70 Leo M. Birmingham Parkway, Brighton, MA

Residential Development

PROJECT NOTIFICATION FORM October 2, 2017

Submitted Pursuant to Article 80B of the Boston Zoning Code

SUBMITTED BY:

Residences at Birmingham Condominium LLC
70 Leo M. Birmingham Parkway
Brighton, MA 02135

SUBMITTED TO:

Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201

PREPARED BY:

Mitchell L. Fischman ("MLF") Consulting LLC
41 Brush Hill Road
Newton, MA 02461

IN ASSOCIATION WITH:

Hendren Associates Architects + Planners
McDermott Quilty & Miller LLP
Howard Stein Hudson
Marc Mazzarelli Associates
Tech Environmental, Inc.
Soden Sustainability Consulting
Feldman Land Surveyors
IES, Inc.

McDERMOTT
QUILTY &
MILLER LLP

28 STATE STREET, SUITE 802
BOSTON, MA 02109

30 ROWES WHARF, SUITE 600
Boston, MA 02110

VIA HAND DELIVERY

October 2, 2017

Mr. Brian Golden, Director
Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201
Attn: Lance Campbell, Project Manager

RE: Project Notification Form
Proposed Multi-Family Residential Development
70 Leo M. Birmingham Parkway, Ward 22, Brighton

Dear Director Golden:

On behalf of Residences at Birmingham Condominium LLC (the "Proponent"), as owner-developer of 21,752 square feet of land, including three (3) contiguous parcels of land at 6-8 Lincoln Street and 70 Leo M. Birmingham Parkway in the City's Brighton neighborhood (the "Project Site"), we are pleased to submit this Project Notification Form ("PNF") to the Boston Planning and Development Agency ("BPDA") in accordance with the Article 80B-2 Large Project Review requirements of the Boston Zoning Code, with respect to a proposed multifamily residential development at the Project Site. The public notice for the PNF appears in the October 2, 2017, edition of the *Boston Herald*.

The project proposes revitalizing this underutilized Project Site with a new six-story residential condominium building of approximately 82,000 gross square feet, including 82 units of home-ownership housing, on-site garage parking for 65 vehicles and related open space, sidewalk and site improvements (the "Proposed Project"). The scope and scale of the Proponent's residential program is intended to advance the policy goals of Mayor Walsh's "Housing Boston 2030" housing strategy; and to help offset the disproportionate share of rental housing in the Allston-Brighton neighborhood, by providing much-needed condominium home-

ownership (of market-rate and affordable on-site housing) at a desirable location next to a City park and within a short walk to a new commuter rail station. Pursuant to the City's Inclusionary Development Policy (the "IDP"), the Proponent proposes the creation of 11 new on-site affordable home ownership units.

As the Proposed Project exceeds the 50,000 square foot size threshold of Article 80 for a project within a Boston neighborhood, it requires several additional filings pursuant to Large Project Review regulations. A Letter of Intent (LOI) to File a Project Notification Form was filed with the BPDA on August 4, 2017 (attached hereto as Appendix "A"). Prior to this filing, and in support of the Article 80 Large Project Review process, the Proponent conducted extensive preliminary community outreach with neighbors and abutters of the site, including meetings and discussions with elected representatives and other officials, and presentations before the applicable neighborhood interest groups.

On behalf of the entire project team, we thank you and the BPDA staff assigned to the Proposed Project, particularly the Project Manager, Lance Campbell, and the reviewing BPDA Urban Designer, Michael Cannizzo, for their invaluable assistance to date in assisting the development team in shaping the Proposed Project and in completing this comprehensive PNF filing. The development team also looks forward to continuing the Large Project Review process and advancing the Proposed Project through public review with the cooperation of the BPDA, City officials, the Impact Advisory Committee and the Allston-Brighton community.

In accordance with BPDA requirements, please find attached ten (10) copies of the PNF plus a CD containing the electronic PNF file to be uploaded to the BPDA's online portal for public review.

Very truly yours,

Joseph P. Hanley, Esq., Partner -- McDermott, Quilty & Miller, LLP

Table of Contents

APPENDICES

List of Tables

List of Figures

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Residences at Birmingham Condominium LLC (the "Proponent") is submitting this Project Notification Form ("PNF") for a multi-family residential development at 70 Leo M. Birmingham Parkway in the Brighton neighborhood in accordance with the Article 80 requirements of the Boston Zoning Code ("Code"). The Project proposes construction of 82 residential units with a total overall project floor area of approximately 82,000 gsf (excluding the parking spaces) with 65 garage spaces in two below parking levels accessed from Lincoln Street (the "Proposed Project"). An alternative vehicular access is also being evaluated from Leo M. Birmingham Parkway.

The proposed site includes 0.5 acres (21,752 sf) and includes three addresses: 70 Leo M. Birmingham Parkway, 6 Lincoln Street, and 8 Lincoln Street and is bounded to the north by Leo M. Birmingham Parkway, to the south by the City of Boston Portsmouth Street Playground, to the west by Lincoln Street, and to the east by Centola Street. The scope and scale of the Proponent's residential program is also intended to further the residential policy goals of Boston Mayor Martin J. Walsh's 2030 Housing Plan. Please see **Figures 1-1** thru **1-6**.

A Letter of Intent ("LOI") to File a Project Notification Form was filed with the Boston Planning and Development Agency for the proposed multi-family residential development on August 4, 2017 (See **Appendix A**).

The nearby neighborhood is a mix of commercial/retail, residential, and office uses. The site is located in proximity to several public transportation opportunities. The Framingham/Worcester Line of the MBTA Commuter Rail stops at Boston Landing Station, a 5-10 minute walk and located less than a half-mile east of the Project site. The MBTA also operates five bus routes that can be accessed within a short walk from the Project site. The existing MBTA bus lines that run in proximity to the Project site also provide access to both Harvard Square and Central Square, where the MBTA Red Line can be accessed to travel to points in Cambridge and downtown Boston.

