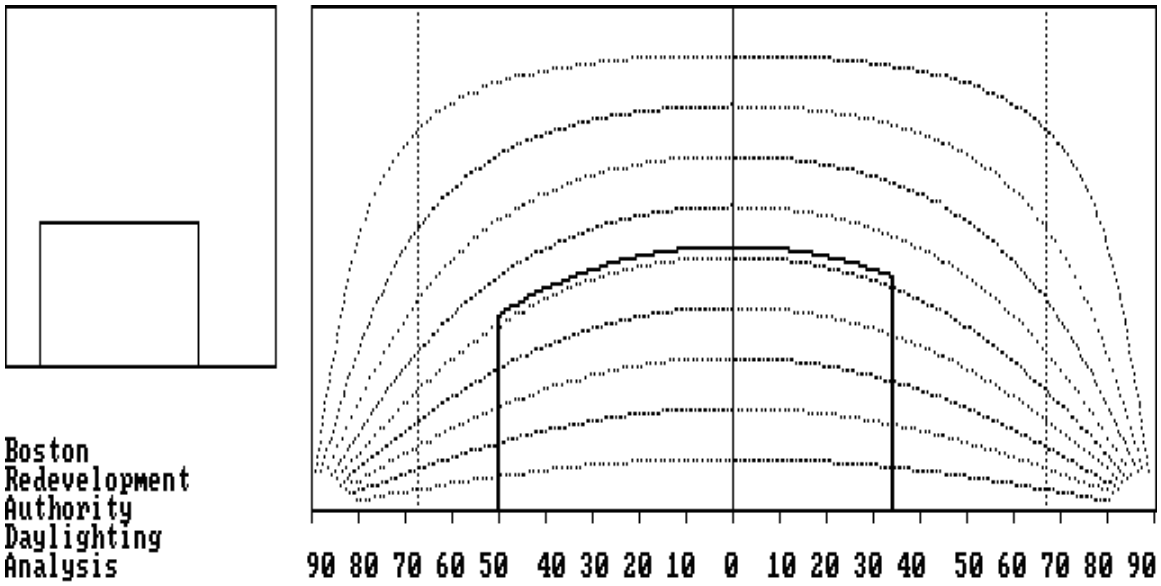
Obstruction of daylight by the building is 42.7 %
Press any key to continue ...

View from Washington Street looking east at 2500 Washington Street.



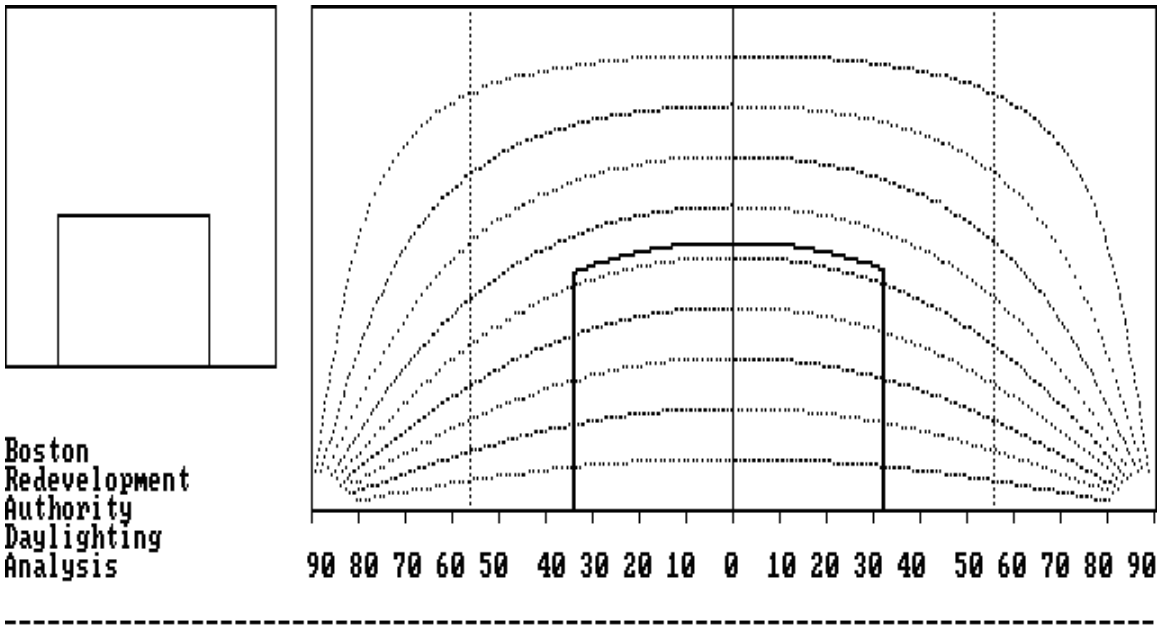
Obstruction of daylight by the building is 23.1 %
Press any key to continue ...

View from Lambert Avenue looking northwest at 15-17 Lambert Avenue.



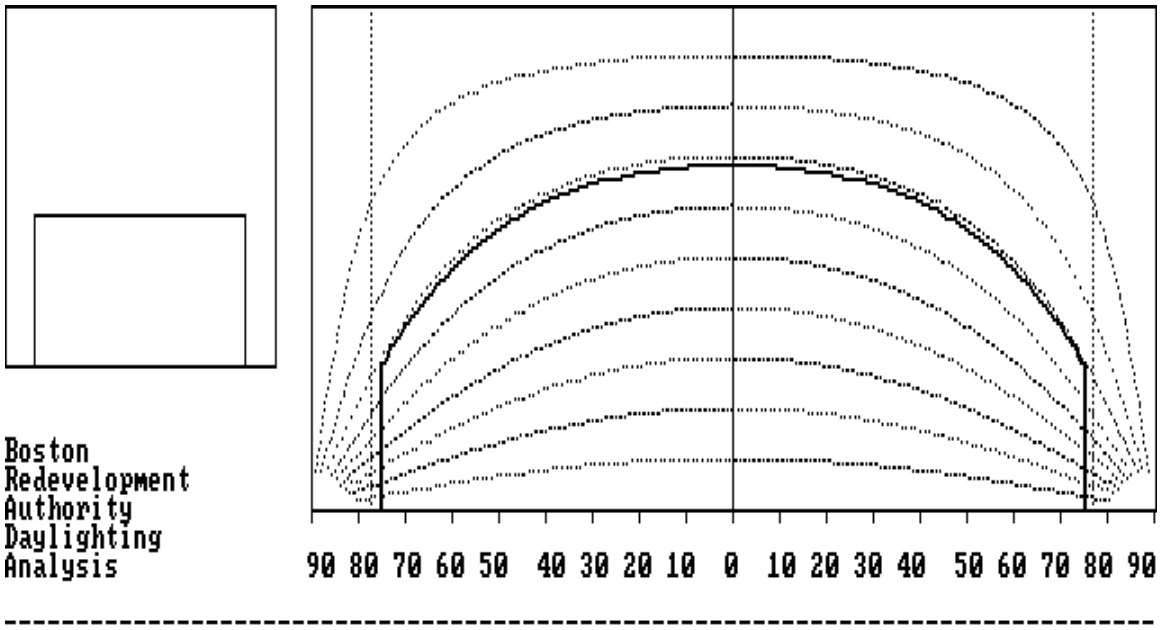
Obstruction of daylight by the building is 32.9 %
Press any key to continue ...

View from Bartlett Street looking south at 58-60 Bartlett Street.



Obstruction of daylight by the building is 31.6 %
Press any key to continue ...

View from Guild Street looking south at 40-52 Guild Street.



Obstruction of daylight by the building is 67.2 %
Press any key to continue ...

Washington Street – Viewpoint 1

Washington Street runs east of the Project Site and will serve as a main edge of the first phase of the Project. Viewpoint 1 was taken from the center of Washington Street, looking directly west at the Project site. The Project Site is currently occupied by two industrial buildings with surrounding surface parking lots and has an existing daylight obstruction value of 14.4 percent. The development of the Project will increase daylight obstruction values to 63.3 percent for Building A and 47.2 percent for Building B. While this is an increase over existing conditions, the daylight obstruction value for the Project from this perspective is typical of an urban area.

Bartlett Street – Viewpoint 2

Viewpoint 2 was taken from the center of Bartlett Street, looking south at the Project Site. From this perspective the buildings from the Project Site are far from the street edge leading to an existing daylight obstruction value of 1.5 percent. The development of the Project will increase daylight obstruction values to 78.1 percent. While this is an increase over existing conditions, the daylight obstruction value for the Project is typical for an urban location.

Guild Street – Viewpoint 3

Viewpoint 3 was taken from the center of Guild Street, looking directly north at the Project Site. From this perspective the Project Site is largely obscured by existing trees, which are not accounted for in daylight analyses. As such, the existing daylight obstruction value of from Guild Street has been recorded as 0 percent. The development of the Project will increase daylight obstruction values to 42.7 percent. While this is an increase over existing conditions, the daylight obstruction value for the Project is less than other buildings in the Project vicinity such as AC4.

Area Context Views

The Project area is primarily characterized by industrial and residential uses. The buildings in the Project vicinity are predominantly low-rise, ranging between one and 4 stories. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for the two Area Context Points described above and shown on Figure 4.3-1.

The daylight obstruction values ranged from 67.2 percent on Guild Street (AC4) to 23.1 percent on Washington Street (AC1). Daylight obstruction values for the Project are fully consistent with the Area Context values and are typical for urban areas.

4.3.4 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.

4.4 Solar Glare

The Proponent will take care to make use of non-reflective materials as the Project's design progresses in order to avoid adverse impacts from spot glare. Due to the relatively low scale and height of the buildings solar glare impacts are not anticipated.

4.5 Air Quality

4.5.1 Introduction

An air quality analysis was conducted to determine the impact of pollutant emissions from combustion and mobile source emissions 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 Site.

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 (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM10 and PM2.5), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in Table 4.5-1. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS. However, since the NAAQS are not incorporated into the MAAQS by reference, there can be differences if EPA promulgates new standards and there is delay for Massachusetts to incorporate them into 310 CMR 6.04.

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 adverse effects associated with the presence of air pollutants, for example, damage to vegetation. The more stringent of the primary or secondary standards were applied when comparing to the modeling results for the Project.

Table 4.5-1 summarizes the current NAAQS.

Table 4.5-1 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]	80	None
	24-hour [2]	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]	15	Same
	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 3 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 3-yr average of the 98th (NO2) or 99th (SO2) percentile of the daily maximum 1-hour concentrations.
Source: 40 CFR 50 and 310 CMR 6.00

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

The inhalable particulate (PM10) NAAQS were promulgated on July 1, 1987 at the federal level with the intent of replacing the existing standards limiting ambient levels of Total Suspended Particulate (TSP). EPA also promulgated a Fine Particulate (PM2.5) NAAQS, effective December 2006, with an annual standard of 15 micrograms per cubic meter ($\mu g/m^3$) and the 24-hour standard of 35 $\mu g/m^3$.

The impacts from the Project were modeled and were added to monitored background values and compared to the NAAQS.

The modeling methodology was developed in accordance with the latest Massachusetts Department of Environmental Protection (MassDEP) modeling policies and Federal modeling guidelines.[2]

Modeling assumptions and backup data for results presented in this section are provided in the Air Quality Appendix.

4.5.2 Methodology

4.5.2.1 Microscale Analysis

The BRA 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 a proposed project causes a 10 percent increase in traffic or where the LOS is E or F and the proposed Projects contribute to a reduction in LOS. The microscale analysis involves modeling of carbon monoxide (CO) emissions from vehicles idling at and traveling through both signaled and unsignalized intersections. Predicted ambient concentrations of CO for the Build and No Build cases are compared with federal (and state) ambient air quality standards for CO.

The microscale analysis typically examines ground-level CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. The NAAQS standards do not allow ambient CO concentrations to exceed 35 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 U.S. EPA's intersection modeling guidance.[3]

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

---

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

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

Baseline (2012), Interim (2017), and future year (2022) emission factor data calculated from the MOBILE6.2 model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections.

Existing background values of CO at the nearest monitor location in Kenmore Square were obtained from the MassDEP. CAL3QHC results were then added to background CO values of 1.9 ppm (one-hour) and 1.5 ppm (eight-hour), as provided by 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).

Intersection Selection

As stated previously, a "microscale" analysis is required for the Project at intersections where 1) project traffic would impact intersections or roadway links currently operating at Level of Service ("LOS") D, E, or F or would cause LOS to decline to D, E, or F; 2) project traffic would increase traffic volumes on nearby roadways by 10 percent 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.

The modeling guidance identifies the following steps to determine the intersections to be modeled.

- Rank the top 20 intersections by traffic volumes
- Calculate the Level of Service (LOS) for each intersection
- Rank the intersections by volume
- Rank the intersections by LOS
- Model the top three intersections based on worst LOS and the top three intersections based on the highest traffic volumes

An analysis of the nineteen signalized intersections from the traffic study was conducted (See Section 3, Transportation). The traffic volumes and LOS calculations provided in Section 3 form the basis of evaluating the traffic data versus the microscale thresholds.

The following intersections were found to be the worst intersections by either LOS or volumes or both:

- #1/#2, Dudley Square, i.e., the intersection of Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue;
- #3/#4, the intersection of Dudley Street, Harrison Avenue, and Warren Street.

Since intersections #1 and #2, as well as #3 and #4, are only about 250 feet apart, they were modeled as single intersections. Microscale modeling was performed for the intersections based on the aforementioned methodology. The 2012 existing conditions, the 2017 No Action and the First Phase conditions, and the 2022 Build conditions were each evaluated for both morning (AM) and afternoon (PM) peak.

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 (2012), interim (2017), and build year (2022) are provided by MassDEP. As is typical, minor edits to the files were necessary to allow the program to output emission factors for the various speeds used in the analyses.

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

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

Receptors & Meteorology Inputs

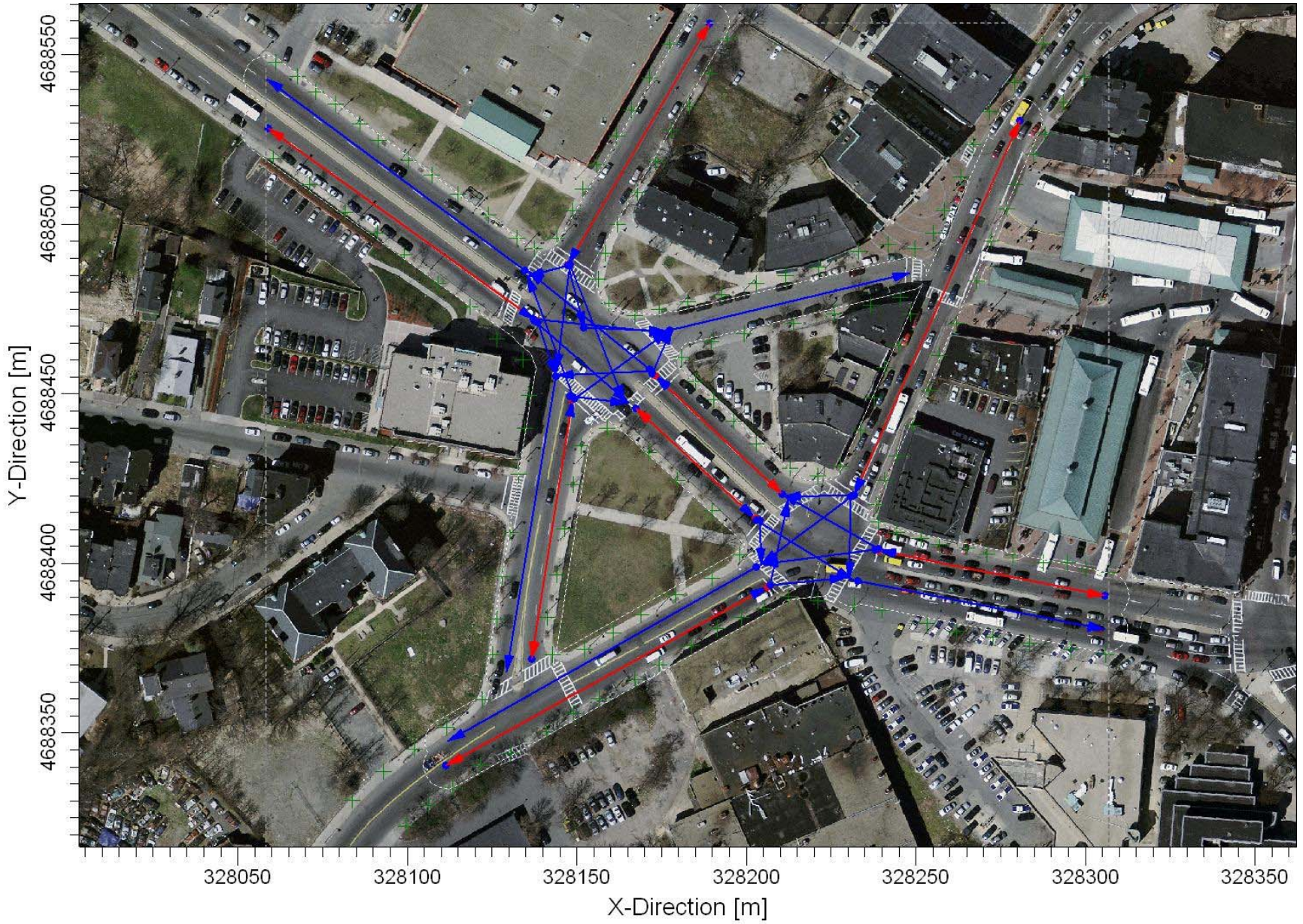
Sets of up to 155 receptors were placed in the vicinity of each of the modeled intersections. Receptors extended approximately 100 to 300 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersections are presented in Figures 4.5-1 through, 4.5-2.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[4], a wind speed of 1 m/s, stability class D (4), and a mixing height of 1000 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 for all four intersections.[5]

---

[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

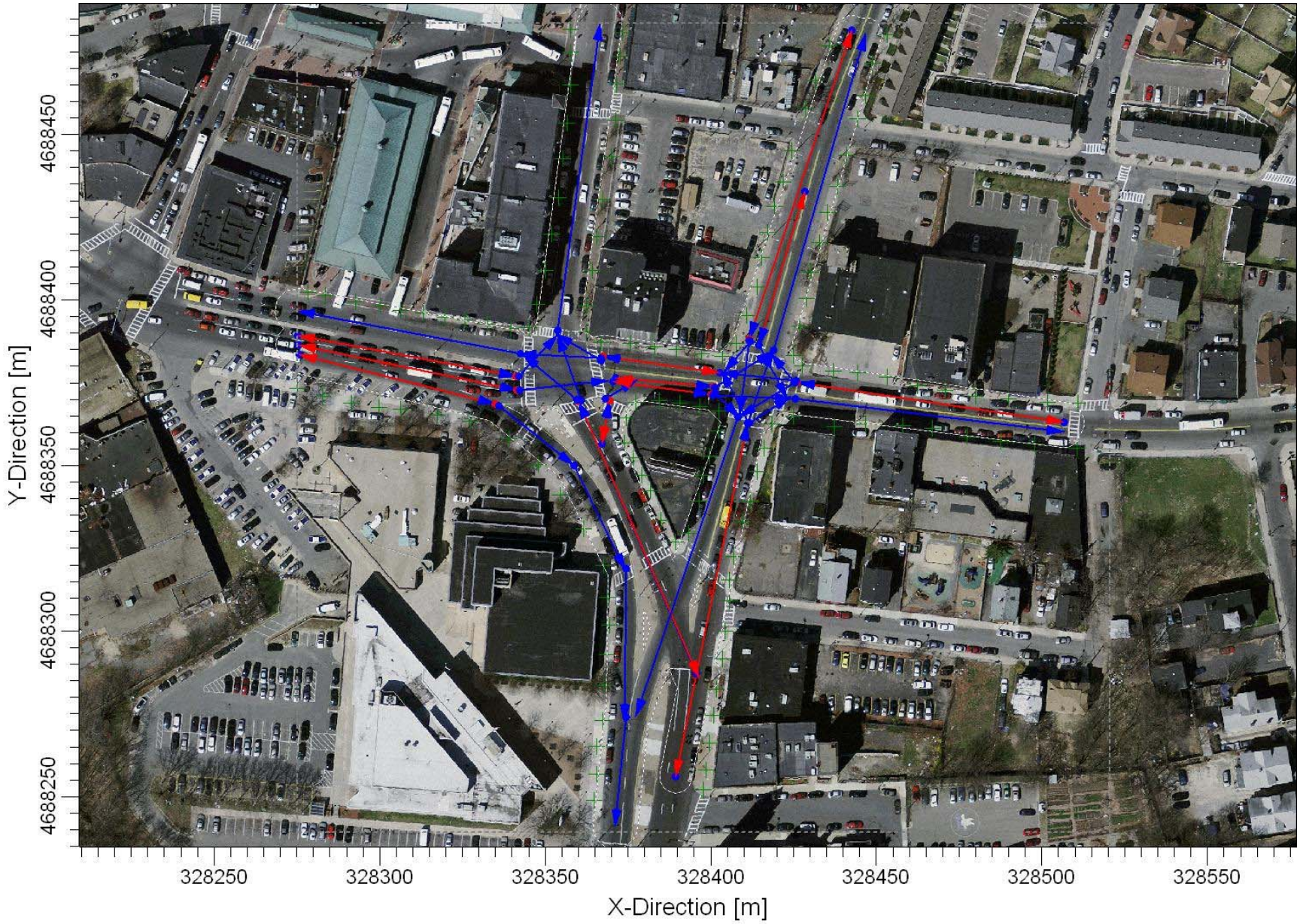


Bartlett Yards - Boston

Epsilon ASSOCIATES INC.

Figure 4.5-1

Link and Receptor Locations for CAL3QHC modeling of Intersection 1: & 2: Malcolm X, Washington & Shawmut



Bartlett Yards - Boston

Epsilon ASSOCIATES INC.

Figure 4.5-2

Link and Receptor Locations for CAL3QHC modeling of Intersection 3/4: Dudley, Warren & Harrison

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 8-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 the Air Quality Appendix.

4.5.2.2 Background Concentrations

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

The Clean Air Act allows for one exceedance per year of the CO and SO2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM-10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM-2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 μg/m3. For annual PM-2.5 averages, the average of the highest yearly observations was used as the background concentration. A new 1-hr NO2 standard was recently promulgated. To attain this standard, the 3-year average of the 98th percentile of the maximum daily 1-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, in Boston. A summary of the background air quality concentrations are presented in Table 4.5-2.

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

Table 4.5-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

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

Notes: From 2007-2011 MA DEP Annual Data Summaries

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

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

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

[4] Background level for 24-hour 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 & 2011 SO_2 3-hr value is not reported. Years 2007-2009 used instead.

For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 1.9 ppm for 1-hour and 1.5 ppm for 8-hour CO.

4.5.3 Air Quality Results

4.5.3.1 Microscale Analysis

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 4.5-3 through 4.5-6 for the 2012, 2017, and 2022 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.7.[7]

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

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 (1.9 ppm) plus background (2.9 ppm) is 4.8 ppm for the 2022 morning peak hour case at the intersection of Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (1.3 ppm) plus background (2.1 ppm) is 3.4 ppm for at the same location and scenario. Both concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

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

Table 4.5-3 Summary of Microscale Modeling Analysis (Existing 2012)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.5	2.9	4.4	35
	PM	1.9	2.9	4.8	35
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	1.3	2.9	4.2	35
	PM	1.3	2.9	4.2	35
8-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.1	2.1	3.2	9
	PM	1.3	2.1	3.4	9
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	0.9	2.1	3	9
	PM	0.9	2.1	3	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

Table 4.5-4 Summary of Microscale Modeling Analysis (No-Build 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.4	2.9	4.3	35
	PM	1.7	2.9	4.6	35
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	1.2	2.9	4.1	35
	PM	1.1	2.9	4.1	35
8-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.0	2.1	3.1	9
	PM	1.2	2.1	3.3	9
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	0.8	2.1	2.9	9
	PM	0.8	2.1	2.9	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

Table 4.5-5 Summary of Microscale Modeling Analysis (First Phase 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.4	2.9	4.3	35
	PM	1.7	2.9	4.6	35
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	1.3	2.9	4.2	35
	PM	1.1	2.9	4.0	35
8-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.0	2.1	3.1	9
	PM	1.2	2.1	3.3	9
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	0.9	2.1	3.0	9
	PM	0.8	2.1	2.9	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

Table 4.5-6 Summary of Microscale Modeling Analysis (Full Build 2022)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.7	2.9	4.6	35
	PM	1.8	2.9	4.7	35
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	1.3	2.9	4.2	35
	PM	1.1	2.9	4.0	35
8-Hour					
#1/#2, Malcolm X Boulevard, Dudley Street, Washington Street, Roxbury Street, and Shawmut Avenue	AM	1.2	2.1	3.3	9
	PM	1.3	2.1	3.4	9
#3/4, Dudley Street, Harrison Avenue, and Warren Street	AM	0.9	2.1	3.0	9
	PM	0.8	2.1	2.9	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

4.5.4 Conclusions

4.5.4.1 Microscale Analysis

Results of the microscale analysis show that all predicted CO concentrations are well below 1-hour and 8-hour NAAQS. Therefore, it can be concluded that there will be no adverse air quality impacts resulting from increased traffic in the area.

4.5.5 Stationary Sources

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

4.5.5.1 Boilers

The current plans are include a number of small condensing boilers for heat and domestic hot water. All units will be natural gas-fired and located in a penthouse mechanical area on the roofs of the buildings. The units are expected to be exhausted through individual stacks.

4.5.5.2 Emergency Generators

Current design plans include an emergency generator to be installed on the building to be constructed. The units will provide life safety and standby emergency power to the building. Typically, generators operate for approximately one hour each month for testing and general maintenance and as needed for emergency power. The units will be diesel-fired and located in a mechanical area on the roof of the building or in the basement. The generators are to be designed such that its exhaust stack extends at least 10 feet above the individual building roof height above ground level.

4.5.5.3 Cooling Towers

Current plans call for cooling towers to be installed on the building to be constructed. These units will remove the excess heat generated by the building's mechanical equipment. All units will be located on the roofs of the buildings.

4.5.5.4 Parking Garage Exhausts

Since the planned parking areas are above ground, there will likely be no requirement for mechanical ventilation.

4.5.5.5 Permitting

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

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

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

4.6 Flood Hazard Zone/Wetlands

The Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") indicates the FEMA Flood Zone Designations for the site areas (City of Boston, Community-Panel Number, 25025C0079G). The map for the Project Site shows the Project is located outside of designated flood zones. The Project Site does not contain wetlands.

4.7 Noise

The primary set of noise regulations relating to a potential increase in sound levels due to the Project 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). 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. Zoning District Standards are presented below in Table 4.7-1.

Table 4.7-1 City of Boston Zoning District Noise Standards, Maximum Allowable Sound Pressure Levels

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

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

Additionally, the 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. The 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 3 dB or more than the sound levels in each of two adjacent bands.

While the details of the mechanical equipment associated with the Project have not yet been precisely determined, steady operational noise from stationary sources will primarily involve a minimal amount residentially-sized heating, cooling, and ventilation equipment, including: small residential cooling fans, boilers and furnaces located within interior mechanical spaces, and rooftop chillers/air conditioner units. It is assumed that the proposed chillers will be fitted with appropriate sound blankets or acoustical enclosures to control noise emissions, providing at least 10 dBA of attenuation per unit.

No detailed sound level assessment was performed due to the limited size and scope of the mechanical equipment proposed for the Project at this time. However, a screening level evaluation of the equipment considered indicates that the Project would operate without significant impact on the existing acoustical environment.

At this time, the mechanical equipment and noise controls are conceptual in nature and, during the final design phase of the Project, will be specified to meet the applicable City of Boston and MassDEP noise limits. Reasonable efforts will be made, if necessary, to minimize noise impacts from the Project using routinely employed methods of noise control, including the:

- Selection of "low-noise" equipment models
- Fitting of inlet and discharge vents with duct silencers;
- Installation of screening barriers to provide shielding where appropriate;
- Use of sound-attenuating enclosures and/or acoustical blankets on continuously operating equipment with outdoor exposure;
- Siting of noisy equipment at locations that protect sensitive receptors by shielding or with increased distance.

In summary, the Project, with appropriate noise control, is not expected to result in any adverse noise impacts at nearby sensitive receptors. Short-term, intermittent increases in noise levels will occur during Project construction. However, every reasonable effort will be made to minimize the noise impacts and ensure the project complies with the requirements of the City of Boston noise ordinance.

4.8 Geotechnical Conditions & Hazardous Materials

4.8.1 Site Conditions

In addition to the existing buildings, the majority of the ground surface around the Project Site is paved with asphalt. However, an approximately 100- to 125-foot wide strip along the Guild Street and Lambert Avenue portion of the Site perimeter is vegetated with trees. Site grades vary from approximately elevations of 34′ (NAVD88) near the intersection of Bartlett Street and Washington Street up to 76′ near the intersection of Lambert Avenue and Guild Street. The pavement grades generally vary from about elevations of 34′ to elevations of 44′. There is an approximately 12-foot to 20-foot stone masonry retaining wall along a portion of Guild Street that separates the paved area at the bottom of the wall from the forested strip of land along the Guild Street edge of the Site.

4.8.2 Proposed Below-Grade Conditions

In addition to Buildings A and B, Phase I will include an approximately 15,500 square-foot public plaza. No below-grade levels are proposed except for a partial below-grade parking level at Building B near the Washington Street and Guild Street intersection.

4.8.3 Subsurface Explorations and Conditions

A November of 2008, Phase II Investigation Report by LFR indicates a total of 70 soil borings, 18 monitoring well installations, and 10 test pits were completed at the Site.

Based on data from the borings, fill soils at the Site consist of loose to dense mixtures of sand, gravel and silt with varying amounts of brick and asphalt fragments, coal ash, glass and other debris in thicknesses varying from less than 1 foot to approximately 14 feet below existing grades. The underlying naturally deposited soils consisted of medium dense to very dense sand and gravel with trace to some silt. Depths to bedrock varied from four feet to 31 feet. The bedrock was not classified on the boring logs. Groundwater levels measured in monitoring wells varied from less than two feet to about ten feet below ground surface. The subsurface data suggest that groundwater flows approximately west to east in both the soil overburden and bedrock at the Site.

Samples of both the fill and naturally deposited soil were sometimes noted on the boring logs as having slight to strong volatile organic odor and elevated organic vapor readings. Elevated concentrations of metals, and volatile and semi-volatile organic compounds were identified by chemical analyzes of soil and water samples taken from the explorations.

Depths of penetration for explorations along Lambert Avenue and behind the top of the retaining wall along Guild Street ranged from a few inches to less than five ft. Many of these samples were hand auger samples and probably do not indicate the actual depth of soil

overburden in this part of the site. Standard test borings should be collected in these parts of the Site to confirm the thickness range and characteristics of the soil overburden in this area.

With the exception of the area behind the top of the Guild Street retaining wall, the soil overburden thickness (combined fill and native soil thickness) encountered in test borings drilled in the First Phase area varies between approximately 11 feet and 31 feet. The observed fill thickness in this area ranges from less than three feet to about 14 feet.

4.8.4 Foundation Design and Construction Considerations

Primary considerations relative to foundation design and construction include variable undocumented (non-engineered) fill thickness across the Site, presence of environmental contamination in soil and groundwater, and the proximity of proposed construction to the stone masonry retaining wall along Guild Street (both behind the top and next to the base of the wall).

The presence of environmental contaminants in soil and groundwater below the First Phase area and the variable fill thickness suggests that standard shallow footing foundation construction may not be the best option for this site. The Proponent is currently considering utilizing soil improvement using rammed aggregate piers (RAPs) prior to shallow footing construction. Soil improvement at the site can reduce the required depth of excavation for foundation construction from the 10- to 15-foot range down to the 4- to 5-foot range. Shallower foundation construction depths dramatically reduce the need for groundwater control and excavation support at the Site. However, deeper utility trench excavation may still be required for storm drains and other below-grade utilities.

RAPs consist of columns of compacted (rammed) crushed stone aggregate designed to compact the surrounding fill material to improve bearing capacity and reduce settlement of overlying site improvements. RAPs are constructed by driving a hollow steel pipe (mandrel) with a sacrificial bottom closure into the ground to reach suitable bearing soil or bedrock. The bottom closure is knocked off the mandrel, which is withdrawn while placing and compacting (either by vibration or impact) stone aggregate into the hole left by the mandrel. The aggregate is typically a quarried crushed stone product. The tops of the finished RAPs are generally compacted and covered with an additional layer of compacted crushed stone prior to construction of overlying foundations, slabs, or other site improvements.

The RAPs improve the ground to provide support for both conventional shallow spread footings for buildings as well as for other overlying features such as pavements and sidewalks. Building foundations are then designed based on allowable bearing pressures, subgrade moduli, and estimated settlement values provided by the geotechnical engineer. The geotechnical engineer provides performance based specifications to be met by the

installation contractor who establishes the layout patterns, sizes and installation criteria for the RAPs. Field tests are then conducted to verify adequacy of the installation prior to production RAP installation.

This foundation construction system has been widely used throughout the United States and New England over the past decade and is well suited and generally cost effective for use on sites such as this.

Since the RAPs are constructed of highly pervious compacted crushed aggregate it is unlikely that groundwater flow patterns would be disrupted by RAP construction. Shallow footings extending to only four feet below finished grade over the RAPs are also expected to have little if any impact on groundwater flow patterns. Note that the Site is outside of the Boston Groundwater Conservation Overlay District and on original ground based on discussions with Mr. Elliot Laffer of the Boston Groundwater Trust.

The south end of Building B is close to the east end of the stone masonry retaining wall where it extends into the site approximately perpendicular from Guild Street. The wall appears to have good horizontal and vertical alignment. However, little is known about the wall geometry, how it is backfilled, and the foundation bearing condition of the wall. These issues should be explored as part of the project design.

4.8.5 Proposed Design-Phase Foundation Explorations

Design-phase explorations will be required to fill gaps in the existing test boring data set. The existing borings were drilled primarily for collecting information on environmental contamination of soil and groundwater. The proposed borings would be drilled primarily for collecting information on engineering properties of the soils at the Site for purposes of foundation design. Accordingly, the proposed borings should be drilled using drive-and-wash casing drilling methods with standard split- spoon sampling. An estimated 15 to 18 test borings will be needed to collect foundation design data. Drilling depths would likely range from about 15 feet to 30 feet below ground surface. Some of the explorations should focus on conditions below and at the top of the stone masonry retaining wall. The wall geometry (foundation depth, wall thickness/changes in thickness with height, etc.) should be explored for use in evaluating impacts of the proposed construction on the wall. It may be beneficial to excavate several test pits near the wall to help with this evaluation.

4.9 Construction

4.9.1 Introduction

A Construction Management Plan, in compliance with the City's Construction Management Program, will be submitted to the Boston Transportation Department 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 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. The Proponent intends to follow the guidelines of the City of Boston and of MassDEP, which direct the evaluation and mitigation of construction impacts.

4.9.2 Construction Methodology/Public Safety

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

It may be necessary to occasionally occupy pedestrian walkways and portions of the surrounding roadways. 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. 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.

All of these measures will be incorporated into the CMP that will be submitted to BTD for approval prior to the commencement of construction work.

4.9.3 Construction Schedule

It is anticipated that Phase I construction will commence in the fourth quarter of 2014. Once begun, construction is expected to last approximately 30 months.

Typical construction hours will be from 7:00 AM to 6:00 PM, Monday through Friday, with most shifts ordinarily ending at 3:30 PM. No substantial sound-generating activity will occur before 7:00 AM. If longer hours, additional shifts, or Saturday work is required, the construction manager will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. Notification should occur during normal business hours, Monday through Friday. It is noted that some activities such as finishing activities could run beyond 6:00 PM 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.

4.9.4 Construction Staging/Access

Access to the site and construction staging areas will be identified in the CMP. Although specific construction and staging details have not been finalized, the Proponent and its construction management consultant will work to ensure that staging areas are 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.

4.9.5 Construction Mitigation

The Proponent will follow City and MassDEP guidelines that 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.

4.9.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 400 full-time equivalent (FTE) construction jobs will be created over the length of construction. The Proponent will enter into a Boston Residents Construction Employment Program agreement with the BRA, thereby committing to make reasonable, good-faith efforts to have at least 50 percent of the total employee work hours for Boston residents, at least 25 percent of total employee work hours for minorities and at least ten percent of the total employee work hours for women.

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

4.9.7 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 Project 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 Project 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 posted at the loading, delivery, pick-up and drop-off areas.

4.9.8 Construction Air Quality

Short-term air quality impacts from fugitive dust may be expected during excavation and the early phases of construction. Plans for controlling fugitive dust during excavation and construction include mechanical street sweeping, wetting portions of the Project Site during periods of high wind, and removal of debris in covered trucks. The construction contract documents will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts, pursuant to Article 80 of the Boston Zoning Code. 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 Project Site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.

4.9.9 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 Noise Standards;
- 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.

4.9.10 Construction Vibration

Means and methods for performing work at the Project Site will be evaluated for potential vibration impacts on adjoining property, utilities, and 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.

4.9.11 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 feasibly 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 documents. 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.

4.9.12 Protection of Utilities

Existing public and private infrastructure located within the public right-of-way and within easements across the property will be protected during construction. The installation of proposed utilities within public ways will be in accordance with the MWRA, BWSC, Boston Public Works, Dig Safe, and the governing utility company requirements. Required 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.

4.9.13 Rodent Control

A rodent extermination certificate will be filed with the Boston Inspectional Services Department along with the building permit applications 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.

4.9.14 Wildlife Habitat

The Project Site is in an established urban neighborhood. According to the 2008 Natural Heritage online MassGIS data layer, prepared by the Massachusetts Natural Heritage and Endangered Species Program, there are no Priority Habitats of Rare Species or Estimated Habitats of Rare Wildlife on the Project Site.

4.10 Sustainable Design

The Project offers opportunities to address sustainability and sustainable design at many levels. The planned redevelopment of the Site is superbly aligned with the Commonwealth of Massachusetts' Sustainable Development Principles:

It offers Concentrated Development with a Mix of Uses and contributes to Regional Plans to increase density and promote high-quality, walkable neighborhoods; it Promotes Equity through community participation in the transformation of the Site into a positive community resource with a Mix of Housing Options and neighborhood services and retail; redevelopment such as Bartlett Place Protects other Land from development and the redevelopment plans include high-quality open space and passive recreation; site and building development will prioritize Wise Use of Natural Resources with waste management, energy efficiency, water conservation, and materials selection; the Site offers multiple Transportation Choices and the planned retail and commercial development offers space for Business Growth and Job Opportunities; Energy Efficiency and Renewable Energy are a major design focus and will be incorporated in all aspects of the Project.

4.10.1 Sustainability Goals for Bartlett Place

The Proponent has established the following sustainability goals for the Project:

- Redevelop the Site so that it is integrated with and connected to the surrounding neighborhoods
- Create a transit-connected, pedestrian-friendly development that encourages walking and biking, as well as casual interactions with neighbors, workers and visitors
- Provide increased housing density for a range of household types and incomes that supports local businesses, and include a wide mix of local retail and service establishments to meet the needs of current and future residents
- Provide for ecological and environmental site restoration through "re-greening" the Site with public and private green space, reducing heat island effects of the past uses of the Site, and employing advanced stormwater management strategies
- Build highly-efficient buildings that minimize energy and water use, offer healthy indoor environments for living and working, and use materials wisely
- Generate energy on-site for use within the Project, and incorporate renewable energy generation to the greatest extent feasible.

To ensure that the Project achieves its sustainability goals, the Proponent will use the green certification program of the U.S. Green Building Council and/or Enterprise Green Communities. All residential buildings will participate in and seek certification through the ENERGY STAR for New Homes program. The current scheme for program guidance and certification is shown in Table 4.10-1.

Table 4.10-1 Proposed Green Building Programs

PROJECT ELEMENT	BUILDINGS	PROPOSED PROGRAM Certification or Certifiability
SITE		LEED for Neighborhood Development Project intends to Register and Certify
PHASE 1	Building A Building B	LEED for Homes Midrise for entire building or LEED for Homes Midrise for Residential/Retail and LEED-NC for Commercial
LATER PHASES		LEED for Homes Midrise for entire building LEED for Homes Midrise or Enterprise Green Communities and/or LEED for Homes

4.10.2 LEED for Neighborhood Development

The Proponent intends to register the Project for LEED for Neighborhood Development. Based on the current level of planning and analysis the Project can comfortably achieve SILVER level certification. Further planning and analysis is likely to increase the scoring. LEED ND has three broad categories for credits, plus categories for Innovation and Regional Credits. Brief descriptions of the scoring for the broad categories follow, with a detailed scoring table and additional descriptive material in Table 4.10-2.

4.10.2.1 Smart Location and Linkage

The Project will meet all five Prerequisites and is currently scoring 22 of 27 possible points. The Site is a previously developed infill location with excellent transit access that reduces automobile dependence. Brownfield remediation will precede redevelopment. The development plans will be coordinated with City of Boston bicycle network plans and include bicycle storage throughout.

4.10.2.2 Neighborhood Pattern and Design

The Project will meet all three Prerequisites and is currently scoring 20 of 44 possible points. In this category the project may qualify for up to 17 additional points depending on final design decisions and further analysis. The Project will score well in the Walkable Streets, Compact Development and Mixed Income Diverse Development Credits, with plans calling for relatively high density mixed used buildings, multiple building entrances, retail spaces with clear glass along all primary pedestrian arteries, and a housing mix that includes affordable and market rate rental, senior housing and for-sale townhouses.

4.10.2.3 Green Infrastructure and Planning

The proposed development will meet all three Prerequisites and is currently scoring 8 of 29 possible points. In this category the Project may qualify for up to 15 additional points as plans are finalized. Prerequisite 1 requires at least one building within the project to be certified using an applicable LEED certification standard. The Proponent will certify either Building A or B using the LEED for Homes Midrise program. All buildings in all phases will be LEED certifiable at a minimum SILVER level, but decisions regarding registration and certification will be made as each phase is built. The design standards for every building will meet or exceed the Energy Stretch Code, which will satisfy the requirements of Prerequisite 2, and design standards for water conservation will exceed the requirements of Prerequisite 3. Additionally, the Project's design requirements will set energy and water performance standards that will qualify for additional credits for Building Energy Efficiency and may qualify for additional credits for water efficiency. Water efficiency measures will be extended to the landscape to limit the use of potable water for landscaping. The Proponent is investigating how to include on-site renewable energy and district energy

approaches for meeting the energy needs of the development. Other measures in the Green Infrastructure and Planning section require coordination with various City departments and requirements and will be evaluated as plans are further developed.

4.10.2.4 Innovation and Design Process / Regional Priority Credits

The Proponent has not targeted specific measures that would qualify for credits in these categories, but expect that one or two additional credits could be obtained, e.g., for exemplary performance in other categories.

4.10.2.5 Preliminary Scoring

The current certification categories are: Certified, 40 to 49 points; Silver, 50 to 59 points; Gold, 60 to 79 points; and Platinum, greater than 80 points.

The Proponent is confident that the Project will meet all Prerequisites and will score a minimum of 51 points. Currently up to 38 points are in the Maybe column, but the Project is likely to earn a number of these points. Thus the Project is projected to achieve a minimum certification level of SILVER, and may be able to achieve GOLD. Table 4.10-2 includes short descriptions detailing how the Project intends to achieve the points.

Table 4.10-2 LEED for Neighborhood Development Scoring

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
22	4	1	Smart Location and Linkage		27 Points Possible	COMMENTS
Yes			Prereq 1	Smart Location	Required	OPTION 1: Infill site
Yes			Prereq 2	Imperiled Species and Ecological Communities	Required	OPTION 1: No Impact
Yes			Prereq 3	Wetland and Water Body Conservation	Required	Option 1: None
Yes			Prereq 4	Agricultural Land Conservation	Required	Option 2: Infill Site
Yes			Prereq 5	Floodplain Avoidance	Required	Option 1: Not in a floodplain
8	2		Credit 1	Preferred Locations	10	Option 1: Site is previously developed infill (5 pts) Option 2: Site is well-connected within the existing urban grid
2			Credit 2	Brownfield Redevelopment	2	Option 1: Site is a brownfield, subject to remediation plan Option 2: Site is within Treasury CDFI-eligible community
7			Credit 3	Locations with Reduced Automobile Dependence	7	>50% residential units and non-residential buildings are w/in 0.25-mile walk distance to bus stops (multiple lines) OR w/in 0.5-mile walk distance to bus rapid transit (Silver Line) or light/heavy rail (Orange Line)

Table 4.10-2 LEED for Neighborhood Development Scoring (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
1			Credit 4	Bicycle Network and Storage	1	NETWORK: Team is working with City of Boston to incorporate the site in bike network plans STORAGE: Storage: bike storage capacity will be integral to all buildings and to site plans.
3			Credit 5	Housing and Jobs Proximity	3	Addition of both housing and retail/commercial space will increase the connectivity between housing and job opportunities
		1	Credit 6	Steep Slope Protections	1	Unlikely to meet requirements
1			Credit 7	Site Design for Habitat, Wetland and Water Body Conservation	1	Option 1: No significant habitat on-site
	1		Credit 8	Restoration of Habitat or Wetlands and Water Bodies	1	Subject to further analysis and credit interpretation: We will create, not restore habitat, would need 10% of development footprint
	1		Credit 9	Long-Term Conservation Management of Habitat or Wetlands and Water Bodies	1	Subject to further analysis and credit interpretation: Creation, maintenance of a range of habitats might qualify

Table 4.10-2 LEED for Neighborhood Development Scoring (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
21	16	4	Neighborhood Pattern and Design		44 Points Possible	COMMENTS
Yes			Prereq 1	Walkable Streets	Required	a: Principal entries face streets or public spaces; b: building height to street width ratios met; c: continuous sidewalks; d: <20% of frontages are service bays or garage entries
Yes			Prereq 2	Compact Development	Required	Option 1: High-density development in a transit corridor
Yes			Prereq 3	Connected and Open Community	Required	Option 1: Connected to surrounding development
7	2	3	Credit 1	Walkable Streets	12	Plans put buildings close to the property line to create a strong pedestrian-friendly street edge. Buildings have multiple entrances, clear glass for retail and limited "blank" walls to encourage a lively, interactive pedestrian environment.
3	2	1	Credit 2	Compact Development	6	Current housing density is 34 dwelling units/acre. Final design and further analysis may increase score
2	1		Credit 3	Mixed-use Neighborhood Centers	4	Final score depends on the mix of on-site and nearby facilities and services when the development is complete
6	1		Credit 4	Mixed-Income Diverse Communities	7	Option 1: Housing type diversity - 3 pts Option 2: Affordable housing - 3 pts Option 3: Likely to pick up the extra point for deep affordability
	1		Credit 5	Reduced Parking Footprint	1	Multiple requirements must be evaluated before incorporation into plans

Table 4.10-2 LEED for Neighborhood Development Scoring (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
	2		Credit 6	Street Network	2	Subject to further analysis and credit interpretation
	1		Credit 7	Transit Facilities	1	Washington Street is targeted for future Silver Line extension
	1	1	Credit 8	Transportation Demand Management	2	Not likely to meet requirements
	1		Credit 9	Access to Civic and Public Spaces	1	Subject to further analysis and final design
	1		Credit 10	Access to Recreation Facilities	1	Subject to further analysis and final design
	1		Credit 11	Visitability and Universal Design	1	Subject to further analysis and final design: Design team is evaluating how best to incorporate for the site and buildings
1	0		Credit 12	Community Outreach and Involvement	2	Community review and participation has been incorporated in the planning process.
	1		Credit 13	Local Food Production	1	Development team is considering ways to incorporate food production and access to fresh local food in the plans
1	1		Credit 14	Tree-Lined and Shaded Streets	2	Subject to further analysis and final design
1			Credit 15	Neighborhood Schools	1	Site is located within walking distance of O'Bryant and Mission Hill High Schools and City on a Hill Charter School

Table 4.10-2 LEED for Neighborhood Development Scoring (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
8	15	3	Green Infrastructure and Buildings		29 Points Possible	COMMENTS
Yes			Prereq 1	Certified Green Building	Required	Phase 1 Bldg A and/or B
Yes			Prereq 2	Minimum Building Energy Efficiency	Required	Meet or exceed Stretch Code
Yes			Prereq 3	Minimum Building Water Efficiency	Required	Establish building design requirements, methods to meet
Yes			Prereq 4	Construction Activity Pollution Prevention	Required	Doable - establish requirements, methods
1	2		Credit 1	Certified Green Buildings	5	Future certified/certifiable decisions will be made as phases are built out
2			Credit 2	Building Energy Efficiency	2	Energy modeling as appropriate for each building type
	1		Credit 3	Building Water Efficiency	1	Requirements will be evaluated for each building
1			Credit 4	Water-Efficient Landscaping	1	Will meet through a combination of strategies
		1	Credit 5	Existing Building Use	1	Will not meet - demolition planned
		1	Credit 6	Historic Resource Preservation and Adaptive Reuse	1	Will not meet
1			Credit 7	Minimized Site Disturbance in Design and Construction	1	Achieved due to site characteristics

Table 4.10-2 LEED for Neighborhood Development Scoring (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
1	3		Credit 8	Stormwater Management	4	Credits depend on final stormwater mgmt. plan
	1		Credit 9	Heat Island Reduction	1	Subject to further analysis and final design
		1	Credit 10	Solar Orientation	1	Unlikely to meet requirements
1	2		Credit 11	On-Site Renewable Energy Sources	3	Final scoring based on percent of solar and electrical generated on-site
	2		Credit 12	District Heating and Cooling	2	Subject to further analysis
	1		Credit 13	Infrastructure Energy Efficiency	1	Subject to further analysis and final design, coordination with City
	1		Credit 14	Wastewater Management	2	Unlikely but subject to further analysis
	1		Credit 15	Recycled Content in Infrastructure	1	Subject to further analysis and final design, coordination with City
1			Credit 16	Solid Waste Management Infrastructure	1	Subject to further analysis and final design, coordination with City
	1		Credit 17	Light Pollution Reduction	1	Subject to further analysis and final design, coordination with City Evaluate relative to design, City reqs

Table 4.10-2 LEED for Neighborhood Development Scoring (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
1	2	0	Innovation and Design Process		6 Points	COMMENTS
	2		Credits 1.1 – 1.5	Innovation and Exemplary Performance : Provide Specific Title	1 each, up to 5	Likely to achieve a couple of these points
1			Credit 2	LEED Accredited Professional	1	
Y	M	N				
0	0	0	Regional Priority Credit		4 Points	COMMENTS
			Credits 1.1 – 1.4	Regional Priority Credit: Region Defined	1 each, up to 4	
Y	M	N				
51	38	8	PROJECT TOTALS		110 Points	

Certified: 40 - 49 points, Silver: 50 - 59 points, Gold: 60 - 79 points, Platinum: 80+ points

4.10.3 Buildings A and B Sustainability

As noted in Table4.10-3, the sustainability design guidelines for Buildings A and B will be the LEED for Homes Multifamily Mid-Rise program. In order to meet the LEED-ND certification requirements for the entire Project, one or both of these buildings will be registered and certified through this program with the US Green Building Council. Both buildings are targeted to achieve a LEED SILVER performance level with a possibility for GOLD.

Regardless of green building certification program, Nuestra Comunidad has certain sustainability design guidelines that govern their projects and that directly relate to the Sustainability Goals for Bartlett Place. These include:

4.10.3.1 Energy Efficiency

- Participate in applicable ENERGY STAR program:
  - All residential buildings will achieve ENERGY STAR for NEW HOMES V3 certification
  - All mixed-use/retail/commercial buildings will meet ENERGY STAR new construction certification
- Include energy modeling during design to optimize energy performance
  - All residential either ASHRAE 90.1 or REMRate/HERS modeling
  - All mixed-use/retail/commercial: ASHRAE 90.1
- All residential buildings modeled using REMRate will achieve a HERS rating no greater than 50 without consideration of on-site electrical production
- All residential buildings modeled using ASHRAE 90.1 will achieve at least a 25 percent reduction in energy costs relative to the ASHRAE 90.1 baseline without consideration of on-site electrical production
- Measures to achieve the targeted ratings include high performance envelopes, high efficiency heating and cooling systems, energy recovery ventilation, advanced lighting and controls, high-efficiency equipment and appliances
- Actively seek to incorporate integral thermal or electrical on-site energy generation, including renewable energy sources

4.10.3.2 Water Conservation

- Use WaterSense® qualified fixtures and fittings for toilets, showers, faucets
- Plan hot water circulation to limit water waste
- Limit use of potable water for landscaping—drought-tolerant plants, native species; consider rainwater collection for irrigation
- Limit or eliminate landscape irrigation

4.10.3.3 Healthy Homes & Indoor Environmental Quality

- Design ventilation systems to comply with ASHRAE 62.1 and/or62.2, including Addendum J
- Provide direct fresh air supply to each living unit as part of a balanced ventilation system

- Implement advanced air-sealing strategies to compartmentalize units—reducing uncontrolled airflow from adjacent units and common areas as well as from the outdoors
- Prevent combustion by-product exposure
- Specify low-VOC sealants, adhesives and other construction products
- Specify low-VOC paints and other finish materials
- Specify urea-formaldehyde-free products, especially insulation and wood products
- Limit or eliminate carpet, with a preference for low-VOC hard surface flooring

4.10.3.4 Healthy Residents and Green Living

- Promote effective recycling
- Offer easy connections to transit, pedestrian zones and bicycling
- Provide bike storage
- Create public and private green space and provide good access
- Offer play spaces for children and passive recreation space for adults
- Offer options to understand and control energy costs—such as programmable thermostats
- Offer resident information and education regarding building green features and green living

4.10.3.5 Site Considerations

- Control erosion during construction and post-development
- Implement advanced stormwater management practices to maximize on-site recharge
- Implement measures such as high-reflectance roofing, shaded pavement to reduce urban heat island effect
- Plan exterior lighting to address "dark sky" concerns

4.10.4 LEED for Homes Multifamily Mid-Rise Scoring

Both buildings A and B have been preliminarily scored using the Mid-Rise LEED checklist. Although there are some differences between the buildings, the Nuestra Comunidad design guidelines are being applied to both, and the LEED scores are achieved in similar ways. One scoring description and table will be used to explain both buildings. Any significant differences will be noted. LEED for Homes allows

for the target certification scores to be adjusted based on the averages sizes of homes in the development relative to a baseline. The Building A and B units are smaller than this baseline, and as a result the certification score levels are reduced by six points. With the adjusted scores the buildings are currently achieving a preliminary rating of Silver. General category comments follow.

4.10.4.1 Innovation and Design Process

The Project will meet the four Prerequisites and is currently scoring 5 of 11 possible points. The team is employing an integrated design strategy to guide the design

4.10.4.2 Location and Linkages

The Project is participating in the LEED for Neighborhood Development program and will qualify for all 10 available Credits in this category.

4.10.4.3 Sustainable Sites

The buildings will meet the two Prerequisites and are currently scoring 15 of 22 available points. The urban infill location with good transit access and moderate increase in density meets many Smart Growth principles, which are reflected in the credits.

4.10.4.4 Water Efficiency

This category does not have prerequisites. The buildings are currently scoring 4 of 15 available points. The buildings will use Water Sense® qualified fixtures and fittings, and the team will consider water re-use and methods for limiting landscaping irrigation needs during design development.

4.10.4.5 Energy and Atmosphere

The buildings will meet the two Prerequisites and will use a performance-based approach incorporating energy modeling to determine the optimal mix of building envelope, HVAC systems, and lighting and equipment choices to achieve energy performance at least 25 percent better than an ASHRAE 90.1 baseline. This exceeds the Prerequisite 1 minimum improvement of 15 percent. The Project will participate in the Energy Star for New Homes program and will follow the testing and verification protocols from the Multifamily Highrise program to meet Prerequisite 2.

4.10.4.6 Materials and Resources

The buildings will meet the three Prerequisites. The building construction methods are likely to include some degree of panelization and off-site fabrication to minimize wood waste from framing. The team will set construction waste diversion goals of at least 75 percent and monitor compliance through a construction waste management plan.

4.10.4.7 Indoor Environmental Quality

The buildings will meet the eight Prerequisites in this category. Many of these requirements are also necessary for Energy Star Homes and to meet ASHRAE 62.1/62.2 standards. Additional measures in this category include radon-resistant construction for occupied spaces connected to the ground; unit compartmentalization; and contaminant control during construction. Nuestra Comunidad has begun implementing smoke-free housing policies throughout its portfolio, and will extend those policies to the housing at Bartlett Place.

4.10.4.8 Awareness and Education

The Project will meet the one Prerequisite. The Proponent will provide basic education about the green features, energy efficiency and general upkeep to new residents. Further, the transition from construction to operations will include extended training for Operations and Maintenance staff. The Proponent will communicate the sustainability features of the Project in multiple communication modes.

4.10.4.9 Preliminary Scoring

LEED for Homes scoring includes a Size Adjustment feature to reward compact home sizes and discourage oversized houses. Due to the unit configuration and square footages of the apartments in Buildings A and B, both buildings qualify for a downward adjustment of six points. The resulting certification categories are: Certified, 39 to 53 points; Silver, 54 to 68 points; Gold, 69 to 83 points; and Platinum, greater than 84 points.

Presently the Proponent is confident that the Project will meet all Prerequisites and will definitely score a minimum of 65.5 points. Currently another 24+ points are in the Maybe column, but the Project is likely to earn a number of these points. Thus the Project is projected to achieve a minimum certification level of SILVER, and may be able to achieve GOLD. In the table that follows, short descriptions detail how the Project intends to achieve the points.

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
5	3	2	Innovation and Design Process (ID)		11 Points Possible/ 0 Required	COMMENTS
1. Integrated Project Planning						
Yes			Prereq 1.1	Preliminary Rating	Required	Preliminary Rating: SILVER
Yes			Prereq 1.2	Energy Expertise	Required	Energy Modeling will be included in design development process
	1		Credit 1.3	LEED for Homes-credentialed team member	1	Team member(s) may become credentialed during the design time-frame
1			Credit 1.4	Design Charrette	1	The team will use a charrette and other integrated design strategies throughout the design development process
		1	Credit 1.5	Solar Orientation	1	Site constraints are such that requirements will not be met
	1		Credit 1.6	Trades Training	1	The developer will consider a formal training program when the Project is closer to construction

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
2. Durability Management Process						
Yes			Prereq 1.1	Durability Planning/ Checklist	Required	Team will develop the required durability checklist during design development
Yes			Prereq 1.2	Durability Management during construction	Required	• >50% residential units and non-residential buildings are w/in .25 mile walk distance to bus stops (multiple lines) OR w/in .5 mile walk distance to bus rapid transit (Silver Line) or light/heavy rail (Orange Line)
3			Credit 1.3	Third-Party Durability Verification	3	Construction inspections and commissioning will incorporate durability checklist elements
3. Innovative or Regional Design						
1	1	1	Credits 3.1 – 3.4	Innovation or Regional Design Priorities	3	Project is likely to earn innovation credits, for example for bike accommodations and storage
10	0	0	Location and Linkages (LL)		10 Points Possible/ 0 Required	COMMENTS
10			Credit 1	LEED for Neighborhood Development	10	Project will register and certify under LEED ND and qualify for all points
			Credits 2 – 6	Alternate credits if not using LEED ND	10	Not applicable due to LEED ND

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS	POINTS	COMMENTS
15	5	9	Sustainable Sites (SS)	22 Points Possible/ 5 min Required	COMMENTS
1. Site Stewardship					
Yes			Prereq 1.1 Erosion Controls	Required	Project will meet requirements
		1	Credit 1.2 Minimize		Due to previous development site will not meet requirements
2. Landscaping					
Yes			Prereq 2.1 Erosion Controls	Required	Project will meet requirements
1			Credit 2.2 Basic Landscaping	1	Landscaping will limit turf, include drought-tolerant species, and meet other requirements
2			Credit 2.3 Limit conventional Turf	2	Softscape will have limited turf
	1		Credit 2.4 Drought-tolerant plants	1	Scoring depends on final design and calculations
1	2		Credit 2.5 Reduce irrigation demand by at least 20%	3	Scoring depends on final design and calculations
3. Local Heat Island Effects					
		1	Credit 3.1 Reduce heat island effect--site	1	Unlikely to meet requirements

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
1			Credit 3.2	Reduce heat island effect—roofs	1	Will meet with a combination of vegetated and/or high-reflectance roofing materials
4. Surface Water Management						
0.5	1.5		Credit 4.1	Permeable Lot	2	Scoring depends on final design and calculations
1			Credit 4.2	Permanent Erosion Controls	1	Designs will meet requirements
2			Credit 4.3	Stormwater Quality	2	Designs will meet requirements
5. Non-toxic Pest Control						
1.5	0.5		Credit 5	Pest Control Alternatives	2	Pest control strategies will be incorporated into the designs
6. Compact Development						
2			Credit 6.1	Moderate Density	2	The current density qualifies for this Credit
		3	Credit 6.2	High Density	3	Density does not meet requirements
		4	Credit 6.3	Very High Density	4	Density does not meet requirements
7. Alternative Transportation						
2			Credit 7.1	Public Transit	2	Project location qualifies for both points in this Credit
1			Credit 7.2	Bicycle Storage	1	Bicycle storage plans meet will meet requirements

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
1			Credit 7.3	Parking Capacity	1	Parking plans do not exceed code; spots will allocated to car-sharing services if offering service on the site
4	6	9	Water Efficiency (WE)		15 Points Possible/ 3 min Required	COMMENTS
1. Water Re-use						
		5	Credit 1	Water Re-use	5	Will evaluate during design, but not currently expecting to meet requirements
2. Irrigation System						
	2		Credit 2.1	High-efficiency irrigation	2	Scoring depends on final design and calculations
	2		Credit 2.2	Reduce irrigation demand by at least 45%	2	Scoring depends on final design and calculations
3. Indoor Water Use						
2			Credit 3.1	High-efficiency fixtures and fittings	2	Design will include Water Sense qualified fixtures and fittings
2		4	Credit 3.2		6	Design will include Water Sense qualified fixtures and fittings
	2		Credit 3.3		2	Laundry and Dishwasher specs not yet determined

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS	POINTS	COMMENTS
14	2+	22	Energy and Atmosphere (EA)	38 Points Possible/ 0 Required	COMMENTS
1. Optimize Energy Performance (Performance Path incorporates Credits 1 – 6, 8 -10)					
Yes			Prereq 1.1	15% better performance than ASHRAE 90.1-2007	Required	Energy modeling will ensure that minimum performance is met
Yes			Prereq 1.2	Testing and Verification	Required	Planned participation in Energy Star for New Homes program will meet requirements
12		22	Credit 1.3	Optimize Energy Performance	34	Current score based on estimated minimum 25% improvement from baseline
7. Water Heating					
	2		Credit 2.1	Efficient Distribution	2	Difficult to achieve in multifamily
1			Credit 2.2	Pipe insulation	1	Specs will require
11. Refrigerant Management					
Yes			Prereq 11.1	Refrigerant Charge Test	Required	Requirement will be included in testing and verification
1				Appropriate HVAC Refrigerants	1	Qualifying refrigerants will be specified

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
6.5	4+	9	Materials and Resources (EA)		16 Points Possible/ 6 min Required	COMMENTS
1. Material-Efficient Framing						
Yes			Prereq 1.1	Minimize Framing Waste	Required	Requirement will be included in specs
		1	Credit 1.2	Detailed Framing Documents	1	Credits unavailable due to scoring credit 1.5
		1	Credit 1.3	Detailed Cut List	1	Credits unavailable due to scoring credit 1.5
		3	Credit 1.4	Framing Efficiencies	3	Credits unavailable due to scoring credit 1.5
4			Credit 1.5	Off-site fabrication	4	Project expects to incorporate panelization and other off-site methods
2. Environmentally Preferable Products						
Yes			Prereq 2.1	FSC-certified Tropical Wood	Required	Requirement will be included in specs
	4	4	Credit 2.2	Environmentally Preferable Products	8	Team expects to incorporate materials that will meet requirements—to be determined during design development
3. Waste Management						
Yes			Prereq 3.1	CWM Planning	Required	Requirement will be included in specs

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
2.5	0.5		Credit 3.2	Construction Waste Reduction	3	Projects will target 75% diversion rate as a minimum
8	4	12	Indoor Environmental Quality (IE)		21 Points Possible/ 6 min Required	COMMENTS
2. Combustion Venting						
Yes			Prereq 2	Basic Combustion Venting Measures	Required	Requirement will be included in specs
3. Moisture Control						
		1	Credit 3	Moisture Load Control	1	Supplemental humidity control unlikely to be included
4. Outdoor Air Ventilation						
Yes			Prereq 4.1	Basic Outdoor Air Ventilation	Required	Required by ASHRAE 62.2
2			Credit 4.2	Enhanced Outdoor Air Ventilation	2	Will be included as part of a balanced unit-based ventilation system
1			Credit 4.3	Third-Party Performance Testing	1	Construction inspections and commissioning will incorporate these elements
5. Local Exhaust						
Yes			Prereq 5.1	Basic Local Exhaust	Required	Required by ASHRAE 62.2
1			Credit 5.2	Enhanced Local Exhaust	1	Will be included as part of a balanced unit-based ventilation system

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
1				Third-Party Performance Testing	1	Construction inspections and commissioning will incorporate these elements
6. Distribution of Space Heating and Cooling						
Yes			Prereq 6.1	Room-by-room load calculations	Required	Room-by-room calcs or ASHRAE handbook guidelines will be used by MEP engineers for heating/cooling system design
		1	Credit 6.2	Return Air Flow/ room by room controls	1	May not apply depending on system design
		2	Credit 6.3	Third-party Performance testing for multi-zone systems	2	May not apply depending on system design
7. Air Filtering						
Yes			Prereq 7.1	Good Filters	Required	Also required for Energy Star Homes certification
		1	Credit 7.2	Better Filters	1	Will depend on final design
		2	Credit 7.3	Best Filters	2	Will depend on final design
8. Contaminant Control						
1			Credit 8.1	Indoor Contaminant Control during construction	1	Requirement will be included in specs

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
		2	Credit 8.2	Indoor Contaminant Control for Mid-rise	2	Unlikely to meet requirements
	1		Credit 8.3	Preoccupancy Flush	1	Will be considered as construction schedule is developed
9. Radon Protection						
Yes			Prereq 9.1	Radon-resistant construction	Required	Not applicable—Suffolk County is in an EPA Zone 1 (Low Risk)
1			Credit 9.2	Radon-resistant construction in moderate risk zones	1	Will be incorporated in design for occupied spaces connected to the ground
10. Garage Pollutants						
Yes			Prereq 10.1	No HVAC in garage	Required	Will be incorporated in design
	2		Credit 10.2	Minimize pollutants from garage	2	Will consider for inclusion during design development
		3	Credit 10.3	Detached garage or no garage	3	Buildings will have garages within the building envelope
11. Environmental Tobacco Smoke Control						
1			Credit 11	Smoke-free housing	1	Nuestra Comunidad has implemented smoke-free housing policies throughout its portfolio and will continue this policy at Bartlett Place

Table 4.10-3 LEED for Homes Multifamily Mid-Rise Scoring—Buildings A and B (Continued)

Y	M	N	CATEGORY & CREDITS		POINTS	COMMENTS
12. Compartmentalization of Units						
Yes			Prereq 12.1	Basic compartmental-ization of units	Required	Also required by Energy Star Homes. Will be incorporated in design
	1		Credit 12.2	Enhanced compartmental-ization of units	1	Standard is very difficult to achieve but will be considered during design development
3	0	0	Awareness and Education (AE)		3 Points Possible/ 0 Required	COMMENTS
1. Education of Homeowner and Education						
Yes			Prereq 1.1	Basic Operations Training	Required	Will be included in planning for transition from construction to occupancy
1			Credit 1.2	Enhanced Training	1	Will be included in planning for transition from construction to occupancy
1			Credit 1.3	Public Awareness	1	The team will promote the green features of the entire project in multiple communication modes
2. Education of Building Manager						
1			Credit 2	Education of Building Manager	1	Will be included in planning for transition from construction to occupancy
65.5	17.5	63	Total Preliminary Score			
Certification Levels after (-6) point size adjustment: Certified: 39 – 53; Silver: 54 – 68; Gold: 69 – 83; Platinum: ≥ 84						

4.11 Historic Resources

This section discusses historic resources within and in the vicinity of the Project site and anticipated impacts to them.

4.11.1 Historic Resources within and in the Vicinity of the Project

The former Boston Elevated Railway Company Yard, most recently known as the MBTA's Bartlett Street Yard, at 2565 Washington Street encompasses two large garage buildings, the Roxbury Garage constructed in four phases between 1929 and 1938 and Bartlett Street Garage constructed ca. 1930, and the foundation of a former elevated railway platform. There are also two more recent structures on the site, a small office building and a small utility shed (both ca. 1970s). The Bartlett Street Yard is included in the Inventory of Historic and Archaeological Assets of the Commonwealth (Inv. Nos. BOS.11451 and BOS.11452), maintained by the Massachusetts Historical Commission (MHC). The buildings are not listed in the State or National Registers of Historic Places. The project proposes to utilize state and federal funding and therefore requires review by the MHC. As part of that review process, in 2010 the proponent provided the MHC with an MHC Project Notification Form and an updated inventory form documenting the history of the buildings and site. The MHC reviewed the materials and determined the former Bartlett Elevated Railway Company Yard meets the criteria for listing on the State and National Register of Historic Places.

In addition to the historic properties within Bartlett Yard, the project site is immediately adjacent to the Roxbury Highlands National Register Historic District at its south, west, and north property boundaries. Further to the northeast is the Dudley Station Historic District.

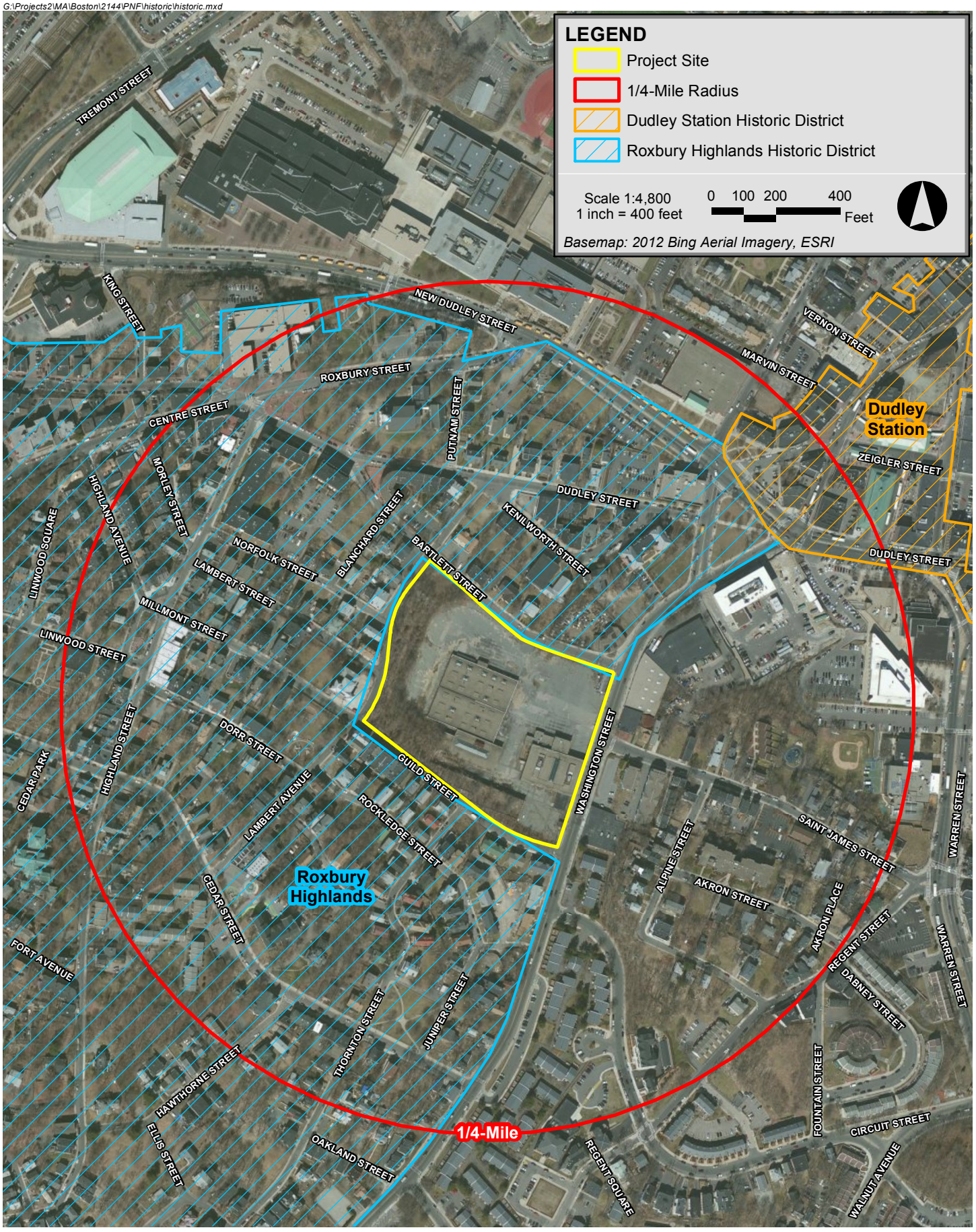
Figure 4.11-1 depicts Bartlett Yard and the Roxbury Highlands and Dudley Station Historic Districts.

4.11.2 Archaeological Resources

There are no known archaeological resources listed in the State and National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth within the Project site. The Project site consists of a previously developed urban site; therefore, it is unlikely that the proposed Project will affect previously unidentified archaeological resources.

4.11.3 Impacts to Historic Resources

The Project proposes the demolition of all of the structures on the site – the two garage buildings, the elevated railway platform foundation, the office building, and utility shed. The MHC determined that the proposed demolition would have an adverse effect on significant historic properties. However, the MHC agreed to accept the demolition, concluding there are no prudent and feasible alternatives that could preserve and reuse the



Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 4.11-1
Historic Resources

historic structures on the site and meet the goals and objectives of the project to provide housing for the neighborhood. In addition, the design review that was undertaken as part of the MHC review process concluded that the new residential buildings are sensitively designed to fit into the context of the surrounding neighborhood, through appropriate scaling of the structures and the use of materials and detailing that are well established. The provision of secure pedestrian connections to Washington Street and Dudley Square will further enhance the adjacent historic district.

The MHC concluded that the submittal of the well-documented MHC inventory form would suffice as mitigation for the adverse effect for the project and that for the purposes of their review process, no further review or mitigation is required. A draft Memorandum of Agreement (MOA) has been prepared by the MHC, accepting the adverse effect. The MOA will be executed among the MHC, DHCD, and proponent as the project approvals and funding applications move forward.

The proposed demolition of the two garage buildings will be subject to review by the Boston Landmarks Commission (BLC) under Article 85 of the Boston Zoning Code. An Article 85 Application for each property will be submitted to the BLC.

Section 5.0

Urban Design

5.0 URBAN DESIGN

5.1 Introduction/Vision

The Project Site has been used by transportation companies since the 1880s. These semi-industrial uses, combined with the extreme re-countouring of the Site, rendered it impassable and inhospitable for 125 years. Today, Bartlett Yard is an abandoned 8.59 acre plateau carved out of the southern base of the Roxbury Highlands neighborhood. It forms a unique juncture between the active commercial district of Dudley Square, and the adjacent residential neighborhoods.

The twin goals of the plan for Bartlett Place are to integrate the Site into the rich, largely residential fabric of the Highlands, and to create an important economic adjunct to Dudley Square. The Site is envisioned as a creative village, which will bring energy and innovation to Roxbury.

5.2 Existing Urban Fabric

Bartlett Place is at the meeting point between the Dudley Square business district and the Highland Park, St. James, and St. Joseph neighborhoods. The development of the Site as a train and bus yard created a void in the urban fabric of the surrounding residential neighborhoods, and an empty space along Washington St.

The Project improves with the existing context by placing active, mixed-use buildings along the Washington Street edge, and smaller townhouse and apartment style buildings along the residential streets of Bartlett, Guild, and Lambert Avenue. This arrangement takes advantage of the topography, with taller buildings downhill and shorter buildings uphill, and compliments both the scale and the uses of the surrounding buildings.

5.3 Program

Bartlett Place is designed both to be a comprehensive community, and to enhance surrounding the Washington Street Corridor, Highland Park, and Dudley Square communities. The Project's program provides housing, services, and jobs, all situated at a natural transition point between a major boulevard and business district through the adjacent small neighborhood streets.

The Project has been organized to respect and enhance that transition by placing larger prominent buildings along the Dudley Square side of the Site, and smaller individual townhouses and apartment buildings scaled to match existing context as the Site climbs up into the Highland Park neighborhood.

The Site will be an enhancement to the surrounding community because it fills the void that currently exists, and it will generate residential, commercial, and recreational activity. Neighbors are invited into the Site with a terraced orchard and landscaped pedestrian path

designed to be welcoming and safe. This path will encourage people to walk from the Highland Park neighborhood into Dudley Square for shopping, work, and public transportation. The large buildings at the bottom of the site, along with a massive existing historic puddingstone wall, spiral around a central public plaza that will be home to passive and active recreation such as community festivals, art exhibits, performances, and farmers' markets.

5.4 Evolution of Design/Program

The Project's design and program evolved in cooperation with the community and in accord with the Request for Proposal issued by the MBTA and BRA in 2006. The design responds to the demand for a combination of elderly and family rental and homeownership housing opportunities in a mixed-income development. The Project also developed from the neighborhood's desire for a variety of retail uses and increased job creation by seeking a new mix of businesses for the area, and the development of sufficient commercial spaces suited for the types of businesses that would like to locate in the Dudley Square area.

Since the original RFP and submission and community process, the design has evolved to include a wider variety of retail and commercial spaces, including micro-entrepreneur sheds, live/work units, community agriculture, and a 20,000 square foot single tenant commercial building.

The primary public plaza forms the heart of the Site. Its location concentrates more intense public activity close to the commercial uses near Washington Street, away from the quieter residential areas. This plaza location highlights the massive, beautiful historic pudding stone wall in that corner of the Site.

5.5 Urban Design Principles

The layout of the Site is designed to fill in the gap in the surrounding residential neighborhood, and to extend the active street life of Dudley Square along the Washington Street Corridor further into the surrounding community.

The primary goals of the design are:

- Fill in the empty street edges along Guild, Lambert, Bartlett, and Washington Streets with new housing and commercial spaces that recognizes and reinforces the scale and character of surrounding uses.

- Extend the commercial district of Dudley Square down Washington Street towards Egleston Square.

- Increase connectivity across the Site by providing pedestrian, bicycle, and vehicular connections to the greatest extent possible with the steep topography.

- Provide a central public plaza that can become a hub for both passive recreation and community activities.

- Preserve and highlight the history of the Site through the existing pudding stone retaining wall and new terraced orchards.

- Create active streets by having a variety of public, semi-public, and private spaces, and by having a variety of building and unit entries.

- The Site is primarily organized by a hierarchy of green spaces, ranging from public, to semi-private, to private.

- Connectivity with the surrounding neighborhoods is established by breaking down the scale of the Site with landscaped paths for vehicles and pedestrians.

- The scale and pattern of adjacent neighborhoods are reinforced by appropriately sized residential and commercial structures along the periphery of Bartlett Place.

- Active use of public and semi-private areas throughout most hours of the day is assured through lively streetscapes with multiple building entries, transparent commercial storefronts, outdoor seating and dining, tot lots, and dispersed parking.

- Walkability of the Site is promoted and vehicular impact is minimized through a mix of structured parking, traffic-calming features, and limited-access residential parking areas. The penetration of trucks and service vehicles is restricted, and loading areas are close to Washington Street. The use of public transportation is encouraged by covered bus stops and well-defined pedestrian and bicycle paths.

5.5.1 Lambert Avenue, Guild, and Bartlett Streets

The Project will enhance and enliven the surrounding residential streets by filling in the now vacant edges with new housing. The housing will be primarily three- and four-story townhouses, with some four-story apartment buildings at roadway intersections. This scale of housing is consistent with the surrounding neighborhoods. The improved, secure pedestrian environment will promote connectivity between Washington Street, Fort Hill, and John Eliot Square.

New public parallel parking will be provided within the project boundary along Lambert Street to widen the street and improve parking opportunities. Private parking for townhouse units will be provided on a one-way driveway behind the townhouses. The driveway is entered from Guild Street and exits onto Bartlett Street.

The Project Site's current boundary is paved or wooded with a fence along the property line and no sidewalk or public infrastructure. The Project will improve the local streetscapes through the addition of sidewalks and street trees. Townhouses will be set back from the street, and will have small front yards and stoops providing a pedestrian friendly environment.

5.5.2 Washington Street

The City is currently in the planning stage for streetscape improvements along Washington Street. Planned improvements will extend out of Dudley Square, and will include the entire length of the Project Site.

The Project proposes to provide two, larger scale new buildings along Washington Street, with first floor commercial spaces along the entire frontage, and residential units above. Partially covered commercial entries will face directly onto Washington Street along both buildings to encourage pedestrian activity and to extend commercial activity from Dudley Square. Included will be a series of micro-entrepreneur sheds at the southern end of the Site.

Access to the main public plaza will be provided by a passageway through Building B, near a new MBTA bus stop. The 60 residential units in Building B will be entered from Washington Street, while the 42 residential units in Building A will be entered near the corner of Bartlett and Washington Streets.

5.5.3 Marcia Street

Marcia Street is the L-shaped central spine of Bartlett Place that connects Washington Street with Bartlett Street. It is a two-way extension of St. James Street to the east, and will likely be signalized at the Washington Street intersection. A signal at this location will calm the southbound traffic from Dudley Square, and will allow for easy vehicular access in and out of the Site, as well as a safe pedestrian crossing point.

The entry to Marcia Street will be flanked by the ground floor retail uses of Buildings A and B. The development team is committed to finding retail tenants that will bring activity to the sidewalk, such as outdoor cafes.

On entering the Site, Marcia Street passes through the heart of the development, where the public plaza meets Buildings A and B, the commercial use on the ground floor of the opportunity building, the senior building, and the gallery space in Building D. The left side of Marcia Street features a pedestrian promenade that passes along the public plaza and the gallery and ground floor live/work spaces of Building D. The promenade then continues up the terraced hillside orchards and gardens to connect to Lambert Ave. Marcia Street and the promenade have been oriented to highlight the view of the historic church at the top of the hill.

After turning right, the character of Marcia Street changes to a more residential scale, with individual townhouses and duplexes that will be completed during the Later Phases of the Project.

5.5.4 Building Design: Building A

Building A sits at the corner of Bartlett and Washington Streets, and will be a prominent view for people approaching from Dudley Square. The building is designed to have many public faces, including the retail storefronts along Washington Street, the opportunity building commercial space, with entries on Marcia and Bartlett Streets, and the residential units above, with their entry on Bartlett Street. Storefronts will be open and inviting, and retail tenants will be encouraged to make use of sidewalk space for outdoor dining.

The central courtyard of the building is designed with retail entries along the interior on both sides, and a second floor terrace to bring activity in and through the courtyard. A public walkway connects from Bartlett Street to Marcia Street to make the site more permeable to pedestrians.

5.5.5 Building Design: Building B

Building B is located between Washington Street and the public plaza. Its mass is divided into two sections, separated by a bridge. The section closest to Marcia Street houses retail spaces on the first floor. At the bridge, there is a pedestrian path that connects to the public plaza. This is also the location of the residential entry.

Beyond the residential entry is a curb cut to access the first floor garage, then a series of "micro-entrepreneur" storefronts that will bring small-scale retail to Washington Street. There will also be micro-entrepreneur storefronts on the rear of the main retail space, facing the public plaza.

Because of the steep ascent at Guild Street, the first floor parking garage is buried in the hill, and the second floor parking is accessed off of Guild Street. A terraced hill and stair connect Guild Street with the public plaza, running along the face of a pudding stone wall.

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 5.5-1

Site Plan – First Phase

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 5.5-2

Building A – Looking South from the Intersection of Washington and Bartlett Streets

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 5.5-3

Building B – Looking South from the Intersection of Washington and Marcia Streets

Figure 5.5-4

Building B – Pedestrian Path looking West from Washington Street

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 5.5-5

View from the Public Plaza East down Marcia Street

Bartlett Place Boston, MA

Epsilon ASSOCIATES INC.

Figure 5.5-6

View from the Public Plaza looking North

Section 6.0

Infrastructure

6.0 INFRASTRUCTURE

6.1 Introduction

This chapter discusses the existing and proposed utility infrastructure systems that will support the Project and provide estimates of water use and wastewater generation.

The Project includes the demolition of the existing buildings and structures on the Site. The current utility service connections for these buildings will be abandoned and capped at the respective mains located in the street. It is not anticipated that any of the existing service connections will be reused for the Project.

Fire protection service removal will be coordinated with Boston Water and Sewer Commission (BWSC), Boston Fire Department (BFD), and Inspectional Services Department (ISD). Prior to any demolition or abandonment of services, a Termination Verification Approval Form for Demolition will be submitted to BWSC for approval.

6.2 Water Supply

6.2.1 Existing Conditions

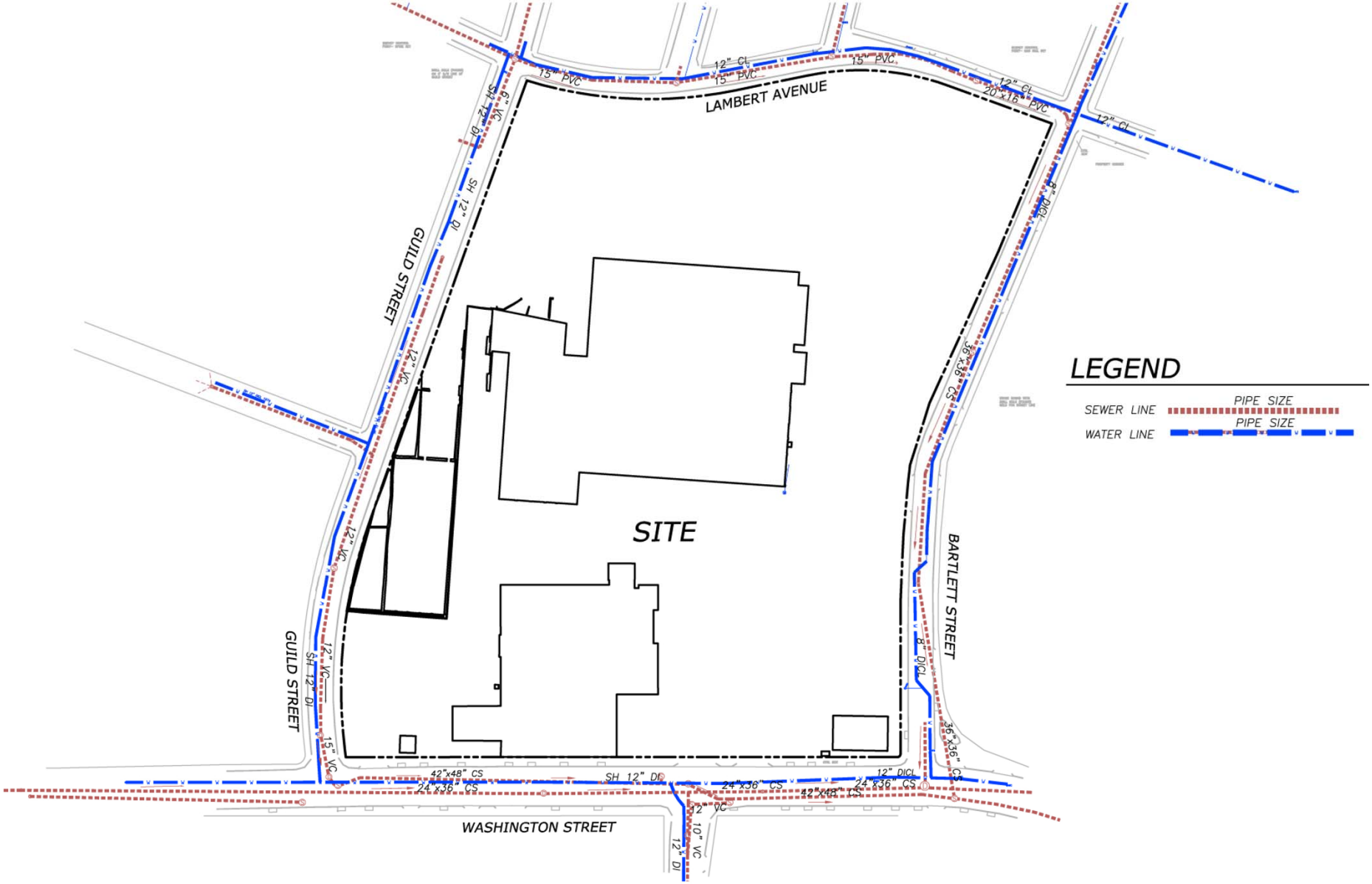
The water mains in the City of Boston are owned and operated by BWSC. Water is purchased and supplied from Massachusetts Water Resource Authority (MWRA). The MWRA water supply is considered an unlimited source from the Quabbin Reservoir in Central Massachusetts. Water to the Project vicinity is delivered via the BWSC water main systems.

Water mains exist within all the streets surrounding the site. 12" water mains are located in Washington Street, cement lined (CL)1988, Guild Street, CL 1985 and Lambert Avenue, CL 1935 and an 8" water main, CL 2002 exists in Bartlett Street, see Figure 6.2-1, Existing Water and Sewer Exhibit. Various services, for Fire protection and domestic water use, enter the Site from Guild Street, Washington Street and Bartlett Street.

Several fire hydrants are located within the Site. These hydrants will be removed, as part of the Site and utility demolition. Fire hydrants are located within the surrounding streets at an approximately 300' intervals. During the Project's design development phase, hydrant flow tests will be performed to assess the water flow and pressure in the area.

6.2.2 Water Demand

The overall Project's estimated domestic water demand can be calculated by applying a factor of 1.1 to the estimated wastewater generation calculations. These calculations are based on the Department of Environmental Protection (DEP), 314 CMR 7.00, Sewer System Extension and Connection Permit Program and 310 CMR 15.00, The State Environmental



Bartlett Place Boston, MA

DZ I
DeVellis Zrein Inc.

Figure 6.2-1
Existing Water and Sewer Exhibit

Code, Title 5. This will result in an additional ten percent consumption that can be attributed to building cooling systems, overall system losses, and other consumption that is not converted into wastewater. The results of these calculations are presented in Table 6.2-1 and shown for the First Phase and Later Phases independently.

Table 6.2-1 Proposed Project Wastewater Generation

Proposed Use	Size		Unit flow	Total Flow (gpd)	
	First Phase	Later Phases		First Phase	Later Phases
Commercial/Office	22,153 SF	-	75 gpd/1,000 SF	1,661	-
Retail	31,322 SF	-	5 gpd/100 SF	1,566	-
Elderly Housing	-	35 units	150 gpd/unit	-	5,250
Residential	184 bdm	328 bdm	110 gpd/bdm	20,240	36,080
TOTAL				**23,467**	**41,330**

SF = square feet, gpd = gallon per day, bdm = bedroom

The total water demand for the First Phase of the Project is therefore estimated at 1.1 times 23,467, which equals to 25,814 gpd and the water demand for Later Phases of the Project are estimated at 1.1 times 41,330, which equals to 45,463 gpd.

It is anticipated that BWSC system will have adequate capacity to deliver this volume of water. This will be confirmed during the Site Plan Approval process with BWSC.

6.2.3 Proposed Water service

The domestic water services to each proposed building will be tapped off the closest existing water main within the surrounding streets. Each service will have an individual meter that will be installed with meter transmitting units in accordance with BWSC's Automatic Meter Reading System. The exact size and location of each service will be determined during the final design and Site Plan Approval process.

Fire protection to each building will also be tapped off the closest existing water main within the surrounding streets. Any new hydrant locations will be coordinated with BWSC and Boston Fire Department. The building exteriors will also feature Siamese Connections for additional fire protection. All services, both domestic and fire protection will have backflow prevention devices.

6.2.4 Water Conservation Measures

Water conservation measures proposed for the Project will include low consumption plumbing fixtures such as low flow water closets and showers, aerated faucets in lavatories, and sensor operated devices in public areas, potential cisterns to capture rainwater for irrigation, and drought-tolerant or native plant selection in the landscaping design.

Rainwater Re-use

Rainwater harvesting in either underground cisterns or rain barrels will be implemented in the development program, as a supplemental source to irrigation supply.

Native Plant Selection

Every attempt will be made to use a native plant palette. A landscapes system based predominantly on native species will reduce water demand and site maintenance; particularly after the initial one or two year period of establishment. When non-native species are desired, invasive species will not be specified.

Xeriscaping

Xeriscaping is a concept that group plants with similar water requirements to use water efficiently. In addition to incorporating native species, newly planted areas will be designed using the principals of xeriscaping. In most instances, these plantings require less water than typical plantings design and often rely solely on rainwater.

Eco-roof

A roof top garden is proposed on Building B during the Project's First Phase. In addition to creating attractive window views, these gardens typically require little or no irrigation and absorb the majority of rainwater falling on them; thus reducing stormwater runoff.

6.3 Wastewater Generation

6.3.1 Existing Conditions

The sewer mains, in the city of Boston, are owned and operated by BWSC. These mains convey sanitary flows to the system owned and operated by the Massachusetts Water Resources Authority (MWRA), which carries the flow to the Deer Island Wastewater Treatment Plant for final treatment and disposal in Boston Harbor.

Sewer mains exist within all the streets surrounding the Site. The existing Site is served by the sewer mains, located in Bartlett Street and Washington Street. A 24″x36″ combined sewer pipe is located in Bartlett Street and a twin combined system pipes, a 42″x48″ and a 24″x36″ are located in Washington Street. See Figure 6.2-1 for the location of these systems.

6.3.2 Wastewater Generation

The overall project's estimated wastewater generation calculations are based on the DEP, 314 CMR 7.00, Sewer System Extension and Connection Permit Program and 310 CMR 15.00, The State Environmental Code, Title 5. While these flows are generally considered conservative values for new construction given current technologies in water demand and wastewater generation, they are the accepted standard for determination of permitting thresholds and hydraulic capacity design. The results of these calculations are presented above in Table 6.2-1 for the First Phase and Later Phases.

6.3.3 Proposed Sewer service

As required by BWSC, the sewer service to each proposed building will have a separate connection to the BWSC system. These connections will be made at the closest existing sewer main within the surrounding Streets. It is anticipated that the existing BWSC system will be able to accommodate the anticipated flows generated by the Project. In order to connect to the system, BWSC will require individual Site Plan Approval for each separate building.

Buildings A and B from the Project's First Phase, will likely connect to the sewer system located in Washington Street.

6.4 Stormwater Management

The stormwater management plan is based on a multi-dimensional approach, which recognizes the need for site planning, source control of potential contaminants, and implementation of structural and non-structural treatment methods to ensure the protection of ground water and downstream resource areas.

The stormwater management plan is developed in compliance with Boston Water and Sewer Commission (BWSC) regulations, the Stormwater policy Handbook issued by the Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency's (USEPA) NPDES general Permit Program for stormwater Discharges from Construction Sites. The Project has been designed to minimize impacts on downstream resource areas from the construction and operation of the Project.

6.4.1 Existing Conditions

The Site is approximately 8.59 acres and is bounded by Washington Street to the east, Bartlett Street to the north, Lambert Avenue to the west and Guild Street to the south.

Several buildings and expansive paved area occupy the majority of the Site. A small wooded and undeveloped area is located to the west of the Site along Lambert Avenue. The total impervious areas on Site are approximately 6.5 acres. The Site slopes upward from northeast to southwest.

The runoff from the Site is currently either collected through a series of catch basins and roof drains that discharge to a subsurface storm drainage system and connect to the BWSC systems, located in Bartlett Street and Washington Street, or sheet flows overland and enters the BWSC system in Washington Street. See Figure 6.2-2, Existing Drainage System.

Bartlett Street's drainage system consists of a 36-inch by 36-inch combined sewer line and Washington Street's drainage system consists of a 48-inch by 42-inch and 24-inch by 36-inch combined sewer lines.

6.4.2 Proposed Conditions

The Project consists of the construction of a mixed-use development (commercial and residential) with several proposed buildings with associated parking, a network of roadways and walkways, utility connections, public use spaces and landscaping areas.

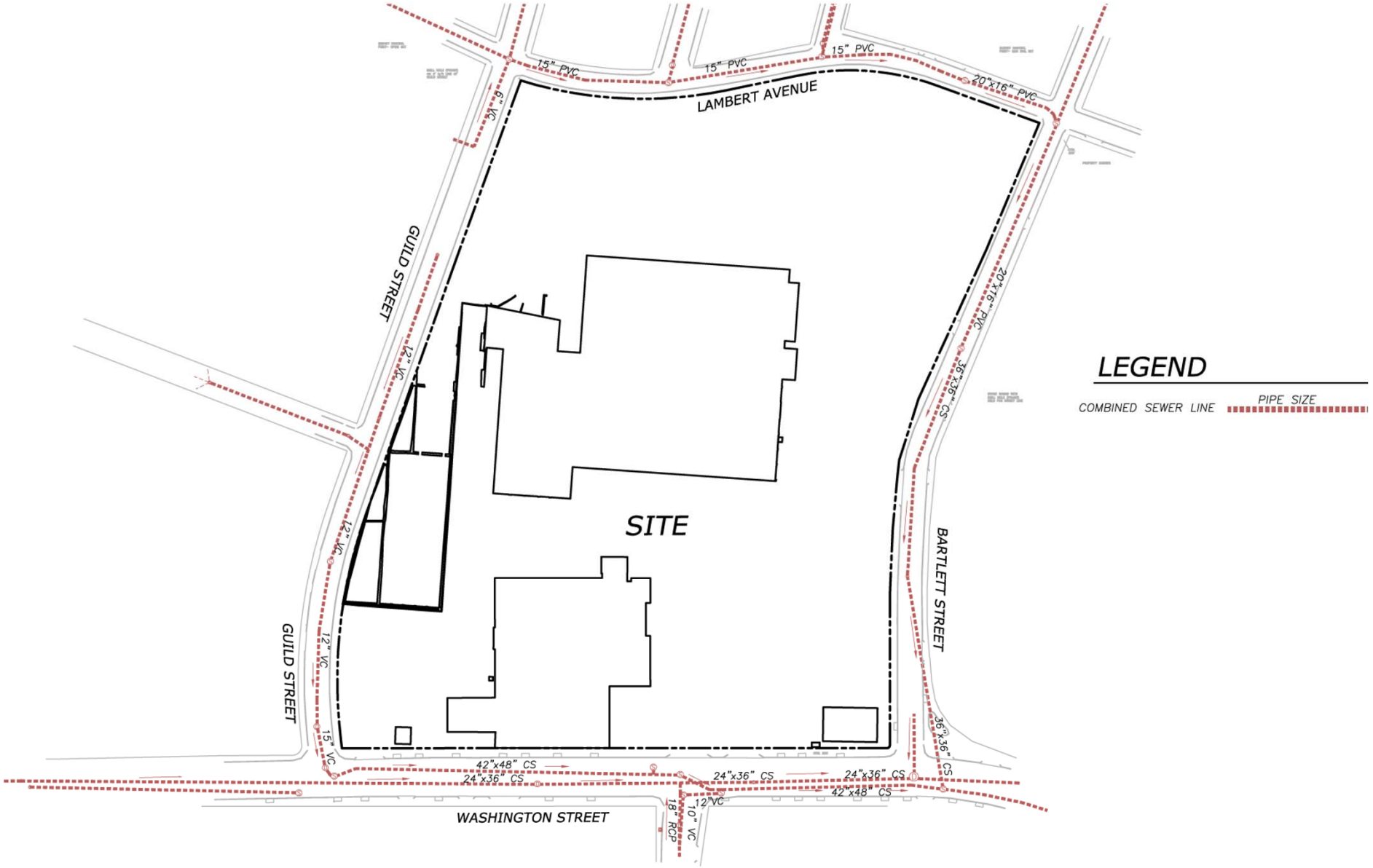
The Project will slightly reduce the total impervious areas on site from approximately 6.5 acres to 6.4 acres and therefore reduce the stormwater runoff quantity and improve the quality of stormwater runoff discharged from the Site. It will also provide some recharge benefits where none exists today. The overall integrated approach to storm water management does not only address and focus on water quantity discharged from the Site but also water quality. Due to the inclusion of expansive rooftops and newly created public spaces, there will be modest opportunities to introduce rain gardens, rainwater harvesting from roofs, and recharge areas for stormwater to surcharge back into the ground at the Project Site. Additional water conservation measures incorporated into the drainage design include native plant selection and the potential to incorporate eco-roof gardens into the Project. This will help reduce the quantity of runoff generated as well as enhance the runoff by removing sediment and pollutants from the overall site discharge.

The proposed Site drainage includes the installation of catch basins with hoods and deep sumps, a subsurface piping network leading to water quality inlets and below-grade stormwater recharge systems.

The stormwater management system will be designed in accordance with BWSC design standards and requirements. Site Plan Approval will be required for the connections to the BWSC storm drain system. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared. The SWPPP will include spill contingency plans, short term and long term operation and maintenance information and construction operations discussions, all relating to the storm water management of the Project.

6.4.2.1 Stormwater Quality

The goal of the stormwater quality plan is not only to protect property and resources on-site and nearby, but also to protect resources in the region that may be affected by the activities at the Site during and after construction. Water quality treatment measures will result in the



Bartlett Place **Boston, MA**

DZ I
DeVellis Zrein Inc.

Figure 6.2-2
Existing Drainage Exhibit

removal of a minimum of 80 percent of the total suspended solid (TSS) load in runoff prior to discharge from the Site, consistent with DEP's TSS removal standard. Non-structural pollutant controls include encouraging the use of salt substitutes for maintenance of parking and roadway areas; sweeping of driveways and parking areas on a regular basis; use of slow-release organic fertilizers on landscaped areas to limit the amount of nutrients that could enter downstream resource areas. Structural pollutant controls include catch basins equipped with deep sumps and hoods, water quality inlets designed to separate gas, oil, and suspended solids from the stormwater, and recharge/infiltration trenches.

6.4.2.2 Non-Structural Pollutant Controls

The proposed stormwater management system is designed to protect the runoff water quality through the removal of sediments and pollutants. Non-structural pollutant controls used to separate and capture stormwater pollutants are described below.

Deicing

Sand will be the primary agent used for roadway and parking lot safety during ice or snow conditions. Use of road salt (sodium chloride) for maintenance of parking and roadway areas will be limited, and use of salt substitutes, such as calcium magnesium acetate, will be encouraged. These practices will limit the amount of dissolved pollutants in runoff and minimize potential impacts of deicing chemicals on downstream resource areas.

Pavement Sweeping

Long-term management practices will include regular sweeping of driveways and parking areas. The sweeping program will remove contaminants directly from paved surfaces to prevent their release into the drainage system. Street sweeping has been shown to be an effective initial treatment for reducing pollutant loadings in stormwater.

Fertilizer

Only slow-release organic fertilizers will be used in the landscaped areas to limit the amount of nutrients that could enter downstream resource areas. Fertilizer use will be reduced once proposed landscaping is established.

6.4.2.3 Structural Pollutant Controls

The proposed stormwater management system is designed to protect the quality of storm water runoff through the removal of sediments and pollutants. Structural pollutant controls used to separate and capture stormwater pollutants are described below.

Catch Basins

Catch basins at the Site will be equipped with deep sumps and hooded outlets to trap debris, sediments, and floating contaminants, which are the largest constituents of urban runoff. Catch basins will be cleaned twice per year. This practice, in coordination with minimal use of sand and street sweeping, comprises a multi-level source control approach that prevents sand, sediment, and litter from entering the drainage basins and ultimately the resource area. Regular maintenance and cleaning of catch basins will assure adequate performance of these structures.

Gas and Oil Separators (Water Quality Inlets)

The interception and removal of petroleum products is essential to maintaining the quality of stormwater. Flow collected by catch basins and stormwater piping is conveyed to water quality inlets designed to lower sediment and hydrocarbon loadings from parking lot runoff. These units will also serve as gas and oil traps in case of a spill in parking areas. These water quality inlets will be located at the terminal point of drainage trunk lines, before discharging into BWSC system. Regular maintenance and cleaning of these units will assure adequate performance.

Recharge/Infiltration Trenches

Loss of annual recharge to groundwater is minimized through the use of infiltration measures to the maximum extent practicable. Stormwater peak runoff rate and volume mitigation are provided via infiltration trenches, where feasible. The annual recharge from the post-development site will be higher than the annual recharge from the existing site conditions.