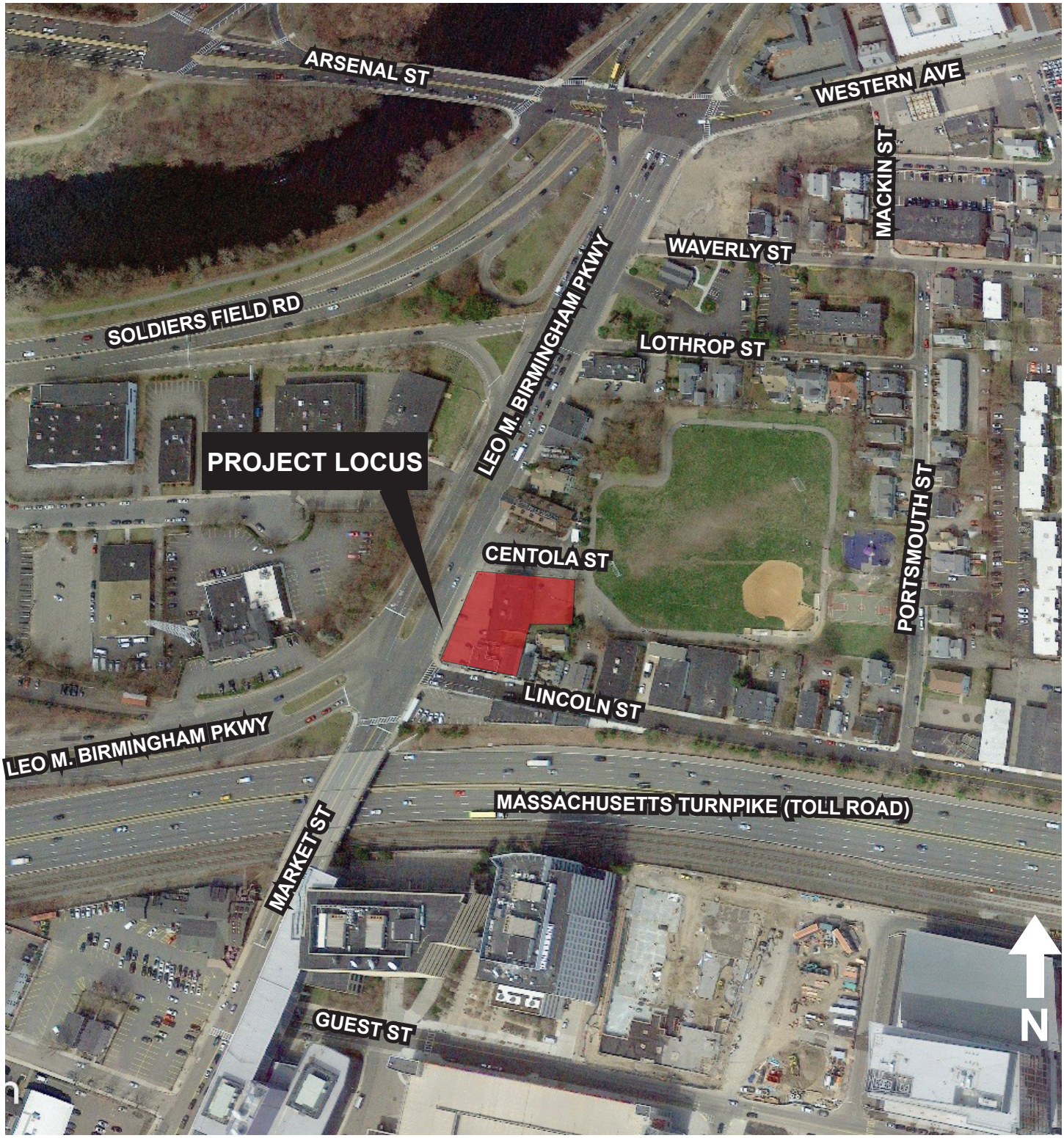


Figure 1-1. Project Locus
70 Leo M. Birmingham Pkwy, Brighton, MA

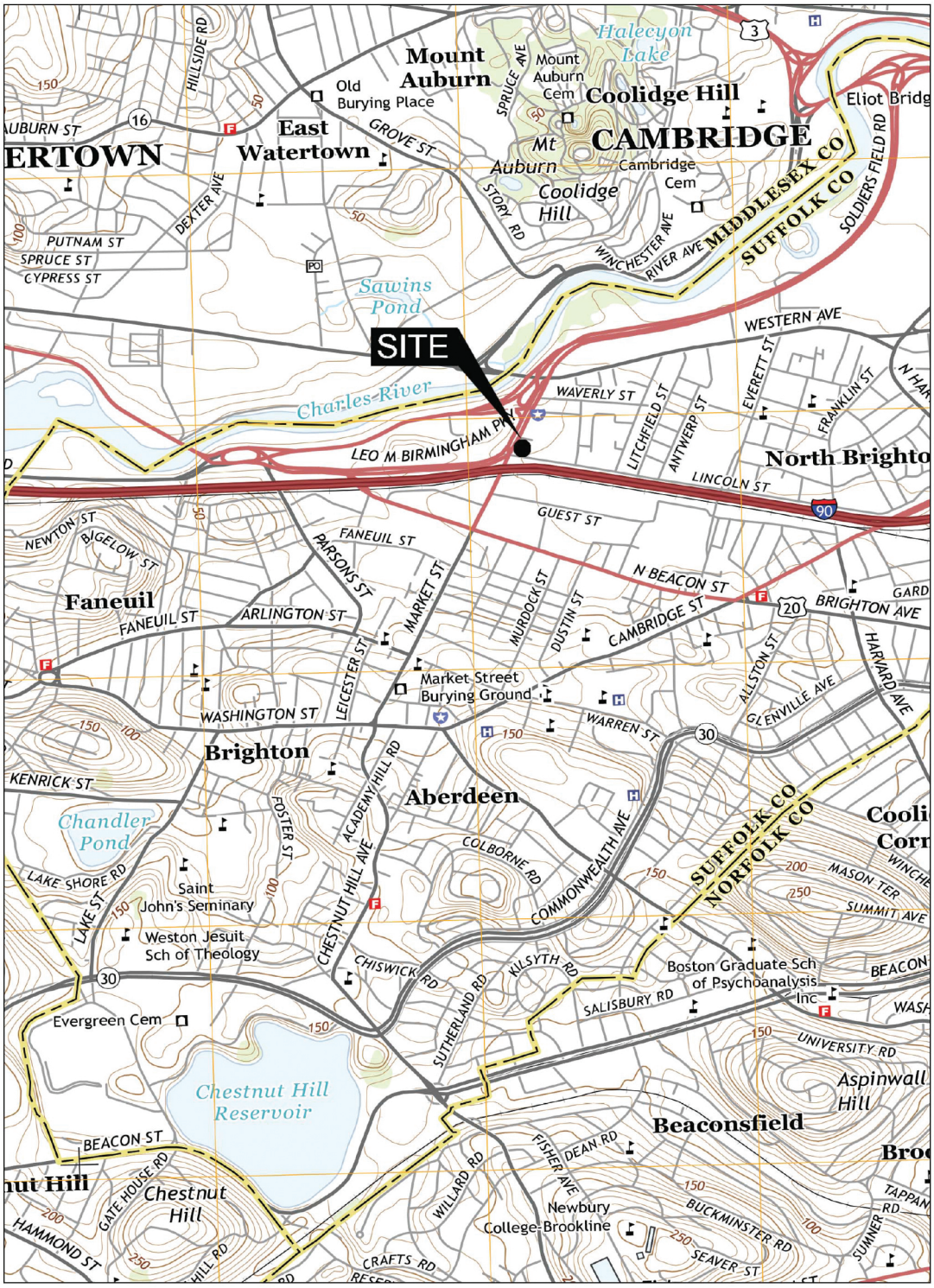


Figure 1-2.
USGS Map

Figure 1-3. Existing Site Photos

70 Leo M. Birmingham Parkway

70 Leo M. Birmingham Parkway & Adjoining Lincoln Bar & Grill

Figure 1-4. Existing Site Photos

70 Leo M. Birmingham Parkway and WGBH from Centola St.

Lincoln Bar & Grill

Figure 1-5. Existing Site Photos

Adjacent Lincoln St. Houses

View of Centola St and 58 Leo M. Birmingham Parkway

Figure 1-6. Existing Site Photos

View of Centola St and Rear of Existing Site From Playground

View of Adjacent Portsmouth Street Playground

1.2 Detailed Project Description

1.2.1 Existing Conditions Plan

The proposed site includes 0.5 acres (21,752 sf) bounded to the north by Leo M. Birmingham Parkway, to the south by the City of Boston Portsmouth Street Playground, to the west by Lincoln Street, and to the east by Centola Street. The site is currently occupied by two-story brick office building with surface parking at the front of the site along Leo M. Birmingham Parkway and a one-story restaurant at the corner of Lincoln Street and Leo M. Birmingham which will be demolished to allow for the new construction to commence. (See **Figure 1-7**. **Existing Conditions Plan.**)

1.2.2 Detailed Project Program

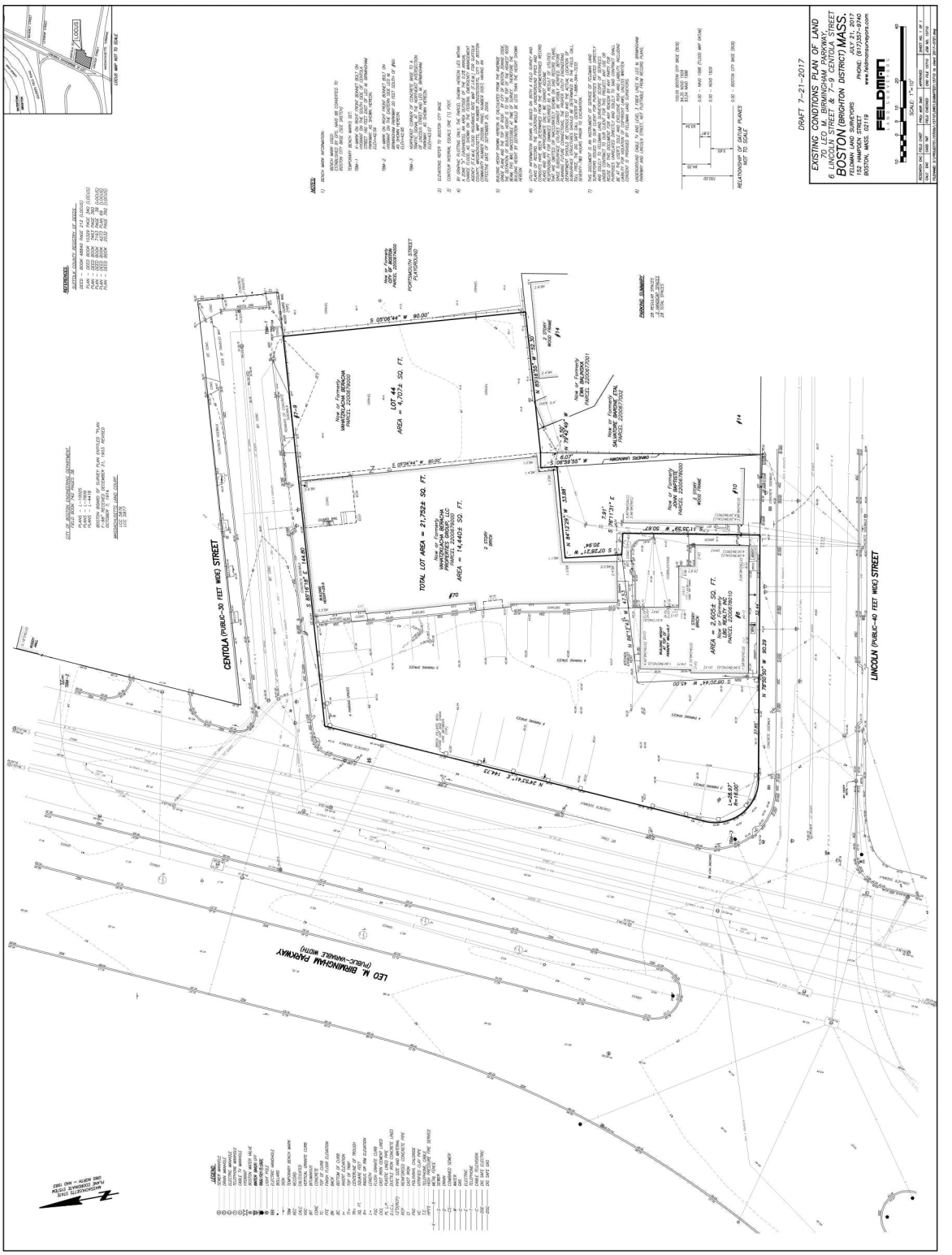
The Project proposes construction of approximately 82 residential units with a total overall project floor area of approximately 82,000 gsf (excluding the parking spaces) with 65 garage spaces in two below parking levels accessed from Lincoln Street (the "Proposed Project"). An alternative vehicular access is also being evaluated from Leo M. Birmingham Parkway. The residential units currently being planned will include 8-street level garden apartment units, 15 two- bedroom and 59 one-bedroom units on floors 2 through 6. Service vehicle access for trash and deliveries will be provided from Lincoln Street (an alternative vehicular access is also being evaluated from Leo M. Birmingham Parkway). The context of the immediate area is supportive and well-suited for the proposed scale and scope of the Proposed Project. It includes several buildings of four to six stories in height, along with the nearby WGBH building with a height of 84 feet along the Massachusetts Turnpike. See Project Dimensions in **Table 1-1** below.

Table 1-1. Approximate Project Dimensions of Proposed Project

Lot Area	0.5 acres / 21,752 square feet
Gross Square Feet	82,000 gross square feet
FAR	3.6
Floors	6 Floors Plus Rooftop
Height*	68 feet (with 76 feet at the tower portion at Lincoln Street and Leo M. Birmingham Parkway)

*Height from Average Front Grade

Figure 1-7. Existing Conditions Plan



1.3 Summary of Project Impacts and Mitigation

1.3.1 Urban Design

The proposed building has been situated on the site to present an impressive image to the Parkway and accent the main approach from the westbound traffic coming over the Market Street/MassPike bridge/overpass. This massing serves to buffer the playground and smaller residential scale neighborhood beyond from the hustle and bustle of Leo M. Birmingham Parkway. Then the building is stepped down in height and density approaching the park and is set back with a large side yard before merging with the greenway of the playfields. There will be private yards and shared roof terraces overlooking the open space and green of the park. The stepped profile also mitigates shadow impact on the playing fields with the exception of the late afternoon during the winter when the fields are not in use.

1.3.2 Sustainable Design

To meet the City of Boston Requirements, the project is demonstrating the compliance with the LEED BD&C v4 criteria. The project is currently tracking 44 points in the YES column with 44 in the study column. Further study over the coming weeks and months will determine final credit achievement. We have outlined in the narrative contained in **Section 3.0** and presented in **Figure 3-18** how the project intends to achieve the prerequisites and credits for the LEED BD&C v4 certification.

1.3.3 Pedestrian Level Wind Conditions

The height of the proposed structure will not exceed 68 feet (except for a small extension at the corner of Lincoln Street and Leo M. Birmingham Parkway). Wind conditions are expected to be similar to that of existing buildings along Leo M. Birmingham Parkway where nearby buildings range from 2-6 or greater number of floors.

1.3.4 Shadow Impact Analysis

New shadow is generally limited to the streets surrounding the Site. Late afternoon and evening shadows will extend in an easterly/northeasterly direction toward the Portsmouth Street Playground during the winter sunsets when there will be minimal activity in the playground, and onto the nearby structures along Lincoln Street. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings.

1.3.5 Daylight Analysis

Although the Proposed Project would cause an increase in daylight obstruction when compared to the existing 2-story site condition, the Proposed Project was designed to be of a similar massing to existing buildings and approved buildings along Leo M. Birmingham Parkway. As a result,

daylight obstruction values from the Proposed Project are expected to be consistent with, and typical to, the surrounding overall neighborhood.

1.3.6 Solar Glare

It is not expected that the Proposed Project will include the use of reflective glass or other reflective materials on the building facades that would result in adverse impacts from reflected solar glare.

1.3.7 Air Quality Analysis

Tech Environmental, Inc., the Project's air quality consultant, conducted analyses to evaluate the existing air quality in the Project area, predict the worst-case air quality impacts from the Project's enclosed parking garage, and evaluate the potential impacts of Project-generated traffic on the air quality at the most congested local intersections (See **Section 4.2**).

Recent representative air quality measurements from the Massachusetts Department of Environmental Protection (DEP) monitors reveal that the existing air quality in the Project area is in compliance with Massachusetts and National Ambient Air Quality Standards (NAAQS) for all of the criteria air pollutants.