Maintenance Program of Structural Pollutant Controls

An operation and maintenance plan is proposed to ensure the effectiveness of the structural controls and is as follows:

During construction the site contractor will inspect sediment and erosion control structures weekly and after each rainfall event. Silt will be removed from hay bales either if the silt depth exceeds six inches or as needed. Damaged and deteriorated erosion control measures will be repaired immediately after identification. The underside of the hay bales will be kept in close contact with the earth and reset as necessary. Erosion control measures will remain in place until construction is completed and disturbed earth is stabilized. Additional mitigation measures are described below.

Following construction, the property owner will sweep paved parking areas and drives on a semi-annual basis. Catch basin sumps will be cleaned twice per year. Eroded areas will be immediately repaired with loam, seed, and jute matting or other acceptable erosion control measures.

6.4.3 Mitigation Measures

Grading, filling and installation of structures may cause erosion and sedimentation, resulting in temporarily increased turbidity and suspended solids loads. Runoff from construction sites may also transport sediment to downstream watercourses, where sediment deposition and accumulation will occur as flow velocities decrease. Erosion and sedimentation controls will be employed to minimize the erosion and transport of sediment during the earthwork and construction phases of the Project.

Storm Water Runoff Quality During Construction (NPDES)

The Project will result in disturbance of greater than one acre of land and, therefore, requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for an EPA NPDES Construction General Permit. The short-term erosion and sediment control measures described below, in conjunction with the permanent stormwater management system and maintenance program, will ensure that no aspect of the Project Site preparation, construction or continuing operation will have detrimental impact on downstream resource areas. Two factors are significant for meeting water quality standards: (1) minimization of exposed soil subject to erosion and (2) containment of stormwater runoff so that it can be treated before it is discharged.

The majority of the Site is occupied by building and pavement. Site demolition will likely take place all at once and minimization of exposed areas will be achieved through implementation of construction best management practices. Some areas, such as parking lots or future building pads, will be disturbed initially through site grading, but may not be subject to immediate development. These areas will be temporarily stabilized, where feasible, by the methods described below:

Erosion and Sediment Control Measures

Erosion and sedimentation controls will be employed to minimize the erosion and transport of sediment into resource areas during the earthwork and construction phases of the project. Erosion and sedimentation control measures will be installed prior to site excavation or disturbance and will be maintained throughout the construction period.

Primary erosion control techniques proposed include hay bale barriers, silt fence barriers, inlet sediment traps, a stabilized construction entrance and temporary diversion channels, when applicable. A detailed description of each technique is discussed below. During the growing season, slope stabilization will be achieved by applying topsoil followed by seeding and mulching as soon as final grades are achieved. Organic mulching, jute netting, or a combination, will be used to stabilize slopes completed outside of the growing season.

Silt Fence Hay Bale Barriers

Hay bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. In areas where high runoff velocities or high sediment loads are expected, silt fencing may be installed adjacent to the hay bale barriers. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and hay bale barrier will be replaced as determined by periodic field inspection. The underside of hay bales will be kept in close contact with the earth and reset as necessary. Hay bale barriers and siltation fences will be maintained and cleaned until slopes have healthy stands of grass.

Drain System Protection

Hay bale sediment traps will be installed at drainage structures and maintained and cleaned until slopes have healthy stands of grass. Catch basins, drain manholes, storm drain pipes, and water quality inlets will be cleaned of sediment and debris after the completion of construction. Sediment collected in structures will be disposed of properly and covered, if stored on-site.

Diversion Channels.

Diversion channels may be used to intercept and divert runoff from slopes that are exposed during construction. These diversions will minimize the development of concentrated runoff down slopes, which could produce gully erosion. Diversions will also be used to collect runoff from construction areas and convey it to temporary sediment basins or traps. Temporary diversions will remain in place until slopes are stabilized or graded level. vegetation of the diversion channel is required to avoid erosion of the channel, the channel will be temporarily stabilized to ensure viability of the grass seed.

Slope Stabilization

The smallest practicable area of land will be exposed at a time. Slopes greater than three-to-one (horizontal to vertical) will be stabilized with seed, secured geotextile fabric, or rip-rap, as appropriate, to prevent erosion during construction. After disturbed areas have been stabilized, the temporary erosion control measures will be removed and accumulated sediment will be removed and disposed of in an appropriate location. Disturbed areas will be stabilized with appropriate ground cover as soon as possible. After the removal of temporary erosion control measures, disturbed areas will receive a layer of topsoil for stabilization.

Stabilized Construction Entrance

Temporary stabilized construction entrances will be installed at the Site. The purpose of the construction entrance is to remove sediment attached to vehicle tires and to minimize sediment transport and deposition onto public road surfaces. The construction entrances will be composed of beds of crushed stone, which will be replenished as necessary to maintain their proper function.

6.4.4 Compliance with DEP Stormwater Management Policies

A discussion of how the redevelopment of the Site will be will comply with the DEP's

Stormwater Management Policy is presented below.

Standard 1: No New Untreated Discharges

The Project will treat all of the stormwater runoff from the entire Site.

Standard 2: Peak Rate Attenuation

The post-redevelopment of the Site will result in a net decrease in impervious area as compared to existing conditions. As a result of the decrease in impervious area and implementation of best management practices (BMPs), the post-redevelopment discharge rate and volume will be less than the existing runoff discharge rate. Therefore, the redevelopment of the Site is expected to improve the existing drainage conditions at the Site.

Standard 3: Recharge

The groundwater recharge systems will be sized in accordance with the DEP's Stormwater Handbook.

Standard 4: Water Quality

The long-term stormwater pollution plan will incorporate all items described under this standard. The overall water quality discharged from the Site will be dramatically improved compared to existing conditions. The proposed drainage system will reduce the total suspended solids (TSS) and nutrient pollution by using control devices such as hooded deep sump catch basins, rain gardens, water quality inlets and subsurface recharge/infiltration trenches.

Standard 5: Land Uses with Higher Potential Pollutant Loads

The Project Site does not contain land uses with higher potential pollutant loads.

Standard 6: Critical Areas

The Project Site does not contain any critical areas.

Standard 7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

The redevelopment of the Site will decrease the impervious area and meet all of the stormwater management standards to the maximum extent practicable. Overall, the stormwater runoff will improve in quality and quantity compared to the existing condition.

Standard 8: Construction-Period Pollution Prevention and Erosion and Sedimentation Control

A stormwater pollution and prevention plan will be created as part of the NPDES permit requirements. The construction documents for the Project will include measures and specifications for all erosion and sediment control techniques. These may include items like siltation fences, hay bales, erosion control blankets, seeding, mulching, inlet protection devices, silt sacks, construction entrance details, vehicle washdown area details, and any other measures needed to minimize site erosion.

Standard 9: Operation and Maintenance Plan

An Operation and Maintenance Plan will be developed for both the construction and post-construction phases. It will provide the system ownership information, parties responsible for operation and maintenance, and maintenance schedules. Routine maintenance will include catch basin and water quality inlets cleaning, sweeping of parking areas and roadways and the removal of debris.

Standard 10: Prohibition of Illicit Discharges

The Project will not have any such discharges.

6.4.5 Methodology and Design Criteria

Hydrologic Model Description

The drainage analysis is performed using the software HydroCAD 7.10 which utilizes the Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service) TR-20 program. The SCS TR-55 Method was utilized in developing the pertinent back-up data.

Design Storms

The analysis was performed on the 2, 10, and 100-year frequency rainfall events. The events were based on the 24-hour duration storm.

Time of Concentration

The minimum time of concentration (Tc) used is six minutes. Values found using Average Velocities for Overland Flow, found in SCS TR-55 Urban Hydrology for Small Watersheds.

Curve Numbers

Curve numbers were developed for each of the different use categories and hydrologic soil group types within each sub-area. The curve numbers were based on the SCS TR-55 method.

Rainfall Intensity

Rainfall intensities were acquired from the publication Rainfall Frequency Atlas of the United States (TP-40). Rainfall events for the 2, 10, 20, and 100-year storms were analyzed.

SCS rainfall frequency values with 24-hour duration are:

Table 6.4-1 Rainfall Frequency Values with 24-hour duration

Storm Event	Rainfall
2-Year	3.20 Inches
10-Year	4.80 Inches
100-Year	6.80 Inches

Section 7.0

Coordination with other Governmental Agencies

7.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

7.1 Architectural Access Board Requirements

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

7.2 Massachusetts Environmental Policy Act (MEPA)

The Project Site was acquired in 2010 from the MBTA, constituting a "land transfer" pursuant to the MEPA Regulations, thus establishing broad scope MEPA jurisdiction. Furthermore, the Project, as currently envisioned, exceeds MEPA review thresholds related to transportation. Accordingly, the Project is subject to MEPA review, and the Proponent intends to file an Environmental Notification Form to initiate MEPA review in the first quarter of 2013.

7.3 Massachusetts Historical Commission

The Massachusetts Historical Commission (MHC) has review authority over projects requiring state or federal funding, licensing, permitting, and/or approvals that may have direct or indirect impacts to properties listed or eligible for inclusion in the State or National Register of Historic Places. The Project involves transferring land from the MBTA to the Proponent and proposes to utilize state and federal funding. Therefore, the project is subject to MHC review in compliance with Section 106 of the National Historic Preservation Act and MGL Chapter 9, Sections 26-27C, as amended by Chapter 254 of the Acts of 1988. An MHC Project Notification Form was submitted in 2010. The MHC concluded that the proposed demolition of the Bartlett Street Yard structures would have an adverse effect on historic properties. The MHC agreed to accept the demolition, following consultation with the proponent, concluding there are no prudent and feasible alternatives. A draft Memorandum of Agreement (MOA) has been prepared by the MHC, accepting the adverse effect. The MOA will be executed among the MHC, DHCD, and proponent as the project approvals and funding applications move forward.

7.4 Boston Landmarks Commission Article 85 Review

The proposed demolition of the two garage buildings will be subject to review by the Boston Landmarks Commission (BLC) under Article 85 of the Boston Zoning Code. An Article 85 Application for each property will be submitted to the BLC.

7.5 Boston Civic Design Commission

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

7.6 Boston Inspectional Services Department

The Proponent will obtain all necessary permits for the Project from the Boston Inspectional Services Department, consistent with the Boston Zoning Code and the State Building Code.

7.7 Boston Transportation Department

As part of Large Project Review under Article 80 of the Boston Zoning Code, the Proponent will prepare and submit a Transportation Access Plan Agreement for execution by the Proponent and the Boston Transportation Department. In addition, a Construction Management Plan (CMP) will be prepared for review by BTD and other City of Boston agencies.

Section 8.0

Project Certification

8.0 PROJECT CERTIFICATION

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

Signature of Proponent's Representative

David Price
Executive Director

Bartlett Place Land, Inc.
Nuestra Comunidad Development Corporation
56 Warren Street, Suite 200
Roxbury, MA 02119

03/01/2013
Date

Signature of Preparer

David Hewett
Associate

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

3/1/13
Date

Appendix A

Transportation

Traffic Count Data

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Trucks - Buses

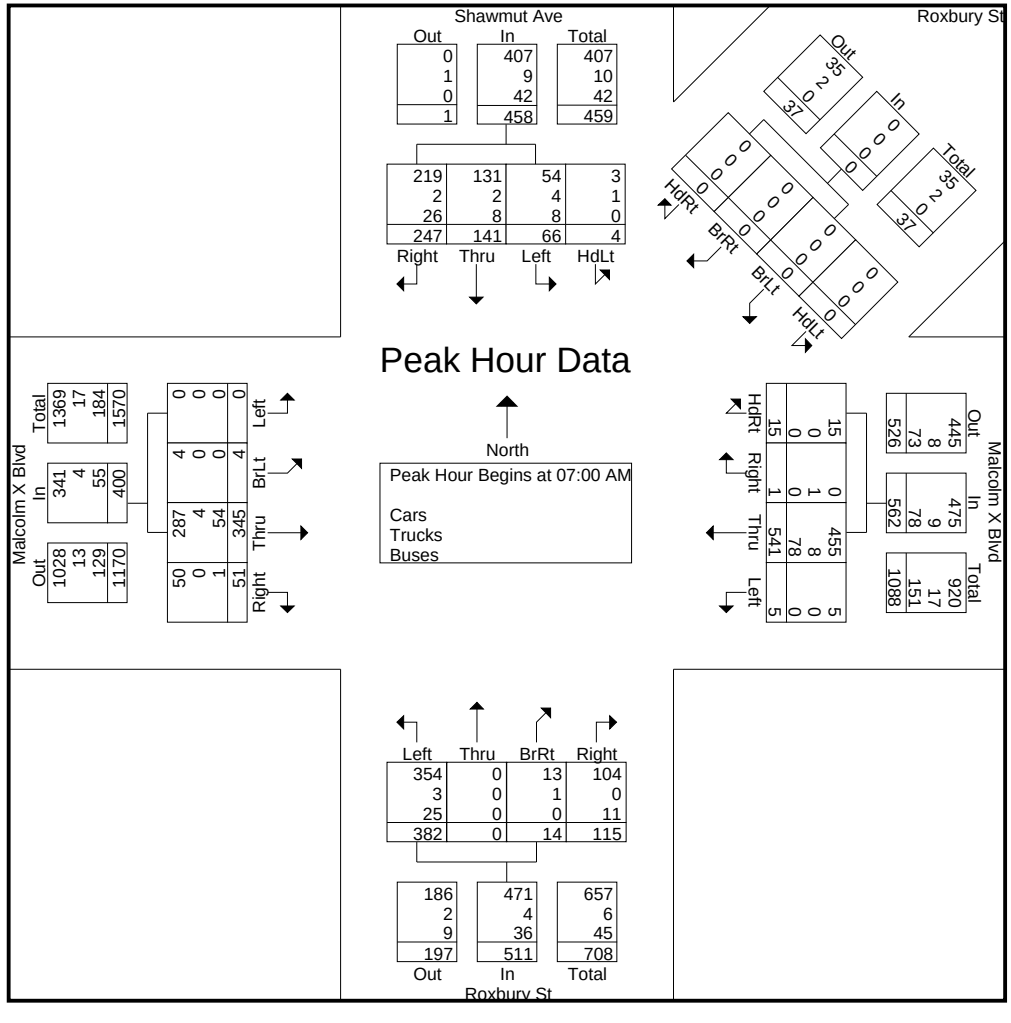
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
07:00 AM	1	20	35	48	0	0	0	0	2	125	1	3	102	0	5	27	0	1	83	17	470
07:15 AM	0	14	32	74	0	0	0	0	1	125	0	5	126	0	2	17	0	3	85	8	492
07:30 AM	2	19	37	66	0	0	0	0	1	143	0	3	77	0	1	42	0	0	86	14	491
07:45 AM	1	13	37	59	0	0	0	0	1	148	0	4	77	0	6	29	0	0	91	12	478
Total	4	66	141	247	0	0	0	0	5	541	1	15	382	0	14	115	0	4	345	51	1931
08:00 AM	2	25	48	65	0	0	0	0	0	95	0	1	65	0	4	35	0	3	80	9	432
08:15 AM	3	16	45	50	0	0	0	0	1	154	0	5	67	0	3	38	0	2	85	8	477
08:30 AM	0	16	48	54	0	0	0	0	0	130	0	3	49	0	5	32	0	1	71	17	426
08:45 AM	0	16	40	71	0	0	0	0	0	99	0	7	57	0	2	35	0	1	81	6	415
Total	5	73	181	240	0	0	0	0	1	478	0	16	238	0	14	140	0	7	317	40	1750
Grand Total	9	139	322	487	0	0	0	0	6	1019	1	31	620	0	28	255	0	11	662	91	3681
Apprch %	0.9	14.5	33.6	50.9	0	0	0	0	0.6	96.4	0.1	2.9	68.7	0	3.1	28.2	0	1.4	86.6	11.9	
Total %	0.2	3.8	8.7	13.2	0	0	0	0	0.2	27.7	0	0.8	16.8	0	0.8	6.9	0	0.3	18	2.5	
Cars	8	118	304	436	0	0	0	0	6	864	0	31	582	0	27	234	0	11	543	86	3250
% Cars	88.9	84.9	94.4	89.5	0	0	0	0	100	84.8	0	100	93.9	0	96.4	91.8	0	100	82	94.5	88.3
Trucks	1	5	3	2	0	0	0	0	0	17	1	0	6	0	1	0	0	0	11	2	49
% Trucks	11.1	3.6	0.9	0.4	0	0	0	0	0	1.7	100	0	1	0	3.6	0	0	0	1.7	2.2	1.3
Buses	0	16	15	49	0	0	0	0	0	138	0	0	32	0	0	21	0	0	108	3	382
% Buses	0	11.5	4.7	10.1	0	0	0	0	0	13.5	0	0	5.2	0	0	8.2	0	0	16.3	3.3	10.4

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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	1	**20**	35	48	104	0	0	0	0	0	**2**	125	**1**	3	131	102	0	5	27	134	0	1	83	**17**	101	470
07:15 AM	0	14	32	**74**	120	0	0	0	0	0	1	125	0	**5**	131	**126**	0	2	17	**145**	0	**3**	85	8	96	**492**
07:30 AM	**2**	19	**37**	66	**124**	0	0	0	0	0	1	143	0	3	147	77	0	1	**42**	120	0	0	86	14	100	491
07:45 AM	1	13	37	59	110	0	0	0	0	0	1	**148**	0	4	**153**	77	0	**6**	29	112	0	0	**91**	12	**103**	478
Total Volume	4	66	141	247	458	0	0	0	0	0	5	541	1	15	562	382	0	14	115	511	0	4	345	51	400	1931
% App. Total	0.9	14.4	30.8	53.9		0	0	0	0		0.9	96.3	0.2	2.7		74.8	0	2.7	22.5		0	1	86.2	12.8		
PHF	.500	.825	.953	.834	.923	.000	.000	.000	.000	.000	.625	.914	.250	.750	.918	.758	.000	.583	.685	.881	.000	.333	.948	.750	.971	.981
Cars	3	54	131	219	407	0	0	0	0	0	5	455	0	15	475	354	0	13	104	471	0	4	287	50	341	1694
% Cars	75.0	81.8	92.9	88.7	88.9	0	0	0	0	0	100	84.1	0	100	84.5	92.7	0	92.9	90.4	92.2	0	100	83.2	98.0	85.3	87.7
Trucks	1	4	2	2	9	0	0	0	0	0	0	8	1	0	9	3	0	1	0	4	0	0	4	0	4	26
% Trucks	25.0	6.1	1.4	0.8	2.0	0	0	0	0	0	0	1.5	100	0	1.6	0.8	0	7.1	0	0.8	0	0	1.2	0	1.0	1.3
Buses	0	8	8	26	42	0	0	0	0	0	0	78	0	0	78	25	0	0	11	36	0	0	54	1	55	211
% Buses	0	12.1	5.7	10.5	9.2	0	0	0	0	0	0	14.4	0	0	13.9	6.5	0	0	9.6	7.0	0	0	15.7	2.0	13.8	10.9

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



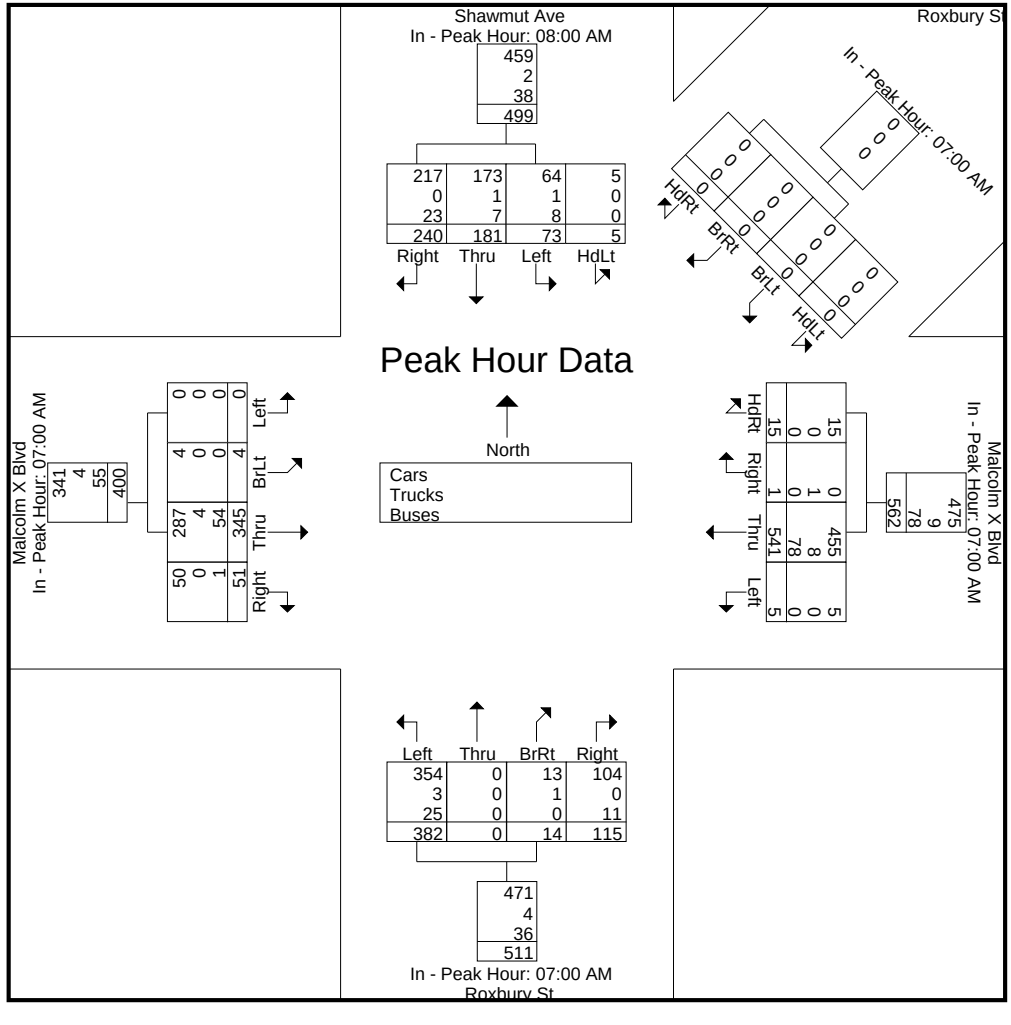
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM					07:00 AM					07:00 AM					07:00 AM					07:00 AM				
+0 mins.	2	**25**	**48**	65	**140**	0	0	0	0	0	**2**	125	**1**	3	131	102	0	5	27	134	0	1	83	**17**	101
+15 mins.	**3**	16	45	50	114	0	0	0	0	0	1	125	0	**5**	131	**126**	0	2	17	**145**	0	**3**	85	8	96
+30 mins.	0	16	48	54	118	0	0	0	0	0	1	143	0	3	147	77	0	1	**42**	120	0	0	86	14	100
+45 mins.	0	16	40	**71**	127	0	0	0	0	0	1	**148**	0	4	**153**	77	0	**6**	29	112	0	0	**91**	12	**103**
Total Volume	5	73	181	240	499	0	0	0	0	0	5	541	1	15	562	382	0	14	115	511	0	4	345	51	400
% App. Total	1	14.6	36.3	48.1		0	0	0	0		0.9	96.3	0.2	2.7		74.8	0	2.7	22.5		0	1	86.2	12.8	
PHF	.417	.730	.943	.845	.891	.000	.000	.000	.000	.000	.625	.914	.250	.750	.918	.758	.000	.583	.685	.881	.000	.333	.948	.750	.971
Cars	5	64	173	217	459	0	0	0	0	0	5	455	0	15	475	354	0	13	104	471	0	4	287	50	341
% Cars	100	87.7	95.6	90.4	92	0	0	0	0	0	100	84.1	0	100	84.5	92.7	0	92.9	90.4	92.2	0	100	83.2	98	85.2
Trucks	0	1	1	0	2	0	0	0	0	0	0	8	1	0	9	3	0	1	0	4	0	0	4	0	4

Accurate Counts

978-664-2565

Buses	0	8	7	23	38	0	0	0	0	0	0	78	0	0	78	25	0	0	11	36	0	0	54	1	55
% Buses	0	11	3.9	9.6	7.6	0	0	0	0	0	0	14.4	0	0	13.9	6.5	0	0	9.6	7	0	0	15.7	2	13.8



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

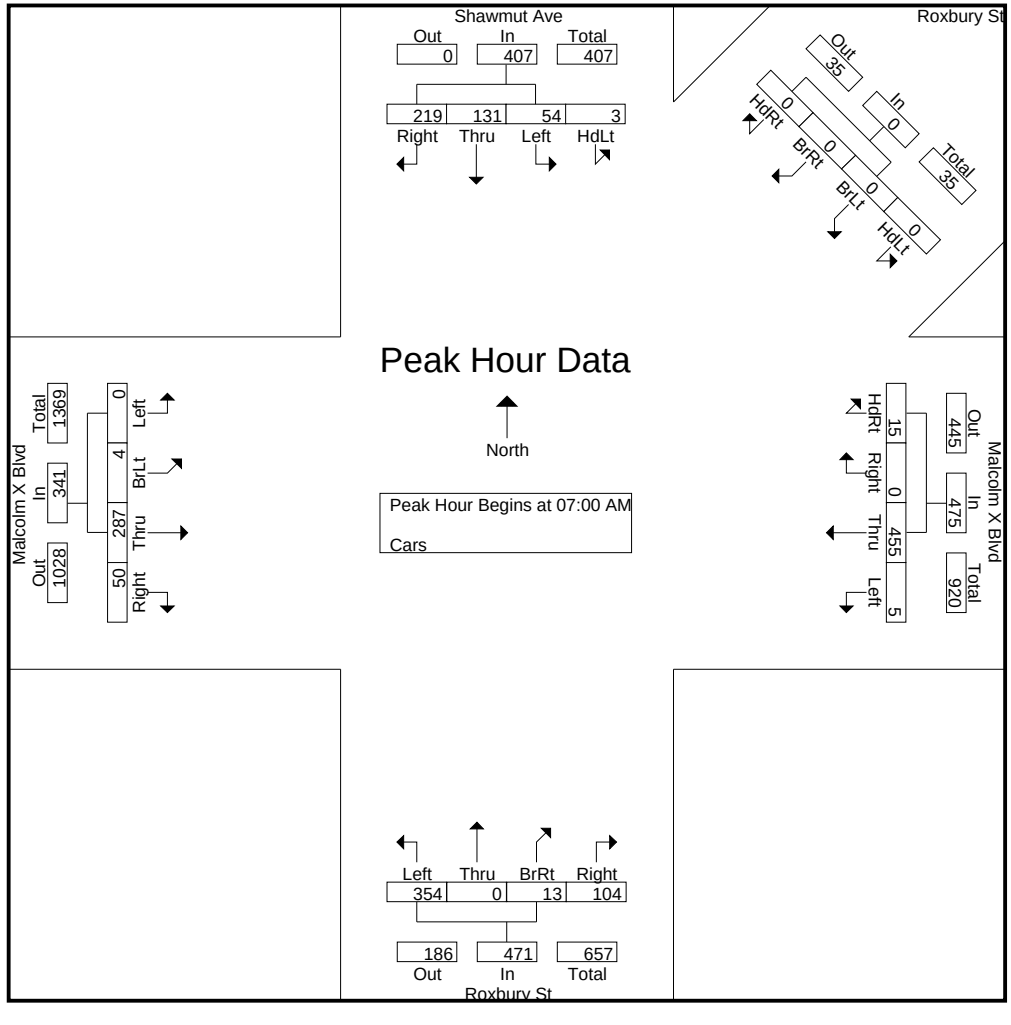
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
07:00 AM	0	16	32	43	0	0	0	0	2	104	0	3	95	0	5	23	0	1	66	17	407
07:15 AM	0	12	32	64	0	0	0	0	1	104	0	5	110	0	2	16	0	3	72	8	429
07:30 AM	2	17	35	60	0	0	0	0	1	125	0	3	75	0	1	37	0	0	72	14	442
07:45 AM	1	9	32	52	0	0	0	0	1	122	0	4	74	0	5	28	0	0	77	11	416
Total	3	54	131	219	0	0	0	0	5	455	0	15	354	0	13	104	0	4	287	50	1694
08:00 AM	2	21	45	59	0	0	0	0	0	78	0	1	64	0	4	33	0	3	68	9	387
08:15 AM	3	15	44	47	0	0	0	0	1	134	0	5	65	0	3	35	0	2	67	7	428
08:30 AM	0	13	46	47	0	0	0	0	0	112	0	3	48	0	5	30	0	1	57	16	378
08:45 AM	0	15	38	64	0	0	0	0	0	85	0	7	51	0	2	32	0	1	64	4	363
Total	5	64	173	217	0	0	0	0	1	409	0	16	228	0	14	130	0	7	256	36	1556
Grand Total	8	118	304	436	0	0	0	0	6	864	0	31	582	0	27	234	0	11	543	86	3250
Apprch %	0.9	13.6	35.1	50.3	0	0	0	0	0.7	95.9	0	3.4	69	0	3.2	27.8	0	1.7	84.8	13.4	
Total %	0.2	3.6	9.4	13.4	0	0	0	0	0.2	26.6	0	1	17.9	0	0.8	7.2	0	0.3	16.7	2.6	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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	16	32	43	91	0	0	0	0	0	**2**	104	0	3	109	95	0	**5**	23	123	0	1	66	**17**	84	407
07:15 AM	0	12	32	**64**	108	0	0	0	0	0	1	104	0	**5**	110	**110**	0	2	16	**128**	0	**3**	72	8	83	429
07:30 AM	**2**	**17**	**35**	60	**114**	0	0	0	0	0	1	**125**	0	3	**129**	75	0	1	**37**	113	0	0	72	14	86	**442**
07:45 AM	1	9	32	52	94	0	0	0	0	0	1	122	0	4	127	74	0	5	28	107	0	0	**77**	11	**88**	416
Total Volume	3	54	131	219	407	0	0	0	0	0	5	455	0	15	475	354	0	13	104	471	0	4	287	50	341	1694
% App. Total	0.7	13.3	32.2	53.8		0	0	0	0		1.1	95.8	0	3.2		75.2	0	2.8	22.1		0	1.2	84.2	14.7		
PHF	.375	.794	.936	.855	.893	.000	.000	.000	.000	.000	.625	.910	.000	.750	.921	.805	.000	.650	.703	.920	.000	.333	.932	.735	.969	.958

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



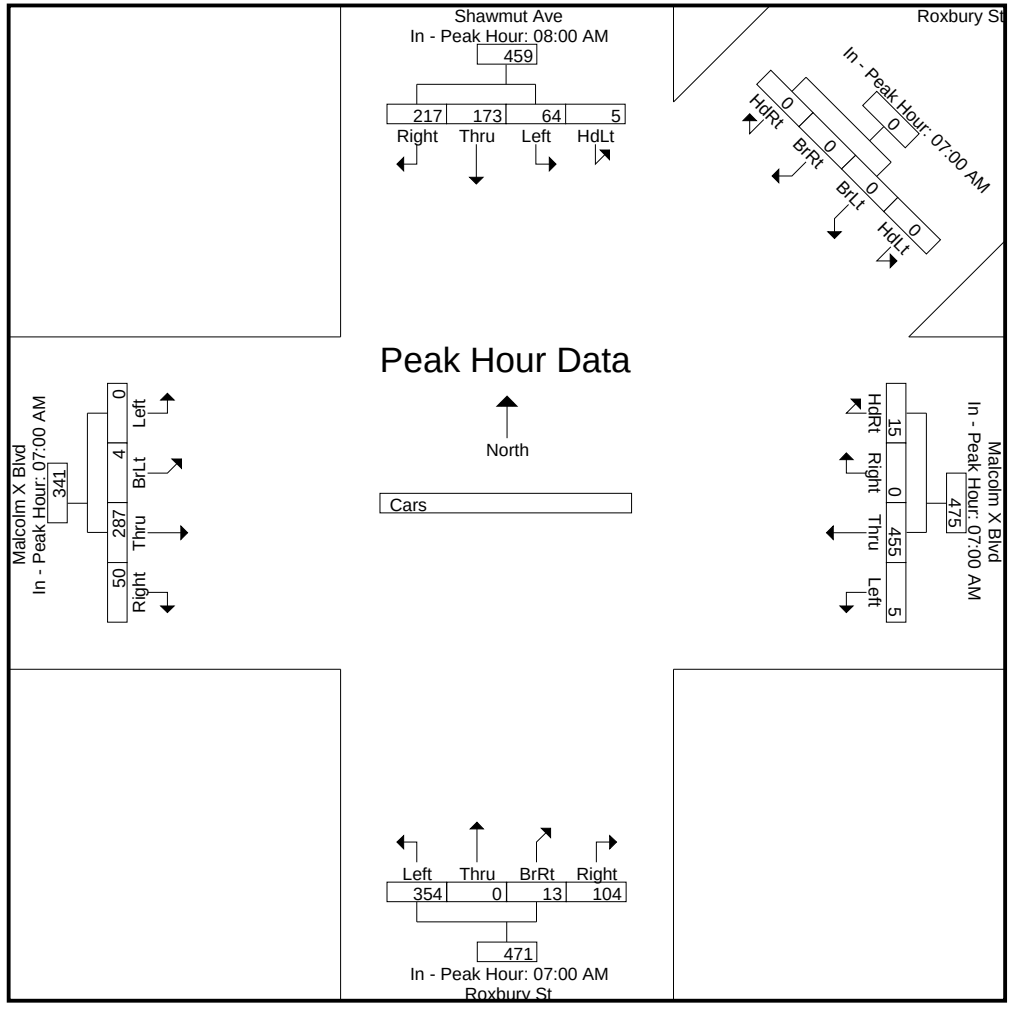
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM					07:00 AM					07:00 AM					07:00 AM					07:00 AM				
+0 mins.	2	**21**	45	59	**127**	0	0	0	0	0	**2**	104	0	3	109	95	0	**5**	23	123	0	1	66	**17**	84
+15 mins.	**3**	15	44	47	109	0	0	0	0	0	1	104	0	**5**	110	**110**	0	2	16	**128**	0	**3**	72	8	83
+30 mins.	0	13	**46**	47	106	0	0	0	0	0	1	**125**	0	3	**129**	75	0	1	**37**	113	0	0	72	14	86
+45 mins.	0	15	38	**64**	117	0	0	0	0	0	1	122	0	4	127	74	0	5	28	107	0	0	**77**	11	**88**
Total Volume	5	64	173	217	459	0	0	0	0	0	5	455	0	15	475	354	0	13	104	471	0	4	287	50	341
% App. Total	1.1	13.9	37.7	47.3		0	0	0	0		1.1	95.8	0	3.2		75.2	0	2.8	22.1		0	1.2	84.2	14.7	
PHF	.417	.762	.940	.848	.904	.000	.000	.000	.000	.000	.625	.910	.000	.750	.921	.805	.000	.650	.703	.920	.000	.333	.932	.735	.969

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

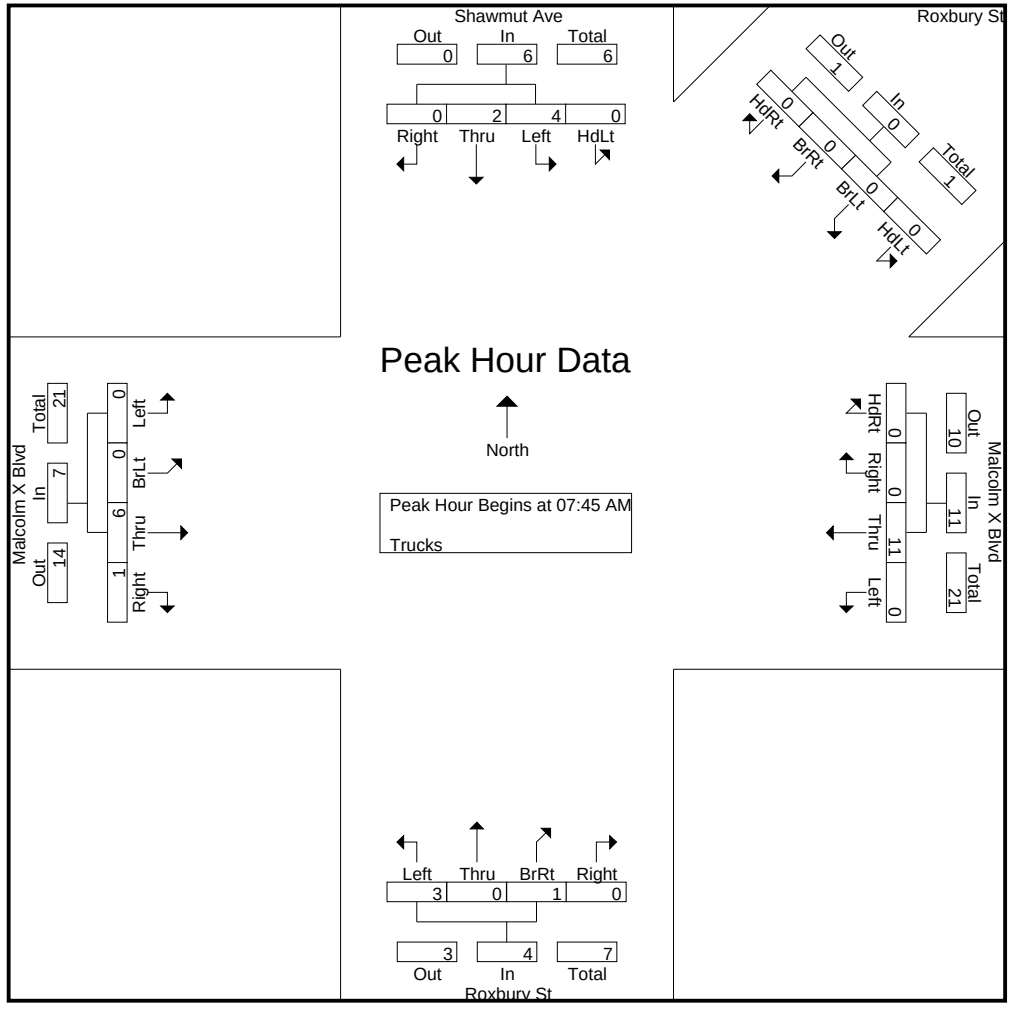
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
07:00 AM	1	1	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	2	0	8
07:15 AM	0	0	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	4
07:45 AM	0	3	1	0	0	0	0	0	0	3	0	0	1	0	1	0	0	0	1	0	10
Total	1	4	2	2	0	0	0	0	0	8	1	0	3	0	1	0	0	0	4	0	26
08:00 AM	0	0	1	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	1	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	3	0	7
08:30 AM	0	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	1	1	6
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	1	5
Total	0	1	1	0	0	0	0	0	0	9	0	0	3	0	0	0	0	0	7	2	23
Grand Total	1	5	3	2	0	0	0	0	0	17	1	0	6	0	1	0	0	0	11	2	49
Apprch %	9.1	45.5	27.3	18.2	0	0	0	0	0	94.4	5.6	0	85.7	0	14.3	0	0	0	84.6	15.4	
Total %	2	10.2	6.1	4.1	0	0	0	0	0	34.7	2	0	12.2	0	2	0	0	0	22.4	4.1	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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	**3**	**1**	0	**4**	0	0	0	0	0	0	3	0	0	3	**1**	0	**1**	0	**2**	0	0	1	0	1	**10**
08:00 AM	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	0	1	0	1	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	**4**	0	0	**4**	0	0	0	0	0	0	0	**3**	0	**3**	7
08:30 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	0	1	**1**	2	6
Total Volume	0	4	2	0	6	0	0	0	0	0	0	11	0	0	11	3	0	1	0	4	0	0	6	1	7	28
% App. Total	0	66.7	33.3	0		0	0	0	0		0	100	0	0		75	0	25	0		0	0	85.7	14.3		
PHF	.000	.333	.500	.000	.375	.000	.000	.000	.000	.000	.000	.688	.000	.000	.688	.750	.000	.250	.000	.500	.000	.000	.500	.250	.583	.700

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



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

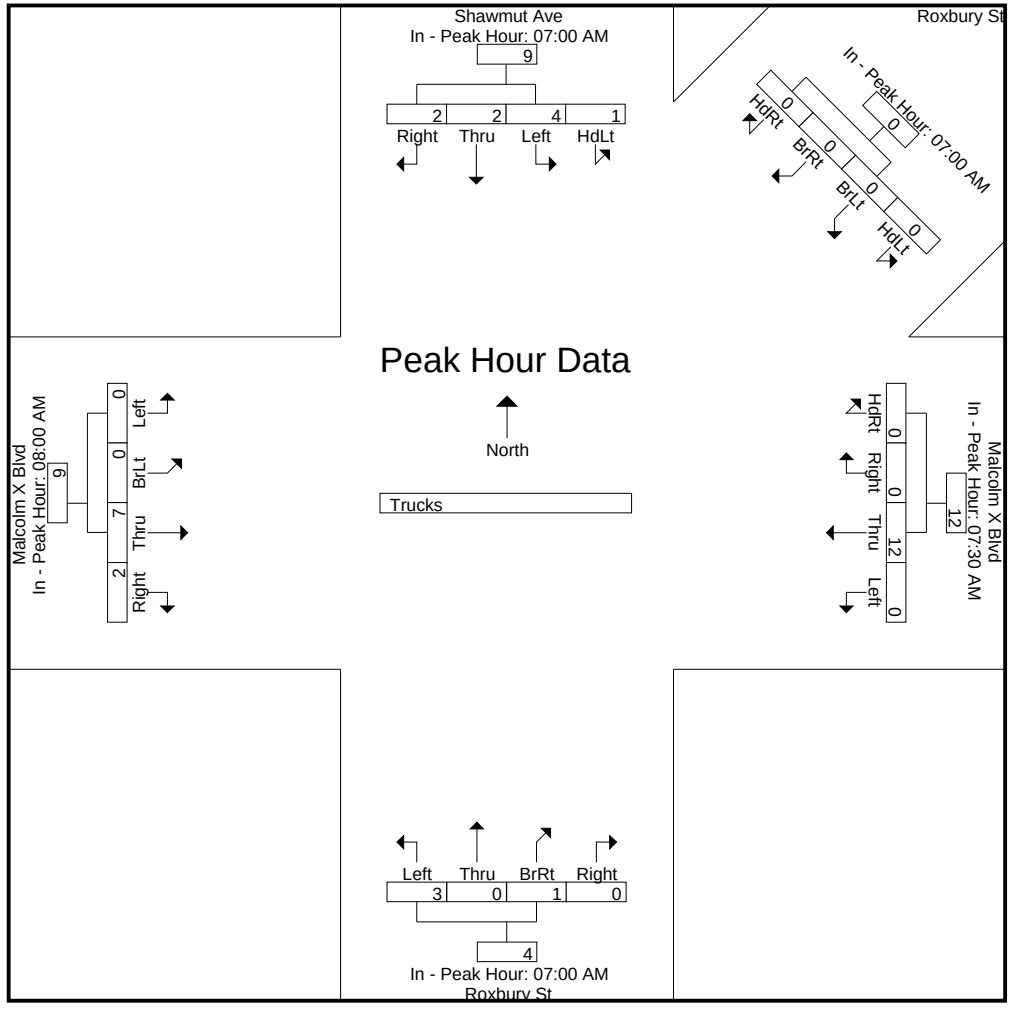
Peak Hour for Each Approach Begins at:

	07:00 AM					07:00 AM					07:30 AM					07:00 AM					08:00 AM				
+0 mins.	**1**	1	**1**	0	3	0	0	0	0	0	0	3	0	0	3	**1**	0	0	0	1	0	0	1	0	1
+15 mins.	0	0	0	**2**	2	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	0	**3**	0	**3**
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	1	**1**	2
+45 mins.	0	**3**	1	0	**4**	0	0	0	0	0	0	**4**	0	0	**4**	1	0	**1**	0	**2**	0	0	2	1	3
Total Volume	1	4	2	2	9	0	0	0	0	0	0	12	0	0	12	3	0	1	0	4	0	0	7	2	9
% App. Total	11.1	44.4	22.2	22.2		0	0	0	0		0	100	0	0		75	0	25	0		0	0	77.8	22.2	
PHF	.250	.333	.500	.250	.563	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.750	.000	.250	.000	.500	.000	.000	.583	.500	.750

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

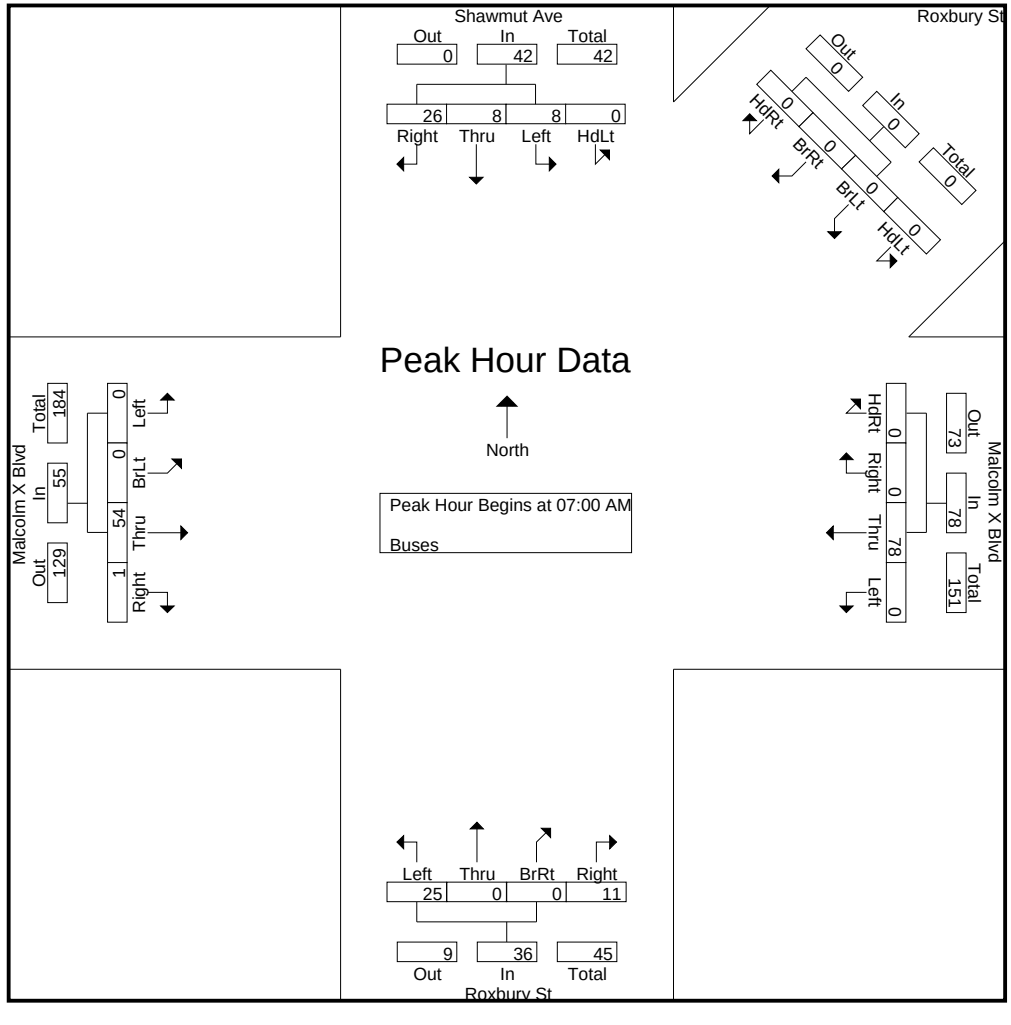
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
07:00 AM	0	3	2	5	0	0	0	0	0	20	0	0	6	0	0	4	0	0	15	0	55
07:15 AM	0	2	0	8	0	0	0	0	0	20	0	0	15	0	0	1	0	0	13	0	59
07:30 AM	0	2	2	6	0	0	0	0	0	15	0	0	2	0	0	5	0	0	13	0	45
07:45 AM	0	1	4	7	0	0	0	0	0	23	0	0	2	0	0	1	0	0	13	1	52
Total	0	8	8	26	0	0	0	0	0	78	0	0	25	0	0	11	0	0	54	1	211
08:00 AM	0	4	2	6	0	0	0	0	0	15	0	0	0	0	0	2	0	0	11	0	40
08:15 AM	0	1	1	3	0	0	0	0	0	16	0	0	2	0	0	3	0	0	15	1	42
08:30 AM	0	2	2	7	0	0	0	0	0	16	0	0	0	0	0	2	0	0	13	0	42
08:45 AM	0	1	2	7	0	0	0	0	0	13	0	0	5	0	0	3	0	0	15	1	47
Total	0	8	7	23	0	0	0	0	0	60	0	0	7	0	0	10	0	0	54	2	171
Grand Total	0	16	15	49	0	0	0	0	0	138	0	0	32	0	0	21	0	0	108	3	382
Apprch %	0	20	18.8	61.2	0	0	0	0	0	100	0	0	60.4	0	0	39.6	0	0	97.3	2.7	
Total %	0	4.2	3.9	12.8	0	0	0	0	0	36.1	0	0	8.4	0	0	5.5	0	0	28.3	0.8	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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	**3**	2	5	10	0	0	0	0	0	0	20	0	0	20	6	0	0	4	10	0	0	**15**	0	**15**	55
07:15 AM	0	2	0	**8**	10	0	0	0	0	0	0	20	0	0	20	**15**	0	0	1	**16**	0	0	13	0	13	**59**
07:30 AM	0	2	2	6	10	0	0	0	0	0	0	15	0	0	15	2	0	0	**5**	7	0	0	13	0	13	45
07:45 AM	0	1	**4**	7	**12**	0	0	0	0	0	0	**23**	0	0	**23**	2	0	0	1	3	0	0	13	**1**	14	52
Total Volume	0	8	8	26	42	0	0	0	0	0	0	78	0	0	78	25	0	0	11	36	0	0	54	1	55	211
% App. Total	0	19	19	61.9		0	0	0	0		0	100	0	0		69.4	0	0	30.6		0	0	98.2	1.8		
PHF	.000	.667	.500	.813	.875	.000	.000	.000	.000	.000	.000	.848	.000	.000	.848	.417	.000	.000	.550	.563	.000	.000	.900	.250	.917	.894

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



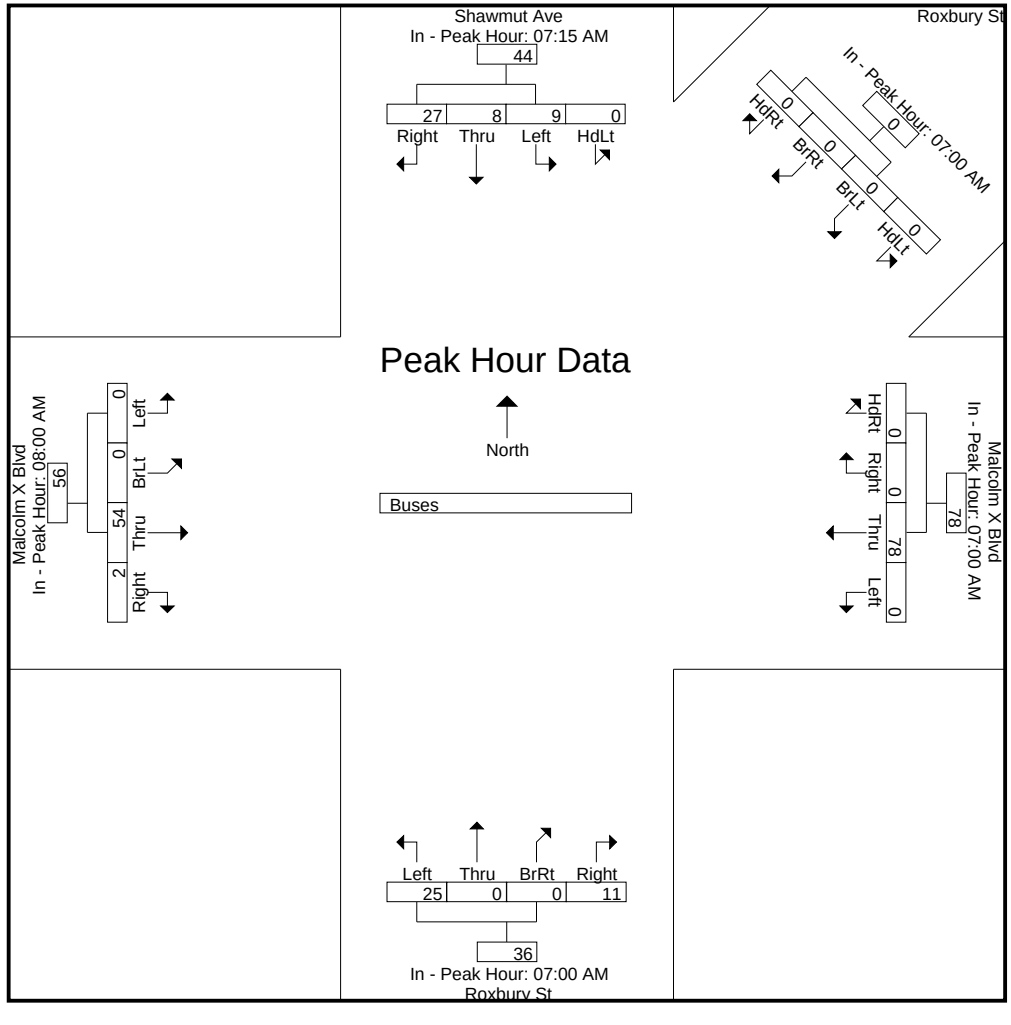
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM					07:00 AM					07:00 AM					07:00 AM					08:00 AM				
+0 mins.	0	2	0	**8**	10	0	0	0	0	0	0	20	0	0	20	6	0	0	4	10	0	0	11	0	11
+15 mins.	0	2	2	6	10	0	0	0	0	0	0	20	0	0	20	**15**	0	0	1	**16**	0	0	**15**	**1**	**16**
+30 mins.	0	1	**4**	7	**12**	0	0	0	0	0	0	15	0	0	15	2	0	0	**5**	7	0	0	13	0	13
+45 mins.	0	**4**	2	6	12	0	0	0	0	0	0	**23**	0	0	**23**	2	0	0	1	3	0	0	15	1	16
Total Volume	0	9	8	27	44	0	0	0	0	0	0	78	0	0	78	25	0	0	11	36	0	0	54	2	56
% App. Total	0	20.5	18.2	61.4		0	0	0	0		0	100	0	0		69.4	0	0	30.6		0	0	96.4	3.6	
PHF	.000	.563	.500	.844	.917	.000	.000	.000	.000	.000	.000	.848	.000	.000	.848	.417	.000	.000	.550	.563	.000	.000	.900	.500	.875

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

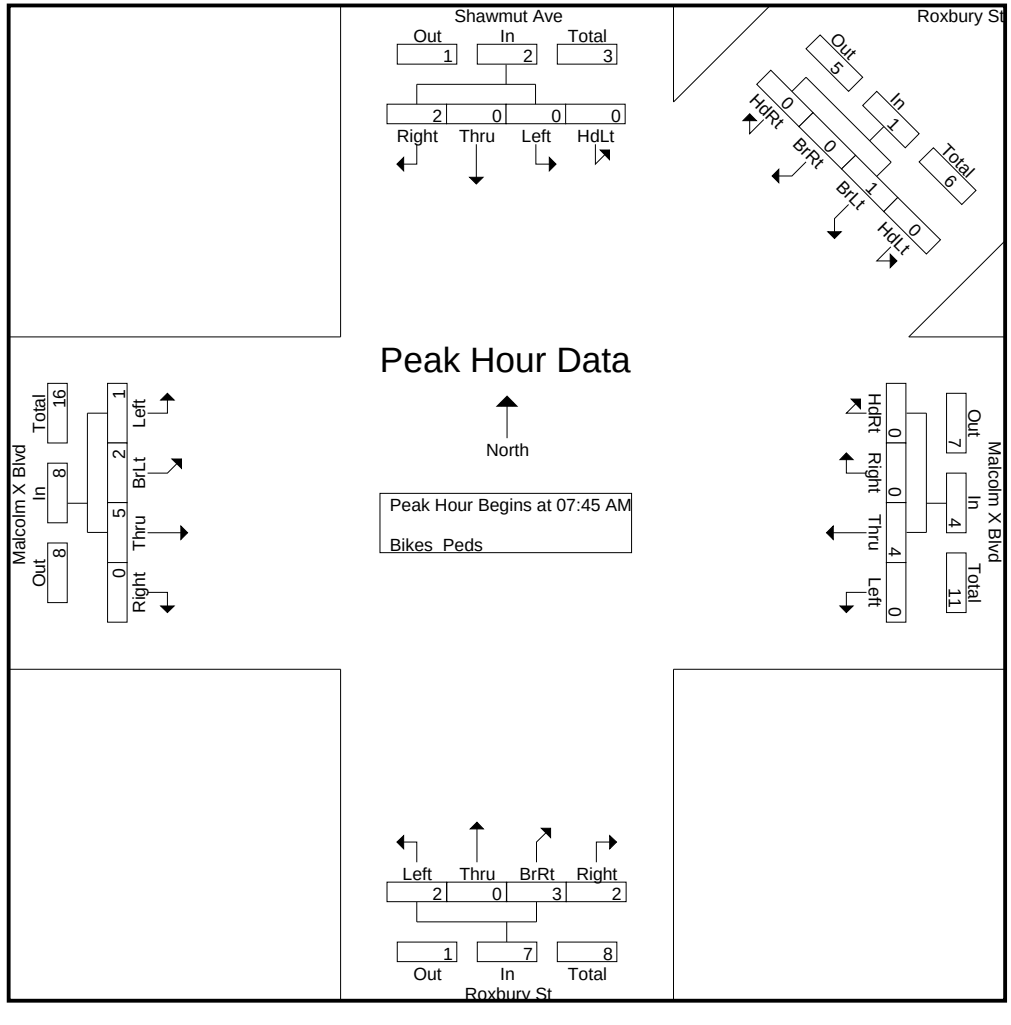
	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West							
Start Time	HdLt	Left	Thru	Right	Peds	HdLt	BrLt	BrRt	HdRt	Peds	Left	Thru	Right	HdRt	Peds	Left	Thru	BrRt	Right	Peds	Left	BrLt	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	19	0	2	0	0	19	0	0	0	0	7	0	0	0	0	2	0	0	0	0	10	57	2	59
07:15 AM	0	0	0	0	14	0	0	0	0	11	0	2	0	0	6	0	0	0	0	2	0	0	1	0	14	47	3	50
07:30 AM	0	0	0	0	15	0	0	0	0	16	0	3	0	0	11	0	0	0	0	5	0	0	0	0	17	64	3	67
07:45 AM	0	0	0	0	14	0	0	0	0	3	0	2	0	0	9	1	0	0	1	8	0	1	2	0	10	44	7	51
Total	0	0	0	0	62	0	2	0	0	49	0	7	0	0	33	1	0	0	1	17	0	1	3	0	51	212	15	227
08:00 AM	0	0	0	0	8	0	0	0	0	6	0	0	0	0	7	0	0	0	0	2	1	1	0	0	9	32	2	34
08:15 AM	0	0	0	1	7	0	0	0	0	4	0	2	0	0	13	0	0	3	1	7	0	0	2	0	14	45	9	54
08:30 AM	0	0	0	1	16	0	1	0	0	6	0	0	0	0	12	1	0	0	0	10	0	0	1	0	12	56	4	60
08:45 AM	0	0	0	0	5	0	0	0	0	6	0	2	0	0	6	0	0	0	0	6	0	0	1	0	14	37	3	40
Total	0	0	0	2	36	0	1	0	0	22	0	4	0	0	38	1	0	3	1	25	1	1	4	0	49	170	18	188
Grand Total	0	0	0	2	98	0	3	0	0	71	0	11	0	0	71	2	0	3	2	42	1	2	7	0	100	382	33	415
Apprch %	0	0	0	100		0	100	0	0		0	100	0	0		28.6	0	42.9	28.6		10	20	70	0				
Total %	0	0	0	6.1		0	9.1	0	0		0	33.3	0	0		6.1	0	9.1	6.1		3	6.1	21.2	0		92	8	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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	0	0	0	0	0	0	0	0	0	0	**2**	0	0	**2**	**1**	0	0	**1**	2	0	**1**	**2**	0	**3**	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	2	2
08:15 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	2	0	0	2	0	0	**3**	1	**4**	0	0	2	0	2	**9**
08:30 AM	0	0	0	1	1	0	**1**	0	0	**1**	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	4
Total Volume	0	0	0	2	2	0	1	0	0	1	0	4	0	0	4	2	0	3	2	7	1	2	5	0	8	22
% App. Total	0	0	0	100		0	100	0	0		0	100	0	0		28.6	0	42.9	28.6		12.5	25	62.5	0		
PHF	.000	.000	.000	.500	.500	.000	.250	.000	.000	.250	.000	.500	.000	.000	.500	.500	.000	.250	.500	.438	.250	.500	.625	.000	.667	.611

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



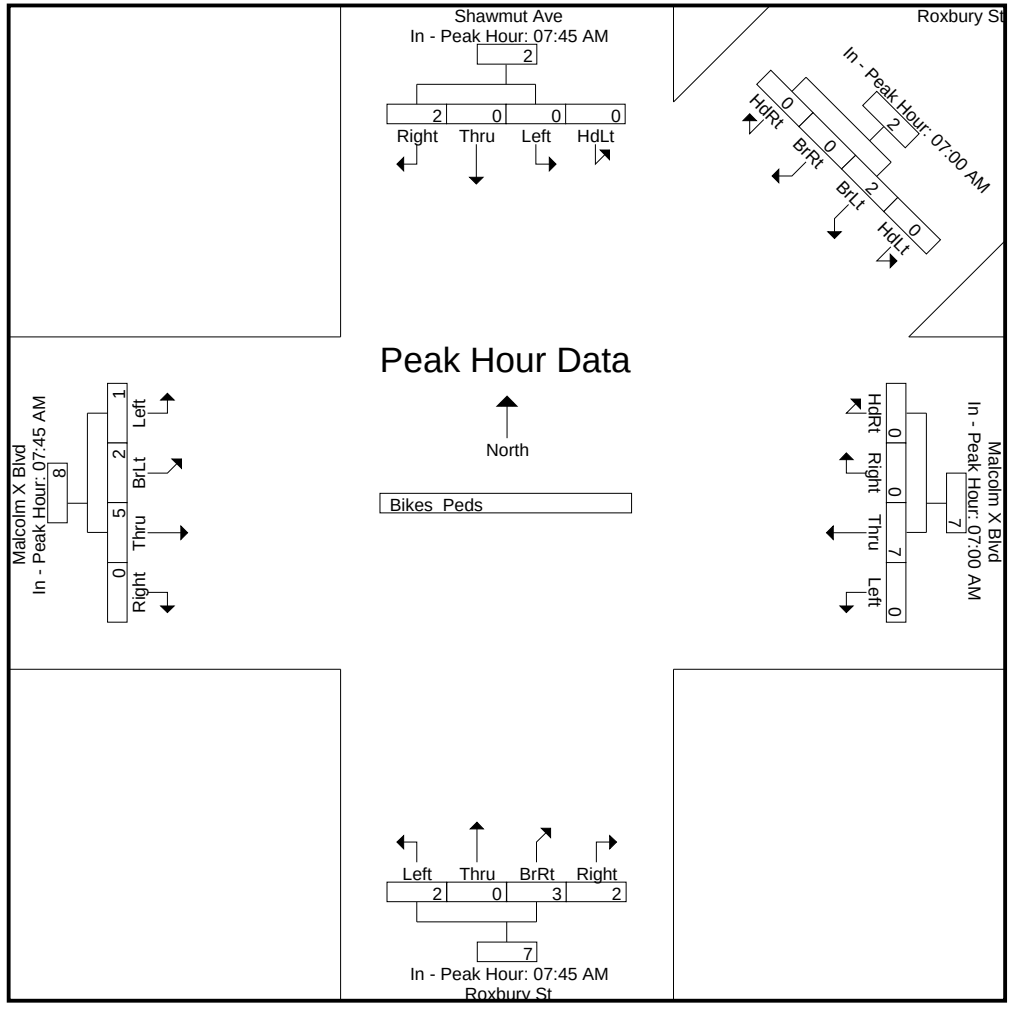
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM					07:00 AM					07:00 AM					07:45 AM					07:45 AM				
+0 mins.	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	**1**	0	0	**1**	2	0	**1**	**2**	0	**3**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	**1**	1	0	0	2
+30 mins.	0	0	0	**1**	**1**	0	0	0	0	0	0	**3**	0	0	**3**	0	0	**3**	1	**4**	0	0	2	0	2
+45 mins.	0	0	0	1	1	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	0	1	0	1
Total Volume	0	0	0	2	2	0	2	0	0	2	0	7	0	0	7	2	0	3	2	7	1	2	5	0	8
% App. Total	0	0	0	100		0	100	0	0		0	100	0	0		28.6	0	42.9	28.6		12.5	25	62.5	0	
PHF	.000	.000	.000	.500	.500	.000	.250	.000	.000	.250	.000	.583	.000	.000	.583	.500	.000	.250	.500	.438	.250	.500	.625	.000	.667

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Trucks - Buses

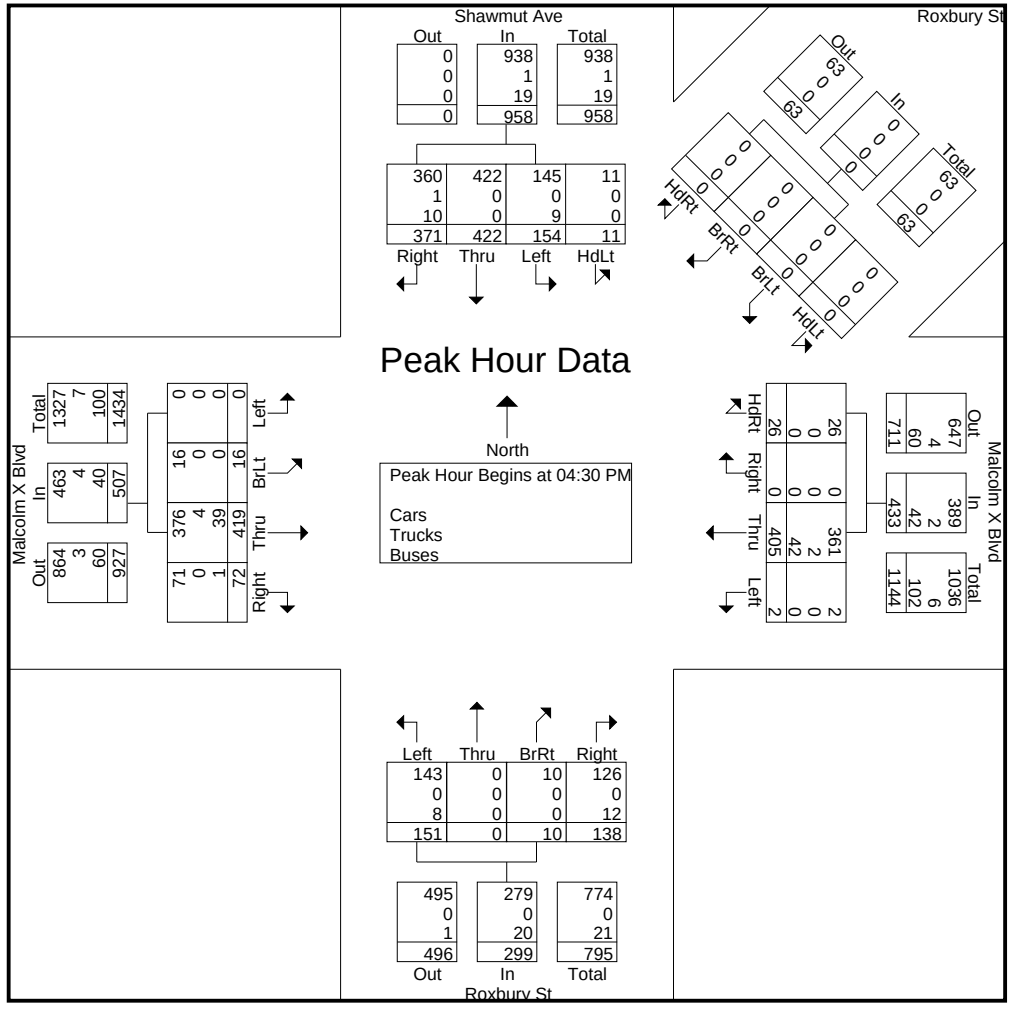
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
04:00 PM	4	44	92	100	0	0	0	0	1	117	0	1	44	0	3	39	0	3	106	23	577
04:15 PM	2	28	99	83	0	0	0	0	0	110	0	0	57	0	6	30	0	2	118	10	545
04:30 PM	1	29	112	83	0	0	0	0	1	104	0	5	45	0	0	27	0	5	107	12	531
04:45 PM	4	47	87	77	0	0	0	0	0	99	0	6	31	0	7	33	0	7	111	21	530
Total	11	148	390	343	0	0	0	0	2	430	0	12	177	0	16	129	0	17	442	66	2183
05:00 PM	6	35	105	113	0	0	0	0	0	84	0	8	40	0	2	48	0	2	103	20	566
05:15 PM	0	43	118	98	0	0	0	0	1	118	0	7	35	0	1	30	0	2	98	19	570
05:30 PM	3	32	92	85	0	0	0	0	0	115	0	6	25	0	1	22	0	1	103	14	499
05:45 PM	2	39	77	96	0	0	0	0	0	115	0	7	26	0	6	24	0	2	112	12	518
Total	11	149	392	392	0	0	0	0	1	432	0	28	126	0	10	124	0	7	416	65	2153
Grand Total	22	297	782	735	0	0	0	0	3	862	0	40	303	0	26	253	0	24	858	131	4336
Apprch %	1.2	16.2	42.6	40	0	0	0	0	0.3	95.2	0	4.4	52.1	0	4.5	43.5	0	2.4	84.7	12.9	
Total %	0.5	6.8	18	17	0	0	0	0	0.1	19.9	0	0.9	7	0	0.6	5.8	0	0.6	19.8	3	
Cars	22	280	773	708	0	0	0	0	3	761	0	40	291	0	26	232	0	24	762	130	4052
% Cars	100	94.3	98.8	96.3	0	0	0	0	100	88.3	0	100	96	0	100	91.7	0	100	88.8	99.2	93.5
Trucks	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	7	0	11
% Trucks	0	0	0	0.3	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0.8	0	0.3
Buses	0	17	9	25	0	0	0	0	0	99	0	0	12	0	0	21	0	0	89	1	273
% Buses	0	5.7	1.2	3.4	0	0	0	0	0	11.5	0	0	4	0	0	8.3	0	0	10.4	0.8	6.3

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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 04:30 PM																										
04:30 PM	1	29	112	83	225	0	0	0	0	0	**1**	104	0	5	110	**45**	0	0	27	72	0	5	107	12	124	531
04:45 PM	4	**47**	87	77	215	0	0	0	0	0	0	99	0	6	105	31	0	**7**	33	71	0	**7**	**111**	**21**	**139**	530
05:00 PM	**6**	35	105	**113**	**259**	0	0	0	0	0	0	84	0	**8**	92	40	0	2	**48**	**90**	0	2	103	20	125	566
05:15 PM	0	43	**118**	98	259	0	0	0	0	0	1	**118**	0	7	**126**	35	0	1	30	66	0	2	98	19	119	**570**
Total Volume	11	154	422	371	958	0	0	0	0	0	2	405	0	26	433	151	0	10	138	299	0	16	419	72	507	2197
% App. Total	1.1	16.1	44.1	38.7		0	0	0	0		0.5	93.5	0	6		50.5	0	3.3	46.2		0	3.2	82.6	14.2		
PHF	.458	.819	.894	.821	.925	.000	.000	.000	.000	.000	.500	.858	.000	.813	.859	.839	.000	.357	.719	.831	.000	.571	.944	.857	.912	.964
Cars	11	145	422	360	938	0	0	0	0	0	2	361	0	26	389	143	0	10	126	279	0	16	376	71	463	2069
% Cars	100	94.2	100	97.0	97.9	0	0	0	0	0	100	89.1	0	100	89.8	94.7	0	100	91.3	93.3	0	100	89.7	98.6	91.3	94.2
Trucks	0	0	0	1	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	4	0	4	7
% Trucks	0	0	0	0.3	0.1	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	0	0	1.0	0	0.8	0.3
Buses	0	9	0	10	19	0	0	0	0	0	0	42	0	0	42	8	0	0	12	20	0	0	39	1	40	121
% Buses	0	5.8	0	2.7	2.0	0	0	0	0	0	0	10.4	0	0	9.7	5.3	0	0	8.7	6.7	0	0	9.3	1.4	7.9	5.5

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



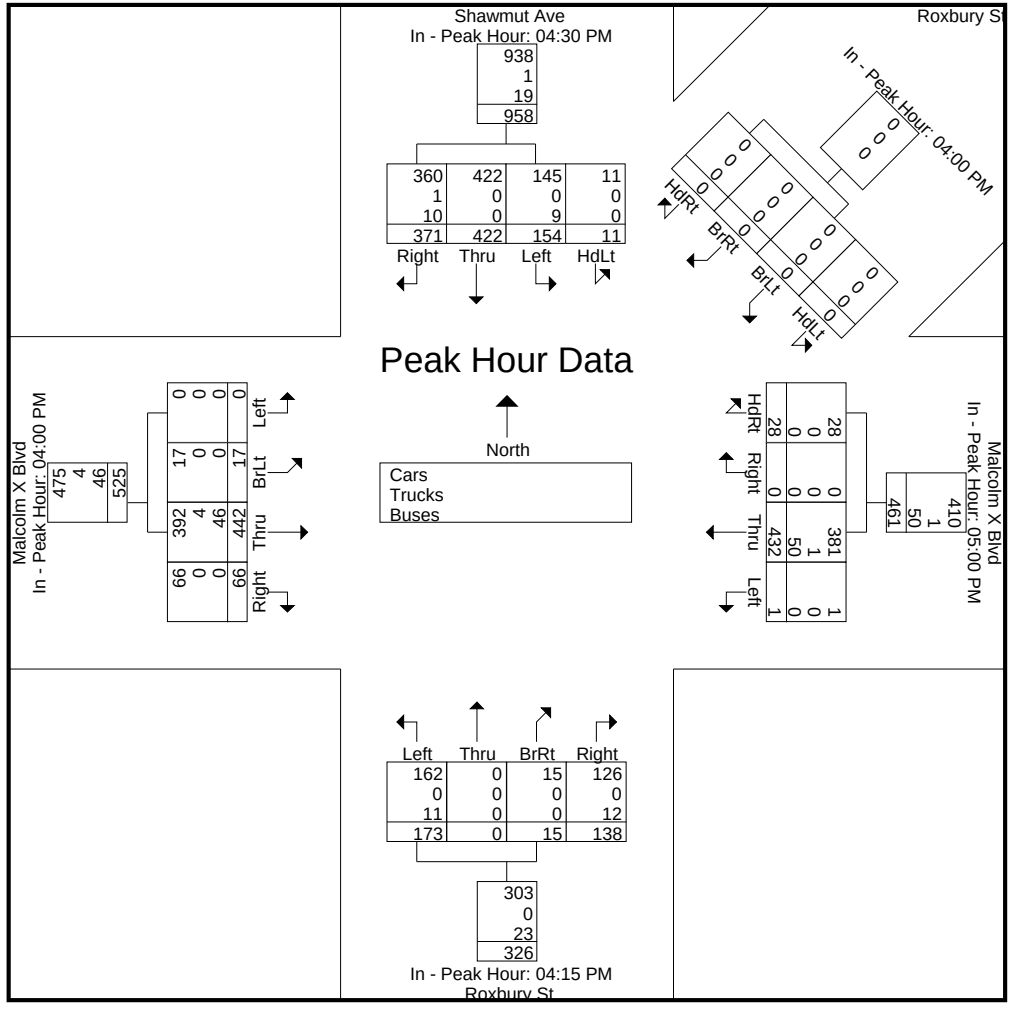
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM					04:00 PM					05:00 PM					04:15 PM					04:00 PM				
+0 mins.	1	29	112	83	225	0	0	0	0	0	0	84	0	**8**	92	**57**	0	6	30	**93**	0	3	106	**23**	132
+15 mins.	4	**47**	87	77	215	0	0	0	0	0	**1**	**118**	0	7	**126**	45	0	0	27	72	0	2	**118**	10	130
+30 mins.	**6**	35	105	**113**	**259**	0	0	0	0	0	0	115	0	6	121	31	0	**7**	33	71	0	5	107	12	124
+45 mins.	0	43	**118**	98	259	0	0	0	0	0	0	115	0	7	122	40	0	2	**48**	90	0	**7**	111	21	**139**
Total Volume	11	154	422	371	958	0	0	0	0	0	1	432	0	28	461	173	0	15	138	326	0	17	442	66	525
% App. Total	1.1	16.1	44.1	38.7		0	0	0	0		0.2	93.7	0	6.1		53.1	0	4.6	42.3		0	3.2	84.2	12.6	
PHF	.458	.819	.894	.821	.925	.000	.000	.000	.000	.000	.250	.915	.000	.875	.915	.759	.000	.536	.719	.876	.000	.607	.936	.717	.944
Cars	11	145	422	360	938	0	0	0	0	0	1	381	0	28	410	162	0	15	126	303	0	17	392	66	475
% Cars	100	94.2	100	97	97.9	0	0	0	0	0	100	88.2	0	100	88.9	93.6	0	100	91.3	92.9	0	100	88.7	100	90.5
Trucks	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4	0	4

Accurate Counts

978-664-2565

Buses	0	9	0	10	19	0	0	0	0	0	0	50	0	0	50	11	0	0	12	23	0	0	46	0	46
% Buses	0	5.8	0	2.7	2	0	0	0	0	0	0	11.6	0	0	10.8	6.4	0	0	8.7	7.1	0	0	10.4	0	8.8



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

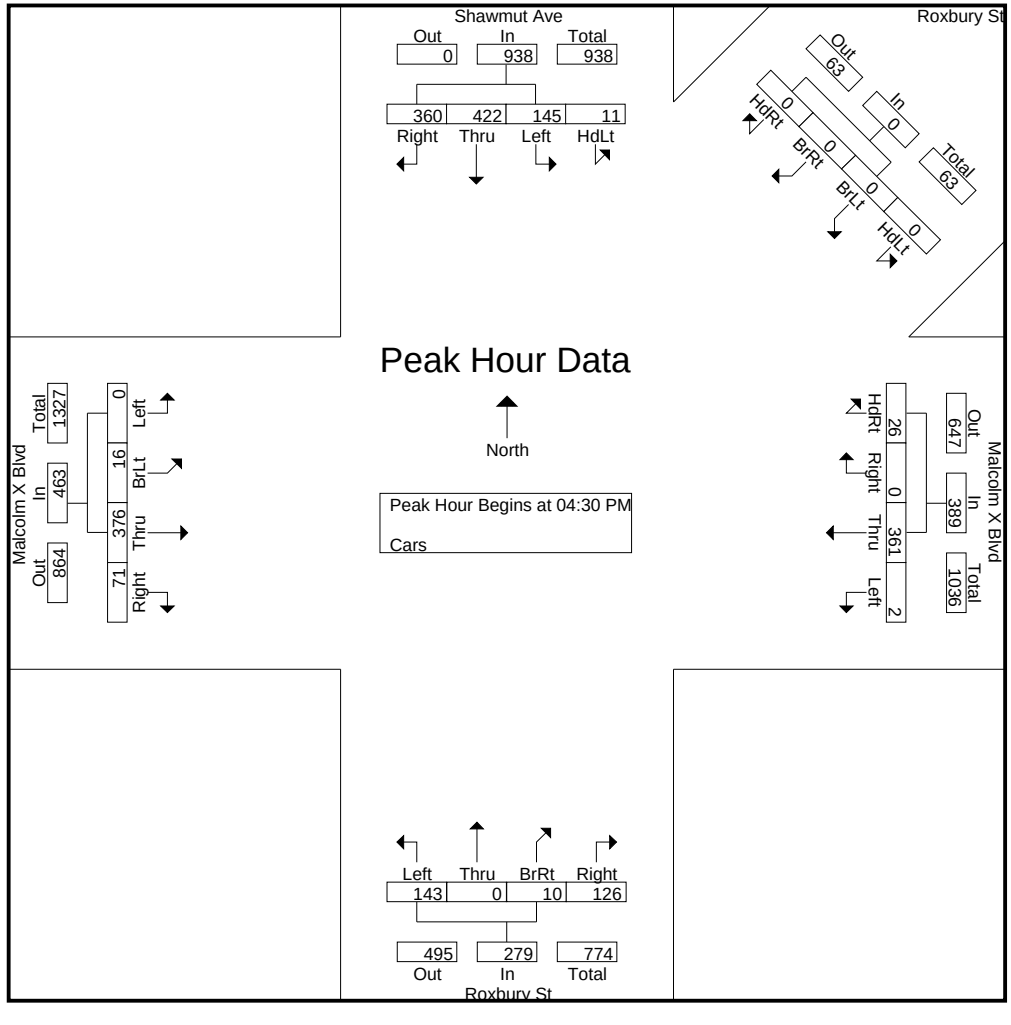
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
04:00 PM	4	43	90	98	0	0	0	0	1	99	0	1	44	0	3	35	0	3	92	23	536
04:15 PM	2	25	97	74	0	0	0	0	0	99	0	0	54	0	6	28	0	2	103	10	500
04:30 PM	1	27	112	80	0	0	0	0	1	93	0	5	42	0	0	23	0	5	99	12	500
04:45 PM	4	44	87	75	0	0	0	0	0	89	0	6	29	0	7	27	0	7	98	21	494
Total	11	139	386	327	0	0	0	0	2	380	0	12	169	0	16	113	0	17	392	66	2030
05:00 PM	6	34	105	111	0	0	0	0	0	72	0	8	37	0	2	48	0	2	92	20	537
05:15 PM	0	40	118	94	0	0	0	0	1	107	0	7	35	0	1	28	0	2	87	18	538
05:30 PM	3	31	91	83	0	0	0	0	0	99	0	6	24	0	1	20	0	1	91	14	464
05:45 PM	2	36	73	93	0	0	0	0	0	103	0	7	26	0	6	23	0	2	100	12	483
Total	11	141	387	381	0	0	0	0	1	381	0	28	122	0	10	119	0	7	370	64	2022
Grand Total	22	280	773	708	0	0	0	0	3	761	0	40	291	0	26	232	0	24	762	130	4052
Apprch %	1.2	15.7	43.4	39.7	0	0	0	0	0.4	94.7	0	5	53	0	4.7	42.3	0	2.6	83.2	14.2	
Total %	0.5	6.9	19.1	17.5	0	0	0	0	0.1	18.8	0	1	7.2	0	0.6	5.7	0	0.6	18.8	3.2	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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 04:30 PM																										
04:30 PM	1	27	112	80	220	0	0	0	0	0	**1**	93	0	5	99	**42**	0	0	23	65	0	5	**99**	12	116	500
04:45 PM	4	**44**	87	75	210	0	0	0	0	0	0	89	0	6	95	29	0	**7**	27	63	0	**7**	98	**21**	**126**	494
05:00 PM	**6**	34	105	**111**	**256**	0	0	0	0	0	0	72	0	**8**	80	37	0	2	**48**	**87**	0	2	92	20	114	537
05:15 PM	0	40	**118**	94	252	0	0	0	0	0	1	**107**	0	7	**115**	35	0	1	28	64	0	2	87	18	107	**538**
Total Volume	11	145	422	360	938	0	0	0	0	0	2	361	0	26	389	143	0	10	126	279	0	16	376	71	463	2069
% App. Total	1.2	15.5	45	38.4		0	0	0	0		0.5	92.8	0	6.7		51.3	0	3.6	45.2		0	3.5	81.2	15.3		
PHF	.458	.824	.894	.811	.916	.000	.000	.000	.000	.000	.500	.843	.000	.813	.846	.851	.000	.357	.656	.802	.000	.571	.949	.845	.919	.961

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



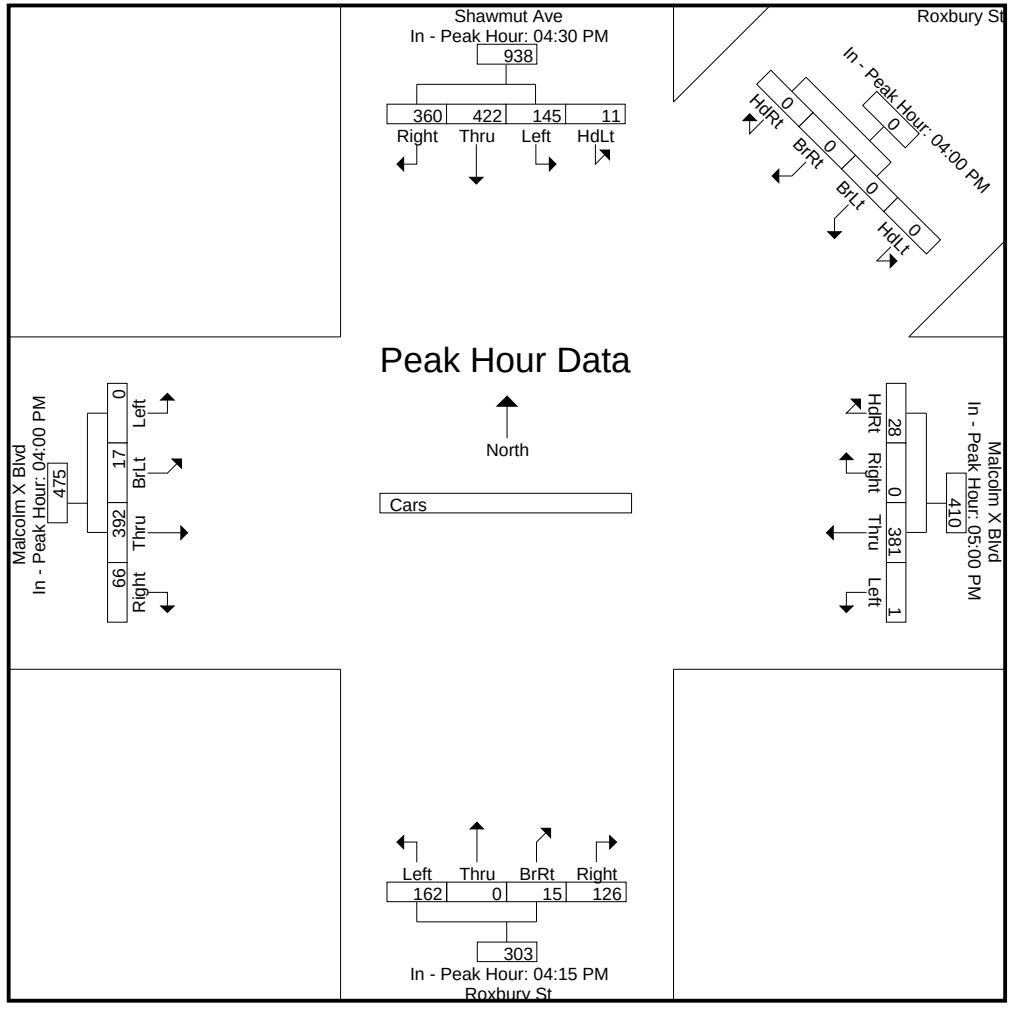
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM					04:00 PM					05:00 PM					04:15 PM					04:00 PM				
+0 mins.	1	27	112	80	220	0	0	0	0	0	0	72	0	**8**	80	**54**	0	6	28	**88**	0	3	92	**23**	118
+15 mins.	4	**44**	87	75	210	0	0	0	0	0	**1**	**107**	0	7	**115**	42	0	0	23	65	0	2	**103**	10	115
+30 mins.	**6**	34	105	**111**	**256**	0	0	0	0	0	0	99	0	6	105	29	0	**7**	27	63	0	5	99	12	116
+45 mins.	0	40	**118**	94	252	0	0	0	0	0	0	103	0	7	110	37	0	2	**48**	87	0	**7**	98	21	**126**
Total Volume	11	145	422	360	938	0	0	0	0	0	1	381	0	28	410	162	0	15	126	303	0	17	392	66	475
% App. Total	1.2	15.5	45	38.4		0	0	0	0		0.2	92.9	0	6.8		53.5	0	5	41.6		0	3.6	82.5	13.9	
PHF	.458	.824	.894	.811	.916	.000	.000	.000	.000	.000	.250	.890	.000	.875	.891	.750	.000	.536	.656	.861	.000	.607	.951	.717	.942

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

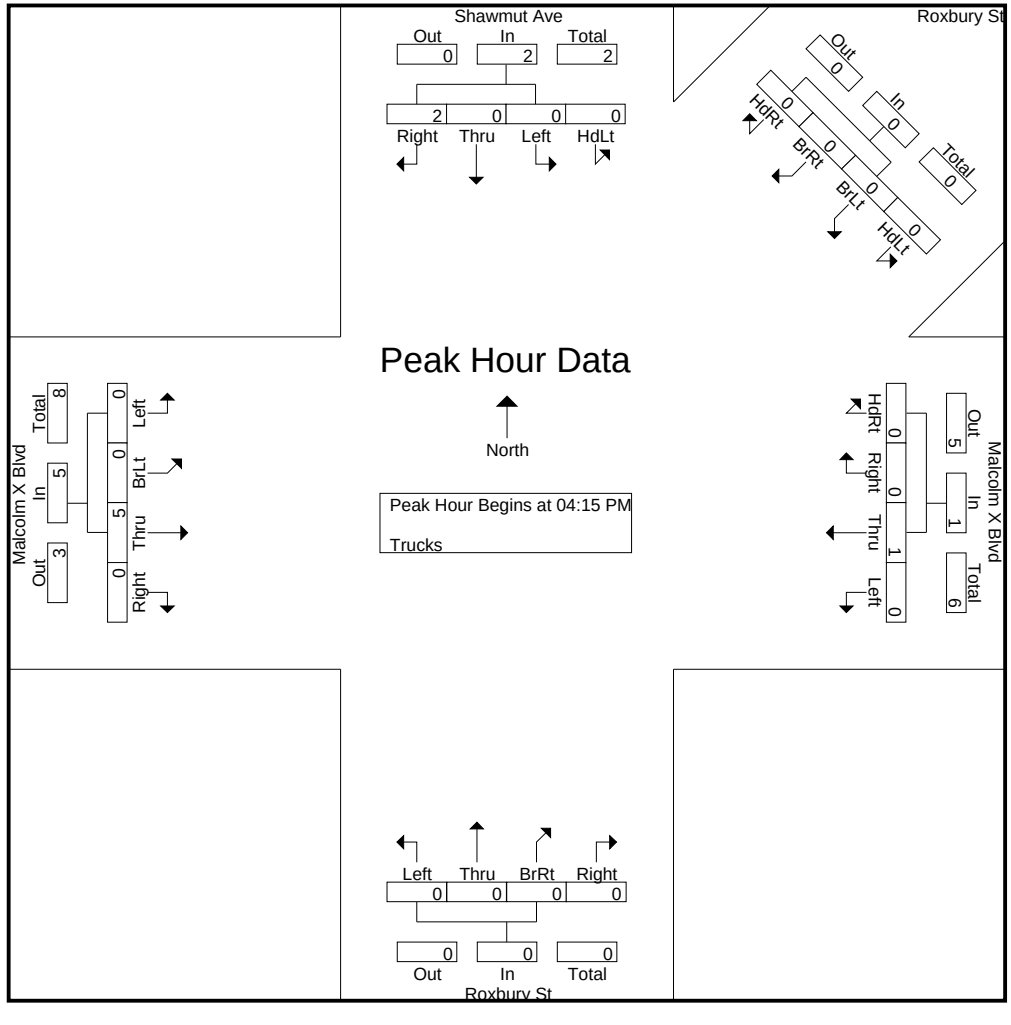
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	6
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	5
Grand Total	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	7	0	11
Apprch %	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	0	0	0	100	0	
Total %	0	0	0	18.2	0	0	0	0	0	18.2	0	0	0	0	0	0	0	0	63.6	0	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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 04:15 PM																										
04:15 PM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	**3**
Total Volume	0	0	0	2	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	5	0	5	8
% App. Total	0	0	0	100		0	0	0	0		0	100	0	0		0	0	0	0		0	0	100	0		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.625	.000	.625	.667

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



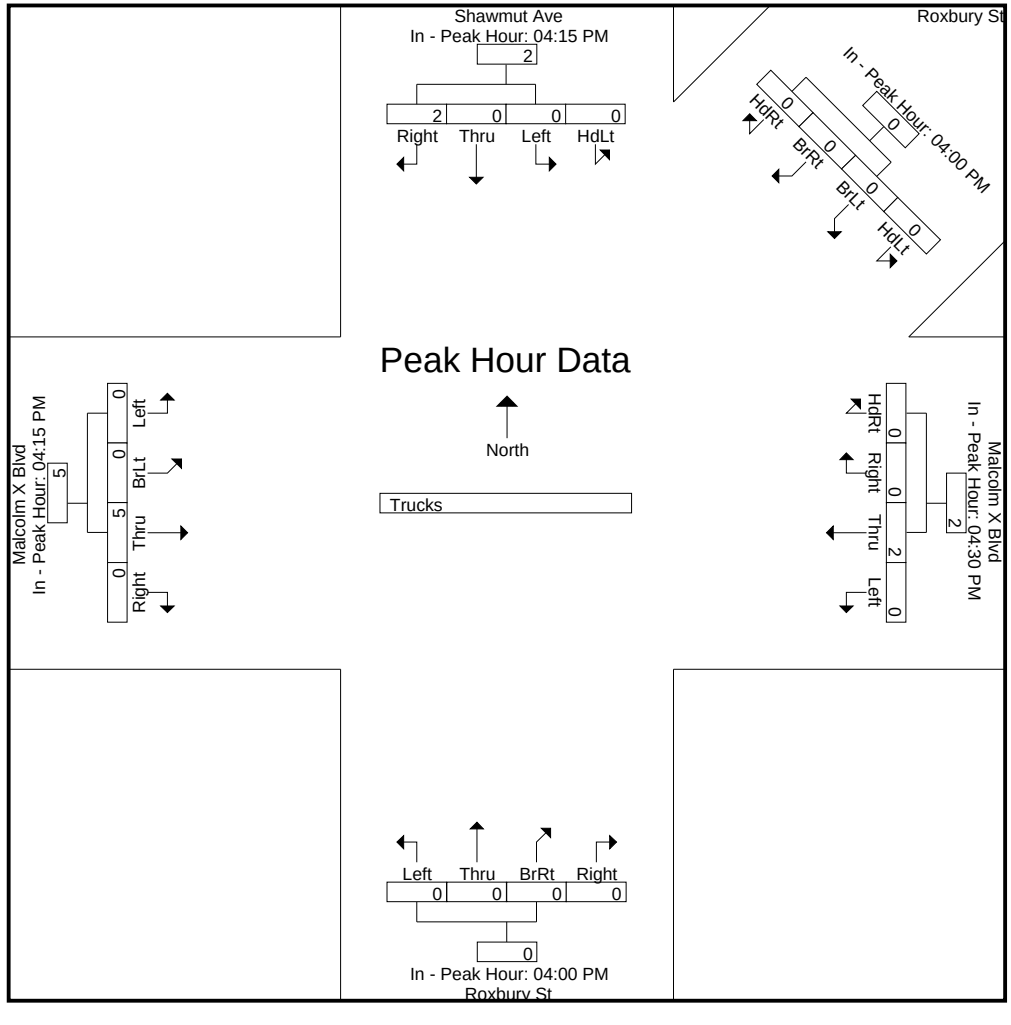
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM					04:00 PM					04:30 PM					04:00 PM					04:15 PM				
+0 mins.	0	0	0	**1**	**1**	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**2**	0	**2**
Total Volume	0	0	0	2	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	5	0	5
% App. Total	0	0	0	100		0	0	0	0		0	100	0	0		0	0	0	0		0	0	100	0	
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.625	.000	.625

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

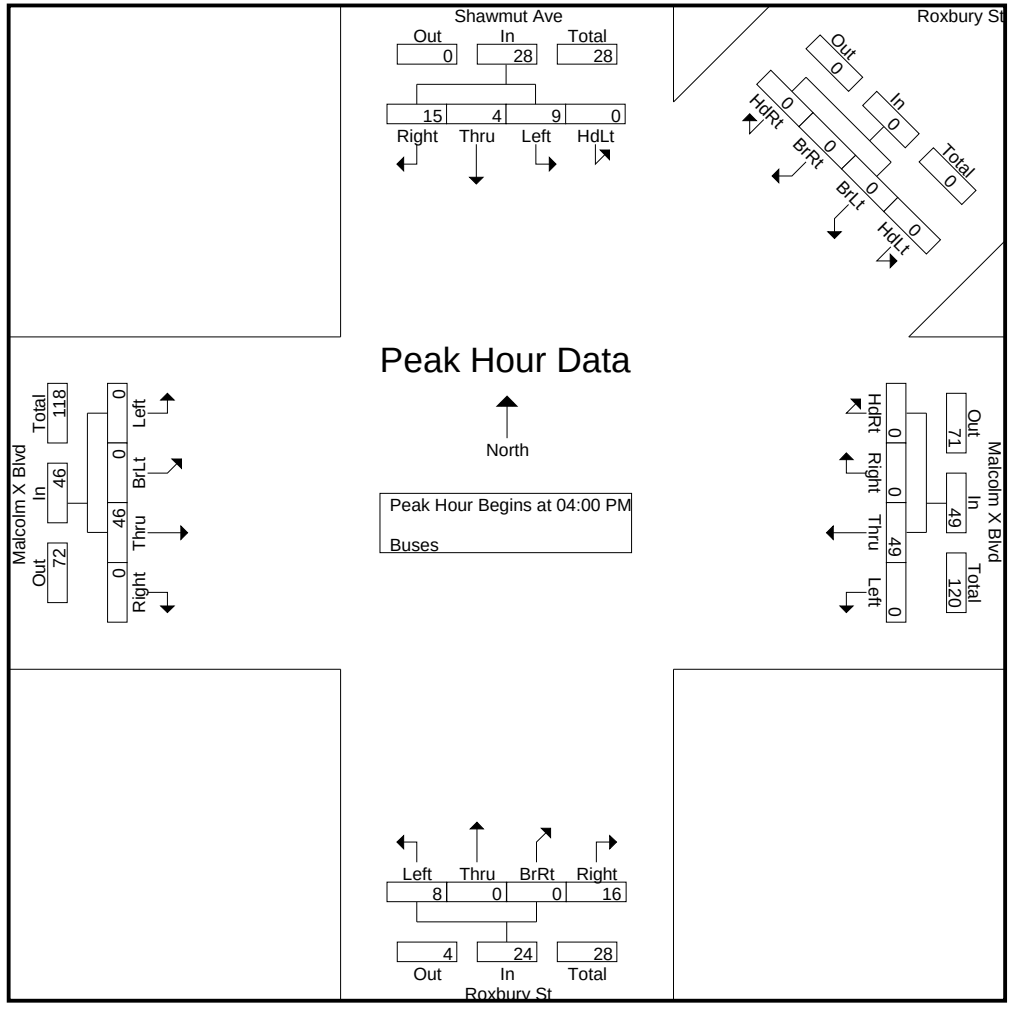
	Shawmut Ave From North				Roxbury St From Northeast				Malcolm X Blvd From East				Roxbury St From South				Malcolm X Blvd From West				
Start Time	HdLt	Left	Thru	Right	HdLt	BrLt	BrRt	HdRt	Left	Thru	Right	HdRt	Left	Thru	BrRt	Right	Left	BrLt	Thru	Right	Int. Total
04:00 PM	0	1	2	2	0	0	0	0	0	18	0	0	0	0	0	4	0	0	13	0	40
04:15 PM	0	3	2	8	0	0	0	0	0	11	0	0	3	0	0	2	0	0	14	0	43
04:30 PM	0	2	0	3	0	0	0	0	0	10	0	0	3	0	0	4	0	0	7	0	29
04:45 PM	0	3	0	2	0	0	0	0	0	10	0	0	2	0	0	6	0	0	12	0	35
Total	0	9	4	15	0	0	0	0	0	49	0	0	8	0	0	16	0	0	46	0	147
05:00 PM	0	1	0	1	0	0	0	0	0	12	0	0	3	0	0	0	0	0	9	0	26
05:15 PM	0	3	0	4	0	0	0	0	0	10	0	0	0	0	0	2	0	0	11	1	31
05:30 PM	0	1	1	2	0	0	0	0	0	16	0	0	1	0	0	2	0	0	12	0	35
05:45 PM	0	3	4	3	0	0	0	0	0	12	0	0	0	0	0	1	0	0	11	0	34
Total	0	8	5	10	0	0	0	0	0	50	0	0	4	0	0	5	0	0	43	1	126
Grand Total	0	17	9	25	0	0	0	0	0	99	0	0	12	0	0	21	0	0	89	1	273
Apprch %	0	33.3	17.6	49	0	0	0	0	0	100	0	0	36.4	0	0	63.6	0	0	98.9	1.1	
Total %	0	6.2	3.3	9.2	0	0	0	0	0	36.3	0	0	4.4	0	0	7.7	0	0	32.6	0.4	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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	**2**	2	5	0	0	0	0	0	0	**18**	0	0	**18**	0	0	0	4	4	0	0	13	0	13	40
04:15 PM	0	**3**	2	**8**	**13**	0	0	0	0	0	0	11	0	0	11	**3**	0	0	2	5	0	0	**14**	0	**14**	**43**
04:30 PM	0	2	0	3	5	0	0	0	0	0	0	10	0	0	10	3	0	0	4	7	0	0	7	0	7	29
04:45 PM	0	3	0	2	5	0	0	0	0	0	0	10	0	0	10	2	0	0	**6**	**8**	0	0	12	0	12	35
Total Volume	0	9	4	15	28	0	0	0	0	0	0	49	0	0	49	8	0	0	16	24	0	0	46	0	46	147
% App. Total	0	32.1	14.3	53.6		0	0	0	0		0	100	0	0		33.3	0	0	66.7		0	0	100	0		
PHF	.000	.750	.500	.469	.538	.000	.000	.000	.000	.000	.000	.681	.000	.000	.681	.667	.000	.000	.667	.750	.000	.000	.821	.000	.821	.855

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



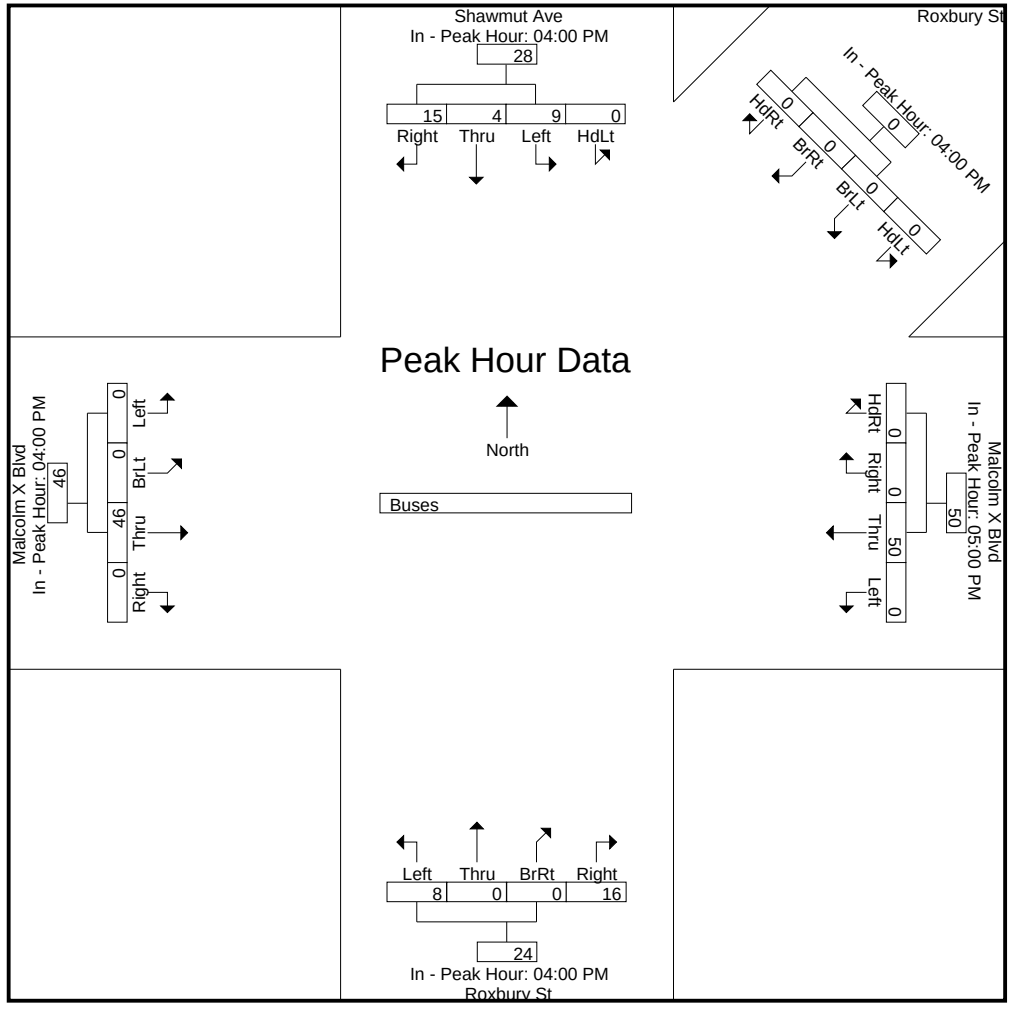
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM					04:00 PM					05:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	1	**2**	2	5	0	0	0	0	0	0	12	0	0	12	0	0	0	4	4	0	0	13	0	13
+15 mins.	0	**3**	2	**8**	**13**	0	0	0	0	0	0	10	0	0	10	**3**	0	0	2	5	0	0	**14**	0	**14**
+30 mins.	0	2	0	3	5	0	0	0	0	0	0	**16**	0	0	**16**	3	0	0	4	7	0	0	7	0	7
+45 mins.	0	3	0	2	5	0	0	0	0	0	0	12	0	0	12	2	0	0	**6**	**8**	0	0	12	0	12
Total Volume	0	9	4	15	28	0	0	0	0	0	0	50	0	0	50	8	0	0	16	24	0	0	46	0	46
% App. Total	0	32.1	14.3	53.6		0	0	0	0		0	100	0	0		33.3	0	0	66.7		0	0	100	0	
PHF	.000	.750	.500	.469	.538	.000	.000	.000	.000	.000	.000	.781	.000	.000	.781	.667	.000	.000	.667	.750	.000	.000	.821	.000	.821