The worst-case air quality impacts from the Project's parking garage will not have an adverse impact on air quality. The maximum one-hour and eight-hour ambient CO impacts from the parking garage, at all locations around the Project site, including background CO concentrations, are predicted to be safely in compliance with the NAAQS for CO.

A microscale air quality analysis was not performed for the Proposed Project due to the estimated Project trip generation having minimal impacts on the overall delays at the six intersections. Therefore, the motor vehicle traffic generated by the project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project. The air quality in the Project area will remain safely in compliance with the NAAQS for CO after the Project is built.

1.3.8 Noise Analysis

Tech Environmental, Inc., the Project's noise consultant, conducted a noise study to determine whether the operation of the proposed Project will comply with the Massachusetts DEP Noise Policy and City of Boston Noise Regulations (See **Section 4.3**).

This acoustical analysis involved five steps: (1) establishment of pre-construction ambient sound levels in the vicinity of the Site; (2) identification of potential major noise sources; (3) development of noise source terms based on manufacturer specifications (where available) and similar project designs; (4) conservative predictions of maximum sound level impacts at sensitive locations using industry standard acoustic methodology; and (5) determination of compliance

with applicable City of Boston noise regulations, ordinances and guidelines and with the DEP Noise Policy.

Nighttime ambient baseline sound level (L_{90}) monitoring was conducted at four locations deemed to be representative of the nearby residential areas, during the time period when human activity is at a minimum and any future noise would be most noticeable. The lowest nighttime L_{90} measured in the Project area was 50.5 dBA.

The potential significant sources of exterior sound from the Project have been identified as:

- Eighty-three (83) Goodman Model SS-GSZ13 rooftop or equivalent 2.5 ton condensing units.
- 2 Exhaust Fans.

The 70 Leo M. Birmingham Parkway project will not create a noise nuisance condition and will fully comply with the most stringent sound level limits set by the Massachusetts DEP Noise Policy, City of Boston Noise Regulations and the HUD Noise Guideline.

1.3.9 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See **Section 4.4**) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The Project will result in an increase in impervious area, but will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged.

In addition to the installation of an on-site infiltration system, stormwater runoff will be treated through the use of deep sump catch basins and water quality treatment units. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

1.3.10 Solid and Hazardous Waste

Solid Waste

During construction of the proposed new building, the General Contractor will be directed to minimize waste through good stewardship practices such as panelization of non-load bearing walls and exterior wall fabrications, pre-cut framing members and efficient material utilization practices. There will also be segregated dumpsters on-site to promote recycling of all possible waste materials and to be in conformance with the Boston Environmental Department and the LEED rating system.

A significant portion of the project's operational waste will be recycled. The recycling program will meet or exceed the City's guidelines for waste paper and newspaper, metal glass and plastics (21 through 27, co-mingled).

Hazardous Waste

Based on the results of the ASTM Screen/Limited Site Assessment (October 20, 2016) by IES, potential environmental concerns (PECS) identified at the site include the listing of the site as the location of a DEP Spill (N93-0851) and a CERLIS-SEMS Site (MAD985318542). The on-site DEP Spill is listed as "closed"; and the on-site CERLIS-SEMS listing is identified as a "Removal Only Site" with "No Site Assessment Work Needed". Additional on-site Potential Environmental Concerns (PECS) identified during the investigation include the former presence of a fuel oil UST that was removed from the site in 1988 with no confirmatory soil sampling.

The Proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or off-site disposal of contaminated soil and groundwater encountered during construction. If necessary, the LSP will also prepare the required Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) regulatory submittals. Additional information is presented in **Section 4.6.2.**

1.3.11 Geotechnical/Groundwater Impacts Analysis

Based on existing subsurface information, the site is anticipated to be underlain by a loose to compact granular fill layer that extends to depths between approximately 8 to 10 feet below the existing ground surface. The granular fill layer is underlain by a compact to dense, natural outwash sand deposit that extends to a depth of at least 30 feet below the existing ground surface. Groundwater at the site is anticipated to be roughly coincident with the level of the nearby Charles River, which is understood to typically fluctuate between approximately Elevation +7.5 and Elevation +8.5, corresponding to about 32 to 35 feet below the existing ground surface at the site.

The proposed 6-story, L-shaped residential structure is planned to occupy a plan area of approximately 12,500 square feet. Current plans also include two levels of below grade parking. The proposed building will be supported on a shallow foundation system consisting of spread footings with a soil-supported slab on-grade for the lowest level floor slab within the below grade portion of the building. A temporary excavation support system is anticipated to be required to construct the below grade garage.

Refer to **Section 4.7** for a more detailed analysis of the geotechnical/groundwater issues.

1.3.12 Construction Impacts Analysis

Section 4.8 describes impacts likely to result from the Proposed Project's construction and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager that will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

Construction is expected to commence in the 2nd quarter 2018 and will require approximately 18 months to complete.

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractor comply with the Construction Management Plan ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Most construction activities will be accommodated within the current site boundaries. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan to be filed with BTD in accordance with the City's transportation maintenance plan requirements. To minimize transportation impacts during the construction period, there will be limited construction worker parking on-site, carpooling will be encouraged, secure on-site spaces will be provided for workers' supplies and tools so they do not have to be brought to the site each day, and subsidies for MBTA passes will be considered. The Construction Management Plan to be executed with the City prior to commencement of construction will document all committed measures.

1.3.13 Wetlands/Flood Hazard Zone

The existing Project Site is not a part of a wetland resource area regulated by the Massachusetts Wetland Protection Act. Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Suffolk County, the Project Site is not located in a special flood hazard area, floodway area, or other flood area.

1.3.14 Historic Resources Component

According to files at the Massachusetts Historical Commission, there are no structures listed in the National or State Register of Historic Places, or the Inventory of Historical and

Archaeological Assets of the Commonwealth on-site. It is not expected that the Project will cause adverse impacts on the historic or architectural elements of nearby historic resources outside the Project Site (see **Section 5.0**).

1.3.15 Infrastructure Systems Component

An infrastructure system's analysis (**Section 6.0**) was completed by Howard Stein Hudson Associates ("HSH"), the Project's Civil Engineer. The existing infrastructure surrounding the site appears sufficient to service the needs of the Proposed Project. This section describes the existing sewer, water, and drainage systems surrounding the site and explains how these systems will service the development. This analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

1.3.16 Transportation Component

Section 7.0 presents the comprehensive transportation study completed by HSH for the proposed Project in conformance with the BTD Transportation Access Plan Guidelines (2001). The study analyzes existing conditions within the Project study area, as well as conditions forecast to be in place under a seven-year planning horizon of 2024.

The Project is located along Leo M. Birmingham Parkway, Lincoln Street, and Centola Street in the Brighton neighborhood of Boston. The Project is located in proximity to the Boston Landing Commuter Rail station and several MBTA bus routes that provide access to Cambridge and the Red Line subway. There is also a nearby Hubway station just south of the site. It is expected that residents of the Project will take advantage of the proximity to non-vehicular modes of transportation.

The site is currently occupied by the Lincoln Bar & Grill and an existing office building that will be removed as part of the Project. The site is currently served by curb cuts along Leo M. Birmingham Parkway and Lincoln Street. The existing curb cuts along Leo M. Birmingham Parkway will be closed as part of the Project. Access to the proposed Project will be provided by a single curb cut along the north side of Lincoln Street (an alternative vehicular access is also being evaluated from Leo M. Birmingham Parkway). The curb cut will serve a parking garage with capacity for 65 vehicles. The parking supply is consistent with BTD recommended guidelines for maximum parking ratios. The Project will also provide secure and covered storage for approximately 82 bicycles. Move-in/move-out activity is expected to be light and will be dispersed throughout the year. All move-in/move-out activity will occur on the Project site with no impact to Lincoln Street or Leo M. Birmingham Parkway.