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

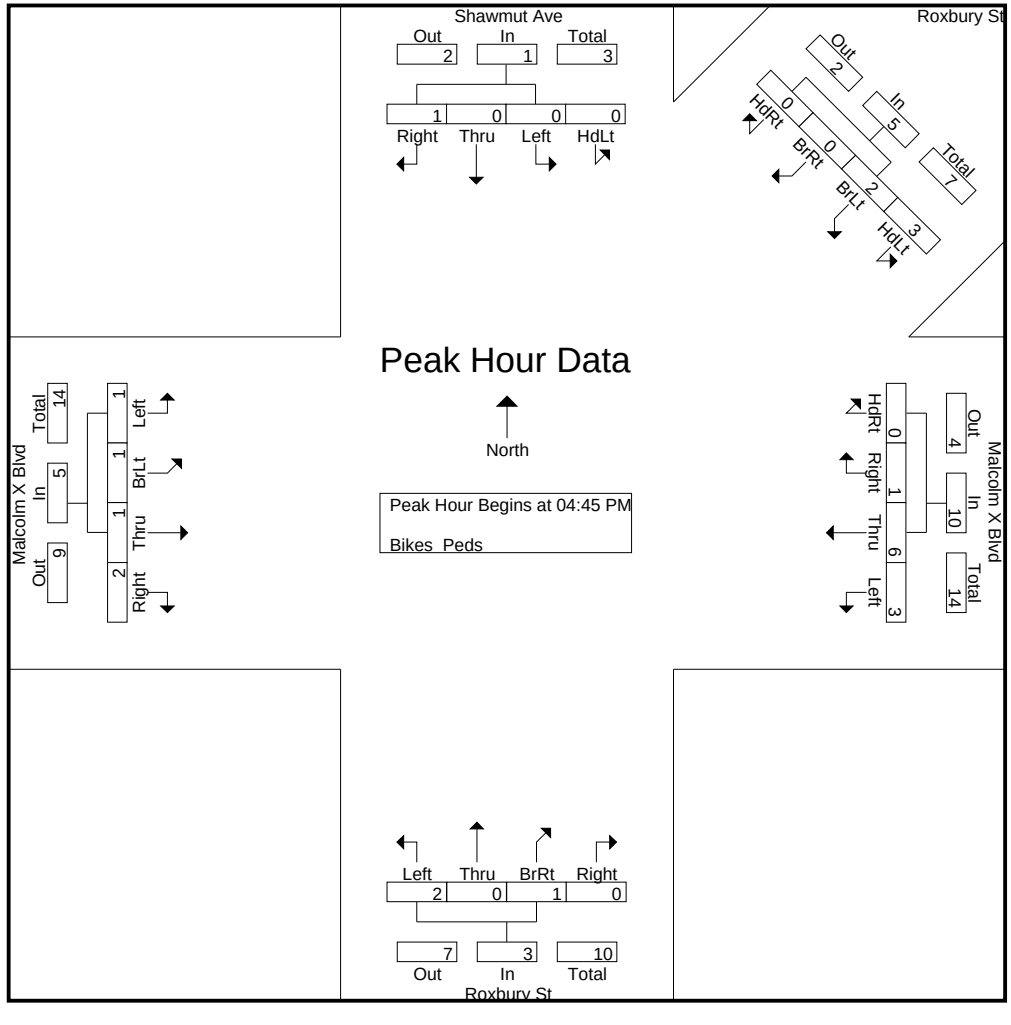
	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West							
Start Time	HdLt	Left	Thru	Right	Peds	HdLt	BrLt	BrRt	HdRt	Peds	Left	Thru	Right	HdRt	Peds	Left	Thru	BrRt	Right	Peds	Left	BrLt	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	1	0	51	0	0	0	0	13	0	1	0	0	9	0	0	0	1	8	0	0	1	0	18	99	4	103
04:15 PM	0	1	0	0	12	0	1	0	0	5	1	0	0	0	4	0	0	0	0	5	0	0	0	0	10	36	3	39
04:30 PM	0	0	0	0	13	1	0	0	0	4	0	1	0	0	4	0	0	0	0	4	1	1	2	0	10	35	6	41
04:45 PM	0	0	0	0	19	0	0	0	0	12	0	3	0	0	14	1	0	0	0	1	1	1	0	0	8	54	6	60
Total	0	1	1	0	95	1	1	0	0	34	1	5	0	0	31	1	0	0	1	18	2	2	3	0	46	224	19	243
05:00 PM	0	0	0	0	17	0	0	0	0	9	2	1	0	0	14	1	0	0	0	7	0	0	1	0	8	55	5	60
05:15 PM	0	0	0	0	10	0	2	0	0	7	0	2	0	0	9	0	0	0	0	5	0	0	0	0	5	36	4	40
05:30 PM	0	0	0	1	27	3	0	0	0	7	1	0	1	0	7	0	0	1	0	8	0	0	0	2	9	58	9	67
05:45 PM	0	0	0	0	12	0	0	0	0	8	0	0	0	0	12	1	0	1	0	7	0	0	0	1	8	47	3	50
Total	0	0	0	1	66	3	2	0	0	31	3	3	1	0	42	2	0	2	0	27	0	0	1	3	30	196	21	217
Grand Total	0	1	1	1	161	4	3	0	0	65	4	8	1	0	73	3	0	2	1	45	2	2	4	3	76	420	40	460
Apprch %	0	33.3	33.3	33.3		57.1	42.9	0	0		30.8	61.5	7.7	0		50	0	33.3	16.7		18.2	18.2	36.4	27.3				
Total %	0	2.5	2.5	2.5		10	7.5	0	0		10	20	2.5	0		7.5	0	5	2.5		5	5	10	7.5		91.3	8.7	

	Shawmut Ave From North					Roxbury St From Northeast					Malcolm X Blvd From East					Roxbury St From South					Malcolm X Blvd From West					
Start Time	HdLt	Left	Thru	Right	App. Total	HdLt	BrLt	BrRt	HdRt	App. Total	Left	Thru	Right	HdRt	App. Total	Left	Thru	BrRt	Right	App. Total	Left	BrLt	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 04:45 PM																										
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	**3**	0	0	**3**	**1**	0	0	0	**1**	**1**	**1**	0	0	**2**	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	**2**	1	0	0	3	1	0	0	0	1	0	0	**1**	0	1	5
05:15 PM	0	0	0	0	0	0	**2**	0	0	2	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	4
05:30 PM	0	0	0	**1**	**1**	**3**	0	0	0	**3**	1	0	**1**	0	2	0	0	**1**	0	1	0	0	0	**2**	2	**9**
Total Volume	0	0	0	1	1	3	2	0	0	5	3	6	1	0	10	2	0	1	0	3	1	1	1	2	5	24
% App. Total	0	0	0	100		60	40	0	0		30	60	10	0		66.7	0	33.3	0		20	20	20	40			
PHF	.000	.000	.000	.250	.250	.250	.250	.000	.000	.417	.375	.500	.250	.000	.833	.500	.000	.250	.000	.750	.250	.250	.250	.250	.625	.667

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 2



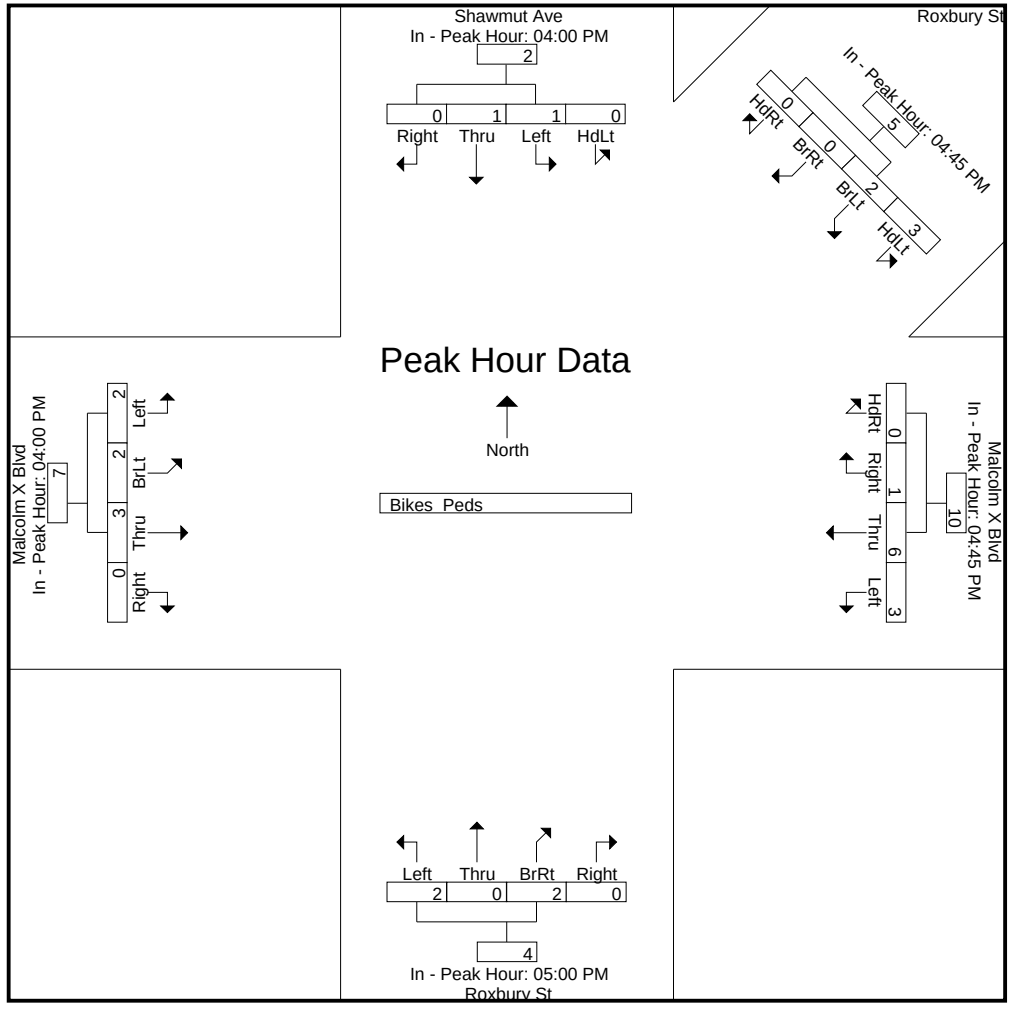
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM					04:45 PM					04:45 PM					05:00 PM					04:00 PM				
+0 mins.	0	0	**1**	0	**1**	0	0	0	0	0	0	**3**	0	0	**3**	**1**	0	0	0	1	0	0	1	0	1
+15 mins.	0	**1**	0	0	1	0	0	0	0	0	**2**	1	0	0	3	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**2**	0	0	2	0	2	0	0	2	0	0	**1**	0	1	**1**	**1**	**2**	0	**4**
+45 mins.	0	0	0	0	0	**3**	0	0	0	**3**	1	0	**1**	0	2	1	0	1	0	**2**	1	1	0	0	2
Total Volume	0	1	1	0	2	3	2	0	0	5	3	6	1	0	10	2	0	2	0	4	2	2	3	0	7
% App. Total	0	50	50	0		60	40	0	0		30	60	10	0		50	0	50	0		28.6	28.6	42.9	0	
PHF	.000	.250	.250	.000	.500	.250	.250	.000	.000	.417	.375	.500	.250	.000	.833	.500	.000	.500	.000	.500	.500	.500	.375	.000	.438

Accurate Counts
978-664-2565

N/S Street : Roxbury St / Shawmut Ave
E/W Street: Malcolm X Boulevard
City/State : Boston, MA
Weather : Cloudy

File Name : 15890001
Site Code : 15890001
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Buses - Trucks

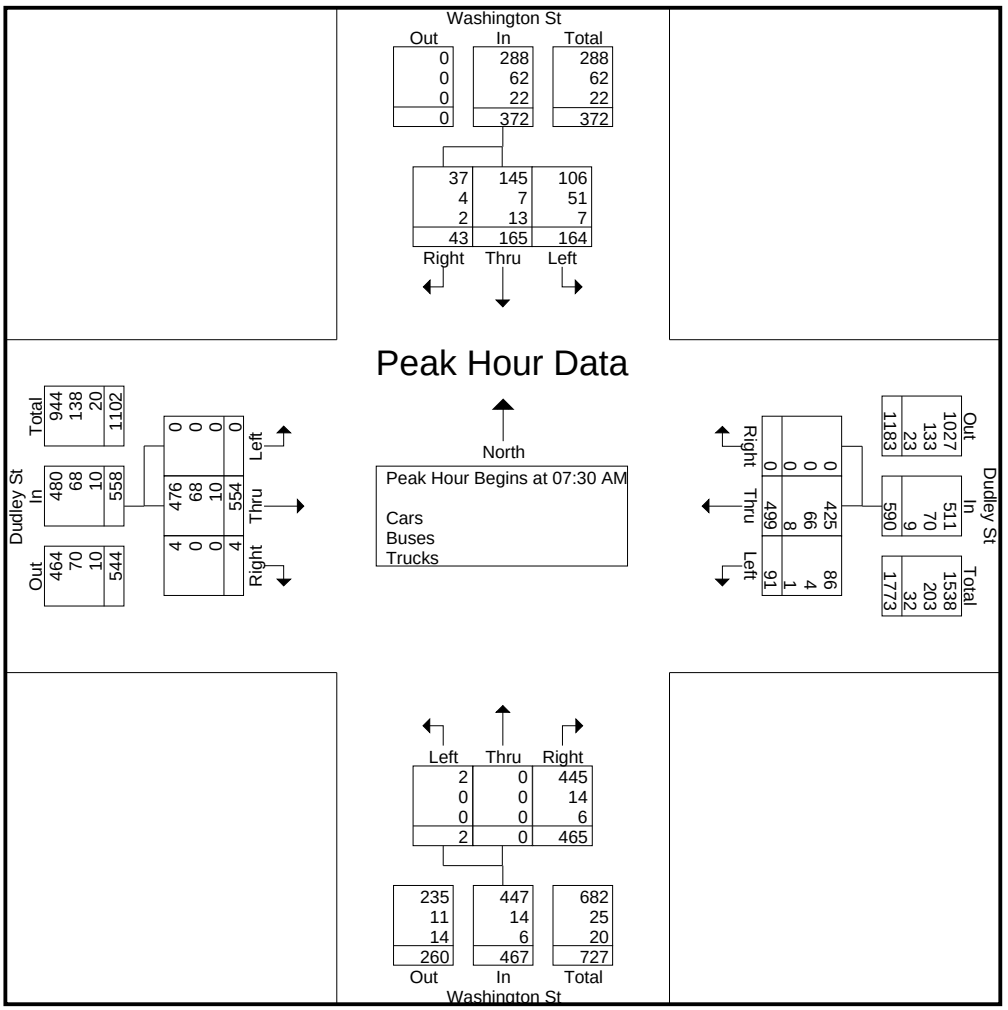
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	36	30	14	17	122	0	2	0	97	0	109	0	427
07:15 AM	38	33	12	23	94	0	1	0	116	0	116	1	434
07:30 AM	36	36	10	22	131	0	0	0	128	0	144	1	508
07:45 AM	44	42	13	24	129	0	1	0	109	0	133	1	496
Total	154	141	49	86	476	0	4	0	450	0	502	3	1865
08:00 AM	46	43	5	19	111	0	1	0	123	0	148	1	497
08:15 AM	38	44	15	26	128	0	0	0	105	0	129	1	486
08:30 AM	43	35	10	22	119	0	2	0	114	0	122	1	468
08:45 AM	49	45	14	18	92	0	1	0	104	0	124	1	448
Total	176	167	44	85	450	0	4	0	446	0	523	4	1899
Grand Total	330	308	93	171	926	0	8	0	896	0	1025	7	3764
Apprch %	45.1	42.1	12.7	15.6	84.4	0	0.9	0	99.1	0	99.3	0.7	
Total %	8.8	8.2	2.5	4.5	24.6	0	0.2	0	23.8	0	27.2	0.2	
Cars	210	282	78	151	786	0	7	0	852	0	872	7	3245
% Cars	63.6	91.6	83.9	88.3	84.9	0	87.5	0	95.1	0	85.1	100	86.2
Buses	103	10	10	13	127	0	0	0	34	0	138	0	435
% Buses	31.2	3.2	10.8	7.6	13.7	0	0	0	3.8	0	13.5	0	11.6
Trucks	17	16	5	7	13	0	1	0	10	0	15	0	84
% Trucks	5.2	5.2	5.4	4.1	1.4	0	12.5	0	1.1	0	1.5	0	2.2

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	36	36	10	82	22	**131**	0	153	0	0	**128**	**128**	0	144	**1**	145	**508**
07:45 AM	44	42	13	**99**	24	129	0	153	**1**	0	109	110	0	133	1	134	496
08:00 AM	**46**	43	5	94	19	111	0	130	1	0	123	124	0	**148**	1	**149**	497
08:15 AM	38	**44**	**15**	97	**26**	128	0	**154**	0	0	105	105	0	129	1	130	486
Total Volume	164	165	43	372	91	499	0	590	2	0	465	467	0	554	4	558	1987
% App. Total	44.1	44.4	11.6		15.4	84.6	0		0.4	0	99.6		0	99.3	0.7		
PHF	.891	.938	.717	.939	.875	.952	.000	.958	.500	.000	.908	.912	.000	.936	1.00	.936	.978
Cars	106	145	37	288	86	425	0	511	2	0	445	447	0	476	4	480	1726
% Cars	64.6	87.9	86.0	77.4	94.5	85.2	0	86.6	100	0	95.7	95.7	0	85.9	100	86.0	86.9
Buses	51	7	4	62	4	66	0	70	0	0	14	14	0	68	0	68	214
% Buses	31.1	4.2	9.3	16.7	4.4	13.2	0	11.9	0	0	3.0	3.0	0	12.3	0	12.2	10.8
Trucks	7	13	2	22	1	8	0	9	0	0	6	6	0	10	0	10	47
% Trucks	4.3	7.9	4.7	5.9	1.1	1.6	0	1.5	0	0	1.3	1.3	0	1.8	0	1.8	2.4

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

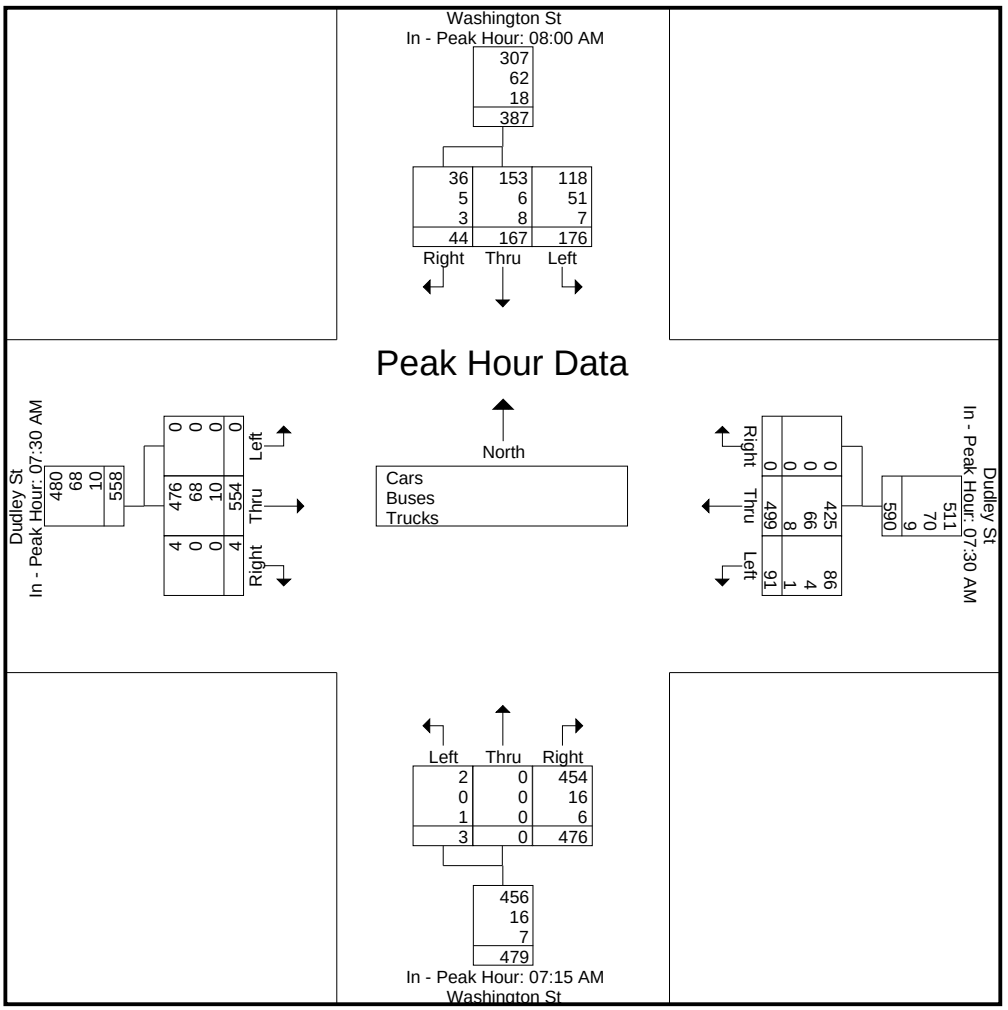
Peak Hour for Each Approach Begins at:

	08:00 AM				07:30 AM				07:15 AM				07:30 AM			
+0 mins.	46	43	5	94	22	**131**	0	153	**1**	0	116	117	0	144	**1**	145
+15 mins.	38	44	**15**	97	24	129	0	153	0	0	**128**	**128**	0	133	1	134
+30 mins.	43	35	10	88	19	111	0	130	1	0	109	110	0	**148**	1	**149**
+45 mins.	**49**	**45**	14	**108**	**26**	128	0	**154**	1	0	123	124	0	129	1	130
Total Volume	176	167	44	387	91	499	0	590	3	0	476	479	0	554	4	558
% App. Total	45.5	43.2	11.4		15.4	84.6	0		0.6	0	99.4		0	99.3	0.7	
PHF	.898	.928	.733	.896	.875	.952	.000	.958	.750	.000	.930	.936	.000	.936	1.000	.936
Cars	118	153	36	307	86	425	0	511	2	0	454	456	0	476	4	480
% Cars	67	91.6	81.8	79.3	94.5	85.2	0	86.6	66.7	0	95.4	95.2	0	85.9	100	86
Buses	51	6	5	62	4	66	0	70	0	0	16	16	0	68	0	68
% Buses	29	3.6	11.4	16	4.4	13.2	0	11.9	0	0	3.4	3.3	0	12.3	0	12.2
Trucks	7	8	3	18	1	8	0	9	1	0	6	7	0	10	0	10
% Trucks	4	4.8	6.8	4.7	1.1	1.6	0	1.5	33.3	0	1.3	1.5	0	1.8	0	1.8

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

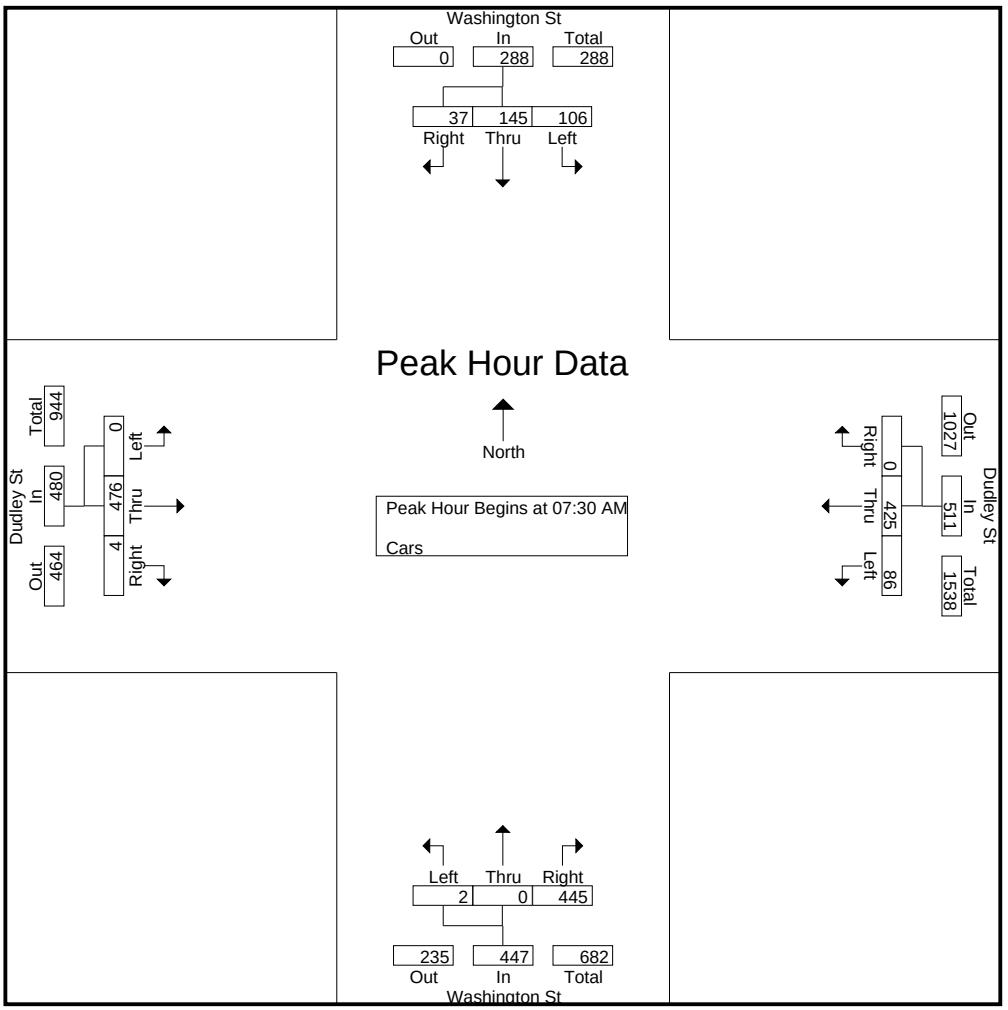
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	21	29	12	15	104	0	2	0	85	0	87	0	355
07:15 AM	21	32	9	16	74	0	0	0	111	0	99	1	363
07:30 AM	20	33	9	21	112	0	0	0	119	0	124	1	439
07:45 AM	30	35	12	22	106	0	1	0	106	0	114	1	427
Total	92	129	42	74	396	0	3	0	421	0	424	3	1584
08:00 AM	30	38	5	17	93	0	1	0	118	0	129	1	432
08:15 AM	26	39	11	26	114	0	0	0	102	0	109	1	428
08:30 AM	31	31	6	19	102	0	2	0	112	0	106	1	410
08:45 AM	31	45	14	15	81	0	1	0	99	0	104	1	391
Total	118	153	36	77	390	0	4	0	431	0	448	4	1661
Grand Total	210	282	78	151	786	0	7	0	852	0	872	7	3245
Apprch %	36.8	49.5	13.7	16.1	83.9	0	0.8	0	99.2	0	99.2	0.8	
Total %	6.5	8.7	2.4	4.7	24.2	0	0.2	0	26.3	0	26.9	0.2	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	20	33	9	62	21	112	0	133	0	0	**119**	**119**	0	124	**1**	125	**439**
07:45 AM	**30**	35	**12**	**77**	22	106	0	128	**1**	0	106	107	0	114	1	115	427
08:00 AM	30	38	5	73	17	93	0	110	1	0	118	119	0	**129**	1	**130**	432
08:15 AM	26	**39**	11	76	**26**	**114**	0	**140**	0	0	102	102	0	109	1	110	428
Total Volume	106	145	37	288	86	425	0	511	2	0	445	447	0	476	4	480	1726
% App. Total	36.8	50.3	12.8		16.8	83.2	0		0.4	0	99.6		0	99.2	0.8		
PHF	.883	.929	.771	.935	.827	.932	.000	.913	.500	.000	.935	.939	.000	.922	1.00	.923	.983

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

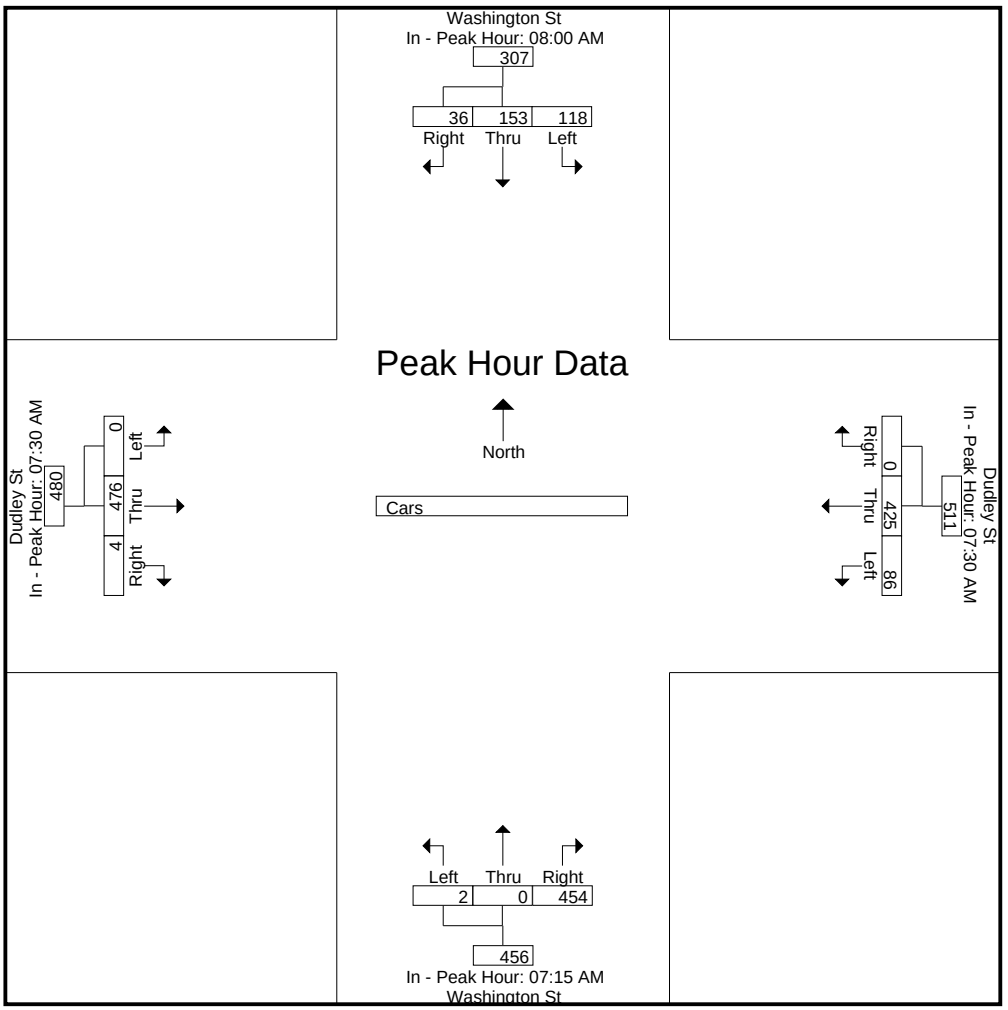
Peak Hour for Each Approach Begins at:

	08:00 AM				07:30 AM				07:15 AM				07:30 AM			
+0 mins.	30	38	5	73	21	112	0	133	0	0	111	111	0	124	**1**	125
+15 mins.	26	39	11	76	22	106	0	128	0	0	**119**	**119**	0	114	1	115
+30 mins.	**31**	31	6	68	17	93	0	110	**1**	0	106	107	0	**129**	1	**130**
+45 mins.	31	**45**	**14**	**90**	**26**	**114**	0	**140**	1	0	118	119	0	109	1	110
Total Volume	118	153	36	307	86	425	0	511	2	0	454	456	0	476	4	480
% App. Total	38.4	49.8	11.7		16.8	83.2	0		0.4	0	99.6		0	99.2	0.8	
PHF	.952	.850	.643	.853	.827	.932	.000	.913	.500	.000	.954	.958	.000	.922	1.000	.923

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

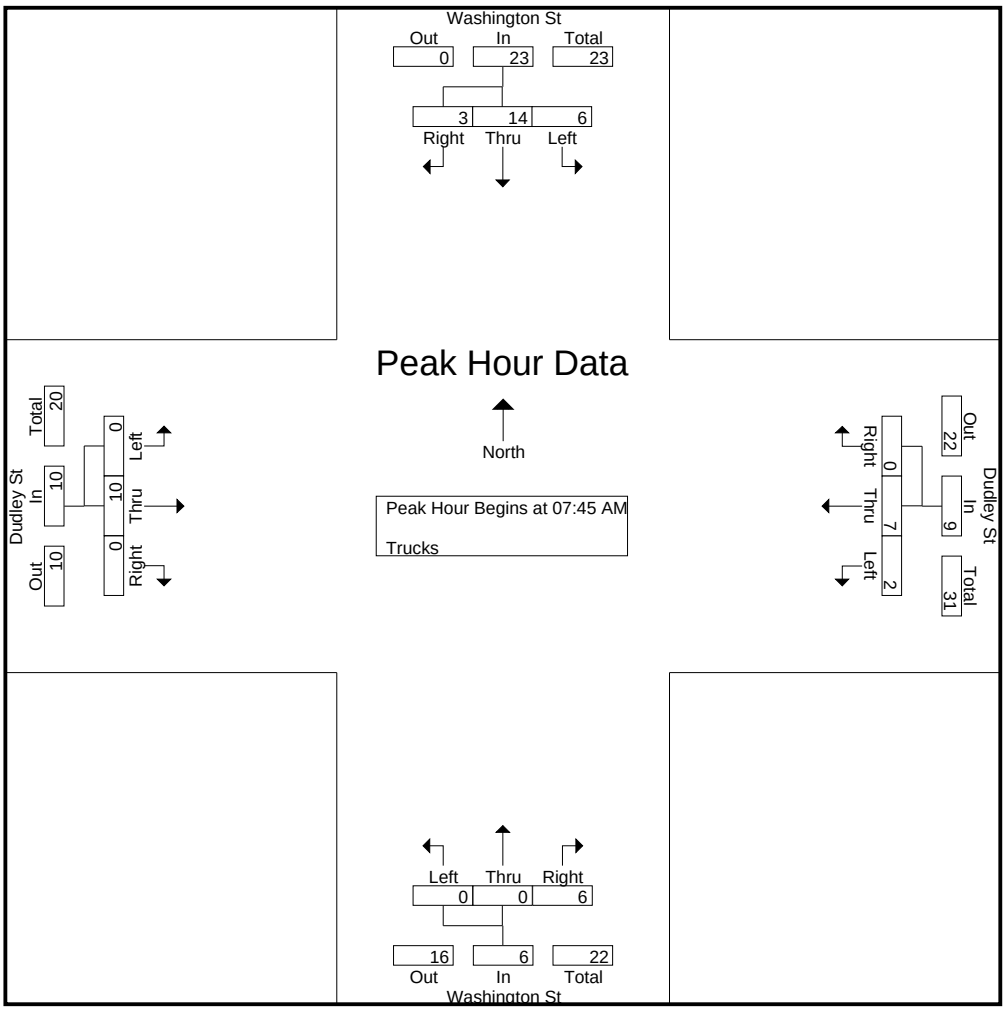
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	0	2	0	0	0	0	0	1	0	2	0	9
07:15 AM	3	1	0	3	4	0	1	0	1	0	0	0	13
07:30 AM	1	1	0	0	2	0	0	0	1	0	1	0	6
07:45 AM	2	6	0	1	3	0	0	0	2	0	4	0	18
Total	10	8	2	4	9	0	1	0	5	0	7	0	46
08:00 AM	2	3	0	0	1	0	0	0	2	0	1	0	9
08:15 AM	2	3	2	0	2	0	0	0	1	0	4	0	14
08:30 AM	0	2	1	1	1	0	0	0	1	0	1	0	7
08:45 AM	3	0	0	2	0	0	0	0	1	0	2	0	8
Total	7	8	3	3	4	0	0	0	5	0	8	0	38
Grand Total	17	16	5	7	13	0	1	0	10	0	15	0	84
Apprch %	44.7	42.1	13.2	35	65	0	9.1	0	90.9	0	100	0	
Total %	20.2	19	6	8.3	15.5	0	1.2	0	11.9	0	17.9	0	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	**2**	**6**	0	**8**	**1**	**3**	0	**4**	0	0	**2**	**2**	0	**4**	0	**4**	**18**
08:00 AM	2	3	0	5	0	1	0	1	0	0	2	2	0	1	0	1	9
08:15 AM	2	3	**2**	7	0	2	0	2	0	0	1	1	0	4	0	4	14
08:30 AM	0	2	1	3	1	1	0	2	0	0	1	1	0	1	0	1	7
Total Volume	6	14	3	23	2	7	0	9	0	0	6	6	0	10	0	10	48
% App. Total	26.1	60.9	13		22.2	77.8	0		0	0	100		0	100	0		
PHF	.750	.583	.375	.719	.500	.583	.000	.563	.000	.000	.750	.750	.000	.625	.000	.625	.667

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

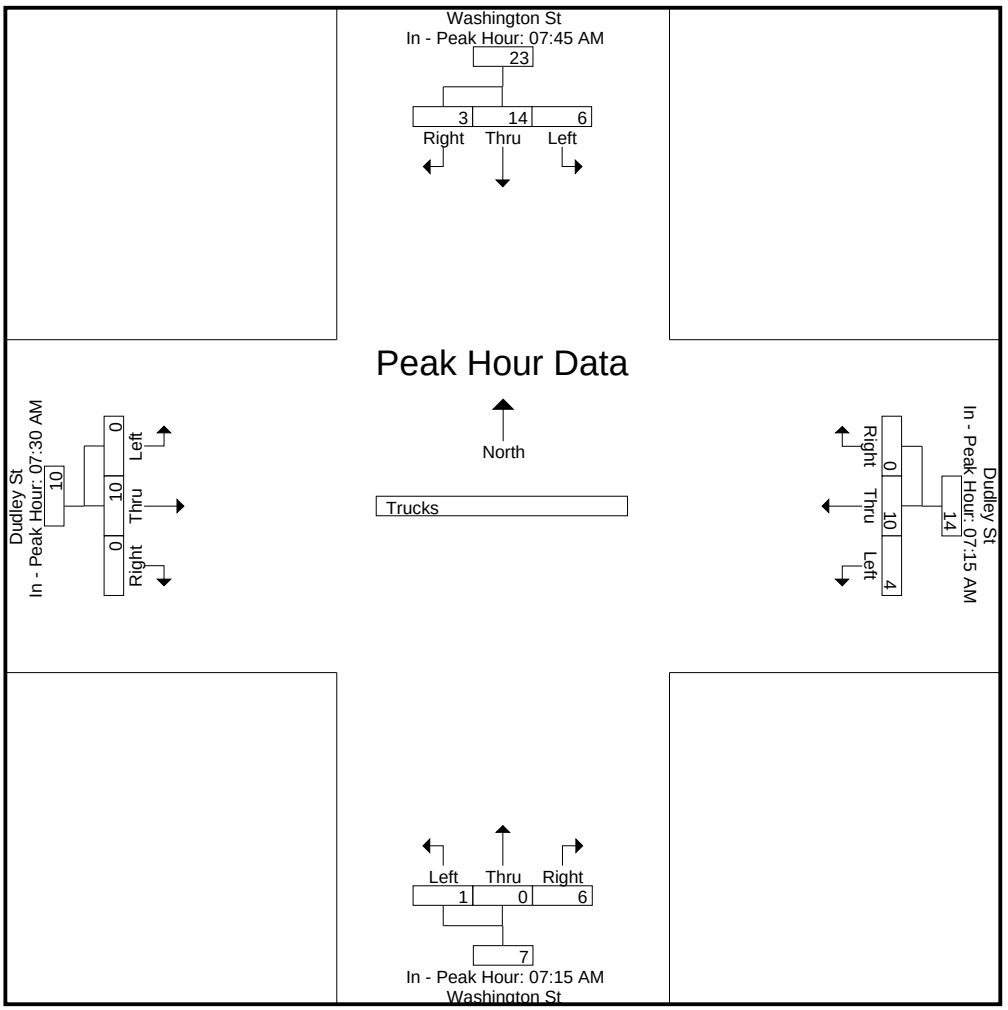
Peak Hour for Each Approach Begins at:

	07:45 AM				07:15 AM				07:15 AM				07:30 AM			
+0 mins.	**2**	**6**	0	**8**	**3**	**4**	0	**7**	**1**	0	1	**2**	0	1	0	1
+15 mins.	2	3	0	5	0	2	0	2	0	0	1	1	0	**4**	0	**4**
+30 mins.	2	3	**2**	7	1	3	0	4	0	0	**2**	2	0	1	0	1
+45 mins.	0	2	1	3	0	1	0	1	0	0	2	2	0	4	0	4
Total Volume	6	14	3	23	4	10	0	14	1	0	6	7	0	10	0	10
% App. Total	26.1	60.9	13		28.6	71.4	0		14.3	0	85.7		0	100	0	
PHF	.750	.583	.375	.719	.333	.625	.000	.500	.250	.000	.750	.875	.000	.625	.000	.625

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

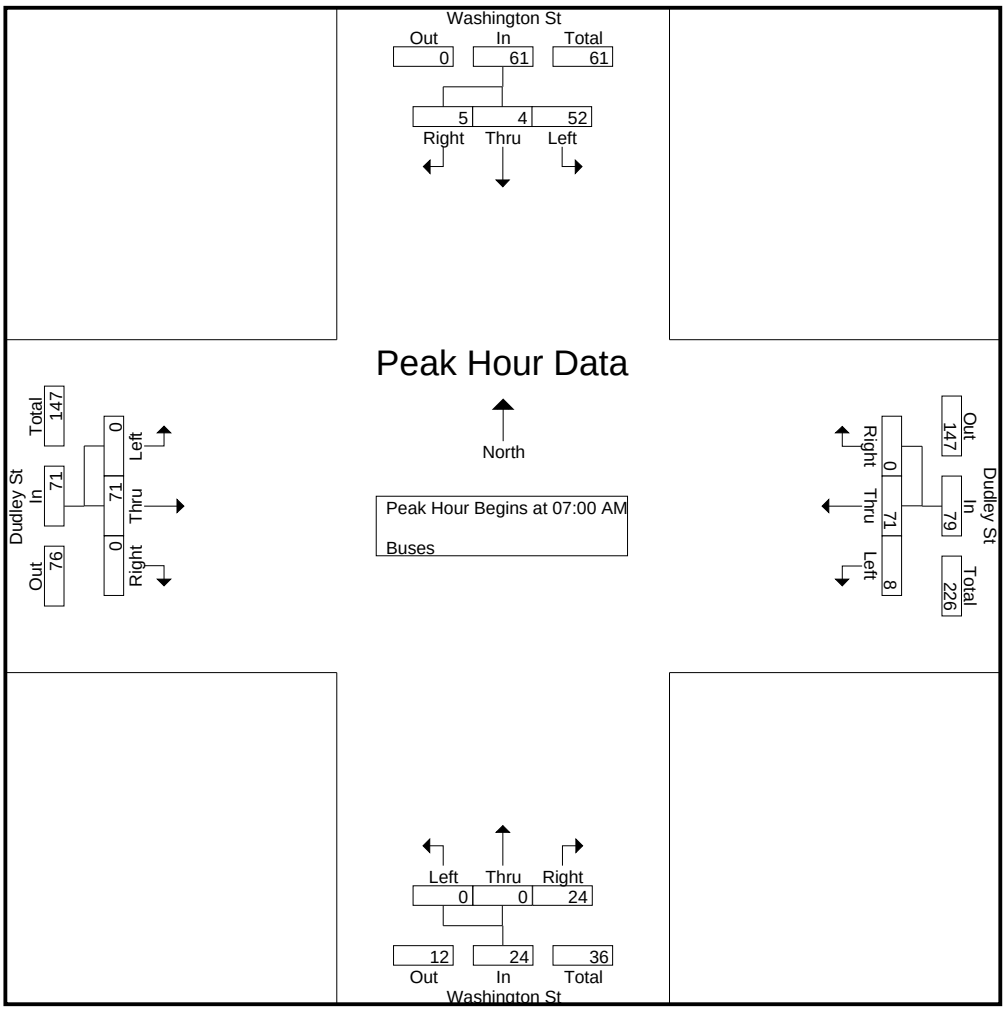
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	11	1	0	2	18	0	0	0	11	0	20	0	63
07:15 AM	14	0	3	4	16	0	0	0	4	0	17	0	58
07:30 AM	15	2	1	1	17	0	0	0	8	0	19	0	63
07:45 AM	12	1	1	1	20	0	0	0	1	0	15	0	51
Total	52	4	5	8	71	0	0	0	24	0	71	0	235
08:00 AM	14	2	0	2	17	0	0	0	3	0	18	0	56
08:15 AM	10	2	2	0	12	0	0	0	2	0	16	0	44
08:30 AM	12	2	3	2	16	0	0	0	1	0	15	0	51
08:45 AM	15	0	0	1	11	0	0	0	4	0	18	0	49
Total	51	6	5	5	56	0	0	0	10	0	67	0	200
Grand Total	103	10	10	13	127	0	0	0	34	0	138	0	435
Apprch %	83.7	8.1	8.1	9.3	90.7	0	0	0	100	0	100	0	
Total %	23.7	2.3	2.3	3	29.2	0	0	0	7.8	0	31.7	0	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	11	1	0	12	2	18	0	20	0	0	**11**	**11**	0	**20**	0	**20**	**63**
07:15 AM	14	0	**3**	17	**4**	16	0	20	0	0	4	4	0	17	0	17	58
07:30 AM	**15**	**2**	1	**18**	1	17	0	18	0	0	8	8	0	19	0	19	63
07:45 AM	12	1	1	14	1	**20**	0	**21**	0	0	1	1	0	15	0	15	51
Total Volume	52	4	5	61	8	71	0	79	0	0	24	24	0	71	0	71	235
% App. Total	85.2	6.6	8.2		10.1	89.9	0		0	0	100		0	100	0		
PHF	.867	.500	.417	.847	.500	.888	.000	.940	.000	.000	.545	.545	.000	.888	.000	.888	.933

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

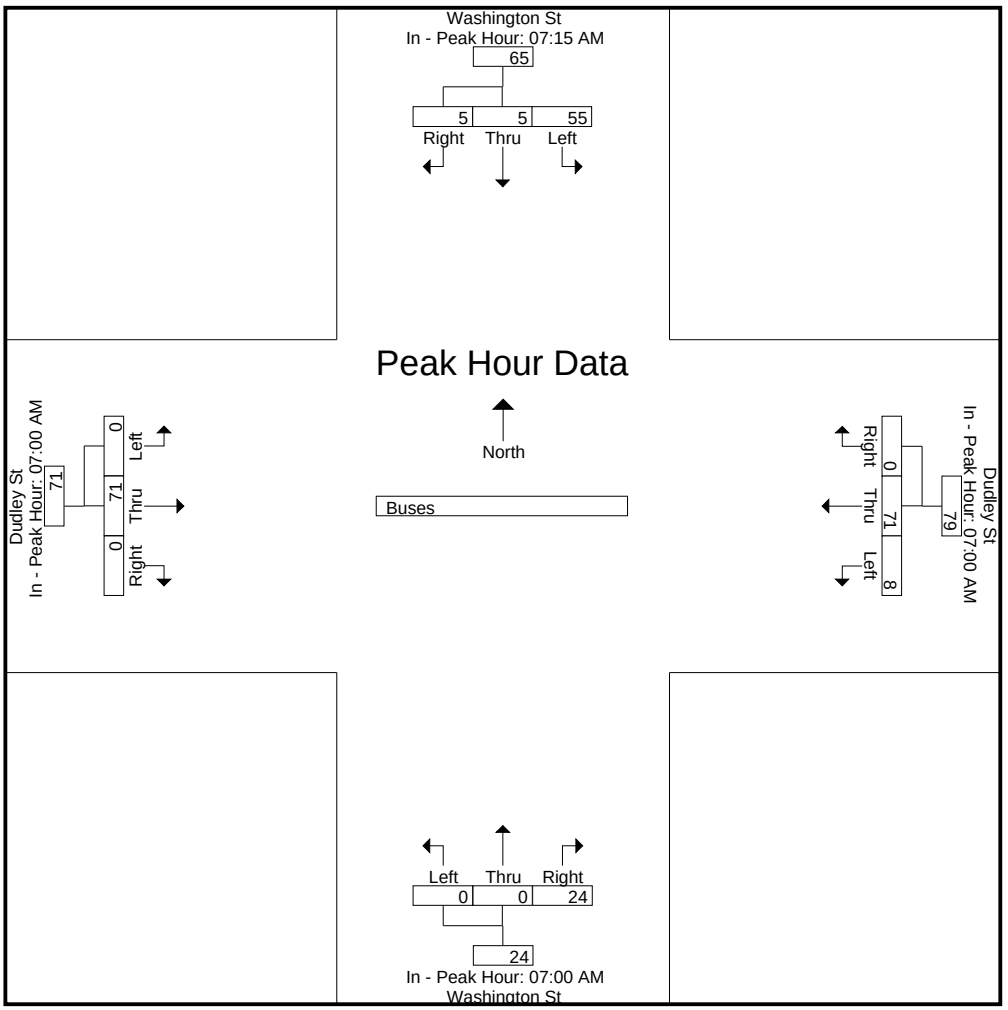
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	14	0	**3**	17	2	18	0	20	0	0	**11**	**11**	0	**20**	0	**20**
+15 mins.	**15**	**2**	1	**18**	**4**	16	0	20	0	0	4	4	0	17	0	17
+30 mins.	12	1	1	14	1	17	0	18	0	0	8	8	0	19	0	19
+45 mins.	14	2	0	16	1	**20**	0	**21**	0	0	1	1	0	15	0	15
Total Volume	55	5	5	65	8	71	0	79	0	0	24	24	0	71	0	71
% App. Total	84.6	7.7	7.7		10.1	89.9	0		0	0	100		0	100	0	
PHF	.917	.625	.417	.903	.500	.888	.000	.940	.000	.000	.545	.545	.000	.888	.000	.888

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

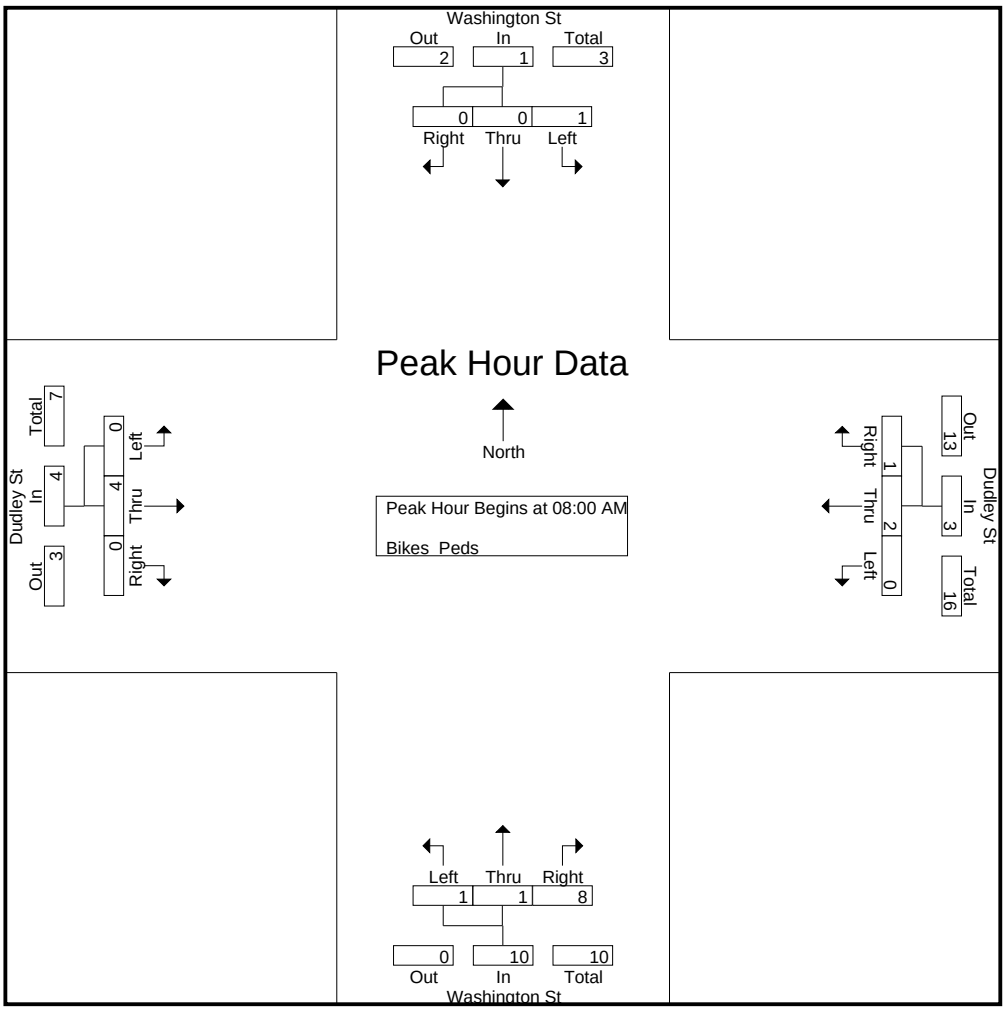
	Washington St From North				Dudley St From East				Washington St From South				Dudley St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	1	0	0	0	6	0	0	0	4	0	1	0	8	19	1	20
07:15 AM	0	0	0	0	0	1	0	23	0	1	1	7	0	1	0	3	33	4	37
07:30 AM	0	0	0	2	0	0	0	10	0	0	2	4	0	0	0	5	21	2	23
07:45 AM	0	1	0	1	0	2	0	6	0	1	1	3	0	1	0	8	18	6	24
Total	0	1	0	4	0	3	0	45	0	2	4	18	0	3	0	24	91	13	104
08:00 AM	0	0	0	0	0	0	0	11	0	0	0	2	0	0	0	12	25	0	25
08:15 AM	0	0	0	1	0	0	0	12	1	0	2	8	0	2	0	8	29	5	34
08:30 AM	1	0	0	1	0	0	1	6	0	0	3	7	0	1	0	14	28	6	34
08:45 AM	0	0	0	2	0	2	0	7	0	1	3	5	0	1	0	13	27	7	34
Total	1	0	0	4	0	2	1	36	1	1	8	22	0	4	0	47	109	18	127
Grand Total	1	1	0	8	0	5	1	81	1	3	12	40	0	7	0	71	200	31	231
Apprch %	50	50	0		0	83.3	16.7		6.2	18.8	75		0	100	0				
Total %	3.2	3.2	0		0	16.1	3.2		3.2	9.7	38.7		0	22.6	0		86.6	13.4	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	**1**	0	2	3	0	**2**	0	**2**	5
08:30 AM	**1**	0	0	**1**	0	0	**1**	1	0	0	**3**	3	0	1	0	1	6
08:45 AM	0	0	0	0	0	**2**	0	**2**	0	**1**	3	**4**	0	1	0	1	**7**
Total Volume	1	0	0	1	0	2	1	3	1	1	8	10	0	4	0	4	18
% App. Total	100	0	0		0	66.7	33.3		10	10	80		0	100	0		
PHF	.250	.000	.000	.250	.000	.250	.250	.375	.250	.250	.667	.625	.000	.500	.000	.500	.643

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

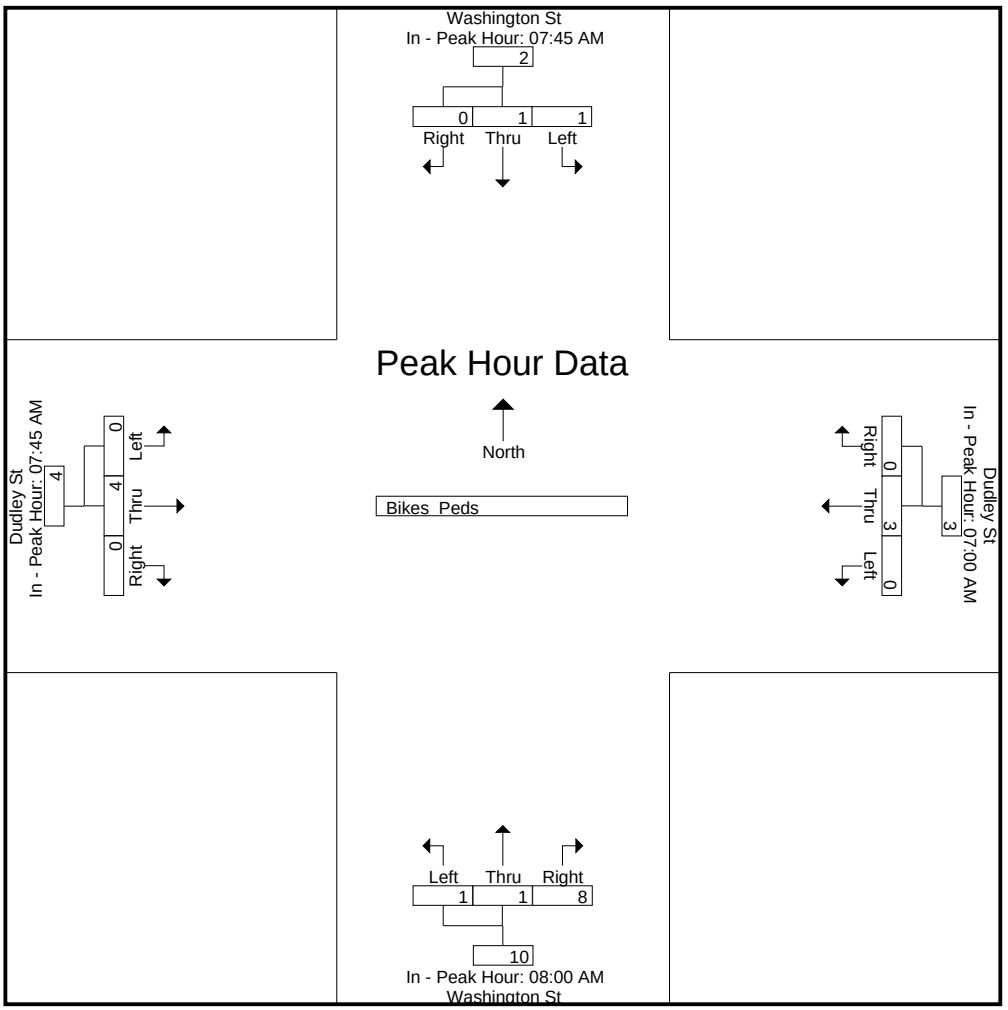
Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				08:00 AM				07:45 AM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	1	0	1	**1**	0	2	3	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	**3**	3	0	**2**	0	**2**
+45 mins.	**1**	0	0	1	0	**2**	0	**2**	0	**1**	3	**4**	0	1	0	1
Total Volume	1	1	0	2	0	3	0	3	1	1	8	10	0	4	0	4
% App. Total	50	50	0		0	100	0		10	10	80		0	100	0	
PHF	.250	.250	.000	.500	.000	.375	.000	.375	.250	.250	.667	.625	.000	.500	.000	.500

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Buses - Trucks

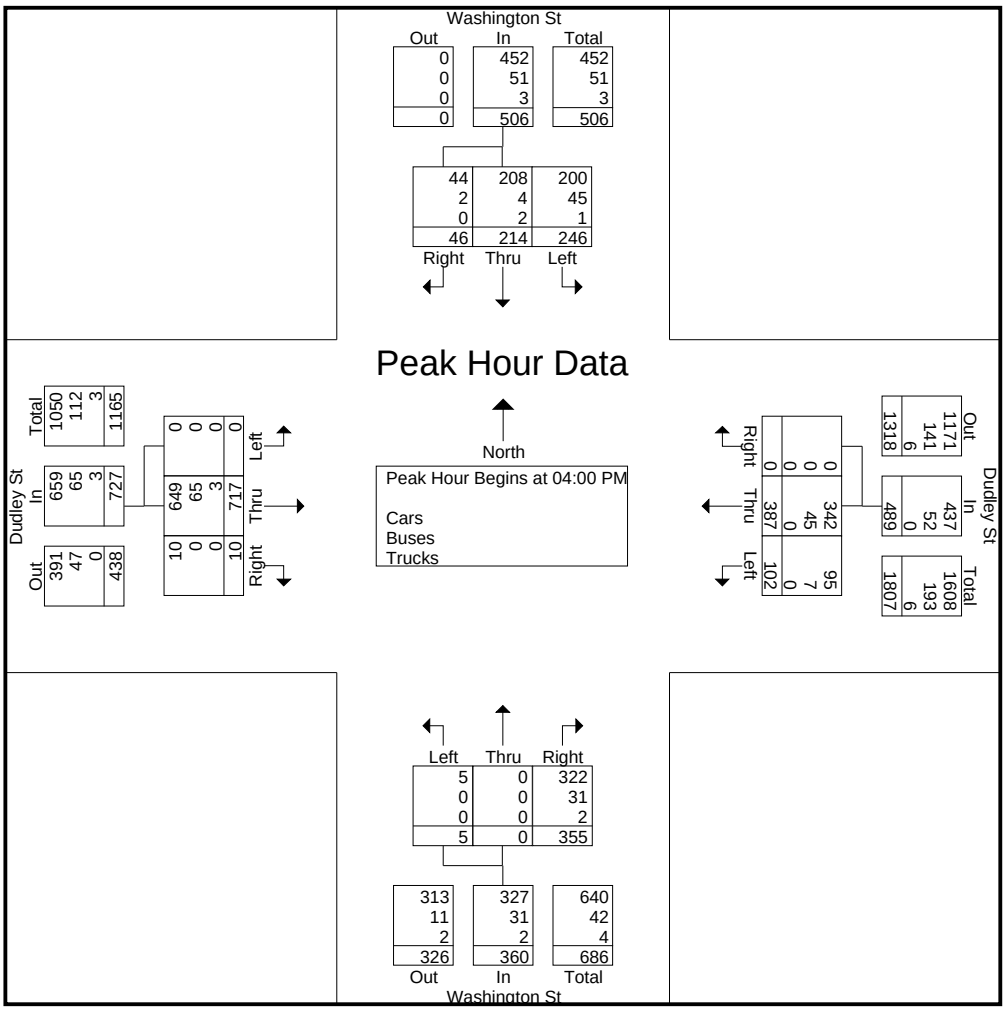
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	60	56	10	25	96	0	3	0	82	0	193	1	526
04:15 PM	56	48	11	27	97	0	0	0	102	0	172	2	515
04:30 PM	65	63	14	28	101	0	1	0	77	0	175	2	526
04:45 PM	65	47	11	22	93	0	1	0	94	0	177	5	515
Total	246	214	46	102	387	0	5	0	355	0	717	10	2082
05:00 PM	71	48	17	27	75	0	1	0	72	0	165	1	477
05:15 PM	76	63	8	31	113	0	2	0	78	0	184	1	556
05:30 PM	56	55	22	37	96	0	5	0	89	0	156	2	518
05:45 PM	68	54	10	41	102	0	2	0	75	0	166	2	520
Total	271	220	57	136	386	0	10	0	314	0	671	6	2071
Grand Total	517	434	103	238	773	0	15	0	669	0	1388	16	4153
Apprch %	49.1	41.2	9.8	23.5	76.5	0	2.2	0	97.8	0	98.9	1.1	
Total %	12.4	10.5	2.5	5.7	18.6	0	0.4	0	16.1	0	33.4	0.4	
Cars	435	427	100	226	681	0	15	0	625	0	1267	16	3792
% Cars	84.1	98.4	97.1	95	88.1	0	100	0	93.4	0	91.3	100	91.3
Buses	81	5	3	11	92	0	0	0	40	0	117	0	349
% Buses	15.7	1.2	2.9	4.6	11.9	0	0	0	6	0	8.4	0	8.4
Trucks	1	2	0	1	0	0	0	0	4	0	4	0	12
% Trucks	0.2	0.5	0	0.4	0	0	0	0	0.6	0	0.3	0	0.3

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	60	56	10	126	25	96	0	121	**3**	0	82	85	0	**193**	1	**194**	**526**
04:15 PM	56	48	11	115	27	97	0	124	0	0	**102**	**102**	0	172	2	174	515
04:30 PM	**65**	**63**	**14**	**142**	**28**	**101**	0	**129**	1	0	77	78	0	175	2	177	526
04:45 PM	65	47	11	123	22	93	0	115	1	0	94	95	0	177	**5**	182	515
Total Volume	246	214	46	506	102	387	0	489	5	0	355	360	0	717	10	727	2082
% App. Total	48.6	42.3	9.1		20.9	79.1	0		1.4	0	98.6		0	98.6	1.4		
PHF	.946	.849	.821	.891	.911	.958	.000	.948	.417	.000	.870	.882	.000	.929	.500	.937	.990
Cars	200	208	44	452	95	342	0	437	5	0	322	327	0	649	10	659	1875
% Cars	81.3	97.2	95.7	89.3	93.1	88.4	0	89.4	100	0	90.7	90.8	0	90.5	100	90.6	90.1
Buses	45	4	2	51	7	45	0	52	0	0	31	31	0	65	0	65	199
% Buses	18.3	1.9	4.3	10.1	6.9	11.6	0	10.6	0	0	8.7	8.6	0	9.1	0	8.9	9.6
Trucks	1	2	0	3	0	0	0	0	0	0	2	2	0	3	0	3	8
% Trucks	0.4	0.9	0	0.6	0	0	0	0	0	0	0.6	0.6	0	0.4	0	0.4	0.4

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

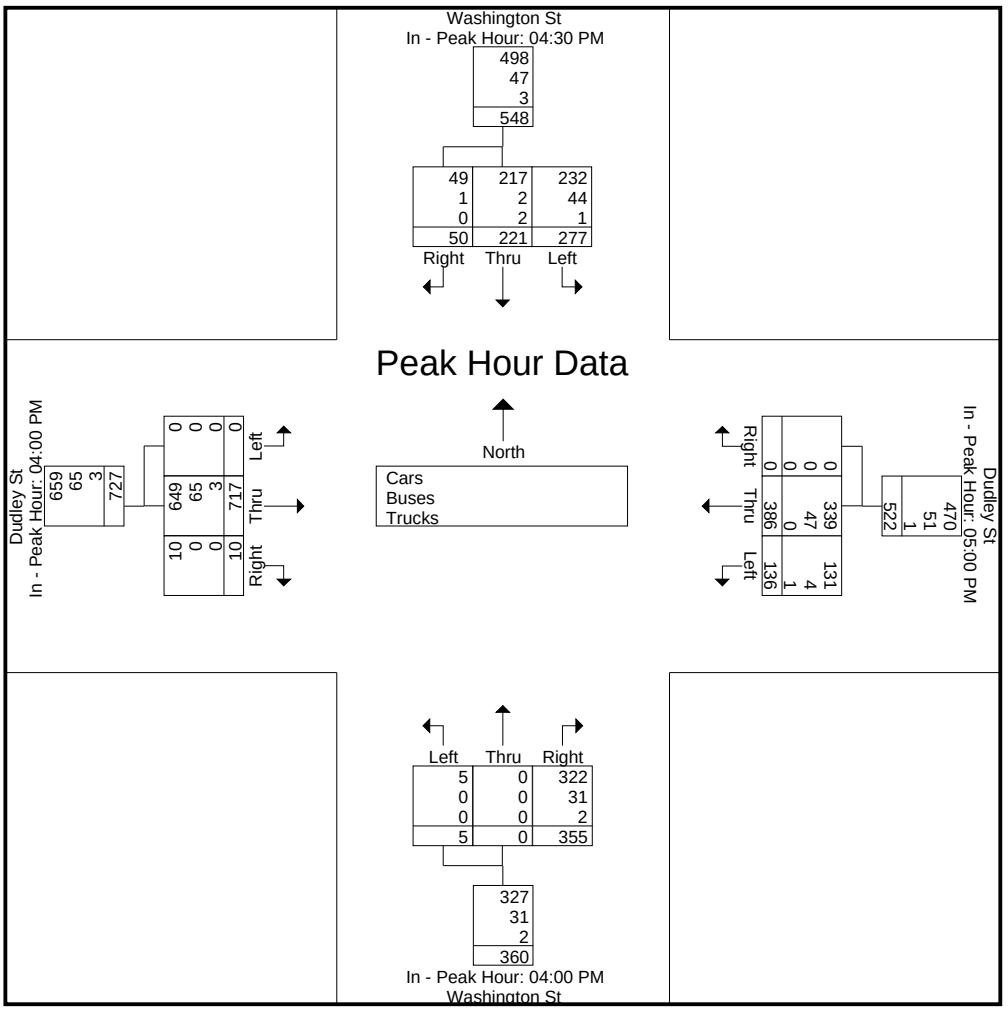
Peak Hour for Each Approach Begins at:

	04:30 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	65	**63**	14	142	27	75	0	102	**3**	0	82	85	0	**193**	1	**194**
+15 mins.	65	47	11	123	31	**113**	0	**144**	0	0	**102**	**102**	0	172	2	174
+30 mins.	71	48	**17**	136	37	96	0	133	1	0	77	78	0	175	2	177
+45 mins.	**76**	63	8	**147**	**41**	102	0	143	1	0	94	95	0	177	**5**	182
Total Volume	277	221	50	548	136	386	0	522	5	0	355	360	0	717	10	727
% App. Total	50.5	40.3	9.1		26.1	73.9	0		1.4	0	98.6		0	98.6	1.4	
PHF	.911	.877	.735	.932	.829	.854	.000	.906	.417	.000	.870	.882	.000	.929	.500	.937
Cars	232	217	49	498	131	339	0	470	5	0	322	327	0	649	10	659
% Cars	83.8	98.2	98	90.9	96.3	87.8	0	90	100	0	90.7	90.8	0	90.5	100	90.6
Buses	44	2	1	47	4	47	0	51	0	0	31	31	0	65	0	65
% Buses	15.9	0.9	2	8.6	2.9	12.2	0	9.8	0	0	8.7	8.6	0	9.1	0	8.9
Trucks	1	2	0	3	1	0	0	1	0	0	2	2	0	3	0	3
% Trucks	0.4	0.9	0	0.5	0.7	0	0	0.2	0	0	0.6	0.6	0	0.4	0	0.4

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

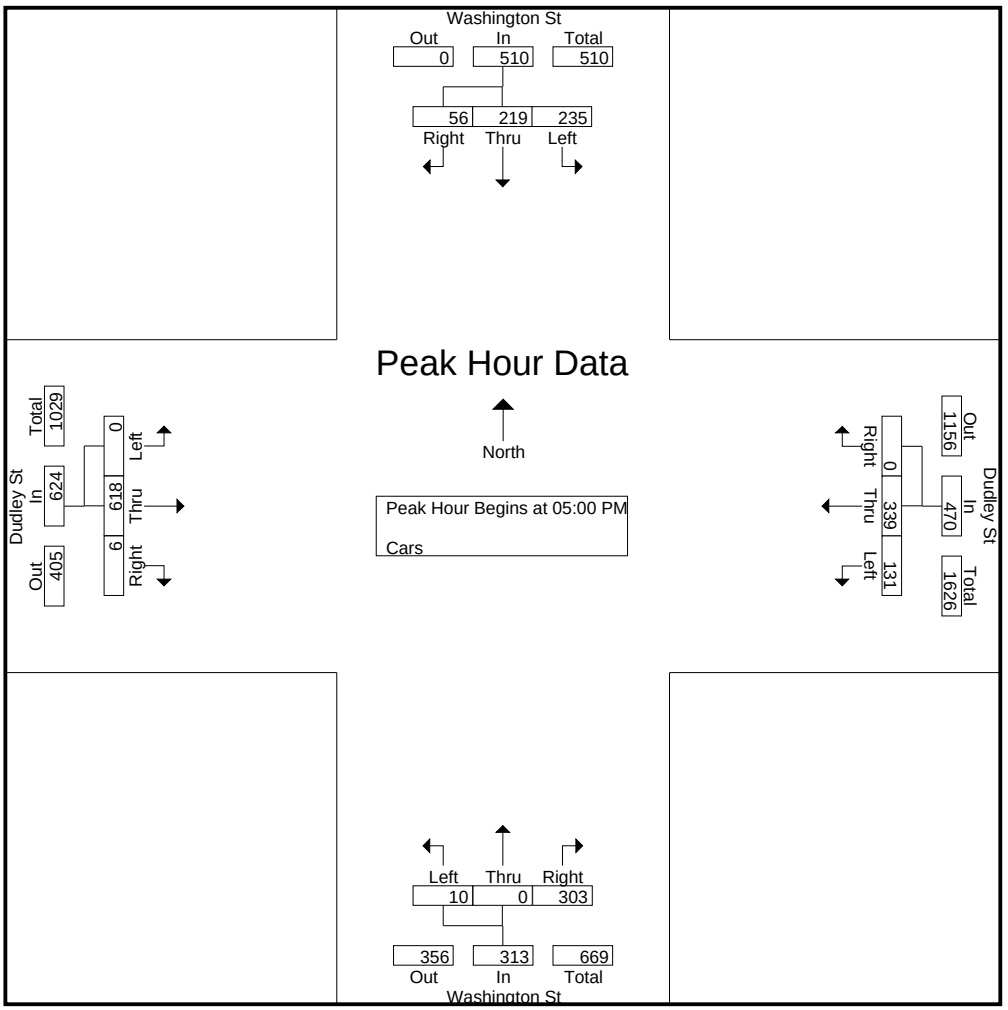
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	51	55	9	21	79	0	3	0	72	0	178	1	469
04:15 PM	44	47	11	26	86	0	0	0	92	0	152	2	460
04:30 PM	55	62	14	26	92	0	1	0	72	0	160	2	484
04:45 PM	50	44	10	22	85	0	1	0	86	0	159	5	462
Total	200	208	44	95	342	0	5	0	322	0	649	10	1875
05:00 PM	64	48	17	25	62	0	1	0	67	0	156	1	441
05:15 PM	63	63	8	31	103	0	2	0	73	0	168	1	512
05:30 PM	47	55	21	36	81	0	5	0	89	0	142	2	478
05:45 PM	61	53	10	39	93	0	2	0	74	0	152	2	486
Total	235	219	56	131	339	0	10	0	303	0	618	6	1917
Grand Total	435	427	100	226	681	0	15	0	625	0	1267	16	3792
Apprch %	45.2	44.4	10.4	24.9	75.1	0	2.3	0	97.7	0	98.8	1.2	
Total %	11.5	11.3	2.6	6	18	0	0.4	0	16.5	0	33.4	0.4	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	**64**	48	17	129	25	62	0	87	1	0	67	68	0	156	1	157	441
05:15 PM	63	**63**	8	**134**	31	**103**	0	**134**	2	0	73	75	0	**168**	1	**169**	**512**
05:30 PM	47	55	**21**	123	36	81	0	117	**5**	0	**89**	**94**	0	142	**2**	144	478
05:45 PM	61	53	10	124	**39**	93	0	132	2	0	74	76	0	152	2	154	486
Total Volume	235	219	56	510	131	339	0	470	10	0	303	313	0	618	6	624	1917
% App. Total	46.1	42.9	11		27.9	72.1	0		3.2	0	96.8		0	99	1		
PHF	.918	.869	.667	.951	.840	.823	.000	.877	.500	.000	.851	.832	.000	.920	.750	.923	.936

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

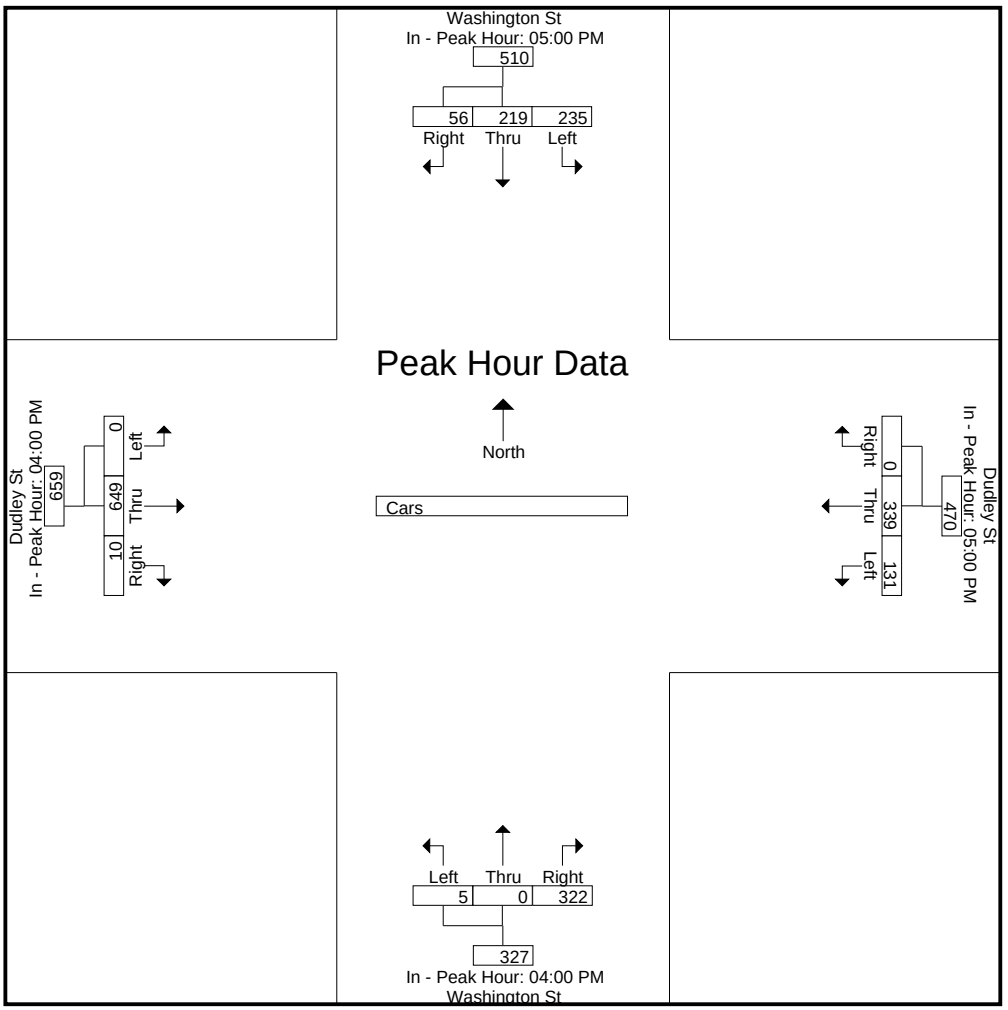
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	**64**	48	17	129	25	62	0	87	**3**	0	72	75	0	**178**	1	**179**
+15 mins.	63	**63**	8	**134**	31	**103**	0	**134**	0	0	**92**	**92**	0	152	2	154
+30 mins.	47	55	**21**	123	36	81	0	117	1	0	72	73	0	160	2	162
+45 mins.	61	53	10	124	**39**	93	0	132	1	0	86	87	0	159	**5**	164
Total Volume	235	219	56	510	131	339	0	470	5	0	322	327	0	649	10	659
% App. Total	46.1	42.9	11		27.9	72.1	0		1.5	0	98.5		0	98.5	1.5	
PHF	.918	.869	.667	.951	.840	.823	.000	.877	.417	.000	.875	.889	.000	.912	.500	.920

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

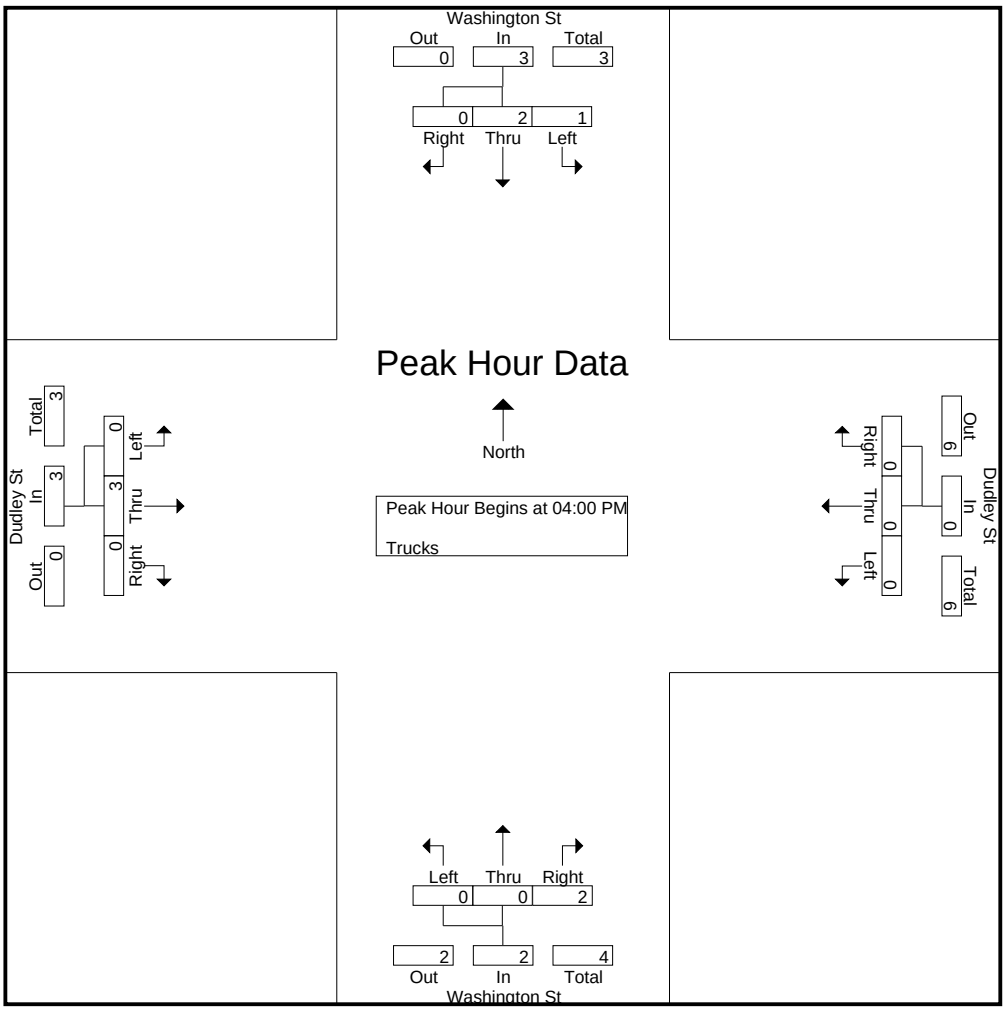
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	1	0	1	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:45 PM	1	2	0	0	0	0	0	0	1	0	0	0	4
Total	1	2	0	0	0	0	0	0	2	0	3	0	8
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	1	0	1	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	1	0	0	0	0	1	0	0	0	2
Total	0	0	0	1	0	0	0	0	2	0	1	0	4
Grand Total	1	2	0	1	0	0	0	0	4	0	4	0	12
Apprch %	33.3	66.7	0	100	0	0	0	0	100	0	100	0	
Total %	8.3	16.7	0	8.3	0	0	0	0	33.3	0	33.3	0	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	0	0	0	0	0	0	0	0	0	**1**	**1**	0	**1**	0	**1**	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	**1**	**2**	0	**3**	0	0	0	0	0	0	1	1	0	0	0	0	**4**
Total Volume	1	2	0	3	0	0	0	0	0	0	2	2	0	3	0	3	8
% App. Total	33.3	66.7	0		0	0	0		0	0	100		0	100	0		
PHF	.250	.250	.000	.250	.000	.000	.000	.000	.000	.000	.500	.500	.000	.750	.000	.750	.500

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

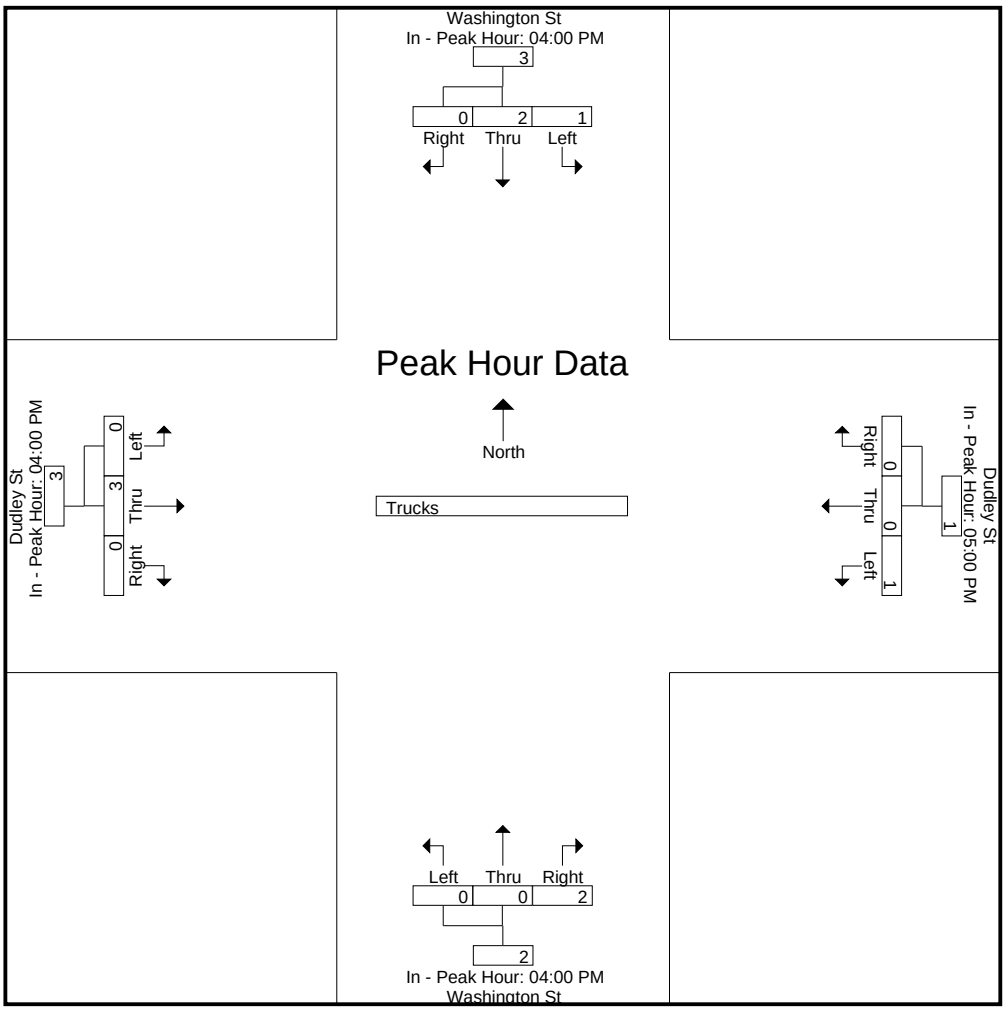
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	**1**	0	**1**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	**1**	**2**	0	**3**	**1**	0	0	**1**	0	0	1	1	0	0	0	0
Total Volume	1	2	0	3	1	0	0	1	0	0	2	2	0	3	0	3
% App. Total	33.3	66.7	0		100	0	0		0	0	100		0	100	0	
PHF	.250	.250	.000	.250	.250	.000	.000	.250	.000	.000	.500	.500	.000	.750	.000	.750

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

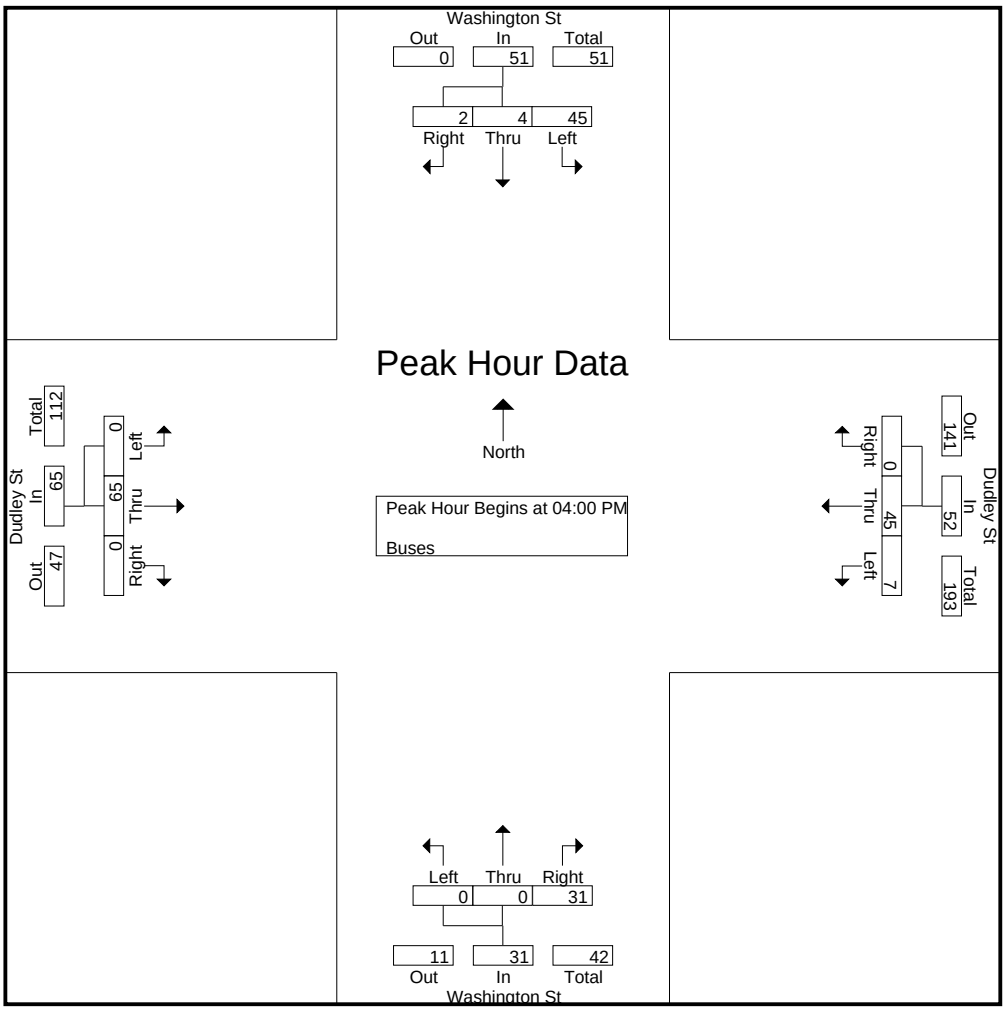
	Washington St From North			Dudley St From East			Washington St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	9	1	1	4	17	0	0	0	9	0	14	0	55
04:15 PM	12	1	0	1	11	0	0	0	10	0	19	0	54
04:30 PM	10	1	0	2	9	0	0	0	5	0	14	0	41
04:45 PM	14	1	1	0	8	0	0	0	7	0	18	0	49
Total	45	4	2	7	45	0	0	0	31	0	65	0	199
05:00 PM	7	0	0	2	13	0	0	0	5	0	9	0	36
05:15 PM	13	0	0	0	10	0	0	0	4	0	15	0	42
05:30 PM	9	0	1	1	15	0	0	0	0	0	14	0	40
05:45 PM	7	1	0	1	9	0	0	0	0	0	14	0	32
Total	36	1	1	4	47	0	0	0	9	0	52	0	150
Grand Total	81	5	3	11	92	0	0	0	40	0	117	0	349
Apprch %	91	5.6	3.4	10.7	89.3	0	0	0	100	0	100	0	
Total %	23.2	1.4	0.9	3.2	26.4	0	0	0	11.5	0	33.5	0	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	9	**1**	**1**	11	**4**	**17**	0	**21**	0	0	9	9	0	14	0	14	**55**
04:15 PM	12	1	0	13	1	11	0	12	0	0	**10**	**10**	0	**19**	0	**19**	54
04:30 PM	10	1	0	11	2	9	0	11	0	0	5	5	0	14	0	14	41
04:45 PM	**14**	1	1	**16**	0	8	0	8	0	0	7	7	0	18	0	18	49
Total Volume	45	4	2	51	7	45	0	52	0	0	31	31	0	65	0	65	199
% App. Total	88.2	7.8	3.9		13.5	86.5	0		0	0	100		0	100	0		
PHF	.804	1.00	.500	.797	.438	.662	.000	.619	.000	.000	.775	.775	.000	.855	.000	.855	.905

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

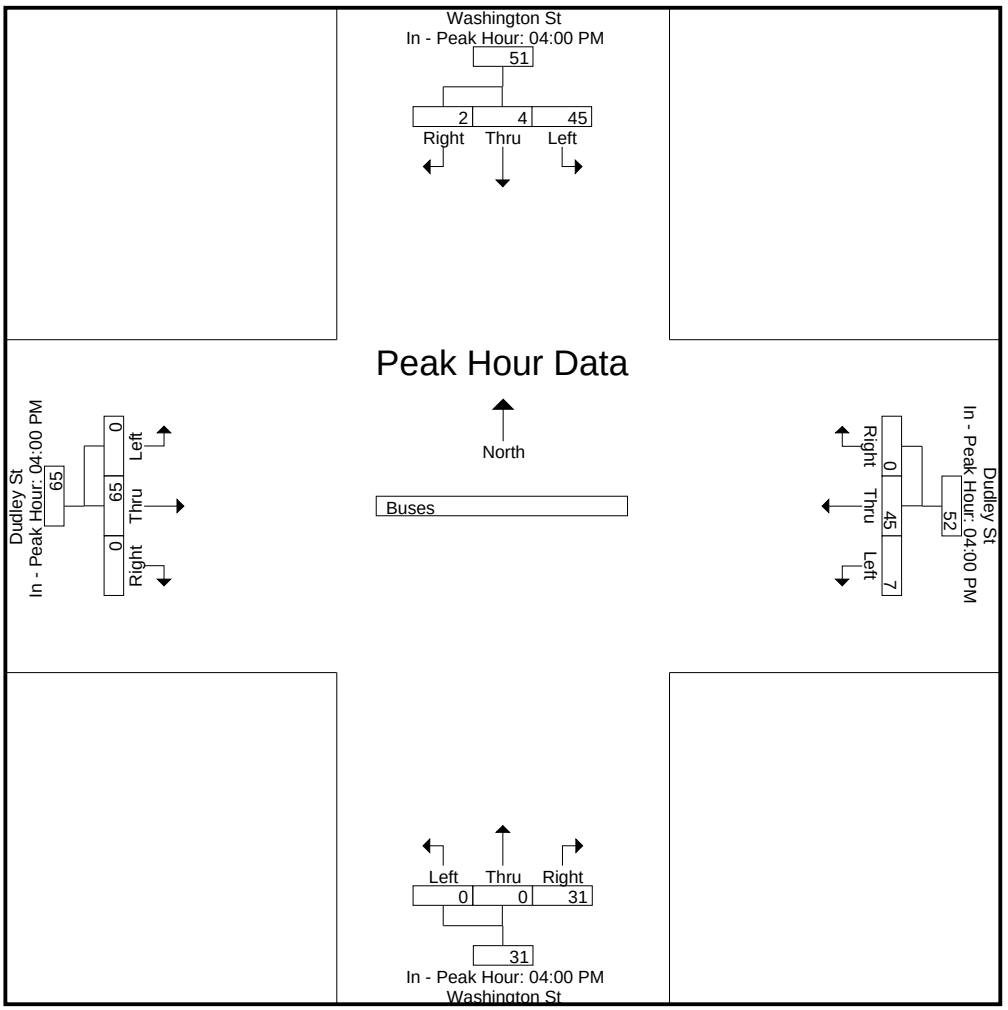
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	9	**1**	**1**	11	**4**	**17**	0	**21**	0	0	9	9	0	14	0	14
+15 mins.	12	1	0	13	1	11	0	12	0	0	**10**	**10**	0	**19**	0	**19**
+30 mins.	10	1	0	11	2	9	0	11	0	0	5	5	0	14	0	14
+45 mins.	**14**	1	1	**16**	0	8	0	8	0	0	7	7	0	18	0	18
Total Volume	45	4	2	51	7	45	0	52	0	0	31	31	0	65	0	65
% App. Total	88.2	7.8	3.9		13.5	86.5	0		0	0	100		0	100	0	
PHF	.804	1.000	.500	.797	.438	.662	.000	.619	.000	.000	.775	.775	.000	.855	.000	.855

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

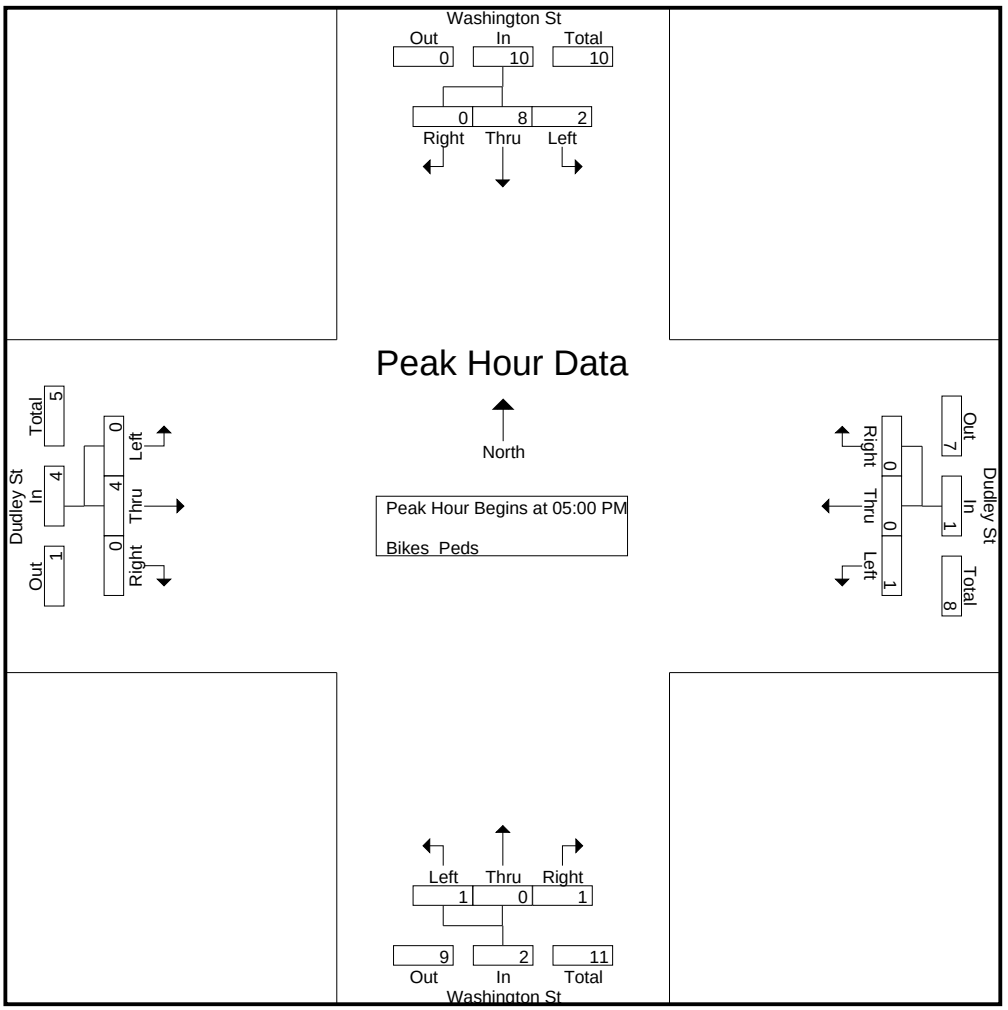
	Washington St From North				Dudley St From East				Washington St From South				Dudley St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	15	0	0	0	5	0	1	0	17	37	2	39
04:15 PM	1	2	0	0	0	0	0	10	0	0	0	0	0	0	0	15	25	3	28
04:30 PM	0	0	0	0	0	1	0	25	0	0	0	3	0	2	0	8	36	3	39
04:45 PM	0	0	0	0	0	0	0	16	0	0	0	6	0	0	0	15	37	0	37
Total	1	2	0	0	0	2	0	66	0	0	0	14	0	3	0	55	135	8	143
05:00 PM	0	0	0	0	1	0	0	10	0	0	0	1	0	1	0	13	24	2	26
05:15 PM	0	3	0	0	0	0	0	6	1	0	1	4	0	1	0	5	15	6	21
05:30 PM	1	1	0	0	0	0	0	15	0	0	0	8	0	2	0	14	37	4	41
05:45 PM	1	4	0	0	0	0	0	24	0	0	0	7	0	0	0	10	41	5	46
Total	2	8	0	0	1	0	0	55	1	0	1	20	0	4	0	42	117	17	134
Grand Total	3	10	0	0	1	2	0	121	1	0	1	34	0	7	0	97	252	25	277
Apprch %	23.1	76.9	0		33.3	66.7	0		50	0	50		0	100	0				
Total %	12	40	0		4	8	0		4	0	4		0	28	0		91	9	

	Washington St From North				Dudley St From East				Washington St From South				Dudley 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	0	0	0	**1**	0	0	**1**	0	0	0	0	0	1	0	1	2
05:15 PM	0	3	0	3	0	0	0	0	**1**	0	**1**	**2**	0	1	0	1	**6**
05:30 PM	**1**	1	0	2	0	0	0	0	0	0	0	0	0	**2**	0	**2**	4
05:45 PM	1	**4**	0	**5**	0	0	0	0	0	0	0	0	0	0	0	0	5
Total Volume	2	8	0	10	1	0	0	1	1	0	1	2	0	4	0	4	17
% App. Total	20	80	0		100	0	0		50	0	50		0	100	0		
PHF	.500	.500	.000	.500	.250	.000	.000	.250	.250	.000	.250	.250	.000	.500	.000	.500	.708