Primary pedestrian access to the site will be provided at the corner of Leo M. Birmingham Parkway and Lincoln Street, with secondary access provided for the individual units located on the ground floor.

The Proponent is committed to implementing a transportation demand management ("TDM") program that supports the City's efforts to reduce dependency on the automobile by encouraging alternatives to driving alone, especially during peak travel periods. Proposed measures include, but are not limited to designating an on-site transportation coordinator, providing transit information (schedules, maps, and fare information) to residents, providing on-site bicycle storage, and working with a car sharing service to determine the feasibility of locating a car share parking space on the site.

The transportation analysis used mode-share data for the area surrounding the Project site based on data from the 2000 U.S. Census and BTD and identifies the number of trips expected to be generated by the Project by mode (walk, bicycle, transit, and vehicle). Due to the numerous transit opportunities in proximity to the Project site including a new rail station and stop on the Framingham and Worcester MBTA line within 5-10 minutes' walk from the project site, it is anticipated that many of the Project-generated trips will occur via transit, on foot, and by bicycle.

The Project is expected to generate approximately 17 vehicular trips during the weekday a.m. peak hour and 20 vehicular trips during the weekday p.m. peak hour. When compared to the existing uses on the site, this results in a slight increase of 7 trips during the weekday a.m. peak hour and 2 trips during the weekday p.m. peak hour.

A detailed traffic operations analysis was conducted for the nearby intersections including the following:

- Leo M. Birmingham Parkway/Market Street/Lincoln Street;
- Leo M. Birmingham Parkway/Soldiers Field Road EB Off-Ramp/Lothrop Street;
- Leo M. Birmingham Parkway/Waverley Street;
- Waverley Street/Mackin Street/Portsmouth Street; and
- Lincoln Street/Portsmouth Street.

Based on the trip generation estimates, the Project is expected to have minimal impact to traffic operations at the study area intersections.

1.3.17 Response to Climate Change Questionnaire

Please see **Appendix E** for the Proponent's Response to the City of Boston's Climate Change Questionnaire.

1.3.18 Response to City of Boston Access Guidelines

Please see **Appendix F** for the Proponent's Response to the City of Boston's Access Guidelines.

2.0 GENERAL INFORMATION

2.1 Applicant Information

2.1.1 Project Proponent

The Proponent is **Residences at Birmingham Condominium LLC** based in Brighton. The Proponents' management team has over 70 years of experience in residential new property construction and renovation in over 10 states. Their experience is primarily concentrated in Massachusetts, but includes over 2,500 engagements in New Hampshire, New York, Pennsylvania, Virginia, Florida, Texas, California, Illinois and Ohio. The management team has also had extensive experience working with government agencies. This includes having completed projects both with the local bodies in Boston, as well as with the building regulatory agencies in the states where management has built, and renovated homes. Additionally, the team has worked extensively with Ginnie Mae as far as managing construction loans on behalf of the agency's securities investors. Throughout the careers of the proponents' management team has developed and maintained the resources and relationships with the necessary professionals to successfully complete such projects as the proposed condominium project at the site in question, 70 Leo M. Birmingham Parkway, Brighton, Massachusetts.

2.1.2 Project Team

Project Name	70 Leo M. Birmingham Parkway, Brighton
Property Owner / Developer	**Residences at Birmingham Condominium LLC** 70 Leo M. Birmingham Parkway Brighton, MA 02135 Tel: 617-232-9000 Barry S. Polack Barry@polack.us Patrick Maloney pat@park-property.com
Article 80 Permitting Consultant	**Mitchell L. Fischman Consulting ("MLF Consulting") LLC** 41 Brush Hill Road Newton, MA 02461 Mitchell L. Fischman mitchfischman@gmail.com Tel: 781-760-1726

Legal Counsel/Outreach	**McDermott Quilty & Miller LLP** 28 State Street, Suite 802 Boston, MA 02109 Tel: 617-946-4600 Joseph Hanley, Esq. - Partner jhanley@mqmllp.com Tel: 617-946-4600, Ext. 4438 Nicholas Zozula, Esq. nzozula@mqmllp.com Tel: 617-946-4600, Ext. 4440
Architect	**Hendren Associates** **Architects + Planners** 119 Braintree Street Suite 209 Allston, MA 02134 Tel: 617-782-6003 Gary Hendren architect@hendrenassociates.com
Landscape Architect	**Marc Mazzarelli Associates** 284 Concord Avenue Cambridge, MA 02138 Tel: 617-227-2312 Marc Mazzarelli, Principal mazzarelli@verizon.net
Transportation Planner / Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Keri Pyke, P.E., PTOE kpyke@hshassoc.com Tel: 617-348-3301
Civil Engineer / Infrastructure	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Richard Latini, P.E. rlatini@hshassoc.com James Downing, P.E. jdowning@hshassoc.com

Sustainability Consultant	**Soden Sustainability Consulting** 19 Richardson Street Winchester, MA 01890 Tel: 617-372-7857 Colleen Ryan Soden, LEED AP BD+C colleen@sodensustainability.com
Noise and Air Consultant	**Tech Environmental, Inc.** Hobbs Brook Office Park 303 Wyman Street, Suite 295 Waltham, MA 02451 Tel: 781-890-2220 Marc C. Wallace mwallace@techenv.com Tel: 781-890-2220 ext. 30
Geotechnical Engineer	**McPhail Associates LLC** 2269 Massachusetts Avenue Cambridge, MA 02140
Surveyor	**Feldman Land Surveyors** 152 Hampden Street Boston, MA 02119 Tel: 617-357-9740 Michael Feldman mfeldman@feldmansurveyors.com Sean McDonagh SMcDonagh@feldmansurveyors.com
Construction Commencement	2nd Quarter 2018
Construction Completion	4th Quarter 2019
Status of Project Design	Schematic

2.1.3 Legal Information

Site Control

The three (3) parcels of land making up the Project Site are owned by two different owners: 8 Lincoln Street is owned by LBG Realty Inc., of which Patrick Maloney (one of the Proponents) is the owner; while 6 Lincoln Street and the Centola Street Parcel are both owned by Beracha Vehatzklacha, with which the Proponents currently have an agreement to purchase the properties.

Legal Judgments or Actions Pending Concerning the Proposed Project
None based upon available information and belief.

History of Tax Arrears on Property Owned in Boston by the Applicant
There is no current or past history of tax arrears on property owned by the Proponent.

Nature and Extent of Any and All Public Easements
The Site is bounded by utility easements for sewer, electric, telephone and gas.

2.2 Public Benefits

The Proposed Project will provide substantial public benefits to the City of Boston and the Brighton neighborhood. The Proposed Project provides for:

- Creating 82 units of much-needed residential housing of which eleven (11) will be affordable in accordance with the City's Inclusionary Development Policy (IDP);
- Introducing new neighborhood residents who will provide support to the local community and utilize local businesses;
- Including a project scope and scale that is intended to further the residential policy goals of Boston Mayor Martin J. Walsh's 2030 Housing Plan;
- Encouraging the use of alternative modes of transportation, such as mass transit, ride sharing services, and bicycle use;
- Improving the safety and visual appearance of the site and surrounding neighborhood by replacing an unattractive two-story brick commercial building and adjacent restaurant building surrounded by front-lot open-air parking;
- Activating an underutilized site at the crossroads of numerous modes of public transit with ready access to the state highway system;
- Introducing street trees, improved sidewalks and other streetscape amenities to improve and enhance the pedestrian landscape and experience;
- Establishing a premier example of sustainable construction and development;
- Closing and reducing the amount of curb cuts on the site to one (1) curb cut;
- Temporary creation of many new jobs in the construction and building trade industries; and
- Substantial addition to real property taxes for the City of Boston.

2.3 Regulatory Controls and Permits

2.3.1 Zoning Overview

The proposed site includes approximately 0.5 acres (21,752 sf) and includes three (3) parcels: an unnumbered Centola Street parcel, 6 Lincoln Street, and 8 Lincoln Street, and is bounded to the north by Leo M. Birmingham Parkway, to the south by the City of Boston Portsmouth Street Playground, to the west by Lincoln Street, and to the east by Centola Street. In this regard, all three (3) parcels are located within the Allston/Brighton Neighborhood District and thus governed pursuant to Article 51 of the Zoning Code. However, 8 Lincoln Street (2,605 sq ft) is located within the 3F-4000 Subdistrict, whereas 6 Lincoln Street (14,440 sq ft) and the Centola Street Parcel (4,707 sq ft) are both in the Community Commercial 1 Subdistrict. As a result, only approximately 12% of the overall Project Site is located within the 3F-4000 Subdistrict.

The Proposed Project will require a Conditional Use Permit for the proposed multi-family residential use for the portion of the site situated in the Community Commercial 1 Subdistrict and a Variance for the proposed multi-family residential use for the portion of the site situated in the 3F-4000 Subdistrict, both from the Boston Zoning Board of Appeal (ZBA). The Site and its proposed uses are also subject to review under the Greenbelt Protection Overlay District (GPOD) (Article 29 of the Code), requiring the Proponent to submit plans to the City of Boston Parks Commission for review, and approval of a Conditional Use Permit from the ZBA. The GPOD is a special zoning district designated along Boston's Greenbelt Roadways. A Greenbelt Roadway includes any landscaped roadway or major thoroughfare that is characterized by open space or landscaping along its right-of-way or that is used primarily by noncommercial or pleasure vehicles. Any projects proposed in a GPOD must show that it will result in the minimum interference with significant natural features, provide for proper management and maintenance of those features, and avoid excessive runoff and erosion.

While 65 off-street garage parking spaces are currently programmed in two underground parking levels accessed from Lincoln Street, the final amount of off-street parking and loading will be reviewed and determined by the BPDA pursuant to the provisions of the Article 80 Large Project Review process.

2.3.2 Boston Zoning Code – Use Requirements

The proposed Multifamily Residential Use is a Conditional Use within the relevant Community Commercial 1 zoning subdistrict. The proposed Multifamily Residential Use is a Forbidden Use within the smaller relevant 3F-4000 zoning subdistrict.

2.3.3 Boston Zoning Code – Dimensional Requirements

The Proposed Project will include approximately 82,000 gross square foot floor area (excluding parking spaces). As referenced above, the Proposed Project is located within two (2) applicable zoning subdistricts of the Allston/Brighton Neighborhood District: the 3F-4000 Subdistrict and the Community Commercial 1 Subdistrict.

The CC-1 Subdistrict and 3F-4000 Subdistrict allow for the below-referenced dimensional regulations pursuant to Article 51 -Tables D and E of the Code. While the CC-1 Subdistrict is more liberal in terms of maximum and minimum dimensional requirements, the 3F-4000 Subdistrict is more restrictive. As such, it is anticipated that the proposed building will require Variances for building height, FAR, Lot Area per Dwelling Unit, Open Space and insufficient yard setbacks.

Again, for a project that is subject to Large Project Review, required off-street parking spaces and off-street loading facilities are expected to be determined as a part of the Large Project Review in accordance with the provisions of Article 80 of the Boston Zoning Code. Design elements of the Proposed Project will also be reviewed pursuant to Large Project Review.

Table 2-1. Community Commercial 1 (CC-1) and 3F-4000 Subdistricts - Dimensional Requirements

Dimensional Element	Community Commercial 1 (CC-1) Subdistrict	3F-4000 Subdistrict	Proposed Project (1)	Conditional Use Permits/ Variance(s) Required?
Minimum Lot Size	NONE	4,000 sf (for 1 or 2 units)	21,752 sf	No
Minimum Lot Area Per Dwelling	NONE	2,000 sf per unit	272 SF per Additional Unit	Yes (3F-4000)
Maximum Floor Area Ratio	1.0	0.8	3.6	Yes (Both CC-1 and 3F-4000)
Maximum Building Height	35 feet	35 feet	76 feet	Yes (Both CC-1 and 3F-4000)
Minimum Lot Width	NONE	45 feet	89 feet	No
Minimum Lot Frontage	None	45 feet	144 feet	No
Minimum Front Yard	7 feet (4)	20 feet (7)	7 feet	Yes (3F-4000)
Minimum Side Yard	NONE (5)	At least five (5) feet from a side lot line and ten (10) feet from an existing structure on an abutting lot, and the aggregate side yard width shall be not less than fifteen (15) feet.	5 feet	Yes (3F-4000)

Dimensional Element	Community Commercial 1 (CC-1) Subdistrict	3F-4000 Subdistrict	Proposed Project (1)	Conditional Use Permits/ Variance(s) Required?
Minimum Rear Yard	20 feet (6)	20 feet	30 feet	Yes (3F-4000)
Minimum Usable Open Space	50 sf (3)	650 sf	144 sf	Yes (3F-4000)
Minimum Number of Parking Spaces	N/A	N/A	65 spaces	Article 80 (2)

1. The dimensions described in this above table may change as the Proposed Project undergoes design review with the BPDA.
2. Required off-street parking spaces shall be determined through BPDA's Large Project Review in accordance with Article 80 of the Code.
3. In a Neighborhood Business Subdistrict, all or a portion of required usable open space may be met by suitably designed and accessible space on balconies of main buildings or on roofs of wings of main buildings, or on the roofs of accessory buildings.
4. See Section 51-52.1, Street Wall Continuity. In the Western Avenue/Soldiers Field Road Community Commercial Subdistrict (CC-1), the minimum required front yard shall be seven (7) feet. (Text Amend. No. 407 , § 3, 7-23-14)
5. In a Neighborhood Business Subdistrict, no side yard is required except in the case of a lot with a side lot line abutting a Residential Subdistrict, which shall have side yards as if it were in such abutting district. Every side yard so required that does not abut a street line shall, along every lot line on which such yard abuts, be at a level no higher than that of the lowest window sill of the lowest room designed for human occupancy or so occupied, and relying upon natural light or natural ventilation from windows opening on such yard.
6. In a Neighborhood Business Subdistrict, every rear yard required by this code that does not abut a street line shall, along every lot line on which such yard abuts, be at a level no higher than the level of the lowest window sill in the lowest room designed for human occupancy or so occupied, and relying upon natural light or natural ventilation from windows opening on such yard.
7. See Section 51-50.2, Conformity with Existing Building Alignment. A bay window may protrude into a Front Yard.