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 2



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

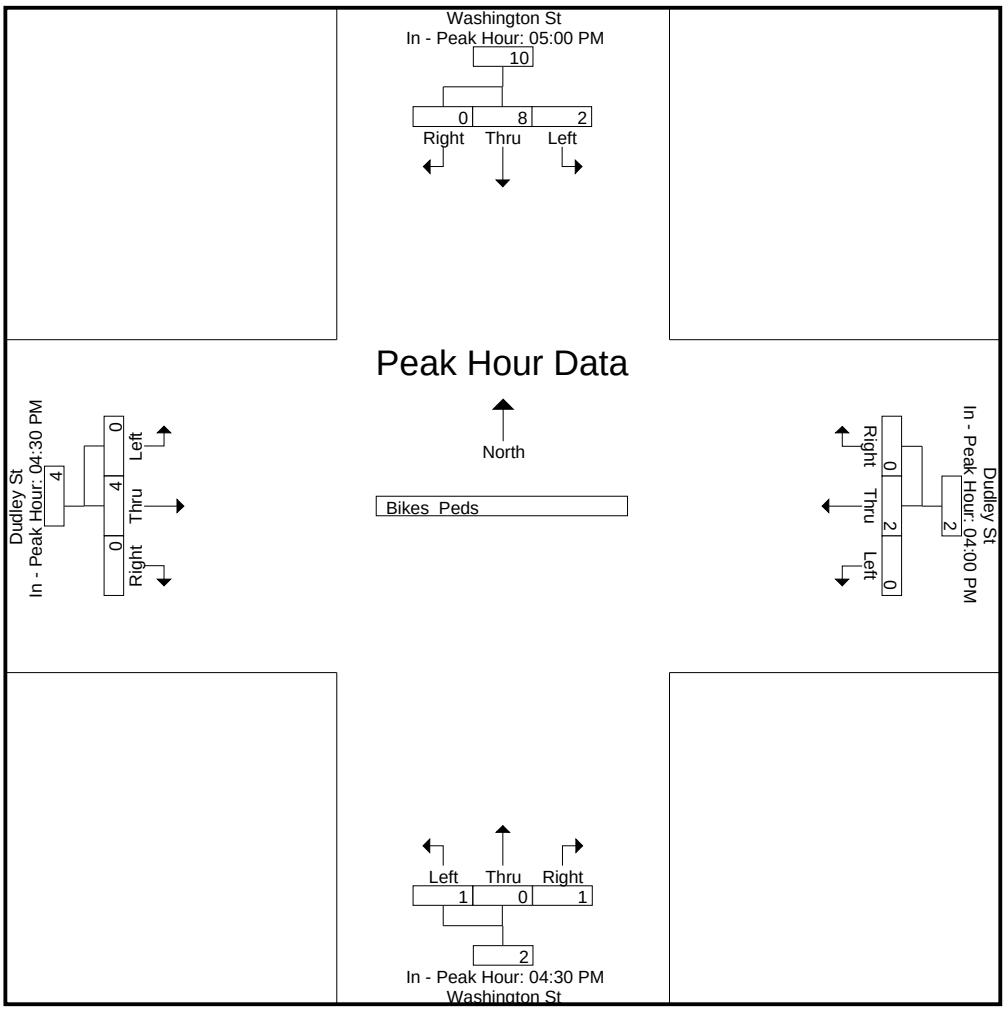
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**2**	0	**2**
+15 mins.	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	**1**	1	0	2	0	1	0	1	0	0	0	0	0	1	0	1
+45 mins.	1	**4**	0	**5**	0	0	0	0	**1**	0	**1**	**2**	0	1	0	1
Total Volume	2	8	0	10	0	2	0	2	1	0	1	2	0	4	0	4
% App. Total	20	80	0		0	100	0		50	0	50		0	100	0	
PHF	.500	.500	.000	.500	.000	.500	.000	.500	.250	.000	.250	.250	.000	.500	.000	.500

Accurate Counts
978-664-2565

N/S Street : Washington Street
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890002
Site Code : 15890002
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Trucks - Buses

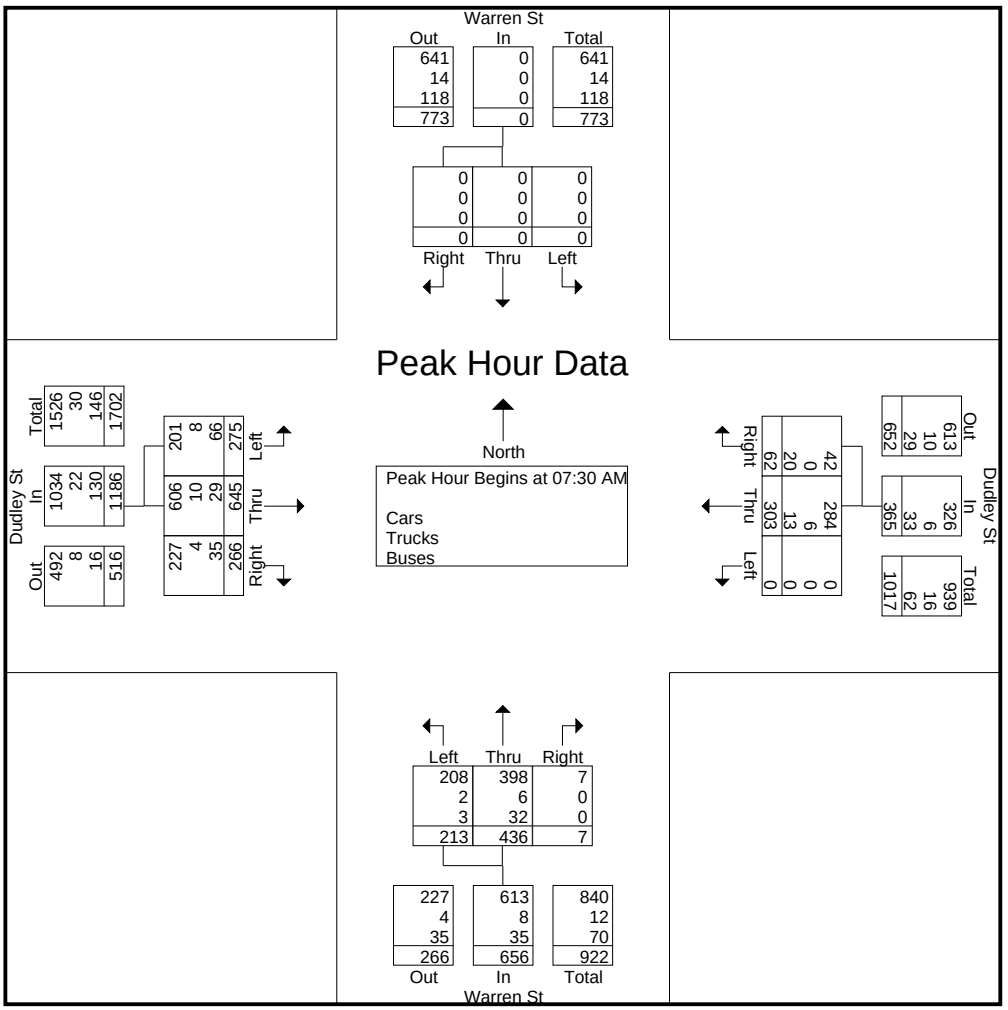
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	66	22	58	76	3	68	105	62	460
07:15 AM	0	0	0	0	52	12	63	96	4	60	128	76	491
07:30 AM	0	0	0	0	67	13	62	98	1	69	174	66	550
07:45 AM	0	0	0	0	72	14	54	127	2	72	151	61	553
Total	0	0	0	0	257	61	237	397	10	269	558	265	2054
08:00 AM	0	0	0	0	68	21	57	117	4	65	177	78	587
08:15 AM	0	0	0	0	96	14	40	94	0	69	143	61	517
08:30 AM	0	0	0	0	93	13	36	96	3	72	150	58	521
08:45 AM	0	0	0	0	55	21	43	91	2	66	131	72	481
Total	0	0	0	0	312	69	176	398	9	272	601	269	2106
Grand Total	0	0	0	0	569	130	413	795	19	541	1159	534	4160
Apprch %	0	0	0	0	81.4	18.6	33.7	64.8	1.5	24.2	51.9	23.9	
Total %	0	0	0	0	13.7	3.1	9.9	19.1	0.5	13	27.9	12.8	
Cars	0	0	0	0	535	92	398	705	19	396	1075	453	3673
% Cars	0	0	0	0	94	70.8	96.4	88.7	100	73.2	92.8	84.8	88.3
Trucks	0	0	0	0	14	1	3	11	0	15	18	9	71
% Trucks	0	0	0	0	2.5	0.8	0.7	1.4	0	2.8	1.6	1.7	1.7
Buses	0	0	0	0	20	37	12	79	0	130	66	72	416
% Buses	0	0	0	0	3.5	28.5	2.9	9.9	0	24	5.7	13.5	10

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	67	13	80	**62**	98	1	161	69	174	66	309	550
07:45 AM	0	0	0	0	0	72	14	86	54	**127**	2	**183**	**72**	151	61	284	553
08:00 AM	0	0	0	0	0	68	**21**	89	57	117	**4**	178	65	**177**	**78**	**320**	**587**
08:15 AM	0	0	0	0	0	**96**	14	**110**	40	94	0	134	69	143	61	273	517
Total Volume	0	0	0	0	0	303	62	365	213	436	7	656	275	645	266	1186	2207
% App. Total	0	0	0		0	83	17		32.5	66.5	1.1		23.2	54.4	22.4		
PHF	.000	.000	.000	.000	.000	.789	.738	.830	.859	.858	.438	.896	.955	.911	.853	.927	.940
Cars	0	0	0	0	0	284	42	326	208	398	7	613	201	606	227	1034	1973
% Cars	0	0	0	0	0	93.7	67.7	89.3	97.7	91.3	100	93.4	73.1	94.0	85.3	87.2	89.4
Trucks	0	0	0	0	0	6	0	6	2	6	0	8	8	10	4	22	36
% Trucks	0	0	0	0	0	2.0	0	1.6	0.9	1.4	0	1.2	2.9	1.6	1.5	1.9	1.6
Buses	0	0	0	0	0	13	20	33	3	32	0	35	66	29	35	130	198
% Buses	0	0	0	0	0	4.3	32.3	9.0	1.4	7.3	0	5.3	24.0	4.5	13.2	11.0	9.0

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



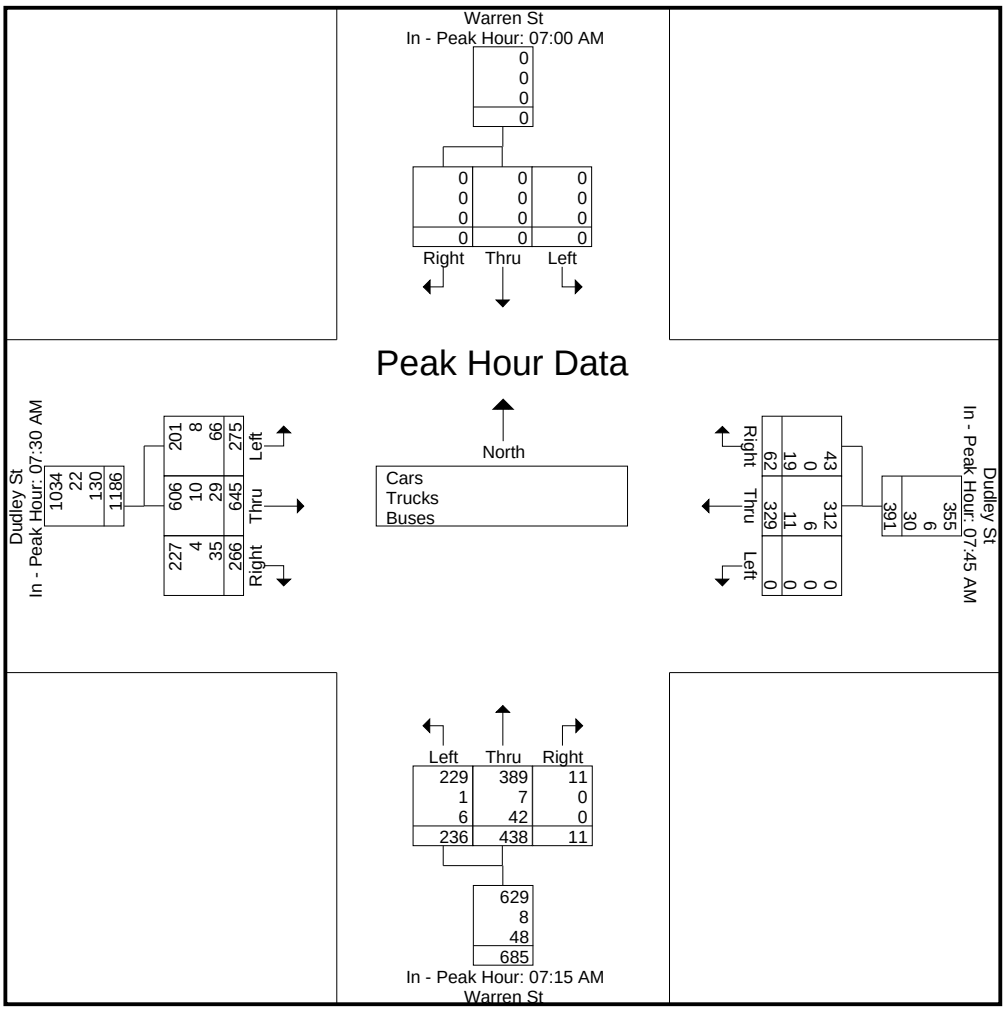
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:45 AM				07:15 AM				07:30 AM			
+0 mins.	0	0	0	0	0	72	14	86	**63**	96	**4**	163	69	174	66	309
+15 mins.	0	0	0	0	0	68	**21**	89	62	98	1	161	**72**	151	61	284
+30 mins.	0	0	0	0	0	**96**	14	**110**	54	**127**	2	**183**	65	**177**	**78**	**320**
+45 mins.	0	0	0	0	0	93	13	106	57	117	4	178	69	143	61	273
Total Volume	0	0	0	0	0	329	62	391	236	438	11	685	275	645	266	1186
% App. Total	0	0	0		0	84.1	15.9		34.5	63.9	1.6		23.2	54.4	22.4	
PHF	.000	.000	.000	.000	.000	.857	.738	.889	.937	.862	.688	.936	.955	.911	.853	.927
Cars	0	0	0	0	0	312	43	355	229	389	11	629	201	606	227	1034
% Cars	0	0	0	0	0	94.8	69.4	90.8	97	88.8	100	91.8	73.1	94	85.3	87.2
Trucks	0	0	0	0	0	6	0	6	1	7	0	8	8	10	4	22
% Trucks	0	0	0	0	0	1.8	0	1.5	0.4	1.6	0	1.2	2.9	1.6	1.5	1.9
Buses	0	0	0	0	0	11	19	30	6	42	0	48	66	29	35	130
% Buses	0	0	0	0	0	3.3	30.6	7.7	2.5	9.6	0	7	24	4.5	13.2	11

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

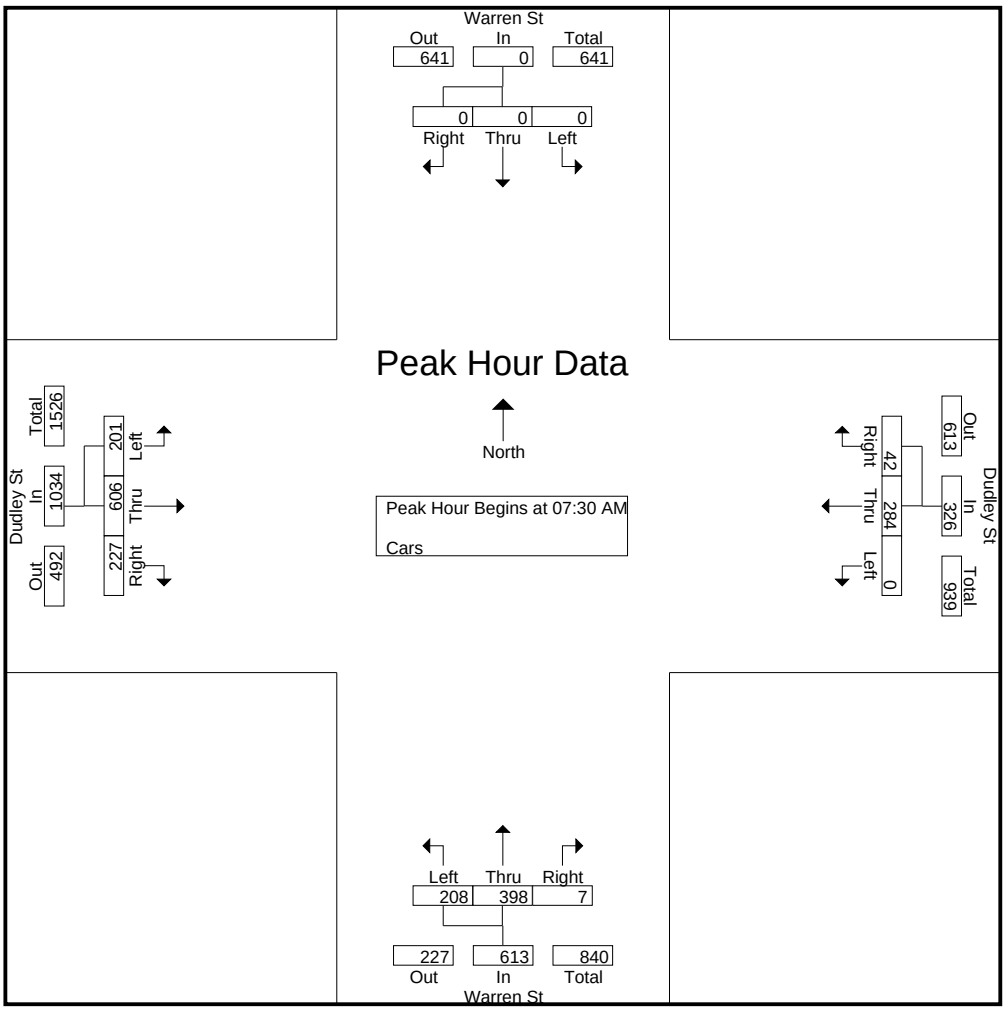
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	62	16	53	62	3	47	86	53	382
07:15 AM	0	0	0	0	46	9	60	83	4	44	118	64	428
07:30 AM	0	0	0	0	64	7	59	86	1	44	164	59	484
07:45 AM	0	0	0	0	64	11	54	114	2	53	145	50	493
Total	0	0	0	0	236	43	226	345	10	188	513	226	1787
08:00 AM	0	0	0	0	62	15	56	106	4	48	167	66	524
08:15 AM	0	0	0	0	94	9	39	92	0	56	130	52	472
08:30 AM	0	0	0	0	92	8	35	81	3	58	141	51	469
08:45 AM	0	0	0	0	51	17	42	81	2	46	124	58	421
Total	0	0	0	0	299	49	172	360	9	208	562	227	1886
Grand Total	0	0	0	0	535	92	398	705	19	396	1075	453	3673
Apprch %	0	0	0	0	85.3	14.7	35.5	62.8	1.7	20.6	55.9	23.5	
Total %	0	0	0	0	14.6	2.5	10.8	19.2	0.5	10.8	29.3	12.3	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	64	7	71	**59**	86	1	146	44	164	59	267	484
07:45 AM	0	0	0	0	0	64	11	75	54	**114**	2	**170**	53	145	50	248	493
08:00 AM	0	0	0	0	0	62	**15**	77	56	106	**4**	166	48	**167**	**66**	**281**	**524**
08:15 AM	0	0	0	0	0	**94**	9	**103**	39	92	0	131	**56**	130	52	238	472
Total Volume	0	0	0	0	0	284	42	326	208	398	7	613	201	606	227	1034	1973
% App. Total	0	0	0		0	87.1	12.9		33.9	64.9	1.1		19.4	58.6	22		
PHF	.000	.000	.000	.000	.000	.755	.700	.791	.881	.873	.438	.901	.897	.907	.860	.920	.941

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



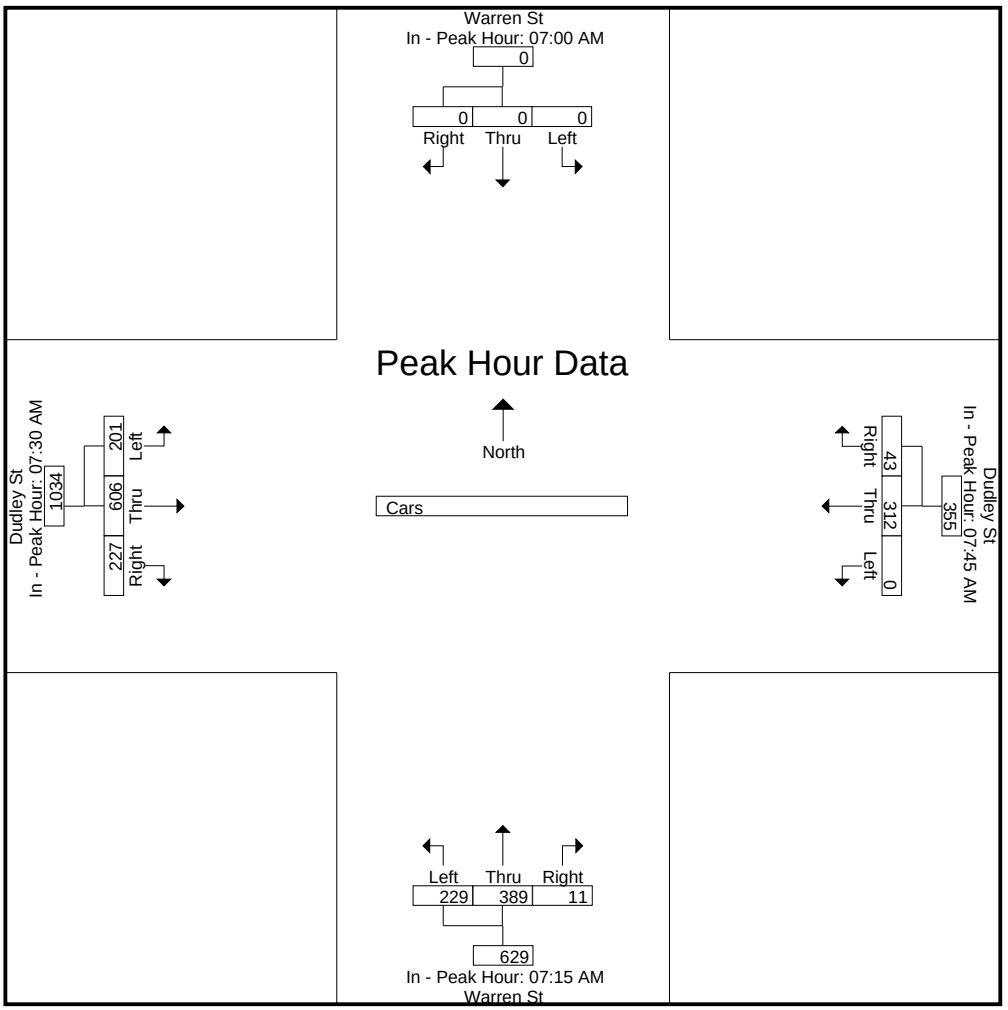
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:45 AM				07:15 AM				07:30 AM			
+0 mins.	0	0	0	0	0	64	11	75	**60**	83	**4**	147	44	164	59	267
+15 mins.	0	0	0	0	0	62	**15**	77	59	86	1	146	53	145	50	248
+30 mins.	0	0	0	0	0	**94**	9	**103**	54	**114**	2	**170**	48	**167**	**66**	**281**
+45 mins.	0	0	0	0	0	92	8	100	56	106	4	166	**56**	130	52	238
Total Volume	0	0	0	0	0	312	43	355	229	389	11	629	201	606	227	1034
% App. Total	0	0	0		0	87.9	12.1		36.4	61.8	1.7		19.4	58.6	22	
PHF	.000	.000	.000	.000	.000	.830	.717	.862	.954	.853	.688	.925	.897	.907	.860	.920

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

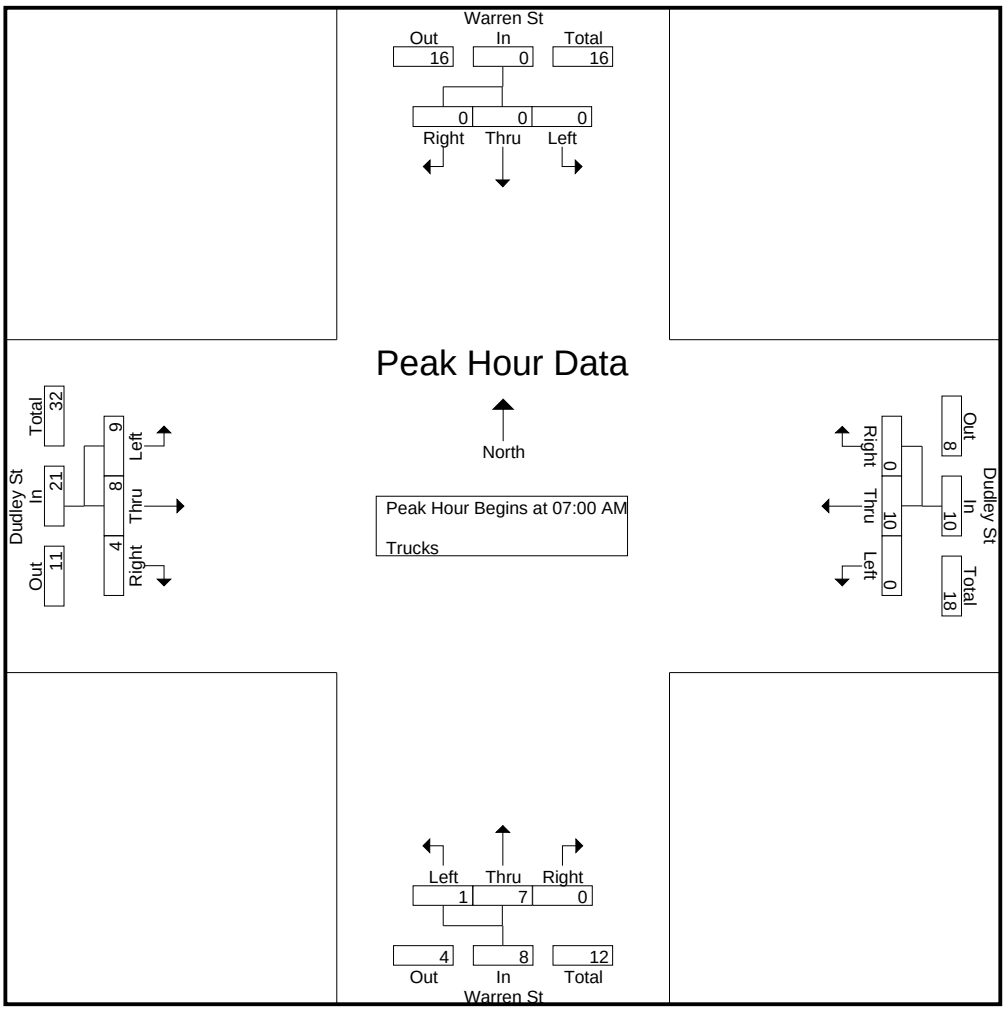
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	0	0	1	0	3	3	0	7
07:15 AM	0	0	0	0	5	0	0	1	0	1	2	2	11
07:30 AM	0	0	0	0	1	0	1	3	0	1	2	0	8
07:45 AM	0	0	0	0	4	0	0	2	0	4	1	2	13
Total	0	0	0	0	10	0	1	7	0	9	8	4	39
08:00 AM	0	0	0	0	1	0	0	1	0	2	2	1	7
08:15 AM	0	0	0	0	0	0	1	0	0	1	5	1	8
08:30 AM	0	0	0	0	1	0	0	1	0	2	1	0	5
08:45 AM	0	0	0	0	2	1	1	2	0	1	2	3	12
Total	0	0	0	0	4	1	2	4	0	6	10	5	32
Grand Total	0	0	0	0	14	1	3	11	0	15	18	9	71
Apprch %	0	0	0	0	93.3	6.7	21.4	78.6	0	35.7	42.9	21.4	
Total %	0	0	0	0	19.7	1.4	4.2	15.5	0	21.1	25.4	12.7	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	0	0	0	0	1	0	1	3	**3**	0	6	7
07:15 AM	0	0	0	0	0	**5**	0	**5**	0	1	0	1	1	2	**2**	5	11
07:30 AM	0	0	0	0	0	1	0	1	**1**	**3**	0	**4**	1	2	0	3	8
07:45 AM	0	0	0	0	0	4	0	4	0	2	0	2	**4**	1	2	**7**	**13**
Total Volume	0	0	0	0	0	10	0	10	1	7	0	8	9	8	4	21	39
% App. Total	0	0	0		0	100	0		12.5	87.5	0		42.9	38.1	19		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.250	.583	.000	.500	.563	.667	.500	.750	.750

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



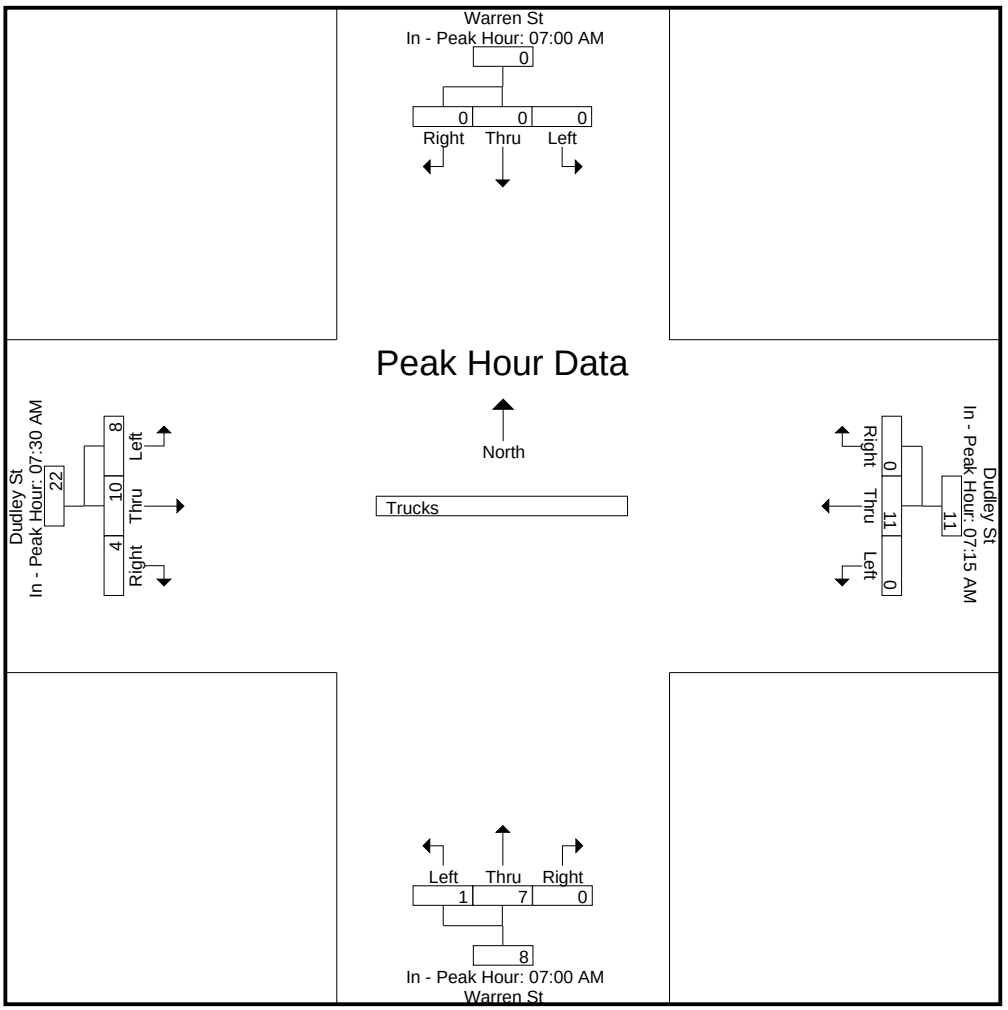
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:00 AM				07:30 AM			
+0 mins.	0	0	0	0	0	**5**	0	**5**	0	1	0	1	1	2	0	3
+15 mins.	0	0	0	0	0	1	0	1	0	1	0	1	**4**	1	**2**	**7**
+30 mins.	0	0	0	0	0	4	0	4	**1**	**3**	0	**4**	2	2	1	5
+45 mins.	0	0	0	0	0	1	0	1	0	2	0	2	1	**5**	1	7
Total Volume	0	0	0	0	0	11	0	11	1	7	0	8	8	10	4	22
% App. Total	0	0	0		0	100	0		12.5	87.5	0		36.4	45.5	18.2	
PHF	.000	.000	.000	.000	.000	.550	.000	.550	.250	.583	.000	.500	.500	.500	.500	.786

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

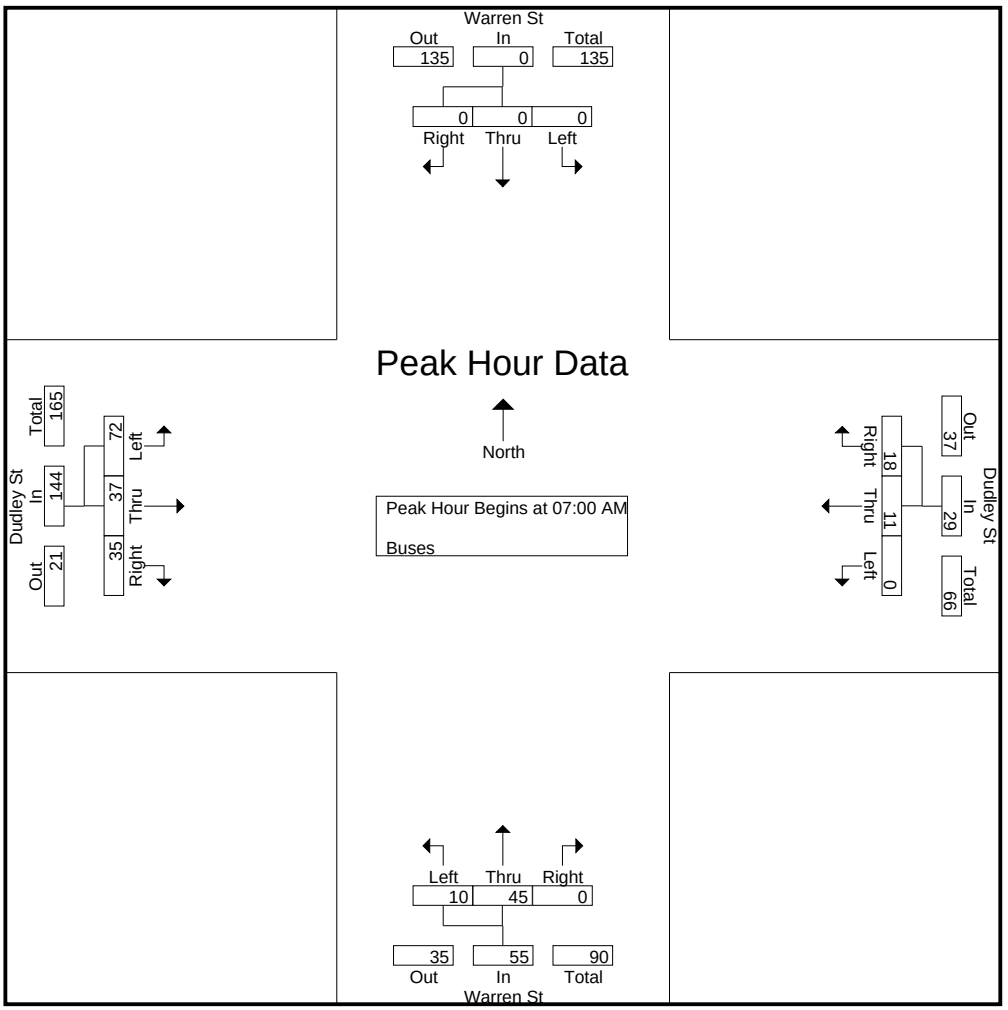
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	4	6	5	13	0	18	16	9	71
07:15 AM	0	0	0	0	1	3	3	12	0	15	8	10	52
07:30 AM	0	0	0	0	2	6	2	9	0	24	8	7	58
07:45 AM	0	0	0	0	4	3	0	11	0	15	5	9	47
Total	0	0	0	0	11	18	10	45	0	72	37	35	228
08:00 AM	0	0	0	0	5	6	1	10	0	15	8	11	56
08:15 AM	0	0	0	0	2	5	0	2	0	12	8	8	37
08:30 AM	0	0	0	0	0	5	1	14	0	12	8	7	47
08:45 AM	0	0	0	0	2	3	0	8	0	19	5	11	48
Total	0	0	0	0	9	19	2	34	0	58	29	37	188
Grand Total	0	0	0	0	20	37	12	79	0	130	66	72	416
Apprch %	0	0	0	0	35.1	64.9	13.2	86.8	0	48.5	24.6	26.9	
Total %	0	0	0	0	4.8	8.9	2.9	19	0	31.2	15.9	17.3	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	**4**	**6**	**10**	**5**	**13**	0	**18**	18	**16**	9	**43**	**71**
07:15 AM	0	0	0	0	0	1	3	4	3	12	0	15	15	8	**10**	33	52
07:30 AM	0	0	0	0	0	2	6	8	2	9	0	11	**24**	8	7	39	58
07:45 AM	0	0	0	0	0	4	3	7	0	11	0	11	15	5	9	29	47
Total Volume	0	0	0	0	0	11	18	29	10	45	0	55	72	37	35	144	228
% App. Total	0	0	0		0	37.9	62.1		18.2	81.8	0		50	25.7	24.3		
PHF	.000	.000	.000	.000	.000	.688	.750	.725	.500	.865	.000	.764	.750	.578	.875	.837	.803

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



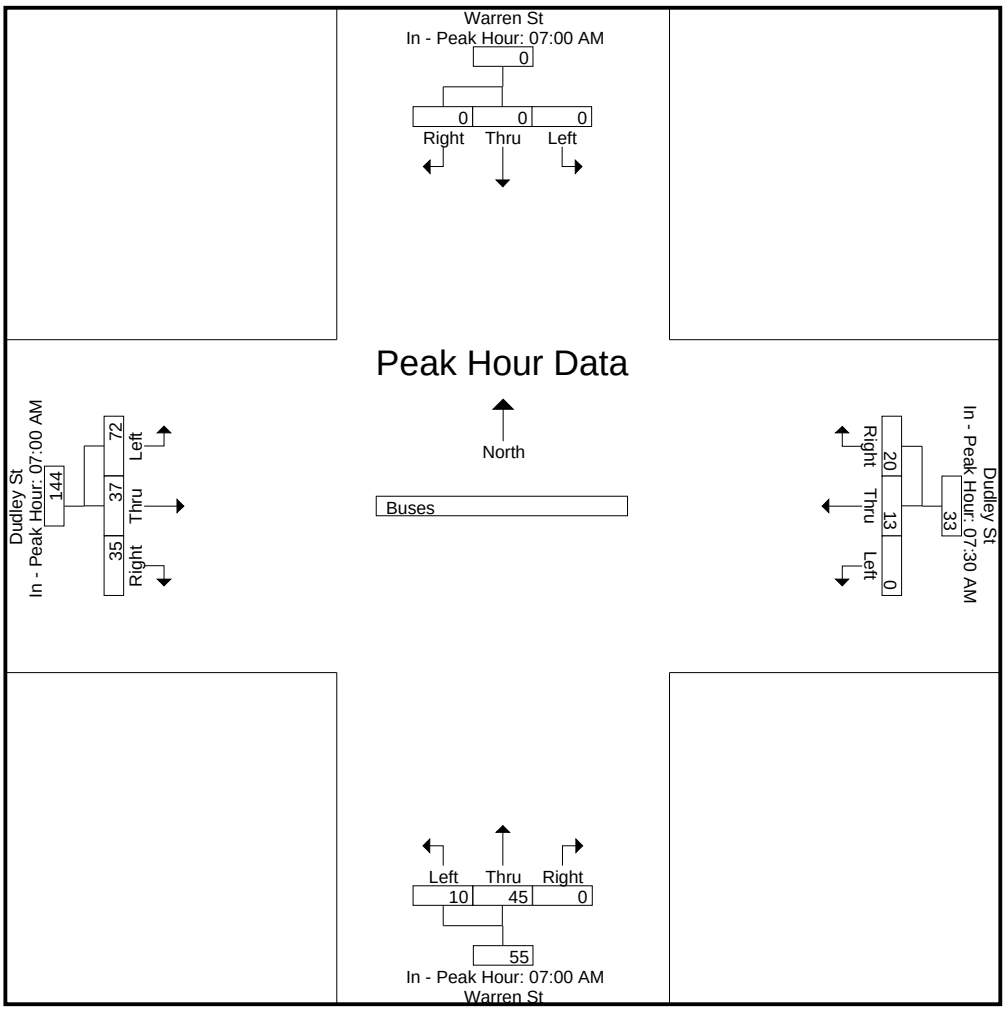
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	2	**6**	8	**5**	**13**	0	**18**	18	**16**	9	**43**
+15 mins.	0	0	0	0	0	4	3	7	3	12	0	15	15	8	**10**	33
+30 mins.	0	0	0	0	0	**5**	6	**11**	2	9	0	11	**24**	8	7	39
+45 mins.	0	0	0	0	0	2	5	7	0	11	0	11	15	5	9	29
Total Volume	0	0	0	0	0	13	20	33	10	45	0	55	72	37	35	144
% App. Total	0	0	0		0	39.4	60.6		18.2	81.8	0		50	25.7	24.3	
PHF	.000	.000	.000	.000	.000	.650	.833	.750	.500	.865	.000	.764	.750	.578	.875	.837

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

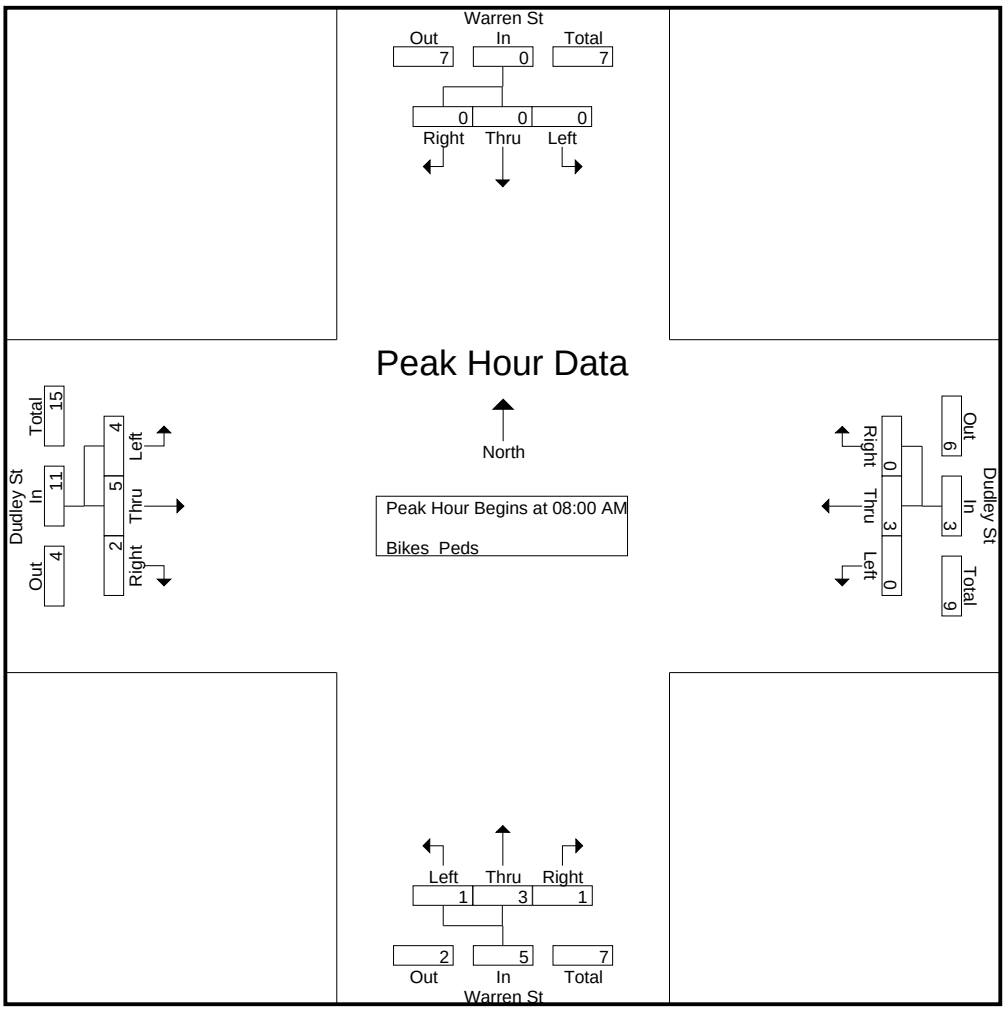
	Warren St From North				Dudley St From East				Warren St From South				Dudley St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	24	0	0	0	9	0	0	0	0	0	1	1	28	61	2	63
07:15 AM	0	0	0	16	0	0	0	12	0	1	0	2	0	1	0	26	56	2	58
07:30 AM	0	0	0	5	0	0	0	3	0	1	0	6	1	2	0	23	37	4	41
07:45 AM	0	0	0	11	0	0	0	9	0	0	0	1	1	1	0	35	56	2	58
Total	0	0	0	56	0	0	0	33	0	2	0	9	2	5	1	112	210	10	220
08:00 AM	0	0	0	13	0	0	0	13	0	0	0	2	0	0	1	15	43	1	44
08:15 AM	0	0	0	39	0	1	0	17	1	0	0	3	1	2	0	38	97	5	102
08:30 AM	0	0	0	22	0	0	0	10	0	1	0	5	1	2	1	39	76	5	81
08:45 AM	0	0	0	8	0	2	0	17	0	2	1	5	2	1	0	36	66	8	74
Total	0	0	0	82	0	3	0	57	1	3	1	15	4	5	2	128	282	19	301
Grand Total	0	0	0	138	0	3	0	90	1	5	1	24	6	10	3	240	492	29	521
Apprch %	0	0	0		0	100	0		14.3	71.4	14.3		31.6	52.6	15.8				
Total %	0	0	0		0	10.3	0		3.4	17.2	3.4		20.7	34.5	10.3		94.4	5.6	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1	1
08:15 AM	0	0	0	0	0	1	0	1	**1**	0	0	1	1	**2**	0	3	5
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	1	2	1	**4**	5
08:45 AM	0	0	0	0	0	**2**	0	**2**	0	**2**	**1**	**3**	**2**	1	0	3	**8**
Total Volume	0	0	0	0	0	3	0	3	1	3	1	5	4	5	2	11	19
% App. Total	0	0	0		0	100	0		20	60	20		36.4	45.5	18.2		
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.250	.375	.250	.417	.500	.625	.500	.688	.594

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



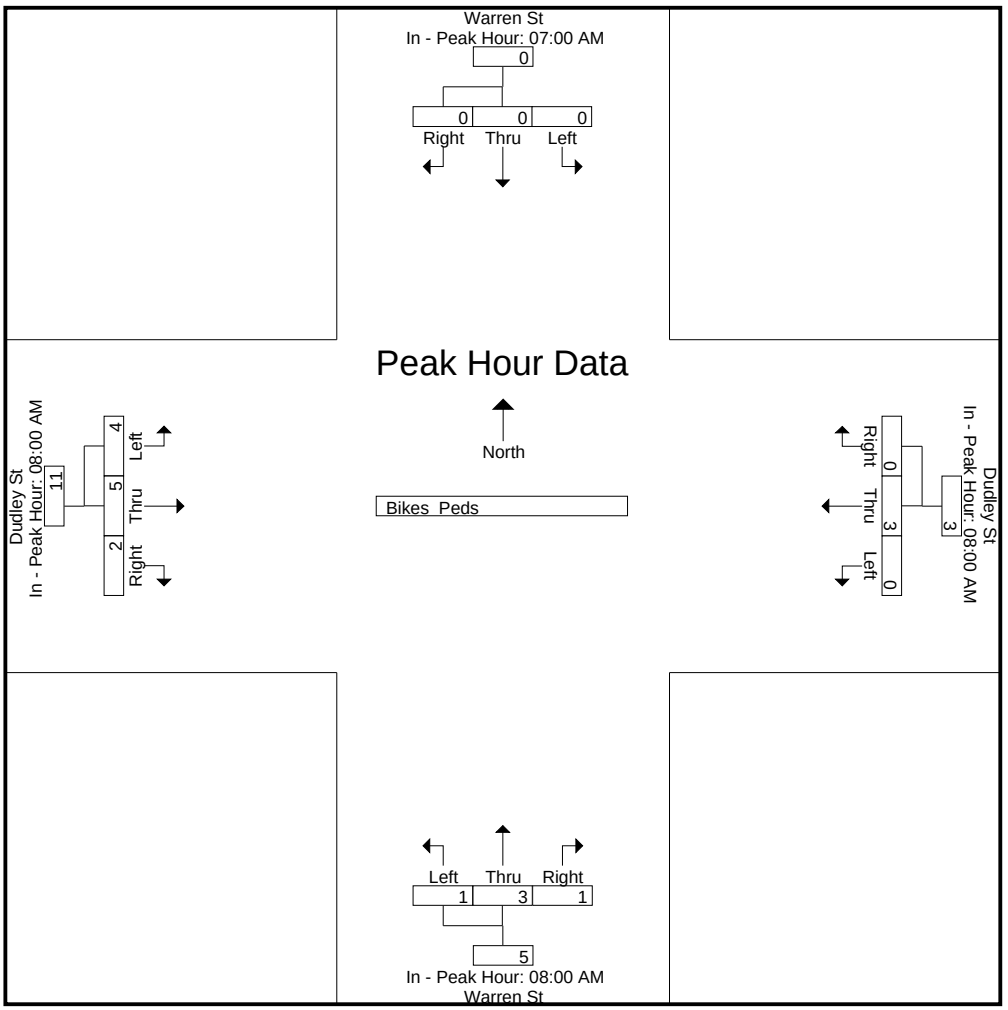
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1
+15 mins.	0	0	0	0	0	1	0	1	**1**	0	0	1	1	**2**	0	3
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	1	2	1	**4**
+45 mins.	0	0	0	0	0	**2**	0	**2**	0	**2**	**1**	**3**	**2**	1	0	3
Total Volume	0	0	0	0	0	3	0	3	1	3	1	5	4	5	2	11
% App. Total	0	0	0		0	100	0		20	60	20		36.4	45.5	18.2	
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.250	.375	.250	.417	.500	.625	.500	.688

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Trucks - Buses

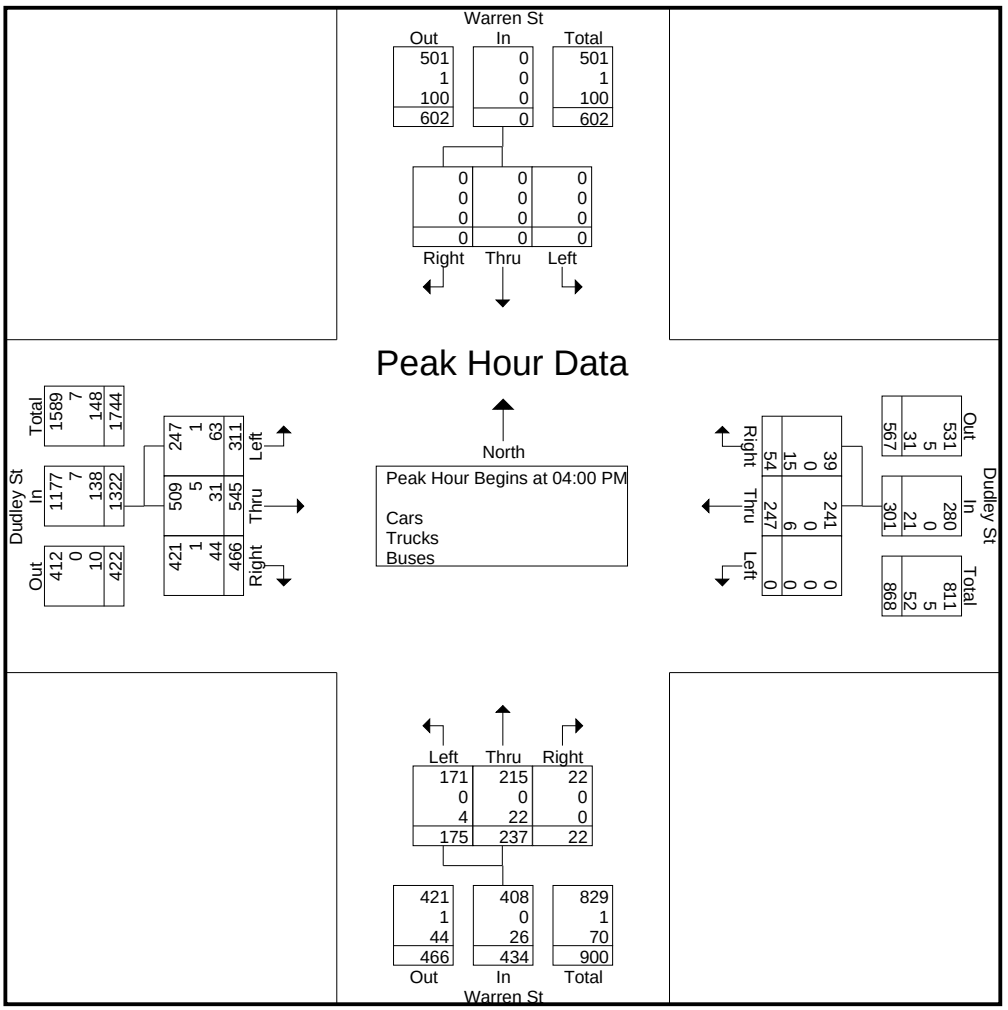
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	52	15	43	53	7	86	142	108	506
04:15 PM	0	0	0	0	66	14	51	67	6	61	144	117	526
04:30 PM	0	0	0	0	69	10	45	64	5	83	128	106	510
04:45 PM	0	0	0	0	60	15	36	53	4	81	131	135	515
Total	0	0	0	0	247	54	175	237	22	311	545	466	2057
05:00 PM	0	0	0	0	56	7	26	59	1	72	124	106	451
05:15 PM	0	0	0	0	80	11	49	58	2	68	140	124	532
05:30 PM	0	0	0	0	86	12	32	57	1	59	140	102	489
05:45 PM	0	0	0	0	84	21	47	61	0	65	119	124	521
Total	0	0	0	0	306	51	154	235	4	264	523	456	1993
Grand Total	0	0	0	0	553	105	329	472	26	575	1068	922	4050
Apprch %	0	0	0	0	84	16	39.8	57.1	3.1	22.4	41.6	35.9	
Total %	0	0	0	0	13.7	2.6	8.1	11.7	0.6	14.2	26.4	22.8	
Cars	0	0	0	0	543	74	322	420	26	467	1006	843	3701
% Cars	0	0	0	0	98.2	70.5	97.9	89	100	81.2	94.2	91.4	91.4
Trucks	0	0	0	0	1	1	0	0	0	2	6	3	13
% Trucks	0	0	0	0	0.2	1	0	0	0	0.3	0.6	0.3	0.3
Buses	0	0	0	0	9	30	7	52	0	106	56	76	336
% Buses	0	0	0	0	1.6	28.6	2.1	11	0	18.4	5.2	8.2	8.3

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	52	**15**	67	43	53	**7**	103	**86**	142	108	336	506
04:15 PM	0	0	0	0	0	66	14	**80**	**51**	**67**	6	**124**	61	**144**	117	322	**526**
04:30 PM	0	0	0	0	0	**69**	10	79	45	64	5	114	83	128	106	317	510
04:45 PM	0	0	0	0	0	60	15	75	36	53	4	93	81	131	**135**	**347**	515
Total Volume	0	0	0	0	0	247	54	301	175	237	22	434	311	545	466	1322	2057
% App. Total	0	0	0		0	82.1	17.9		40.3	54.6	5.1		23.5	41.2	35.2		
PHF	.000	.000	.000	.000	.000	.895	.900	.941	.858	.884	.786	.875	.904	.946	.863	.952	.978
Cars	0	0	0	0	0	241	39	280	171	215	22	408	247	509	421	1177	1865
% Cars	0	0	0	0	0	97.6	72.2	93.0	97.7	90.7	100	94.0	79.4	93.4	90.3	89.0	90.7
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	7	7
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.9	0.2	0.5	0.3
Buses	0	0	0	0	0	6	15	21	4	22	0	26	63	31	44	138	185
% Buses	0	0	0	0	0	2.4	27.8	7.0	2.3	9.3	0	6.0	20.3	5.7	9.4	10.4	9.0

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



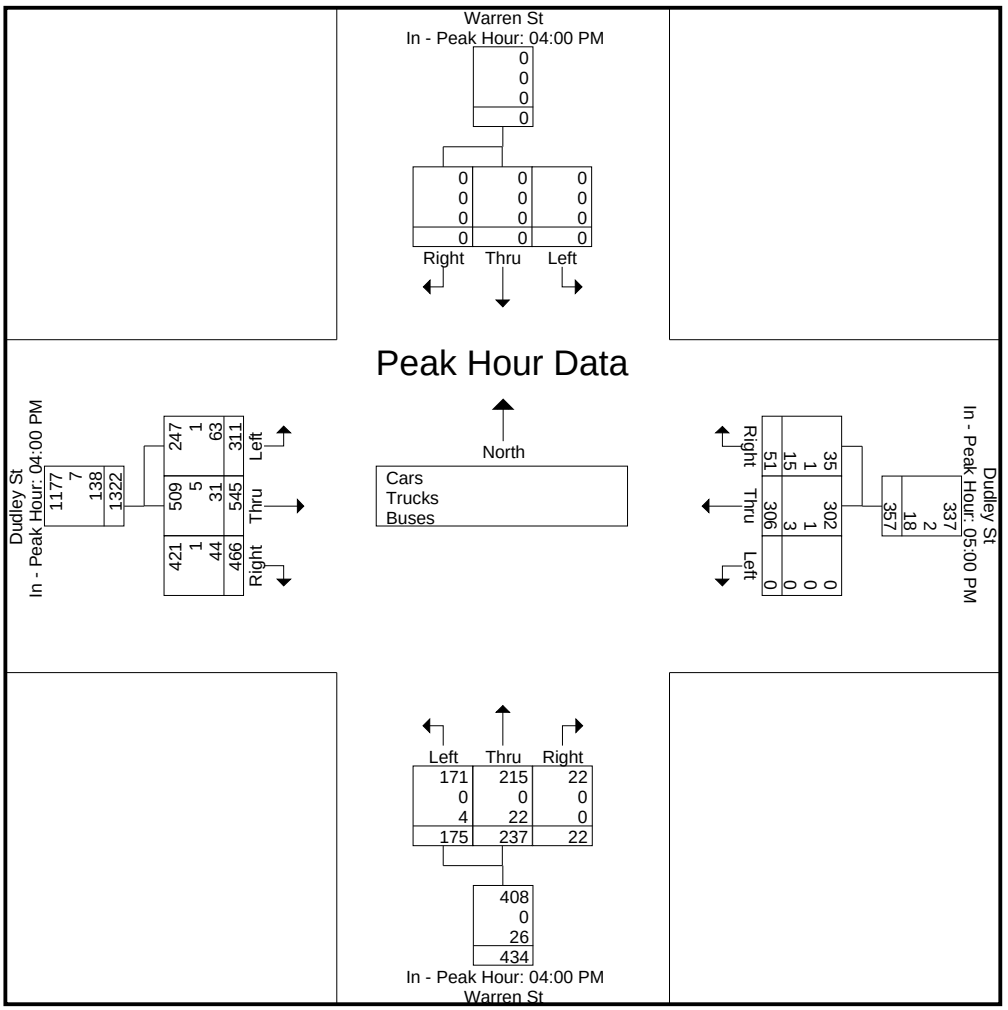
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	56	7	63	43	53	**7**	103	**86**	142	108	336
+15 mins.	0	0	0	0	0	80	11	91	**51**	**67**	6	**124**	61	**144**	117	322
+30 mins.	0	0	0	0	0	**86**	12	98	45	64	5	114	83	128	106	317
+45 mins.	0	0	0	0	0	84	**21**	**105**	36	53	4	93	81	131	**135**	**347**
Total Volume	0	0	0	0	0	306	51	357	175	237	22	434	311	545	466	1322
% App. Total	0	0	0		0	85.7	14.3		40.3	54.6	5.1		23.5	41.2	35.2	
PHF	.000	.000	.000	.000	.000	.890	.607	.850	.858	.884	.786	.875	.904	.946	.863	.952
Cars	0	0	0	0	0	302	35	337	171	215	22	408	247	509	421	1177
% Cars	0	0	0	0	0	98.7	68.6	94.4	97.7	90.7	100	94	79.4	93.4	90.3	89
Trucks	0	0	0	0	0	1	1	2	0	0	0	0	1	5	1	7
% Trucks	0	0	0	0	0	0.3	2	0.6	0	0	0	0	0.3	0.9	0.2	0.5
Buses	0	0	0	0	0	3	15	18	4	22	0	26	63	31	44	138
% Buses	0	0	0	0	0	1	29.4	5	2.3	9.3	0	6	20.3	5.7	9.4	10.4

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

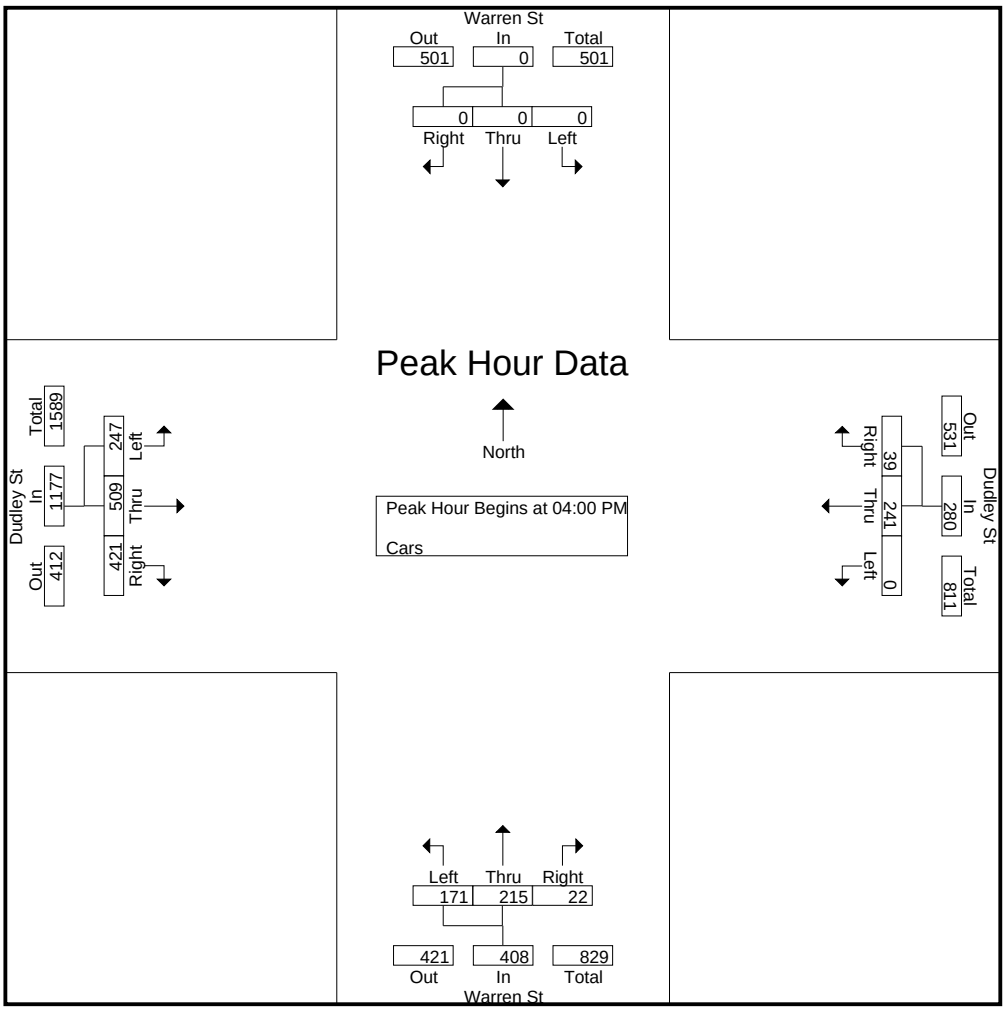
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	50	12	41	46	7	71	134	95	456
04:15 PM	0	0	0	0	65	8	49	64	6	43	136	105	476
04:30 PM	0	0	0	0	67	8	45	58	5	71	118	98	470
04:45 PM	0	0	0	0	59	11	36	47	4	62	121	123	463
Total	0	0	0	0	241	39	171	215	22	247	509	421	1865
05:00 PM	0	0	0	0	54	4	25	51	1	57	118	101	411
05:15 PM	0	0	0	0	80	8	49	54	2	55	133	111	492
05:30 PM	0	0	0	0	85	8	31	46	1	48	137	95	451
05:45 PM	0	0	0	0	83	15	46	54	0	60	109	115	482
Total	0	0	0	0	302	35	151	205	4	220	497	422	1836
Grand Total	0	0	0	0	543	74	322	420	26	467	1006	843	3701
Apprch %	0	0	0	0	88	12	41.9	54.7	3.4	20.2	43.4	36.4	
Total %	0	0	0	0	14.7	2	8.7	11.3	0.7	12.6	27.2	22.8	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	50	**12**	62	41	46	**7**	94	**71**	134	95	300	456
04:15 PM	0	0	0	0	0	65	8	73	**49**	**64**	6	**119**	43	**136**	105	284	**476**
04:30 PM	0	0	0	0	0	**67**	8	**75**	45	58	5	108	71	118	98	287	470
04:45 PM	0	0	0	0	0	59	11	70	36	47	4	87	62	121	**123**	**306**	463
Total Volume	0	0	0	0	0	241	39	280	171	215	22	408	247	509	421	1177	1865
% App. Total	0	0	0		0	86.1	13.9		41.9	52.7	5.4		21	43.2	35.8		
PHF	.000	.000	.000	.000	.000	.899	.813	.933	.872	.840	.786	.857	.870	.936	.856	.962	.980

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



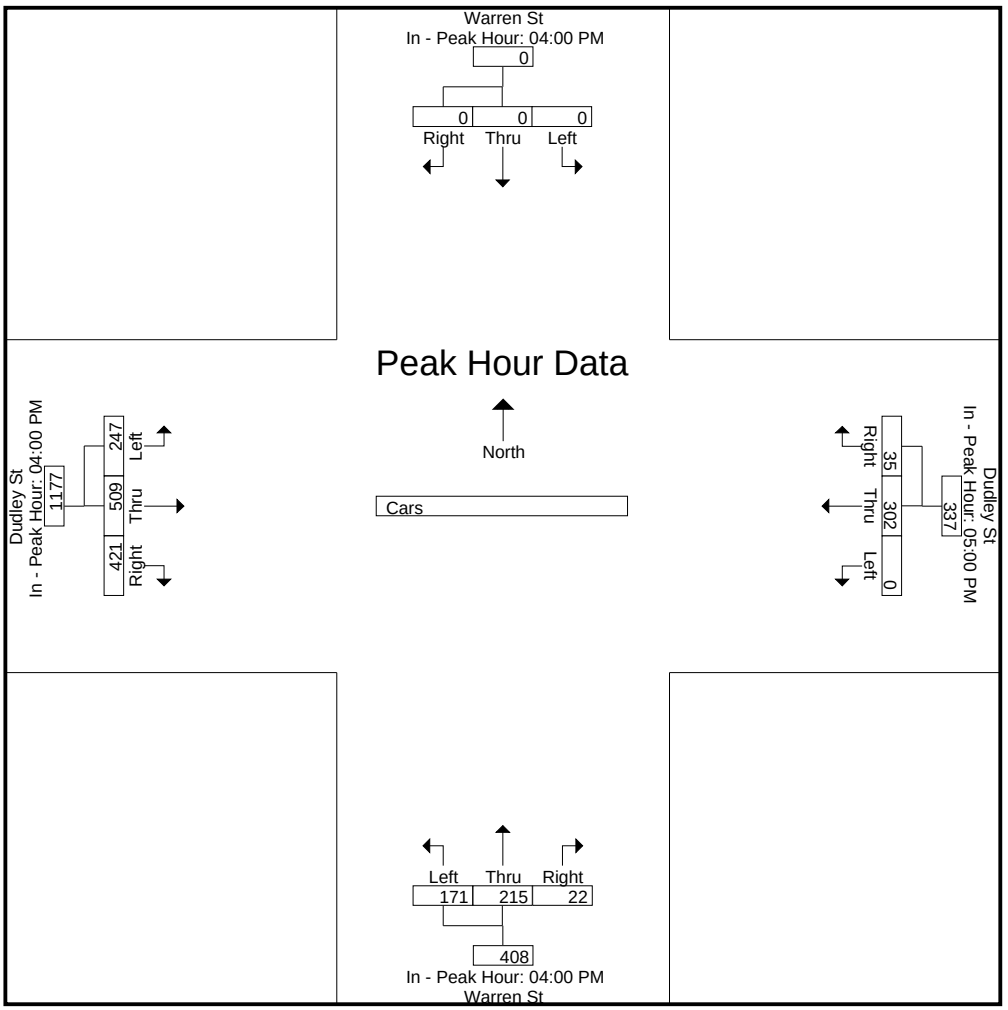
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	54	4	58	41	46	**7**	94	**71**	134	95	300
+15 mins.	0	0	0	0	0	80	8	88	**49**	**64**	6	**119**	43	**136**	105	284
+30 mins.	0	0	0	0	0	**85**	8	93	45	58	5	108	71	118	98	287
+45 mins.	0	0	0	0	0	83	**15**	**98**	36	47	4	87	62	121	**123**	**306**
Total Volume	0	0	0	0	0	302	35	337	171	215	22	408	247	509	421	1177
% App. Total	0	0	0		0	89.6	10.4		41.9	52.7	5.4		21	43.2	35.8	
PHF	.000	.000	.000	.000	.000	.888	.583	.860	.872	.840	.786	.857	.870	.936	.856	.962

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

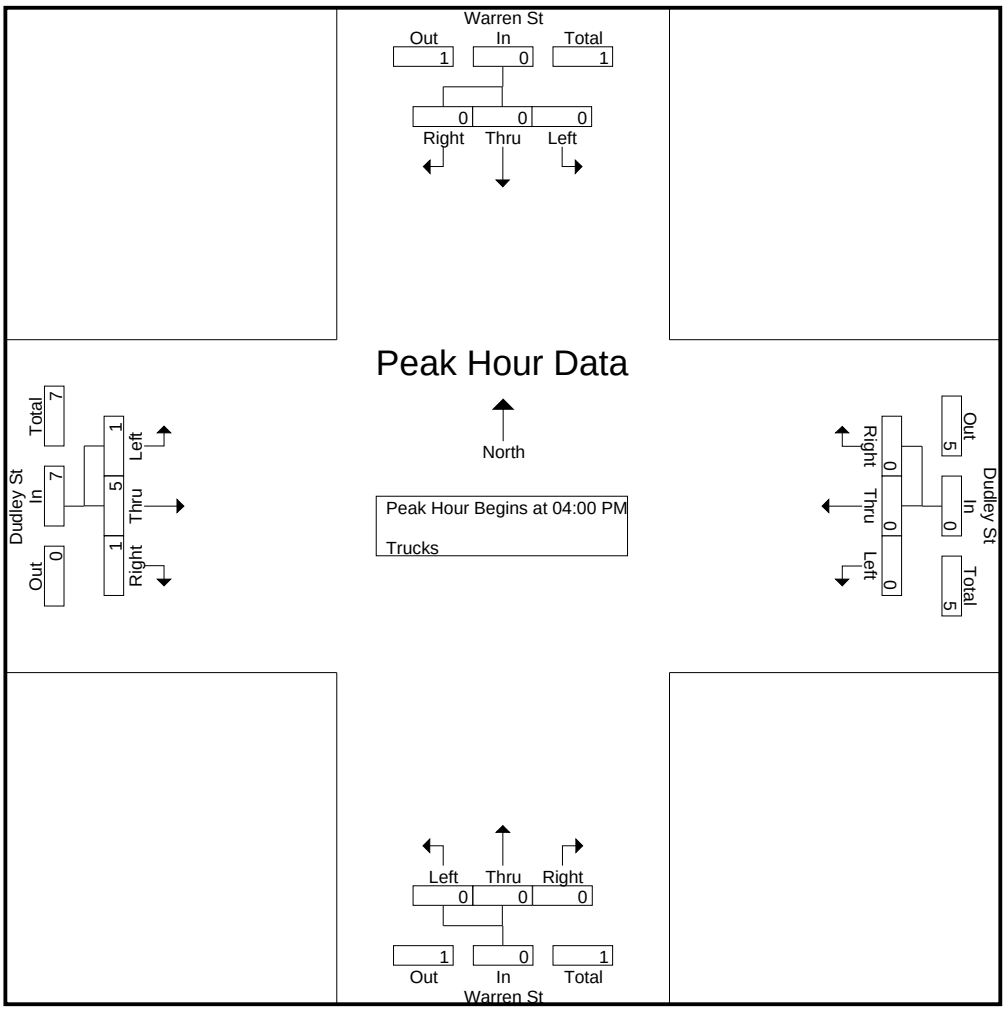
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
Total	0	0	0	0	0	0	0	0	0	1	5	1	7
05:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
Total	0	0	0	0	1	1	0	0	0	1	1	2	6
Grand Total	0	0	0	0	1	1	0	0	0	2	6	3	13
Apprch %	0	0	0	0	50	50	0	0	0	18.2	54.5	27.3	
Total %	0	0	0	0	7.7	7.7	0	0	0	15.4	46.2	23.1	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	**2**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	1	5	1	7	7
% App. Total	0	0	0		0	0	0		0	0	0		14.3	71.4	14.3		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.625	.250	.875	.875

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



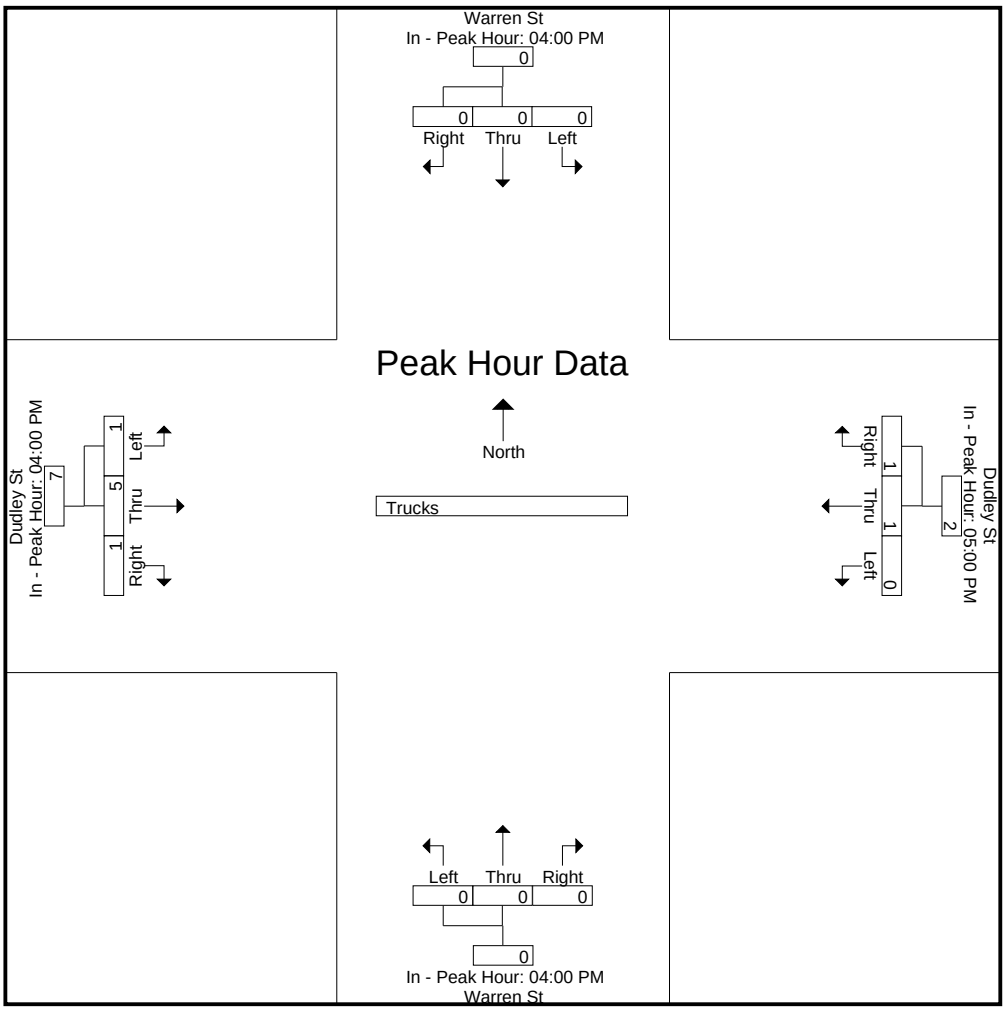
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	**2**	0	**2**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**	2
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1
+45 mins.	0	0	0	0	0	**1**	0	1	0	0	0	0	0	2	0	2
Total Volume	0	0	0	0	0	1	1	2	0	0	0	0	1	5	1	7
% App. Total	0	0	0		0	50	50		0	0	0		14.3	71.4	14.3	
PHF	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.000	.000	.250	.625	.250	.875

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

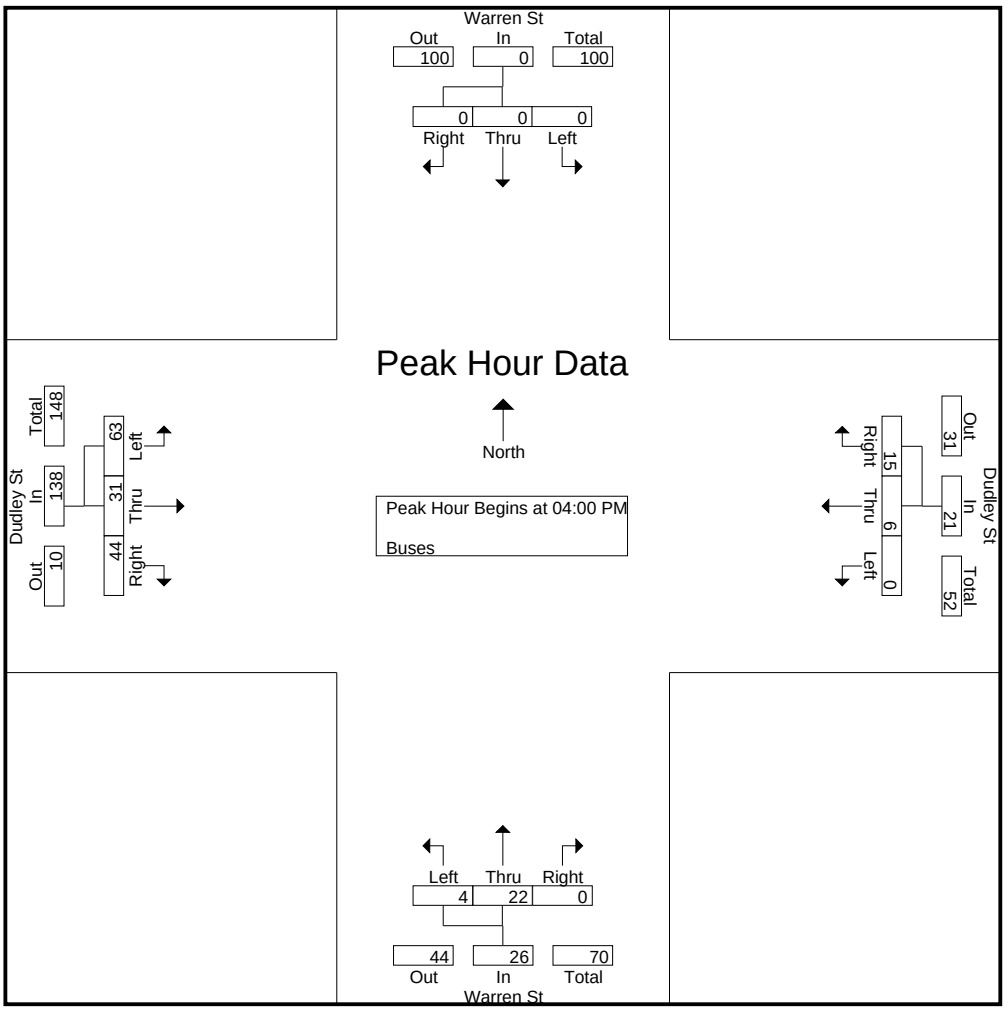
	Warren St From North			Dudley St From East			Warren St From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	2	3	2	7	0	15	6	13	48
04:15 PM	0	0	0	0	1	6	2	3	0	18	7	11	48
04:30 PM	0	0	0	0	2	2	0	6	0	11	10	8	39
04:45 PM	0	0	0	0	1	4	0	6	0	19	8	12	50
Total	0	0	0	0	6	15	4	22	0	63	31	44	185
05:00 PM	0	0	0	0	2	2	1	8	0	14	6	5	38
05:15 PM	0	0	0	0	0	3	0	4	0	13	7	11	38
05:30 PM	0	0	0	0	1	4	1	11	0	11	3	7	38
05:45 PM	0	0	0	0	0	6	1	7	0	5	9	9	37
Total	0	0	0	0	3	15	3	30	0	43	25	32	151
Grand Total	0	0	0	0	9	30	7	52	0	106	56	76	336
Apprch %	0	0	0	0	23.1	76.9	11.9	88.1	0	44.5	23.5	31.9	
Total %	0	0	0	0	2.7	8.9	2.1	15.5	0	31.5	16.7	22.6	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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	0	0	0	0	**2**	3	5	**2**	**7**	0	**9**	15	6	**13**	34	48
04:15 PM	0	0	0	0	0	1	**6**	**7**	2	3	0	5	18	7	11	36	48
04:30 PM	0	0	0	0	0	2	2	4	0	6	0	6	11	**10**	8	29	39
04:45 PM	0	0	0	0	0	1	4	5	0	6	0	6	**19**	8	12	**39**	**50**
Total Volume	0	0	0	0	0	6	15	21	4	22	0	26	63	31	44	138	185
% App. Total	0	0	0		0	28.6	71.4		15.4	84.6	0		45.7	22.5	31.9		
PHF	.000	.000	.000	.000	.000	.750	.625	.750	.500	.786	.000	.722	.829	.775	.846	.885	.925

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



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

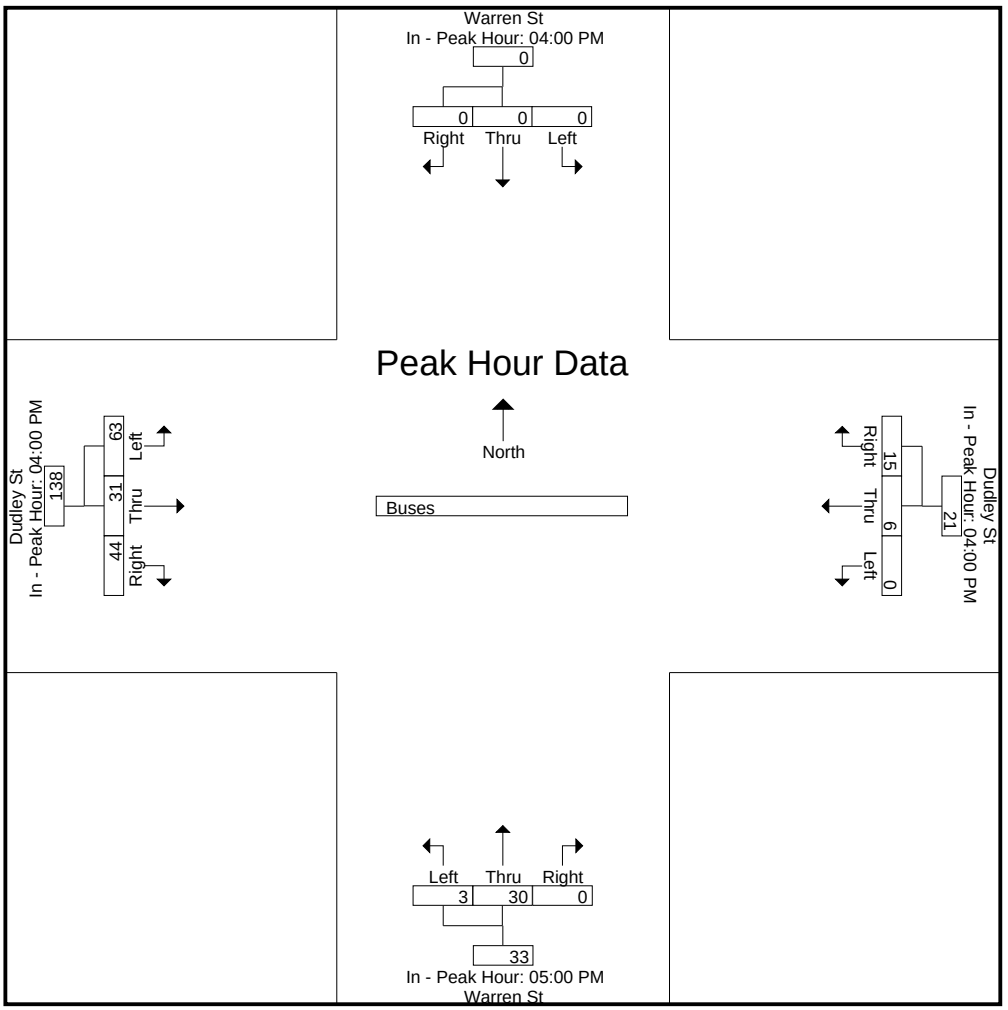
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	**2**	3	5	**1**	8	0	9	15	6	**13**	34
+15 mins.	0	0	0	0	0	1	**6**	**7**	0	4	0	4	18	7	11	36
+30 mins.	0	0	0	0	0	2	2	4	1	**11**	0	**12**	11	**10**	8	29
+45 mins.	0	0	0	0	0	1	4	5	1	7	0	8	**19**	8	12	**39**
Total Volume	0	0	0	0	0	6	15	21	3	30	0	33	63	31	44	138
% App. Total	0	0	0		0	28.6	71.4		9.1	90.9	0		45.7	22.5	31.9	
PHF	.000	.000	.000	.000	.000	.750	.625	.750	.750	.682	.000	.688	.829	.775	.846	.885

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

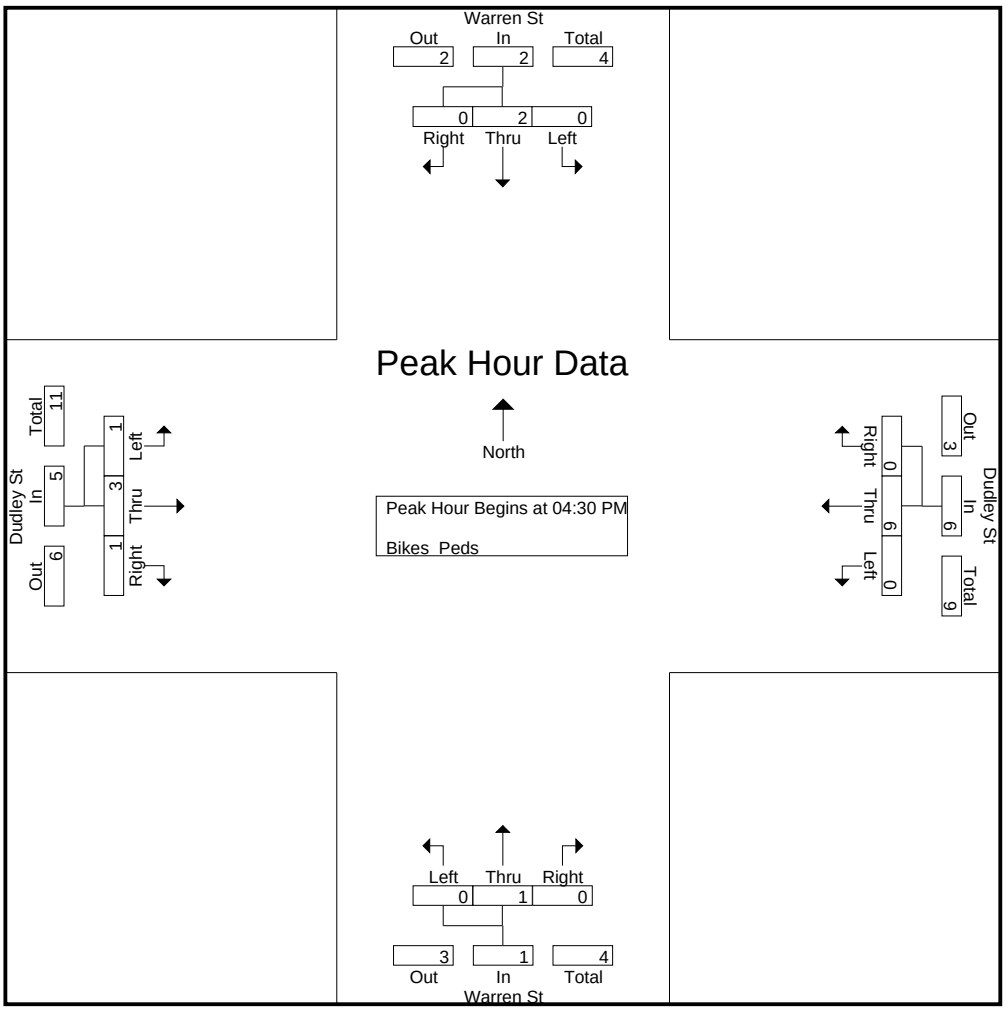
	Warren St From North				Dudley St From East				Warren St From South				Dudley St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	19	0	0	0	29	0	3	0	1	0	0	0	47	96	3	99
04:15 PM	0	0	0	9	0	0	0	8	0	1	0	1	0	0	0	52	70	1	71
04:30 PM	0	0	0	16	0	0	0	15	0	0	0	6	0	2	1	33	70	3	73
04:45 PM	0	1	0	12	0	3	0	7	0	0	0	6	0	0	0	40	65	4	69
Total	0	1	0	56	0	3	0	59	0	4	0	14	0	2	1	172	301	11	312
05:00 PM	0	1	0	9	0	2	0	21	0	1	0	6	0	1	0	50	86	5	91
05:15 PM	0	0	0	20	0	1	0	17	0	0	0	11	1	0	0	23	71	2	73
05:30 PM	0	0	0	14	0	1	0	26	0	0	0	9	0	0	2	31	80	3	83
05:45 PM	0	0	0	18	0	0	0	29	0	1	0	0	0	0	1	59	106	2	108
Total	0	1	0	61	0	4	0	93	0	2	0	26	1	1	3	163	343	12	355
Grand Total	0	2	0	117	0	7	0	152	0	6	0	40	1	3	4	335	644	23	667
Apprch %	0	100	0		0	100	0		0	100	0		12.5	37.5	50				
Total %	0	8.7	0		0	30.4	0		0	26.1	0		4.3	13	17.4		96.6	3.4	

	Warren St From North				Dudley St From East				Warren St From South				Dudley 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 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**1**	**3**	3
04:45 PM	0	**1**	0	**1**	0	**3**	0	**3**	0	0	0	0	0	0	0	0	4
05:00 PM	0	1	0	1	0	2	0	2	0	**1**	0	**1**	0	1	0	1	**5**
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	**1**	0	0	1	2
Total Volume	0	2	0	2	0	6	0	6	0	1	0	1	1	3	1	5	14
% App. Total	0	100	0		0	100	0		0	100	0		20	60	20		
PHF	.000	.500	.000	.500	.000	.500	.000	.500	.000	.250	.000	.250	.250	.375	.250	.417	.700

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 2



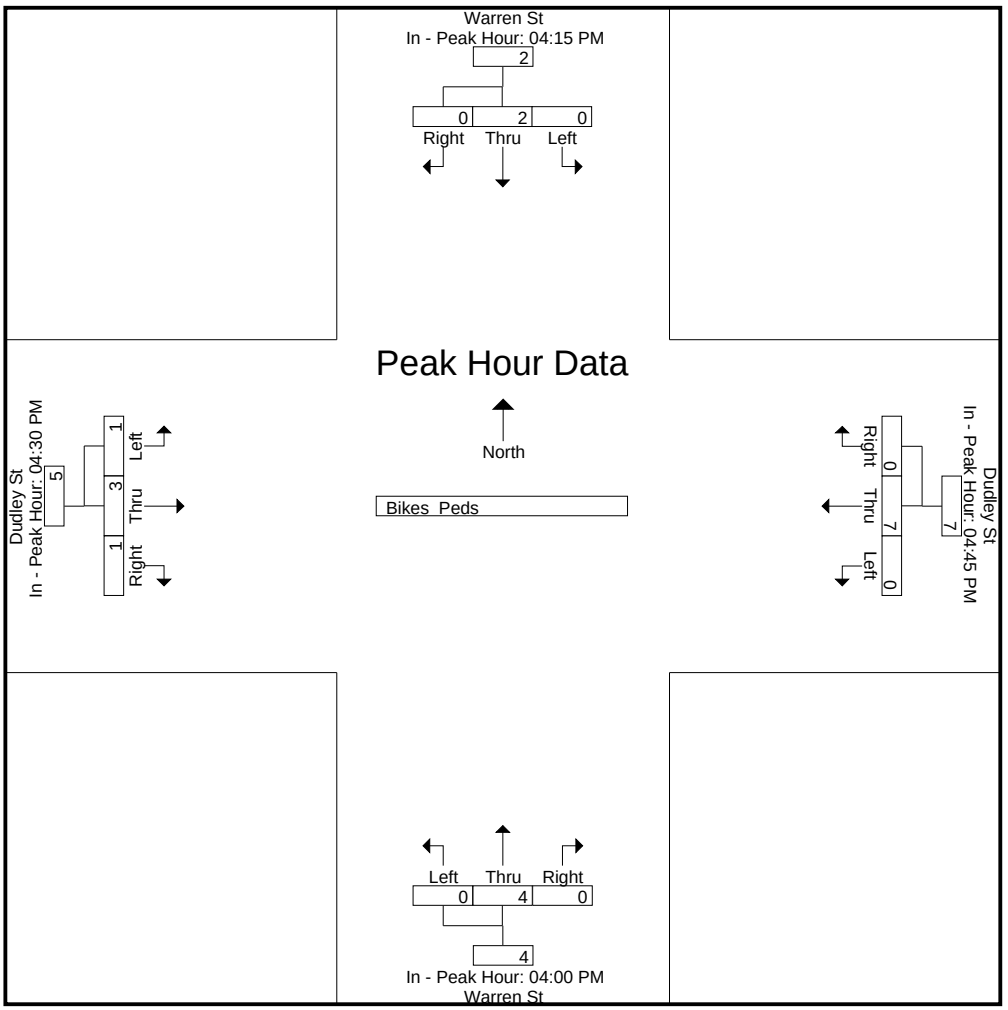
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	**3**	0	**3**	0	**3**	0	**3**	0	**2**	**1**	**3**
+15 mins.	0	0	0	0	0	2	0	2	0	1	0	1	0	0	0	0
+30 mins.	0	**1**	0	**1**	0	1	0	1	0	0	0	0	0	1	0	1
+45 mins.	0	1	0	1	0	1	0	1	0	0	0	0	**1**	0	0	1
Total Volume	0	2	0	2	0	7	0	7	0	4	0	4	1	3	1	5
% App. Total	0	100	0		0	100	0		0	100	0		20	60	20	
PHF	.000	.500	.000	.500	.000	.583	.000	.583	.000	.333	.000	.333	.250	.375	.250	.417

Accurate Counts
978-664-2565

N/S Street : Warren Street
E/W Street: Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890003
Site Code : 15890003
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Buses - Trucks

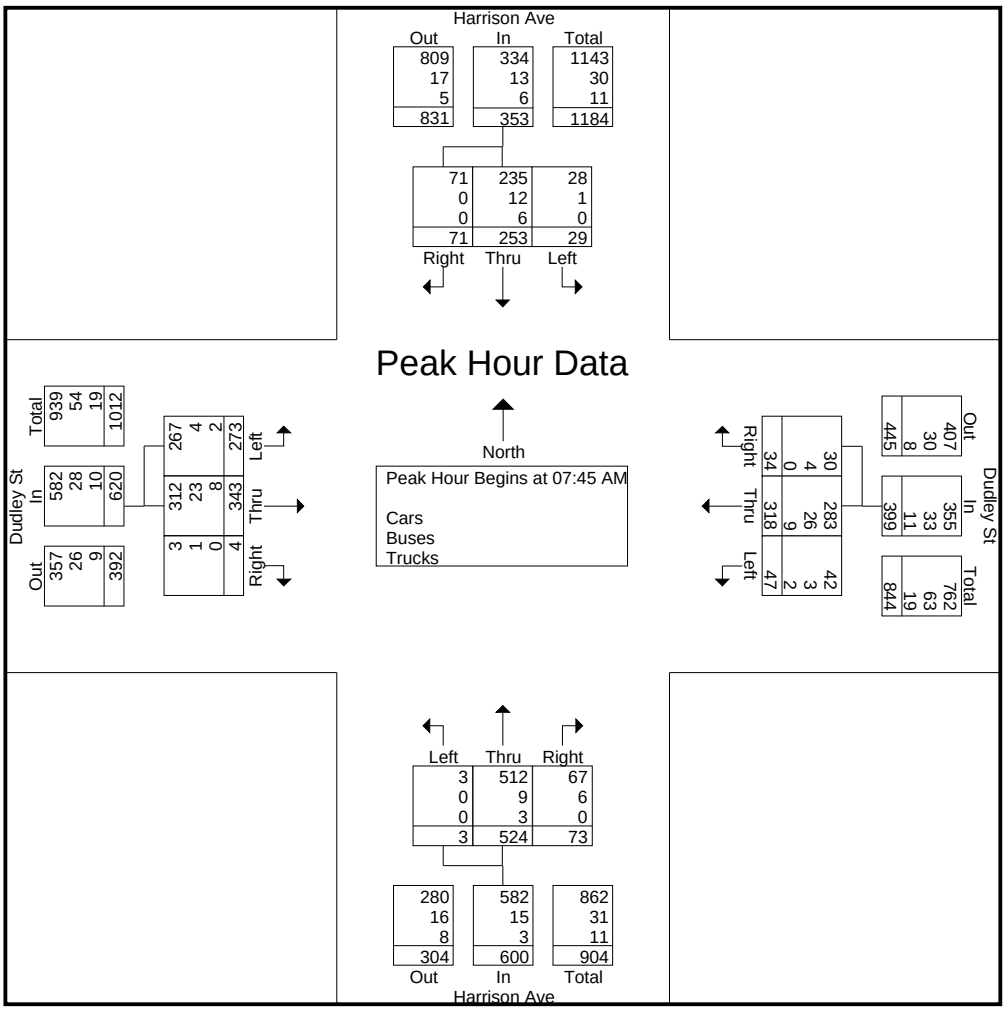
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	64	14	16	69	9	0	103	23	54	69	0	425
07:15 AM	6	49	15	3	55	4	0	115	18	58	61	2	386
07:30 AM	3	62	19	8	69	6	0	132	13	73	97	0	482
07:45 AM	9	56	15	14	80	8	0	139	24	70	83	1	499
Total	22	231	63	41	273	27	0	489	78	255	310	3	1792
08:00 AM	6	55	20	12	76	4	2	132	14	68	93	2	484
08:15 AM	6	64	20	11	82	5	1	125	15	68	83	0	480
08:30 AM	8	78	16	10	80	17	0	128	20	67	84	1	509
08:45 AM	8	65	23	10	65	8	1	118	10	64	69	2	443
Total	28	262	79	43	303	34	4	503	59	267	329	5	1916
Grand Total	50	493	142	84	576	61	4	992	137	522	639	8	3708
Apprch %	7.3	72	20.7	11.7	79.9	8.5	0.4	87.6	12.1	44.7	54.7	0.7	
Total %	1.3	13.3	3.8	2.3	15.5	1.6	0.1	26.8	3.7	14.1	17.2	0.2	
Cars	46	454	140	75	501	56	4	965	122	506	574	7	3450
% Cars	92	92.1	98.6	89.3	87	91.8	100	97.3	89.1	96.9	89.8	87.5	93
Buses	4	29	0	7	58	4	0	22	15	10	54	1	204
% Buses	8	5.9	0	8.3	10.1	6.6	0	2.2	10.9	1.9	8.5	12.5	5.5
Trucks	0	10	2	2	17	1	0	5	0	6	11	0	54
% Trucks	0	2	1.4	2.4	3	1.6	0	0.5	0	1.1	1.7	0	1.5

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	**9**	56	15	80	**14**	80	8	102	0	**139**	**24**	**163**	**70**	83	1	154	499
08:00 AM	6	55	**20**	81	12	76	4	92	**2**	132	14	148	68	**93**	**2**	**163**	484
08:15 AM	6	64	20	90	11	**82**	5	98	1	125	15	141	68	83	0	151	480
08:30 AM	8	**78**	16	**102**	10	80	**17**	**107**	0	128	20	148	67	84	1	152	**509**
Total Volume	29	253	71	353	47	318	34	399	3	524	73	600	273	343	4	620	1972
% App. Total	8.2	71.7	20.1		11.8	79.7	8.5		0.5	87.3	12.2		44	55.3	0.6		
PHF	.806	.811	.888	.865	.839	.970	.500	.932	.375	.942	.760	.920	.975	.922	.500	.951	.969
Cars	28	235	71	334	42	283	30	355	3	512	67	582	267	312	3	582	1853
% Cars	96.6	92.9	100	94.6	89.4	89.0	88.2	89.0	100	97.7	91.8	97.0	97.8	91.0	75.0	93.9	94.0
Buses	1	12	0	13	3	26	4	33	0	9	6	15	4	23	1	28	89
% Buses	3.4	4.7	0	3.7	6.4	8.2	11.8	8.3	0	1.7	8.2	2.5	1.5	6.7	25.0	4.5	4.5
Trucks	0	6	0	6	2	9	0	11	0	3	0	3	2	8	0	10	30
% Trucks	0	2.4	0	1.7	4.3	2.8	0	2.8	0	0.6	0	0.5	0.7	2.3	0	1.6	1.5

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

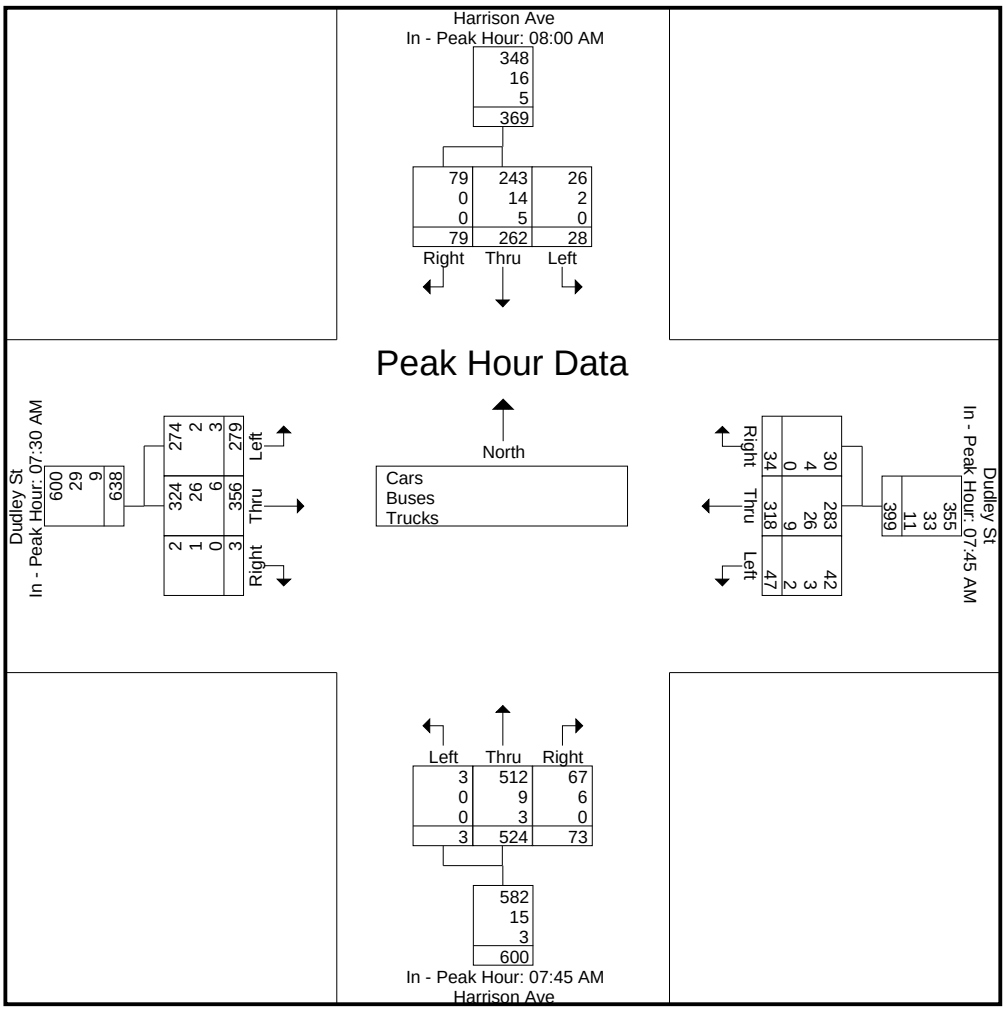
Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				07:45 AM				07:30 AM			
+0 mins.	6	55	20	81	**14**	80	8	102	0	**139**	**24**	**163**	**73**	**97**	0	**170**
+15 mins.	6	64	20	90	12	76	4	92	**2**	132	14	148	70	83	1	154
+30 mins.	**8**	**78**	16	**102**	11	**82**	5	98	1	125	15	141	68	93	**2**	163
+45 mins.	8	65	**23**	96	10	80	**17**	**107**	0	128	20	148	68	83	0	151
Total Volume	28	262	79	369	47	318	34	399	3	524	73	600	279	356	3	638
% App. Total	7.6	71	21.4		11.8	79.7	8.5		0.5	87.3	12.2		43.7	55.8	0.5	
PHF	.875	.840	.859	.904	.839	.970	.500	.932	.375	.942	.760	.920	.955	.918	.375	.938
Cars	26	243	79	348	42	283	30	355	3	512	67	582	274	324	2	600
% Cars	92.9	92.7	100	94.3	89.4	89	88.2	89	100	97.7	91.8	97	98.2	91	66.7	94
Buses	2	14	0	16	3	26	4	33	0	9	6	15	2	26	1	29
% Buses	7.1	5.3	0	4.3	6.4	8.2	11.8	8.3	0	1.7	8.2	2.5	0.7	7.3	33.3	4.5
Trucks	0	5	0	5	2	9	0	11	0	3	0	3	3	6	0	9
% Trucks	0	1.9	0	1.4	4.3	2.8	0	2.8	0	0.6	0	0.5	1.1	1.7	0	1.4

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

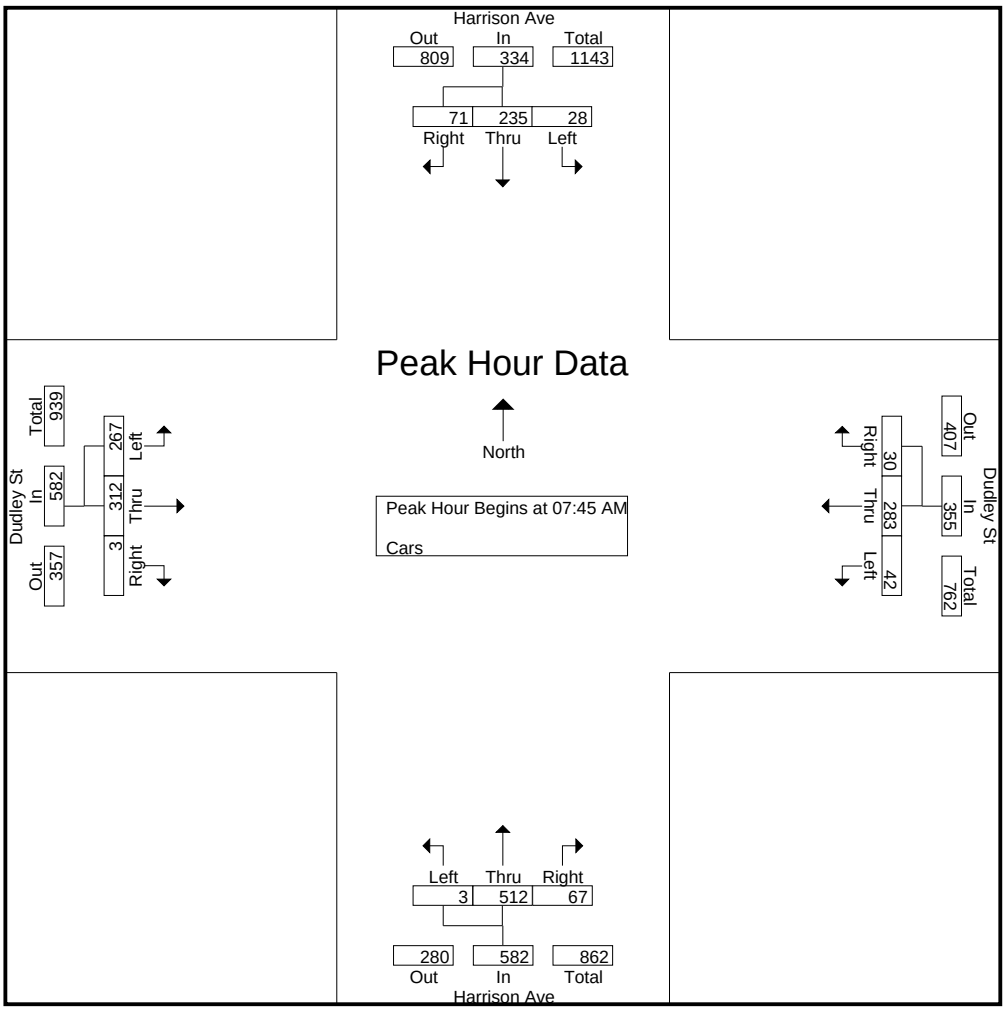
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	2	59	14	14	60	8	0	100	16	47	56	0	376
07:15 AM	6	45	13	2	46	4	0	111	18	58	52	2	357
07:30 AM	3	55	19	7	58	6	0	126	13	71	89	0	447
07:45 AM	9	52	15	11	71	7	0	137	23	69	78	1	473
Total	20	211	61	34	235	25	0	474	70	245	275	3	1653
08:00 AM	6	51	20	12	63	2	2	127	11	68	84	1	447
08:15 AM	5	60	20	11	74	4	1	121	14	66	73	0	449
08:30 AM	8	72	16	8	75	17	0	127	19	64	77	1	484
08:45 AM	7	60	23	10	54	8	1	116	8	63	65	2	417
Total	26	243	79	41	266	31	4	491	52	261	299	4	1797
Grand Total	46	454	140	75	501	56	4	965	122	506	574	7	3450
Apprch %	7.2	70.9	21.9	11.9	79.3	8.9	0.4	88.5	11.2	46.6	52.8	0.6	
Total %	1.3	13.2	4.1	2.2	14.5	1.6	0.1	28	3.5	14.7	16.6	0.2	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	**9**	52	15	76	11	71	7	89	0	**137**	**23**	**160**	**69**	78	**1**	148	473
08:00 AM	6	51	**20**	77	**12**	63	2	77	**2**	127	11	140	68	**84**	1	**153**	447
08:15 AM	5	60	20	85	11	74	4	89	1	121	14	136	66	73	0	139	449
08:30 AM	8	**72**	16	**96**	8	**75**	**17**	**100**	0	127	19	146	64	77	1	142	**484**
Total Volume	28	235	71	334	42	283	30	355	3	512	67	582	267	312	3	582	1853
% App. Total	8.4	70.4	21.3		11.8	79.7	8.5		0.5	88	11.5		45.9	53.6	0.5		
PHF	.778	.816	.888	.870	.875	.943	.441	.888	.375	.934	.728	.909	.967	.929	.750	.951	.957

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012



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

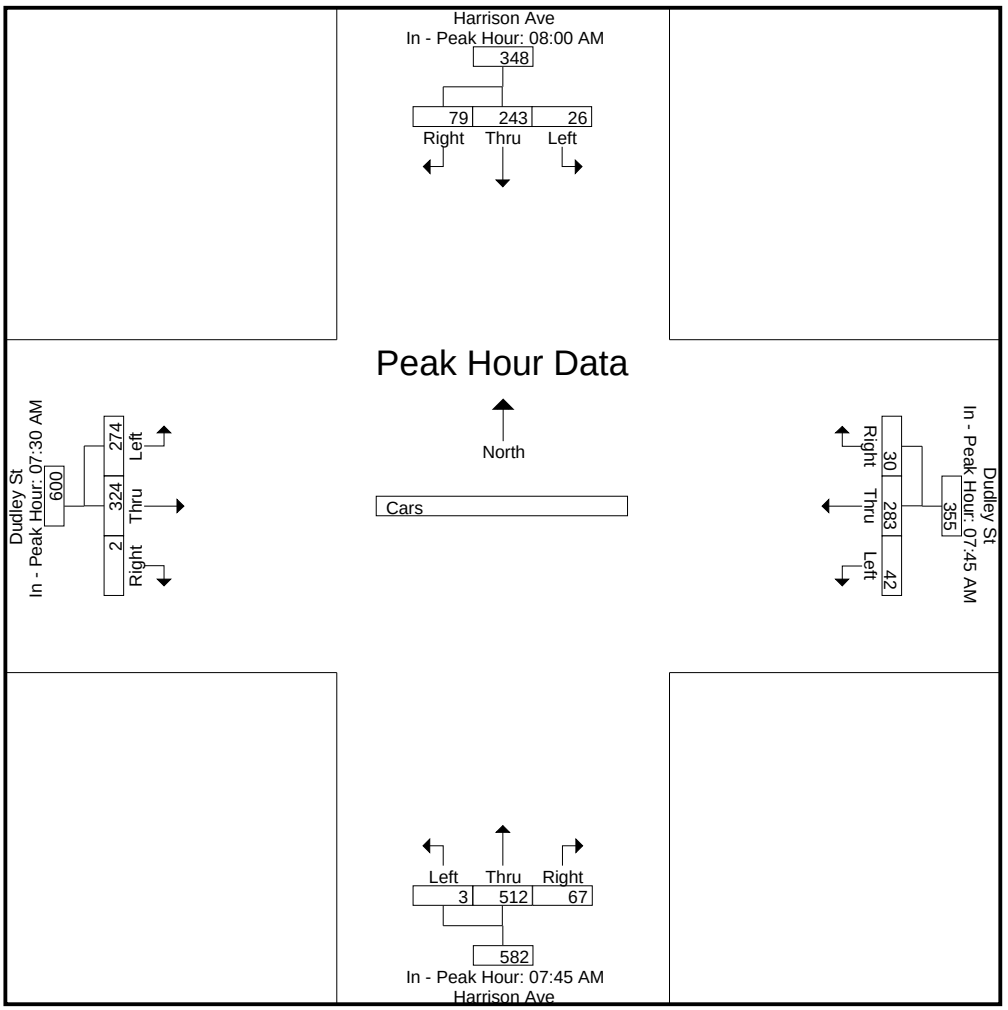
Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				07:45 AM				07:30 AM			
+0 mins.	6	51	20	77	11	71	7	89	0	**137**	**23**	**160**	**71**	**89**	0	**160**
+15 mins.	5	60	20	85	**12**	63	2	77	**2**	127	11	140	69	78	**1**	148
+30 mins.	**8**	**72**	16	**96**	11	74	4	89	1	121	14	136	68	84	1	153
+45 mins.	7	60	**23**	90	8	**75**	**17**	**100**	0	127	19	146	66	73	0	139
Total Volume	26	243	79	348	42	283	30	355	3	512	67	582	274	324	2	600
% App. Total	7.5	69.8	22.7		11.8	79.7	8.5		0.5	88	11.5		45.7	54	0.3	
PHF	.813	.844	.859	.906	.875	.943	.441	.888	.375	.934	.728	.909	.965	.910	.500	.938

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

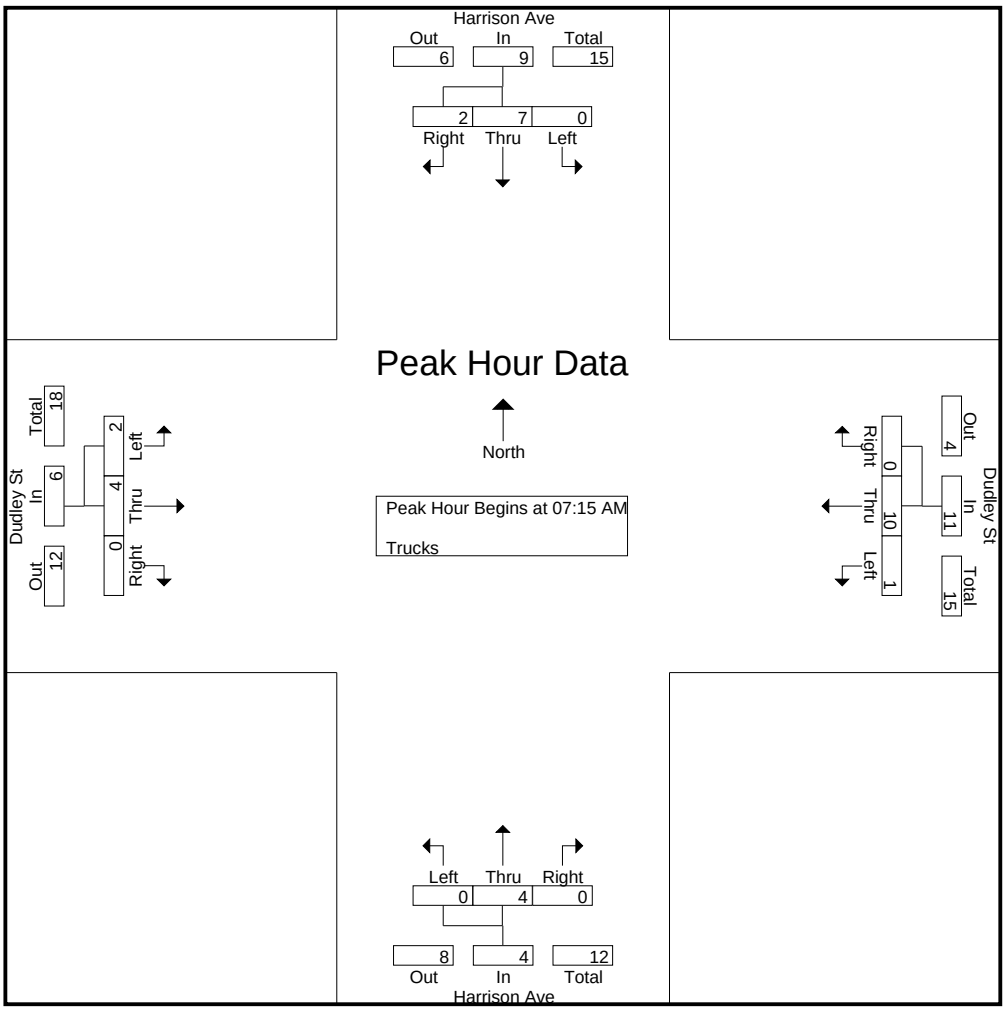
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	1	1	0	0	0	2	2	0	6
07:15 AM	0	3	2	0	2	0	0	1	0	0	1	0	9
07:30 AM	0	1	0	0	1	0	0	1	0	1	0	0	4
07:45 AM	0	1	0	1	4	0	0	1	0	1	1	0	9
Total	0	5	2	1	8	1	0	3	0	4	4	0	28
08:00 AM	0	2	0	0	3	0	0	1	0	0	2	0	8
08:15 AM	0	1	0	0	1	0	0	1	0	1	3	0	7
08:30 AM	0	2	0	1	1	0	0	0	0	0	2	0	6
08:45 AM	0	0	0	0	4	0	0	0	0	1	0	0	5
Total	0	5	0	1	9	0	0	2	0	2	7	0	26
Grand Total	0	10	2	2	17	1	0	5	0	6	11	0	54
Apprch %	0	83.3	16.7	10	85	5	0	100	0	35.3	64.7	0	
Total %	0	18.5	3.7	3.7	31.5	1.9	0	9.3	0	11.1	20.4	0	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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 07:15 AM																	
07:15 AM	0	**3**	**2**	**5**	0	2	0	2	0	**1**	0	**1**	0	1	0	1	**9**
07:30 AM	0	1	0	1	0	1	0	1	0	1	0	1	**1**	0	0	1	4
07:45 AM	0	1	0	1	**1**	**4**	0	**5**	0	1	0	1	1	1	0	**2**	9
08:00 AM	0	2	0	2	0	3	0	3	0	1	0	1	0	**2**	0	2	8
Total Volume	0	7	2	9	1	10	0	11	0	4	0	4	2	4	0	6	30
% App. Total	0	77.8	22.2		9.1	90.9	0		0	100	0		33.3	66.7	0		
PHF	.000	.583	.250	.450	.250	.625	.000	.550	.000	1.00	.000	1.00	.500	.500	.000	.750	.833

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

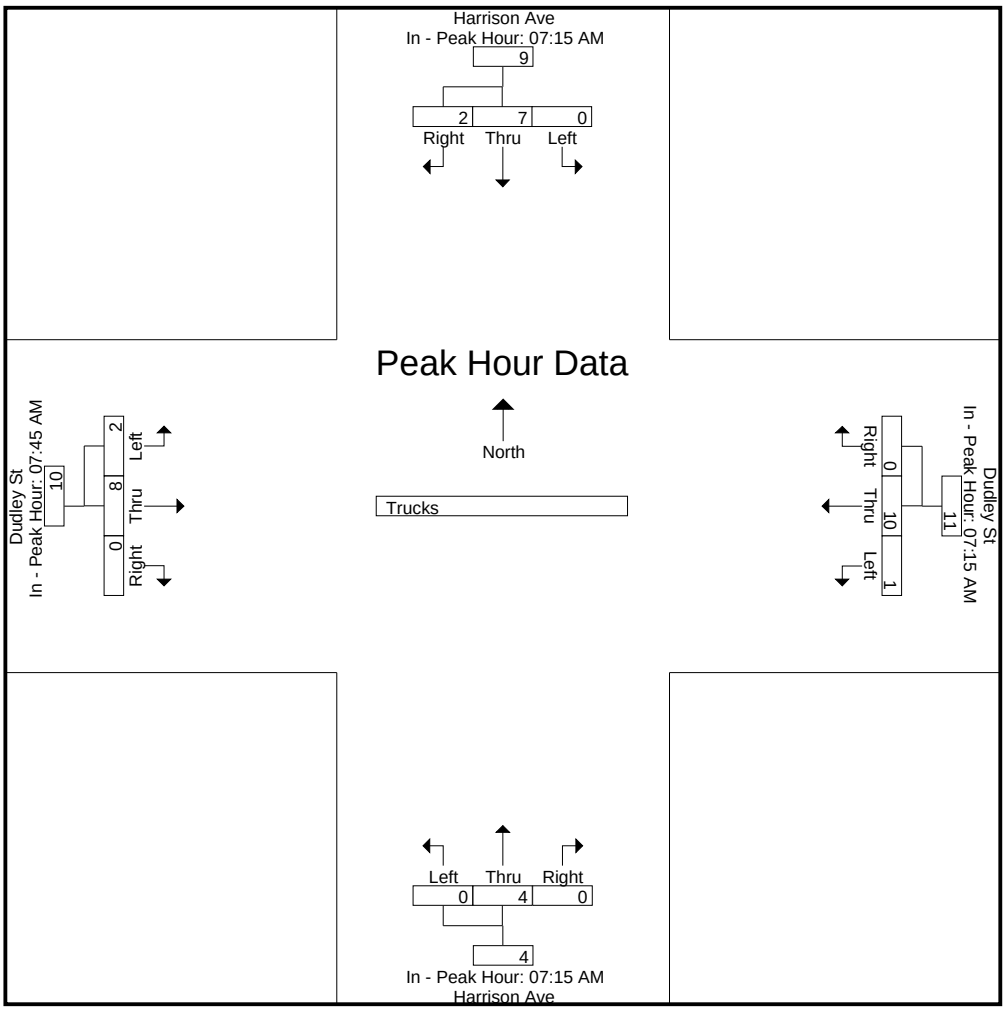
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:45 AM			
+0 mins.	0	**3**	**2**	**5**	0	2	0	2	0	**1**	0	**1**	**1**	1	0	2
+15 mins.	0	1	0	1	0	1	0	1	0	1	0	1	0	2	0	2
+30 mins.	0	1	0	1	**1**	**4**	0	**5**	0	1	0	1	1	**3**	0	**4**
+45 mins.	0	2	0	2	0	3	0	3	0	1	0	1	0	2	0	2
Total Volume	0	7	2	9	1	10	0	11	0	4	0	4	2	8	0	10
% App. Total	0	77.8	22.2		9.1	90.9	0		0	100	0		20	80	0	
PHF	.000	.583	.250	.450	.250	.625	.000	.550	.000	1.000	.000	1.000	.500	.667	.000	.625

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

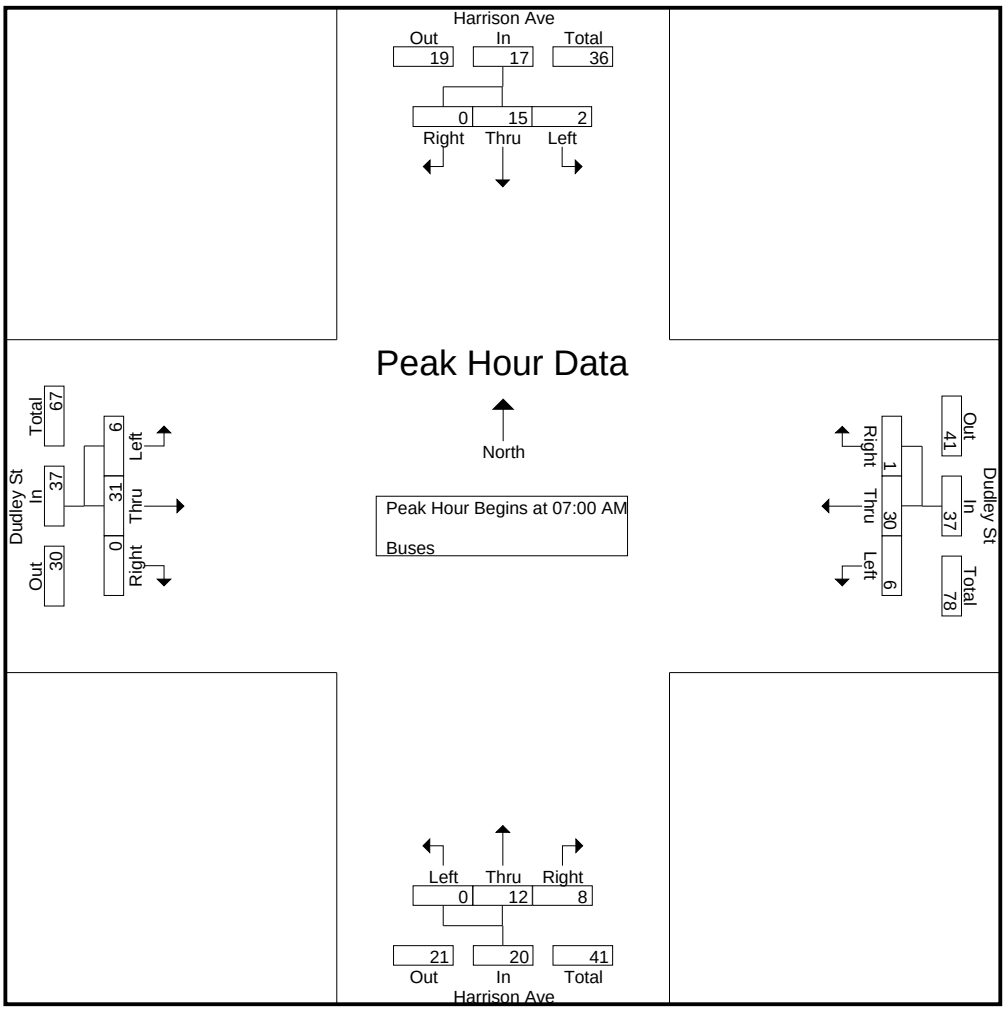
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	2	5	0	2	8	0	0	3	7	5	11	0	43
07:15 AM	0	1	0	1	7	0	0	3	0	0	8	0	20
07:30 AM	0	6	0	1	10	0	0	5	0	1	8	0	31
07:45 AM	0	3	0	2	5	1	0	1	1	0	4	0	17
Total	2	15	0	6	30	1	0	12	8	6	31	0	111
08:00 AM	0	2	0	0	10	2	0	4	3	0	7	1	29
08:15 AM	1	3	0	0	7	1	0	3	1	1	7	0	24
08:30 AM	0	4	0	1	4	0	0	1	1	3	5	0	19
08:45 AM	1	5	0	0	7	0	0	2	2	0	4	0	21
Total	2	14	0	1	28	3	0	10	7	4	23	1	93
Grand Total	4	29	0	7	58	4	0	22	15	10	54	1	204
Apprch %	12.1	87.9	0	10.1	84.1	5.8	0	59.5	40.5	15.4	83.1	1.5	
Total %	2	14.2	0	3.4	28.4	2	0	10.8	7.4	4.9	26.5	0.5	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	**2**	5	0	**7**	**2**	8	0	10	0	3	**7**	**10**	**5**	**11**	0	**16**	**43**
07:15 AM	0	1	0	1	1	7	0	8	0	3	0	3	0	8	0	8	20
07:30 AM	0	**6**	0	6	1	**10**	0	**11**	0	**5**	0	5	1	8	0	9	31
07:45 AM	0	3	0	3	2	5	**1**	8	0	1	1	2	0	4	0	4	17
Total Volume	2	15	0	17	6	30	1	37	0	12	8	20	6	31	0	37	111
% App. Total	11.8	88.2	0		16.2	81.1	2.7		0	60	40		16.2	83.8	0		
PHF	.250	.625	.000	.607	.750	.750	.250	.841	.000	.600	.286	.500	.300	.705	.000	.578	.645

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

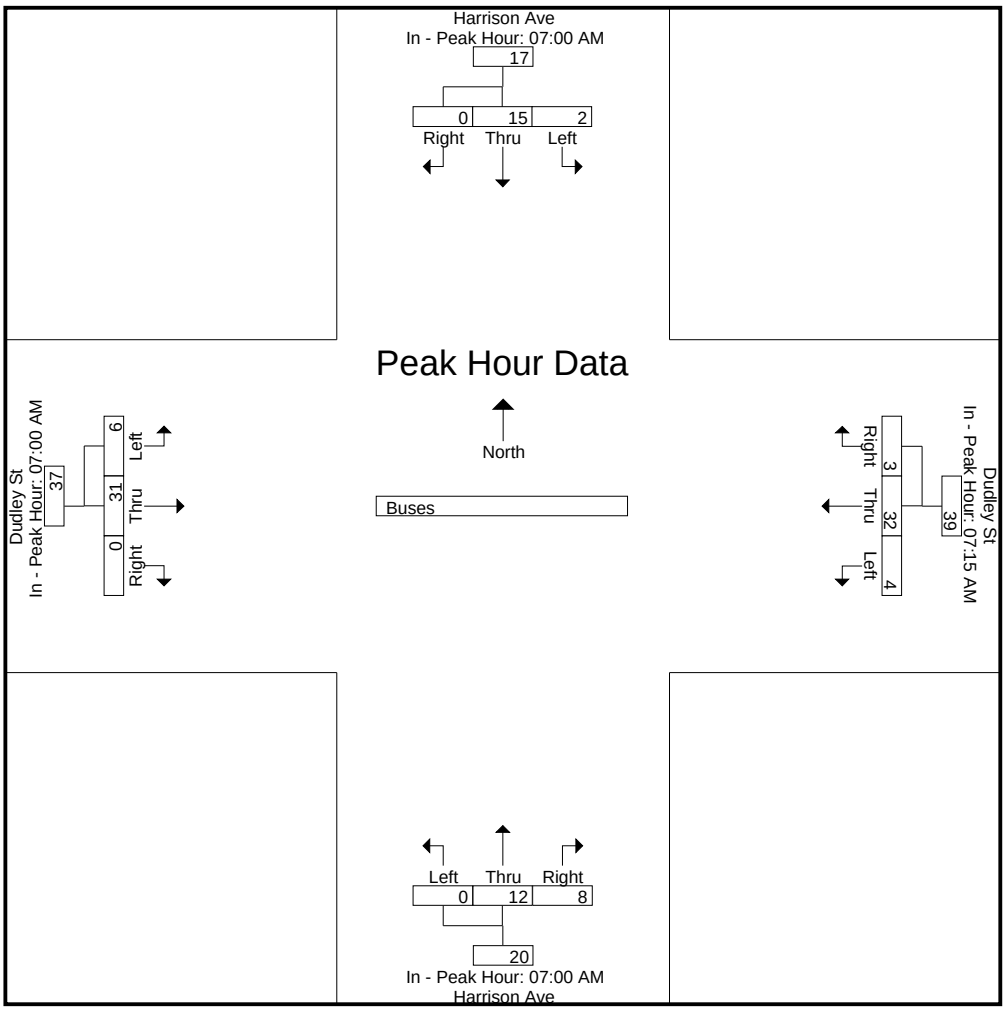
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:00 AM				07:00 AM			
+0 mins.	**2**	5	0	**7**	1	7	0	8	0	3	**7**	**10**	**5**	**11**	0	**16**
+15 mins.	0	1	0	1	1	**10**	0	11	0	3	0	3	0	8	0	8
+30 mins.	0	**6**	0	6	**2**	5	1	8	0	**5**	0	5	1	8	0	9
+45 mins.	0	3	0	3	0	10	**2**	**12**	0	1	1	2	0	4	0	4
Total Volume	2	15	0	17	4	32	3	39	0	12	8	20	6	31	0	37
% App. Total	11.8	88.2	0		10.3	82.1	7.7		0	60	40		16.2	83.8	0	
PHF	.250	.625	.000	.607	.500	.800	.375	.813	.000	.600	.286	.500	.300	.705	.000	.578

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Bikes Peds

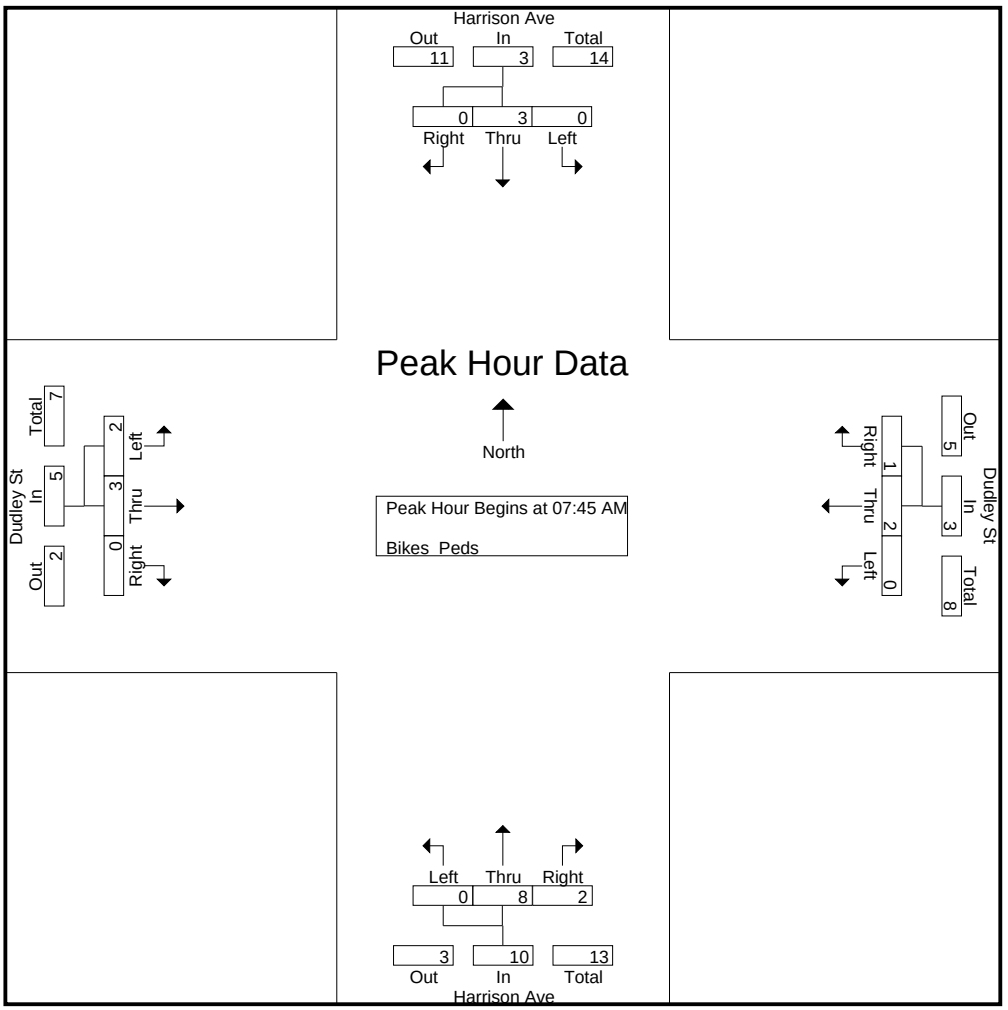
	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	20	0	0	1	6	0	0	0	4	0	2	0	3	33	3	36
07:15 AM	0	0	1	29	0	2	0	2	0	1	0	6	0	1	0	1	38	5	43
07:30 AM	0	0	0	25	0	0	0	2	0	0	0	5	0	0	0	0	32	0	32
07:45 AM	0	0	0	14	0	1	0	3	0	2	0	1	0	1	0	0	18	4	22
Total	0	0	1	88	0	3	1	13	0	3	0	16	0	4	0	4	121	12	133
08:00 AM	0	1	0	25	0	1	0	10	0	0	2	6	0	0	0	1	42	4	46
08:15 AM	0	1	0	18	0	0	0	2	0	3	0	5	1	1	0	0	25	6	31
08:30 AM	0	1	0	12	0	0	1	3	0	3	0	10	1	1	0	1	26	7	33
08:45 AM	0	0	1	19	0	0	0	1	0	0	0	5	1	1	1	3	28	4	32
Total	0	3	1	74	0	1	1	16	0	6	2	26	3	3	1	5	121	21	142
Grand Total	0	3	2	162	0	4	2	29	0	9	2	42	3	7	1	9	242	33	275
Apprch %	0	60	40		0	66.7	33.3		0	81.8	18.2		27.3	63.6	9.1				
Total %	0	9.1	6.1		0	12.1	6.1		0	27.3	6.1		9.1	21.2	3		88	12	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	0	0	0	0	**1**	0	**1**	0	2	0	2	0	**1**	0	1	4
08:00 AM	0	**1**	0	**1**	0	1	0	1	0	0	**2**	2	0	0	0	0	4
08:15 AM	0	1	0	1	0	0	0	0	0	**3**	0	**3**	**1**	1	0	**2**	6
08:30 AM	0	1	0	1	0	0	**1**	1	0	3	0	3	1	1	0	2	**7**
Total Volume	0	3	0	3	0	2	1	3	0	8	2	10	2	3	0	5	21
% App. Total	0	100	0		0	66.7	33.3		0	80	20		40	60	0		
PHF	.000	.750	.000	.750	.000	.500	.250	.750	.000	.667	.250	.833	.500	.750	.000	.625	.750

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

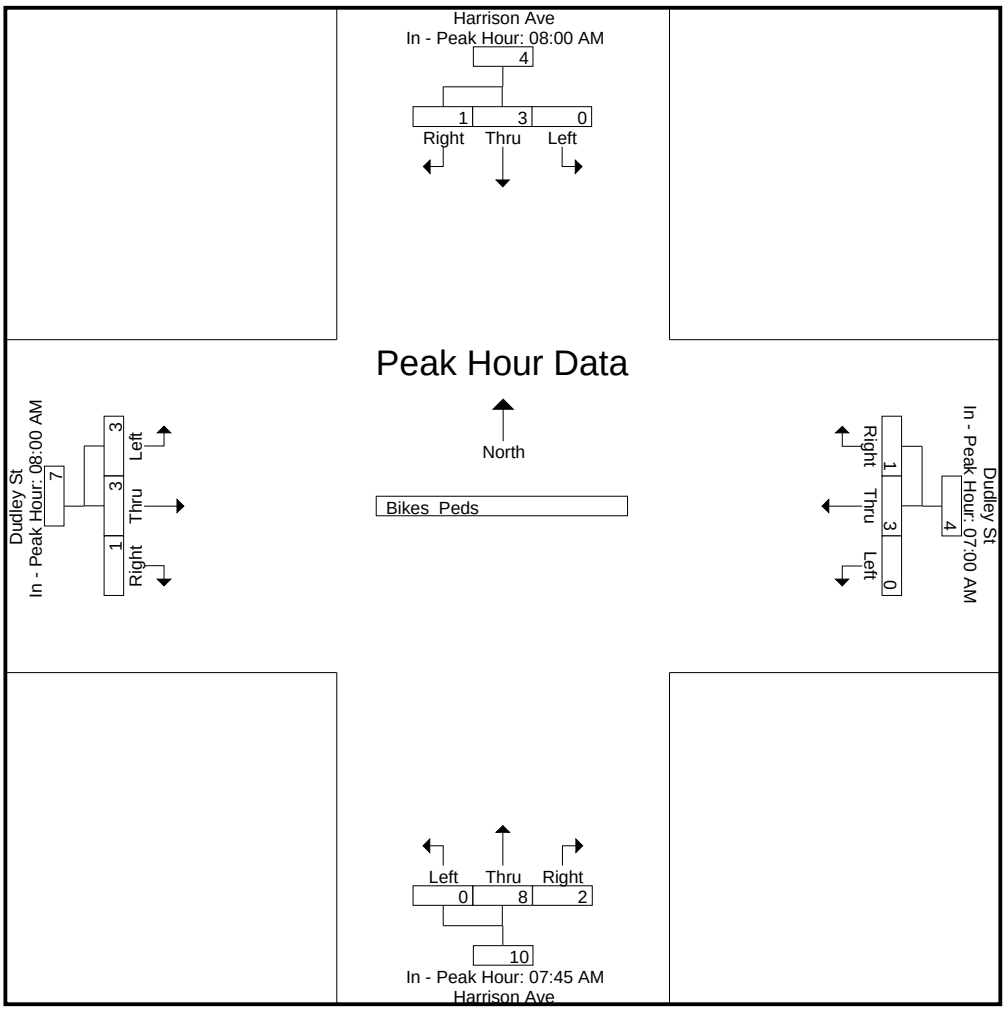
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:45 AM				08:00 AM			
+0 mins.	0	**1**	0	**1**	0	0	**1**	1	0	2	0	2	0	0	0	0
+15 mins.	0	1	0	1	0	**2**	0	**2**	0	0	**2**	2	**1**	**1**	0	2
+30 mins.	0	1	0	1	0	0	0	0	0	**3**	0	**3**	1	1	0	2
+45 mins.	0	0	**1**	1	0	1	0	1	0	3	0	3	1	1	**1**	**3**
Total Volume	0	3	1	4	0	3	1	4	0	8	2	10	3	3	1	7
% App. Total	0	75	25		0	75	25		0	80	20		42.9	42.9	14.3	
PHF	.000	.750	.250	1.000	.000	.375	.250	.500	.000	.667	.250	.833	.750	.750	.250	.583

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars - Buses - Trucks

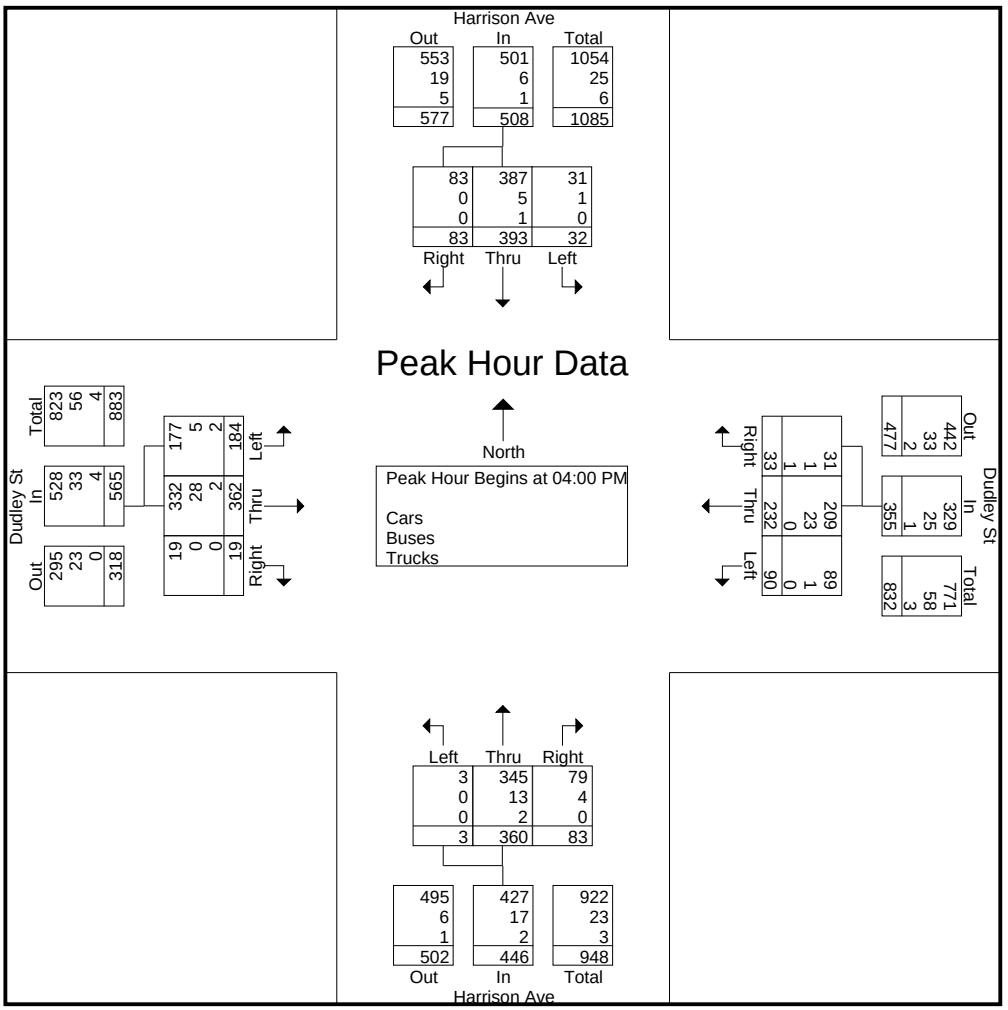
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	6	106	23	22	58	5	0	90	25	51	90	5	481
04:15 PM	8	92	30	17	55	5	2	99	17	54	108	5	492
04:30 PM	8	95	10	21	64	9	1	83	19	37	77	4	428
04:45 PM	10	100	20	30	55	14	0	88	22	42	87	5	473
Total	32	393	83	90	232	33	3	360	83	184	362	19	1874
05:00 PM	8	104	20	28	51	3	0	83	25	48	82	1	453
05:15 PM	6	97	26	28	68	10	2	91	19	45	90	2	484
05:30 PM	15	102	30	12	61	9	2	74	13	40	87	2	447
05:45 PM	5	106	36	15	66	10	1	92	15	36	83	2	467
Total	34	409	112	83	246	32	5	340	72	169	342	7	1851
Grand Total	66	802	195	173	478	65	8	700	155	353	704	26	3725
Apprch %	6.2	75.4	18.3	24.2	66.8	9.1	0.9	81.1	18	32.6	65	2.4	
Total %	1.8	21.5	5.2	4.6	12.8	1.7	0.2	18.8	4.2	9.5	18.9	0.7	
Cars	65	784	195	172	436	58	8	671	144	340	654	26	3553
% Cars	98.5	97.8	100	99.4	91.2	89.2	100	95.9	92.9	96.3	92.9	100	95.4
Buses	1	13	0	1	41	6	0	27	10	10	47	0	156
% Buses	1.5	1.6	0	0.6	8.6	9.2	0	3.9	6.5	2.8	6.7	0	4.2
Trucks	0	5	0	0	1	1	0	2	1	3	3	0	16
% Trucks	0	0.6	0	0	0.2	1.5	0	0.3	0.6	0.8	0.4	0	0.4

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	6	**106**	23	**135**	22	58	5	85	0	90	**25**	115	51	90	**5**	146	481
04:15 PM	8	92	**30**	130	17	55	5	77	**2**	**99**	17	**118**	**54**	**108**	5	**167**	**492**
04:30 PM	8	95	10	113	21	**64**	9	94	1	83	19	103	37	77	4	118	428
04:45 PM	**10**	100	20	130	**30**	55	**14**	**99**	0	88	22	110	42	87	5	134	473
Total Volume	32	393	83	508	90	232	33	355	3	360	83	446	184	362	19	565	1874
% App. Total	6.3	77.4	16.3		25.4	65.4	9.3		0.7	80.7	18.6		32.6	64.1	3.4		
PHF	.800	.927	.692	.941	.750	.906	.589	.896	.375	.909	.830	.945	.852	.838	.950	.846	.952
Cars	31	387	83	501	89	209	31	329	3	345	79	427	177	332	19	528	1785
% Cars	96.9	98.5	100	98.6	98.9	90.1	93.9	92.7	100	95.8	95.2	95.7	96.2	91.7	100	93.5	95.3
Buses	1	5	0	6	1	23	1	25	0	13	4	17	5	28	0	33	81
% Buses	3.1	1.3	0	1.2	1.1	9.9	3.0	7.0	0	3.6	4.8	3.8	2.7	7.7	0	5.8	4.3
Trucks	0	1	0	1	0	0	1	1	0	2	0	2	2	2	0	4	8
% Trucks	0	0.3	0	0.2	0	0	3.0	0.3	0	0.6	0	0.4	1.1	0.6	0	0.7	0.4

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

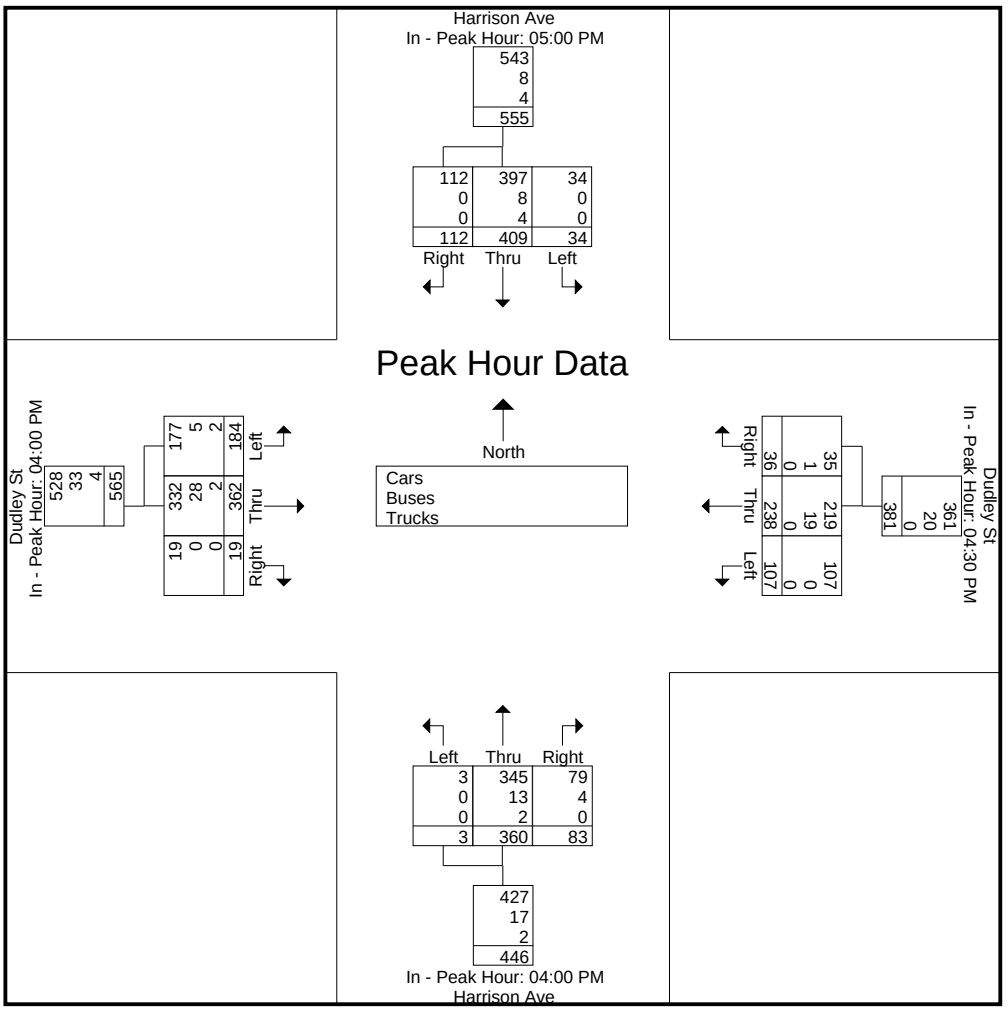
Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	8	104	20	132	21	64	9	94	0	90	**25**	115	51	90	**5**	146
+15 mins.	6	97	26	129	**30**	55	**14**	99	**2**	**99**	17	**118**	**54**	**108**	5	**167**
+30 mins.	**15**	102	30	**147**	28	51	3	82	1	83	19	103	37	77	4	118
+45 mins.	5	**106**	**36**	147	28	**68**	10	**106**	0	88	22	110	42	87	5	134
Total Volume	34	409	112	555	107	238	36	381	3	360	83	446	184	362	19	565
% App. Total	6.1	73.7	20.2		28.1	62.5	9.4		0.7	80.7	18.6		32.6	64.1	3.4	
PHF	.567	.965	.778	.944	.892	.875	.643	.899	.375	.909	.830	.945	.852	.838	.950	.846
Cars	34	397	112	543	107	219	35	361	3	345	79	427	177	332	19	528
% Cars	100	97.1	100	97.8	100	92	97.2	94.8	100	95.8	95.2	95.7	96.2	91.7	100	93.5
Buses	0	8	0	8	0	19	1	20	0	13	4	17	5	28	0	33
% Buses	0	2	0	1.4	0	8	2.8	5.2	0	3.6	4.8	3.8	2.7	7.7	0	5.8
Trucks	0	4	0	4	0	0	0	0	0	2	0	2	2	2	0	4
% Trucks	0	1	0	0.7	0	0	0	0	0	0.6	0	0.4	1.1	0.6	0	0.7

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Cars

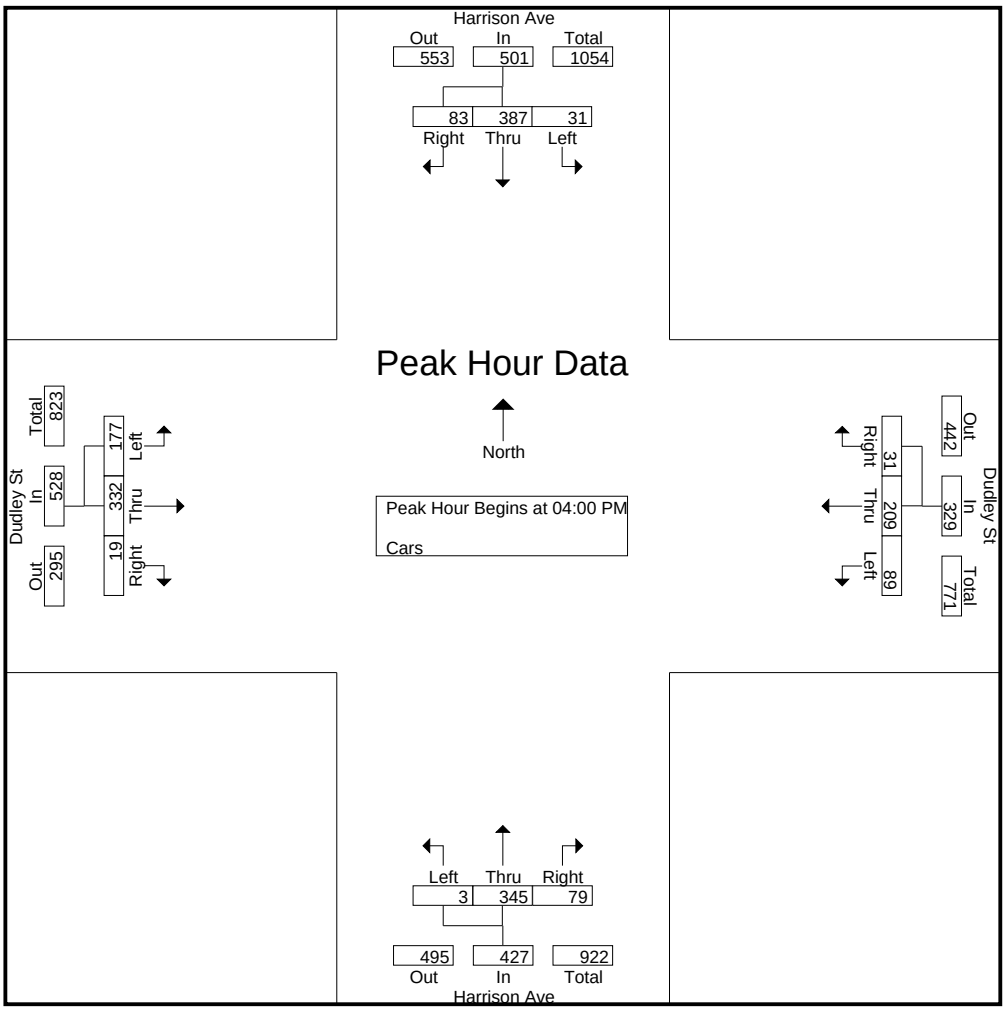
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	6	102	23	21	53	4	0	88	22	49	83	5	456
04:15 PM	7	92	30	17	48	5	2	93	17	53	100	5	469
04:30 PM	8	94	10	21	59	8	1	80	18	35	69	4	407
04:45 PM	10	99	20	30	49	14	0	84	22	40	80	5	453
Total	31	387	83	89	209	31	3	345	79	177	332	19	1785
05:00 PM	8	101	20	28	47	3	0	78	20	47	79	1	432
05:15 PM	6	96	26	28	64	10	2	86	18	42	84	2	464
05:30 PM	15	97	30	12	55	4	2	72	12	40	84	2	425
05:45 PM	5	103	36	15	61	10	1	90	15	34	75	2	447
Total	34	397	112	83	227	27	5	326	65	163	322	7	1768
Grand Total	65	784	195	172	436	58	8	671	144	340	654	26	3553
Apprch %	6.2	75.1	18.7	25.8	65.5	8.7	1	81.5	17.5	33.3	64.1	2.5	
Total %	1.8	22.1	5.5	4.8	12.3	1.6	0.2	18.9	4.1	9.6	18.4	0.7	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	6	**102**	23	**131**	21	53	4	78	0	88	**22**	110	49	83	**5**	137	456
04:15 PM	7	92	**30**	129	17	48	5	70	**2**	**93**	17	**112**	**53**	**100**	5	**158**	**469**
04:30 PM	8	94	10	112	21	**59**	8	88	1	80	18	99	35	69	4	108	407
04:45 PM	**10**	99	20	129	**30**	49	**14**	**93**	0	84	22	106	40	80	5	125	453
Total Volume	31	387	83	501	89	209	31	329	3	345	79	427	177	332	19	528	1785
% App. Total	6.2	77.2	16.6		27.1	63.5	9.4		0.7	80.8	18.5		33.5	62.9	3.6		
PHF	.775	.949	.692	.956	.742	.886	.554	.884	.375	.927	.898	.953	.835	.830	.950	.835	.951

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

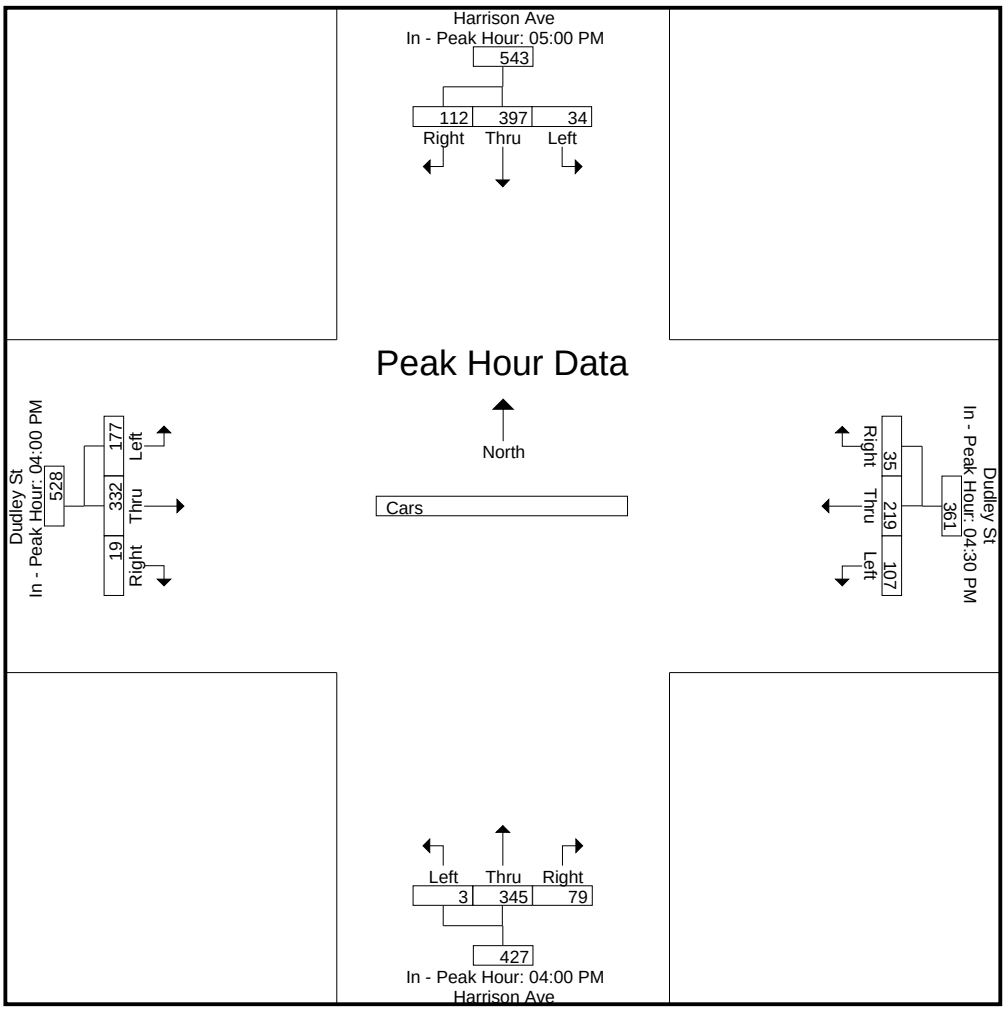
Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	8	101	20	129	21	59	8	88	0	88	**22**	110	49	83	**5**	137
+15 mins.	6	96	26	128	**30**	49	**14**	93	**2**	**93**	17	**112**	**53**	**100**	5	**158**
+30 mins.	**15**	97	30	142	28	47	3	78	1	80	18	99	35	69	4	108
+45 mins.	5	**103**	**36**	**144**	28	**64**	10	**102**	0	84	22	106	40	80	5	125
Total Volume	34	397	112	543	107	219	35	361	3	345	79	427	177	332	19	528
% App. Total	6.3	73.1	20.6		29.6	60.7	9.7		0.7	80.8	18.5		33.5	62.9	3.6	
PHF	.567	.964	.778	.943	.892	.855	.625	.885	.375	.927	.898	.953	.835	.830	.950	.835

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Trucks

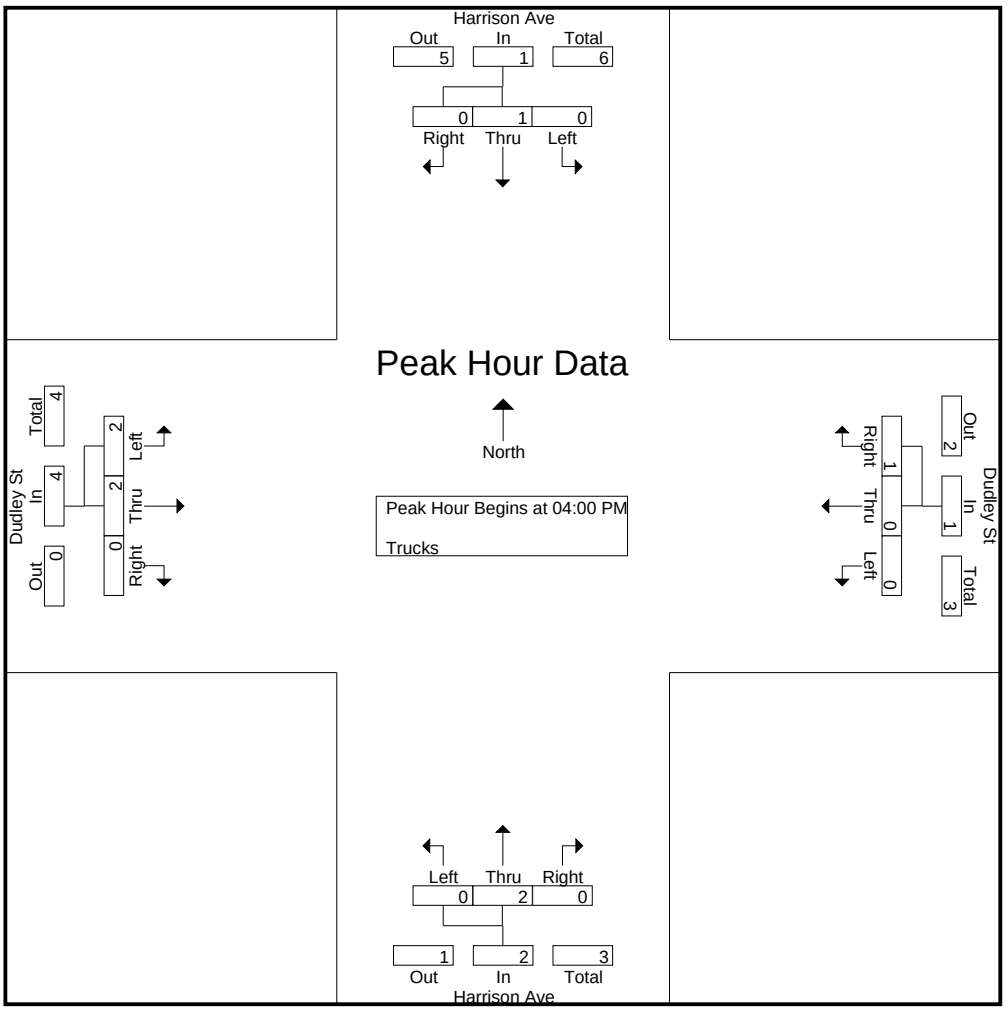
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	1	0	1	0	1	1	0	4
04:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	2
Total	0	1	0	0	0	1	0	2	0	2	2	0	8
05:00 PM	0	1	0	0	0	0	0	0	1	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
05:30 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
05:45 PM	0	1	0	0	0	0	0	0	0	0	1	0	2
Total	0	4	0	0	1	0	0	0	1	1	1	0	8
Grand Total	0	5	0	0	1	1	0	2	1	3	3	0	16
Apprch %	0	100	0	0	50	50	0	66.7	33.3	50	50	0	
Total %	0	31.2	0	0	6.2	6.2	0	12.5	6.2	18.8	18.8	0	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	0	0	0	0	0	**1**	**1**	0	**1**	0	**1**	**1**	**1**	0	**2**	**4**
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	1	0	1	0	0	1	1	0	2	0	2	2	2	0	4	8
% App. Total	0	100	0		0	0	100		0	100	0		50	50	0		
PHF	.000	.250	.000	.250	.000	.000	.250	.250	.000	.500	.000	.500	.500	.500	.000	.500	.500

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

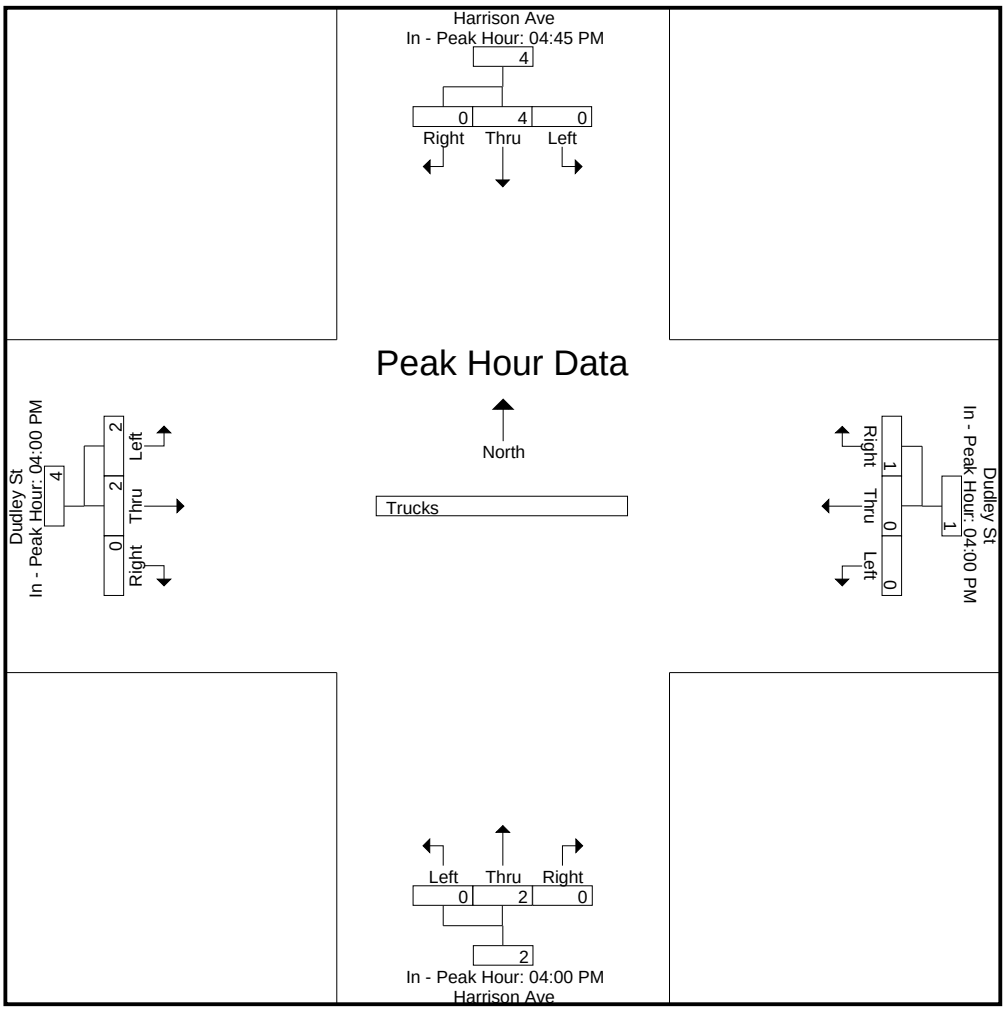
Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	1	0	1	0	0	**1**	**1**	0	**1**	0	**1**	**1**	**1**	0	**2**
+15 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	**2**	0	**2**	0	0	0	0	0	0	0	0	1	0	0	1
Total Volume	0	4	0	4	0	0	1	1	0	2	0	2	2	2	0	4
% App. Total	0	100	0		0	0	100		0	100	0		50	50	0	
PHF	.000	.500	.000	.500	.000	.000	.250	.250	.000	.500	.000	.500	.500	.500	.000	.500

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 1

Groups Printed- Buses

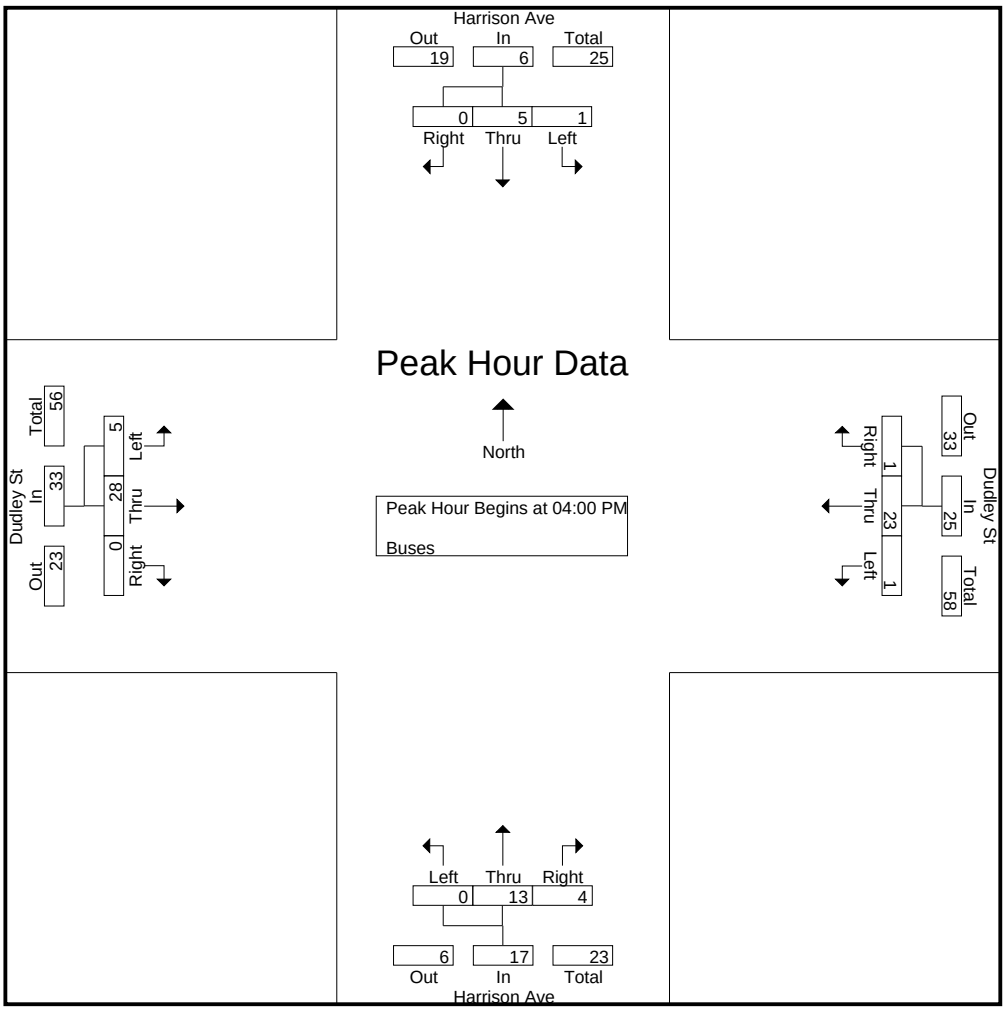
	Harrison Ave From North			Dudley St From East			Harrison Ave From South			Dudley St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	4	0	1	5	0	0	1	3	1	6	0	21
04:15 PM	1	0	0	0	7	0	0	5	0	1	7	0	21
04:30 PM	0	1	0	0	5	1	0	3	1	2	8	0	21
04:45 PM	0	0	0	0	6	0	0	4	0	1	7	0	18
Total	1	5	0	1	23	1	0	13	4	5	28	0	81
05:00 PM	0	2	0	0	4	0	0	5	4	1	3	0	19
05:15 PM	0	1	0	0	4	0	0	5	1	2	6	0	19
05:30 PM	0	3	0	0	5	5	0	2	1	0	3	0	19
05:45 PM	0	2	0	0	5	0	0	2	0	2	7	0	18
Total	0	8	0	0	18	5	0	14	6	5	19	0	75
Grand Total	1	13	0	1	41	6	0	27	10	10	47	0	156
Apprch %	7.1	92.9	0	2.1	85.4	12.5	0	73	27	17.5	82.5	0	
Total %	0.6	8.3	0	0.6	26.3	3.8	0	17.3	6.4	6.4	30.1	0	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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	**4**	0	**4**	**1**	5	0	6	0	1	**3**	4	1	6	0	7	**21**
04:15 PM	**1**	0	0	1	0	**7**	0	**7**	0	**5**	0	**5**	1	7	0	8	21
04:30 PM	0	1	0	1	0	5	**1**	6	0	3	1	4	**2**	**8**	0	**10**	21
04:45 PM	0	0	0	0	0	6	0	6	0	4	0	4	1	7	0	8	18
Total Volume	1	5	0	6	1	23	1	25	0	13	4	17	5	28	0	33	81
% App. Total	16.7	83.3	0		4	92	4		0	76.5	23.5		15.2	84.8	0		
PHF	.250	.313	.000	.375	.250	.821	.250	.893	.000	.650	.333	.850	.625	.875	.000	.825	.964

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

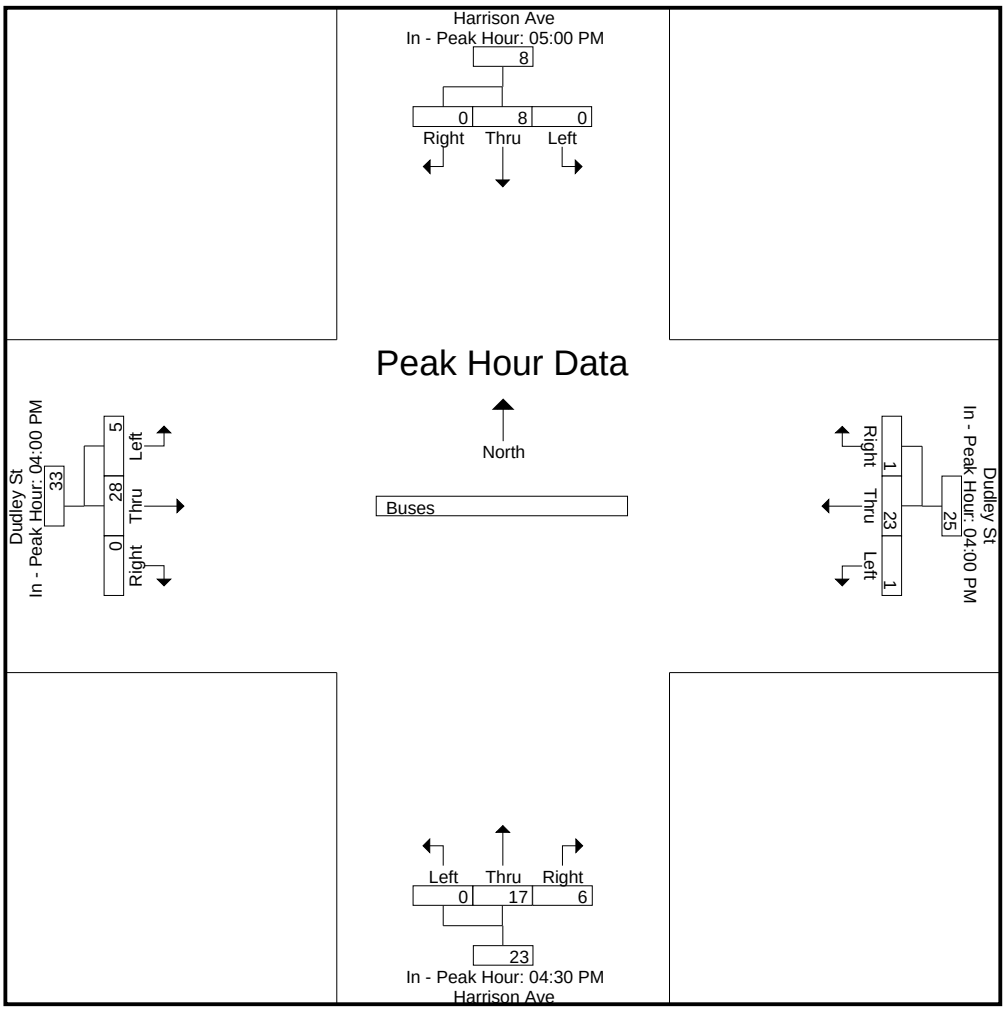
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:30 PM				04:00 PM			
+0 mins.	0	2	0	2	**1**	5	0	6	0	3	1	4	1	6	0	7
+15 mins.	0	1	0	1	0	**7**	0	**7**	0	4	0	4	1	7	0	8
+30 mins.	0	**3**	0	**3**	0	5	**1**	6	0	**5**	**4**	**9**	**2**	**8**	0	**10**
+45 mins.	0	2	0	2	0	6	0	6	0	5	1	6	1	7	0	8
Total Volume	0	8	0	8	1	23	1	25	0	17	6	23	5	28	0	33
% App. Total	0	100	0		4	92	4		0	73.9	26.1		15.2	84.8	0	
PHF	.000	.667	.000	.667	.250	.821	.250	.893	.000	.850	.375	.639	.625	.875	.000	.825

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012

Groups Printed- Bikes Peds

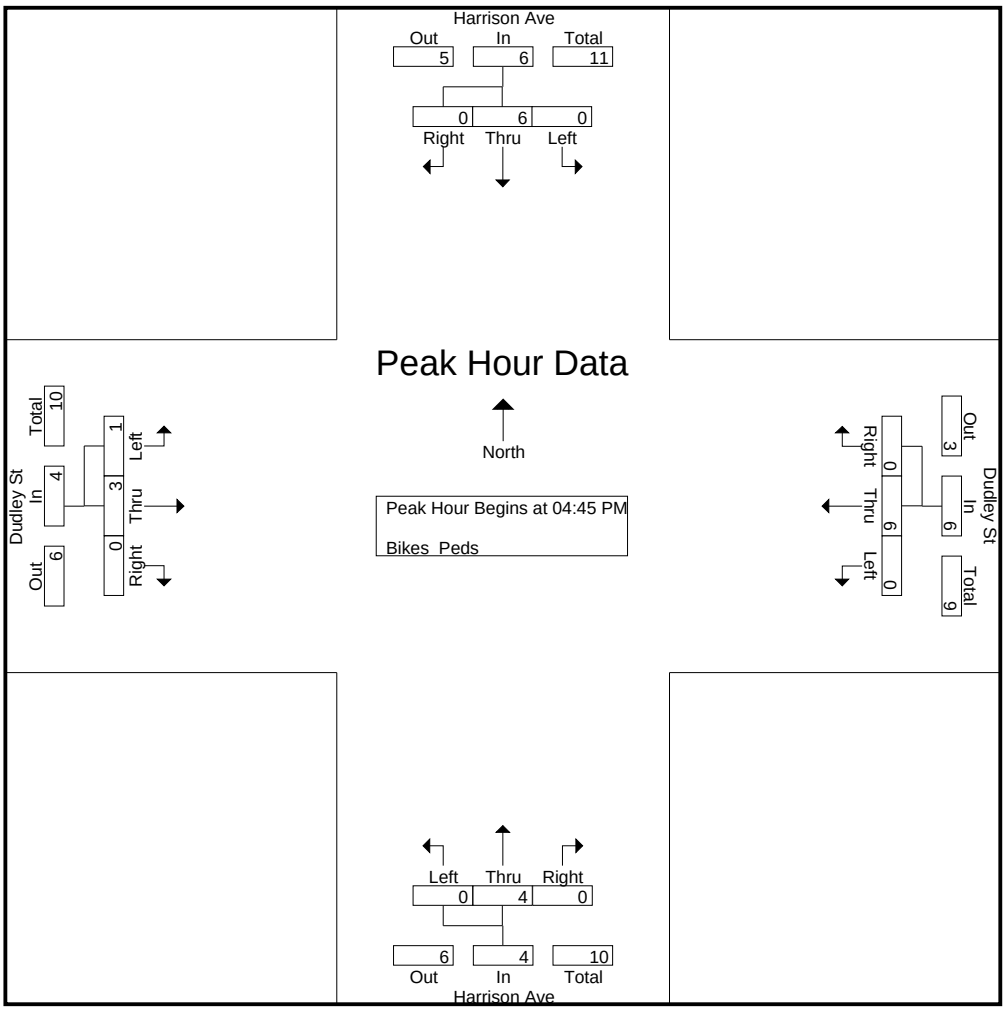
	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	1	0	20	0	0	0	4	0	0	0	10	0	0	0	3	37	2	39
04:15 PM	1	0	0	6	0	3	0	3	0	0	0	3	0	2	0	0	12	6	18
04:30 PM	0	0	0	17	0	0	0	8	0	0	0	8	0	0	0	2	35	0	35
04:45 PM	0	0	0	26	0	3	0	1	0	0	0	5	0	1	0	0	32	4	36
Total	2	1	0	69	0	6	0	16	0	0	0	26	0	3	0	5	116	12	128
05:00 PM	0	2	0	15	0	1	0	2	0	1	0	12	0	2	0	5	34	6	40
05:15 PM	0	2	0	29	0	2	0	6	0	1	0	5	1	0	0	2	42	6	48
05:30 PM	0	2	0	14	0	0	0	1	0	2	0	17	0	0	0	2	34	4	38
05:45 PM	0	0	1	23	0	1	0	5	0	0	0	4	0	1	0	1	33	3	36
Total	0	6	1	81	0	4	0	14	0	4	0	38	1	3	0	10	143	19	162
Grand Total	2	7	1	150	0	10	0	30	0	4	0	64	1	6	0	15	259	31	290
Apprch %	20	70	10		0	100	0		0	100	0		14.3	85.7	0				
Total %	6.5	22.6	3.2		0	32.3	0		0	12.9	0		3.2	19.4	0		89.3	10.7	

	Harrison Ave From North				Dudley St From East				Harrison Ave From South				Dudley 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 04:45 PM																	
04:45 PM	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	1	0	1	4
05:00 PM	0	**2**	0	**2**	0	1	0	1	0	1	0	1	0	**2**	0	**2**	**6**
05:15 PM	0	2	0	2	0	2	0	2	0	1	0	1	**1**	0	0	1	6
05:30 PM	0	2	0	2	0	0	0	0	0	**2**	0	**2**	0	0	0	0	4
Total Volume	0	6	0	6	0	6	0	6	0	4	0	4	1	3	0	4	20
% App. Total	0	100	0		0	100	0		0	100	0		25	75	0		
PHF	.000	.750	.000	.750	.000	.500	.000	.500	.000	.500	.000	.500	.250	.375	.000	.500	.833

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 2



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

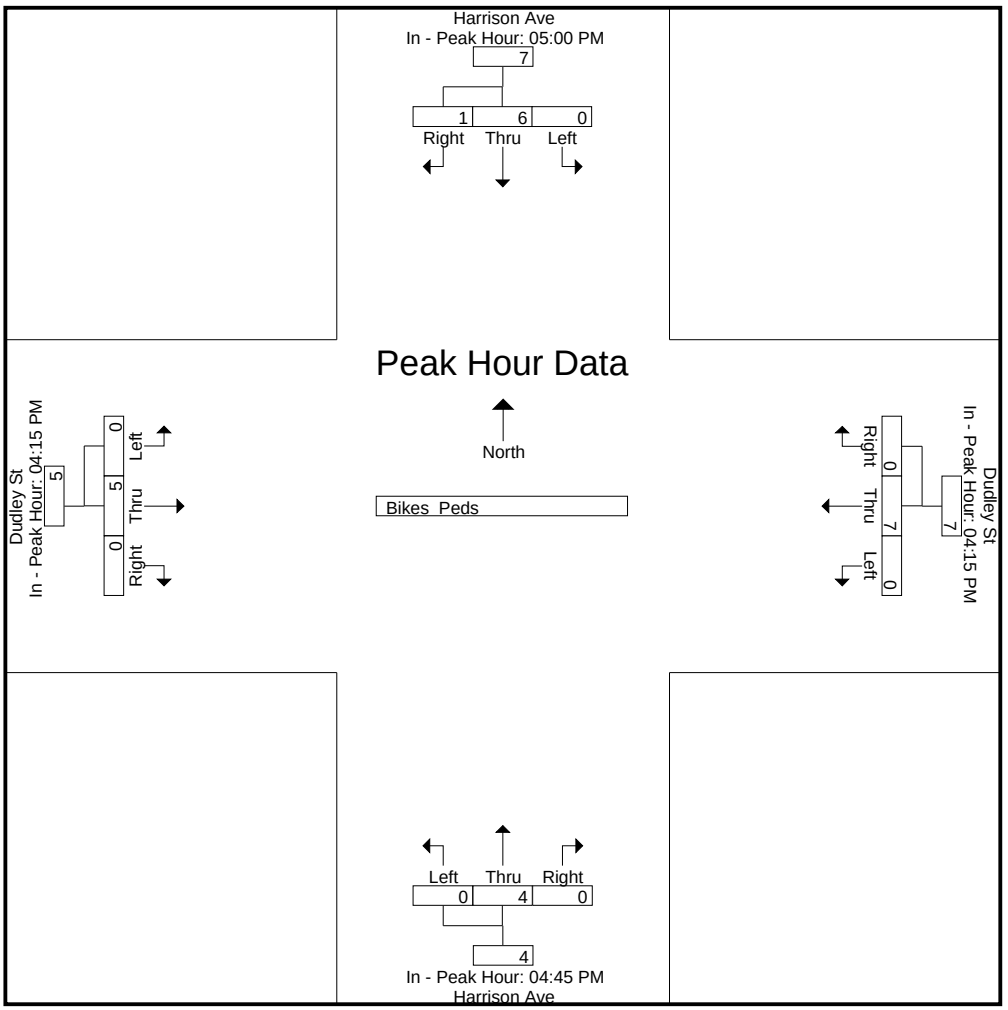
Peak Hour for Each Approach Begins at:

	05:00 PM				04:15 PM				04:45 PM				04:15 PM			
+0 mins.	0	**2**	0	**2**	0	**3**	0	**3**	0	0	0	0	0	**2**	0	**2**
+15 mins.	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	2	0	2	0	3	0	3	0	1	0	1	0	1	0	1
+45 mins.	0	0	**1**	1	0	1	0	1	0	**2**	0	**2**	0	2	0	2
Total Volume	0	6	1	7	0	7	0	7	0	4	0	4	0	5	0	5
% App. Total	0	85.7	14.3		0	100	0		0	100	0		0	100	0	
PHF	.000	.750	.250	.875	.000	.583	.000	.583	.000	.500	.000	.500	.000	.625	.000	.625

Accurate Counts
978-664-2565

N/S Street : Harrison Avenue
E/W Street : Dudley Street
City/State : Boston, MA
Weather : Cloudy

File Name : 15890004
Site Code : 15890004
Start Date : 10/3/2012
Page No : 3



N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 A
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	0	110	0	185	0	0	8	14	0	317
07:15 AM	0	104	0	189	0	0	11	12	0	316
07:30 AM	0	120	0	170	0	0	18	11	0	319
07:45 AM	0	107	0	191	0	0	8	7	0	313
Total	0	441	0	735	0	0	45	44	0	1265
08:00 AM	0	118	1	161	0	0	7	9	0	296
08:15 AM	0	122	0	159	0	0	7	7	0	295
08:30 AM	0	110	0	175	0	0	6	3	0	294
08:45 AM	0	97	0	156	0	0	5	3	0	261
Total	0	447	1	651	0	0	25	22	0	1146
Grand Total	0	888	1	1386	0	0	70	66	0	2411
Apprch %	0	99.9	0.1	100	0	0	51.5	48.5	0	
Total %	0	36.8	0	57.5	0	0	2.9	2.7	0	
Cars	0	811	1	1297	0	0	64	56	0	2229
% Cars	0	91.3	100	93.6	0	0	91.4	84.8	0	92.5
Heavy Vehicles	0	77	0	89	0	0	6	10	0	182
% Heavy Vehicles	0	8.7	0	6.4	0	0	8.6	15.2	0	7.5

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 07:00 AM													
07:00 AM	0	110	0	110	185	0	0	185	8	14	0	22	317
07:15 AM	0	104	0	104	189	0	0	189	11	12	0	23	316
07:30 AM	0	120	0	120	170	0	0	170	18	11	0	29	319
07:45 AM	0	107	0	107	191	0	0	191	8	7	0	15	313
Total Volume	0	441	0	441	735	0	0	735	45	44	0	89	1265
% App. Total	0	100	0		100	0	0		50.6	49.4	0		
PHF	.000	.919	.000	.919	.962	.000	.000	.962	.625	.786	.000	.767	.991
Cars	0	397	0	397	687	0	0	687	39	35	0	74	1158
% Cars	0	90.0	0	90.0	93.5	0	0	93.5	86.7	79.5	0	83.1	91.5
Heavy Vehicles	0	44	0	44	48	0	0	48	6	9	0	15	107
% Heavy Vehicles	0	10.0	0	10.0	6.5	0	0	6.5	13.3	20.5	0	16.9	8.5

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 A
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	0	99	0	163	0	0	7	9	0	278
07:15 AM	0	89	0	174	0	0	9	10	0	282
07:30 AM	0	110	0	164	0	0	18	9	0	301
07:45 AM	0	99	0	186	0	0	5	7	0	297
Total	0	397	0	687	0	0	39	35	0	1158
08:00 AM	0	113	1	146	0	0	7	9	0	276
08:15 AM	0	114	0	151	0	0	7	7	0	279
08:30 AM	0	101	0	164	0	0	6	2	0	273
08:45 AM	0	86	0	149	0	0	5	3	0	243
Total	0	414	1	610	0	0	25	21	0	1071
Grand Total	0	811	1	1297	0	0	64	56	0	2229
Apprch %	0	99.9	0.1	100	0	0	53.3	46.7	0	
Total %	0	36.4	0	58.2	0	0	2.9	2.5	0	

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 07:00 AM													
07:00 AM	0	99	0	99	163	0	0	163	7	9	0	16	278
07:15 AM	0	89	0	89	174	0	0	174	9	10	0	19	282
07:30 AM	0	110	0	110	164	0	0	164	18	9	0	27	301
07:45 AM	0	99	0	99	186	0	0	186	5	7	0	12	297
Total Volume	0	397	0	397	687	0	0	687	39	35	0	74	1158
% App. Total	0	100	0		100	0	0		52.7	47.3	0		
PHF	.000	.902	.000	.902	.923	.000	.000	.923	.542	.875	.000	.685	.962

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

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 A
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	0	11	0	22	0	0	1	5	0	39
07:15 AM	0	15	0	15	0	0	2	2	0	34
07:30 AM	0	10	0	6	0	0	0	2	0	18
07:45 AM	0	8	0	5	0	0	3	0	0	16
Total	0	44	0	48	0	0	6	9	0	107
08:00 AM	0	5	0	15	0	0	0	0	0	20
08:15 AM	0	8	0	8	0	0	0	0	0	16
08:30 AM	0	9	0	11	0	0	0	1	0	21
08:45 AM	0	11	0	7	0	0	0	0	0	18
Total	0	33	0	41	0	0	0	1	0	75
Grand Total	0	77	0	89	0	0	6	10	0	182
Apprch %	0	100	0	100	0	0	37.5	62.5	0	
Total %	0	42.3	0	48.9	0	0	3.3	5.5	0	

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 07:00 AM													
07:00 AM	0	11	0	11	22	0	0	22	1	5	0	6	39
07:15 AM	0	15	0	15	15	0	0	15	2	2	0	4	34
07:30 AM	0	10	0	10	6	0	0	6	0	2	0	2	18
07:45 AM	0	8	0	8	5	0	0	5	3	0	0	3	16
Total Volume	0	44	0	44	48	0	0	48	6	9	0	15	107
% App. Total	0	100	0		100	0	0		40	60	0		
PHF	.000	.733	.000	.733	.545	.000	.000	.545	.500	.450	.000	.625	.686

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 A
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	1	1	1	0	1	0	0	1	5
07:15 AM	0	0	0	1	0	3	0	0	7	11
07:30 AM	0	0	0	1	0	2	0	0	7	10
07:45 AM	0	1	0	2	0	0	0	0	8	11
Total	0	2	1	5	0	6	0	0	23	37
08:00 AM	0	0	0	1	0	0	0	0	2	3
08:15 AM	0	0	0	2	0	1	0	0	3	6
08:30 AM	0	1	0	3	0	0	0	0	2	6
08:45 AM	0	1	0	3	0	0	0	0	5	9
Total	0	2	0	9	0	1	0	0	12	24
Grand Total	0	4	1	14	0	7	0	0	35	61
Apprch %	0	80	20	66.7	0	33.3	0	0	100	
Total %	0	6.6	1.6	23	0	11.5	0	0	57.4	

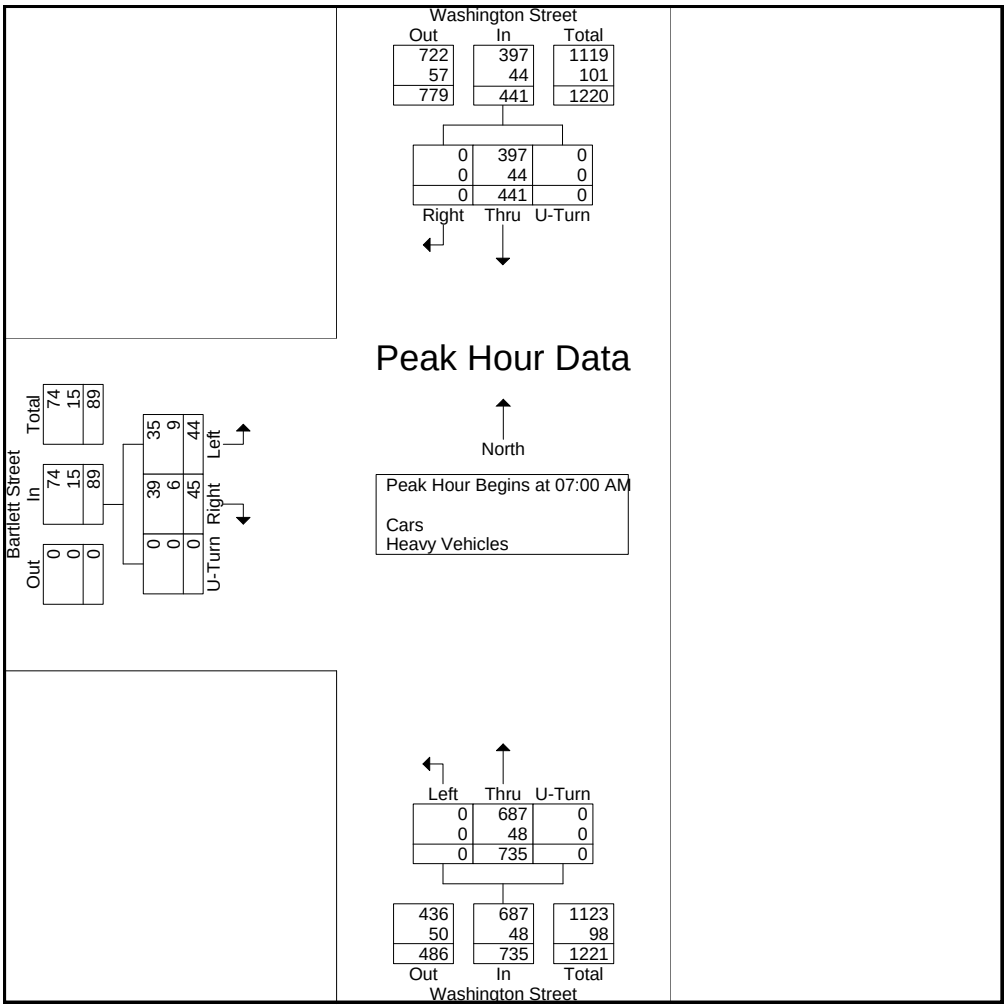
	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	1	1	2	1	0	1	2	0	0	1	1	5
07:15 AM	0	0	0	0	1	0	3	4	0	0	7	7	11
07:30 AM	0	0	0	0	1	0	2	3	0	0	7	7	10
07:45 AM	0	1	0	1	2	0	0	2	0	0	8	8	11
Total Volume	0	2	1	3	5	0	6	11	0	0	23	23	37
% App. Total	0	66.7	33.3		45.5	0	54.5		0	0	100		
PHF	.000	.500	.250	.375	.625	.000	.500	.688	.000	.000	.719	.719	.841

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 A
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 07:00 AM													
07:00 AM	0	110	0	110	185	0	0	185	8	14	0	22	317
07:15 AM	0	104	0	104	189	0	0	189	11	12	0	23	316
07:30 AM	0	120	0	120	170	0	0	170	18	11	0	29	319
07:45 AM	0	107	0	107	191	0	0	191	8	7	0	15	313
Total Volume	0	441	0	441	735	0	0	735	45	44	0	89	1265
% App. Total	0	100	0		100	0	0		50.6	49.4	0		
PHF	.000	.919	.000	.919	.962	.000	.000	.962	.625	.786	.000	.767	.991
Cars	0	397	0	397	687	0	0	687	39	35	0	74	1158
% Cars	0	90.0	0	90.0	93.5	0	0	93.5	86.7	79.5	0	83.1	91.5
Heavy Vehicles	0	44	0	44	48	0	0	48	6	9	0	15	107
% Heavy Vehicles	0	10.0	0	10.0	6.5	0	0	6.5	13.3	20.5	0	16.9	8.5



N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 AA
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	0	197	0	119	0	0	26	4	0	346
04:15 PM	0	175	0	113	0	0	19	3	0	310
04:30 PM	0	185	0	102	0	0	13	4	0	304
04:45 PM	0	202	0	87	0	0	18	6	0	313
Total	0	759	0	421	0	0	76	17	0	1273
05:00 PM	0	233	0	101	0	0	14	7	0	355
05:15 PM	0	241	0	109	0	0	25	2	0	377
05:30 PM	0	184	1	98	0	0	26	6	0	315
05:45 PM	0	135	0	110	0	0	12	4	0	261
Total	0	793	1	418	0	0	77	19	0	1308
Grand Total	0	1552	1	839	0	0	153	36	0	2581
Apprch %	0	99.9	0.1	100	0	0	81	19	0	
Total %	0	60.1	0	32.5	0	0	5.9	1.4	0	
Cars	0	1513	1	791	0	0	146	34	0	2485
% Cars	0	97.5	100	94.3	0	0	95.4	94.4	0	96.3
Heavy Vehicles	0	39	0	48	0	0	7	2	0	96
% Heavy Vehicles	0	2.5	0	5.7	0	0	4.6	5.6	0	3.7

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:45 PM													
04:45 PM	0	202	0	202	87	0	0	87	18	6	0	24	313
05:00 PM	0	233	0	233	101	0	0	101	14	7	0	21	355
05:15 PM	0	241	0	241	109	0	0	109	25	2	0	27	377
05:30 PM	0	184	1	185	98	0	0	98	26	6	0	32	315
Total Volume	0	860	1	861	395	0	0	395	83	21	0	104	1360
% App. Total	0	99.9	0.1		100	0	0		79.8	20.2	0		
PHF	.000	.892	.250	.893	.906	.000	.000	.906	.798	.750	.000	.813	.902
Cars	0	843	1	844	374	0	0	374	81	21	0	102	1320
% Cars	0	98.0	100	98.0	94.7	0	0	94.7	97.6	100	0	98.1	97.1
Heavy Vehicles	0	17	0	17	21	0	0	21	2	0	0	2	40
% Heavy Vehicles	0	2.0	0	2.0	5.3	0	0	5.3	2.4	0	0	1.9	2.9

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

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 AA
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	0	189	0	111	0	0	25	4	0	329
04:15 PM	0	168	0	107	0	0	16	3	0	294
04:30 PM	0	183	0	90	0	0	12	3	0	288
04:45 PM	0	197	0	81	0	0	17	6	0	301
Total	0	737	0	389	0	0	70	16	0	1212
05:00 PM	0	226	0	93	0	0	14	7	0	340
05:15 PM	0	237	0	105	0	0	25	2	0	369
05:30 PM	0	183	1	95	0	0	25	6	0	310
05:45 PM	0	130	0	109	0	0	12	3	0	254
Total	0	776	1	402	0	0	76	18	0	1273
Grand Total	0	1513	1	791	0	0	146	34	0	2485
Apprch %	0	99.9	0.1	100	0	0	81.1	18.9	0	
Total %	0	60.9	0	31.8	0	0	5.9	1.4	0	

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:45 PM													
04:45 PM	0	197	0	197	81	0	0	81	17	6	0	23	301
05:00 PM	0	226	0	226	93	0	0	93	14	7	0	21	340
05:15 PM	0	237	0	237	105	0	0	105	25	2	0	27	369
05:30 PM	0	183	1	184	95	0	0	95	25	6	0	31	310
Total Volume	0	843	1	844	374	0	0	374	81	21	0	102	1320
% App. Total	0	99.9	0.1		100	0	0		79.4	20.6	0		
PHF	.000	.889	.250	.890	.890	.000	.000	.890	.810	.750	.000	.823	.894

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

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 AA
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	0	8	0	8	0	0	1	0	0	17
04:15 PM	0	7	0	6	0	0	3	0	0	16
04:30 PM	0	2	0	12	0	0	1	1	0	16
04:45 PM	0	5	0	6	0	0	1	0	0	12
Total	0	22	0	32	0	0	6	1	0	61
05:00 PM	0	7	0	8	0	0	0	0	0	15
05:15 PM	0	4	0	4	0	0	0	0	0	8
05:30 PM	0	1	0	3	0	0	1	0	0	5
05:45 PM	0	5	0	1	0	0	0	1	0	7
Total	0	17	0	16	0	0	1	1	0	35
Grand Total	0	39	0	48	0	0	7	2	0	96
Apprch %	0	100	0	100	0	0	77.8	22.2	0	
Total %	0	40.6	0	50	0	0	7.3	2.1	0	

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:00 PM													
04:00 PM	0	8	0	8	8	0	0	8	1	0	0	1	17
04:15 PM	0	7	0	7	6	0	0	6	3	0	0	3	16
04:30 PM	0	2	0	2	12	0	0	12	1	1	0	2	16
04:45 PM	0	5	0	5	6	0	0	6	1	0	0	1	12
Total Volume	0	22	0	22	32	0	0	32	6	1	0	7	61
% App. Total	0	100	0		100	0	0		85.7	14.3	0		
PHF	.000	.688	.000	.688	.667	.000	.000	.667	.500	.250	.000	.583	.897

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 AA
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North			Washington Street From South			Bartlett Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	1	0	1	0	2	0	0	12	16
04:15 PM	0	2	0	0	0	2	0	0	11	15
04:30 PM	0	1	0	0	0	1	0	0	5	7
04:45 PM	0	1	0	2	0	3	0	0	7	13
Total	0	5	0	3	0	8	0	0	35	51
05:00 PM	0	1	1	0	0	0	0	0	4	6
05:15 PM	0	4	0	1	0	0	0	0	3	8
05:30 PM	0	4	0	0	0	0	0	0	5	9
05:45 PM	0	2	0	0	0	0	0	0	6	8
Total	0	11	1	1	0	0	0	0	18	31
Grand Total	0	16	1	4	0	8	0	0	53	82
Apprch %	0	94.1	5.9	33.3	0	66.7	0	0	100	
Total %	0	19.5	1.2	4.9	0	9.8	0	0	64.6	

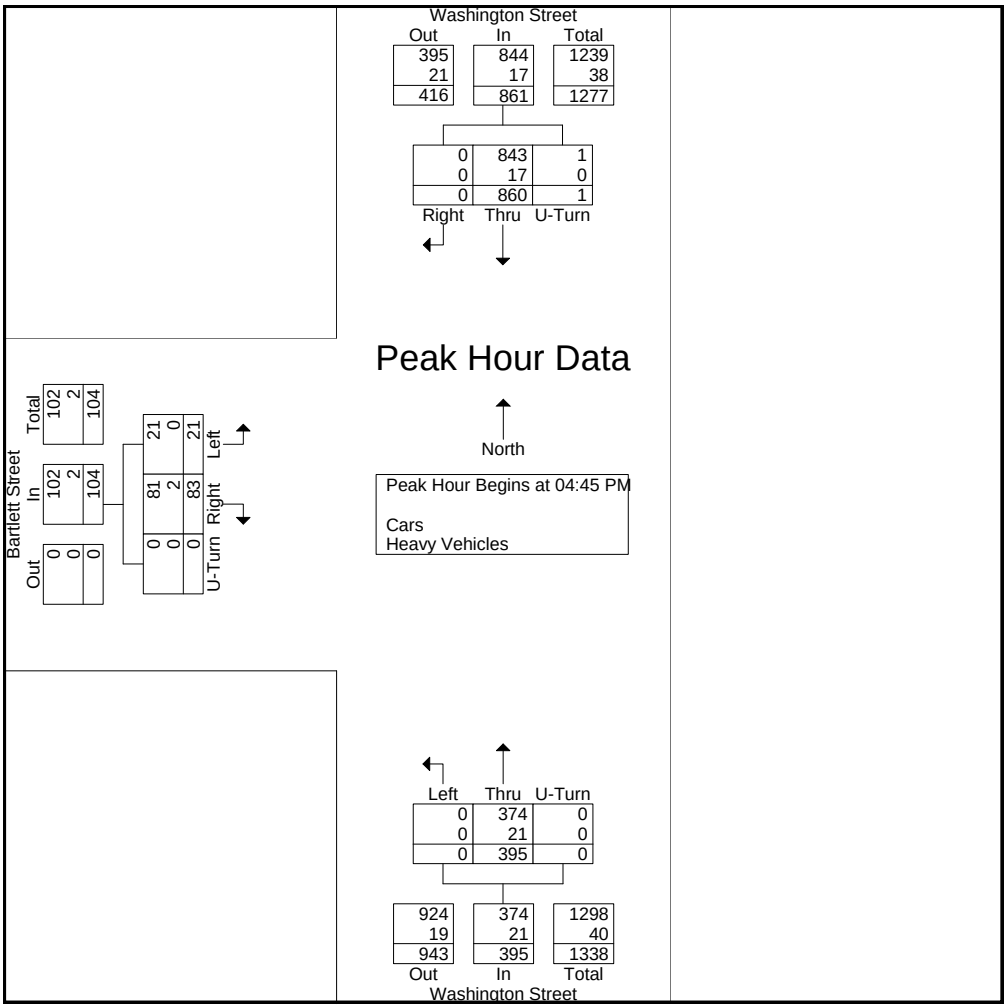
	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	1	0	1	1	0	2	3	0	0	12	12	16
04:15 PM	0	2	0	2	0	0	2	2	0	0	11	11	15
04:30 PM	0	1	0	1	0	0	1	1	0	0	5	5	7
04:45 PM	0	1	0	1	2	0	3	5	0	0	7	7	13
Total Volume	0	5	0	5	3	0	8	11	0	0	35	35	51
% App. Total	0	100	0		27.3	0	72.7		0	0	100		
PHF	.000	.625	.000	.625	.375	.000	.667	.550	.000	.000	.729	.729	.797