2.3.4 Preliminary List of Permits or Other Approvals Which May be Sought

Agency Name	Permit or Action*
Federal or State Agencies	
U.S. Environmental Protection Agency	Notice of Intent for EPA Construction Activities General Discharge Permit with associated SWPPP, If Required
MA Department of Environmental Protection, Division of Air Quality Control	Notice of Commencement of Demolition and Construction
MA Historical Commission	Leo M. Birmingham Parkway listed on State and National Register of Historic Places (MHC Bos.9608)
MA Water Resources Authority	Temporary Construction Dewatering Permit 8(m) Permit
MA Department of Conservation and Recreation	Permit Application For Construction or Modification of a Curb-cut (Driveway)
Local Agencies	
Boston Planning and Development Agency	Article 80 Review and Execution of Related Agreements; Section 80B-6 Certificate of Compliance
Boston Parks Commission	Proposed Project within 100 feet of Greenbelt Protection Overlay District or Land Subject to Parks Commission Review
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan
Boston Zoning Board of Appeal	Variances, Conditional Use Permit(s), Zoning Relief, as Required
Boston Department of Public Works Public Improvements Commission	Possible Sidewalk Repair Plan; Curb-Cut Permit; Street / Sidewalk Occupancy Permit; Permit for Street Opening
Boston Fire Department	Permits for Demolition, Construction & Fire Alarm
Boston Lighting Department	Design Review
Boston Public Safety Commission Committee on Licenses	Garage License, Flammable Fuels
Boston Water and Sewer Commission	Site Plan Review and Approval; General Service Application; Dewatering Discharge Permit for Construction
Boston Department of Inspectional Services	Demolition Permit; Building Permits; Certificate of Occupancy; Other Construction-Related Permits

*This is a preliminary list based on project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits may be needed.

2.4 Public Review Process and Agency Coordination

In support of the required Article 80 Large Project Review process, the Proponent has conducted, and will continue to conduct, community outreach with neighbors and abutters of the Site, including meetings and discussions with the elected representatives and officials from the area, and with the residents of the adjacent Lincoln Street neighborhood. The most recent meeting organized by the Proponent was an abutter site meeting on September 13, 2017 to present informal and initial plans with the neighborhood. Additionally, the Proponent has had initial project meetings with the Allston Civic Association and the Brighton-Allston Improvement Association.

The Proponent has also discussed the Proposed Project with representatives of the BPDA on numerous occasions, including on May 8, 2017 and June 14, 2017, prior to filing this Project Notification Form in order to identify issues/concerns as well as design requirements related to the Project.

In accordance with Article 80 requirements, an Impact Advisory Committee ("IAG") has been formed and neighborhood meeting will be scheduled to review the PNF and receive community comments on the Project during the PNF public review period.

The Proponent will continue to meet with public agencies, neighborhood representatives, local business organizations, abutting property owners, and other interested parties, and will follow the requirements of Article 80 pertaining to the public review process.

2.5 Development Impact Payment ("DIP") Status

Based on current schematic design plans, it is not anticipated that the Proposed Project will be subject to the requirements of Section 80B-7 of the Article 80, owing to the fact the Proposed Project will not occupy an aggregate gross floor area of more than 100,000 square feet as it is proposing a total overall project floor area of approximately 82,000 gross square feet.

3.0 URBAN DESIGN AND SUSTAINABILITY

3.1 Urban Design Overview

The proposed 70 Leo M. Birmingham Parkway Project, a.k.a. **The Birmingham**, is a 6-story residential apartment style building incorporating a total of approximately 82 units. In addition to the residences, the building includes a prominent Main Lobby and on-site management office, mail/package Room, a resident social room, an exercise room with outdoor patio, ample indoor bicycle storage and two levels of underground parking.

This building is the second major development within the Leo M. Birmingham Parkway section between the termination of Market Street at the Mass Pike bridge/overpass and the entrance to Soldiers Field Road at Western Avenue. This proposal will effectively "book end" this defined stretch of parkway and continue the revitalization of this prominent introduction to the Brighton/ Allston district of Boston. The proposed building also serves to balance the scale of buildings framing the bridge over the depressed Mass Pike by addressing the height and materials of the WGBH/ Channel 2 Headquarters building on the Market Street side of the bridge.

The proposed building must respond to several conflicting site influences to successfully contribute to the enjoyment of living in this section of Brighton/ Allston. To the east is the six-lane divided Parkway which serves as a major link between Brighton/Allston and Watertown or access to Soldiers Field Road and Cambridge or Storrow Drive directly into downtown Boston. To the west is Portsmouth Playground, a 3-acre public park with many outdoor activities including softball, soccer, basketball, volleyball and a tot lot. To the south is the Massachusetts Turnpike and to the north is a 4-story office building and parking lot. The location is also within comfortable walking distance to the new Boston Landing MBTA Commuter Rail Station and about the same distance from the Charles River Recreational paths and community boating. This location has much to offer in terms of alternative commuting and outdoor activities.

The Proponent has made several presentations to the neighborhood abutters, both neighborhood groups and the BPDA staff to solicit comments and concerns. The design team will continue to evaluate and respond to the issues throughout the preliminary design and make modifications to insure the best possible project for the proponent and the City of Boston.

The Urban Design and Sustainability figures, including the LEED v4 for BD+C Checklist, are included at the end of this section (**Figures 3-1** thru **3-18**).

3.2 Building Design

The proposed building has been situated on the site to present an impressive image to the Parkway and accent the main approach from the westbound traffic coming over the Market Street/MassPike

Bridge/overpass. This massing serves to buffer the playground and smaller residential scale neighborhood beyond from the hustle and bustle of Leo M. Birmingham Parkway. Then the building is stepped down in height and density approaching the park and is set back with a large side yard before merging with the greenway of the playfields. There will be private yards and shared roof terraces overlooking the open space and green of the park. The stepped profile also mitigates shadow impact on the playing fields with the exception of the late afternoon during the winter when the fields are not in use.

The massing and interior layout of the building also responds to the public vs. private concerns of an urban building. The apartments facing Leo M. Birmingham Parkway will have less openness with garden walls at street level and solid railed balconies on the upper floors. The apartments facing Centola Street will be more open with front porches and small front yards at street level, open railings at balconies and larger windows. This project will contribute to the pedestrian connectivity being promoted along Leo M. Birmingham Parkway to link both sides of the Mass Pike, especially with the addition of the Boston landing commuter rail station and all the facilities being constructed in the New Balance development.

3.3 Landscape Design

The proposed landscape design (see **Figure 3-2**) incorporates a mixture of native and adaptive plant species throughout the site. These hardy plant selections were carefully chosen for their appropriateness to the location, attractiveness, and low maintenance characteristics. Along the building foundation a balance of evergreen and deciduous plants are shown for all-season visual interest. Flowering magnolias and dogwood trees with ornamental understory shrubs and grasses feature on all three pubic sides of the building. Tall evergreen arborvitae and spruce trees are shown separating the new residential building from the existing neighbors. The proposed London Plane trees to be planted on Leo M. Birmingham Parkway respond to the large scale of the boulevard and can withstand the harsh urban conditions from the street. Columnar maple trees are proposed to be planted on narrower Lincoln Street. Evergreen 'Green Giant' arborvitaes are shown to edge the Portsmouth Street Playground behind the existing cherry trees to partially obscure and soften the look of the new residential building. Instead of lawns, evergreen spreading ivy is proposed in the interstitial spaces between the plant beds and sidewalks. This groundcover planting approach supports the sustainable goals of the project that includes low water usage and drought tolerant plantings.

3.4 Sustainable Design/Energy Conservation

3.4.1 Introduction

The proposed project involves developing Residences at Birmingham Condominium. The Project proposes construction of 82 residential units with a total overall project floor area of approximately 82,000 gsf with approximately 65 garage spaces on two below-level garage floors accessed from Lincoln Street. The proposed site includes 0.5 acres (21,752 sf) and includes three addresses 70 Leo M. Birmingham Parkway, 6 Lincoln Street, and 10 Lincoln Street.