N/S: Washington Street
W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 AA
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Washington Street From North				Washington Street From South				Bartlett Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:45 PM													
04:45 PM	0	202	0	202	87	0	0	87	18	6	0	24	313
05:00 PM	0	233	0	233	101	0	0	101	14	7	0	21	355
05:15 PM	0	241	0	241	109	0	0	109	25	2	0	27	377
05:30 PM	0	184	1	185	98	0	0	98	26	6	0	32	315
Total Volume	0	860	1	861	395	0	0	395	83	21	0	104	1360
% App. Total	0	99.9	0.1		100	0	0		79.8	20.2	0		
PHF	.000	.892	.250	.893	.906	.000	.000	.906	.798	.750	.000	.813	.902
Cars	0	843	1	844	374	0	0	374	81	21	0	102	1320
% Cars	0	98.0	100	98.0	94.7	0	0	94.7	97.6	100	0	98.1	97.1
Heavy Vehicles	0	17	0	17	21	0	0	21	2	0	0	2	40
% Heavy Vehicles	0	2.0	0	2.0	5.3	0	0	5.3	2.4	0	0	1.9	2.9



N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 B
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	119	0	0	23	0	6	0	0	163	0	0	0	0	0	0	311
07:15 AM	0	112	0	0	31	0	16	0	0	157	0	0	0	0	0	0	316
07:30 AM	0	137	0	2	23	0	17	0	0	142	0	0	0	0	0	0	321
07:45 AM	1	117	0	0	19	0	18	0	0	168	1	0	0	0	0	0	324
Total	1	485	0	2	96	0	57	0	0	630	1	0	0	0	0	0	1272
08:00 AM	0	124	0	0	20	0	10	0	0	143	0	0	0	0	0	0	297
08:15 AM	0	127	0	0	15	0	28	0	0	143	0	0	0	0	0	0	313
08:30 AM	0	117	0	0	21	0	11	0	0	153	0	0	0	0	0	0	302
08:45 AM	0	105	0	0	15	0	17	0	0	141	0	0	0	0	0	0	278
Total	0	473	0	0	71	0	66	0	0	580	0	0	0	0	0	0	1190
Grand Total	1	958	0	2	167	0	123	0	0	1210	1	0	0	0	0	0	2462
Apprch %	0.1	99.7	0	0.2	57.6	0	42.4	0	0	99.9	0.1	0	0	0	0	0	
Total %	0	38.9	0	0.1	6.8	0	5	0	0	49.1	0	0	0	0	0	0	
Cars	1	872	0	2	162	0	114	0	0	1124	0	0	0	0	0	0	2275
% Cars	100	91	0	100	97	0	92.7	0	0	92.9	0	0	0	0	0	0	92.4
Heavy Vehicles	0	86	0	0	5	0	9	0	0	86	1	0	0	0	0	0	187
% Heavy Vehicles	0	9	0	0	3	0	7.3	0	0	7.1	100	0	0	0	0	0	7.6

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 07:00 AM																					
07:00 AM	0	119	0	0	119	23	0	6	0	29	0	163	0	0	163	0	0	0	0	0	311
07:15 AM	0	112	0	0	112	31	0	16	0	47	0	157	0	0	157	0	0	0	0	0	316
07:30 AM	0	137	0	2	139	23	0	17	0	40	0	142	0	0	142	0	0	0	0	0	321
07:45 AM	1	117	0	0	118	19	0	18	0	37	0	168	1	0	169	0	0	0	0	0	324
Total Volume	1	485	0	2	488	96	0	57	0	153	0	630	1	0	631	0	0	0	0	0	1272
% App. Total	0.2	99.4	0	0.4		62.7	0	37.3	0		0	99.8	0.2	0		0	0	0	0		
PHF	.250	.885	.000	.250	.878	.774	.000	.792	.000	.814	.000	.938	.250	.000	.933	.000	.000	.000	.000	.000	.981
Cars	1	435	0	2	438	93	0	54	0	147	0	583	0	0	583	0	0	0	0	0	1168
% Cars	100	89.7	0	100	89.8	96.9	0	94.7	0	96.1	0	92.5	0	0	92.4	0	0	0	0	0	91.8
Heavy Vehicles	0	50	0	0	50	3	0	3	0	6	0	47	1	0	48	0	0	0	0	0	104
% Heavy Vehicles	0	10.3	0	0	10.2	3.1	0	5.3	0	3.9	0	7.5	100	0	7.6	0	0	0	0	0	8.2

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 B
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	107	0	0	22	0	5	0	0	141	0	0	0	0	0	0	275
07:15 AM	0	96	0	0	29	0	15	0	0	144	0	0	0	0	0	0	284
07:30 AM	0	126	0	2	23	0	17	0	0	136	0	0	0	0	0	0	304
07:45 AM	1	106	0	0	19	0	17	0	0	162	0	0	0	0	0	0	305
Total	1	435	0	2	93	0	54	0	0	583	0	0	0	0	0	0	1168
08:00 AM	0	117	0	0	20	0	9	0	0	126	0	0	0	0	0	0	272
08:15 AM	0	120	0	0	14	0	26	0	0	137	0	0	0	0	0	0	297
08:30 AM	0	108	0	0	21	0	10	0	0	143	0	0	0	0	0	0	282
08:45 AM	0	92	0	0	14	0	15	0	0	135	0	0	0	0	0	0	256
Total	0	437	0	0	69	0	60	0	0	541	0	0	0	0	0	0	1107
Grand Total	1	872	0	2	162	0	114	0	0	1124	0	0	0	0	0	0	2275
Apprch %	0.1	99.7	0	0.2	58.7	0	41.3	0	0	100	0	0	0	0	0	0	
Total %	0	38.3	0	0.1	7.1	0	5	0	0	49.4	0	0	0	0	0	0	

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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	126	0	2	128	23	0	17	0	40	0	136	0	0	136	0	0	0	0	0	304
07:45 AM	1	106	0	0	107	19	0	17	0	36	0	162	0	0	162	0	0	0	0	0	305
08:00 AM	0	117	0	0	117	20	0	9	0	29	0	126	0	0	126	0	0	0	0	0	272
08:15 AM	0	120	0	0	120	14	0	26	0	40	0	137	0	0	137	0	0	0	0	0	297
Total Volume	1	469	0	2	472	76	0	69	0	145	0	561	0	0	561	0	0	0	0	0	1178
% App. Total	0.2	99.4	0	0.4		52.4	0	47.6	0		0	100	0	0		0	0	0	0		
PHF	.250	.931	.000	.250	.922	.826	.000	.663	.000	.906	.000	.866	.000	.000	.866	.000	.000	.000	.000	.000	.966

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 B
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	12	0	0	1	0	1	0	0	22	0	0	0	0	0	0	36
07:15 AM	0	16	0	0	2	0	1	0	0	13	0	0	0	0	0	0	32
07:30 AM	0	11	0	0	0	0	0	0	0	6	0	0	0	0	0	0	17
07:45 AM	0	11	0	0	0	0	1	0	0	6	1	0	0	0	0	0	19
Total	0	50	0	0	3	0	3	0	0	47	1	0	0	0	0	0	104
08:00 AM	0	7	0	0	0	0	1	0	0	17	0	0	0	0	0	0	25
08:15 AM	0	7	0	0	1	0	2	0	0	6	0	0	0	0	0	0	16
08:30 AM	0	9	0	0	0	0	1	0	0	10	0	0	0	0	0	0	20
08:45 AM	0	13	0	0	1	0	2	0	0	6	0	0	0	0	0	0	22
Total	0	36	0	0	2	0	6	0	0	39	0	0	0	0	0	0	83
Grand Total	0	86	0	0	5	0	9	0	0	86	1	0	0	0	0	0	187
Apprch %	0	100	0	0	35.7	0	64.3	0	0	98.9	1.1	0	0	0	0	0	
Total %	0	46	0	0	2.7	0	4.8	0	0	46	0.5	0	0	0	0	0	

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 07:00 AM																					
07:00 AM	0	12	0	0	12	1	0	1	0	2	0	22	0	0	22	0	0	0	0	0	36
07:15 AM	0	16	0	0	16	2	0	1	0	3	0	13	0	0	13	0	0	0	0	0	32
07:30 AM	0	11	0	0	11	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	17
07:45 AM	0	11	0	0	11	0	0	1	0	1	0	6	1	0	7	0	0	0	0	0	19
Total Volume	0	50	0	0	50	3	0	3	0	6	0	47	1	0	48	0	0	0	0	0	104
% App. Total	0	100	0	0		50	0	50	0		0	97.9	2.1	0		0	0	0	0		
PHF	.000	.781	.000	.000	.781	.375	.000	.750	.000	.500	.000	.534	.250	.000	.545	.000	.000	.000	.000	.000	.722

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

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 B
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	2	0	0	0	17	0	1	0	0	0	0	0	3	24
07:15 AM	0	0	0	0	0	0	0	10	0	1	0	0	0	0	0	6	17
07:30 AM	0	0	0	3	0	0	0	11	0	1	0	1	0	0	0	6	22
07:45 AM	0	1	0	1	0	0	0	14	0	2	0	1	0	0	0	6	25
Total	0	2	0	6	0	0	0	52	0	5	0	2	0	0	0	21	88
08:00 AM	0	0	0	0	0	0	0	5	0	1	0	0	0	0	0	5	11
08:15 AM	0	0	0	0	0	0	0	12	0	2	0	0	0	0	0	1	15
08:30 AM	0	1	0	0	0	0	0	4	0	3	0	0	0	0	0	2	10
08:45 AM	0	1	0	0	0	0	0	3	0	3	0	0	0	0	0	5	12
Total	0	2	0	0	0	0	0	24	0	9	0	0	0	0	0	13	48
Grand Total	0	4	0	6	0	0	0	76	0	14	0	2	0	0	0	34	136
Apprch %	0	40	0	60	0	0	0	100	0	87.5	0	12.5	0	0	0	100	
Total %	0	2.9	0	4.4	0	0	0	55.9	0	10.3	0	1.5	0	0	0	25	

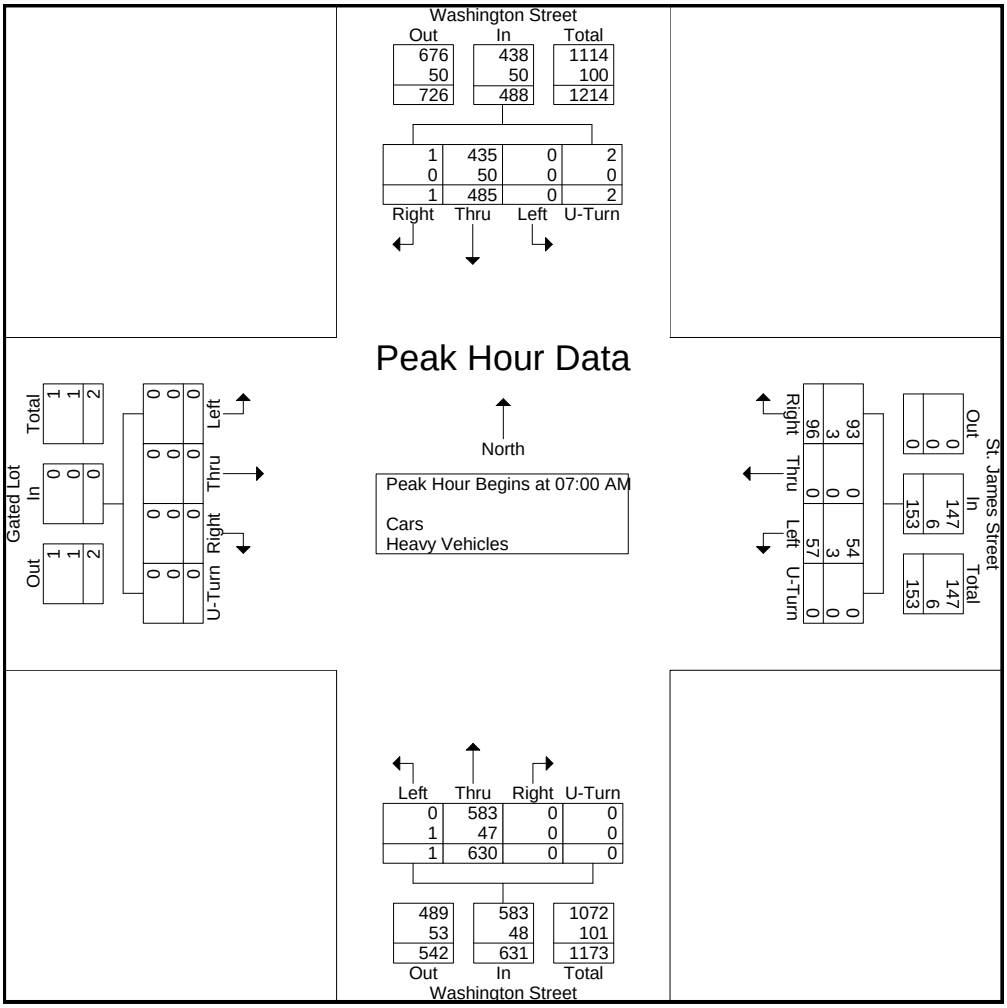
	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	1	0	2	3	0	0	0	17	17	0	1	0	0	1	0	0	0	3	3	24
07:15 AM	0	0	0	0	0	0	0	0	10	10	0	1	0	0	1	0	0	0	6	6	17
07:30 AM	0	0	0	3	3	0	0	0	11	11	0	1	0	1	2	0	0	0	6	6	22
07:45 AM	0	1	0	1	2	0	0	0	14	14	0	2	0	1	3	0	0	0	6	6	25
Total Volume	0	2	0	6	8	0	0	0	52	52	0	5	0	2	7	0	0	0	21	21	88
% App. Total	0	25	0	75		0	0	0	100		0	71.4	0	28.6		0	0	0	100		
PHF	.000	.500	.000	.500	.667	.000	.000	.000	.765	.765	.000	.625	.000	.500	.583	.000	.000	.000	.875	.875	.880

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 B
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 07:00 AM																					
07:00 AM	0	119	0	0	119	23	0	6	0	29	0	163	0	0	163	0	0	0	0	0	311
07:15 AM	0	112	0	0	112	31	0	16	0	47	0	157	0	0	157	0	0	0	0	0	316
07:30 AM	0	137	0	2	139	23	0	17	0	40	0	142	0	0	142	0	0	0	0	0	321
07:45 AM	1	117	0	0	118	19	0	18	0	37	0	168	1	0	169	0	0	0	0	0	324
Total Volume	1	485	0	2	488	96	0	57	0	153	0	630	1	0	631	0	0	0	0	0	1272
% App. Total	0.2	99.4	0	0.4		62.7	0	37.3	0		0	99.8	0.2	0		0	0	0	0		
PHF	.250	.885	.000	.250	.878	.774	.000	.792	.000	.814	.000	.938	.250	.000	.933	.000	.000	.000	.000	.000	.981
Cars	1	435	0	2	438	93	0	54	0	147	0	583	0	0	583	0	0	0	0	0	1168
% Cars	100	89.7	0	100	89.8	96.9	0	94.7	0	96.1	0	92.5	0	0	92.4	0	0	0	0	0	91.8
Heavy Vehicles	0	50	0	0	50	3	0	3	0	6	0	47	1	0	48	0	0	0	0	0	104
% Heavy Vehicles	0	10.3	0	0	10.2	3.1	0	5.3	0	3.9	0	7.5	100	0	7.6	0	0	0	0	0	8.2



N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 BB
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	222	0	0	14	0	20	0	0	104	0	0	0	0	0	0	360
04:15 PM	0	192	0	0	20	0	12	0	0	95	0	0	0	0	0	0	319
04:30 PM	0	199	0	0	17	0	17	0	0	84	1	0	0	0	0	0	318
04:45 PM	0	220	0	0	8	0	12	0	0	79	0	0	0	0	0	0	319
Total	0	833	0	0	59	0	61	0	0	362	1	0	0	0	0	0	1316
05:00 PM	0	246	0	0	19	0	17	0	0	82	0	0	0	0	0	0	364
05:15 PM	0	275	0	0	20	0	16	0	0	92	0	0	0	0	0	0	403
05:30 PM	0	209	0	1	15	0	17	0	0	93	0	0	0	0	0	0	335
05:45 PM	0	146	0	0	18	0	13	0	0	107	0	0	0	0	0	0	284
Total	0	876	0	1	72	0	63	0	0	374	0	0	0	0	0	0	1386
Grand Total	0	1709	0	1	131	0	124	0	0	736	1	0	0	0	0	0	2702
Apprch %	0	99.9	0	0.1	51.4	0	48.6	0	0	99.9	0.1	0	0	0	0	0	
Total %	0	63.2	0	0	4.8	0	4.6	0	0	27.2	0	0	0	0	0	0	
Cars	0	1661	0	1	125	0	116	0	0	693	1	0	0	0	0	0	2597
% Cars	0	97.2	0	100	95.4	0	93.5	0	0	94.2	100	0	0	0	0	0	96.1
Heavy Vehicles	0	48	0	0	6	0	8	0	0	43	0	0	0	0	0	0	105
% Heavy Vehicles	0	2.8	0	0	4.6	0	6.5	0	0	5.8	0	0	0	0	0	0	3.9

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 04:45 PM																					
04:45 PM	0	220	0	0	220	8	0	12	0	20	0	79	0	0	79	0	0	0	0	0	319
05:00 PM	0	246	0	0	246	19	0	17	0	36	0	82	0	0	82	0	0	0	0	0	364
05:15 PM	0	275	0	0	275	20	0	16	0	36	0	92	0	0	92	0	0	0	0	0	403
05:30 PM	0	209	0	1	210	15	0	17	0	32	0	93	0	0	93	0	0	0	0	0	335
Total Volume	0	950	0	1	951	62	0	62	0	124	0	346	0	0	346	0	0	0	0	0	1421
% App. Total	0	99.9	0	0.1		50	0	50	0		0	100	0	0		0	0	0	0		
PHF	.000	.864	.000	.250	.865	.775	.000	.912	.000	.861	.000	.930	.000	.000	.930	.000	.000	.000	.000	.000	.882
Cars	0	929	0	1	930	60	0	61	0	121	0	327	0	0	327	0	0	0	0	0	1378
% Cars	0	97.8	0	100	97.8	96.8	0	98.4	0	97.6	0	94.5	0	0	94.5	0	0	0	0	0	97.0
Heavy Vehicles	0	21	0	0	21	2	0	1	0	3	0	19	0	0	19	0	0	0	0	0	43
% Heavy Vehicles	0	2.2	0	0	2.2	3.2	0	1.6	0	2.4	0	5.5	0	0	5.5	0	0	0	0	0	3.0

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 BB
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	213	0	0	13	0	16	0	0	96	0	0	0	0	0	0	338
04:15 PM	0	183	0	0	19	0	10	0	0	89	0	0	0	0	0	0	301
04:30 PM	0	195	0	0	15	0	16	0	0	75	1	0	0	0	0	0	302
04:45 PM	0	214	0	0	7	0	12	0	0	74	0	0	0	0	0	0	307
Total	0	805	0	0	54	0	54	0	0	334	1	0	0	0	0	0	1248
05:00 PM	0	237	0	0	18	0	17	0	0	75	0	0	0	0	0	0	347
05:15 PM	0	271	0	0	20	0	16	0	0	88	0	0	0	0	0	0	395
05:30 PM	0	207	0	1	15	0	16	0	0	90	0	0	0	0	0	0	329
05:45 PM	0	141	0	0	18	0	13	0	0	106	0	0	0	0	0	0	278
Total	0	856	0	1	71	0	62	0	0	359	0	0	0	0	0	0	1349
Grand Total	0	1661	0	1	125	0	116	0	0	693	1	0	0	0	0	0	2597
Apprch %	0	99.9	0	0.1	51.9	0	48.1	0	0	99.9	0.1	0	0	0	0	0	
Total %	0	64	0	0	4.8	0	4.5	0	0	26.7	0	0	0	0	0	0	

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 04:45 PM																					
04:45 PM	0	214	0	0	214	7	0	12	0	19	0	74	0	0	74	0	0	0	0	0	307
05:00 PM	0	237	0	0	237	18	0	17	0	35	0	75	0	0	75	0	0	0	0	0	347
05:15 PM	0	271	0	0	271	20	0	16	0	36	0	88	0	0	88	0	0	0	0	0	395
05:30 PM	0	207	0	1	208	15	0	16	0	31	0	90	0	0	90	0	0	0	0	0	329
Total Volume	0	929	0	1	930	60	0	61	0	121	0	327	0	0	327	0	0	0	0	0	1378
% App. Total	0	99.9	0	0.1		49.6	0	50.4	0		0	100	0	0		0	0	0	0		
PHF	.000	.857	.000	.250	.858	.750	.000	.897	.000	.840	.000	.908	.000	.000	.908	.000	.000	.000	.000	.000	.872

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

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 BB
Site Code : 2007015
Start Date : 11/28/2012

Groups Printed- Heavy Vehicles

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	9	0	0	1	0	4	0	0	8	0	0	0	0	0	0	22
04:15 PM	0	9	0	0	1	0	2	0	0	6	0	0	0	0	0	0	18
04:30 PM	0	4	0	0	2	0	1	0	0	9	0	0	0	0	0	0	16
04:45 PM	0	6	0	0	1	0	0	0	0	5	0	0	0	0	0	0	12
Total	0	28	0	0	5	0	7	0	0	28	0	0	0	0	0	0	68
05:00 PM	0	9	0	0	1	0	0	0	0	7	0	0	0	0	0	0	17
05:15 PM	0	4	0	0	0	0	0	0	0	4	0	0	0	0	0	0	8
05:30 PM	0	2	0	0	0	0	1	0	0	3	0	0	0	0	0	0	6
05:45 PM	0	5	0	0	0	0	0	0	0	1	0	0	0	0	0	0	6
Total	0	20	0	0	1	0	1	0	0	15	0	0	0	0	0	0	37
Grand Total	0	48	0	0	6	0	8	0	0	43	0	0	0	0	0	0	105
Apprch %	0	100	0	0	42.9	0	57.1	0	0	100	0	0	0	0	0	0	
Total %	0	45.7	0	0	5.7	0	7.6	0	0	41	0	0	0	0	0	0	

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 04:00 PM																					
04:00 PM	0	9	0	0	9	1	0	4	0	5	0	8	0	0	8	0	0	0	0	0	22
04:15 PM	0	9	0	0	9	1	0	2	0	3	0	6	0	0	6	0	0	0	0	0	18
04:30 PM	0	4	0	0	4	2	0	1	0	3	0	9	0	0	9	0	0	0	0	0	16
04:45 PM	0	6	0	0	6	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	12
Total Volume	0	28	0	0	28	5	0	7	0	12	0	28	0	0	28	0	0	0	0	0	68
% App. Total	0	100	0	0		41.7	0	58.3	0		0	100	0	0		0	0	0	0		
PHF	.000	.778	.000	.000	.778	.625	.000	.438	.000	.600	.000	.778	.000	.000	.778	.000	.000	.000	.000	.000	.773

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

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 BB
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North				St. James Street From East				Washington Street From South				Gated Lot 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	1	0	4	0	0	0	9	0	1	0	0	0	0	0	6	21
04:15 PM	0	1	0	4	0	0	0	10	0	0	0	0	0	0	0	13	28
04:30 PM	0	1	0	1	0	0	0	49	0	0	0	0	0	0	0	6	57
04:45 PM	0	1	0	4	0	0	0	19	0	2	0	1	0	0	0	6	33
Total	0	4	0	13	0	0	0	87	0	3	0	1	0	0	0	31	139
05:00 PM	0	1	0	0	0	0	0	9	0	0	0	0	0	0	0	3	13
05:15 PM	0	4	0	0	0	0	0	8	0	2	0	0	0	0	0	2	16
05:30 PM	0	4	0	2	0	0	0	8	0	0	0	0	0	0	0	8	22
05:45 PM	0	3	0	0	0	0	0	26	0	1	0	0	0	0	0	5	35
Total	0	12	0	2	0	0	0	51	0	3	0	0	0	0	0	18	86
Grand Total	0	16	0	15	0	0	0	138	0	6	0	1	0	0	0	49	225
Apprch %	0	51.6	0	48.4	0	0	0	100	0	85.7	0	14.3	0	0	0	100	
Total %	0	7.1	0	6.7	0	0	0	61.3	0	2.7	0	0.4	0	0	0	21.8	

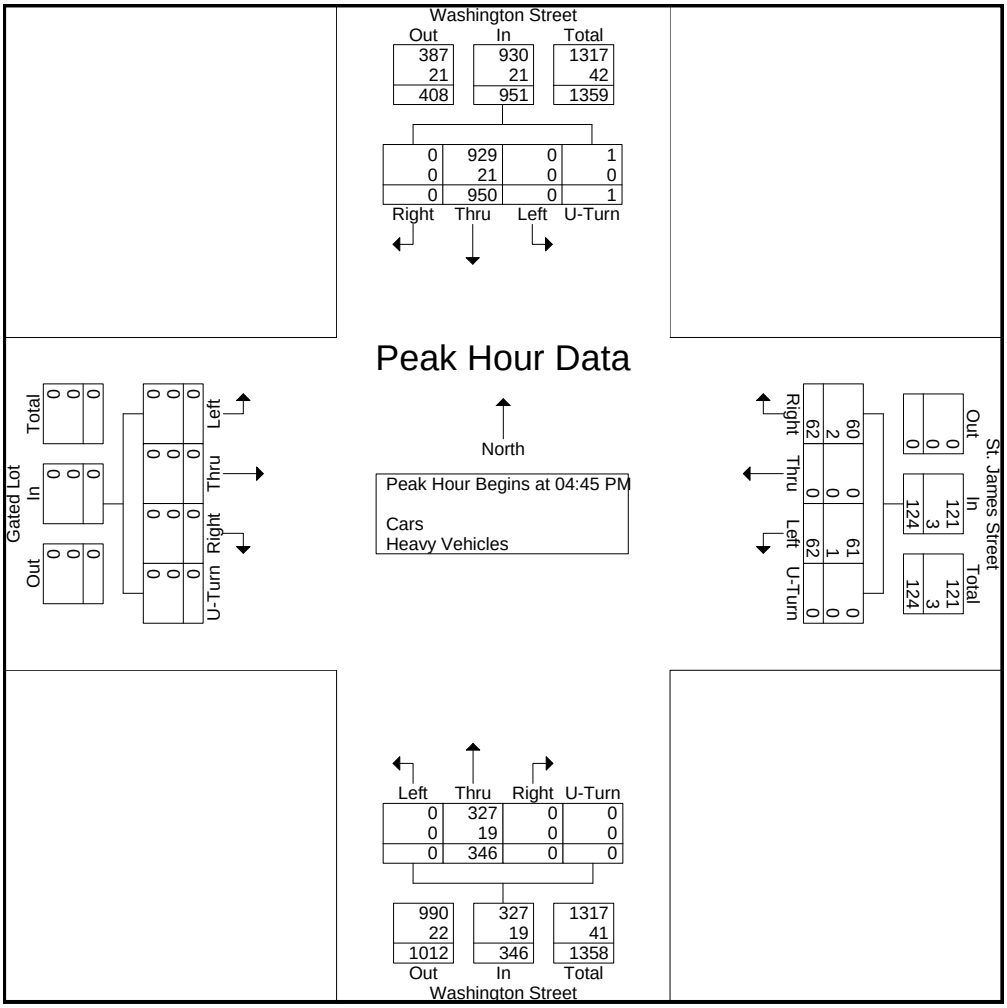
	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	1	0	4	5	0	0	0	9	9	0	1	0	0	1	0	0	0	6	6	21
04:15 PM	0	1	0	4	5	0	0	0	10	10	0	0	0	0	0	0	0	0	13	13	28
04:30 PM	0	1	0	1	2	0	0	0	49	49	0	0	0	0	0	0	0	0	6	6	57
04:45 PM	0	1	0	4	5	0	0	0	19	19	0	2	0	1	3	0	0	0	6	6	33
Total Volume	0	4	0	13	17	0	0	0	87	87	0	3	0	1	4	0	0	0	31	31	139
% App. Total	0	23.5	0	76.5		0	0	0	100		0	75	0	25		0	0	0	100		
PHF	.000	1.00	.000	.813	.850	.000	.000	.000	.444	.444	.000	.375	.000	.250	.333	.000	.000	.000	.596	.596	.610

N/S: Washington Street
E/W: St. James Street/ Gated Lot
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 BB
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Washington Street From North					St. James Street From East					Washington Street From South					Gated Lot 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 04:45 PM																					
04:45 PM	0	220	0	0	220	8	0	12	0	20	0	79	0	0	79	0	0	0	0	0	319
05:00 PM	0	246	0	0	246	19	0	17	0	36	0	82	0	0	82	0	0	0	0	0	364
05:15 PM	0	275	0	0	275	20	0	16	0	36	0	92	0	0	92	0	0	0	0	0	403
05:30 PM	0	209	0	1	210	15	0	17	0	32	0	93	0	0	93	0	0	0	0	0	335
Total Volume	0	950	0	1	951	62	0	62	0	124	0	346	0	0	346	0	0	0	0	0	1421
% App. Total	0	99.9	0	0.1		50	0	50	0		0	100	0	0		0	0	0	0		
PHF	.000	.864	.000	.250	.865	.775	.000	.912	.000	.861	.000	.930	.000	.000	.930	.000	.000	.000	.000	.000	.882
Cars	0	929	0	1	930	60	0	61	0	121	0	327	0	0	327	0	0	0	0	0	1378
% Cars	0	97.8	0	100	97.8	96.8	0	98.4	0	97.6	0	94.5	0	0	94.5	0	0	0	0	0	97.0
Heavy Vehicles	0	21	0	0	21	2	0	1	0	3	0	19	0	0	19	0	0	0	0	0	43
% Heavy Vehicles	0	2.2	0	0	2.2	3.2	0	1.6	0	2.4	0	5.5	0	0	5.5	0	0	0	0	0	3.0



N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 C
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	7	118	0	160	13	0	1	4	0	303
07:15 AM	8	120	0	155	22	0	4	4	0	313
07:30 AM	11	137	0	145	19	0	5	1	0	318
07:45 AM	11	128	0	163	26	0	5	0	0	333
Total	37	503	0	623	80	0	15	9	0	1267
08:00 AM	6	128	0	144	14	0	4	1	0	297
08:15 AM	14	141	0	139	17	0	8	4	0	323
08:30 AM	8	118	0	145	12	0	7	8	0	298
08:45 AM	9	114	0	137	10	0	2	2	0	274
Total	37	501	0	565	53	0	21	15	0	1192
Grand Total	74	1004	0	1188	133	0	36	24	0	2459
Apprch %	6.9	93.1	0	89.9	10.1	0	60	40	0	
Total %	3	40.8	0	48.3	5.4	0	1.5	1	0	
Cars	71	915	0	1108	129	0	34	23	0	2280
% Cars	95.9	91.1	0	93.3	97	0	94.4	95.8	0	92.7
Heavy Vehicles	3	89	0	80	4	0	2	1	0	179
% Heavy Vehicles	4.1	8.9	0	6.7	3	0	5.6	4.2	0	7.3

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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	11	137	0	148	145	19	0	164	5	1	0	6	318
07:45 AM	11	128	0	139	163	26	0	189	5	0	0	5	333
08:00 AM	6	128	0	134	144	14	0	158	4	1	0	5	297
08:15 AM	14	141	0	155	139	17	0	156	8	4	0	12	323
Total Volume	42	534	0	576	591	76	0	667	22	6	0	28	1271
% App. Total	7.3	92.7	0		88.6	11.4	0		78.6	21.4	0		
PHF	.750	.947	.000	.929	.906	.731	.000	.882	.688	.375	.000	.583	.954
Cars	41	496	0	537	560	74	0	634	21	6	0	27	1198
% Cars	97.6	92.9	0	93.2	94.8	97.4	0	95.1	95.5	100	0	96.4	94.3
Heavy Vehicles	1	38	0	39	31	2	0	33	1	0	0	1	73
% Heavy Vehicles	2.4	7.1	0	6.8	5.2	2.6	0	4.9	4.5	0	0	3.6	5.7

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

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 C
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	7	107	0	139	11	0	1	4	0	269
07:15 AM	8	103	0	140	22	0	4	4	0	281
07:30 AM	11	126	0	140	18	0	5	1	0	301
07:45 AM	11	117	0	158	25	0	5	0	0	316
Total	37	453	0	577	76	0	15	9	0	1167
08:00 AM	5	123	0	130	14	0	4	1	0	277
08:15 AM	14	130	0	132	17	0	7	4	0	304
08:30 AM	7	110	0	136	12	0	7	7	0	279
08:45 AM	8	99	0	133	10	0	1	2	0	253
Total	34	462	0	531	53	0	19	14	0	1113
Grand Total	71	915	0	1108	129	0	34	23	0	2280
Apprch %	7.2	92.8	0	89.6	10.4	0	59.6	40.4	0	
Total %	3.1	40.1	0	48.6	5.7	0	1.5	1	0	

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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	11	126	0	137	140	18	0	158	5	1	0	6	301
07:45 AM	11	117	0	128	158	25	0	183	5	0	0	5	316
08:00 AM	5	123	0	128	130	14	0	144	4	1	0	5	277
08:15 AM	14	130	0	144	132	17	0	149	7	4	0	11	304
Total Volume	41	496	0	537	560	74	0	634	21	6	0	27	1198
% App. Total	7.6	92.4	0		88.3	11.7	0		77.8	22.2	0		
PHF	.732	.954	.000	.932	.886	.740	.000	.866	.750	.375	.000	.614	.948

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 C
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	0	11	0	21	2	0	0	0	0	34
07:15 AM	0	17	0	15	0	0	0	0	0	32
07:30 AM	0	11	0	5	1	0	0	0	0	17
07:45 AM	0	11	0	5	1	0	0	0	0	17
Total	0	50	0	46	4	0	0	0	0	100
08:00 AM	1	5	0	14	0	0	0	0	0	20
08:15 AM	0	11	0	7	0	0	1	0	0	19
08:30 AM	1	8	0	9	0	0	0	1	0	19
08:45 AM	1	15	0	4	0	0	1	0	0	21
Total	3	39	0	34	0	0	2	1	0	79
Grand Total	3	89	0	80	4	0	2	1	0	179
Apprch %	3.3	96.7	0	95.2	4.8	0	66.7	33.3	0	
Total %	1.7	49.7	0	44.7	2.2	0	1.1	0.6	0	

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 07:00 AM													
07:00 AM	0	11	0	11	21	2	0	23	0	0	0	0	34
07:15 AM	0	17	0	17	15	0	0	15	0	0	0	0	32
07:30 AM	0	11	0	11	5	1	0	6	0	0	0	0	17
07:45 AM	0	11	0	11	5	1	0	6	0	0	0	0	17
Total Volume	0	50	0	50	46	4	0	50	0	0	0	0	100
% App. Total	0	100	0		92	8	0		0	0	0		
PHF	.000	.735	.000	.735	.548	.500	.000	.543	.000	.000	.000	.000	.735

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 C
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	1	1	1	0	7	0	0	4	14
07:15 AM	0	0	0	1	0	7	0	0	5	13
07:30 AM	0	0	0	1	0	8	0	0	6	15
07:45 AM	0	1	0	2	0	4	0	0	4	11
Total	0	2	1	5	0	26	0	0	19	53
08:00 AM	0	0	1	1	0	0	0	0	5	7
08:15 AM	0	0	0	2	0	1	0	0	0	3
08:30 AM	0	1	0	3	0	0	0	0	1	5
08:45 AM	0	1	0	3	0	0	0	0	5	9
Total	0	2	1	9	0	1	0	0	11	24
Grand Total	0	4	2	14	0	27	0	0	30	77
Apprch %	0	66.7	33.3	34.1	0	65.9	0	0	100	
Total %	0	5.2	2.6	18.2	0	35.1	0	0	39	

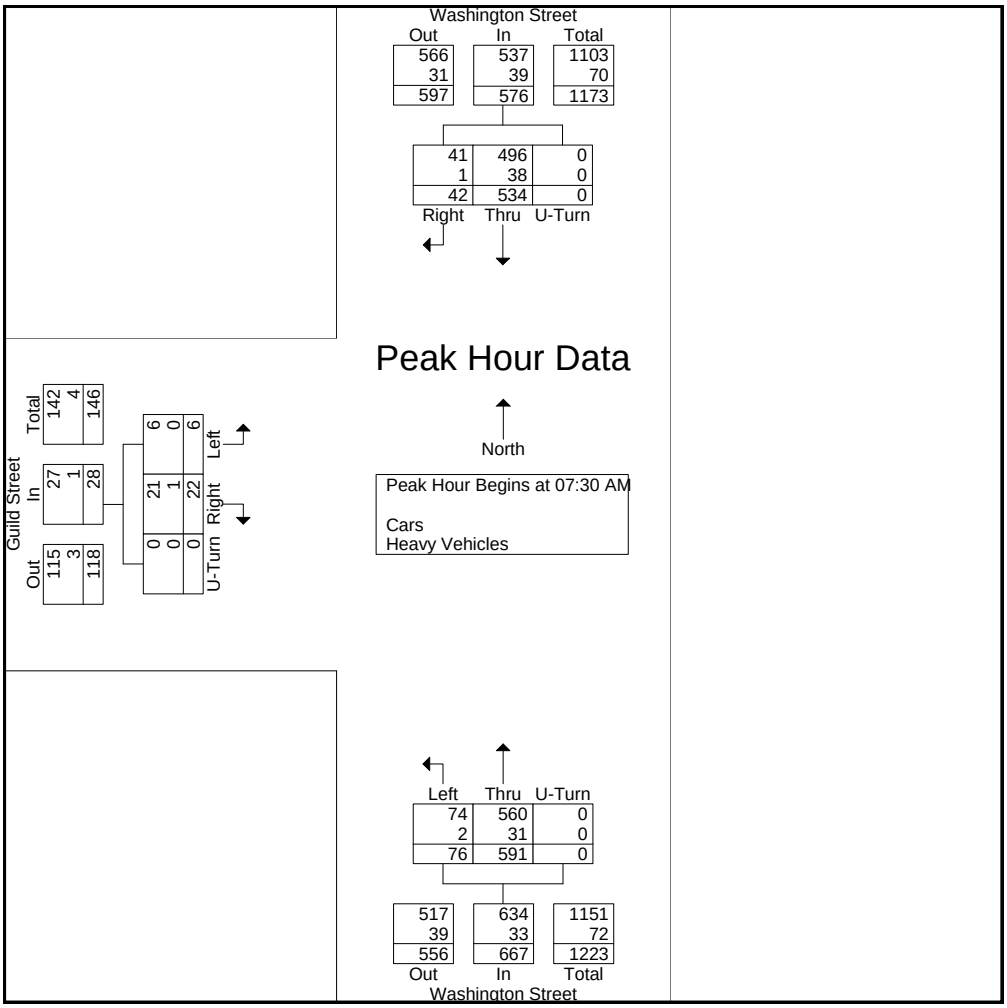
	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	1	1	2	1	0	7	8	0	0	4	4	14
07:15 AM	0	0	0	0	1	0	7	8	0	0	5	5	13
07:30 AM	0	0	0	0	1	0	8	9	0	0	6	6	15
07:45 AM	0	1	0	1	2	0	4	6	0	0	4	4	11
Total Volume	0	2	1	3	5	0	26	31	0	0	19	19	53
% App. Total	0	66.7	33.3		16.1	0	83.9		0	0	100		
PHF	.000	.500	.250	.375	.625	.000	.813	.861	.000	.000	.792	.792	.883

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 C
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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	11	137	0	148	145	19	0	164	5	1	0	6	318
07:45 AM	11	128	0	139	163	26	0	189	5	0	0	5	333
08:00 AM	6	128	0	134	144	14	0	158	4	1	0	5	297
08:15 AM	14	141	0	155	139	17	0	156	8	4	0	12	323
Total Volume	42	534	0	576	591	76	0	667	22	6	0	28	1271
% App. Total	7.3	92.7	0		88.6	11.4	0		78.6	21.4	0		
PHF	.750	.947	.000	.929	.906	.731	.000	.882	.688	.375	.000	.583	.954
Cars	41	496	0	537	560	74	0	634	21	6	0	27	1198
% Cars	97.6	92.9	0	93.2	94.8	97.4	0	95.1	95.5	100	0	96.4	94.3
Heavy Vehicles	1	38	0	39	31	2	0	33	1	0	0	1	73
% Heavy Vehicles	2.4	7.1	0	6.8	5.2	2.6	0	4.9	4.5	0	0	3.6	5.7



N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 CC
Site Code : 2007015
Start Date : 11/28/2012

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	18	219	0	102	15	0	3	1	0	358
04:15 PM	13	195	0	91	10	0	3	2	0	314
04:30 PM	15	202	0	83	13	0	3	1	0	317
04:45 PM	14	216	0	79	16	0	6	1	0	332
Total	60	832	0	355	54	0	15	5	0	1321
05:00 PM	12	248	0	78	11	0	6	2	0	357
05:15 PM	25	266	0	87	20	0	7	2	0	407
05:30 PM	12	213	0	85	11	0	5	0	0	326
05:45 PM	6	152	0	90	8	0	4	1	0	261
Total	55	879	0	340	50	0	22	5	0	1351
Grand Total	115	1711	0	695	104	0	37	10	0	2672
Apprch %	6.3	93.7	0	87	13	0	78.7	21.3	0	
Total %	4.3	64	0	26	3.9	0	1.4	0.4	0	
Cars	113	1658	0	651	101	0	36	10	0	2569
% Cars	98.3	96.9	0	93.7	97.1	0	97.3	100	0	96.1
Heavy Vehicles	2	53	0	44	3	0	1	0	0	103
% Heavy Vehicles	1.7	3.1	0	6.3	2.9	0	2.7	0	0	3.9

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:45 PM													
04:45 PM	14	216	0	230	79	16	0	95	6	1	0	7	332
05:00 PM	12	248	0	260	78	11	0	89	6	2	0	8	357
05:15 PM	25	266	0	291	87	20	0	107	7	2	0	9	407
05:30 PM	12	213	0	225	85	11	0	96	5	0	0	5	326
Total Volume	63	943	0	1006	329	58	0	387	24	5	0	29	1422
% App. Total	6.3	93.7	0		85	15	0		82.8	17.2	0		
PHF	.630	.886	.000	.864	.945	.725	.000	.904	.857	.625	.000	.806	.873
Cars	62	925	0	987	310	58	0	368	23	5	0	28	1383
% Cars	98.4	98.1	0	98.1	94.2	100	0	95.1	95.8	100	0	96.6	97.3
Heavy Vehicles	1	18	0	19	19	0	0	19	1	0	0	1	39
% Heavy Vehicles	1.6	1.9	0	1.9	5.8	0	0	4.9	4.2	0	0	3.4	2.7

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 CC
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	17	207	0	93	13	0	3	1	0	334
04:15 PM	13	184	0	85	10	0	3	2	0	297
04:30 PM	15	195	0	74	12	0	3	1	0	300
04:45 PM	13	211	0	74	16	0	6	1	0	321
Total	58	797	0	326	51	0	15	5	0	1252
05:00 PM	12	241	0	71	11	0	6	2	0	343
05:15 PM	25	262	0	83	20	0	6	2	0	398
05:30 PM	12	211	0	82	11	0	5	0	0	321
05:45 PM	6	147	0	89	8	0	4	1	0	255
Total	55	861	0	325	50	0	21	5	0	1317
Grand Total	113	1658	0	651	101	0	36	10	0	2569
Apprch %	6.4	93.6	0	86.6	13.4	0	78.3	21.7	0	
Total %	4.4	64.5	0	25.3	3.9	0	1.4	0.4	0	

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:45 PM													
04:45 PM	13	211	0	224	74	16	0	90	6	1	0	7	321
05:00 PM	12	241	0	253	71	11	0	82	6	2	0	8	343
05:15 PM	25	262	0	287	83	20	0	103	6	2	0	8	398
05:30 PM	12	211	0	223	82	11	0	93	5	0	0	5	321
Total Volume	62	925	0	987	310	58	0	368	23	5	0	28	1383
% App. Total	6.3	93.7	0		84.2	15.8	0		82.1	17.9	0		
PHF	.620	.883	.000	.860	.934	.725	.000	.893	.958	.625	.000	.875	.869

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 CC
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	1	12	0	9	2	0	0	0	0	24
04:15 PM	0	11	0	6	0	0	0	0	0	17
04:30 PM	0	7	0	9	1	0	0	0	0	17
04:45 PM	1	5	0	5	0	0	0	0	0	11
Total	2	35	0	29	3	0	0	0	0	69
05:00 PM	0	7	0	7	0	0	0	0	0	14
05:15 PM	0	4	0	4	0	0	1	0	0	9
05:30 PM	0	2	0	3	0	0	0	0	0	5
05:45 PM	0	5	0	1	0	0	0	0	0	6
Total	0	18	0	15	0	0	1	0	0	34
Grand Total	2	53	0	44	3	0	1	0	0	103
Apprch %	3.6	96.4	0	93.6	6.4	0	100	0	0	
Total %	1.9	51.5	0	42.7	2.9	0	1	0	0	

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:00 PM													
04:00 PM	1	12	0	13	9	2	0	11	0	0	0	0	24
04:15 PM	0	11	0	11	6	0	0	6	0	0	0	0	17
04:30 PM	0	7	0	7	9	1	0	10	0	0	0	0	17
04:45 PM	1	5	0	6	5	0	0	5	0	0	0	0	11
Total Volume	2	35	0	37	29	3	0	32	0	0	0	0	69
% App. Total	5.4	94.6	0		90.6	9.4	0		0	0	0		
PHF	.500	.729	.000	.712	.806	.375	.000	.727	.000	.000	.000	.000	.719

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 CC
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Washington Street From North			Washington Street From South			Guild Street From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
04:00 PM	0	1	1	1	0	6	0	0	4	13
04:15 PM	0	2	2	0	0	9	0	0	12	25
04:30 PM	0	1	0	0	0	10	0	0	7	18
04:45 PM	0	1	0	2	0	0	0	0	4	7
Total	0	5	3	3	0	25	0	0	27	63
05:00 PM	0	1	0	0	0	1	0	0	3	5
05:15 PM	0	4	0	1	0	0	0	0	3	8
05:30 PM	0	4	2	0	0	0	0	0	3	9
05:45 PM	0	2	1	0	0	1	0	0	7	11
Total	0	11	3	1	0	2	0	0	16	33
Grand Total	0	16	6	4	0	27	0	0	43	96
Apprch %	0	72.7	27.3	12.9	0	87.1	0	0	100	
Total %	0	16.7	6.2	4.2	0	28.1	0	0	44.8	

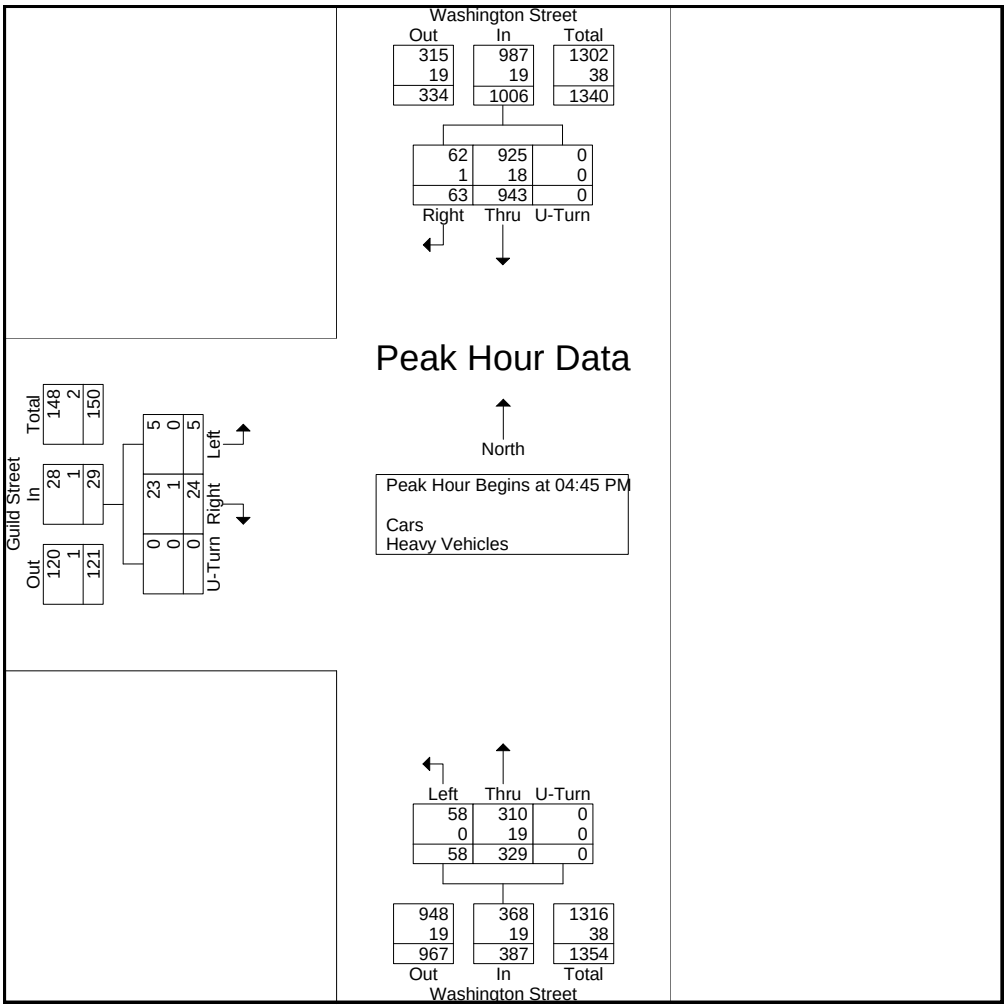
	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	1	1	2	1	0	6	7	0	0	4	4	13
04:15 PM	0	2	2	4	0	0	9	9	0	0	12	12	25
04:30 PM	0	1	0	1	0	0	10	10	0	0	7	7	18
04:45 PM	0	1	0	1	2	0	0	2	0	0	4	4	7
Total Volume	0	5	3	8	3	0	25	28	0	0	27	27	63
% App. Total	0	62.5	37.5		10.7	0	89.3		0	0	100		
PHF	.000	.625	.375	.500	.375	.000	.625	.700	.000	.000	.563	.563	.630

N/S: Washington Street
W: Guild Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 CC
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Washington Street From North				Washington Street From South				Guild Street From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	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 04:45 PM													
04:45 PM	14	216	0	230	79	16	0	95	6	1	0	7	332
05:00 PM	12	248	0	260	78	11	0	89	6	2	0	8	357
05:15 PM	25	266	0	291	87	20	0	107	7	2	0	9	407
05:30 PM	12	213	0	225	85	11	0	96	5	0	0	5	326
Total Volume	63	943	0	1006	329	58	0	387	24	5	0	29	1422
% App. Total	6.3	93.7	0		85	15	0		82.8	17.2	0		
PHF	.630	.886	.000	.864	.945	.725	.000	.904	.857	.625	.000	.806	.873
Cars	62	925	0	987	310	58	0	368	23	5	0	28	1383
% Cars	98.4	98.1	0	98.1	94.2	100	0	95.1	95.8	100	0	96.6	97.3
Heavy Vehicles	1	18	0	19	19	0	0	19	1	0	0	1	39
% Heavy Vehicles	1.6	1.9	0	1.9	5.8	0	0	4.9	4.2	0	0	3.4	2.7



N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 D
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	3	17	0	0	3	3	0	0	0	1	0	0	27
07:15 AM	0	0	0	0	6	25	0	0	5	2	2	0	0	2	0	0	42
07:30 AM	0	0	0	0	3	24	0	0	4	3	1	0	0	2	0	0	37
07:45 AM	0	0	0	0	9	30	0	0	1	0	1	0	0	3	0	0	44
Total	0	0	0	0	21	96	0	0	13	8	4	0	0	8	0	0	150
08:00 AM	0	0	0	0	4	15	0	0	4	2	0	0	0	0	2	0	27
08:15 AM	0	0	0	0	9	21	0	0	7	2	3	0	0	5	0	0	47
08:30 AM	0	0	0	0	4	10	0	0	12	3	2	0	0	3	0	0	34
08:45 AM	0	0	0	0	3	17	0	0	2	5	1	0	0	1	0	0	29
Total	0	0	0	0	20	63	0	0	25	12	6	0	0	9	2	0	137
Grand Total	0	0	0	0	41	159	0	0	38	20	10	0	0	17	2	0	287
Apprch %	0	0	0	0	20.5	79.5	0	0	55.9	29.4	14.7	0	0	89.5	10.5	0	
Total %	0	0	0	0	14.3	55.4	0	0	13.2	7	3.5	0	0	5.9	0.7	0	
Cars	0	0	0	0	39	154	0	0	35	20	9	0	0	17	2	0	276
% Cars	0	0	0	0	95.1	96.9	0	0	92.1	100	90	0	0	100	100	0	96.2
Heavy Vehicles	0	0	0	0	2	5	0	0	3	0	1	0	0	0	0	0	11
% Heavy Vehicles	0	0	0	0	4.9	3.1	0	0	7.9	0	10	0	0	0	0	0	3.8

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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	0	0	0	0	3	24	0	0	27	4	3	1	0	8	0	2	0	0	2	37
07:45 AM	0	0	0	0	0	9	30	0	0	39	1	0	1	0	2	0	3	0	0	3	44
08:00 AM	0	0	0	0	0	4	15	0	0	19	4	2	0	0	6	0	0	2	0	2	27
08:15 AM	0	0	0	0	0	9	21	0	0	30	7	2	3	0	12	0	5	0	0	5	47
Total Volume	0	0	0	0	0	25	90	0	0	115	16	7	5	0	28	0	10	2	0	12	155
% App. Total	0	0	0	0		21.7	78.3	0	0		57.1	25	17.9	0		0	83.3	16.7	0		
PHF	.000	.000	.000	.000	.000	.694	.750	.000	.000	.737	.571	.583	.417	.000	.583	.000	.500	.250	.000	.600	.824
Cars	0	0	0	0	0	25	87	0	0	112	15	7	4	0	26	0	10	2	0	12	150
% Cars	0	0	0	0	0	100	96.7	0	0	97.4	93.8	100	80.0	0	92.9	0	100	100	0	100	96.8
Heavy Vehicles	0	0	0	0	0	0	3	0	0	3	1	0	1	0	2	0	0	0	0	0	5
% Heavy Vehicles	0	0	0	0	0	0	3.3	0	0	2.6	6.3	0	20.0	0	7.1	0	0	0	0	0	3.2

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 D
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	2	15	0	0	3	3	0	0	0	1	0	0	24
07:15 AM	0	0	0	0	6	25	0	0	5	2	2	0	0	2	0	0	42
07:30 AM	0	0	0	0	3	23	0	0	4	3	1	0	0	2	0	0	36
07:45 AM	0	0	0	0	9	29	0	0	1	0	1	0	0	3	0	0	43
Total	0	0	0	0	20	92	0	0	13	8	4	0	0	8	0	0	145
08:00 AM	0	0	0	0	4	14	0	0	4	2	0	0	0	0	2	0	26
08:15 AM	0	0	0	0	9	21	0	0	6	2	2	0	0	5	0	0	45
08:30 AM	0	0	0	0	4	10	0	0	11	3	2	0	0	3	0	0	33
08:45 AM	0	0	0	0	2	17	0	0	1	5	1	0	0	1	0	0	27
Total	0	0	0	0	19	62	0	0	22	12	5	0	0	9	2	0	131
Grand Total	0	0	0	0	39	154	0	0	35	20	9	0	0	17	2	0	276
Apprch %	0	0	0	0	20.2	79.8	0	0	54.7	31.2	14.1	0	0	89.5	10.5	0	
Total %	0	0	0	0	14.1	55.8	0	0	12.7	7.2	3.3	0	0	6.2	0.7	0	

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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	0	0	0	0	3	23	0	0	26	4	3	1	0	8	0	2	0	0	2	36
07:45 AM	0	0	0	0	0	9	29	0	0	38	1	0	1	0	2	0	3	0	0	3	43
08:00 AM	0	0	0	0	0	4	14	0	0	18	4	2	0	0	6	0	0	2	0	2	26
08:15 AM	0	0	0	0	0	9	21	0	0	30	6	2	2	0	10	0	5	0	0	5	45
Total Volume	0	0	0	0	0	25	87	0	0	112	15	7	4	0	26	0	10	2	0	12	150
% App. Total	0	0	0	0		22.3	77.7	0	0		57.7	26.9	15.4	0		0	83.3	16.7	0		
PHF	.000	.000	.000	.000	.000	.694	.750	.000	.000	.737	.625	.583	.500	.000	.650	.000	.500	.250	.000	.600	.833

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

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 D
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	1	2	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	5
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
Total	0	0	0	0	1	1	0	0	3	0	1	0	0	0	0	0	6
Grand Total	0	0	0	0	2	5	0	0	3	0	1	0	0	0	0	0	11
Apprch %	0	0	0	0	28.6	71.4	0	0	75	0	25	0	0	0	0	0	
Total %	0	0	0	0	18.2	45.5	0	0	27.3	0	9.1	0	0	0	0	0	

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2
Total Volume	0	0	0	0	0	1	1	0	0	2	3	0	1	0	4	0	0	0	0	0	6
% App. Total	0	0	0	0		50	50	0	0		75	0	25	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.750	.000	.250	.000	.500	.000	.000	.000	.000	.000	.750

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 D
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	4
07:15 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	3
07:30 AM	0	0	0	1	0	0	0	3	0	0	0	2	0	0	0	0	6
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
Total	0	0	0	1	0	0	0	4	0	1	0	6	0	0	0	3	15
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	6	0	0	0	0	7
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	1	5
Total	0	0	0	1	0	0	0	4	0	0	0	10	0	0	0	1	16
Grand Total	0	0	0	2	0	0	0	8	0	1	0	16	0	0	0	4	31
Apprch %	0	0	0	100	0	0	0	100	0	5.9	0	94.1	0	0	0	100	
Total %	0	0	0	6.5	0	0	0	25.8	0	3.2	0	51.6	0	0	0	12.9	

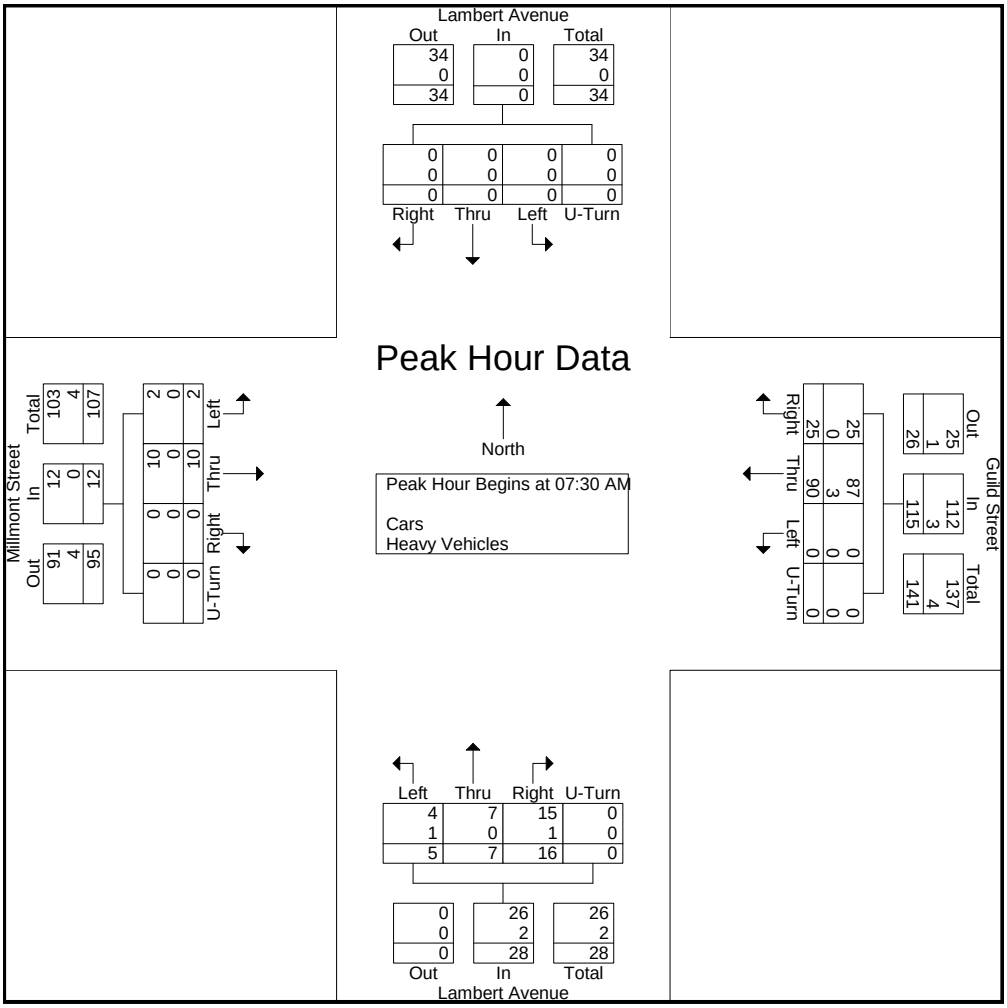
	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	6	6	0	0	0	0	0	7
08:45 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	3	3	0	0	0	1	1	5
Total Volume	0	0	0	1	1	0	0	0	4	4	0	0	0	10	10	0	0	0	1	1	16
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.500	.500	.000	.000	.000	.417	.417	.000	.000	.000	.250	.250	.571

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 D
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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	0	0	0	0	3	24	0	0	27	4	3	1	0	8	0	2	0	0	2	37
07:45 AM	0	0	0	0	0	9	30	0	0	39	1	0	1	0	2	0	3	0	0	3	44
08:00 AM	0	0	0	0	0	4	15	0	0	19	4	2	0	0	6	0	0	2	0	2	27
08:15 AM	0	0	0	0	0	9	21	0	0	30	7	2	3	0	12	0	5	0	0	5	47
Total Volume	0	0	0	0	0	25	90	0	0	115	16	7	5	0	28	0	10	2	0	12	155
% App. Total	0	0	0	0		21.7	78.3	0	0		57.1	25	17.9	0		0	83.3	16.7	0		
PHF	.000	.000	.000	.000	.000	.694	.750	.000	.000	.737	.571	.583	.417	.000	.583	.000	.500	.250	.000	.600	.824
Cars	0	0	0	0	0	25	87	0	0	112	15	7	4	0	26	0	10	2	0	12	150
% Cars	0	0	0	0	0	100	96.7	0	0	97.4	93.8	100	80.0	0	92.9	0	100	100	0	100	96.8
Heavy Vehicles	0	0	0	0	0	0	3	0	0	3	1	0	1	0	2	0	0	0	0	0	5
% Heavy Vehicles	0	0	0	0	0	0	3.3	0	0	2.6	6.3	0	20.0	0	7.1	0	0	0	0	0	3.2



N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 DD
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	8	18	0	0	5	2	1	0	0	1	1	0	36
04:15 PM	0	0	0	0	2	13	0	1	3	3	1	0	0	1	0	0	24
04:30 PM	0	0	0	0	5	17	0	0	4	1	0	0	0	0	0	0	27
04:45 PM	0	0	0	0	6	15	0	0	2	4	0	0	0	2	0	0	29
Total	0	0	0	0	21	63	0	1	14	10	2	0	0	4	1	0	116
05:00 PM	0	0	0	0	8	13	0	0	5	5	1	0	0	1	0	0	33
05:15 PM	0	0	0	0	9	20	0	0	8	5	1	0	0	1	0	0	44
05:30 PM	0	0	0	0	4	18	0	0	4	6	0	0	0	2	0	0	34
05:45 PM	0	0	0	0	5	4	0	0	3	1	0	0	0	1	0	0	14
Total	0	0	0	0	26	55	0	0	20	17	2	0	0	5	0	0	125
Grand Total	0	0	0	0	47	118	0	1	34	27	4	0	0	9	1	0	241
Apprch %	0	0	0	0	28.3	71.1	0	0.6	52.3	41.5	6.2	0	0	90	10	0	
Total %	0	0	0	0	19.5	49	0	0.4	14.1	11.2	1.7	0	0	3.7	0.4	0	
Cars	0	0	0	0	46	116	0	1	32	26	4	0	0	9	1	0	235
% Cars	0	0	0	0	97.9	98.3	0	100	94.1	96.3	100	0	0	100	100	0	97.5
Heavy Vehicles	0	0	0	0	1	2	0	0	2	1	0	0	0	0	0	0	6
% Heavy Vehicles	0	0	0	0	2.1	1.7	0	0	5.9	3.7	0	0	0	0	0	0	2.5

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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 04:45 PM																					
04:45 PM	0	0	0	0	0	6	15	0	0	21	2	4	0	0	6	0	2	0	0	2	29
05:00 PM	0	0	0	0	0	8	13	0	0	21	5	5	1	0	11	0	1	0	0	1	33
05:15 PM	0	0	0	0	0	9	20	0	0	29	8	5	1	0	14	0	1	0	0	1	44
05:30 PM	0	0	0	0	0	4	18	0	0	22	4	6	0	0	10	0	2	0	0	2	34
Total Volume	0	0	0	0	0	27	66	0	0	93	19	20	2	0	41	0	6	0	0	6	140
% App. Total	0	0	0	0		29	71	0	0		46.3	48.8	4.9	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.750	.825	.000	.000	.802	.594	.833	.500	.000	.732	.000	.750	.000	.000	.750	.795
Cars	0	0	0	0	0	27	66	0	0	93	18	20	2	0	40	0	6	0	0	6	139
% Cars	0	0	0	0	0	100	100	0	0	100	94.7	100	100	0	97.6	0	100	0	0	100	99.3
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	5.3	0	0	0	2.4	0	0	0	0	0	0.7

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

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 DD
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	7	17	0	0	4	2	1	0	0	1	1	0	33
04:15 PM	0	0	0	0	2	13	0	1	3	2	1	0	0	1	0	0	23
04:30 PM	0	0	0	0	5	16	0	0	4	1	0	0	0	0	0	0	26
04:45 PM	0	0	0	0	6	15	0	0	2	4	0	0	0	2	0	0	29
Total	0	0	0	0	20	61	0	1	13	9	2	0	0	4	1	0	111
05:00 PM	0	0	0	0	8	13	0	0	5	5	1	0	0	1	0	0	33
05:15 PM	0	0	0	0	9	20	0	0	7	5	1	0	0	1	0	0	43
05:30 PM	0	0	0	0	4	18	0	0	4	6	0	0	0	2	0	0	34
05:45 PM	0	0	0	0	5	4	0	0	3	1	0	0	0	1	0	0	14
Total	0	0	0	0	26	55	0	0	19	17	2	0	0	5	0	0	124
Grand Total	0	0	0	0	46	116	0	1	32	26	4	0	0	9	1	0	235
Apprch %	0	0	0	0	28.2	71.2	0	0.6	51.6	41.9	6.5	0	0	90	10	0	
Total %	0	0	0	0	19.6	49.4	0	0.4	13.6	11.1	1.7	0	0	3.8	0.4	0	

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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 04:45 PM																					
04:45 PM	0	0	0	0	0	6	15	0	0	21	2	4	0	0	6	0	2	0	0	2	29
05:00 PM	0	0	0	0	0	8	13	0	0	21	5	5	1	0	11	0	1	0	0	1	33
05:15 PM	0	0	0	0	0	9	20	0	0	29	7	5	1	0	13	0	1	0	0	1	43
05:30 PM	0	0	0	0	0	4	18	0	0	22	4	6	0	0	10	0	2	0	0	2	34
Total Volume	0	0	0	0	0	27	66	0	0	93	18	20	2	0	40	0	6	0	0	6	139
% App. Total	0	0	0	0		29	71	0	0		45	50	5	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.750	.825	.000	.000	.802	.643	.833	.500	.000	.769	.000	.750	.000	.000	.750	.808

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 DD
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	1	1	0	0	1	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	2	0	0	1	1	0	0	0	0	0	0	5
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	1	2	0	0	2	1	0	0	0	0	0	0	6
Apprch %	0	0	0	0	33.3	66.7	0	0	66.7	33.3	0	0	0	0	0	0	
Total %	0	0	0	0	16.7	33.3	0	0	33.3	16.7	0	0	0	0	0	0	

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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 04:00 PM																					
04:00 PM	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	2	0	0	3	1	1	0	0	2	0	0	0	0	0	5
% App. Total	0	0	0	0		33.3	66.7	0	0		50	50	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.500	.000	.000	.375	.250	.250	.000	.000	.500	.000	.000	.000	.000	.000	.417

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 DD
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Lambert Avenue From North				Guild Street From East				Lambert Avenue From South				Millmont 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	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	1	5
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	3
Total	0	0	0	0	0	0	0	4	0	1	0	5	0	0	0	3	13
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	1	5
Grand Total	0	0	0	1	0	0	0	4	0	1	0	8	0	0	0	4	18
Apprch %	0	0	0	100	0	0	0	100	0	11.1	0	88.9	0	0	0	100	
Total %	0	0	0	5.6	0	0	0	22.2	0	5.6	0	44.4	0	0	0	22.2	

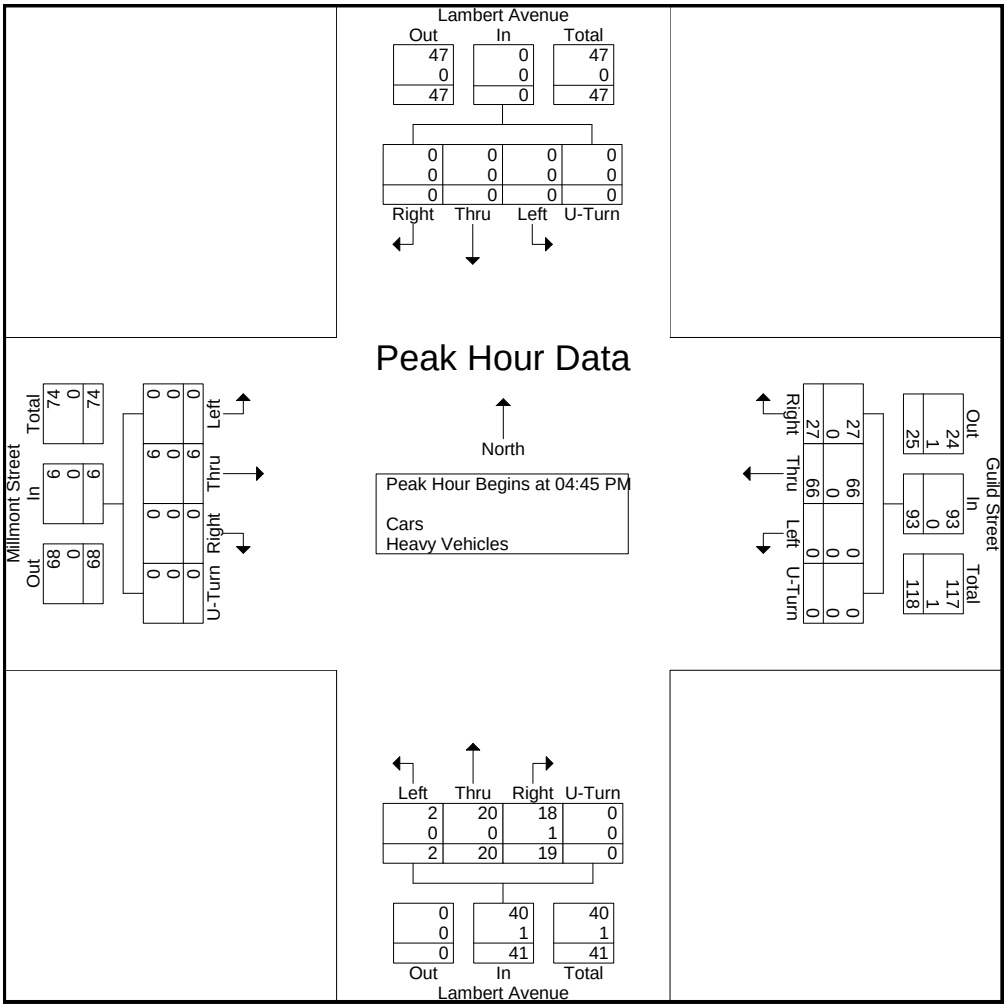
	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	1	1	0	0	0	1	1	5
04:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2	2	3
Total Volume	0	0	0	0	0	0	0	0	4	4	0	1	0	5	6	0	0	0	3	3	13
% App. Total	0	0	0	0		0	0	0	100		0	16.7	0	83.3		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.333	.333	.000	.250	.000	.313	.375	.000	.000	.000	.375	.375	.650

N/S: Lambert Avenue
E/W: Guild Street/ Millmont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 DD
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Lambert Avenue From North					Guild Street From East					Lambert Avenue From South					Millmont 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 04:45 PM																					
04:45 PM	0	0	0	0	0	6	15	0	0	21	2	4	0	0	6	0	2	0	0	2	29
05:00 PM	0	0	0	0	0	8	13	0	0	21	5	5	1	0	11	0	1	0	0	1	33
05:15 PM	0	0	0	0	0	9	20	0	0	29	8	5	1	0	14	0	1	0	0	1	44
05:30 PM	0	0	0	0	0	4	18	0	0	22	4	6	0	0	10	0	2	0	0	2	34
Total Volume	0	0	0	0	0	27	66	0	0	93	19	20	2	0	41	0	6	0	0	6	140
% App. Total	0	0	0	0		29	71	0	0		46.3	48.8	4.9	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.750	.825	.000	.000	.802	.594	.833	.500	.000	.732	.000	.750	.000	.000	.750	.795
Cars	0	0	0	0	0	27	66	0	0	93	18	20	2	0	40	0	6	0	0	6	139
% Cars	0	0	0	0	0	100	100	0	0	100	94.7	100	100	0	97.6	0	100	0	0	100	99.3
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	5.3	0	0	0	2.4	0	0	0	0	0	0.7



N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 E
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	6	2	0	0	0	17	0	0	25
07:15 AM	0	0	0	0	0	0	0	0	4	6	0	0	0	20	1	0	31
07:30 AM	0	0	0	0	0	0	0	0	2	4	0	0	0	24	0	0	30
07:45 AM	0	0	0	0	0	0	0	0	1	9	0	0	0	14	0	0	24
Total	0	0	0	0	0	0	0	0	13	21	0	0	0	75	1	0	110
08:00 AM	0	0	0	0	0	0	0	0	4	2	0	0	0	12	0	0	18
08:15 AM	0	0	0	0	0	0	0	0	2	5	0	0	0	12	0	0	19
08:30 AM	0	0	0	0	0	0	0	0	1	5	0	0	0	8	1	0	15
08:45 AM	0	0	0	0	0	0	0	0	2	3	0	0	0	7	2	0	14
Total	0	0	0	0	0	0	0	0	9	15	0	0	0	39	3	0	66
Grand Total	0	0	0	0	0	0	0	0	22	36	0	0	0	114	4	0	176
Apprch %	0	0	0	0	0	0	0	0	37.9	62.1	0	0	0	96.6	3.4	0	
Total %	0	0	0	0	0	0	0	0	12.5	20.5	0	0	0	64.8	2.3	0	
Cars	0	0	0	0	0	0	0	0	21	34	0	0	0	99	4	0	158
% Cars	0	0	0	0	0	0	0	0	95.5	94.4	0	0	0	86.8	100	0	89.8
Heavy Vehicles	0	0	0	0	0	0	0	0	1	2	0	0	0	15	0	0	18
% Heavy Vehicles	0	0	0	0	0	0	0	0	4.5	5.6	0	0	0	13.2	0	0	10.2

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	6	2	0	0	8	0	17	0	0	17	25
07:15 AM	0	0	0	0	0	0	0	0	0	0	4	6	0	0	10	0	20	1	0	21	31
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	4	0	0	6	0	24	0	0	24	30
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	9	0	0	10	0	14	0	0	14	24
Total Volume	0	0	0	0	0	0	0	0	0	0	13	21	0	0	34	0	75	1	0	76	110
% App. Total	0	0	0	0		0	0	0	0		38.2	61.8	0	0		0	98.7	1.3	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.542	.583	.000	.000	.850	.000	.781	.250	.000	.792	.887
Cars	0	0	0	0	0	0	0	0	0	0	12	20	0	0	32	0	61	1	0	62	94
% Cars	0	0	0	0	0	0	0	0	0	0	92.3	95.2	0	0	94.1	0	81.3	100	0	81.6	85.5
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	14	0	0	14	16
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	7.7	4.8	0	0	5.9	0	18.7	0	0	18.4	14.5

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

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

File Name : 123128 E
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	5	2	0	0	0	12	0	0	19
07:15 AM	0	0	0	0	0	0	0	0	4	6	0	0	0	16	1	0	27
07:30 AM	0	0	0	0	0	0	0	0	2	3	0	0	0	22	0	0	27
07:45 AM	0	0	0	0	0	0	0	0	1	9	0	0	0	11	0	0	21
Total	0	0	0	0	0	0	0	0	12	20	0	0	0	61	1	0	94
08:00 AM	0	0	0	0	0	0	0	0	4	2	0	0	0	12	0	0	18
08:15 AM	0	0	0	0	0	0	0	0	2	5	0	0	0	12	0	0	19
08:30 AM	0	0	0	0	0	0	0	0	1	5	0	0	0	7	1	0	14
08:45 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	7	2	0	13
Total	0	0	0	0	0	0	0	0	9	14	0	0	0	38	3	0	64
Grand Total	0	0	0	0	0	0	0	0	21	34	0	0	0	99	4	0	158
Apprch %	0	0	0	0	0	0	0	0	38.2	61.8	0	0	0	96.1	3.9	0	
Total %	0	0	0	0	0	0	0	0	13.3	21.5	0	0	0	62.7	2.5	0	

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	5	2	0	0	7	0	12	0	0	12	19
07:15 AM	0	0	0	0	0	0	0	0	0	0	4	6	0	0	10	0	16	1	0	17	27
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	3	0	0	5	0	22	0	0	22	27
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	9	0	0	10	0	11	0	0	11	21
Total Volume	0	0	0	0	0	0	0	0	0	0	12	20	0	0	32	0	61	1	0	62	94
% App. Total	0	0	0	0		0	0	0	0		37.5	62.5	0	0		0	98.4	1.6	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.600	.556	.000	.000	.800	.000	.693	.250	.000	.705	.870

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 E
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	1	0	0	0	0	5	0	0	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
Total	0	0	0	0	0	0	0	0	1	1	0	0	0	14	0	0	16
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
Grand Total	0	0	0	0	0	0	0	0	1	2	0	0	0	15	0	0	18
Apprch %	0	0	0	0	0	0	0	0	33.3	66.7	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	0	0	5.6	11.1	0	0	0	83.3	0	0	

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	5	0	0	5	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	14	0	0	14	16
% App. Total	0	0	0	0		0	0	0	0		50	50	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.000	.700	.000	.000	.700	.667

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 E
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	2	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
07:30 AM	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3
07:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
Total	0	0	0	2	0	0	0	2	1	0	0	4	0	0	0	4	13
08:00 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
Total	0	0	0	1	0	0	0	5	0	0	0	0	0	0	0	1	7
Grand Total	0	0	0	3	0	0	0	7	1	0	0	4	0	0	0	5	20
Apprch %	0	0	0	100	0	0	0	100	20	0	0	80	0	0	0	100	
Total %	0	0	0	15	0	0	0	35	5	0	0	20	0	0	0	25	

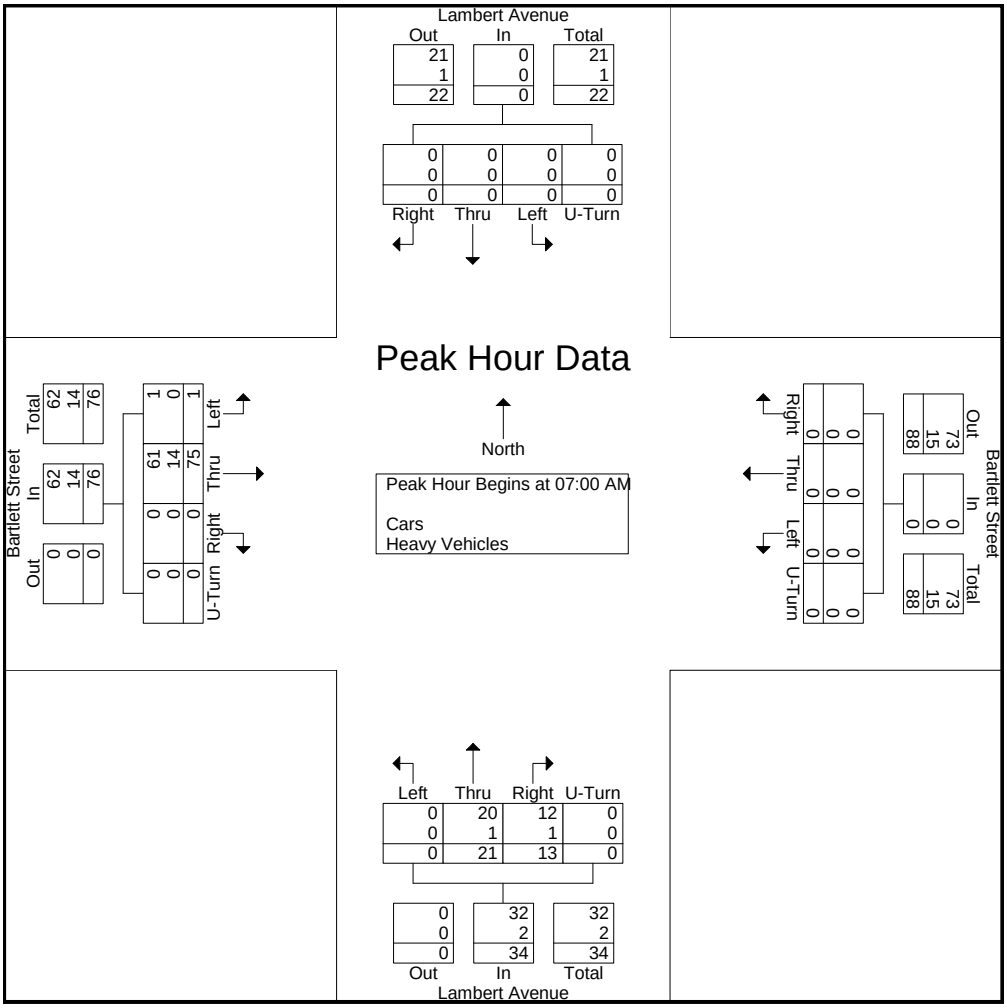
	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	2	2	0	0	0	2	2	0	0	0	2	2	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
07:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	2
Total Volume	0	0	0	2	2	0	0	0	2	2	1	0	0	4	5	0	0	0	4	4	13
% App. Total	0	0	0	100		0	0	0	100		20	0	0	80		0	0	0	100		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.250	.000	.000	.500	.625	.000	.000	.000	.500	.500	.542

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 E
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	6	2	0	0	8	0	17	0	0	17	25
07:15 AM	0	0	0	0	0	0	0	0	0	0	4	6	0	0	10	0	20	1	0	21	31
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	4	0	0	6	0	24	0	0	24	30
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	9	0	0	10	0	14	0	0	14	24
Total Volume	0	0	0	0	0	0	0	0	0	0	13	21	0	0	34	0	75	1	0	76	110
% App. Total	0	0	0	0		0	0	0	0		38.2	61.8	0	0		0	98.7	1.3	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.542	.583	.000	.000	.850	.000	.781	.250	.000	.792	.887
Cars	0	0	0	0	0	0	0	0	0	0	12	20	0	0	32	0	61	1	0	62	94
% Cars	0	0	0	0	0	0	0	0	0	0	92.3	95.2	0	0	94.1	0	81.3	100	0	81.6	85.5
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	14	0	0	14	16
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	7.7	4.8	0	0	5.9	0	18.7	0	0	18.4	14.5



N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 EE
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	2	6	0	0	0	29	1	0	38
04:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	19	0	0	23
04:30 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	16	0	0	22
04:45 PM	0	0	0	0	0	0	0	0	3	5	0	0	0	18	0	0	26
Total	0	0	0	0	0	0	0	0	8	18	0	0	0	82	1	0	109
05:00 PM	0	0	0	0	0	0	0	0	7	6	0	0	0	16	2	0	31
05:15 PM	0	0	0	0	0	0	0	0	1	4	0	0	0	24	1	0	30
05:30 PM	0	0	0	0	0	0	0	0	6	5	0	0	0	27	0	0	38
05:45 PM	0	0	0	0	0	0	0	0	1	4	0	0	0	15	0	0	20
Total	0	0	0	0	0	0	0	0	15	19	0	0	0	82	3	0	119
Grand Total	0	0	0	0	0	0	0	0	23	37	0	0	0	164	4	0	228
Apprch %	0	0	0	0	0	0	0	0	38.3	61.7	0	0	0	97.6	2.4	0	
Total %	0	0	0	0	0	0	0	0	10.1	16.2	0	0	0	71.9	1.8	0	
Cars	0	0	0	0	0	0	0	0	23	34	0	0	0	156	4	0	217
% Cars	0	0	0	0	0	0	0	0	100	91.9	0	0	0	95.1	100	0	95.2
Heavy Vehicles	0	0	0	0	0	0	0	0	0	3	0	0	0	8	0	0	11
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	8.1	0	0	0	4.9	0	0	4.8

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	3	5	0	0	8	0	18	0	0	18	26
05:00 PM	0	0	0	0	0	0	0	0	0	0	7	6	0	0	13	0	16	2	0	18	31
05:15 PM	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	24	1	0	25	30
05:30 PM	0	0	0	0	0	0	0	0	0	0	6	5	0	0	11	0	27	0	0	27	38
Total Volume	0	0	0	0	0	0	0	0	0	0	17	20	0	0	37	0	85	3	0	88	125
% App. Total	0	0	0	0		0	0	0	0		45.9	54.1	0	0		0	96.6	3.4	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.607	.833	.000	.000	.712	.000	.787	.375	.000	.815	.822
Cars	0	0	0	0	0	0	0	0	0	0	17	20	0	0	37	0	83	3	0	86	123
% Cars	0	0	0	0	0	0	0	0	0	0	100	100	0	0	100	0	97.6	100	0	97.7	98.4
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4	0	0	2.3	1.6

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 EE
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	2	5	0	0	0	27	1	0	35
04:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	17	0	0	19
04:30 PM	0	0	0	0	0	0	0	0	3	3	0	0	0	14	0	0	20
04:45 PM	0	0	0	0	0	0	0	0	3	5	0	0	0	17	0	0	25
Total	0	0	0	0	0	0	0	0	8	15	0	0	0	75	1	0	99
05:00 PM	0	0	0	0	0	0	0	0	7	6	0	0	0	16	2	0	31
05:15 PM	0	0	0	0	0	0	0	0	1	4	0	0	0	24	1	0	30
05:30 PM	0	0	0	0	0	0	0	0	6	5	0	0	0	26	0	0	37
05:45 PM	0	0	0	0	0	0	0	0	1	4	0	0	0	15	0	0	20
Total	0	0	0	0	0	0	0	0	15	19	0	0	0	81	3	0	118
Grand Total	0	0	0	0	0	0	0	0	23	34	0	0	0	156	4	0	217
Apprch %	0	0	0	0	0	0	0	0	40.4	59.6	0	0	0	97.5	2.5	0	
Total %	0	0	0	0	0	0	0	0	10.6	15.7	0	0	0	71.9	1.8	0	

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	3	5	0	0	8	0	17	0	0	17	25
05:00 PM	0	0	0	0	0	0	0	0	0	0	7	6	0	0	13	0	16	2	0	18	31
05:15 PM	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	24	1	0	25	30
05:30 PM	0	0	0	0	0	0	0	0	0	0	6	5	0	0	11	0	26	0	0	26	37
Total Volume	0	0	0	0	0	0	0	0	0	0	17	20	0	0	37	0	83	3	0	86	123
% App. Total	0	0	0	0		0	0	0	0		45.9	54.1	0	0		0	96.5	3.5	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.607	.833	.000	.000	.712	.000	.798	.375	.000	.827	.831

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 EE
Site Code : 2007015
Start Date : 11/28/2012

Groups Printed- Heavy Vehicles

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	1	0	0	0	2	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	3	0	0	0	7	0	0	10
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	3	0	0	0	8	0	0	11
Apprch %	0	0	0	0	0	0	0	0	0	100	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	0	0	0	27.3	0	0	0	72.7	0	0	

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	7	0	0	7	10
% App. Total	0	0	0	0		0	0	0	0		0	100	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.000	.000	.375	.000	.875	.000	.000	.875	.625

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 EE
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Lambert Avenue From North				Bartlett Street From East				Lambert Avenue From South				Bartlett 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	0	0	1	0	0	0	1	0	0	0	3	0	0	0	1	6
04:15 PM	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	1	6
04:30 PM	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0	4
04:45 PM	0	0	0	0	0	0	0	1	0	1	0	3	0	0	0	1	6
Total	0	0	0	3	0	0	0	4	0	1	0	11	0	0	0	3	22
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3
05:30 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Total	0	0	0	0	0	0	0	3	0	0	0	2	0	1	0	3	9
Grand Total	0	0	0	3	0	0	0	7	0	1	0	13	0	1	0	6	31
Apprch %	0	0	0	100	0	0	0	100	0	7.1	0	92.9	0	14.3	0	85.7	
Total %	0	0	0	9.7	0	0	0	22.6	0	3.2	0	41.9	0	3.2	0	19.4	

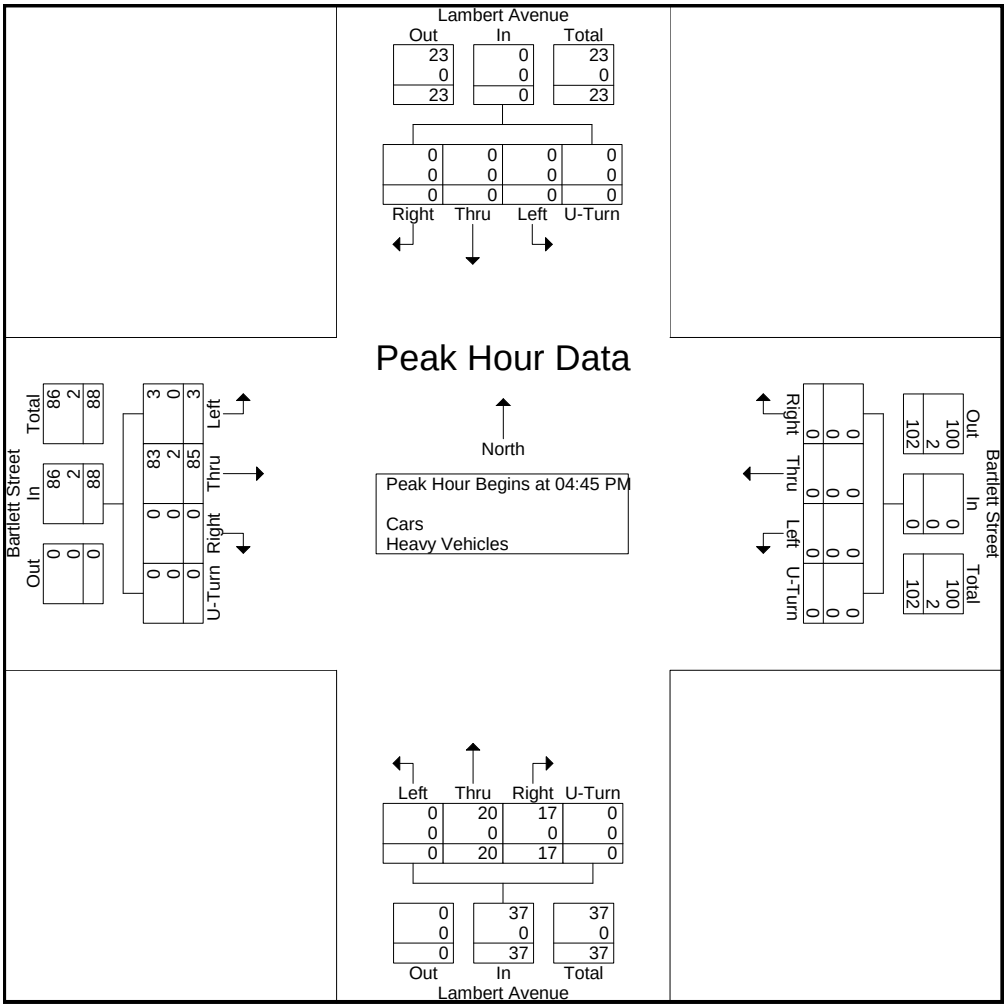
	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	3	3	0	0	0	1	1	6
04:15 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	3	3	0	0	0	1	1	6
04:30 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	4
04:45 PM	0	0	0	0	0	0	0	0	1	1	0	1	0	3	4	0	0	0	1	1	6
Total Volume	0	0	0	3	3	0	0	0	4	4	0	1	0	11	12	0	0	0	3	3	22
% App. Total	0	0	0	100		0	0	0	100		0	8.3	0	91.7		0	0	0	100		
PHF	.000	.000	.000	.750	.750	.000	.000	.000	1.00	1.00	.000	.250	.000	.917	.750	.000	.000	.000	.750	.750	.917

N/S: Lambert Avenue
E/W: Bartlett Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 EE
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Lambert Avenue From North					Bartlett Street From East					Lambert Avenue From South					Bartlett 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 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	3	5	0	0	8	0	18	0	0	18	26
05:00 PM	0	0	0	0	0	0	0	0	0	0	7	6	0	0	13	0	16	2	0	18	31
05:15 PM	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	24	1	0	25	30
05:30 PM	0	0	0	0	0	0	0	0	0	0	6	5	0	0	11	0	27	0	0	27	38
Total Volume	0	0	0	0	0	0	0	0	0	0	17	20	0	0	37	0	85	3	0	88	125
% App. Total	0	0	0	0		0	0	0	0		45.9	54.1	0	0		0	96.6	3.4	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.607	.833	.000	.000	.712	.000	.787	.375	.000	.815	.822
Cars	0	0	0	0	0	0	0	0	0	0	17	20	0	0	37	0	83	3	0	86	123
% Cars	0	0	0	0	0	0	0	0	0	0	100	100	0	0	100	0	97.6	100	0	97.7	98.4
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4	0	0	2.3	1.6



N/S: Guild Road/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 F
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	61	0	4	0	2	48	0	0	2	0	0	0	1	94	96	0	308
07:15 AM	54	2	1	0	1	52	2	0	1	2	0	0	0	110	93	0	318
07:30 AM	48	1	2	0	0	73	0	0	6	3	0	0	0	106	70	0	309
07:45 AM	54	0	0	1	1	52	0	0	7	2	2	0	0	138	59	0	316
Total	217	3	7	1	4	225	2	0	16	7	2	0	1	448	318	0	1251
08:00 AM	51	0	0	0	0	65	0	0	1	0	3	0	0	115	55	0	290
08:15 AM	70	0	0	0	1	54	0	1	3	0	1	0	0	112	54	0	296
08:30 AM	54	0	0	0	0	55	0	0	2	1	2	0	1	119	55	0	289
08:45 AM	40	1	0	0	0	57	0	0	6	3	1	0	1	97	62	1	269
Total	215	1	0	0	1	231	0	1	12	4	7	0	2	443	226	1	1144
Grand Total	432	4	7	1	5	456	2	1	28	11	9	0	3	891	544	1	2395
Apprch %	97.3	0.9	1.6	0.2	1.1	98.3	0.4	0.2	58.3	22.9	18.8	0	0.2	61.9	37.8	0.1	
Total %	18	0.2	0.3	0	0.2	19	0.1	0	1.2	0.5	0.4	0	0.1	37.2	22.7	0	
Cars	408	4	6	1	5	401	2	1	26	10	8	0	3	818	517	1	2211
% Cars	94.4	100	85.7	100	100	87.9	100	100	92.9	90.9	88.9	0	100	91.8	95	100	92.3
Heavy Vehicles	24	0	1	0	0	55	0	0	2	1	1	0	0	73	27	0	184
% Heavy Vehicles	5.6	0	14.3	0	0	12.1	0	0	7.1	9.1	11.1	0	0	8.2	5	0	7.7

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 07:00 AM																					
07:00 AM	61	0	4	0	65	2	48	0	0	50	2	0	0	0	2	1	94	96	0	191	308
07:15 AM	54	2	1	0	57	1	52	2	0	55	1	2	0	0	3	0	110	93	0	203	318
07:30 AM	48	1	2	0	51	0	73	0	0	73	6	3	0	0	9	0	106	70	0	176	309
07:45 AM	54	0	0	1	55	1	52	0	0	53	7	2	2	0	11	0	138	59	0	197	316
Total Volume	217	3	7	1	228	4	225	2	0	231	16	7	2	0	25	1	448	318	0	767	1251
% App. Total	95.2	1.3	3.1	0.4		1.7	97.4	0.9	0		64	28	8	0		0.1	58.4	41.5	0		
PHF	.889	.375	.438	.250	.877	.500	.771	.250	.000	.791	.571	.583	.250	.000	.568	.250	.812	.828	.000	.945	.983
Cars	203	3	6	1	213	4	195	2	0	201	14	6	2	0	22	1	409	299	0	709	1145
% Cars	93.5	100	85.7	100	93.4	100	86.7	100	0	87.0	87.5	85.7	100	0	88.0	100	91.3	94.0	0	92.4	91.5
Heavy Vehicles	14	0	1	0	15	0	30	0	0	30	2	1	0	0	3	0	39	19	0	58	106
% Heavy Vehicles	6.5	0	14.3	0	6.6	0	13.3	0	0	13.0	12.5	14.3	0	0	12.0	0	8.7	6.0	0	7.6	8.5

N/S: Guild Road/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 F
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	57	0	4	0	2	44	0	0	2	0	0	0	1	74	89	0	273
07:15 AM	51	2	0	0	1	39	2	0	1	1	0	0	0	104	81	0	282
07:30 AM	45	1	2	0	0	66	0	0	6	3	0	0	0	99	70	0	292
07:45 AM	50	0	0	1	1	46	0	0	5	2	2	0	0	132	59	0	298
Total	203	3	6	1	4	195	2	0	14	6	2	0	1	409	299	0	1145
08:00 AM	50	0	0	0	0	60	0	0	1	0	3	0	0	104	54	0	272
08:15 AM	68	0	0	0	1	47	0	1	3	0	1	0	0	104	52	0	277
08:30 AM	52	0	0	0	0	49	0	0	2	1	1	0	1	108	54	0	268
08:45 AM	35	1	0	0	0	50	0	0	6	3	1	0	1	93	58	1	249
Total	205	1	0	0	1	206	0	1	12	4	6	0	2	409	218	1	1066
Grand Total	408	4	6	1	5	401	2	1	26	10	8	0	3	818	517	1	2211
Apprch %	97.4	1	1.4	0.2	1.2	98	0.5	0.2	59.1	22.7	18.2	0	0.2	61.1	38.6	0.1	
Total %	18.5	0.2	0.3	0	0.2	18.1	0.1	0	1.2	0.5	0.4	0	0.1	37	23.4	0	

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 07:00 AM																					
07:00 AM	57	0	4	0	61	2	44	0	0	46	2	0	0	0	2	1	74	89	0	164	273
07:15 AM	51	2	0	0	53	1	39	2	0	42	1	1	0	0	2	0	104	81	0	185	282
07:30 AM	45	1	2	0	48	0	66	0	0	66	6	3	0	0	9	0	99	70	0	169	292
07:45 AM	50	0	0	1	51	1	46	0	0	47	5	2	2	0	9	0	132	59	0	191	298
Total Volume	203	3	6	1	213	4	195	2	0	201	14	6	2	0	22	1	409	299	0	709	1145
% App. Total	95.3	1.4	2.8	0.5		2	97	1	0		63.6	27.3	9.1	0		0.1	57.7	42.2	0		
PHF	.890	.375	.375	.250	.873	.500	.739	.250	.000	.761	.583	.500	.250	.000	.611	.250	.775	.840	.000	.928	.961

N/S: Guild Road/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 F
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	4	0	0	0	0	4	0	0	0	0	0	0	0	20	7	0	35
07:15 AM	3	0	1	0	0	13	0	0	0	1	0	0	0	6	12	0	36
07:30 AM	3	0	0	0	0	7	0	0	0	0	0	0	0	7	0	0	17
07:45 AM	4	0	0	0	0	6	0	0	2	0	0	0	0	6	0	0	18
Total	14	0	1	0	0	30	0	0	2	1	0	0	0	39	19	0	106
08:00 AM	1	0	0	0	0	5	0	0	0	0	0	0	0	11	1	0	18
08:15 AM	2	0	0	0	0	7	0	0	0	0	0	0	0	8	2	0	19
08:30 AM	2	0	0	0	0	6	0	0	0	0	1	0	0	11	1	0	21
08:45 AM	5	0	0	0	0	7	0	0	0	0	0	0	0	4	4	0	20
Total	10	0	0	0	0	25	0	0	0	0	1	0	0	34	8	0	78
Grand Total	24	0	1	0	0	55	0	0	2	1	1	0	0	73	27	0	184
Apprch %	96	0	4	0	0	100	0	0	50	25	25	0	0	73	27	0	
Total %	13	0	0.5	0	0	29.9	0	0	1.1	0.5	0.5	0	0	39.7	14.7	0	

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 07:00 AM																					
07:00 AM	4	0	0	0	4	0	4	0	0	4	0	0	0	0	0	0	20	7	0	27	35
07:15 AM	3	0	1	0	4	0	13	0	0	13	0	1	0	0	1	0	6	12	0	18	36
07:30 AM	3	0	0	0	3	0	7	0	0	7	0	0	0	0	0	0	7	0	0	7	17
07:45 AM	4	0	0	0	4	0	6	0	0	6	2	0	0	0	2	0	6	0	0	6	18
Total Volume	14	0	1	0	15	0	30	0	0	30	2	1	0	0	3	0	39	19	0	58	106
% App. Total	93.3	0	6.7	0		0	100	0	0		66.7	33.3	0	0		0	67.2	32.8	0		
PHF	.875	.000	.250	.000	.938	.000	.577	.000	.000	.577	.250	.250	.000	.000	.375	.000	.488	.396	.000	.537	.736

N/S: Guild Road/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 F
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Guild Row From North				Washington Street From East				Driveway From South				Washington Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	3	0	0	0	19	0	1	0	8	31
07:15 AM	0	0	0	6	0	0	0	1	0	0	0	6	0	0	0	1	14
07:30 AM	0	0	0	5	0	0	0	1	0	0	0	7	0	1	0	0	14
07:45 AM	0	0	0	2	0	0	0	0	0	0	0	10	0	1	0	1	14
Total	0	0	0	13	0	0	0	5	0	0	0	42	0	3	0	10	73
08:00 AM	0	0	0	3	0	0	0	0	0	0	0	9	0	1	0	0	13
08:15 AM	0	0	0	5	0	0	0	1	0	0	0	14	0	1	1	0	22
08:30 AM	0	0	0	4	0	1	0	0	0	0	0	10	0	2	0	0	17
08:45 AM	1	0	0	6	0	0	0	1	0	0	0	5	0	1	0	1	15
Total	1	0	0	18	0	1	0	2	0	0	0	38	0	5	1	1	67
Grand Total	1	0	0	31	0	1	0	7	0	0	0	80	0	8	1	11	140
Apprch %	3.1	0	0	96.9	0	12.5	0	87.5	0	0	0	100	0	40	5	55	
Total %	0.7	0	0	22.1	0	0.7	0	5	0	0	0	57.1	0	5.7	0.7	7.9	

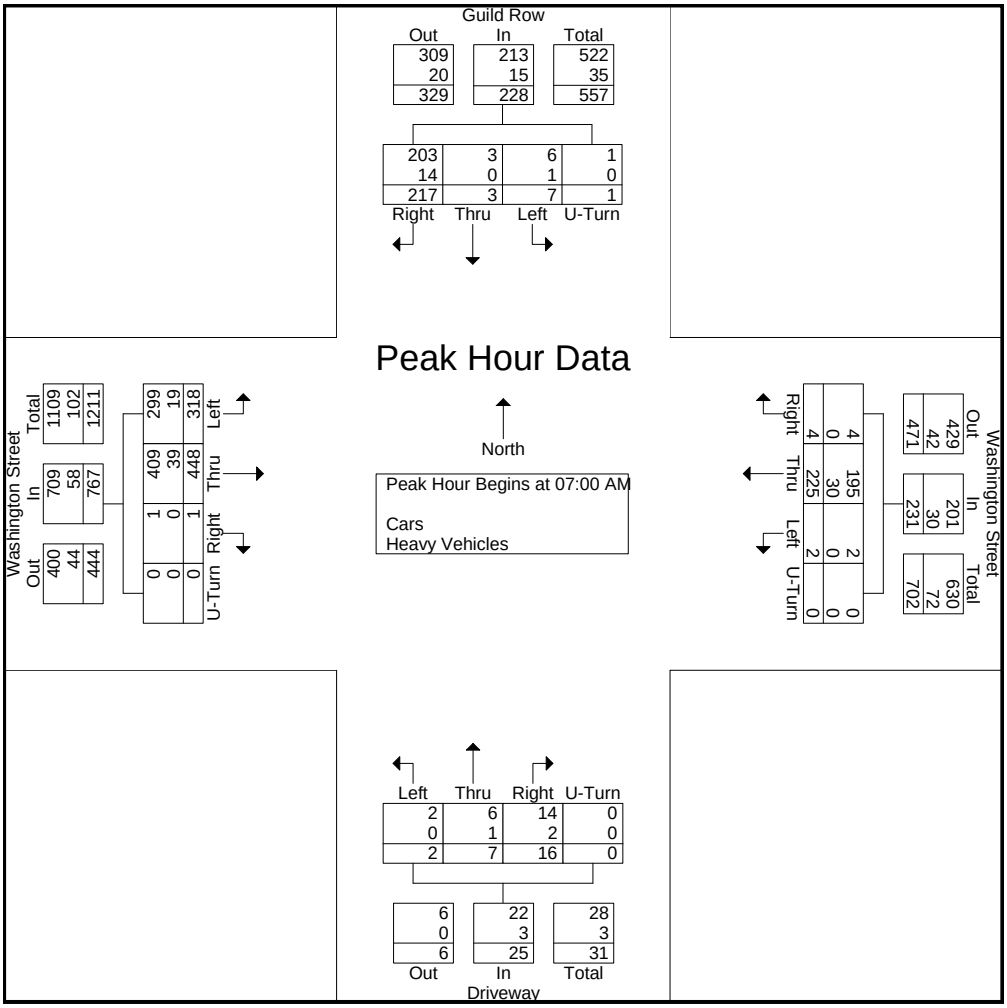
	Guild Row From North					Washington Street From East					Driveway From South					Washington Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	3	3	0	0	0	19	19	0	1	0	8	9	31
07:15 AM	0	0	0	6	6	0	0	0	1	1	0	0	0	6	6	0	0	0	1	1	14
07:30 AM	0	0	0	5	5	0	0	0	1	1	0	0	0	7	7	0	1	0	0	1	14
07:45 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	10	10	0	1	0	1	2	14
Total Volume	0	0	0	13	13	0	0	0	5	5	0	0	0	42	42	0	3	0	10	13	73
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	23.1	0	76.9		
PHF	.000	.000	.000	.542	.542	.000	.000	.000	.417	.417	.000	.000	.000	.553	.553	.000	.750	.000	.313	.361	.589

N/S: Guild Road/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 F
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 07:00 AM																					
07:00 AM	61	0	4	0	65	2	48	0	0	50	2	0	0	0	2	1	94	96	0	191	308
07:15 AM	54	2	1	0	57	1	52	2	0	55	1	2	0	0	3	0	110	93	0	203	318
07:30 AM	48	1	2	0	51	0	73	0	0	73	6	3	0	0	9	0	106	70	0	176	309
07:45 AM	54	0	0	1	55	1	52	0	0	53	7	2	2	0	11	0	138	59	0	197	316
Total Volume	217	3	7	1	228	4	225	2	0	231	16	7	2	0	25	1	448	318	0	767	1251
% App. Total	95.2	1.3	3.1	0.4		1.7	97.4	0.9	0		64	28	8	0		0.1	58.4	41.5	0		
PHF	.889	.375	.438	.250	.877	.500	.771	.250	.000	.791	.571	.583	.250	.000	.568	.250	.812	.828	.000	.945	.983
Cars	203	3	6	1	213	4	195	2	0	201	14	6	2	0	22	1	409	299	0	709	1145
% Cars	93.5	100	85.7	100	93.4	100	86.7	100	0	87.0	87.5	85.7	100	0	88.0	100	91.3	94.0	0	92.4	91.5
Heavy Vehicles	14	0	1	0	15	0	30	0	0	30	2	1	0	0	3	0	39	19	0	58	106
% Heavy Vehicles	6.5	0	14.3	0	6.6	0	13.3	0	0	13.0	12.5	14.3	0	0	12.0	0	8.7	6.0	0	7.6	8.5



N/S: Guild Row/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 FF
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	104	0	1	0	1	85	0	0	5	2	7	0	0	88	34	0	327
04:15 PM	96	0	0	0	0	78	0	0	5	2	3	0	0	87	29	0	300
04:30 PM	105	0	0	0	0	77	0	0	1	2	5	0	0	66	37	0	293
04:45 PM	117	0	0	0	0	79	0	0	5	1	1	0	0	66	31	0	300
Total	422	0	1	0	1	319	0	0	16	7	16	0	0	307	131	0	1220
05:00 PM	143	0	2	0	0	101	0	0	4	3	2	0	0	74	29	0	358
05:15 PM	143	0	3	0	0	93	0	0	8	1	3	0	0	76	33	0	360
05:30 PM	122	0	1	0	2	66	0	0	4	2	1	0	0	82	22	0	302
05:45 PM	103	0	4	0	1	32	0	0	5	1	1	0	0	87	21	0	255
Total	511	0	10	0	3	292	0	0	21	7	7	0	0	319	105	0	1275
Grand Total	933	0	11	0	4	611	0	0	37	14	23	0	0	626	236	0	2495
Apprch %	98.8	0	1.2	0	0.7	99.3	0	0	50	18.9	31.1	0	0	72.6	27.4	0	
Total %	37.4	0	0.4	0	0.2	24.5	0	0	1.5	0.6	0.9	0	0	25.1	9.5	0	
Cars	914	0	9	0	4	588	0	0	37	14	23	0	0	585	227	0	2401
% Cars	98	0	81.8	0	100	96.2	0	0	100	100	100	0	0	93.5	96.2	0	96.2
Heavy Vehicles	19	0	2	0	0	23	0	0	0	0	0	0	0	41	9	0	94
% Heavy Vehicles	2	0	18.2	0	0	3.8	0	0	0	0	0	0	0	6.5	3.8	0	3.8

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 04:45 PM																					
04:45 PM	117	0	0	0	117	0	79	0	0	79	5	1	1	0	7	0	66	31	0	97	300
05:00 PM	143	0	2	0	145	0	101	0	0	101	4	3	2	0	9	0	74	29	0	103	358
05:15 PM	143	0	3	0	146	0	93	0	0	93	8	1	3	0	12	0	76	33	0	109	360
05:30 PM	122	0	1	0	123	2	66	0	0	68	4	2	1	0	7	0	82	22	0	104	302
Total Volume	525	0	6	0	531	2	339	0	0	341	21	7	7	0	35	0	298	115	0	413	1320
% App. Total	98.9	0	1.1	0		0.6	99.4	0	0		60	20	20	0		0	72.2	27.8	0		
PHF	.918	.000	.500	.000	.909	.250	.839	.000	.000	.844	.656	.583	.583	.000	.729	.000	.909	.871	.000	.947	.917
Cars	516	0	6	0	522	2	330	0	0	332	21	7	7	0	35	0	281	111	0	392	1281
% Cars	98.3	0	100	0	98.3	100	97.3	0	0	97.4	100	100	100	0	100	0	94.3	96.5	0	94.9	97.0
Heavy Vehicles	9	0	0	0	9	0	9	0	0	9	0	0	0	0	0	0	17	4	0	21	39
% Heavy Vehicles	1.7	0	0	0	1.7	0	2.7	0	0	2.6	0	0	0	0	0	0	5.7	3.5	0	5.1	3.0

N/S: Guild Row/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 FF
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Cars

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	102	0	1	0	1	79	0	0	5	2	7	0	0	81	33	0	311
04:15 PM	93	0	0	0	0	74	0	0	5	2	3	0	0	81	29	0	287
04:30 PM	104	0	0	0	0	75	0	0	1	2	5	0	0	56	34	0	277
04:45 PM	116	0	0	0	0	75	0	0	5	1	1	0	0	61	30	0	289
Total	415	0	1	0	1	303	0	0	16	7	16	0	0	279	126	0	1164
05:00 PM	140	0	2	0	0	97	0	0	4	3	2	0	0	69	26	0	343
05:15 PM	140	0	3	0	0	92	0	0	8	1	3	0	0	72	33	0	352
05:30 PM	120	0	1	0	2	66	0	0	4	2	1	0	0	79	22	0	297
05:45 PM	99	0	2	0	1	30	0	0	5	1	1	0	0	86	20	0	245
Total	499	0	8	0	3	285	0	0	21	7	7	0	0	306	101	0	1237
Grand Total	914	0	9	0	4	588	0	0	37	14	23	0	0	585	227	0	2401
Apprch %	99	0	1	0	0.7	99.3	0	0	50	18.9	31.1	0	0	72	28	0	
Total %	38.1	0	0.4	0	0.2	24.5	0	0	1.5	0.6	1	0	0	24.4	9.5	0	

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 04:45 PM																					
04:45 PM	116	0	0	0	116	0	75	0	0	75	5	1	1	0	7	0	61	30	0	91	289
05:00 PM	140	0	2	0	142	0	97	0	0	97	4	3	2	0	9	0	69	26	0	95	343
05:15 PM	140	0	3	0	143	0	92	0	0	92	8	1	3	0	12	0	72	33	0	105	352
05:30 PM	120	0	1	0	121	2	66	0	0	68	4	2	1	0	7	0	79	22	0	101	297
Total Volume	516	0	6	0	522	2	330	0	0	332	21	7	7	0	35	0	281	111	0	392	1281
% App. Total	98.9	0	1.1	0		0.6	99.4	0	0		60	20	20	0		0	71.7	28.3	0		
PHF	.921	.000	.500	.000	.913	.250	.851	.000	.000	.856	.656	.583	.583	.000	.729	.000	.889	.841	.000	.933	.910

N/S: Guild Row/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 FF
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	2	0	0	0	0	6	0	0	0	0	0	0	0	7	1	0	16
04:15 PM	3	0	0	0	0	4	0	0	0	0	0	0	0	6	0	0	13
04:30 PM	1	0	0	0	0	2	0	0	0	0	0	0	0	10	3	0	16
04:45 PM	1	0	0	0	0	4	0	0	0	0	0	0	0	5	1	0	11
Total	7	0	0	0	0	16	0	0	0	0	0	0	0	28	5	0	56
05:00 PM	3	0	0	0	0	4	0	0	0	0	0	0	0	5	3	0	15
05:15 PM	3	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	8
05:30 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	5
05:45 PM	4	0	2	0	0	2	0	0	0	0	0	0	0	1	1	0	10
Total	12	0	2	0	0	7	0	0	0	0	0	0	0	13	4	0	38
Grand Total	19	0	2	0	0	23	0	0	0	0	0	0	0	41	9	0	94
Apprch %	90.5	0	9.5	0	0	100	0	0	0	0	0	0	0	82	18	0	
Total %	20.2	0	2.1	0	0	24.5	0	0	0	0	0	0	0	43.6	9.6	0	

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 04:00 PM																					
04:00 PM	2	0	0	0	2	0	6	0	0	6	0	0	0	0	0	0	7	1	0	8	16
04:15 PM	3	0	0	0	3	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	13
04:30 PM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	10	3	0	13	16
04:45 PM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	5	1	0	6	11
Total Volume	7	0	0	0	7	0	16	0	0	16	0	0	0	0	0	0	28	5	0	33	56
% App. Total	100	0	0	0		0	100	0	0		0	0	0	0		0	84.8	15.2	0		
PHF	.583	.000	.000	.000	.583	.000	.667	.000	.000	.667	.000	.000	.000	.000	.000	.000	.700	.417	.000	.635	.875

N/S: Guild Row/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 FF
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Guild Row From North				Washington Street From East				Driveway From South				Washington 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	0	0	3	0	0	0	2	0	0	0	10	0	1	0	1	17
04:15 PM	1	0	0	4	0	2	0	2	0	0	0	13	0	0	1	0	23
04:30 PM	1	0	0	2	0	0	0	2	0	0	0	41	0	0	0	3	49
04:45 PM	1	0	0	4	0	0	0	0	0	0	0	26	0	1	1	0	33
Total	3	0	0	13	0	2	0	6	0	0	0	90	0	2	2	4	122
05:00 PM	0	0	0	3	0	1	0	2	0	0	0	14	0	0	0	1	21
05:15 PM	0	0	0	6	0	4	0	4	0	0	0	15	0	1	0	0	30
05:30 PM	0	0	0	2	0	4	0	3	0	0	0	10	0	0	0	2	21
05:45 PM	1	0	0	6	0	1	0	0	0	0	0	26	0	0	0	1	35
Total	1	0	0	17	0	10	0	9	0	0	0	65	0	1	0	4	107
Grand Total	4	0	0	30	0	12	0	15	0	0	0	155	0	3	2	8	229
Apprch %	11.8	0	0	88.2	0	44.4	0	55.6	0	0	0	100	0	23.1	15.4	61.5	
Total %	1.7	0	0	13.1	0	5.2	0	6.6	0	0	0	67.7	0	1.3	0.9	3.5	

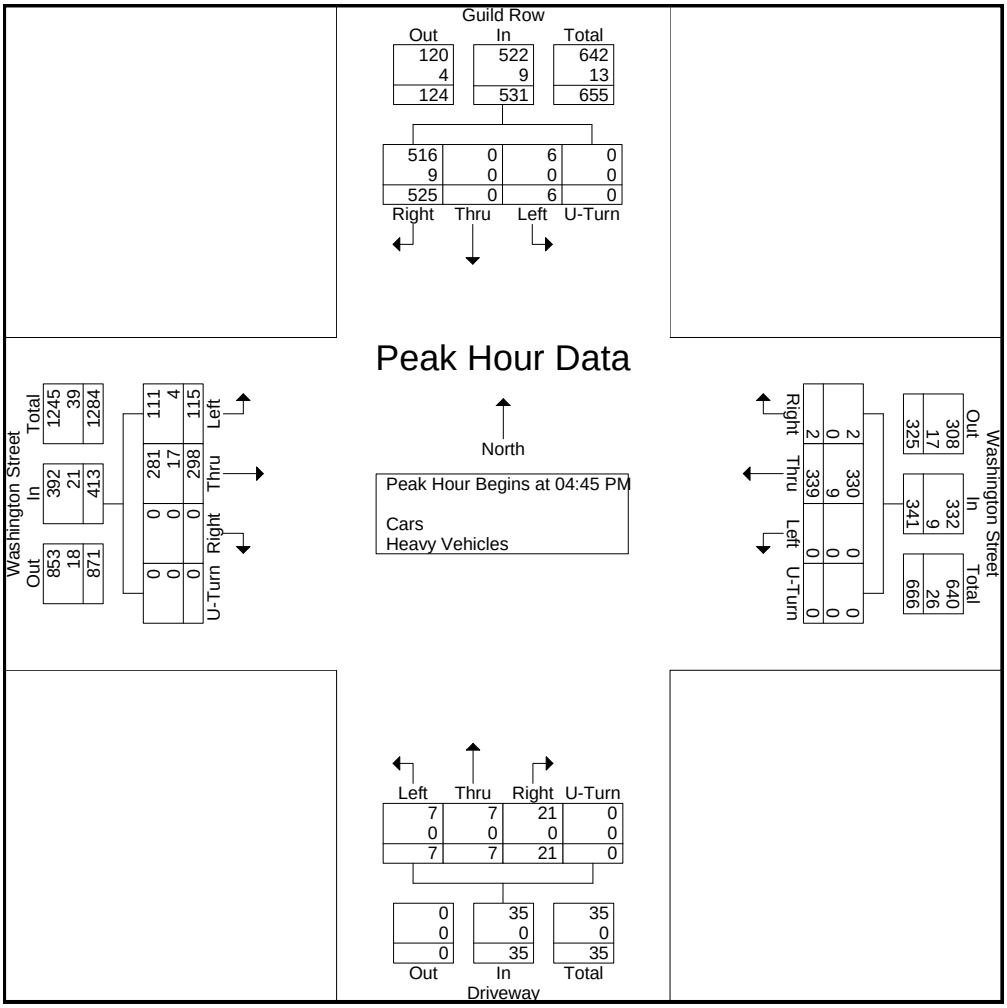
	Guild Row From North					Washington Street From East					Driveway From South					Washington Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	1	0	0	2	3	0	0	0	2	2	0	0	0	41	41	0	0	0	3	3	49
04:45 PM	1	0	0	4	5	0	0	0	0	0	0	0	0	26	26	0	1	1	0	2	33
05:00 PM	0	0	0	3	3	0	1	0	2	3	0	0	0	14	14	0	0	0	1	1	21
05:15 PM	0	0	0	6	6	0	4	0	4	8	0	0	0	15	15	0	1	0	0	1	30
Total Volume	2	0	0	15	17	0	5	0	8	13	0	0	0	96	96	0	2	1	4	7	133
% App. Total	11.8	0	0	88.2		0	38.5	0	61.5		0	0	0	100		0	28.6	14.3	57.1		
PHF	.500	.000	.000	.625	.708	.000	.313	.000	.500	.406	.000	.000	.000	.585	.585	.000	.500	.250	.333	.583	.679

N/S: Guild Row/ Driveway
E/W: Washington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ R. Walsh

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 : 123128 FF
Site Code : 2007015
Start Date : 11/28/2012
Page No : 1

	Guild Row From North					Washington Street From East					Driveway From South					Washington 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 04:45 PM																					
04:45 PM	117	0	0	0	117	0	79	0	0	79	5	1	1	0	7	0	66	31	0	97	300
05:00 PM	143	0	2	0	145	0	101	0	0	101	4	3	2	0	9	0	74	29	0	103	358
05:15 PM	143	0	3	0	146	0	93	0	0	93	8	1	3	0	12	0	76	33	0	109	360
05:30 PM	122	0	1	0	123	2	66	0	0	68	4	2	1	0	7	0	82	22	0	104	302
Total Volume	525	0	6	0	531	2	339	0	0	341	21	7	7	0	35	0	298	115	0	413	1320
% App. Total	98.9	0	1.1	0		0.6	99.4	0	0		60	20	20	0		0	72.2	27.8	0		
PHF	.918	.000	.500	.000	.909	.250	.839	.000	.000	.844	.656	.583	.583	.000	.729	.000	.909	.871	.000	.947	.917
Cars	516	0	6	0	522	2	330	0	0	332	21	7	7	0	35	0	281	111	0	392	1281
% Cars	98.3	0	100	0	98.3	100	97.3	0	0	97.4	100	100	100	0	100	0	94.3	96.5	0	94.9	97.0
Heavy Vehicles	9	0	0	0	9	0	9	0	0	9	0	0	0	0	0	0	17	4	0	21	39
% Heavy Vehicles	1.7	0	0	0	1.7	0	2.7	0	0	2.6	0	0	0	0	0	0	5.7	3.5	0	5.1	3.0



Synchro Reports

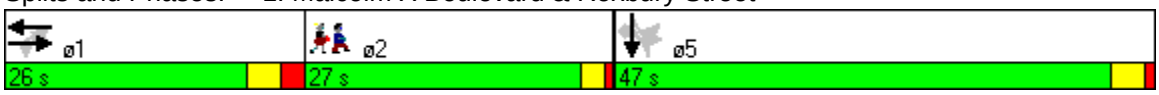
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
Total 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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.995			0.850				
Flt Protected		0.999					0.950				0.950	
Satd. Flow (prot)	0	3186	0	0	2874	0	1525	1358	0	0	1345	1506
Flt Permitted		0.864			0.952		0.586				0.950	
Satd. Flow (perm)	0	2755	0	0	2736	0	940	1358	0	0	1345	1506
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	5	322	45	3	528	13	292	14	155	8	81	176
Peak Hour Factor	0.42	0.95	0.80	0.75	0.89	0.65	0.92	0.58	0.82	0.67	0.70	0.88
Heavy Vehicles (%)	0%	15%	4%	0%	13%	0%	3%	7%	7%	0%	14%	6%
Adj. Flow (vph)	12	339	56	4	593	20	317	24	189	12	116	200
Lane Group Flow (vph)	0	407	0	0	617	0	317	213	0	0	128	200
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	26.0	26.0	0.0	26.0	26.0	0.0	47.0	47.0	0.0	47.0	47.0	47.0
Total Split (%)	26.0%	26.0%	0.0%	26.0%	26.0%	0.0%	47.0%	47.0%	0.0%	47.0%	47.0%	47.0%
Maximum Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		50.3			50.3		36.3	36.3			36.3	36.3
Actuated g/C Ratio		0.50			0.50		0.36	0.36			0.36	0.36
v/c Ratio		0.29			0.45		0.93	0.43			0.26	0.37
Control Delay		19.6			22.1		64.1	25.5			22.0	23.9
Queue Delay		0.0			0.8		0.0	0.0			0.0	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1256	
Flt Permitted		
Satd. Flow (perm)	1256	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	262	
Peak Hour Factor	0.91	
Heavy Vehicles (%)	8%	
Adj. Flow (vph)	288	
Lane Group Flow (vph)	288	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	47.0	27.0
Total Split (%)	47.0%	27%
Maximum Green (s)	43.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	36.3	
Actuated g/C Ratio	0.36	
v/c Ratio	0.63	
Control Delay	31.8	
Queue Delay	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		19.6			22.9		64.1	25.5			22.0	23.9
LOS		B			C		E	C			C	C
Approach Delay		19.6			22.9							27.2
Approach LOS		B			C							C
90th %ile Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
70th %ile Green (s)	48.0	48.0		48.0	48.0		43.0	43.0		43.0	43.0	43.0
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
50th %ile Green (s)	51.1	51.1		51.1	51.1		39.9	39.9		39.9	39.9	39.9
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
30th %ile Green (s)	58.4	58.4		58.4	58.4		32.6	32.6		32.6	32.6	32.6
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
10th %ile Green (s)	68.1	68.1		68.1	68.1		22.9	22.9		22.9	22.9	22.9
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
Stops (vph)		229			315		262	120			58	120
Fuel Used(gal)		5			5		6	2			1	2
CO Emissions (g/hr)		319			377		419	137			81	168
NOx Emissions (g/hr)		62			73		81	27			16	33
VOC Emissions (g/hr)		74			87		97	32			19	39
Dilemma Vehicles (#)		0			0		0	0			0	0
Queue Length 50th (ft)		73			122		180	95			53	87
Queue Length 95th (ft)		178			#327		#323	87			68	132
Internal Link Dist (ft)		543			205							563
Turn Bay Length (ft)												
Base Capacity (vph)		1386			1377		404	584			578	648
Starvation Cap Reductn		0			444		0	0			0	0
Spillback Cap Reductn		10			0		0	8			8	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.30			0.66		0.78	0.37			0.22	0.31

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 57 (57%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 29.8		Intersection LOS: C	
Intersection Capacity Utilization 62.8%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Malcolm X Boulevard & Roxbury Street

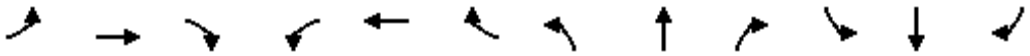


Lane Group	SBR	ø2
Total Delay	31.8	
LOS	C	
Approach Delay		
Approach LOS		
90th %ile Green (s)	43.0	24.0
90th %ile Term Code	Max	Ped
70th %ile Green (s)	43.0	0.0
70th %ile Term Code	Max	Skip
50th %ile Green (s)	39.9	0.0
50th %ile Term Code	Gap	Skip
30th %ile Green (s)	32.6	0.0
30th %ile Term Code	Gap	Skip
10th %ile Green (s)	22.9	0.0
10th %ile Term Code	Gap	Skip
Stops (vph)	207	
Fuel Used(gal)	4	
CO Emissions (g/hr)	291	
NOx Emissions (g/hr)	57	
VOC Emissions (g/hr)	67	
Dilemma Vehicles (#)	0	
Queue Length 50th (ft)	140	
Queue Length 95th (ft)	216	
Internal Link Dist (ft)		
Turn Bay Length (ft)	80	
Base Capacity (vph)	540	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.53	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.999						0.852	0.850		0.962	
Flt Protected					0.992			0.999		0.950		
Satd. Flow (prot)	0	3134	0	0	2938	0	0	1330	1328	1243	1413	0
Flt Permitted					0.544					0.950		
Satd. Flow (perm)	0	3134	0	0	1611	0	0	1332	1328	1243	1413	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											13	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	554	4	91	499	0	2	0	465	164	165	43
Peak Hour Factor	0.92	0.94	1.00	0.88	0.95	0.92	0.50	0.92	0.91	0.89	0.94	0.72
Heavy Vehicles (%)	2%	14%	0%	5%	15%	2%	0%	2%	4%	35%	12%	14%
Adj. Flow (vph)	0	589	4	103	525	0	4	0	511	184	176	60
Lane Group Flow (vph)	0	593	0	0	628	0	0	259	256	184	236	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	24.0	0.0	24.0	24.0	0.0	26.0	20.0	26.0	26.0	26.0	0.0
Total Split (%)	0.0%	20.0%	0.0%	20.0%	20.0%	0.0%	21.7%	16.7%	21.7%	21.7%	21.7%	0.0%
Maximum Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		39.2			39.2			22.0	22.0	21.1	21.1	
Actuated g/C Ratio		0.33			0.33			0.18	0.18	0.18	0.18	
v/c Ratio		0.58			1.19			1.06	1.05	0.84	0.91	
Control Delay		37.9			140.2			121.9	119.9	79.1	83.1	
Queue Delay		6.4			39.4			31.8	4.5	0.0	86.9	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



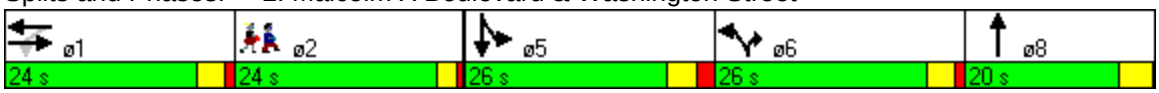
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		44.3			179.6			153.7	124.4	79.1	170.0	
LOS		D			F			F	F	E	F	
Approach Delay		44.3			179.6			139.1			130.2	
Approach LOS		D			F			F			F	
90th %ile Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
90th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
70th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
70th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
50th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
50th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
30th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
30th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
10th %ile Green (s)		44.0		44.0	44.0		22.0	20.6	22.0	16.4	16.4	
10th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Gap	Gap	
Stops (vph)		404			456			194	195	147	176	
Fuel Used(gal)		8			21			7	7	4	5	
CO Emissions (g/hr)		544			1472			519	511	255	333	
NOx Emissions (g/hr)		106			286			101	99	50	65	
VOC Emissions (g/hr)		126			341			120	118	59	77	
Dilemma Vehicles (#)		0			0			0	0	0	0	
Queue Length 50th (ft)		187			~282			~232	~227	138	170	
Queue Length 95th (ft)		#398			#538			#410	#404	#255	#319	
Internal Link Dist (ft)		205			295			220			73	
Turn Bay Length (ft)												
Base Capacity (vph)		1024			527			244	243	228	270	
Starvation Cap Reductn		372			0			0	0	0	0	
Spillback Cap Reductn		19			37			18	3	0	71	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.91			1.28			1.15	1.07	0.81	1.19	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 52 (43%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 123.1		Intersection LOS: F	
Intersection Capacity Utilization 72.1%		ICU Level of Service C	
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: 2: Malcolm X Boulevard & Washington Street

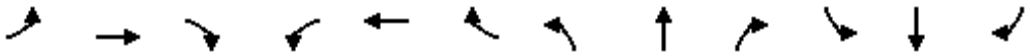


Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.984				0.850			
Flt Protected	0.950							0.983				
Satd. Flow (prot)	1107	3065	1408	0	2772	0	0	3178	1647	0	0	0
Flt Permitted	0.222							0.983				
Satd. Flow (perm)	259	3065	1408	0	2772	0	0	3178	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			287						9			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	249	687	247	0	372	42	218	398	7	0	0	0
Peak Hour Factor	0.90	0.91	0.86	0.92	0.76	0.70	0.88	0.87	0.44	0.92	0.92	0.92
Heavy Vehicles (%)	37%	6%	17%	2%	7%	48%	2%	10%	0%	2%	2%	2%
Adj. Flow (vph)	277	755	287	0	489	60	248	457	16	0	0	0
Lane Group Flow (vph)	277	755	287	0	549	0	0	705	16	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		13.0		16.0		13.0	13.0	13.0			
Total Split (s)	18.0	40.0	35.0	0.0	22.0	0.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	18.0%	40.0%	35.0%	0.0%	22.0%	0.0%	35.0%	35.0%	35.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		2.0		3.0		2.0	2.0	2.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	None		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	52.0	56.0	94.2		38.0			31.0	31.0			
Actuated g/C Ratio	0.52	0.56	0.94		0.38			0.31	0.31			
v/c Ratio	1.09	0.44	0.21		0.52			0.72	0.03			
Control Delay	105.9	15.9	0.8		21.8			35.5	16.7			
Queue Delay	0.0	0.8	0.0		1.2			0.0	0.0			

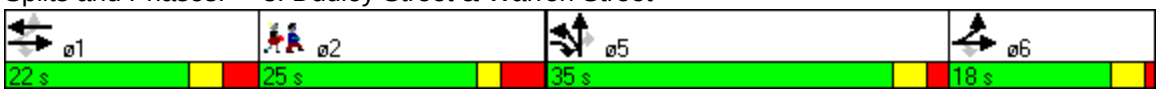
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	105.9	16.7	0.8		23.0			35.5	16.7			
LOS	F	B	A		C			D	B			
Approach Delay		32.0			23.0			35.0				
Approach LOS		C			C			D				
90th %ile Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
90th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
70th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
70th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
50th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
50th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
30th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
30th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
10th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
10th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
Stops (vph)	120	399	7		163			532	4			
Fuel Used(gal)	7	6	1		3			9	0			
CO Emissions (g/hr)	473	450	56		225			612	4			
NOx Emissions (g/hr)	92	87	11		44			119	1			
VOC Emissions (g/hr)	110	104	13		52			142	1			
Dilemma Vehicles (#)	0	0	0		0			0	0			
Queue Length 50th (ft)	~115	120	0		53			208	3			
Queue Length 95th (ft)	#368	280	18		m#227			263	7			
Internal Link Dist (ft)		295			66			206			449	
Turn Bay Length (ft)			100						75			
Base Capacity (vph)	253	1717	1343		1053			985	517			
Starvation Cap Reductn	0	613	141		286			0	0			
Spillback Cap Reductn	0	54	0		0			0	0			
Storage Cap Reductn	0	0	0		0			0	0			
Reduced v/c Ratio	1.09	0.68	0.24		0.72			0.72	0.03			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 23 (23%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 30.9		Intersection LOS: C	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
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.			
m Volume for 95th percentile queue is metered by upstream signal.			

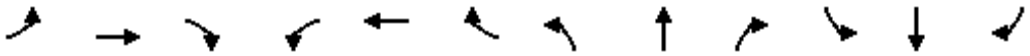
Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

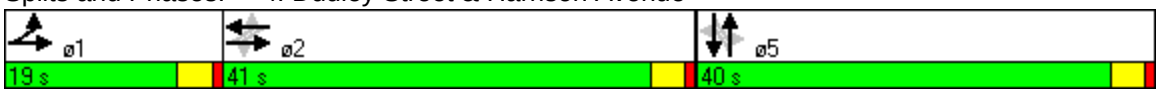
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.989			0.980			0.964	
Flt Protected	0.950				0.994			0.999		0.950		
Satd. Flow (prot)	1486	1506	0	0	2643	0	0	1615	0	1458	1450	0
Flt Permitted	0.420				0.845			0.996		0.195		
Satd. Flow (perm)	657	1506	0	0	2247	0	0	1610	0	299	1450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			9			10			18	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	279	412	3	45	337	23	3	528	66	24	237	74
Peak Hour Factor	0.96	0.92	0.38	0.80	0.94	0.72	0.38	0.95	0.69	0.67	0.93	0.93
Heavy Vehicles (%)	2%	9%	33%	9%	13%	17%	0%	3%	8%	4%	8%	0%
Adj. Flow (vph)	291	448	8	56	359	32	8	556	96	36	255	80
Lane Group Flow (vph)	291	456	0	0	447	0	0	660	0	36	335	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	19.0	60.0	0.0	41.0	41.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	19.0%	60.0%	0.0%	41.0%	41.0%	0.0%	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	52.0	56.0			37.0			36.0		36.0	36.0	
Actuated g/C Ratio	0.52	0.56			0.37			0.36		0.36	0.36	
v/c Ratio	0.62	0.54			0.53			1.13		0.33	0.63	
Control Delay	12.7	7.0			27.1			108.3		33.9	31.2	
Queue Delay	2.1	0.4			0.8			248.8		0.0	13.7	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	14.8	7.3			27.8			357.2		33.9	44.9	
LOS	B	A			C			F		C	D	
Approach Delay		10.2			27.8			357.2			43.8	
Approach LOS		B			C			F			D	
90th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
90th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
70th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
50th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
30th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
10th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	76	86			304			489		19	243	
Fuel Used(gal)	1	2			5			17		0	4	
CO Emissions (g/hr)	102	107			341			1173		25	308	
NOx Emissions (g/hr)	20	21			66			228		5	60	
VOC Emissions (g/hr)	24	25			79			272		6	71	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	21	33			113			~487		17	165	
Queue Length 95th (ft)	114	81			163			#709		33	263	
Internal Link Dist (ft)		66			225			115			367	
Turn Bay Length (ft)										200		
Base Capacity (vph)	466	844			837			586		108	534	
Starvation Cap Reductn	77	93			0			0		0	0	
Spillback Cap Reductn	0	0			155			195		0	178	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.75	0.61			0.66			1.69		0.33	0.94	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 1:EBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 122.3		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		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.			

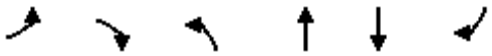
Splits and Phases: 4: Dudley Street & Harrison Avenue



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	224	6	5	17	304	450	0	0	258	2
Peak Hour Factor	0.92	0.92	0.80	0.61	0.42	0.50	0.85	0.85	0.92	0.92	0.84	0.50
Hourly flow rate (vph)	0	0	280	10	12	34	358	529	0	0	307	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.90	0.90	0.90	0.90	0.90		0.90					
vC, conflicting volume	1594	1554	309	1834	1556	529	311			529		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1656	1612	236	1922	1614	529	239			529		
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 %	100	100	61	52	82	94	70			100		
cM capacity (veh/h)	44	66	722	20	67	553	1207			1038		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	280	56	887	311
Volume Left	0	10	358	0
Volume Right	280	34	0	4
cSH	722	77	1207	1700
Volume to Capacity	0.39	0.72	0.30	0.18
Queue Length 95th (ft)	46	86	31	0
Control Delay (s)	13.1	127.4	6.1	0.0
Lane LOS	B	F	A	
Approach Delay (s)	13.1	127.4	6.1	0.0
Approach LOS	B	F		

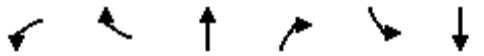
Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	33	40	0	721	485	0
Peak Hour Factor	0.77	0.56	0.92	0.89	0.96	0.92
Hourly flow rate (vph)	43	71	0	810	505	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked						
vC, conflicting volume	1315	505	505			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1315	505	505			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	75	87	100			
cM capacity (veh/h)	171	555	1059			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	114	810	505
Volume Left	43	0	0
Volume Right	71	0	0
cSH	301	1700	1700
Volume to Capacity	0.38	0.48	0.30
Queue Length 95th (ft)	43	0	0
Control Delay (s)	24.1	0.0	0.0
Lane LOS	C		
Approach Delay (s)	24.1	0.0	0.0
Approach LOS	C		

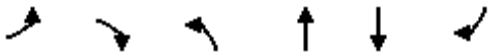
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	73	77	644	0	0	524
Peak Hour Factor	0.65	0.84	0.89	0.92	0.92	0.92
Hourly flow rate (vph)	112	92	724	0	0	570
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked						
vC, conflicting volume	1293	724			724	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1293	724			724	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	37	79			100	
cM capacity (veh/h)	177	428			879	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	204	724	570
Volume Left	112	0	0
Volume Right	92	0	0
cSH	240	1700	1700
Volume to Capacity	0.85	0.43	0.34
Queue Length 95th (ft)	169	0	0
Control Delay (s)	68.9	0.0	0.0
Lane LOS	F		
Approach Delay (s)	68.9	0.0	0.0
Approach LOS	F		

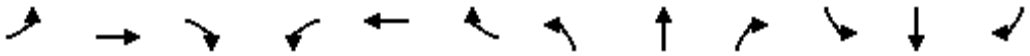
Intersection Summary			
Average Delay	9.4		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	22	76	639	554	43
Peak Hour Factor	0.38	0.69	0.73	0.91	0.95	0.75
Hourly flow rate (vph)	16	32	104	702	583	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked						
vC, conflicting volume	1494	583	640			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1494	583	640			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	94	89			
cM capacity (veh/h)	122	506	939			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	48	806	583	57
Volume Left	16	104	0	0
Volume Right	32	0	0	57
cSH	248	939	1700	1700
Volume to Capacity	0.19	0.11	0.34	0.03
Queue Length 95th (ft)	17	9	0	0
Control Delay (s)	23.0	2.7	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	23.0	2.7	0.0	
Approach LOS	C			

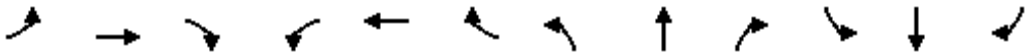
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	11	0	0	93	26	5	7	17	0	0	0
Peak Hour Factor	0.25	0.50	0.92	0.92	0.75	0.69	0.42	0.58	0.57	0.92	0.92	0.92
Hourly flow rate (vph)	8	22	0	0	124	38	12	12	30	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	30	162	54
Volume Left (vph)	8	0	12
Volume Right (vph)	0	38	30
Hadj (s)	0.05	-0.10	-0.16
Departure Headway (s)	4.2	3.9	4.1
Degree Utilization, x	0.04	0.18	0.06
Capacity (veh/h)	830	896	823
Control Delay (s)	7.4	7.8	7.4
Approach Delay (s)	7.4	7.8	7.4
Approach LOS	A	A	A

Intersection Summary				
Delay	7.7			
HCM Level of Service	A			
Intersection Capacity Utilization	16.5%	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		Stop			Stop			Stop			Stop	
Volume (vph)	0	62	0	0	0	0	0	24	11	0	0	0
Peak Hour Factor	0.92	0.65	0.92	0.92	0.92	0.92	0.92	0.56	0.56	0.92	0.92	0.92
Hourly flow rate (vph)	0	95	0	0	0	0	0	43	20	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	95	63
Volume Left (vph)	0	0
Volume Right (vph)	0	20
Hadj (s)	0.14	-0.13
Departure Headway (s)	4.2	4.0
Degree Utilization, x	0.11	0.07
Capacity (veh/h)	846	873
Control Delay (s)	7.7	7.3
Approach Delay (s)	7.7	7.3
Approach LOS	A	A

Intersection Summary				
Delay	7.5			
HCM Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.993			0.850				
Flt Protected		0.998					0.950				0.950	
Satd. Flow (prot)	0	3326	0	0	2973	0	1481	1360	0	0	1439	1580
Flt Permitted		0.802			0.906		0.336				0.950	
Satd. Flow (perm)	0	2673	0	0	2693	0	524	1360	0	0	1439	1580
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	17	488	66	2	450	12	185	16	145	13	157	395
Peak Hour Factor	0.61	0.92	0.72	0.50	0.89	0.50	0.77	0.57	0.84	0.54	0.79	0.88
Heavy Vehicles (%)	0%	10%	0%	0%	9%	0%	6%	0%	8%	0%	6%	1%
Adj. Flow (vph)	28	530	92	4	506	24	240	28	173	24	199	449
Lane Group Flow (vph)	0	650	0	0	534	0	240	201	0	0	223	449
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	0.0	48.0	48.0	0.0	48.0	48.0	48.0
Total Split (%)	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	48.0%	48.0%	0.0%	48.0%	48.0%	48.0%
Maximum Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		42.6			42.6		44.0	44.0			44.0	44.0
Actuated g/C Ratio		0.43			0.43		0.44	0.44			0.44	0.44
v/c Ratio		0.57			0.47		1.04	0.34			0.35	0.65
Control Delay		27.2			25.2		100.5	20.4			20.6	27.3
Queue Delay		0.2			1.2		0.0	0.1			0.1	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1304	
Flt Permitted		
Satd. Flow (perm)	1304	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	358	
Peak Hour Factor	0.88	
Heavy Vehicles (%)	4%	
Adj. Flow (vph)	407	
Lane Group Flow (vph)	407	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	48.0	27.0
Total Split (%)	48.0%	27%
Maximum Green (s)	44.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	44.0	
Actuated g/C Ratio	0.44	
v/c Ratio	0.71	
Control Delay	31.1	
Queue Delay	0.0	

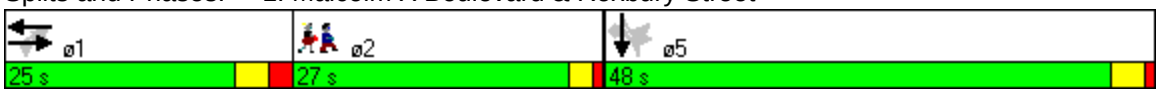
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		27.4			26.4		100.5	20.5			20.7	27.3
LOS		C			C		F	C			C	C
Approach Delay		27.4			26.4							27.3
Approach LOS		C			C							C
90th %ile Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
70th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
50th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
30th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
30th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
10th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
10th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
Stops (vph)		367			301		146	103			109	304
Fuel Used(gal)		8			5		5	2			2	6
CO Emissions (g/hr)		557			355		353	115			151	409
NOx Emissions (g/hr)		108			69		69	22			29	80
VOC Emissions (g/hr)		129			82		82	27			35	95
Dilemma Vehicles (#)		0			0		0	0			0	0
Queue Length 50th (ft)		144			112		~166	82			92	218
Queue Length 95th (ft)		#373			#277		#250	79			127	317
Internal Link Dist (ft)		543			205							563
Turn Bay Length (ft)												
Base Capacity (vph)		1139			1148		231	598			633	695
Starvation Cap Reductn		0			382		0	0			0	0
Spillback Cap Reductn		98			0		0	55			59	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.62			0.70		1.04	0.37			0.39	0.65

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 33.2		Intersection LOS: C	
Intersection Capacity Utilization 75.7%		ICU Level of Service D	
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: 1: Malcolm X Boulevard & Roxbury Street

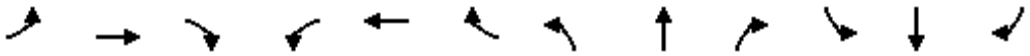


Lane Group	SBR	ø2
Total Delay	31.1	
LOS	C	
Approach Delay		
Approach LOS		
90th %ile Green (s)	44.0	24.0
90th %ile Term Code	Max	Ped
70th %ile Green (s)	44.0	0.0
70th %ile Term Code	Max	Skip
50th %ile Green (s)	44.0	0.0
50th %ile Term Code	Max	Skip
30th %ile Green (s)	44.0	0.0
30th %ile Term Code	Max	Skip
10th %ile Green (s)	44.0	0.0
10th %ile Term Code	Max	Skip
Stops (vph)	289	
Fuel Used(gal)	6	
CO Emissions (g/hr)	395	
NOx Emissions (g/hr)	77	
VOC Emissions (g/hr)	92	
Dilemma Vehicles (#)	0	
Queue Length 50th (ft)	206	
Queue Length 95th (ft)	313	
Internal Link Dist (ft)		
Turn Bay Length (ft)	80	
Base Capacity (vph)	574	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.71	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.996						0.853	0.850		0.969	
Flt Protected					0.989			0.999		0.950		
Satd. Flow (prot)	0	3273	0	0	3026	0	0	1284	1279	1435	1570	0
Flt Permitted					0.528					0.950		
Satd. Flow (perm)	0	3273	0	0	1616	0	0	1285	1279	1435	1570	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											9	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	779	11	113	406	0	3	0	345	257	211	53
Peak Hour Factor	0.92	0.97	0.50	0.93	0.91	0.92	0.75	0.92	0.85	0.90	0.82	0.78
Heavy Vehicles (%)	2%	9%	0%	5%	11%	2%	0%	2%	8%	17%	2%	2%
Adj. Flow (vph)	0	803	22	122	446	0	4	0	406	286	257	68
Lane Group Flow (vph)	0	825	0	0	568	0	0	207	203	286	325	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	18.0	20.0	18.0	23.0	23.0	0.0
Total Split (%)	0.0%	29.2%	0.0%	29.2%	29.2%	0.0%	15.0%	16.7%	15.0%	19.2%	19.2%	0.0%
Maximum Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		50.2			50.2			14.0	14.0	19.0	19.0	
Actuated g/C Ratio		0.42			0.42			0.12	0.12	0.16	0.16	
v/c Ratio		0.60			1.36dl			1.38	1.36	1.26	1.27	
Control Delay		31.2			44.9			246.9	240.4	189.2	188.7	
Queue Delay		36.2			1.3			48.2	0.0	0.0	97.6	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		67.4			46.3			295.1	240.4	189.2	286.3	
LOS		E			D			F	F	F	F	
Approach Delay		67.4			46.3			268.0			240.8	
Approach LOS		E			D			F			F	
90th %ile Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
90th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
70th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
70th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
50th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
50th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
30th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
30th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
10th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
10th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
Stops (vph)		563			378			129	128	200	199	
Fuel Used(gal)		10			8			10	10	11	12	
CO Emissions (g/hr)		691			584			697	670	790	808	
NOx Emissions (g/hr)		134			114			136	130	154	157	
VOC Emissions (g/hr)		160			135			162	155	183	187	
Dilemma Vehicles (#)		0			0			0	0	0	0	
Queue Length 50th (ft)		237			188			~224	~217	~278	~313	
Queue Length 95th (ft)		#469			#421			#387	#350	#452	#434	
Internal Link Dist (ft)		205			295			220			73	
Turn Bay Length (ft)												
Base Capacity (vph)		1369			676			150	149	227	256	
Starvation Cap Reductn		592			0			0	0	0	0	
Spillback Cap Reductn		6			27			11	0	0	38	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		1.06			0.88			1.49	1.36	1.26	1.49	

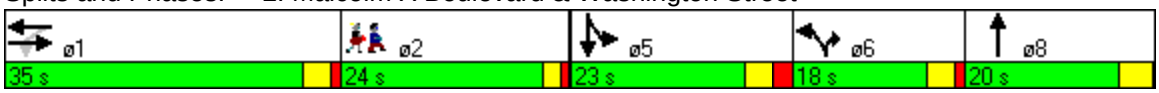
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 140.4		Intersection LOS: F	
Intersection Capacity Utilization 72.9%		ICU Level of Service C	
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.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Malcolm X Boulevard & Washington Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

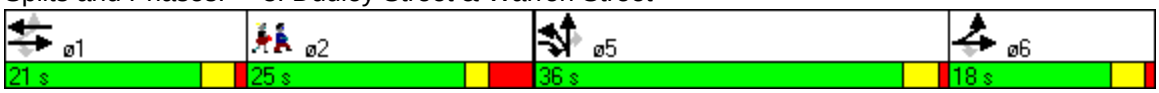
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.978				0.850			
Flt Protected	0.950							0.976				
Satd. Flow (prot)	1243	3065	1525	0	2881	0	0	3204	1647	0	0	0
Flt Permitted	0.286							0.976				
Satd. Flow (perm)	374	3065	1525	0	2881	0	0	3204	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			579						18			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	318	565	498	0	321	48	198	243	16	0	0	0
Peak Hour Factor	0.89	0.91	0.86	0.92	0.91	0.77	0.77	0.91	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	22%	6%	8%	2%	2%	33%	2%	9%	0%	2%	2%	2%
Adj. Flow (vph)	357	621	579	0	353	62	257	267	24	0	0	0
Lane Group Flow (vph)	357	621	579	0	415	0	0	524	24	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		12.0		14.0		12.0	12.0	12.0			
Total Split (s)	18.0	39.0	36.0	0.0	21.0	0.0	36.0	36.0	36.0	0.0	0.0	0.0
Total Split (%)	18.0%	39.0%	36.0%	0.0%	21.0%	0.0%	36.0%	36.0%	36.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		1.0		1.0		1.0	1.0	1.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	Max		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	51.0	55.0	94.2		37.0			32.0	32.0			
Actuated g/C Ratio	0.51	0.55	0.94		0.37			0.32	0.32			
v/c Ratio	1.14	0.37	0.39		0.39			0.51	0.04			
Control Delay	116.1	15.5	1.1		21.5			29.8	12.6			
Queue Delay	0.0	0.5	0.1		3.9			0.0	0.1			

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	116.1	16.0	1.2		25.4			29.8	12.7			
LOS	F	B	A		C			C	B			
Approach Delay		33.4			25.4			29.0				
Approach LOS		C			C			C				
90th %ile Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
90th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
70th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
70th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
50th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
50th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
30th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
30th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
10th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
10th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
Stops (vph)	156	317	12		159			347	7			
Fuel Used(gal)	9	5	2		3			6	0			
CO Emissions (g/hr)	651	362	114		204			390	8			
NOx Emissions (g/hr)	127	70	22		40			76	2			
VOC Emissions (g/hr)	151	84	27		47			90	2			
Dilemma Vehicles (#)	0	0	0		0			0	0			
Queue Length 50th (ft)	~145	96	0		38			142	3			
Queue Length 95th (ft)	#448	225	21		m#187			193	13			
Internal Link Dist (ft)		295			66			206			449	
Turn Bay Length (ft)			100						75			
Base Capacity (vph)	312	1686	1470		1066			1025	539			
Starvation Cap Reductn	0	626	114		552			0	0			
Spillback Cap Reductn	0	86	0		0			0	168			
Storage Cap Reductn	0	0	0		0			0	0			
Reduced v/c Ratio	1.14	0.59	0.43		0.81			0.51	0.06			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 31 (31%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 31.2		Intersection LOS: C	
Intersection Capacity Utilization 55.0%		ICU Level of Service A	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.983			0.973			0.964	
Flt Protected	0.950				0.988			0.999		0.950		
Satd. Flow (prot)	1472	1538	0	0	2759	0	0	1578	0	1472	1527	0
Flt Permitted	0.357				0.728			0.992		0.330		
Satd. Flow (perm)	553	1538	0	0	2033	0	0	1567	0	511	1527	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			14			15			20	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	191	374	16	96	277	31	3	353	83	34	391	89
Peak Hour Factor	0.84	0.82	0.75	0.80	0.88	0.55	0.38	0.89	0.83	0.85	0.94	0.67
Heavy Vehicles (%)	3%	7%	0%	0%	10%	3%	0%	5%	7%	3%	1%	0%
Adj. Flow (vph)	227	456	21	120	315	56	8	397	100	40	416	133
Lane Group Flow (vph)	227	477	0	0	491	0	0	505	0	40	549	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	20.0	55.0	0.0	35.0	35.0	0.0	45.0	45.0	0.0	45.0	45.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	35.0%	35.0%	0.0%	45.0%	45.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	47.0	51.0			31.0			41.0		41.0	41.0	
Actuated g/C Ratio	0.47	0.51			0.31			0.41		0.41	0.41	
v/c Ratio	0.56	0.61			0.77			0.78		0.19	0.86	
Control Delay	17.0	11.8			39.7			34.5		22.0	41.4	
Queue Delay	4.0	0.9			3.1			77.7		0.0	129.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	21.0	12.7			42.8			112.2		22.0	170.6	
LOS	C	B			D			F		C	F	
Approach Delay		15.4			42.8			112.2			160.5	
Approach LOS		B			D			F			F	
90th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
90th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
70th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
50th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
30th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
10th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	77	141			347			360		23	397	
Fuel Used(gal)	1	2			6			6		0	8	
CO Emissions (g/hr)	91	151			429			402		28	553	
NOx Emissions (g/hr)	18	29			84			78		5	108	
VOC Emissions (g/hr)	21	35			99			93		6	128	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	33	70			144			266		16	303	
Queue Length 95th (ft)	76	68			202			395		39	#505	
Internal Link Dist (ft)		66			225			115			367	
Turn Bay Length (ft)										200		
Base Capacity (vph)	407	786			640			651		210	638	
Starvation Cap Reductn	111	118			0			0		0	0	
Spillback Cap Reductn	0	0			76			216		0	211	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.77	0.71			0.87			1.16		0.19	1.29	

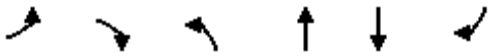
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 1:EBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 80.0	Intersection LOS: E
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 4: Dudley Street & Harrison Avenue

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	463	11	8	19	126	329	0	0	335	0
Peak Hour Factor	0.92	0.92	0.81	0.55	0.67	0.75	0.85	0.84	0.92	0.92	0.83	0.92
Hourly flow rate (vph)	0	0	572	20	12	25	148	392	0	0	404	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1123	1092	404	1663	1092	392	404			392		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1144	1107	303	1776	1107	392	303			392		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	9	0	92	96	86			100		
cM capacity (veh/h)	122	154	630	5	156	661	1057			1167		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	572	57	540	404
Volume Left	0	20	148	0
Volume Right	572	25	0	0
cSH	630	13	1057	1700
Volume to Capacity	0.91	4.44	0.14	0.24
Queue Length 95th (ft)	286	Err	12	0
Control Delay (s)	42.4	Err	3.6	0.0
Lane LOS	E	F	A	
Approach Delay (s)	42.4	9999.0	3.6	0.0
Approach LOS	E	F		

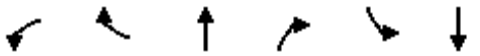
Intersection Summary				
Average Delay	380.9			
Intersection Capacity Utilization	59.6%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	22	64	0	433	809	0
Peak Hour Factor	0.71	0.84	0.92	0.89	0.85	0.92
Hourly flow rate (vph)	31	76	0	487	952	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1438	952	952			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1504	944	944			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	73	72	100			
cM capacity (veh/h)	114	269	631			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	107	487	952
Volume Left	31	0	0
Volume Right	76	0	0
cSH	193	1700	1700
Volume to Capacity	0.55	0.29	0.56
Queue Length 95th (ft)	73	0	0
Control Delay (s)	44.6	0.0	0.0
Lane LOS	E		
Approach Delay (s)	44.6	0.0	0.0
Approach LOS	E		

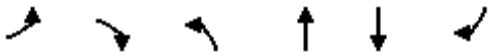
Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	58	69	364	0	0	873
Peak Hour Factor	0.85	0.80	0.89	0.92	0.92	0.87
Hourly flow rate (vph)	68	86	409	0	0	1003
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked	0.88					
vC, conflicting volume	1412	409			409	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1467	409			409	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	44	86			100	
cM capacity (veh/h)	123	630			1150	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	154	409	1003
Volume Left	68	0	0
Volume Right	86	0	0
cSH	223	1700	1700
Volume to Capacity	0.69	0.24	0.59
Queue Length 95th (ft)	112	0	0
Control Delay (s)	51.3	0.0	0.0
Lane LOS	F		
Approach Delay (s)	51.3	0.0	0.0
Approach LOS	F		

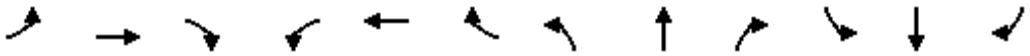
Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	18	50	359	843	30
Peak Hour Factor	0.75	0.75	0.78	0.91	0.87	0.90
Hourly flow rate (vph)	8	24	64	395	969	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1492	969	1002			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1527	967	1002			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	92	90			
cM capacity (veh/h)	110	290	644			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	32	459	969	33
Volume Left	8	64	0	0
Volume Right	24	0	0	33
cSH	206	644	1700	1700
Volume to Capacity	0.16	0.10	0.57	0.02
Queue Length 95th (ft)	13	8	0	0
Control Delay (s)	25.7	2.8	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	25.7	2.8	0.0	
Approach LOS	D			

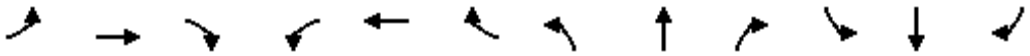
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	4	0	0	59	21	2	19	20	0	0	0
Peak Hour Factor	0.92	0.50	0.74	0.80	0.85	0.66	0.50	0.65	0.70	0.97	0.93	0.74
Hourly flow rate (vph)	0	8	0	0	69	32	4	29	29	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	8	101	62
Volume Left (vph)	0	0	4
Volume Right (vph)	0	32	29
Hadj (s)	0.00	-0.17	-0.20
Departure Headway (s)	4.1	3.9	3.9
Degree Utilization, x	0.01	0.11	0.07
Capacity (veh/h)	850	911	884
Control Delay (s)	7.2	7.3	7.2
Approach Delay (s)	7.2	7.3	7.2
Approach LOS	A	A	A

Intersection Summary				
Delay	7.3			
HCM Level of Service	A			
Intersection Capacity Utilization	14.4%	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)	2	69	0	0	0	0	0	17	23	0	0	0
Peak Hour Factor	0.25	0.91	0.92	0.92	0.92	0.92	0.92	0.75	0.46	0.92	0.92	0.92
Hourly flow rate (vph)	8	76	0	0	0	0	0	23	50	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	84	73
Volume Left (vph)	8	0
Volume Right (vph)	0	50
Hadj (s)	0.13	-0.35
Departure Headway (s)	4.2	3.7
Degree Utilization, x	0.10	0.08
Capacity (veh/h)	844	933
Control Delay (s)	7.6	7.0
Approach Delay (s)	7.6	7.0
Approach LOS	A	A

Intersection Summary				
Delay	7.3			
HCM Level of Service	A			
Intersection Capacity Utilization	13.7%	ICU Level of Service	A	
Analysis Period (min)	15			

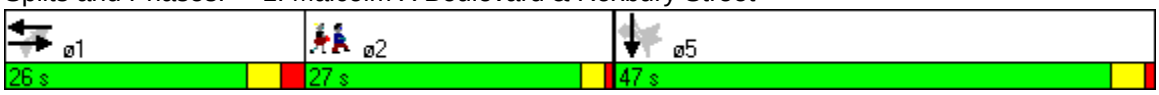
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
Total 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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.995			0.850				
Flt Protected		0.999					0.950				0.950	
Satd. Flow (prot)	0	3185	0	0	2874	0	1525	1358	0	0	1345	1506
Flt Permitted		0.835			0.952		0.571				0.950	
Satd. Flow (perm)	0	2662	0	0	2736	0	916	1358	0	0	1345	1506
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	5	348	48	3	563	14	310	15	166	8	86	188
Peak Hour Factor	0.42	0.95	0.80	0.75	0.89	0.65	0.92	0.58	0.82	0.67	0.70	0.88
Heavy Vehicles (%)	0%	15%	4%	0%	13%	0%	3%	7%	7%	0%	14%	6%
Adj. Flow (vph)	12	366	60	4	633	22	337	26	202	12	123	214
Lane Group Flow (vph)	0	438	0	0	659	0	337	228	0	0	135	214
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	26.0	26.0	0.0	26.0	26.0	0.0	47.0	47.0	0.0	47.0	47.0	47.0
Total Split (%)	26.0%	26.0%	0.0%	26.0%	26.0%	0.0%	47.0%	47.0%	0.0%	47.0%	47.0%	47.0%
Maximum Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		47.9			47.9		38.7	38.7			38.7	38.7
Actuated g/C Ratio		0.48			0.48		0.39	0.39			0.39	0.39
v/c Ratio		0.34			0.50		0.95	0.43			0.26	0.37
Control Delay		21.2			23.9		66.7	24.4			20.9	22.8
Queue Delay		0.0			1.1		0.0	0.1			0.1	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1256	
Flt Permitted		
Satd. Flow (perm)	1256	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	282	
Peak Hour Factor	0.91	
Heavy Vehicles (%)	8%	
Adj. Flow (vph)	310	
Lane Group Flow (vph)	310	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	47.0	27.0
Total Split (%)	47.0%	27%
Maximum Green (s)	43.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	38.7	
Actuated g/C Ratio	0.39	
v/c Ratio	0.64	
Control Delay	30.7	
Queue Delay	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		21.3			25.0		66.7	24.5			21.0	22.8
LOS		C			C		E	C			C	C
Approach Delay		21.3			25.0							26.1
Approach LOS		C			C							C
90th %ile Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
70th %ile Green (s)	48.0	48.0		48.0	48.0		43.0	43.0		43.0	43.0	43.0
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
50th %ile Green (s)	48.0	48.0		48.0	48.0		43.0	43.0		43.0	43.0	43.0
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
30th %ile Green (s)	53.5	53.5		53.5	53.5		37.5	37.5		37.5	37.5	37.5
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
10th %ile Green (s)	63.9	63.9		63.9	63.9		27.1	27.1		27.1	27.1	27.1
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
Stops (vph)		256			348		273	126			60	127
Fuel Used(gal)		5			6		6	2			1	3
CO Emissions (g/hr)		356			422		454	143			84	176
NOx Emissions (g/hr)		69			82		88	28			16	34
VOC Emissions (g/hr)		83			98		105	33			20	41
Dilemma Vehicles (#)		0			0		0	0			0	0
Queue Length 50th (ft)		86			142		189	97			53	88
Queue Length 95th (ft)		195			#358		#359	93			71	141
Internal Link Dist (ft)		543			205							563
Turn Bay Length (ft)												
Base Capacity (vph)		1275			1310		394	584			578	648
Starvation Cap Reductn		0			391		0	0			0	0
Spillback Cap Reductn		76			0		0	41			40	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.37			0.72		0.86	0.42			0.25	0.33

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 57 (57%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Malcolm X Boulevard & Roxbury Street



Lane Group	SBR	ø2
Total Delay	30.7	
LOS	C	
Approach Delay		
Approach LOS		
90th %ile Green (s)	43.0	24.0
90th %ile Term Code	Max	Ped
70th %ile Green (s)	43.0	0.0
70th %ile Term Code	Max	Skip
50th %ile Green (s)	43.0	0.0
50th %ile Term Code	Max	Skip
30th %ile Green (s)	37.5	0.0
30th %ile Term Code	Gap	Skip
10th %ile Green (s)	27.1	0.0
10th %ile Term Code	Gap	Skip
Stops (vph)	220	
Fuel Used(gal)	4	
CO Emissions (g/hr)	307	
NOx Emissions (g/hr)	60	
VOC Emissions (g/hr)	71	
Dilemma Vehicles (#)	0	
Queue Length 50th (ft)	146	
Queue Length 95th (ft)	237	
Internal Link Dist (ft)		
Turn Bay Length (ft)	80	
Base Capacity (vph)	540	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.57	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.999						0.852	0.850		0.961	
Flt Protected					0.992			0.999		0.950		
Satd. Flow (prot)	0	3134	0	0	2938	0	0	1330	1328	1243	1412	0
Flt Permitted					0.548					0.950		
Satd. Flow (perm)	0	3134	0	0	1623	0	0	1332	1328	1243	1412	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											13	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	595	4	96	529	0	2	0	495	180	181	49
Peak Hour Factor	0.92	0.94	1.00	0.88	0.95	0.92	0.50	0.92	0.91	0.89	0.94	0.72
Heavy Vehicles (%)	2%	14%	0%	5%	15%	2%	0%	2%	4%	35%	12%	14%
Adj. Flow (vph)	0	633	4	109	557	0	4	0	544	202	193	68
Lane Group Flow (vph)	0	637	0	0	666	0	0	276	272	202	261	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	24.0	0.0	24.0	24.0	0.0	26.0	20.0	26.0	26.0	26.0	0.0
Total Split (%)	0.0%	20.0%	0.0%	20.0%	20.0%	0.0%	21.7%	16.7%	21.7%	21.7%	21.7%	0.0%
Maximum Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		39.2			39.2			22.0	22.0	22.0	22.0	
Actuated g/C Ratio		0.33			0.33			0.18	0.18	0.18	0.18	
v/c Ratio		0.62			1.26			1.13	1.12	0.89	0.97	
Control Delay		38.8			164.8			142.2	138.6	84.7	94.6	
Queue Delay		11.9			58.1			51.4	9.3	0.0	160.8	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

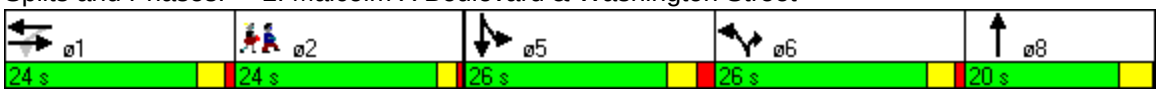
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		50.7			222.8			193.6	147.9	84.7	255.4	
LOS		D			F			F	F	F	F	
Approach Delay		50.7			222.8			170.9			180.9	
Approach LOS		D			F			F			F	
90th %ile Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
90th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
70th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
70th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
50th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
50th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
30th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
30th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
10th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
10th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
Stops (vph)		434			481			205	202	157	189	
Fuel Used(gal)		8			25			9	9	4	6	
CO Emissions (g/hr)		591			1779			626	608	293	402	
NOx Emissions (g/hr)		115			346			122	118	57	78	
VOC Emissions (g/hr)		137			412			145	141	68	93	
Dilemma Vehicles (#)		0			0			0	0	0	0	
Queue Length 50th (ft)		204			~312			~261	~254	154	194	
Queue Length 95th (ft)		#438			#571			#443	#436	#290	#367	
Internal Link Dist (ft)		205			295			220			73	
Turn Bay Length (ft)												
Base Capacity (vph)		1024			530			244	243	228	269	
Starvation Cap Reductn		365			0			0	0	0	0	
Spillback Cap Reductn		23			50			24	5	0	81	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.97			1.39			1.25	1.14	0.89	1.39	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 52 (43%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 154.8		Intersection LOS: F	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
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: 2: Malcolm X Boulevard & Washington Street

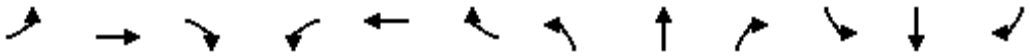


Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.983				0.850			
Flt Protected	0.950							0.983				
Satd. Flow (prot)	1107	3065	1408	0	2764	0	0	3175	1647	0	0	0
Flt Permitted	0.222							0.983				
Satd. Flow (perm)	259	3065	1408	0	2764	0	0	3175	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			305						8			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	278	731	262	0	394	47	230	441	7	0	0	0
Peak Hour Factor	0.90	0.91	0.86	0.92	0.76	0.70	0.88	0.87	0.44	0.92	0.92	0.92
Heavy Vehicles (%)	37%	6%	17%	2%	7%	48%	2%	10%	0%	2%	2%	2%
Adj. Flow (vph)	309	803	305	0	518	67	261	507	16	0	0	0
Lane Group Flow (vph)	309	803	305	0	585	0	0	768	16	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		13.0		16.0		13.0	13.0	13.0			
Total Split (s)	18.0	40.0	35.0	0.0	22.0	0.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	18.0%	40.0%	35.0%	0.0%	22.0%	0.0%	35.0%	35.0%	35.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		2.0		3.0		2.0	2.0	2.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	None		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	52.0	56.0	94.2		38.0			31.0	31.0			
Actuated g/C Ratio	0.52	0.56	0.94		0.38			0.31	0.31			
v/c Ratio	1.22	0.47	0.23		0.56			0.78	0.03			
Control Delay	151.1	16.3	0.8		22.5			38.0	17.4			
Queue Delay	0.0	0.9	0.0		1.6			0.0	0.0			

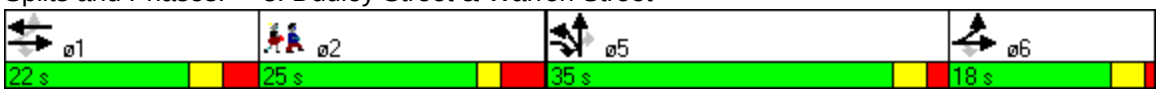
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	151.1	17.2	0.8		24.0			38.0	17.4			
LOS	F	B	A		C			D	B			
Approach Delay		42.9			24.0			37.6				
Approach LOS		D			C			D				
90th %ile Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
90th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
70th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
70th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
50th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
50th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
30th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
30th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
10th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
10th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
Stops (vph)	136	433	8		174			597	4			
Fuel Used(gal)	10	7	1		3			10	0			
CO Emissions (g/hr)	707	486	60		243			698	4			
NOx Emissions (g/hr)	138	95	12		47			136	1			
VOC Emissions (g/hr)	164	113	14		56			162	1			
Dilemma Vehicles (#)	0	0	0		0			0	0			
Queue Length 50th (ft)	~158	131	0		57			233	4			
Queue Length 95th (ft)	#419	303	18		m#253			292	7			
Internal Link Dist (ft)		295			66			206			449	
Turn Bay Length (ft)			100						75			
Base Capacity (vph)	253	1717	1344		1051			984	516			
Starvation Cap Reductn	0	600	138		284			0	0			
Spillback Cap Reductn	0	60	0		0			0	0			
Storage Cap Reductn	0	0	0		0			0	0			
Reduced v/c Ratio	1.22	0.72	0.25		0.76			0.78	0.03			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 23 (23%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 37.4		Intersection LOS: D	
Intersection Capacity Utilization 61.8%		ICU Level of Service B	
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.			
m Volume for 95th percentile queue is metered by upstream signal.			

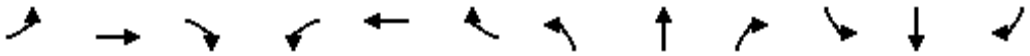
Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

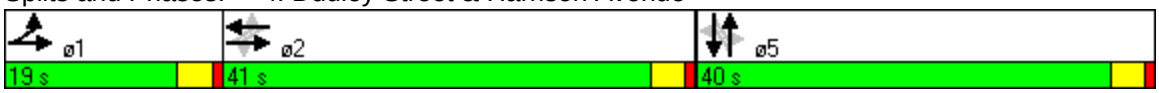
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.990			0.980			0.964	
Flt Protected	0.950				0.994			0.999		0.950		
Satd. Flow (prot)	1486	1502	0	0	2646	0	0	1615	0	1458	1450	0
Flt Permitted	0.400				0.837			0.996		0.179		
Satd. Flow (perm)	626	1502	0	0	2228	0	0	1610	0	275	1450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			9			10			18	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	294	439	5	47	360	24	3	555	69	25	249	78
Peak Hour Factor	0.96	0.92	0.38	0.80	0.94	0.72	0.38	0.95	0.69	0.67	0.93	0.93
Heavy Vehicles (%)	2%	9%	33%	9%	13%	17%	0%	3%	8%	4%	8%	0%
Adj. Flow (vph)	306	477	13	59	383	33	8	584	100	37	268	84
Lane Group Flow (vph)	306	490	0	0	475	0	0	692	0	37	352	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	19.0	60.0	0.0	41.0	41.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	19.0%	60.0%	0.0%	41.0%	41.0%	0.0%	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	52.0	56.0			37.0			36.0		36.0	36.0	
Actuated g/C Ratio	0.52	0.56			0.37			0.36		0.36	0.36	
v/c Ratio	0.67	0.58			0.57			1.18		0.37	0.66	
Control Delay	15.5	7.6			28.0			128.7		37.0	32.5	
Queue Delay	3.0	0.4			1.0			264.6		0.0	21.6	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	18.5	7.9			29.0			393.3		37.0	54.1	
LOS	B	A			C			F		D	D	
Approach Delay		12.0			29.0			393.3			52.5	
Approach LOS		B			C			F			D	
90th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
90th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
70th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
50th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
30th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
10th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	90	96			329			506		21	260	
Fuel Used(gal)	2	2			5			20		0	5	
CO Emissions (g/hr)	123	120			370			1411		27	331	
NOx Emissions (g/hr)	24	23			72			274		5	64	
VOC Emissions (g/hr)	29	28			86			327		6	77	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	22	35			123			~531		17	177	
Queue Length 95th (ft)	124	99			176			#755		34	280	
Internal Link Dist (ft)		66			225			115			367	
Turn Bay Length (ft)										200		
Base Capacity (vph)	455	842			830			586		99	534	
Starvation Cap Reductn	73	78			0			0		0	0	
Spillback Cap Reductn	0	0			154			196		0	178	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.80	0.64			0.70			1.77		0.37	0.99	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 1:EBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 134.3		Intersection LOS: F	
Intersection Capacity Utilization 89.2%		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: Dudley Street & Harrison Avenue



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	239	6	5	18	325	479	0	0	279	2
Peak Hour Factor	0.92	0.92	0.80	0.61	0.42	0.50	0.85	0.85	0.92	0.92	0.84	0.50
Hourly flow rate (vph)	0	0	299	10	12	36	382	564	0	0	332	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.89	0.89	0.89	0.89	0.89		0.89					
vC, conflicting volume	1704	1662	334	1961	1664	564	336			564		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1794	1746	250	2083	1749	564	252			564		
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 %	100	100	57	29	77	93	67			100		
cM capacity (veh/h)	32	51	696	14	52	529	1171			1008		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	299	58	946	336
Volume Left	0	10	382	0
Volume Right	299	36	0	4
cSH	696	57	1171	1700
Volume to Capacity	0.43	1.01	0.33	0.20
Queue Length 95th (ft)	54	117	36	0
Control Delay (s)	14.0	239.8	6.6	0.0
Lane LOS	B	F	A	
Approach Delay (s)	14.0	239.8	6.6	0.0
Approach LOS	B	F		

Intersection Summary			
Average Delay	14.8		
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	35	42	0	769	522	0
Peak Hour Factor	0.77	0.56	0.92	0.89	0.96	0.92
Hourly flow rate (vph)	45	75	0	864	544	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked						
vC, conflicting volume	1408	544	544			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1408	544	544			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	70	86	100			
cM capacity (veh/h)	150	528	1025			

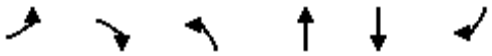
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	120	864	544
Volume Left	45	0	0
Volume Right	75	0	0
cSH	270	1700	1700
Volume to Capacity	0.45	0.51	0.32
Queue Length 95th (ft)	54	0	0
Control Delay (s)	28.6	0.0	0.0
Lane LOS	D		
Approach Delay (s)	28.6	0.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	77	81	688	0	0	563
Peak Hour Factor	0.65	0.84	0.89	0.92	0.92	0.92
Hourly flow rate (vph)	118	96	773	0	0	612
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked						
vC, conflicting volume	1385	773			773	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1385	773			773	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	24	76			100	
cM capacity (veh/h)	156	401			842	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	215	773	612
Volume Left	118	0	0
Volume Right	96	0	0
cSH	214	1700	1700
Volume to Capacity	1.00	0.45	0.36
Queue Length 95th (ft)	225	0	0
Control Delay (s)	109.3	0.0	0.0
Lane LOS	F		
Approach Delay (s)	109.3	0.0	0.0
Approach LOS	F		

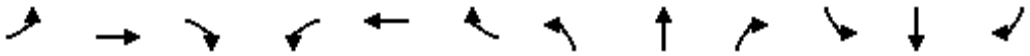
Intersection Summary			
Average Delay	14.7		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	23	80	683	594	45
Peak Hour Factor	0.38	0.69	0.73	0.91	0.95	0.75
Hourly flow rate (vph)	16	33	110	751	625	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked						
vC, conflicting volume	1595	625	685			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1595	625	685			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	93	88			
cM capacity (veh/h)	104	479	904			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	49	860	625	60
Volume Left	16	110	0	0
Volume Right	33	0	0	60
cSH	222	904	1700	1700
Volume to Capacity	0.22	0.12	0.37	0.04
Queue Length 95th (ft)	20	10	0	0
Control Delay (s)	25.7	3.0	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	25.7	3.0	0.0	
Approach LOS	D			

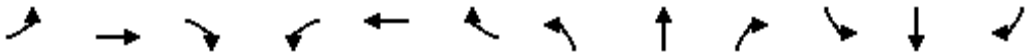
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	12	0	0	98	27	5	7	18	0	0	0
Peak Hour Factor	0.25	0.50	0.92	0.92	0.75	0.69	0.42	0.58	0.57	0.92	0.92	0.92
Hourly flow rate (vph)	8	24	0	0	131	39	12	12	32	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	32	170	56
Volume Left (vph)	8	0	12
Volume Right (vph)	0	39	32
Hadj (s)	0.05	-0.10	-0.17
Departure Headway (s)	4.2	4.0	4.2
Degree Utilization, x	0.04	0.19	0.06
Capacity (veh/h)	828	894	820
Control Delay (s)	7.4	7.9	7.4
Approach Delay (s)	7.4	7.9	7.4
Approach LOS	A	A	A

Intersection Summary				
Delay	7.7			
HCM Level of Service	A			
Intersection Capacity Utilization	16.8%	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	65	0	0	0	0	0	25	12	0	0	0
Peak Hour Factor	0.92	0.65	0.92	0.92	0.92	0.92	0.92	0.56	0.56	0.92	0.92	0.92
Hourly flow rate (vph)	0	100	0	0	0	0	0	45	21	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	100	66
Volume Left (vph)	0	0
Volume Right (vph)	0	21
Hadj (s)	0.14	-0.14
Departure Headway (s)	4.2	4.0
Degree Utilization, x	0.12	0.07
Capacity (veh/h)	844	872
Control Delay (s)	7.7	7.3
Approach Delay (s)	7.7	7.3
Approach LOS	A	A

Intersection Summary				
Delay	7.6			
HCM Level of Service	A			
Intersection Capacity Utilization	13.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.993			0.850				
Flt Protected		0.998					0.950				0.950	
Satd. Flow (prot)	0	3324	0	0	2972	0	1481	1367	0	0	1439	1580
Flt Permitted		0.752			0.840		0.306				0.950	
Satd. Flow (perm)	0	2505	0	0	2497	0	477	1367	0	0	1439	1580
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	18	551	72	2	499	13	197	28	152	14	168	423
Peak Hour Factor	0.61	0.92	0.72	0.50	0.89	0.50	0.77	0.57	0.84	0.54	0.79	0.88
Heavy Vehicles (%)	0%	10%	0%	0%	9%	0%	6%	0%	8%	0%	6%	1%
Adj. Flow (vph)	30	599	100	4	561	26	256	49	181	26	213	481
Lane Group Flow (vph)	0	729	0	0	591	0	256	230	0	0	239	481
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	0.0	48.0	48.0	0.0	48.0	48.0	48.0
Total Split (%)	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	48.0%	48.0%	0.0%	48.0%	48.0%	48.0%
Maximum Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		42.6			42.6		44.0	44.0			44.0	44.0
Actuated g/C Ratio		0.43			0.43		0.44	0.44			0.44	0.44
v/c Ratio		0.68			0.56		1.22	0.38			0.38	0.69
Control Delay		29.9			27.1		162.5	21.2			21.0	29.0
Queue Delay		1.1			2.0		0.0	0.5			0.5	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1304	
Flt Permitted		
Satd. Flow (perm)	1304	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	387	
Peak Hour Factor	0.88	
Heavy Vehicles (%)	4%	
Adj. Flow (vph)	440	
Lane Group Flow (vph)	440	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	48.0	27.0
Total Split (%)	48.0%	27%
Maximum Green (s)	44.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	44.0	
Actuated g/C Ratio	0.44	
v/c Ratio	0.77	
Control Delay	34.4	
Queue Delay	0.0	

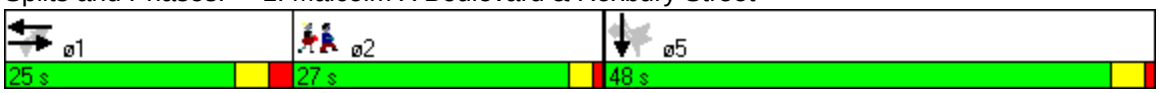
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		31.1			29.1		162.5	21.8			21.5	29.0
LOS		C			C		F	C			C	C
Approach Delay		31.1			29.1							29.5
Approach LOS		C			C							C
90th %ile Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
70th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
50th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
30th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
30th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
10th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
10th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
Stops (vph)		415			328		149	117			119	335
Fuel Used(gal)		9			6		8	2			2	6
CO Emissions (g/hr)		651			405		547	131			164	452
NOx Emissions (g/hr)		127			79		107	25			32	88
VOC Emissions (g/hr)		151			94		127	30			38	105
Dilemma Vehicles (#)		0			0		0	0			0	0
Queue Length 50th (ft)		173			130		~202	96			100	240
Queue Length 95th (ft)		#444			#335		#286	90			137	348
Internal Link Dist (ft)		543			205							563
Turn Bay Length (ft)												
Base Capacity (vph)		1067			1064		210	601			633	695
Starvation Cap Reductn		0			316		0	0			0	0
Spillback Cap Reductn		148			0		0	130			137	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.79			0.79		1.22	0.49			0.48	0.69

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 40.7		Intersection LOS: D	
Intersection Capacity Utilization 81.0%		ICU Level of Service D	
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: 1: Malcolm X Boulevard & Roxbury Street

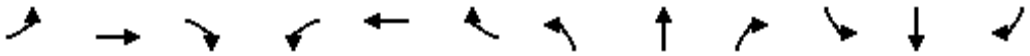


Lane Group	SBR	ø2
Total Delay	34.4	
LOS	C	
Approach Delay		
Approach LOS		
90th %ile Green (s)	44.0	24.0
90th %ile Term Code	Max	Ped
70th %ile Green (s)	44.0	0.0
70th %ile Term Code	Max	Skip
50th %ile Green (s)	44.0	0.0
50th %ile Term Code	Max	Skip
30th %ile Green (s)	44.0	0.0
30th %ile Term Code	Max	Skip
10th %ile Green (s)	44.0	0.0
10th %ile Term Code	Max	Skip
Stops (vph)	320	
Fuel Used(gal)	6	
CO Emissions (g/hr)	449	
NOx Emissions (g/hr)	87	
VOC Emissions (g/hr)	104	
Dilemma Vehicles (#)	0	
Queue Length 50th (ft)	231	
Queue Length 95th (ft)	351	
Internal Link Dist (ft)		
Turn Bay Length (ft)	80	
Base Capacity (vph)	574	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.77	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.996						0.853	0.850		0.968	
Flt Protected					0.989			0.999		0.950		
Satd. Flow (prot)	0	3273	0	0	3029	0	0	1283	1279	1435	1569	0
Flt Permitted					0.542					0.950		
Satd. Flow (perm)	0	3273	0	0	1660	0	0	1285	1279	1435	1569	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											10	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	868	12	134	439	0	3	0	386	270	222	57
Peak Hour Factor	0.92	0.97	0.50	0.93	0.91	0.92	0.75	0.92	0.85	0.90	0.82	0.78
Heavy Vehicles (%)	2%	9%	0%	5%	11%	2%	0%	2%	8%	17%	2%	2%
Adj. Flow (vph)	0	895	24	144	482	0	4	0	454	300	271	73
Lane Group Flow (vph)	0	919	0	0	626	0	0	231	227	300	344	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	18.0	20.0	18.0	23.0	23.0	0.0
Total Split (%)	0.0%	29.2%	0.0%	29.2%	29.2%	0.0%	15.0%	16.7%	15.0%	19.2%	19.2%	0.0%
Maximum Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		50.2			50.2			14.0	14.0	19.0	19.0	
Actuated g/C Ratio		0.42			0.42			0.12	0.12	0.16	0.16	
v/c Ratio		0.67			1.60dl			1.54	1.52	1.32	1.34	
Control Delay		32.7			50.9			309.4	303.0	212.1	214.7	
Queue Delay		71.0			6.4			65.3	9.2	0.0	170.1	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		103.7			57.3			374.7	312.2	212.1	384.8	
LOS		F			E			F	F	F	F	
Approach Delay		103.7			57.3			343.8			304.4	
Approach LOS		F			E			F			F	
90th %ile Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
90th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
70th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
70th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
50th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
50th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
30th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
30th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
10th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
10th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
Stops (vph)		627			427			140	138	205	207	
Fuel Used(gal)		11			10			14	13	13	14	
CO Emissions (g/hr)		789			697			949	917	917	956	
NOx Emissions (g/hr)		153			136			185	178	178	186	
VOC Emissions (g/hr)		183			162			220	213	212	222	
Dilemma Vehicles (#)		0			0			0	0	0	0	
Queue Length 50th (ft)		275			216			~265	~258	~300	~343	
Queue Length 95th (ft)		#551			#467			#434	#397	#478	#466	
Internal Link Dist (ft)		205			295			220			73	
Turn Bay Length (ft)												
Base Capacity (vph)		1369			695			150	149	227	257	
Starvation Cap Reductn		569			0			0	0	0	0	
Spillback Cap Reductn		16			46			13	2	0	57	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		1.15			0.96			1.69	1.54	1.32	1.72	

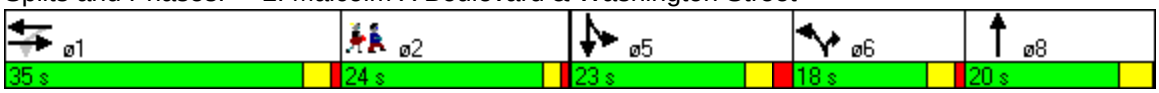
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.54			
Intersection Signal Delay: 183.1		Intersection LOS: F	
Intersection Capacity Utilization 84.1%		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.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Malcolm X Boulevard & Washington Street

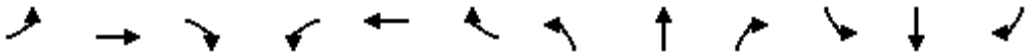


Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.978				0.850			
Flt Protected	0.950							0.978				
Satd. Flow (prot)	1243	3065	1525	0	2882	0	0	3203	1647	0	0	0
Flt Permitted	0.235							0.978				
Satd. Flow (perm)	307	3065	1525	0	2882	0	0	3203	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			630						17			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	389	637	542	0	362	53	210	298	17	0	0	0
Peak Hour Factor	0.89	0.91	0.86	0.92	0.91	0.77	0.77	0.91	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	22%	6%	8%	2%	2%	33%	2%	9%	0%	2%	2%	2%
Adj. Flow (vph)	437	700	630	0	398	69	273	327	25	0	0	0
Lane Group Flow (vph)	437	700	630	0	467	0	0	600	25	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		12.0		14.0		12.0	12.0	12.0			
Total Split (s)	18.0	39.0	36.0	0.0	21.0	0.0	36.0	36.0	36.0	0.0	0.0	0.0
Total Split (%)	18.0%	39.0%	36.0%	0.0%	21.0%	0.0%	36.0%	36.0%	36.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		1.0		1.0		1.0	1.0	1.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	Max		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	51.0	55.0	94.2		37.0			32.0	32.0			
Actuated g/C Ratio	0.51	0.55	0.94		0.37			0.32	0.32			
v/c Ratio	1.52	0.42	0.43		0.44			0.59	0.05			
Control Delay	271.4	16.1	1.2		23.0			31.2	13.5			
Queue Delay	0.0	0.7	0.1		9.0			0.0	0.1			

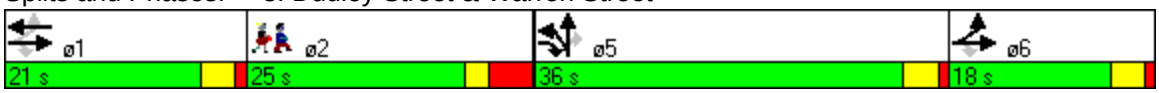
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	271.4	16.8	1.3		32.0			31.2	13.6			
LOS	F	B	A		C			C	B			
Approach Delay		74.2			32.0			30.5				
Approach LOS		E			C			C				
90th %ile Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
90th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
70th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
70th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
50th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
50th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
30th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
30th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
10th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
10th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
Stops (vph)	190	369	14		190			413	7			
Fuel Used(gal)	24	6	2		3			7	0			
CO Emissions (g/hr)	1655	418	126		242			465	9			
NOx Emissions (g/hr)	322	81	24		47			90	2			
VOC Emissions (g/hr)	384	97	29		56			108	2			
Dilemma Vehicles (#)	0	0	0		0			0	0			
Queue Length 50th (ft)	~295	112	0		50			167	3			
Queue Length 95th (ft)	#585	260	22		m#191			225	15			
Internal Link Dist (ft)		295			66			206			449	
Turn Bay Length (ft)			100						75			
Base Capacity (vph)	288	1686	1473		1066			1025	539			
Starvation Cap Reductn	0	605	105		557			0	0			
Spillback Cap Reductn	0	139	0		0			0	165			
Storage Cap Reductn	0	0	0		0			0	0			
Reduced v/c Ratio	1.52	0.65	0.46		0.92			0.59	0.07			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 31 (31%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.52			
Intersection Signal Delay: 57.8		Intersection LOS: E	
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.983			0.974			0.959	
Flt Protected	0.950				0.988			0.999		0.950		
Satd. Flow (prot)	1472	1536	0	0	2758	0	0	1580	0	1472	1520	0
Flt Permitted	0.333				0.712			0.939		0.312		
Satd. Flow (perm)	516	1536	0	0	1987	0	0	1485	0	483	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14			15			23	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	211	417	27	101	297	33	3	376	87	36	427	116
Peak Hour Factor	0.84	0.82	0.75	0.80	0.88	0.55	0.38	0.89	0.83	0.85	0.94	0.67
Heavy Vehicles (%)	3%	7%	0%	0%	10%	3%	0%	5%	7%	3%	1%	0%
Adj. Flow (vph)	251	509	36	126	338	60	8	422	105	42	454	173
Lane Group Flow (vph)	251	545	0	0	524	0	0	535	0	42	627	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	20.0	55.0	0.0	35.0	35.0	0.0	45.0	45.0	0.0	45.0	45.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	35.0%	35.0%	0.0%	45.0%	45.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	47.0	51.0			31.0			41.0		41.0	41.0	
Actuated g/C Ratio	0.47	0.51			0.31			0.41		0.41	0.41	
v/c Ratio	0.64	0.69			0.84			0.87		0.21	0.98	
Control Delay	21.4	14.1			44.9			42.6		22.7	61.7	
Queue Delay	8.1	1.2			22.6			133.2		0.0	200.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	29.5	15.3			67.4			175.8		22.7	261.7	
LOS	C	B			E			F		C	F	
Approach Delay		19.8			67.4			175.8			246.7	
Approach LOS		B			E			F			F	
90th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
90th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
70th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
50th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
30th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
10th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	100	191			370			388		25	448	
Fuel Used(gal)	2	3			7			7		0	11	
CO Emissions (g/hr)	120	198			490			482		30	782	
NOx Emissions (g/hr)	23	39			95			94		6	152	
VOC Emissions (g/hr)	28	46			114			112		7	181	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	37	81			158			298		17	377	
Queue Length 95th (ft)	95	92			#240			#489		41	#620	
Internal Link Dist (ft)		66			225			115			367	
Turn Bay Length (ft)										200		
Base Capacity (vph)	395	786			626			618		198	637	
Starvation Cap Reductn	106	91			0			0		0	0	
Spillback Cap Reductn	0	0			112			205		0	211	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.87	0.78			1.02			1.30		0.21	1.47	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 1:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 122.9	Intersection LOS: F
Intersection Capacity Utilization 82.6%	ICU Level of Service E
Analysis Period (min) 15	

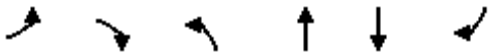
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Dudley Street & Harrison Avenue

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	498	12	8	20	145	369	0	0	412	0
Peak Hour Factor	0.92	0.92	0.81	0.55	0.67	0.75	0.85	0.84	0.92	0.92	0.83	0.92
Hourly flow rate (vph)	0	0	615	22	12	27	171	439	0	0	496	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1309	1277	496	1892	1277	439	496			439		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1362	1324	411	2043	1324	439	411			439		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	0	0	89	96	82			100		
cM capacity (veh/h)	81	110	548	0	111	622	963			1121		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	615	60	610	496
Volume Left	0	22	171	0
Volume Right	615	27	0	0
cSH	548	0	963	1700
Volume to Capacity	1.12	Err	0.18	0.29
Queue Length 95th (ft)	498	Err	16	0
Control Delay (s)	102.9	Err	4.3	0.0
Lane LOS	F	F	A	
Approach Delay (s)	102.9	Err	4.3	0.0
Approach LOS	F	F		

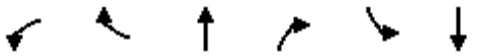
Intersection Summary				
Average Delay			Err	
Intersection Capacity Utilization			65.9%	ICU Level of Service C
Analysis Period (min)			15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	23	67	0	491	921	0
Peak Hour Factor	0.71	0.84	0.92	0.89	0.85	0.92
Hourly flow rate (vph)	32	80	0	552	1084	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1635	1084	1084			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1732	1096	1096			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	61	64	100			
cM capacity (veh/h)	82	219	552			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	112	552	1084
Volume Left	32	0	0
Volume Right	80	0	0
cSH	148	1700	1700
Volume to Capacity	0.76	0.32	0.64
Queue Length 95th (ft)	115	0	0
Control Delay (s)	80.9	0.0	0.0
Lane LOS	F		
Approach Delay (s)	80.9	0.0	0.0
Approach LOS	F		

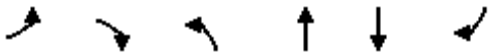
Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	61	73	419	0	0	989
Peak Hour Factor	0.85	0.80	0.89	0.92	0.92	0.87
Hourly flow rate (vph)	72	91	471	0	0	1137
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked	0.88					
vC, conflicting volume	1608	471			471	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1692	471			471	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	19	84			100	
cM capacity (veh/h)	88	581			1091	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	163	471	1137
Volume Left	72	0	0
Volume Right	91	0	0
cSH	168	1700	1700
Volume to Capacity	0.97	0.28	0.67
Queue Length 95th (ft)	188	0	0
Control Delay (s)	116.5	0.0	0.0
Lane LOS	F		
Approach Delay (s)	116.5	0.0	0.0
Approach LOS	F		

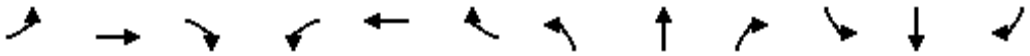
Intersection Summary			
Average Delay	10.7		
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	19	53	413	956	33
Peak Hour Factor	0.75	0.75	0.78	0.91	0.87	0.90
Hourly flow rate (vph)	8	25	68	454	1099	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1689	1099	1136			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1751	1108	1148			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	89	88			
cM capacity (veh/h)	77	236	558			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	33	522	1099	37
Volume Left	8	68	0	0
Volume Right	25	0	0	37
cSH	157	558	1700	1700
Volume to Capacity	0.21	0.12	0.65	0.02
Queue Length 95th (ft)	19	10	0	0
Control Delay (s)	33.9	3.4	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	33.9	3.4	0.0	
Approach LOS	D			

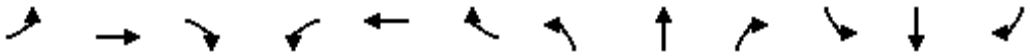
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	4	0	0	63	22	2	20	21	0	0	0
Peak Hour Factor	0.92	0.50	0.74	0.80	0.85	0.66	0.50	0.65	0.70	0.97	0.93	0.74
Hourly flow rate (vph)	0	8	0	0	74	33	4	31	30	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	8	107	65
Volume Left (vph)	0	0	4
Volume Right (vph)	0	33	30
Hadj (s)	0.00	-0.16	-0.20
Departure Headway (s)	4.1	3.9	3.9
Degree Utilization, x	0.01	0.12	0.07
Capacity (veh/h)	847	908	880
Control Delay (s)	7.2	7.4	7.2
Approach Delay (s)	7.2	7.4	7.2
Approach LOS	A	A	A

Intersection Summary				
Delay	7.3			
HCM Level of Service	A			
Intersection Capacity Utilization	14.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	73	0	0	0	0	0	24	12	0	0	0
Peak Hour Factor	0.25	0.91	0.92	0.92	0.92	0.92	0.92	0.75	0.46	0.92	0.92	0.92
Hourly flow rate (vph)	8	80	0	0	0	0	0	32	26	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	88	58
Volume Left (vph)	8	0
Volume Right (vph)	0	26
Hadj (s)	0.13	-0.17
Departure Headway (s)	4.1	3.9
Degree Utilization, x	0.10	0.06
Capacity (veh/h)	851	886
Control Delay (s)	7.6	7.2
Approach Delay (s)	7.6	7.2
Approach LOS	A	A

Intersection Summary				
Delay	7.5			
HCM Level of Service	A			
Intersection Capacity Utilization	14.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977			0.995			0.850				
Flt Protected		0.999					0.950				0.950	
Satd. Flow (prot)	0	3183	0	0	2873	0	1525	1358	0	0	1345	1506
Flt Permitted		0.848			0.952		0.552				0.950	
Satd. Flow (perm)	0	2702	0	0	2735	0	886	1358	0	0	1345	1506
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	5	340	53	3	549	13	308	14	162	8	84	203
Peak Hour Factor	0.42	0.95	0.80	0.75	0.89	0.65	0.92	0.58	0.82	0.67	0.70	0.88
Heavy Vehicles (%)	0%	15%	4%	0%	13%	0%	3%	7%	7%	0%	14%	6%
Adj. Flow (vph)	12	358	66	4	617	20	335	24	198	12	120	231
Lane Group Flow (vph)	0	436	0	0	641	0	335	222	0	0	132	231
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	26.0	26.0	0.0	26.0	26.0	0.0	47.0	47.0	0.0	47.0	47.0	47.0
Total Split (%)	26.0%	26.0%	0.0%	26.0%	26.0%	0.0%	47.0%	47.0%	0.0%	47.0%	47.0%	47.0%
Maximum Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		47.2			47.2		39.4	39.4			39.4	39.4
Actuated g/C Ratio		0.47			0.47		0.39	0.39			0.39	0.39
v/c Ratio		0.34			0.50		0.96	0.41			0.25	0.39
Control Delay		21.4			24.0		69.2	23.7			20.6	23.0
Queue Delay		0.0			1.1		0.0	0.1			0.0	0.0

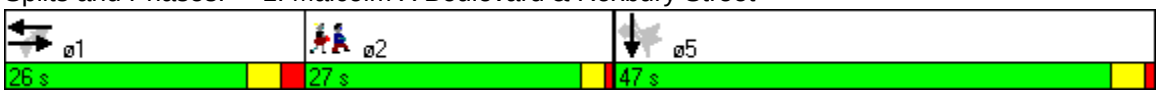
Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1256	
Flt Permitted		
Satd. Flow (perm)	1256	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	276	
Peak Hour Factor	0.91	
Heavy Vehicles (%)	8%	
Adj. Flow (vph)	303	
Lane Group Flow (vph)	303	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	47.0	27.0
Total Split (%)	47.0%	27%
Maximum Green (s)	43.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	39.4	
Actuated g/C Ratio	0.39	
v/c Ratio	0.61	
Control Delay	29.4	
Queue Delay	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		21.4			25.1		69.2	23.8			20.6	23.0
LOS		C			C		E	C			C	C
Approach Delay		21.4			25.1							25.4
Approach LOS		C			C							C
90th %ile Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
70th %ile Green (s)	48.0	48.0		48.0	48.0		43.0	43.0		43.0	43.0	43.0
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
50th %ile Green (s)	48.0	48.0		48.0	48.0		43.0	43.0		43.0	43.0	43.0
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
30th %ile Green (s)	51.6	51.6		51.6	51.6		39.4	39.4		39.4	39.4	39.4
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
10th %ile Green (s)	62.4	62.4		62.4	62.4		28.6	28.6		28.6	28.6	28.6
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	Gap
Stops (vph)		257			344		266	121			58	138
Fuel Used(gal)		5			6		7	2			1	3
CO Emissions (g/hr)		355			414		460	137			82	191
NOx Emissions (g/hr)		69			81		89	27			16	37
VOC Emissions (g/hr)		82			96		107	32			19	44
Dilemma Vehicles (#)		0			0		0	0			0	0
Queue Length 50th (ft)		85			137		191	94			52	97
Queue Length 95th (ft)		193			#345		#365	90			70	153
Internal Link Dist (ft)		543			205							563
Turn Bay Length (ft)												
Base Capacity (vph)		1275			1291		381	584			578	648
Starvation Cap Reductn		0			395		0	0			0	0
Spillback Cap Reductn		54			0		0	32			31	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.36			0.72		0.88	0.40			0.24	0.36

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 57 (57%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 30.8	Intersection LOS: C
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Malcolm X Boulevard & Roxbury Street



Lane Group	SBR	ø2
Total Delay	29.4	
LOS	C	
Approach Delay		
Approach LOS		
90th %ile Green (s)	43.0	24.0
90th %ile Term Code	Max	Ped
70th %ile Green (s)	43.0	0.0
70th %ile Term Code	Max	Skip
50th %ile Green (s)	43.0	0.0
50th %ile Term Code	Max	Skip
30th %ile Green (s)	39.4	0.0
30th %ile Term Code	Gap	Skip
10th %ile Green (s)	28.6	0.0
10th %ile Term Code	Gap	Skip
Stops (vph)	213	
Fuel Used(gal)	4	
CO Emissions (g/hr)	295	
NOx Emissions (g/hr)	57	
VOC Emissions (g/hr)	68	
Dilemma Vehicles (#)	0	
Queue Length 50th (ft)	142	
Queue Length 95th (ft)	230	
Internal Link Dist (ft)		
Turn Bay Length (ft)	80	
Base Capacity (vph)	540	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.56	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.999						0.852	0.850		0.963	
Flt Protected					0.991			0.999		0.950		
Satd. Flow (prot)	0	3134	0	0	2937	0	0	1330	1328	1243	1415	0
Flt Permitted					0.549					0.950		
Satd. Flow (perm)	0	3134	0	0	1627	0	0	1332	1328	1243	1415	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											12	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	581	4	100	516	0	2	0	524	176	193	48
Peak Hour Factor	0.92	0.94	1.00	0.88	0.95	0.92	0.50	0.92	0.91	0.89	0.94	0.72
Heavy Vehicles (%)	2%	14%	0%	5%	15%	2%	0%	2%	4%	35%	12%	14%
Adj. Flow (vph)	0	618	4	114	543	0	4	0	576	198	205	67
Lane Group Flow (vph)	0	622	0	0	657	0	0	292	288	198	272	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	24.0	0.0	24.0	24.0	0.0	26.0	20.0	26.0	26.0	26.0	0.0
Total Split (%)	0.0%	20.0%	0.0%	20.0%	20.0%	0.0%	21.7%	16.7%	21.7%	21.7%	21.7%	0.0%
Maximum Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		39.2			39.2			22.0	22.0	22.0	22.0	
Actuated g/C Ratio		0.33			0.33			0.18	0.18	0.18	0.18	
v/c Ratio		0.61			1.23			1.20	1.19	0.87	1.01	
Control Delay		38.5			156.6			163.9	160.0	81.9	104.7	
Queue Delay		9.4			50.4			56.2	8.3	0.0	167.1	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

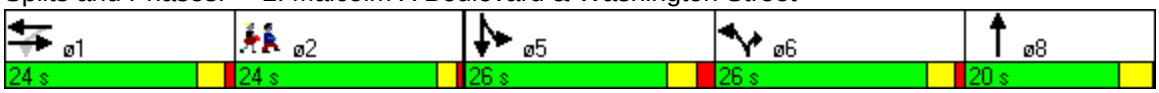
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		47.9			207.0			220.1	168.3	81.9	271.7	
LOS		D			F			F	F	F	F	
Approach Delay		47.9			207.0			194.4			191.8	
Approach LOS		D			F			F			F	
90th %ile Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
90th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
70th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
70th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
50th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
50th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
30th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
30th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
10th %ile Green (s)		44.0		44.0	44.0		22.0	16.0	22.0	21.0	21.0	
10th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
Stops (vph)		424			475			212	210	154	197	
Fuel Used(gal)		8			24			11	10	4	7	
CO Emissions (g/hr)		575			1682			741	721	279	455	
NOx Emissions (g/hr)		112			327			144	140	54	89	
VOC Emissions (g/hr)		133			390			172	167	65	105	
Dilemma Vehicles (#)		0			0			0	0	0	0	
Queue Length 50th (ft)		198			~304			~288	~282	151	~208	
Queue Length 95th (ft)		#424			#562			#473	#467	#282	#389	
Internal Link Dist (ft)		205			295			220			73	
Turn Bay Length (ft)												
Base Capacity (vph)		1024			532			244	243	228	269	
Starvation Cap Reductn		367			0			0	0	0	0	
Spillback Cap Reductn		26			45			24	4	0	78	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.95			1.35			1.33	1.21	0.87	1.42	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 52 (43%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 158.3		Intersection LOS: F	
Intersection Capacity Utilization 77.1%		ICU Level of Service D	
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: 2: Malcolm X Boulevard & Washington Street

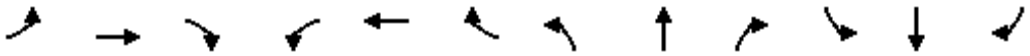


Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.983				0.850			
Flt Protected	0.950							0.983				
Satd. Flow (prot)	1107	3065	1408	0	2765	0	0	3176	1647	0	0	0
Flt Permitted	0.222							0.983				
Satd. Flow (perm)	259	3065	1408	0	2765	0	0	3176	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			297						8			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	285	740	255	0	391	46	225	431	7	0	0	0
Peak Hour Factor	0.90	0.91	0.86	0.92	0.76	0.70	0.88	0.87	0.44	0.92	0.92	0.92
Heavy Vehicles (%)	37%	6%	17%	2%	7%	48%	2%	10%	0%	2%	2%	2%
Adj. Flow (vph)	317	813	297	0	514	66	256	495	16	0	0	0
Lane Group Flow (vph)	317	813	297	0	580	0	0	751	16	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		13.0		16.0		13.0	13.0	13.0			
Total Split (s)	18.0	40.0	35.0	0.0	22.0	0.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	18.0%	40.0%	35.0%	0.0%	22.0%	0.0%	35.0%	35.0%	35.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		2.0		3.0		2.0	2.0	2.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	None		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	52.0	56.0	94.2		38.0			31.0	31.0			
Actuated g/C Ratio	0.52	0.56	0.94		0.38			0.31	0.31			
v/c Ratio	1.25	0.47	0.22		0.55			0.76	0.03			
Control Delay	163.3	16.4	0.8		22.3			37.2	17.4			
Queue Delay	0.0	1.0	0.0		1.5			0.0	0.0			

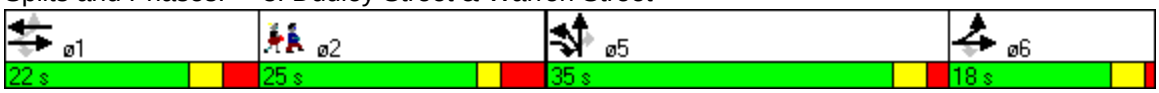
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	163.3	17.4	0.8		23.8			37.2	17.4			
LOS	F	B	A		C			D	B			
Approach Delay		46.3			23.8			36.8				
Approach LOS		D			C			D				
90th %ile Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
90th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
70th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
70th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
50th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
50th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
30th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
30th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
10th %ile Green (s)	14.0		30.0		41.0		30.0	30.0	30.0			
10th %ile Term Code	Max		MaxR		Coord		MaxR	MaxR	MaxR			
Stops (vph)	138	440	7		170			577	4			
Fuel Used(gal)	11	7	1		3			10	0			
CO Emissions (g/hr)	774	494	58		239			672	4			
NOx Emissions (g/hr)	151	96	11		47			131	1			
VOC Emissions (g/hr)	179	114	13		55			156	1			
Dilemma Vehicles (#)	0	0	0		0			0	0			
Queue Length 50th (ft)	~169	133	0		55			226	4			
Queue Length 95th (ft)	#432	307	18		m#250			283	7			
Internal Link Dist (ft)		295			66			206			449	
Turn Bay Length (ft)			100						75			
Base Capacity (vph)	253	1717	1344		1051			985	516			
Starvation Cap Reductn	0	598	139		283			0	0			
Spillback Cap Reductn	0	60	0		0			0	81			
Storage Cap Reductn	0	0	0		0			0	0			
Reduced v/c Ratio	1.25	0.73	0.25		0.76			0.76	0.04			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 23 (23%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 39.0		Intersection LOS: D	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
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.			
m Volume for 95th percentile queue is metered by upstream signal.			

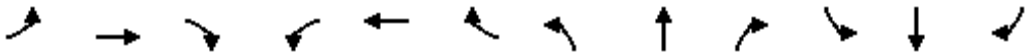
Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

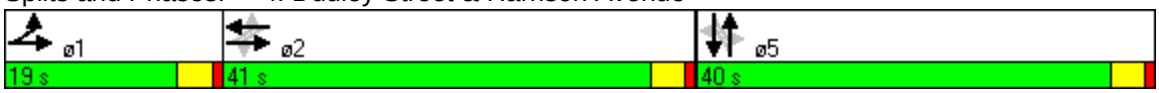
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.990			0.980			0.964	
Flt Protected	0.950				0.994			0.999		0.950		
Satd. Flow (prot)	1486	1502	0	0	2646	0	0	1614	0	1458	1450	0
Flt Permitted	0.402				0.838			0.996		0.187		
Satd. Flow (perm)	629	1502	0	0	2230	0	0	1610	0	287	1450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			9			10			18	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	300	442	5	46	359	24	3	541	68	25	243	76
Peak Hour Factor	0.96	0.92	0.38	0.80	0.94	0.72	0.38	0.95	0.69	0.67	0.93	0.93
Heavy Vehicles (%)	2%	9%	33%	9%	13%	17%	0%	3%	8%	4%	8%	0%
Adj. Flow (vph)	312	480	13	58	382	33	8	569	99	37	261	82
Lane Group Flow (vph)	312	493	0	0	473	0	0	676	0	37	343	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	19.0	60.0	0.0	41.0	41.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	19.0%	60.0%	0.0%	41.0%	41.0%	0.0%	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	52.0	56.0			37.0			36.0		36.0	36.0	
Actuated g/C Ratio	0.52	0.56			0.37			0.36		0.36	0.36	
v/c Ratio	0.68	0.59			0.57			1.15		0.36	0.64	
Control Delay	16.1	7.6			27.9			118.3		35.7	31.8	
Queue Delay	3.2	0.4			1.0			255.8		0.0	16.9	

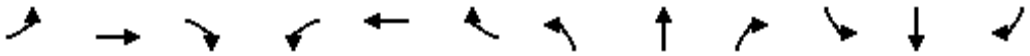


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.3	8.0			28.9			374.1		35.7	48.7	
LOS	B	A			C			F		D	D	
Approach Delay		12.3			28.9			374.1			47.4	
Approach LOS		B			C			F			D	
90th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
90th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
70th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
50th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
30th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
10th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	96	95			327			500		20	251	
Fuel Used(gal)	2	2			5			18		0	5	
CO Emissions (g/hr)	130	120			368			1289		27	319	
NOx Emissions (g/hr)	25	23			72			251		5	62	
VOC Emissions (g/hr)	30	28			85			299		6	74	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	23	35			122			~509		17	171	
Queue Length 95th (ft)	126	99			175			#732		34	271	
Internal Link Dist (ft)		66			225			115			367	
Turn Bay Length (ft)										200		
Base Capacity (vph)	456	842			831			586		103	534	
Starvation Cap Reductn	72	78			0			0		0	0	
Spillback Cap Reductn	0	0			154			195		0	178	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.81	0.65			0.70			1.73		0.36	0.96	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 1:EBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 126.2		Intersection LOS: F	
Intersection Capacity Utilization 88.5%		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: Dudley Street & Harrison Avenue

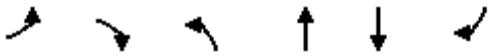




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	260	6	5	17	323	508	0	0	297	2
Peak Hour Factor	0.92	0.92	0.80	0.61	0.42	0.50	0.85	0.85	0.92	0.92	0.84	0.50
Hourly flow rate (vph)	0	0	325	10	12	34	380	598	0	0	354	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1753	1713	356	2038	1715	598	358			598		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1868	1822	258	2196	1824	598	260			598		
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 %	100	100	52	2	74	93	67			100		
cM capacity (veh/h)	27	45	674	10	45	506	1137			979		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	325	56	978	358
Volume Left	0	10	380	0
Volume Right	325	34	0	4
cSH	674	43	1137	1700
Volume to Capacity	0.48	1.31	0.33	0.21
Queue Length 95th (ft)	66	137	37	0
Control Delay (s)	15.2	393.4	6.9	0.0
Lane LOS	C	F	A	
Approach Delay (s)	15.2	393.4	6.9	0.0
Approach LOS	C	F		

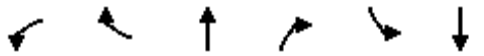
Intersection Summary			
Average Delay	19.6		
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	81	74	0	750	559	0
Peak Hour Factor	0.77	0.56	0.92	0.89	0.96	0.92
Hourly flow rate (vph)	105	132	0	843	582	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked						
vC, conflicting volume	1425	582	582			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1425	582	582			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	28	74	100			
cM capacity (veh/h)	146	502	992			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	237	843	582
Volume Left	105	0	0
Volume Right	132	0	0
cSH	242	1700	1700
Volume to Capacity	0.98	0.50	0.34
Queue Length 95th (ft)	229	0	0
Control Delay (s)	97.2	0.0	0.0
Lane LOS	F		
Approach Delay (s)	97.2	0.0	0.0
Approach LOS	F		

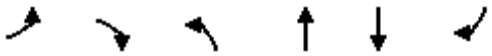
Intersection Summary			
Average Delay	13.9		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	85	79	671	0	0	632
Peak Hour Factor	0.65	0.84	0.89	0.92	0.92	0.92
Hourly flow rate (vph)	131	94	754	0	0	687
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked						
vC, conflicting volume	1441	754			754	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1441	754			754	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	9	77			100	
cM capacity (veh/h)	144	411			856	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	225	754	687
Volume Left	131	0	0
Volume Right	94	0	0
cSH	198	1700	1700
Volume to Capacity	1.14	0.44	0.40
Queue Length 95th (ft)	276	0	0
Control Delay (s)	155.9	0.0	0.0
Lane LOS	F		
Approach Delay (s)	155.9	0.0	0.0
Approach LOS	F		

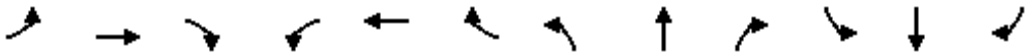
Intersection Summary			
Average Delay	21.0		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	23	78	704	613	44
Peak Hour Factor	0.38	0.69	0.73	0.91	0.95	0.75
Hourly flow rate (vph)	16	33	107	774	645	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked						
vC, conflicting volume	1633	645	704			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1633	645	704			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	93	88			
cM capacity (veh/h)	99	467	889			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	49	880	645	59
Volume Left	16	107	0	0
Volume Right	33	0	0	59
cSH	213	889	1700	1700
Volume to Capacity	0.23	0.12	0.38	0.03
Queue Length 95th (ft)	22	10	0	0
Control Delay (s)	26.9	3.0	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	26.9	3.0	0.0	
Approach LOS	D			

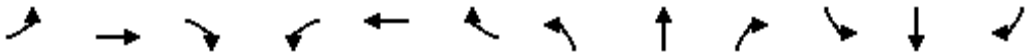
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	11	0	0	95	27	5	7	17	0	0	0
Peak Hour Factor	0.25	0.50	0.92	0.92	0.75	0.69	0.42	0.58	0.57	0.92	0.92	0.92
Hourly flow rate (vph)	8	22	0	0	127	39	12	12	30	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	30	166	54
Volume Left (vph)	8	0	12
Volume Right (vph)	0	39	30
Hadj (s)	0.05	-0.10	-0.16
Departure Headway (s)	4.2	3.9	4.2
Degree Utilization, x	0.04	0.18	0.06
Capacity (veh/h)	829	896	821
Control Delay (s)	7.4	7.8	7.4
Approach Delay (s)	7.4	7.8	7.4
Approach LOS	A	A	A

Intersection Summary				
Delay	7.7			
HCM Level of Service	A			
Intersection Capacity Utilization	16.6%	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	64	0	0	0	0	0	25	11	0	0	0
Peak Hour Factor	0.92	0.65	0.92	0.92	0.92	0.92	0.92	0.56	0.56	0.92	0.92	0.92
Hourly flow rate (vph)	0	98	0	0	0	0	0	45	20	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	98	64
Volume Left (vph)	0	0
Volume Right (vph)	0	20
Hadj (s)	0.14	-0.12
Departure Headway (s)	4.2	4.0
Degree Utilization, x	0.11	0.07
Capacity (veh/h)	845	870
Control Delay (s)	7.7	7.3
Approach Delay (s)	7.7	7.3
Approach LOS	A	A

Intersection Summary				
Delay	7.5			
HCM Level of Service	A			
Intersection Capacity Utilization	13.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.994			0.850				
Flt Protected		0.998					0.950				0.950	
Satd. Flow (prot)	0	3323	0	0	2975	0	1481	1367	0	0	1439	1580
Flt Permitted		0.774			0.851		0.310				0.950	
Satd. Flow (perm)	0	2577	0	0	2532	0	483	1367	0	0	1439	1580
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	17	538	74	2	487	12	197	27	149	13	164	420
Peak Hour Factor	0.61	0.92	0.72	0.50	0.89	0.50	0.77	0.57	0.84	0.54	0.79	0.88
Heavy Vehicles (%)	0%	10%	0%	0%	9%	0%	6%	0%	8%	0%	6%	1%
Adj. Flow (vph)	28	585	103	4	547	24	256	47	177	24	208	477
Lane Group Flow (vph)	0	716	0	0	575	0	256	224	0	0	232	477
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	0.0	48.0	48.0	0.0	48.0	48.0	48.0
Total Split (%)	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	48.0%	48.0%	0.0%	48.0%	48.0%	48.0%
Maximum Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		42.6			42.6		44.0	44.0			44.0	44.0
Actuated g/C Ratio		0.43			0.43		0.44	0.44			0.44	0.44
v/c Ratio		0.65			0.53		1.20	0.37			0.37	0.69
Control Delay		29.0			26.6		155.8	21.1			20.8	28.7
Queue Delay		0.8			1.8		0.0	0.2			0.2	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1304	
Flt Permitted		
Satd. Flow (perm)	1304	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	378	
Peak Hour Factor	0.88	
Heavy Vehicles (%)	4%	
Adj. Flow (vph)	430	
Lane Group Flow (vph)	430	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	48.0	27.0
Total Split (%)	48.0%	27%
Maximum Green (s)	44.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	44.0	
Actuated g/C Ratio	0.44	
v/c Ratio	0.75	
Control Delay	33.3	
Queue Delay	0.0	

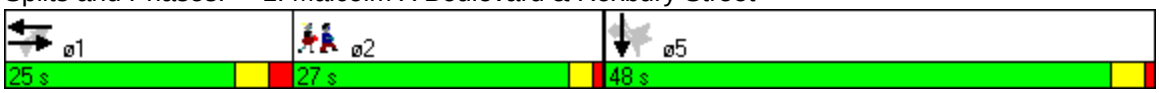
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		29.8			28.4		155.8	21.3			21.0	28.7
LOS		C			C		F	C			C	C
Approach Delay		29.8			28.4							28.9
Approach LOS		C			C							C
90th %ile Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
70th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
50th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
30th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
30th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
10th %ile Green (s)	47.0	47.0		47.0	47.0		44.0	44.0		44.0	44.0	44.0
10th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	Max
Stops (vph)		405			321		150	115			114	333
Fuel Used(gal)		9			6		8	2			2	6
CO Emissions (g/hr)		630			392		529	127			159	448
NOx Emissions (g/hr)		123			76		103	25			31	87
VOC Emissions (g/hr)		146			91		123	30			37	104
Dilemma Vehicles (#)		0			0		0	0			0	0
Queue Length 50th (ft)		166			125		~200	93			96	237
Queue Length 95th (ft)		#429			#321		#284	87			133	346
Internal Link Dist (ft)		543			205							563
Turn Bay Length (ft)												
Base Capacity (vph)		1098			1078		213	601			633	695
Starvation Cap Reductn		0			330		0	0			0	0
Spillback Cap Reductn		143			0		0	72			75	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.75			0.77		1.20	0.42			0.42	0.69

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 39.6		Intersection LOS: D	
Intersection Capacity Utilization 79.7%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

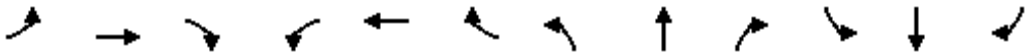
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Malcolm X Boulevard & Roxbury Street



Lane Group	SBR	ø2
Total Delay	33.3	
LOS	C	
Approach Delay		
Approach LOS		
90th %ile Green (s)	44.0	24.0
90th %ile Term Code	Max	Ped
70th %ile Green (s)	44.0	0.0
70th %ile Term Code	Max	Skip
50th %ile Green (s)	44.0	0.0
50th %ile Term Code	Max	Skip
30th %ile Green (s)	44.0	0.0
30th %ile Term Code	Max	Skip
10th %ile Green (s)	44.0	0.0
10th %ile Term Code	Max	Skip
Stops (vph)	311	
Fuel Used(gal)	6	
CO Emissions (g/hr)	432	
NOx Emissions (g/hr)	84	
VOC Emissions (g/hr)	100	
Dilemma Vehicles (#)	0	
Queue Length 50th (ft)	223	
Queue Length 95th (ft)	340	
Internal Link Dist (ft)		
Turn Bay Length (ft)	80	
Base Capacity (vph)	574	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.75	

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.996						0.852	0.850		0.969	
Flt Protected					0.988			0.999		0.950		
Satd. Flow (prot)	0	3272	0	0	3027	0	0	1282	1279	1435	1570	0
Flt Permitted					0.540					0.950		
Satd. Flow (perm)	0	3272	0	0	1654	0	0	1283	1279	1435	1570	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											9	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	848	11	134	428	0	3	0	408	263	227	55
Peak Hour Factor	0.92	0.97	0.50	0.93	0.91	0.92	0.75	0.92	0.85	0.90	0.82	0.78
Heavy Vehicles (%)	2%	9%	0%	5%	11%	2%	0%	2%	8%	17%	2%	2%
Adj. Flow (vph)	0	874	22	144	470	0	4	0	480	292	277	71
Lane Group Flow (vph)	0	896	0	0	614	0	0	244	240	292	348	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	18.0	20.0	18.0	23.0	23.0	0.0
Total Split (%)	0.0%	29.2%	0.0%	29.2%	29.2%	0.0%	15.0%	16.7%	15.0%	19.2%	19.2%	0.0%
Maximum Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		50.2			50.2			14.0	14.0	19.0	19.0	
Actuated g/C Ratio		0.42			0.42			0.12	0.12	0.16	0.16	
v/c Ratio		0.65			1.60dl			1.63	1.61	1.29	1.36	
Control Delay		32.3			49.3			344.6	338.2	198.9	223.0	
Queue Delay		61.9			3.7			69.2	9.8	0.0	158.4	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		94.2			53.0			413.7	348.0	198.9	381.4	
LOS		F			D			F	F	F	F	
Approach Delay		94.2			53.0			381.1			298.1	
Approach LOS		F			D			F			F	
90th %ile Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
90th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
70th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
70th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
50th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
50th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
30th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
30th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
10th %ile Green (s)		55.0		55.0	55.0		14.0	16.0	14.0	18.0	18.0	
10th %ile Term Code		Coord		Coord	Coord		Max	Max	Max	Max	Max	
Stops (vph)		613			416			145	143	203	208	
Fuel Used(gal)		11			10			16	15	12	14	
CO Emissions (g/hr)		765			670			1105	1070	845	1002	
NOx Emissions (g/hr)		149			130			215	208	164	195	
VOC Emissions (g/hr)		177			155			256	248	196	232	
Dilemma Vehicles (#)		0			0			0	0	0	0	
Queue Length 50th (ft)		266			210			~287	~281	~288	~351	
Queue Length 95th (ft)		#531			#457			#462	#421	#463	#474	
Internal Link Dist (ft)		205			295			220			73	
Turn Bay Length (ft)												
Base Capacity (vph)		1369			692			150	149	227	256	
Starvation Cap Reductn		574			0			0	0	0	0	
Spillback Cap Reductn		17			37			13	2	0	53	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		1.13			0.94			1.78	1.63	1.29	1.71	

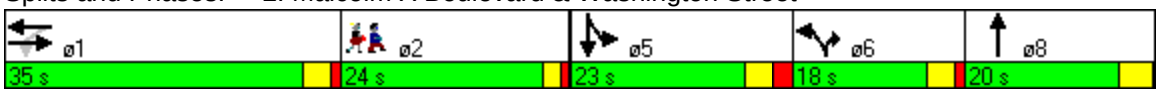
Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.63			
Intersection Signal Delay: 186.9		Intersection LOS: F	
Intersection Capacity Utilization 83.8%		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.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Malcolm X Boulevard & Washington Street

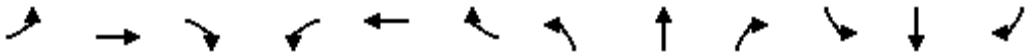


Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	21.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.978				0.850			
Flt Protected	0.950							0.978				
Satd. Flow (prot)	1243	3065	1525	0	2882	0	0	3203	1647	0	0	0
Flt Permitted	0.235							0.978				
Satd. Flow (perm)	307	3065	1525	0	2882	0	0	3203	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			616						16			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	391	642	530	0	357	52	205	292	16	0	0	0
Peak Hour Factor	0.89	0.91	0.86	0.92	0.91	0.77	0.77	0.91	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	22%	6%	8%	2%	2%	33%	2%	9%	0%	2%	2%	2%
Adj. Flow (vph)	439	705	616	0	392	68	266	321	24	0	0	0
Lane Group Flow (vph)	439	705	616	0	460	0	0	587	24	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		12.0		14.0		12.0	12.0	12.0			
Total Split (s)	18.0	39.0	36.0	0.0	21.0	0.0	36.0	36.0	36.0	0.0	0.0	0.0
Total Split (%)	18.0%	39.0%	36.0%	0.0%	21.0%	0.0%	36.0%	36.0%	36.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		1.0		1.0		1.0	1.0	1.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	Max		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	51.0	55.0	94.2		37.0			32.0	32.0			
Actuated g/C Ratio	0.51	0.55	0.94		0.37			0.32	0.32			
v/c Ratio	1.52	0.42	0.42		0.43			0.57	0.04			
Control Delay	274.4	16.1	1.2		22.9			31.0	13.8			
Queue Delay	0.0	0.7	0.1		7.6			0.0	0.1			

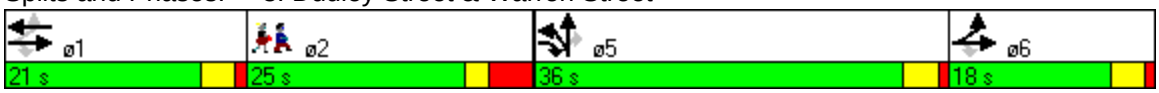
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	274.4	16.8	1.3		30.5			31.0	13.8			
LOS	F	B	A		C			C	B			
Approach Delay		75.6			30.5			30.3				
Approach LOS		E			C			C				
90th %ile Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
90th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
70th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
70th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
50th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
50th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
30th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
30th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
10th %ile Green (s)	14.0		32.0		42.0		32.0	32.0	32.0			
10th %ile Term Code	MaxR		MaxR		Coord		MaxR	MaxR	MaxR			
Stops (vph)	192	373	13		188			403	7			
Fuel Used(gal)	24	6	2		3			6	0			
CO Emissions (g/hr)	1681	423	122		239			452	8			
NOx Emissions (g/hr)	327	82	24		46			88	2			
VOC Emissions (g/hr)	390	98	28		55			105	2			
Dilemma Vehicles (#)	0	0	0		0			0	0			
Queue Length 50th (ft)	~298	113	0		49			163	3			
Queue Length 95th (ft)	#590	262	22		m#194			219	14			
Internal Link Dist (ft)		295			66			206			449	
Turn Bay Length (ft)			100						75			
Base Capacity (vph)	288	1686	1472		1066			1025	538			
Starvation Cap Reductn	0	604	107		554			0	0			
Spillback Cap Reductn	0	137	0		0			0	165			
Storage Cap Reductn	0	0	0		0			0	0			
Reduced v/c Ratio	1.52	0.65	0.45		0.90			0.57	0.06			

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 31 (31%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.52			
Intersection Signal Delay: 58.5		Intersection LOS: E	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	19.0
90th %ile Term Code	Ped
70th %ile Green (s)	0.0
70th %ile Term Code	Skip
50th %ile Green (s)	0.0
50th %ile Term Code	Skip
30th %ile Green (s)	0.0
30th %ile Term Code	Skip
10th %ile Green (s)	0.0
10th %ile Term Code	Skip
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

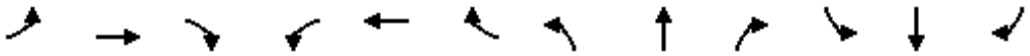
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.983			0.974			0.959	
Flt Protected	0.950				0.988			0.999		0.950		
Satd. Flow (prot)	1472	1536	0	0	2757	0	0	1580	0	1472	1520	0
Flt Permitted	0.341				0.713			0.965		0.320		
Satd. Flow (perm)	528	1536	0	0	1989	0	0	1526	0	496	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14			15			23	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	215	418	26	98	293	32	3	367	85	35	417	113
Peak Hour Factor	0.84	0.82	0.75	0.80	0.88	0.55	0.38	0.89	0.83	0.85	0.94	0.67
Heavy Vehicles (%)	3%	7%	0%	0%	10%	3%	0%	5%	7%	3%	1%	0%
Adj. Flow (vph)	256	510	35	122	333	58	8	412	102	41	444	169
Lane Group Flow (vph)	256	545	0	0	513	0	0	522	0	41	613	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	20.0	55.0	0.0	35.0	35.0	0.0	45.0	45.0	0.0	45.0	45.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	35.0%	35.0%	0.0%	45.0%	45.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	47.0	51.0			31.0			41.0		41.0	41.0	
Actuated g/C Ratio	0.47	0.51			0.31			0.41		0.41	0.41	
v/c Ratio	0.64	0.69			0.82			0.82		0.20	0.96	
Control Delay	21.5	14.1			43.4			38.1		22.3	56.7	
Queue Delay	8.1	1.2			16.2			106.6		0.0	189.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	29.6	15.3			59.6			144.8		22.3	245.8	
LOS	C	B			E			F		C	F	
Approach Delay		19.9			59.6			144.8			231.8	
Approach LOS		B			E			F			F	
90th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
90th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
70th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
50th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
50th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
30th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
30th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
10th %ile Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
10th %ile Term Code	Coord			MaxR	MaxR		MaxR	MaxR		MaxR	MaxR	
Stops (vph)	101	189			364			375		23	438	
Fuel Used(gal)	2	3			7			6		0	10	
CO Emissions (g/hr)	122	197			472			440		29	727	
NOx Emissions (g/hr)	24	38			92			86		6	141	
VOC Emissions (g/hr)	28	46			109			102		7	168	
Dilemma Vehicles (#)	0	0			0			0		0	0	
Queue Length 50th (ft)	38	81			154			283		16	362	
Queue Length 95th (ft)	96	89			#232			#460		39	#598	
Internal Link Dist (ft)		66			225			115			367	
Turn Bay Length (ft)										200		
Base Capacity (vph)	399	786			626			635		203	637	
Starvation Cap Reductn	105	91			0			0		0	0	
Spillback Cap Reductn	0	0			109			211		0	211	
Storage Cap Reductn	0	0			0			0		0	0	
Reduced v/c Ratio	0.87	0.78			0.99			1.23		0.20	1.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 1:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 109.9	Intersection LOS: F
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

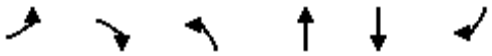
Splits and Phases: 4: Dudley Street & Harrison Avenue



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	496	11	8	19	146	391	0	0	418	0
Peak Hour Factor	0.92	0.92	0.81	0.55	0.67	0.75	0.85	0.84	0.92	0.92	0.83	0.92
Hourly flow rate (vph)	0	0	612	20	12	25	172	465	0	0	504	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1344	1313	504	1925	1313	465	504			465		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1402	1366	420	2082	1366	465	420			465		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	0	0	89	96	82			100		
cM capacity (veh/h)	76	103	542	0	104	601	956			1096		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	612	57	637	504
Volume Left	0	20	172	0
Volume Right	612	25	0	0
cSH	542	0	956	1700
Volume to Capacity	1.13	Err	0.18	0.30
Queue Length 95th (ft)	505	Err	16	0
Control Delay (s)	105.9	Err	4.3	0.0
Lane LOS	F	F	A	
Approach Delay (s)	105.9	Err	4.3	0.0
Approach LOS	F	F		

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	58	91	0	480	924	0
Peak Hour Factor	0.71	0.84	0.92	0.89	0.85	0.92
Hourly flow rate (vph)	82	108	0	539	1087	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1626	1087	1087			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1722	1100	1100			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	2	50	100			
cM capacity (veh/h)	84	218	550			

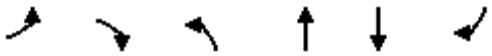
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	190	539	1087
Volume Left	82	0	0
Volume Right	108	0	0
cSH	129	1700	1700
Volume to Capacity	1.47	0.32	0.64
Queue Length 95th (ft)	327	0	0
Control Delay (s)	312.8	0.0	0.0
Lane LOS	F		
Approach Delay (s)	312.8	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	32.7		
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	63	71	409	0	0	1015
Peak Hour Factor	0.85	0.80	0.89	0.92	0.92	0.87
Hourly flow rate (vph)	74	89	460	0	0	1167
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked	0.88					
vC, conflicting volume	1626	460			460	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1714	460			460	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	13	85			100	
cM capacity (veh/h)	86	589			1101	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	163	460	1167
Volume Left	74	0	0
Volume Right	89	0	0
cSH	160	1700	1700
Volume to Capacity	1.02	0.27	0.69
Queue Length 95th (ft)	199	0	0
Control Delay (s)	132.4	0.0	0.0
Lane LOS	F		
Approach Delay (s)	132.4	0.0	0.0
Approach LOS	F		

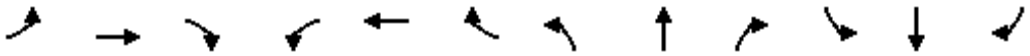
Intersection Summary			
Average Delay	12.1		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	18	51	420	959	32
Peak Hour Factor	0.75	0.75	0.78	0.91	0.87	0.90
Hourly flow rate (vph)	8	24	65	462	1102	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1695	1102	1138			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1758	1112	1150			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	90	88			
cM capacity (veh/h)	76	235	557			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	32	527	1102	36
Volume Left	8	65	0	0
Volume Right	24	0	0	36
cSH	155	557	1700	1700
Volume to Capacity	0.21	0.12	0.65	0.02
Queue Length 95th (ft)	19	10	0	0
Control Delay (s)	34.2	3.3	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	34.2	3.3	0.0	
Approach LOS	D			

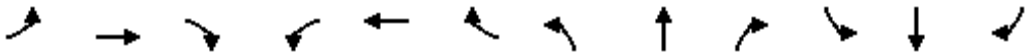
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	4	0	0	61	22	2	19	21	0	0	0
Peak Hour Factor	0.92	0.50	0.74	0.80	0.85	0.66	0.50	0.65	0.70	0.97	0.93	0.74
Hourly flow rate (vph)	0	8	0	0	72	33	4	29	30	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	8	105	63
Volume Left (vph)	0	0	4
Volume Right (vph)	0	33	30
Hadj (s)	0.00	-0.17	-0.21
Departure Headway (s)	4.1	3.9	3.9
Degree Utilization, x	0.01	0.11	0.07
Capacity (veh/h)	848	911	883
Control Delay (s)	7.2	7.4	7.2
Approach Delay (s)	7.2	7.4	7.2
Approach LOS	A	A	A

Intersection Summary				
Delay	7.3			
HCM Level of Service	A			
Intersection Capacity Utilization	14.5%	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		Stop			Stop			Stop			Stop	
Volume (vph)	2	71	0	0	0	0	0	24	11	0	0	0
Peak Hour Factor	0.25	0.91	0.92	0.92	0.92	0.92	0.92	0.75	0.46	0.92	0.92	0.92
Hourly flow rate (vph)	8	78	0	0	0	0	0	32	24	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	86	56
Volume Left (vph)	8	0
Volume Right (vph)	0	24
Hadj (s)	0.13	-0.15
Departure Headway (s)	4.1	3.9
Degree Utilization, x	0.10	0.06
Capacity (veh/h)	852	884
Control Delay (s)	7.6	7.2
Approach Delay (s)	7.6	7.2
Approach LOS	A	A

Intersection Summary				
Delay	7.4			
HCM Level of Service	A			
Intersection Capacity Utilization	13.8%	ICU Level of Service	A	
Analysis Period (min)	15			

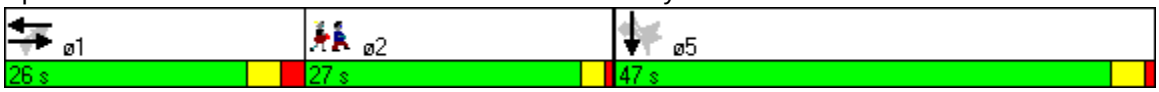
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
Total 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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977			0.995			0.850				
Flt Protected		0.999					0.950				0.950	
Satd. Flow (prot)	0	3183	0	0	2874	0	1525	1358	0	0	1345	1506
Flt Permitted		0.835			0.952		0.544				0.950	
Satd. Flow (perm)	0	2661	0	0	2736	0	873	1358	0	0	1345	1506
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	5	348	55	3	563	14	319	15	166	8	86	209
Peak Hour Factor	0.42	0.95	0.80	0.75	0.89	0.65	0.92	0.58	0.82	0.67	0.70	0.88
Heavy Vehicles (%)	0%	15%	4%	0%	13%	0%	3%	7%	7%	0%	14%	6%
Adj. Flow (vph)	12	366	69	4	633	22	347	26	202	12	123	238
Lane Group Flow (vph)	0	447	0	0	659	0	347	228	0	0	135	238
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	26.0	26.0	0.0	26.0	26.0	0.0	47.0	47.0	0.0	47.0	47.0	47.0
Total Split (%)	26.0%	26.0%	0.0%	26.0%	26.0%	0.0%	47.0%	47.0%	0.0%	47.0%	47.0%	47.0%
Maximum Green (s)	21.0	21.0		21.0	21.0		43.0	43.0		43.0	43.0	43.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		45.6			45.6		41.0	41.0			41.0	41.0
Actuated g/C Ratio		0.46			0.46		0.41	0.41			0.41	0.41
v/c Ratio		0.37			0.53		0.97	0.41			0.24	0.39
Control Delay		22.3			25.1		70.6	23.0			20.0	22.3
Queue Delay		0.0			1.6		0.0	0.1			0.1	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1256	
Flt Permitted		
Satd. Flow (perm)	1256	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	282	
Peak Hour Factor	0.91	
Heavy Vehicles (%)	8%	
Adj. Flow (vph)	310	
Lane Group Flow (vph)	310	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	47.0	27.0
Total Split (%)	47.0%	27%
Maximum Green (s)	43.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	41.0	
Actuated g/C Ratio	0.41	
v/c Ratio	0.60	
Control Delay	28.3	
Queue Delay	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		22.4			26.7		70.6	23.1			20.0	22.3
LOS		C			C		E	C			C	C
Approach Delay		22.4			26.7							24.6
Approach LOS		C			C							C

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 57 (57%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 31.4		Intersection LOS: C	
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Malcolm X Boulevard & Roxbury Street



Lane Group	SBR	ø2
Total Delay	28.3	
LOS	C	
Approach Delay		
Approach LOS		

Intersection Summary

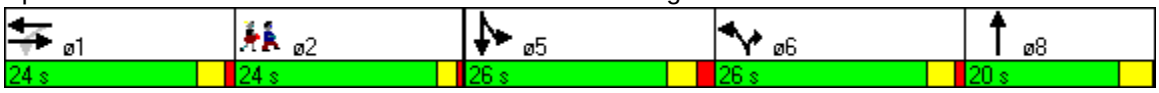
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.999						0.852	0.850		0.964	
Flt Protected					0.991			0.999		0.950		
Satd. Flow (prot)	0	3134	0	0	2938	0	0	1330	1328	1243	1417	0
Flt Permitted					0.551					0.950		
Satd. Flow (perm)	0	3134	0	0	1633	0	0	1332	1328	1243	1417	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											12	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	595	4	104	529	0	2	0	555	180	202	49
Peak Hour Factor	0.92	0.94	1.00	0.88	0.95	0.92	0.50	0.92	0.91	0.89	0.94	0.72
Heavy Vehicles (%)	2%	14%	0%	5%	15%	2%	0%	2%	4%	35%	12%	14%
Adj. Flow (vph)	0	633	4	118	557	0	4	0	610	202	215	68
Lane Group Flow (vph)	0	637	0	0	675	0	0	309	305	202	283	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	24.0	0.0	24.0	24.0	0.0	26.0	20.0	26.0	26.0	26.0	0.0
Total Split (%)	0.0%	20.0%	0.0%	20.0%	20.0%	0.0%	21.7%	16.7%	21.7%	21.7%	21.7%	0.0%
Maximum Green (s)		20.0		20.0	20.0		22.0	16.0	22.0	21.0	21.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		39.2			39.2			22.0	22.0	22.0	22.0	
Actuated g/C Ratio		0.33			0.33			0.18	0.18	0.18	0.18	
v/c Ratio		0.62			1.26			1.27	1.26	0.89	1.05	
Control Delay		38.8			168.2			188.8	184.8	84.7	113.6	
Queue Delay		11.9			58.0			60.6	11.4	0.4	188.7	

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		50.7			226.2			249.4	196.2	85.2	302.3	
LOS		D			F			F	F	F	F	
Approach Delay		50.7			226.2			223.0			211.9	
Approach LOS		D			F			F			F	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 52 (43%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 176.1		Intersection LOS: F	
Intersection Capacity Utilization 79.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Malcolm X Boulevard & Washington Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

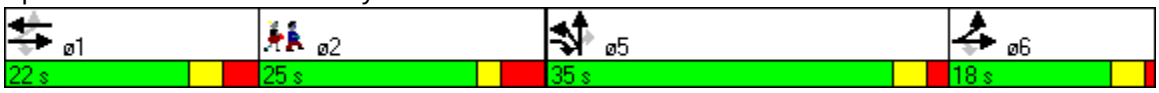
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.983				0.850			
Flt Protected	0.950							0.983				
Satd. Flow (prot)	1107	3065	1408	0	2766	0	0	3175	1647	0	0	0
Flt Permitted	0.222							0.983				
Satd. Flow (perm)	259	3065	1408	0	2766	0	0	3175	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			305						8			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	301	768	262	0	402	47	230	441	7	0	0	0
Peak Hour Factor	0.90	0.91	0.86	0.92	0.76	0.70	0.88	0.87	0.44	0.92	0.92	0.92
Heavy Vehicles (%)	37%	6%	17%	2%	7%	48%	2%	10%	0%	2%	2%	2%
Adj. Flow (vph)	334	844	305	0	529	67	261	507	16	0	0	0
Lane Group Flow (vph)	334	844	305	0	596	0	0	768	16	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		13.0		16.0		13.0	13.0	13.0			
Total Split (s)	18.0	40.0	35.0	0.0	22.0	0.0	35.0	35.0	35.0	0.0	0.0	0.0
Total Split (%)	18.0%	40.0%	35.0%	0.0%	22.0%	0.0%	35.0%	35.0%	35.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		30.0		16.0		30.0	30.0	30.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		2.0		3.0		2.0	2.0	2.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	None		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	52.0	56.0	94.2		38.0			31.0	31.0			
Actuated g/C Ratio	0.52	0.56	0.94		0.38			0.31	0.31			
v/c Ratio	1.32	0.49	0.23		0.57			0.78	0.03			
Control Delay	190.1	16.7	0.8		22.6			38.0	17.4			
Queue Delay	0.0	1.1	0.0		1.7			0.0	0.0			

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	190.1	17.8	0.8		24.3			38.0	17.4			
LOS	F	B	A		C			D	B			
Approach Delay		53.1			24.3			37.6				
Approach LOS		D			C			D				

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 23 (23%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 42.9		Intersection LOS: D	
Intersection Capacity Utilization 63.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	

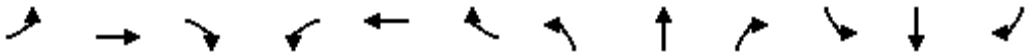
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.990			0.980			0.964	
Flt Protected	0.950				0.994			0.999		0.950		
Satd. Flow (prot)	1486	1502	0	0	2646	0	0	1615	0	1458	1450	0
Flt Permitted	0.395				0.835			0.996		0.179		
Satd. Flow (perm)	618	1502	0	0	2223	0	0	1610	0	275	1450	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			9			10			18	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	315	455	5	47	368	24	3	555	69	25	249	78
Peak Hour Factor	0.96	0.92	0.38	0.80	0.94	0.72	0.38	0.95	0.69	0.67	0.93	0.93
Heavy Vehicles (%)	2%	9%	33%	9%	13%	17%	0%	3%	8%	4%	8%	0%
Adj. Flow (vph)	328	495	13	59	391	33	8	584	100	37	268	84
Lane Group Flow (vph)	328	508	0	0	483	0	0	692	0	37	352	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	19.0	60.0	0.0	41.0	41.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
Total Split (%)	19.0%	60.0%	0.0%	41.0%	41.0%	0.0%	40.0%	40.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	15.0			37.0	37.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	52.0	56.0			37.0			36.0		36.0	36.0	
Actuated g/C Ratio	0.52	0.56			0.37			0.36		0.36	0.36	
v/c Ratio	0.73	0.60			0.58			1.18		0.37	0.66	
Control Delay	18.6	7.8			28.3			128.7		37.0	32.5	
Queue Delay	4.2	0.4			1.1			264.6		0.0	21.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	22.8	8.2			29.4			393.3		37.0	54.1	
LOS	C	A			C			F		D	D	
Approach Delay		13.9			29.4			393.3			52.5	
Approach LOS		B			C			F			D	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 4 (4%), Referenced to phase 1:EBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 132.7		Intersection LOS: F	
Intersection Capacity Utilization 90.4%		ICU Level of Service E	
Analysis Period (min) 15			

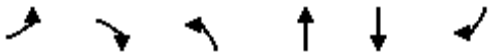
Splits and Phases: 4: Dudley Street & Harrison Avenue



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	267	6	5	18	334	539	0	0	309	2
Peak Hour Factor	0.92	0.92	0.80	0.61	0.42	0.50	0.85	0.85	0.92	0.92	0.84	0.50
Hourly flow rate (vph)	0	0	334	10	12	36	393	634	0	0	368	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1832	1790	370	2124	1792	634	372			634		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1968	1920	266	2308	1922	634	269			634		
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 %	100	100	49	0	68	93	65			100		
cM capacity (veh/h)	21	37	659	8	38	483	1117			949		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	334	58	1027	372
Volume Left	0	10	393	0
Volume Right	334	36	0	4
cSH	659	35	1117	1700
Volume to Capacity	0.51	1.67	0.35	0.22
Queue Length 95th (ft)	72	158	40	0
Control Delay (s)	15.9	575.5	7.3	0.0
Lane LOS	C	F	A	
Approach Delay (s)	15.9	575.5	7.3	0.0
Approach LOS	C	F		

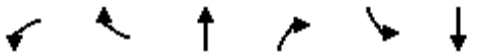
Intersection Summary				
Average Delay	25.7			
Intersection Capacity Utilization	76.6%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	104	88	0	769	580	0
Peak Hour Factor	0.77	0.56	0.92	0.89	0.96	0.92
Hourly flow rate (vph)	135	157	0	864	604	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked						
vC, conflicting volume	1468	604	604			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1468	604	604			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	2	68	100			
cM capacity (veh/h)	138	487	974			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	292	864	604
Volume Left	135	0	0
Volume Right	157	0	0
cSH	224	1700	1700
Volume to Capacity	1.30	0.51	0.36
Queue Length 95th (ft)	389	0	0
Control Delay (s)	208.1	0.0	0.0
Lane LOS	F		
Approach Delay (s)	208.1	0.0	0.0
Approach LOS	F		

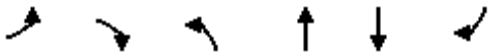
Intersection Summary			
Average Delay	34.5		
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	88	81	688	0	0	665
Peak Hour Factor	0.65	0.84	0.89	0.92	0.92	0.92
Hourly flow rate (vph)	135	96	773	0	0	723
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked						
vC, conflicting volume	1496	773			773	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1496	773			773	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	76			100	
cM capacity (veh/h)	133	401			842	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	232	773	723
Volume Left	135	0	0
Volume Right	96	0	0
cSH	184	1700	1700
Volume to Capacity	1.26	0.45	0.43
Queue Length 95th (ft)	319	0	0
Control Delay (s)	202.8	0.0	0.0
Lane LOS	F		
Approach Delay (s)	202.8	0.0	0.0
Approach LOS	F		

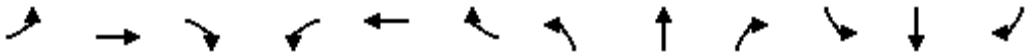
Intersection Summary			
Average Delay	27.2		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	23	80	724	640	45
Peak Hour Factor	0.38	0.69	0.73	0.91	0.95	0.75
Hourly flow rate (vph)	16	33	110	796	674	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked						
vC, conflicting volume	1688	674	734			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1688	674	734			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	93	87			
cM capacity (veh/h)	91	450	867			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	49	905	674	60
Volume Left	16	110	0	0
Volume Right	33	0	0	60
cSH	198	867	1700	1700
Volume to Capacity	0.25	0.13	0.40	0.04
Queue Length 95th (ft)	24	11	0	0
Control Delay (s)	29.0	3.2	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	29.0	3.2	0.0	
Approach LOS	D			

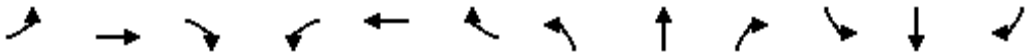
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	12	0	0	98	27	5	7	18	0	0	0
Peak Hour Factor	0.25	0.50	0.92	0.92	0.75	0.69	0.42	0.58	0.57	0.92	0.92	0.92
Hourly flow rate (vph)	8	24	0	0	131	39	12	12	32	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	32	170	56
Volume Left (vph)	8	0	12
Volume Right (vph)	0	39	32
Hadj (s)	0.05	-0.10	-0.17
Departure Headway (s)	4.2	4.0	4.2
Degree Utilization, x	0.04	0.19	0.06
Capacity (veh/h)	828	894	820
Control Delay (s)	7.4	7.9	7.4
Approach Delay (s)	7.4	7.9	7.4
Approach LOS	A	A	A

Intersection Summary				
Delay	7.7			
HCM Level of Service	A			
Intersection Capacity Utilization	16.8%	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	65	0	0	0	0	0	25	12	0	0	0
Peak Hour Factor	0.92	0.65	0.92	0.92	0.92	0.92	0.92	0.56	0.56	0.92	0.92	0.92
Hourly flow rate (vph)	0	100	0	0	0	0	0	45	21	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	100	66
Volume Left (vph)	0	0
Volume Right (vph)	0	21
Hadj (s)	0.14	-0.14
Departure Headway (s)	4.2	4.0
Degree Utilization, x	0.12	0.07
Capacity (veh/h)	844	872
Control Delay (s)	7.7	7.3
Approach Delay (s)	7.7	7.3
Approach LOS	A	A

Intersection Summary				
Delay	7.6			
HCM Level of Service	A			
Intersection Capacity Utilization	13.4%	ICU Level of Service	A	
Analysis Period (min)	15			

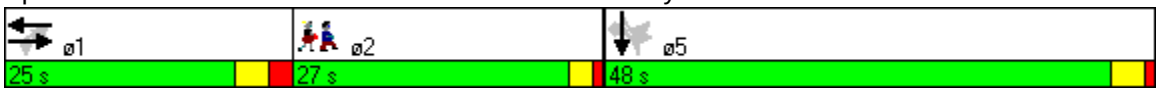
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	14	16	12	12	12	12	11	12	12	12	10	10
Storage Length (ft)	0		0	0			0	0			0	
Storage Lanes	0		0	0			1	1			1	
Total 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	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15	9	9	15	15	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.993			0.850				
Flt Protected		0.998					0.950				0.950	
Satd. Flow (prot)	0	3324	0	0	2972	0	1481	1367	0	0	1439	1580
Flt Permitted		0.752			0.833		0.299				0.950	
Satd. Flow (perm)	0	2505	0	0	2476	0	466	1367	0	0	1439	1580
Right Turn on Red			No			No			No			
Satd. Flow (RTOR)												
Headway Factor	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.14	1.25	1.25
Link Speed (mph)		30			30							30
Link Distance (ft)		623			285							643
Travel Time (s)		14.2			6.5							14.6
Volume (vph)	18	551	78	2	499	13	203	28	152	14	168	430
Peak Hour Factor	0.61	0.92	0.72	0.50	0.89	0.50	0.77	0.57	0.84	0.54	0.79	0.88
Heavy Vehicles (%)	0%	10%	0%	0%	9%	0%	6%	0%	8%	0%	6%	1%
Adj. Flow (vph)	30	599	108	4	561	26	264	49	181	26	213	489
Lane Group Flow (vph)	0	737	0	0	591	0	264	230	0	0	239	489
Turn Type	Perm			Perm			D.Pm	custom		Perm	Perm	
Protected Phases		1			1							5
Permitted Phases	1			1			5	5		5	5	
Detector Phases	1	1		1	1		5	5		5	5	5
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	8.0
Minimum Split (s)	17.0	17.0		17.0	17.0		19.0	19.0		19.0	19.0	19.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	0.0	48.0	48.0	0.0	48.0	48.0	48.0
Total Split (%)	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%	48.0%	48.0%	0.0%	48.0%	48.0%	48.0%
Maximum Green (s)	20.0	20.0		20.0	20.0		44.0	44.0		44.0	44.0	44.0
Yellow Time (s)	3.0	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		1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead	Lead		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	0	0		0	0							
Act Effct Green (s)		42.6			42.6		44.0	44.0			44.0	44.0
Actuated g/C Ratio		0.43			0.43		0.44	0.44			0.44	0.44
v/c Ratio		0.69			0.56		1.29	0.38			0.38	0.70
Control Delay		30.1			27.3		189.2	21.2			21.0	29.4
Queue Delay		1.2			2.1		0.0	0.5			0.5	0.0

Lane Group	SBR	ø2
Lane Configurations		
Ideal Flow (vphpl)	1900	
Lane Width (ft)	10	
Storage Length (ft)	80	
Storage Lanes	1	
Total Lost Time (s)	4.0	
Leading Detector (ft)	50	
Trailing Detector (ft)	0	
Turning Speed (mph)	9	
Lane Util. Factor	1.00	
Frt	0.850	
Flt Protected		
Satd. Flow (prot)	1304	
Flt Permitted		
Satd. Flow (perm)	1304	
Right Turn on Red	No	
Satd. Flow (RTOR)		
Headway Factor	1.25	
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Volume (vph)	387	
Peak Hour Factor	0.88	
Heavy Vehicles (%)	4%	
Adj. Flow (vph)	440	
Lane Group Flow (vph)	440	
Turn Type	Perm	
Protected Phases		2
Permitted Phases	5	
Detector Phases	5	
Minimum Initial (s)	8.0	7.0
Minimum Split (s)	19.0	27.0
Total Split (s)	48.0	27.0
Total Split (%)	48.0%	27%
Maximum Green (s)	44.0	24.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	1.0	1.0
Lead/Lag		Lag
Lead-Lag Optimize?		
Vehicle Extension (s)	2.0	2.0
Recall Mode	None	None
Walk Time (s)		7.0
Flash Dont Walk (s)		17.0
Pedestrian Calls (#/hr)		5
Act Effct Green (s)	44.0	
Actuated g/C Ratio	0.44	
v/c Ratio	0.77	
Control Delay	34.4	
Queue Delay	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBR	NBR2	SBL2	SBL	SBT
Total Delay		31.3			29.3		189.2	21.8			21.5	29.4
LOS		C			C		F	C			C	C
Approach Delay		31.3			29.3							29.7
Approach LOS		C			C							C

Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 95 (95%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 43.5		Intersection LOS: D	
Intersection Capacity Utilization 82.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Malcolm X Boulevard & Roxbury Street



Lane Group	SBR	ø2
Total Delay	34.4	
LOS	C	
Approach Delay		
Approach LOS		

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	13	13	13	11	12	12	13	11	11
Storage Length (ft)	0		0	0		0	25		0	0		75
Storage Lanes	0		0	0		0	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50		50	50	50	50	50	
Trailing Detector (ft)		0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.996						0.852	0.850		0.970	
Flt Protected					0.988			0.999		0.950		
Satd. Flow (prot)	0	3273	0	0	3027	0	0	1282	1279	1435	1572	0
Flt Permitted					0.543					0.950		
Satd. Flow (perm)	0	3273	0	0	1663	0	0	1283	1279	1435	1572	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)											9	
Headway Factor	1.14	1.01	1.14	1.10	1.10	1.10	1.19	1.14	1.14	1.10	1.19	1.19
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		285			375			300			153	
Travel Time (s)		6.5			8.5			6.8			3.5	
Volume (vph)	0	868	12	138	439	0	3	0	422	270	243	57
Peak Hour Factor	0.92	0.97	0.50	0.93	0.91	0.92	0.75	0.92	0.85	0.90	0.82	0.78
Heavy Vehicles (%)	2%	9%	0%	5%	11%	2%	0%	2%	8%	17%	2%	2%
Adj. Flow (vph)	0	895	24	148	482	0	4	0	496	300	296	73
Lane Group Flow (vph)	0	919	0	0	630	0	0	252	248	300	369	0
Turn Type				Perm			Prot		custom	Split		
Protected Phases		1			1		6	8	6	5	5	
Permitted Phases				1								
Detector Phases		1		1	1		6	8	6	5	5	
Minimum Initial (s)		15.0		15.0	15.0		8.0	4.0	8.0	8.0	8.0	
Minimum Split (s)		19.0		19.0	19.0		12.0	20.0	12.0	13.0	13.0	
Total Split (s)	0.0	35.0	0.0	35.0	35.0	0.0	18.0	20.0	18.0	23.0	23.0	0.0
Total Split (%)	0.0%	29.2%	0.0%	29.2%	29.2%	0.0%	15.0%	16.7%	15.0%	19.2%	19.2%	0.0%
Maximum Green (s)		31.0		31.0	31.0		14.0	16.0	14.0	18.0	18.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.5	3.0	3.0	3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	0.5	1.0	2.0	2.0	
Lead/Lag		Lead		Lead	Lead		Lag		Lag	Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0		2.0	2.0		2.0	3.0	2.0	2.0	2.0	
Recall Mode		C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)								5.0				
Flash Dont Walk (s)								11.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		50.2			50.2			14.0	14.0	19.0	19.0	
Actuated g/C Ratio		0.42			0.42			0.12	0.12	0.16	0.16	
v/c Ratio		0.67			1.64dl			1.68	1.66	1.32	1.44	
Control Delay		32.7			51.4			366.5	360.2	212.1	255.6	
Queue Delay		71.0			6.9			71.5	15.3	0.0	184.9	

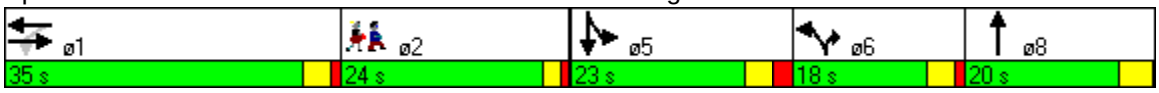
Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	21.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		103.7			58.3			438.0	375.5	212.1	440.5	
LOS		F			E			F	F	F	F	
Approach Delay		103.7			58.3			407.0			338.1	
Approach LOS		F			E			F			F	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.68			
Intersection Signal Delay: 206.7		Intersection LOS: F	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 2: Malcolm X Boulevard & Washington Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

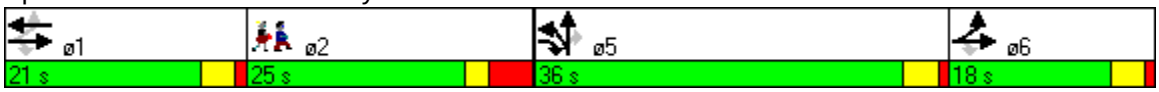
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	16	12	11	12	12	14	16	12	12	12
Storage Length (ft)	0		100	0		0	0		75	0		0
Storage Lanes	1		1	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50		50	50	50			
Trailing Detector (ft)	0	0	0		0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frt			0.850		0.978				0.850			
Flt Protected	0.950							0.978				
Satd. Flow (prot)	1243	3065	1525	0	2883	0	0	3203	1647	0	0	0
Flt Permitted	0.235							0.978				
Satd. Flow (perm)	307	3065	1525	0	2883	0	0	3203	1647	0	0	0
Right Turn on Red			Yes			No			Yes			Yes
Satd. Flow (RTOR)			630						17			
Headway Factor	1.25	1.14	0.97	1.14	1.19	1.14	1.14	1.05	0.97	1.14	1.14	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		375			146			286			529	
Travel Time (s)		8.5			3.3			6.5			12.0	
Volume (vph)	402	659	542	0	366	53	210	298	17	0	0	0
Peak Hour Factor	0.89	0.91	0.86	0.92	0.91	0.77	0.77	0.91	0.67	0.92	0.92	0.92
Heavy Vehicles (%)	22%	6%	8%	2%	2%	33%	2%	9%	0%	2%	2%	2%
Adj. Flow (vph)	452	724	630	0	402	69	273	327	25	0	0	0
Lane Group Flow (vph)	452	724	630	0	471	0	0	600	25	0	0	0
Turn Type	D.P+P		pm+ov				Split		Perm			
Protected Phases	6	1 6	5		1		5	5				
Permitted Phases	1		1 6						5			
Detector Phases	6	1 6	5		1		5	5	5			
Minimum Initial (s)	8.0		8.0		10.0		8.0	8.0	8.0			
Minimum Split (s)	12.0		12.0		14.0		12.0	12.0	12.0			
Total Split (s)	18.0	39.0	36.0	0.0	21.0	0.0	36.0	36.0	36.0	0.0	0.0	0.0
Total Split (%)	18.0%	39.0%	36.0%	0.0%	21.0%	0.0%	36.0%	36.0%	36.0%	0.0%	0.0%	0.0%
Maximum Green (s)	14.0		32.0		17.0		32.0	32.0	32.0			
Yellow Time (s)	3.0		3.0		3.0		3.0	3.0	3.0			
All-Red Time (s)	1.0		1.0		1.0		1.0	1.0	1.0			
Lead/Lag	Lag		Lead		Lead		Lead	Lead	Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0		2.0		2.0		2.0	2.0	2.0			
Recall Mode	Max		Max		C-Max		Max	Max	Max			
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	51.0	55.0	94.2		37.0			32.0	32.0			
Actuated g/C Ratio	0.51	0.55	0.94		0.37			0.32	0.32			
v/c Ratio	1.57	0.43	0.43		0.44			0.59	0.05			
Control Delay	293.8	16.3	1.2		22.9			31.2	13.5			
Queue Delay	0.0	0.7	0.1		9.5			0.0	0.1			

Lane Group	ø2
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	25%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	4.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	8.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	5
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	293.8	17.0	1.3		32.4			31.2	13.6			
LOS	F	B	A		C			C	B			
Approach Delay		80.8			32.4			30.5				
Approach LOS		F			C			C				

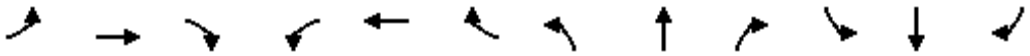
Intersection Summary			
Area Type:	CBD		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 31 (31%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.57			
Intersection Signal Delay: 62.1		Intersection LOS: E	
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Dudley Street & Warren Street



Lane Group	ø2
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

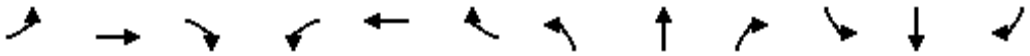


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	10	10	10	10	12	12	12	10	10	10
Storage Length (ft)	0		0	110		0	0		0	200		0
Storage Lanes	1		0	1		0	0		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.983			0.974			0.959	
Flt Protected	0.950				0.988			0.999		0.950		
Satd. Flow (prot)	1472	1536	0	0	2757	0	0	1580	0	1472	1520	0
Flt Permitted	0.330				0.709			0.939		0.312		
Satd. Flow (perm)	511	1536	0	0	1979	0	0	1485	0	483	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14			15			23	
Headway Factor	1.25	1.19	1.25	1.25	1.25	1.25	1.14	1.14	1.14	1.25	1.25	1.25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		146			305			195			447	
Travel Time (s)		3.3			6.9			4.4			10.2	
Volume (vph)	223	427	27	101	301	33	3	376	87	36	427	116
Peak Hour Factor	0.84	0.82	0.75	0.80	0.88	0.55	0.38	0.89	0.83	0.85	0.94	0.67
Heavy Vehicles (%)	3%	7%	0%	0%	10%	3%	0%	5%	7%	3%	1%	0%
Adj. Flow (vph)	265	521	36	126	342	60	8	422	105	42	454	173
Lane Group Flow (vph)	265	557	0	0	528	0	0	535	0	42	627	0
Turn Type	D.P+P			Perm			Perm			Perm		
Protected Phases	1	1 2			2			5			5	
Permitted Phases	2			2			5			5		
Detector Phases	1	1 2		2	2		5	5		5	5	
Minimum Initial (s)	5.0			10.0	10.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0			21.0	21.0		18.0	18.0		18.0	18.0	
Total Split (s)	20.0	55.0	0.0	35.0	35.0	0.0	45.0	45.0	0.0	45.0	45.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	35.0%	35.0%	0.0%	45.0%	45.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)	16.0			31.0	31.0		41.0	41.0		41.0	41.0	
Yellow Time (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0			1.0	1.0		1.0	1.0		1.0	1.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max			Max	Max		Max	Max		Max	Max	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)				0	0		0	0		0	0	
Act Effct Green (s)	47.0	51.0			31.0			41.0		41.0	41.0	
Actuated g/C Ratio	0.47	0.51			0.31			0.41		0.41	0.41	
v/c Ratio	0.67	0.71			0.85			0.87		0.21	0.98	
Control Delay	23.5	14.8			45.9			42.6		22.7	61.7	
Queue Delay	11.3	1.4			27.7			133.2		0.0	200.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	34.8	16.1			73.5			175.8		22.7	261.7	
LOS	C	B			E			F		C	F	
Approach Delay		22.1			73.5			175.8			246.7	
Approach LOS		C			E			F			F	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 8 (8%), Referenced to phase 1:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 123.8	Intersection LOS: F
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

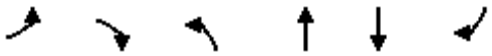
Splits and Phases: 4: Dudley Street & Harrison Avenue



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	511	12	8	20	151	405	0	0	440	0
Peak Hour Factor	0.92	0.92	0.81	0.55	0.67	0.75	0.85	0.84	0.92	0.92	0.83	0.92
Hourly flow rate (vph)	0	0	631	22	12	27	178	482	0	0	530	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											300	
pX, platoon unblocked	0.86	0.86	0.86	0.86	0.86		0.86					
vC, conflicting volume	1400	1368	530	1998	1368	482	530			482		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1468	1430	451	2168	1430	482	451			482		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	100	0	0	87	95	81			100		
cM capacity (veh/h)	67	93	521	0	94	588	931			1080		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	631	60	660	530
Volume Left	0	22	178	0
Volume Right	631	27	0	0
cSH	521	0	931	1700
Volume to Capacity	1.21	Err	0.19	0.31
Queue Length 95th (ft)	594	Err	18	0
Control Delay (s)	137.4	Err	4.5	0.0
Lane LOS	F	F	A	
Approach Delay (s)	137.4	Err	4.5	0.0
Approach LOS	F	F		

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	65	94	0	491	962	0
Peak Hour Factor	0.71	0.84	0.92	0.89	0.85	0.92
Hourly flow rate (vph)	92	112	0	552	1132	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					592	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1683	1132	1132			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1788	1152	1152			
tC, single (s)	6.4	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	0	45	100			
cM capacity (veh/h)	76	203	526			

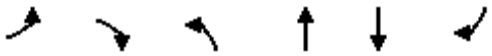
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	203	552	1132
Volume Left	92	0	0
Volume Right	112	0	0
cSH	116	1700	1700
Volume to Capacity	1.76	0.32	0.67
Queue Length 95th (ft)	394	0	0
Control Delay (s)	437.1	0.0	0.0
Lane LOS	F		
Approach Delay (s)	437.1	0.0	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	47.1		
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	65	73	419	0	0	1057
Peak Hour Factor	0.85	0.80	0.89	0.92	0.92	0.87
Hourly flow rate (vph)	76	91	471	0	0	1215
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						794
pX, platoon unblocked	0.88					
vC, conflicting volume	1686	471			471	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1782	471			471	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	2	84			100	
cM capacity (veh/h)	78	581			1091	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	168	471	1215
Volume Left	76	0	0
Volume Right	91	0	0
cSH	147	1700	1700
Volume to Capacity	1.14	0.28	0.71
Queue Length 95th (ft)	233	0	0
Control Delay (s)	178.0	0.0	0.0
Lane LOS	F		
Approach Delay (s)	178.0	0.0	0.0
Approach LOS	F		

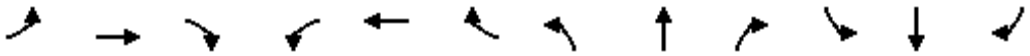
Intersection Summary			
Average Delay	16.1		
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	6	19	53	438	983	33
Peak Hour Factor	0.75	0.75	0.78	0.91	0.87	0.90
Hourly flow rate (vph)	8	25	68	481	1130	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1130	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1747	1130	1167			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1826	1144	1184			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	89	87			
cM capacity (veh/h)	67	222	533			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	33	549	1130	37
Volume Left	8	68	0	0
Volume Right	25	0	0	37
cSH	143	533	1700	1700
Volume to Capacity	0.23	0.13	0.66	0.02
Queue Length 95th (ft)	21	11	0	0
Control Delay (s)	37.6	3.6	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	37.6	3.6	0.0	
Approach LOS	E			

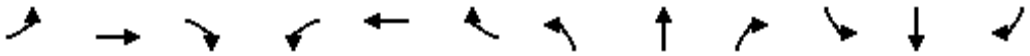
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	4	0	0	63	22	2	20	21	0	0	0
Peak Hour Factor	0.92	0.50	0.74	0.80	0.85	0.66	0.50	0.65	0.70	0.97	0.93	0.74
Hourly flow rate (vph)	0	8	0	0	74	33	4	31	30	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	8	107	65
Volume Left (vph)	0	0	4
Volume Right (vph)	0	33	30
Hadj (s)	0.00	-0.16	-0.20
Departure Headway (s)	4.1	3.9	3.9
Degree Utilization, x	0.01	0.12	0.07
Capacity (veh/h)	847	908	880
Control Delay (s)	7.2	7.4	7.2
Approach Delay (s)	7.2	7.4	7.2
Approach LOS	A	A	A

Intersection Summary				
Delay	7.3			
HCM Level of Service	A			
Intersection Capacity Utilization	14.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	2	73	0	0	0	0	0	24	12	0	0	0
Peak Hour Factor	0.25	0.91	0.92	0.92	0.92	0.92	0.92	0.75	0.46	0.92	0.92	0.92
Hourly flow rate (vph)	8	80	0	0	0	0	0	32	26	0	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	88	58
Volume Left (vph)	8	0
Volume Right (vph)	0	26
Hadj (s)	0.13	-0.17
Departure Headway (s)	4.1	3.9
Degree Utilization, x	0.10	0.06
Capacity (veh/h)	851	886
Control Delay (s)	7.6	7.2
Approach Delay (s)	7.6	7.2
Approach LOS	A	A

Intersection Summary				
Delay	7.5			
HCM Level of Service	A			
Intersection Capacity Utilization	14.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Crash Data

Scenario	Intersection/# of Crashes									
	Roxbury St./ Malcolm X Blvd/ Shawmut Ave (Signalized)	Malcolm X Blvd./ Dudley St./ Washington St. (Signalized)	Dudley St./ Warren St. (Signalized)	Dudley St./ Harrison Ave. (Signalized)	Shawmut Ave./ Washington St. (Unsignalized)	Bartlett St./ Washington St. (Unsignalized)	St. James St./ Washington St. (Unsignalized)	Guild St/ Washington St. (Unsignalized)	Millmont St./ Guild St./ Lambert Ave. (Unsignalized)	Bartlett St./ Lambert Ave. (Unsignalized)
Year										
2008	2	3	0	5	1	1	0	0	0	0
2009	4	0	0	4	2	0	0	0	0	0
2010	1	0	1	15	0	0	0	0	0	0
Type										
Single vehicle	0	0	0	1	0	0	0	0	0	0
Angle	1	2	0	8	0	0	0	0	0	0
Rear-end	1	0	0	3	0	0	0	0	0	0
Head-on	0	0	0	1	1	0	0	0	0	0
Sideswipe	2	0	1	1	0	0	0	0	0	0
Unknown/other	3	1	0	10	2	1	0	0	0	0
Total	**7**	**3**	**1**	**24**	**3**	**1**	**0**	**0**	**0**	**0**
Severity										
Property damage only	2	1	0	5	1	0	0	0	0	0
Personal injury	2	2	1	12	1	1	0	0	0	0
Fatality	0	0	0	0	0	0	0	0	0	0
Hit-and-run	0	0	0	0	0	0	0	0	0	0
Unknown	3	0	0	7	1	0	0	0	0	0
Total	**7**	**3**	**1**	**24**	**3**	**1**	**0**	**0**	**0**	**0**
Light Conditions										
Day	4	1	1	8	2	1	0	0	0	0
Dusk/Dawn	1	0	0	2	0	0	0	0	0	0
Dark (road lit)	0	2	0	6	0	0	0	0	0	0
Unknown	2	0	0	8	1	0	0	0	0	0
Dark (road unlit)	0	0	0	0	0	0	0	0	0	0
Total	**7**	**3**	**1**	**24**	**3**	**1**	**0**	**0**	**0**	**0**
Road Conditions										
Dry	4	2	1	13	2	1	0	0	0	0
Wet	1	0	0	1	0	0	0	0	0	0
Snow	0	1	0	2	0	0	0	0	0	0
Ice	0	0	0	0	0	0	0	0	0	0
Unknown/other	2	0	0	8	1	0	0	0	0	0
Total	**7**	**3**	**1**	**24**	**3**	**1**	**0**	**0**	**0**	**0**
Hour of Day										
6:00–9:00 a.m.	1	1	1	3	0	0	0	0	0	0
9:00 a.m.–3:00 p.m.	3	0	0	9	2	1	0	0	0	0
3:00–6:00 p.m.	3	1	0	3	0	0	0	0	0	0
6:00 p.m.–6:00 a.m.	0	1	0	9	1	0	0	0	0	0
Total	**7**	**3**	**1**	**24**	**3**	**1**	**0**	**0**	**0**	**0**
Day of Week										
Monday	0	1	0	3	1	0	0	0	0	0
Tuesday	3	1	0	4	1	1	0	0	0	0
Wednesday	0	0	1	1	0	0	0	0	0	0
Thursday	1	0	0	3	0	0	0	0	0	0
Friday	0	0	0	3	0	0	0	0	0	0
Saturday	2	0	0	4	1	0	0	0	0	0
Sunday	1	1	0	6	0	0	0	0	0	0
Total	**7**	**3**	**1**	**24**	**3**	**1**	**0**	**0**	**0**	**0**
Crash Rate	**0.50**	**0.23**	**0.07**	**2.04**	**0.39**	**0.12**	**0**	**0**	**0**	**0**
District Average[1]	**0.77**	**0.77**	**0.77**	**0.77**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**

1. *Source: MassDOT, Average Crash Rates based on crash information queried on July17, 2011.*

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Roxbury COUNT DATE : 10.04.12

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : x

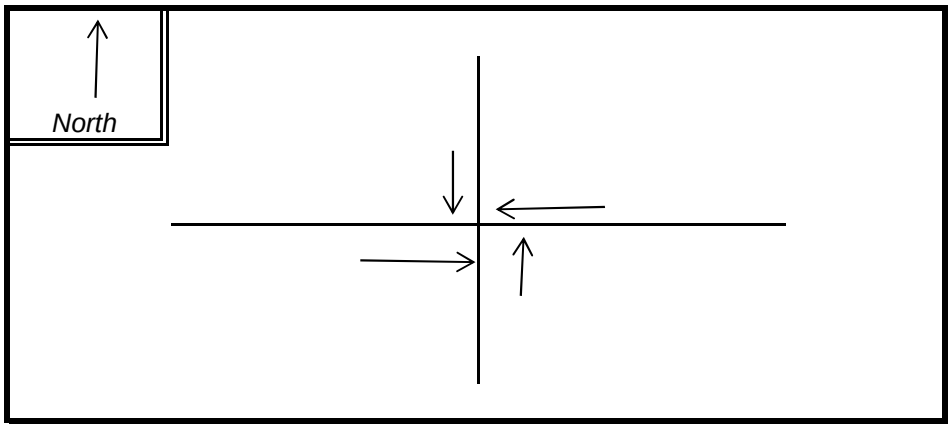
~ INTERSECTION DATA ~

MAJOR STREET : Malcolm X Boulevard

MINOR STREET(S) : Roxbury Street

Shawmut Avenue

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	571	464	346	923		2,304

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **25,600**

TOTAL # OF CRASHES : 7 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **2.33**

CRASH RATE CALCULATION : **0.25** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 2007015 Bartlett Yard RW

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Roxbury COUNT DATE : 10.04.12

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : x

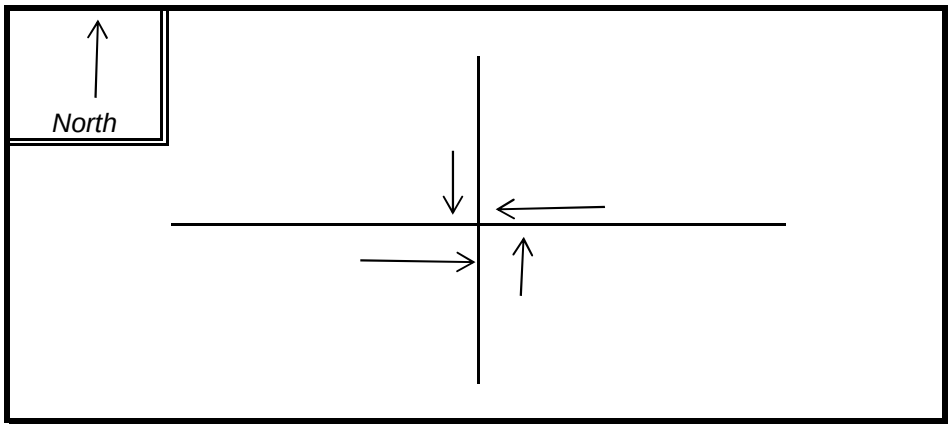
~ INTERSECTION DATA ~

MAJOR STREET : Malcolm X Boulevard

MINOR STREET(S) : Dudley Street

Washington Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	790	519	348	521		2,178

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **24,200**

TOTAL # OF CRASHES : 3 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : **0.11** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 2007015 Bartlett Yard RW

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Roxbury COUNT DATE : 10.04.12

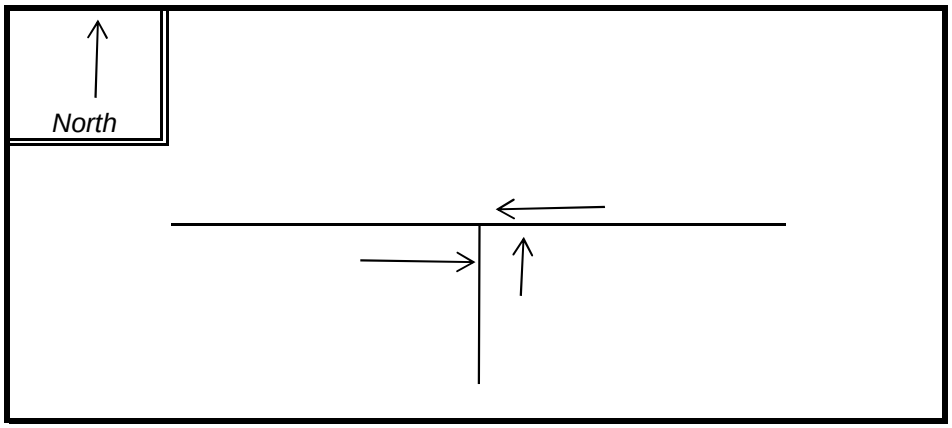
DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : x

~ INTERSECTION DATA ~

MAJOR STREET : Dudley Street

MINOR STREET(S) : Warren Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (PM) :	1,398	369	457			**2,224**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **24,711**

TOTAL # OF CRASHES : 1 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : **0.04** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 2007015 Bartlett Yard RW

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Roxbury COUNT DATE : 10.04.12

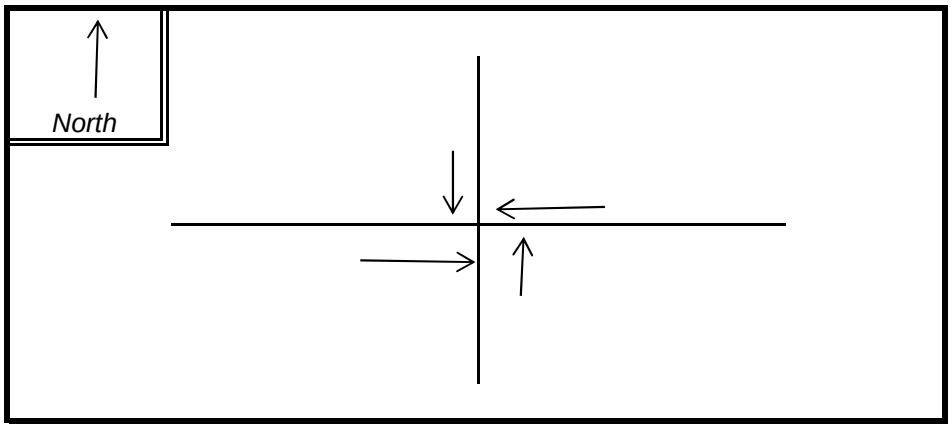
DISTRICT : 6 UNSIGNALIZED : SIGNALIZED : x

~ INTERSECTION DATA ~

MAJOR STREET : Dudley Street

MINOR STREET(S) : Harrison Avenue

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	581	404	439	514		**1,938**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **21,533**

TOTAL # OF CRASHES : 24 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **8.00**

CRASH RATE CALCULATION : **1.02** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 2007015 Bartlett Yard RW

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Roxbury COUNT DATE : 11.28.12

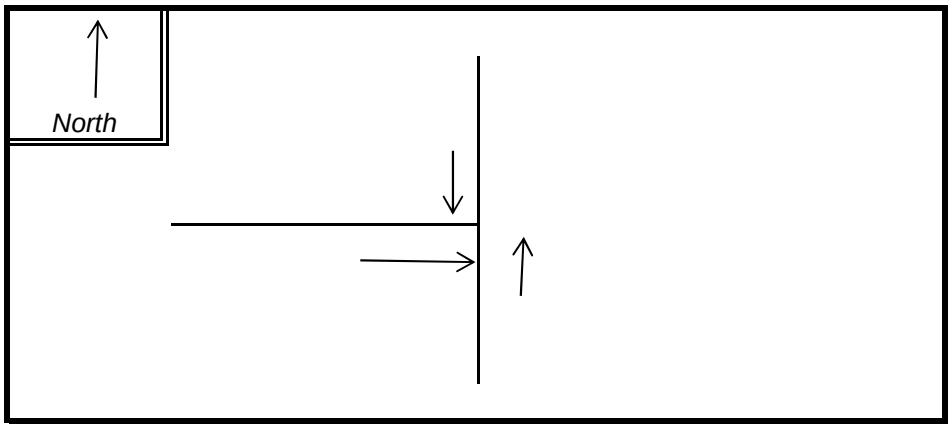
DISTRICT : 6 UNSIGNALIZED : x SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street

MINOR STREET(S) : Shawmut Avenue

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	463	455	335			**1,253**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **13,922**

TOTAL # OF CRASHES : 3 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : **0.20** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 2007015 Bartlett Yard RW

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Roxbury COUNT DATE : 11.28.12

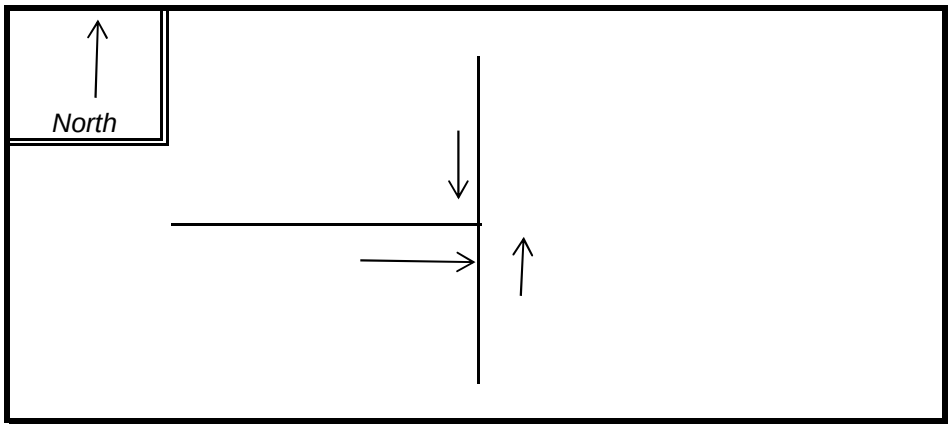
DISTRICT : 6 UNSIGNALIZED : x SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Washington Street

MINOR STREET(S) : Bartlett Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	SB			
PEAK HOURLY VOLUMES (PM) :	86	433	809			**1,328**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **14,756**

TOTAL # OF CRASHES : 1 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : **0.06** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 2007015 Bartlett Yard RW

Trip Generation

Bartlett Yard - Phase 1

Detailed Trip Generation Estimation - Proposed Project

Howard/Stein-Hudson Associates
1/17/2013

Component	Size	Category	Trip Rates (Trips/unit)	Directional Split	Unadjusted Vehicle Trips Equation/Rate	National vehicle occupancy rate[1]	**Converted to Person trips**	Capture Rate	Captured Trips	Person Trips less Captured Trips	Transit Share[2]	**Transit Trips**	Walk/Bike/ Other Share[2]	**Walk/ Bike/ Other Trips**	Vehicle Share[2]	Vehicle Person Trips	Local vehicle occupancy rate[3]	**Total Adjusted Vehicle Trips**
Daily Trip Generation																		
Residential [3]	102	Total	8	100%	742	1.13	**838**	0%	266	572		**97**		**148**		326	1.18	**276**
	units	In	4	50%	371	1.13	**419**	0%	133	286	17%	**49**	26%	**74**	57%	163	1.18	**138**
		Out	4	50%	371	1.13	**419**	0%	133	286	17%	**49**	26%	**74**	57%	163	1.18	**138**
Recreational [4]	5.4645	Total	33	100%	180	1.13	**204**	0%		204		**24**		**72**		108	1.18	**92**
	KSF	In	17	50%	90	1.13	**102**	0%		102	12%	**12**	35%	**36**	53%	54	1.18	**46**
		Out	16	50%	90	1.13	**102**	0%		102	12%	**12**	35%	**36**	53%	54	1.18	**46**
Institutional [6]	11.22	Total	28	100%	308	1.13	**348**	0%		348		**42**		**122**		184	1.18	**156**
	KSF	In	14	50%	154	1.13	**174**	0%		174	12%	**21**	35%	**61**	53%	92	1.18	**78**
		Out	14	50%	154	1.13	**174**	0%		174	12%	**21**	35%	**61**	53%	92	1.18	**78**
Office [7]	5.4645	Total	38	100%	204	1.13	**230**	0%	40	190		**46**		**32**		112	1.18	**94**
	KSF	In	19	50%	102	1.13	**115**	0%	20	95	24%	**23**	17%	**16**	58%	56	1.18	**47**
		Out	19	50%	102	1.13	**115**	0%	20	95	24%	**23**	17%	**16**	58%	56	1.18	**47**
Retail [8]	28.839	Total	44	100%	1272	1.13	**1,438**	0%	300	1,138		**194**		**308**		638	1.18	**541**
	KSF	In	22	50%	636	1.13	**719**	0%	150	569	17%	**97**	27%	**154**	56%	319	1.18	**270**
		Out	22	50%	636	1.13	**719**	0%	150	569	17%	**97**	27%	**154**	56%	319	1.18	**270**
Total		**Total**			2706		3059					404		682		1368		1159
		In			1353		1529					202		341		684		579
		Out			1353		1529					202		341		684		579
AM Peak-hour Trip Generation																		
Residential [3]	102	Total	1	100%	54	1.13	**61**	0%		61		**16**		**17**		28	1.18	**24**
	units	In	0	20%	11	1.13	**12**	0%		12	19%	**2**	27%	**4**	54%	7	1.18	**6**
		Out	1	80%	43	1.13	**49**	0%		49	29%	**14**	27%	**13**	44%	21	1.18	**18**
Recreational [4]	5.4645	Total	2	100%	8	1.13	**10**	0%		10		**2**		**4**		**4**	1.18	**4**
	KSF	In	1	50%	4	1.13	**5**	0%		5	13%	**1**	36%	**2**	51%	2	1.18	**2**
		Out	1	50%	4	1.13	**5**	0%		5	21%	**1**	37%	**2**	42%	2	1.18	**2**
Institutional [6]	11.224	Total	3	100%	34	1.13	**38**	0%		38		**6**		**14**		**18**	1.18	**16**
	KSF	In	2	74%	25	1.13	**28**	0%		28	13%	**4**	36%	**10**	51%	14	1.18	**12**
		Out	1	26%	9	1.13	**10**	0%		10	21%	**2**	37%	**4**	42%	4	1.18	**4**
Office [7]	5.4645	Total	6	100%	31	1.13	**35**	0%		35		**10**		**7**		**19**	1.18	**16**
	KSF	In	5	89%	28	1.13	**31**	0%		31	27%	**8**	18%	**6**	55%	17	1.18	**15**
		Out	1	11%	3	1.13	**4**	0%		4	40%	**2**	17%	**1**	43%	2	1.18	**2**
Retail [8]	28.839	Total	9	100%	257	1.13	**291**	0%		291		**70**		**80**		**139**	1.18	**118**
	KSF	In	4	48%	123	1.13	**140**	0%		140	20%	**28**	27%	**38**	53%	74	1.18	**63**
		Out	5	52%	134	1.13	**151**	0%		151	28%	**42**	28%	**42**	43%	65	1.18	**55**
Total		**Total**			384		435					104		122		208		177
		In			192		217					43		59		114		98
		Out			193		219					61		61		94		80
PM Peak-hour Trip Generation																		
Residential [3]	102	Total	1	100%	74	1.13	**83**	0%	16	67		**18**		**18**		**32**	1.18	**27**
	units	In	1	65%	48	1.13	**54**	0%	8	46	29%	**13**	27%	**12**	44%	20	1.18	**17**
		Out	0	35%	26	1.13	**29**	0%	8	21	19%	**4**	27%	**6**	54%	11	1.18	**10**
Recreational [5]	5.4645	Total	4	100%	21	1.13	**24**	0%		24		**4**		**9**		**11**	1.18	**10**
	KSF	In	2	57%	12	1.13	**14**	0%		14	21%	**3**	37%	**5**	42%	6	1.18	**5**
		Out	2	43%	9	1.13	**10**	0%		10	13%	**1**	36%	**4**	51%	5	1.18	**4**
Institutional [6]	11.224	Total	3	100%	29	1.13	**33**	0%		33		**6**		**12**		**15**	1.18	**13**
	KSF	In	2	58%	17	1.13	**19**	0%		19	21%	**4**	37%	**7**	42%	8	1.18	**7**
		Out	1	42%	12	1.13	**14**	0%		14	13%	**2**	36%	**5**	51%	7	1.18	**6**
Office [7]	5.4645	Total	8	100%	43	1.13	**49**	0%	10	39		**11**		**7**		**21**	1.18	**18**
	KSF	In	1	15%	6	1.13	**7**	0%	5	2	40%	**1**	17%	**0**	43%	1	1.18	**1**
		Out	7	85%	37	1.13	**42**	0%	5	37	27%	**10**	18%	**7**	55%	20	1.18	**17**
Retail [8]	28.839	Total	3	100%	91	1.13	**102**	0%	24	78		**18**		**22**		**39**	1.18	**33**
	KSF	In	1	44%	40	1.13	**45**	0%	12	33	28%	**9**	28%	**9**	43%	14	1.18	**12**
		Out	2	56%	51	1.13	**58**	0%	12	46	20%	**9**	27%	**12**	53%	24	1.18	**21**
Total		**Total**			257		292					57		68		118		101
		In			123		139					30		34		49		42
		Out			135		153					26		34		68		59

1. Mode shares based on BTD data for Area 15
2. Local vehicle occupancy rates based on 2010 Census and 2009 National Household Travel Survey.
3. ITE Trip Generation, 9th Edition, LUC 220 (Apartment), Fitted Curve Equation
4. ITE Trip Generation, 9th Edition, LUC 492 (Health/Fitness Club), Average Rate
5. ITE Trip Generation, 9th Edition, LUC 492 (Health/Fitness Club), Fitted Curve Equation
6. ITE Trip Generation, 9th Edition, LUC 540 (Junior/Community College), Average Rate
7. ITE Trip Generation, 9th Edition, LUC 715 (Single Tenant Office Building), Fitted Curve Equation
8. ITE Trip Generation Rate, 9th Edition, LUC 826 (Specialty Retail Center), Fitted Curve Equation

Bartlett Yard - Full Buildout

Detailed Trip Generation Estimation - Proposed Project

Howard/Stein-Hudson Associates
January 17, 2013

Component	Size	Category	Trip Rates (Trips/unit)	Directional Split	Unadjusted Vehicle Trips: Equation/Rate	National vehicle occupancy rate[1]	**Converted to Person trips**	Capture Rate	Captured Trips	Person Trips less Captured Trips	Transit Share[2]	**Transit Trips**	Walk/Bike/ Other Share[2]	**Walk/ Bike/ Other Trips**	Vehicle Share[2]	Vehicle Person Trips	Local vehicle occupancy rate[3]	**Total Adjusted Vehicle Trips**
Daily Trip Generation																		
Residential [3]	245	Total	7	100%	1608	1.13	**1,818**	0%	344	1,474		**250**		**384**		840	1.18	**712**
	units	In	3	50%	804	1.13	**909**	0%	172	737	17%	**125**	26%	**192**	57%	420	1.18	**356**
		Out	3	50%	804	1.13	**909**	0%	172	737	17%	**125**	26%	**192**	57%	420	1.18	**356**
Residential [4]	55	Total	7	100%	382	1.13	**432**	0%	80	352		**60**		**92**		202	1.18	**172**
	units	In	3	50%	191	1.13	**216**	0%	40	176	17%	**30**	26%	**46**	57%	101	1.18	**86**
		Out	3	50%	191	1.13	**216**	0%	40	176	17%	**30**	26%	**46**	57%	101	1.18	**86**
Recreational [5]	5.4645	Total	33	100%	180	1.13	**204**	0%		204		**24**		**72**		108	1.18	**92**
	KSF	In	16	50%	90	1.13	**102**	0%		102	12%	**12**	35%	**36**	53%	54	1.18	**46**
		Out	16	50%	90	1.13	**102**	0%		102	12%	**12**	35%	**36**	53%	54	1.18	**46**
Institutional [7]	11.22	Total	27	100%	308	1.13	**348**	0%		348		**42**		**122**		184	1.18	**156**
	KSF	In	14	50%	154	1.13	**174**	0%		174	12%	**21**	35%	**61**	53%	92	1.18	**78**
		Out	14	50%	154	1.13	**174**	0%		174	12%	**21**	35%	**61**	53%	92	1.18	**78**
Office [8]	5.4645	Total	37	100%	204	1.13	**230**	0%	40	190		**46**		**32**		112	1.18	**94**
	KSF	In	19	50%	102	1.13	**115**	0%	20	95	24%	**23**	17%	**16**	58%	56	1.18	**47**
		Out	19	50%	102	1.13	**115**	0%	20	95	24%	**23**	17%	**16**	58%	56	1.18	**47**
Retail [9]	28.839	Total	44	100%	1272	1.13	**1,438**	0%	300	1,138		**194**		**308**		638	1.18	**540**
	KSF	In	22	50%	636	1.13	**719**	0%	150	569	17%	**97**	27%	**154**	56%	319	1.18	**270**
		Out	22	50%	636	1.13	**719**	0%	150	569	17%	**97**	27%	**154**	56%	319	1.18	**270**
Total		**Total**			3954		4470					616		1010		2084		1766
		In			1977		2235					308		505		1042		883
		Out			1977		2235					308		505		1042		883
AM Peak-hour Trip Generation																		
Residential [3]	245	Total	1	100%	124	1.13	**140**	0%		140		**37**		**38**		65	1.18	**55**
	units	In	0	20%	25	1.13	**28**	0%		28	19%	**5**	27%	**8**	54%	16	1.18	**14**
		Out	0	80%	99	1.13	**112**	0%		112	29%	**32**	27%	**30**	44%	49	1.18	**42**
Residential [4]	55	Total	1	100%	32	1.13	**36**	0%		36		**10**		**10**		17	1.18	**15**
	units	In	0	17%	5	1.13	**6**	0%		6	19%	**1**	27%	**2**	54%	4	1.18	**4**
		Out	0	83%	27	1.13	**30**	0%		30	29%	**9**	27%	**8**	44%	13	1.18	**11**
Recreational [5]	5.4645	Total	1	100%	8	1.13	**10**	0%		10		**2**		**4**		**4**	1.18	**4**
	KSF	In	1	50%	4	1.13	**5**	0%		5	13%	**1**	36%	**2**	51%	2	1.18	**2**
		Out	1	50%	4	1.13	**5**	0%		5	21%	**1**	37%	**2**	42%	2	1.18	**2**
Institutional [7]	11.224	Total	3	100%	34	1.13	**38**	0%		38		**6**		**14**		**18**	1.18	**16**
	KSF	In	2	74%	25	1.13	**28**	0%		28	13%	**4**	36%	**10**	51%	14	1.18	**12**
		Out	1	26%	9	1.13	**10**	0%		10	21%	**2**	37%	**4**	42%	4	1.18	**4**
Office [8]	5.4645	Total	6	100%	31	1.13	**35**	0%		35		**10**		**7**		**19**	1.18	**16**
	KSF	In	5	89%	28	1.13	**31**	0%		31	27%	**8**	18%	**6**	55%	17	1.18	**15**
		Out	1	11%	3	1.13	**4**	0%		4	40%	**2**	17%	**1**	43%	2	1.18	**1**
Retail [9]	28.839	Total	9	100%	257	1.13	**291**	0%		291		**70**		**80**		**139**	1.18	**118**
	KSF	In	4	48%	123	1.13	**140**	0%		140	20%	**28**	27%	**38**	53%	74	1.18	**63**
		Out	5	52%	134	1.13	**151**	0%		151	28%	**42**	28%	**42**	43%	65	1.18	**55**
Total		**Total**			486		550					135		152		263		223
		In			210		238					47		65		128		109
		Out			276		312					88		87		135		115
PM Peak-hour Trip Generation																		
Residential [3]	245	Total	1	100%	152	1.13	**173**	0%	28	145		**37**		**39**		**69**	1.18	**58**
	units	In	0	65%	99	1.13	**112**	0%	14	98	29%	**28**	27%	**26**	44%	43	1.18	**37**
		Out	0	35%	53	1.13	**60**	0%	14	46	19%	**9**	27%	**12**	54%	25	1.18	**22**
Residential [4]	55	Total	1	100%	37	1.13	**42**	0%	8	34		**9**		**9**		**16**	1.18	**13**
	units	In	0	67%	25	1.13	**28**	0%	4	24	29%	**7**	27%	**6**	44%	11	1.18	**9**
		Out	0	33%	12	1.13	**14**	0%	4	10	19%	**2**	27%	**3**	54%	5	1.18	**4**
Recreational [6]	5.4645	Total	4	100%	21	1.13	**24**	0%		24		**4**		**9**		**11**	1.18	**9**
	KSF	In	2	57%	12	1.13	**14**	0%		14	21%	**3**	37%	**5**	42%	6	1.18	**5**
		Out	2	43%	9	1.13	**10**	0%		10	13%	**1**	36%	**4**	51%	5	1.18	**4**
Institutional [7]	11.224	Total	3	100%	29	1.13	**33**	0%		33		**6**		**12**		**15**	1.18	**13**
	KSF	In	1	58%	17	1.13	**19**	0%		19	21%	**4**	37%	**7**	42%	8	1.18	**7**
		Out	1	42%	12	1.13	**14**	0%		14	13%	**2**	36%	**5**	51%	7	1.18	**6**
Office [8]	5.4645	Total	8	100%	43	1.13	**49**	0%	10	39		**11**		**7**		**21**	1.18	**18**
	KSF	In	1	15%	6	1.13	**7**	0%	5	2	40%	**1**	17%	**0**	43%	1	1.18	**1**
		Out	7	85%	37	1.13	**42**	0%	5	37	27%	**10**	18%	**7**	55%	20	1.18	**17**
Retail [9]	28.839	Total	3	100%	91	1.13	**103**	0%	44	59		**14**		**17**		**29**	1.18	**25**
	KSF	In	1	44%	40	1.13	**45**	0%	22	23	28%	**7**	28%	**7**	43%	10	1.18	**9**
		Out	2	56%	51	1.13	**58**	0%	22	36	20%	**7**	27%	**10**	53%	19	1.18	**16**
Total		**Total**			373		424					80		93		160		137
		In			199		225					50		52		79		68
		Out			174		198					31		41		81		69

1. Mode shares based on BTD data for Area 15
2. Local vehicle occupancy rates based on 2010 Census and 2009 National Household Travel Survey.
3. ITE Trip Generation, 9th Edition, LUC 220 (Apartment), Fitted Curve Equation
4. ITE Trip Generation, 9th Edition, LUC 230 (Residential Condominium/Townhouse), Fitted Curve Equation
5. ITE Trip Generation, 9th Edition, LUC 492 (Health/Fitness Club), Average Rate
6. ITE Trip Generation, 9th Edition, LUC 492 (Health/Fitness Club), Fitted Curve Equation
7. ITE Trip Generation, 9th Edition, LUC 540 (Junior/Community College), Average Rate
8. ITE Trip Generation, 9th Edition, LUC 715 (Single Tenant Office Building), Fitted Curve Equation
9. ITE Trip Generation Rate, 9th Edition, LUC 826 (Specialty Retail Center), Fitted Curve Equation

Appendix B

Wind

CONSULTING ENGINEERS & SCIENTISTS

Tel: 519.823.1311
Fax: 519.823.1316

Rowan Williams Davies & Irwin Inc.
650 Woodlawn Road West
Guelph, Ontario, Canada N1K 1B8

February 15, 2013

David Hewett
Associate
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754
dhewett@epsilonassociates.com

Re: Pedestrian Wind Conditions - Letter of Opinion
Bartlett Place Phase 1
Boston, MA
RWDI Project #1301129

Rowan Williams Davies & Irwin Inc. (RWDI) has reviewed the potential pedestrian wind conditions around the proposed Bartlett Place Phase 1 development in Boston, MA. This letter summarizes our findings, based on the current design drawings and our past experience of wind-tunnel testing for buildings in the Boston area.

Site Information

The proposed development will be located on the west side of Washington Street, between Guild Street to the south and Bartlett Street to the north, as shown in Image 1. Currently, the development site consists of low buildings and open spaces, surrounded by low buildings and trees. Further away from the site are also dense low-rise buildings in all directions. There are some grade changes in the area, with the site at a basin lower than most surrounding areas except to the northeast.

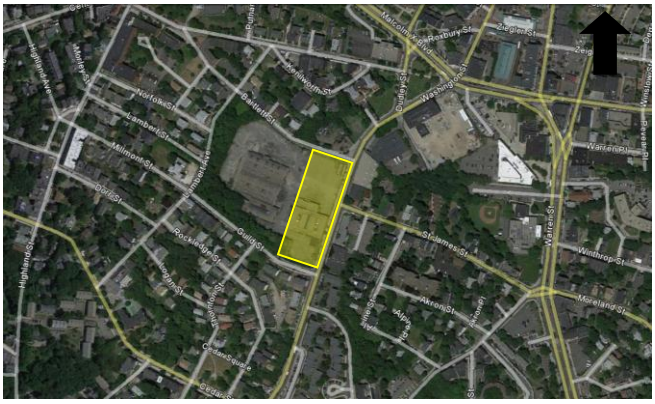


Image 1 - Aerial photo of the existing site and surroundings (Courtesy of Google earth™)

According to the drawings received by RWDI on January 29, 2013, the proposed Bartlett Place Phase 1 development includes two five-storey buildings (A and B) along Washington Street and a public space west of Building B (see Images 2a and 2b). Buildings in the future phases are also low, located to the west of the Phase 1 development. Images 3a and 3b are the east elevation for Building B and the north elevation for Building A, respectively. Pedestrian areas on and around the development consist of building entrances, sidewalks, the public space, driveways/walkways underneath the buildings and parking lots.

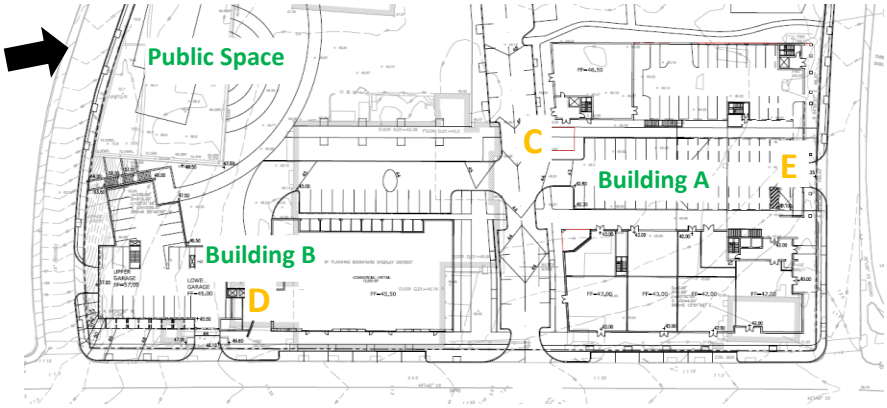


Image 2a – Site Plan

Image 2b – Site Plan for Phase 1

Image 3a – East Elevation for Building B

Image 3b – North Elevation for Building A

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.

Pedestrian Wind Assessment

In order to provide an opinion on the overall wind conditions expected around the proposed development, RWDI reviewed meteorological data for the area, as described above. Drawings of the proposed development were also reviewed, as well as information regarding the surroundings. This data, in conjunction with our past experience in the area and our engineering judgement, allows us to summarize the expected wind conditions as follows:

- Due to their limited height, the proposed buildings will not cause any significant wind impact on or around the development. As a result, wind conditions on sidewalks along adjacent streets and parking lots will be similar to those that currently exist and are considered to be suitable throughout the year.

- Most entrances are sheltered by the proposed development from one or more of the prevailing winds by the proposed development. Hence, suitable wind conditions are expected. However the entrances at building corners (e.g., Location C in Image 2b) will tend to have higher wind activity.

These conditions can be improved by relocating the entrances away from the building corners, recessing the doorways from building facade or installing wind mitigation such as screens, landscaping and canopies.

- Wind conditions on the public space are predicted to be suitable in the summer and fall seasons, when this space will be typically in use. Future development to the west will further enhance the wind conditions in this space.

- There is a driveway/walkway underneath each building (Locations D and E in Images 2b, 3a and 3b). When winds are aligned with these driveways, wind accelerations may occur (see Image 4), resulting in wind conditions that may not be comfortable for pedestrians. This is acceptable for driveways, but wind mitigation (e.g., screens and landscaping) may be desirable if frequent pedestrian usage is anticipated through these openings.

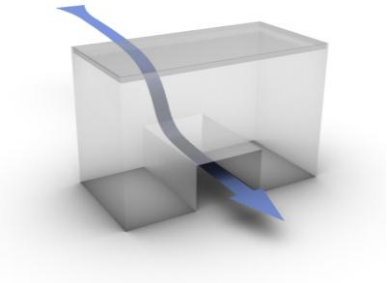


Image 4 – Passage Acceleration

Conclusion

The proposed Bartlett Place Phase 1 buildings are only five stories in height. They will not cause a significant wind impact on the surrounding areas when compared to the existing conditions. Suitable wind conditions are predicted at sidewalks, building entrances, parking lots and driveways throughout the year, as well as at the public space during the summer and fall seasons. For entrances at building corners and walkways underneath the buildings, higher-than-desired wind speeds may be experienced and improved wind conditions can be achieved through wind mitigation measures.

Yours very truly,

ROWAN WILLIAMS DAVIES & IRWIN Inc.

Hanqing Wu, Ph.D., P.Eng.
Technical Director / Principal

Jordan Gilmour, P.Eng.
Project Manager

JWG/kpk