To meet the City of Boston Requirements the project is demonstrating the compliance with the LEED v4 for BD+ C criteria. The project is currently tracking 54 points in the YES column with 34 in the study column. Further study over the coming weeks and months will determine final

credit achievement. We have outlined in the narrative below, how the project intends to achieve the prerequisites and credits for LEED v4 for BD+C certification.

Sustainability informs every design decision. Enduring and efficient buildings conserve embodied energy and preserve natural resources. The project embraces the opportunity to positively influence the urban environment. Its urban location takes advantage of existing infrastructure while some access to mass transportation will reduce dependence on single occupant vehicle trips and minimize transportation impacts.

The Proponent and the Project design team are committed to an integrated design approach and are using the LEED Building Design and Construction v4 rating system and intend to meet certification as presented above and in **Figure 3-18**. This rating will meet or exceed Boston's Green Building standard. The LEED rating system tracks the sustainable features of the project by achieving points in following categories: Location & Transportation; Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.

3.4.2 Location and Transportation

The Location and Transportation credit category encourages development on previously developed land, minimizing a building's impact on ecosystems and waterways, regionally appropriate landscaping, smart transportation choices.

The site is located on a site whose surrounding existing density within a ¼-mile [400-meter] radius of the project boundary and provided dozens of amenities within 0.5 mile of the project site.

The City of Boston requires 1 bicycle parking space per residential unit. With a proposed 82 dwelling units, this would mean there are a minimum of 82 secure and covered bicycle parking spaces provided for the project.

Additionally, the City requires one outdoor/open bicycle parking space per 5 dwelling units, meaning this project requires 17 outdoor bicycle parking spaces these will also be provided onsite.

The project provides access to quality transit as the project is located within 0.25 mile of the following busses 86, 70, 70A, and 64.

The project is providing bicycle facilities and showers for the occupants of the building along with bicycle parking spots for visitors, far exceeding the LEED requirement.

3.4.3 Sustainable Sites

The development of sustainable sites is at the core of sustainable design, stormwater runoff management, and reduction of erosion, light pollution, heat island effect, and pollution related to construction and site maintenance are critical to lessening the impact of development.

The project will create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan will conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent.

The project will complete and document a site survey or assessment that will demonstrate the relationships between the site features and topics, Topography, Hydrology, Climate, Vegetation, Soils, Human use. The project will evaluate compliance with light pollution reduction from the building and the site lighting.

In order to reduce the impact of urban heat island effect, more than 75% of the parking spaces will be below grade under an SRI compliant roof along with light colored paving materials.

The project will also meet the requirements of Light Pollution Reduction.

3.4.4 Water Efficiency

Buildings are major users of our potable water supply and conservation of water preserves a natural resource while reducing the amount of energy and chemicals used for sewage treatment. The goal of the Water Efficiency credit category is to encourage smarter use of water, inside and out. Water reduction is typically achieved through more efficient appliances, fixtures and fittings inside and water-wise landscaping outside. To satisfy the requirements of the Water Use Reduction Prerequisite and credit, the project will incorporate water conservation strategies that include low flow plumbing fixtures for water closets and faucets. The landscape will be designed so it will reduce the need for potable water for irrigation by 50% and select plant material that is native and adaptive.

The project is targeting a minimum 50% indoor water use reduction from the baseline. All newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling will have the Water Sense label.

The project will evaluate installing permanent water meters that measure the total potable water use for the building and associated grounds in addition to water meters for two or more of the following water subsystems, as applicable to the project: Irrigation, Indoor plumbing fixtures and fittings, Domestic hot water, Boiler. Metering data will be compiled into monthly and annual summaries; and will be shared with USGBC the resulting whole-project water usage data.

3.4.5 Energy and Atmosphere

According to the U.S. Department of Energy, buildings use 39% of the energy and 74% of the electricity produced each year in the United States. The Energy and Atmosphere credit

category encourages a wide variety of energy strategies: commissioning; energy use monitoring; efficient design and construction; efficient appliances, systems and lighting; the use of renewable and clean sources of energy, generated on-site or off-site; and other innovative practices.

Fundamental Commissioning and Enhanced commissioning will be pursued for the project. Envelope commissioning will also be evaluated as an alternative.

A whole-building energy simulation will be performed for the projects demonstrating a minimum improvement of 26% for new construction according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata. The team will analyze efficiency measures during the design process and account for the results in design decision making. The team will use energy simulation of efficiency opportunities, past energy simulation analyses for similar buildings.

The project will evaluate installing new or use existing building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc.). Prereq 4- Fundamental refrigerant management. The project will not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems.

The project will evaluate renewable energy production if it is not possible the building will be solar ready.

The project will select refrigerants that are used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. Project will perform the calculations once systems are selected.

The project will also engage in a contract for 50% or 100% of the project's energy from green power, carbon offsets, or renewable energy certificates (RECs).

3.4.6 Materials and Resources

During both construction and operations, buildings generate tremendous waste and use many materials and resources. This credit category encourages the selection of sustainable materials, including those that are harvested and manufactured locally, contain high-recycled content, and are rapidly renewable. It also promotes the reduction of waste through building and material reuse, construction waste management, and ongoing recycling programs.

The project will provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclable materials will include mixed paper, corrugated cardboard, glass, plastics, and metals. The project will also take appropriate measures for the safe

collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.

The project will develop and implement a construction and demolition waste management plan that will identifying at least five materials (both structural and nonstructural) targeted for diversion and approximate a percentage of the overall project waste that these materials represent. The project will divert at least 75% of the total construction and demolition material; diverted materials must include at least four material streams. The project will also consider completing a life-cycle assessment.

Careful material selection will be performed for the project. Where possible the project hopes to integrate products that have Environmental Product Declarations (EPD), Sourcing of raw materials and corporate sustainability reporting, and Material Ingredients disclosures.

3.4.7 Indoor Environmental Quality

The U.S. Environmental Protection Agency estimates that Americans spend about 90% of their day indoors, where the air quality can be significantly worse than outside. The Indoor Environmental Quality credit category promotes strategies that can improve indoor air through low emitting materials selection and increased ventilation. It also promotes access to natural daylight and views.

The project will meet the minimum requirements of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata), or a local equivalent, whichever is more stringent.

The project will provide enhanced indoor air quality strategies. The project will provide entryway systems design systems, interior cross-contamination prevention and filtration. The project will target Low emitting materials for all materials within the building interior is defined as everything within the waterproofing membrane. This includes requirements for product manufacturing volatile organic compound (VOC) emissions in the indoor air and the VOC content of materials.

The project will develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building, meeting or exceeding all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3. The project will protect absorptive materials stored on-site and installed from moisture damage.

The project prohibits the use of all tobacco products inside the building and within 25 feet (8 meters) of the building entrance during construction. Daylight will be evaluated for energy efficiency opportunities and benefits for the occupants.

The project will achieve a direct line of sight to the outdoors for at least 75% of all regularly occupied floor area. View glazing in the contributing area will provide a clear image of the exterior, not obstructed by frits, fibers, patterned glazing, or added tints that distort color balance.

3.4.8 Innovation and Design Process

The Innovation in Design and Innovation in Operations credit categories provide additional points for projects that use new and innovative technologies, achieve performance well beyond what is required by LEED credits, or utilize green building strategies that are not specifically addressed elsewhere in LEED. This credit category also rewards projects for including a LEED Accredited Professional on the team to ensure a holistic, integrated approach to design, construction, operations and maintenance. Five credits are being pursued and could include the following.

- Innovation in Design: Exemplary Perf Quality Transit (yes)
- Innovation in Design: Green Housekeeping (yes)
- Innovation in Design: Integrated Pest Mgmt (yes)
- Innovation in Design: Education (yes)
- Innovation in Design: Water Rec (yes)

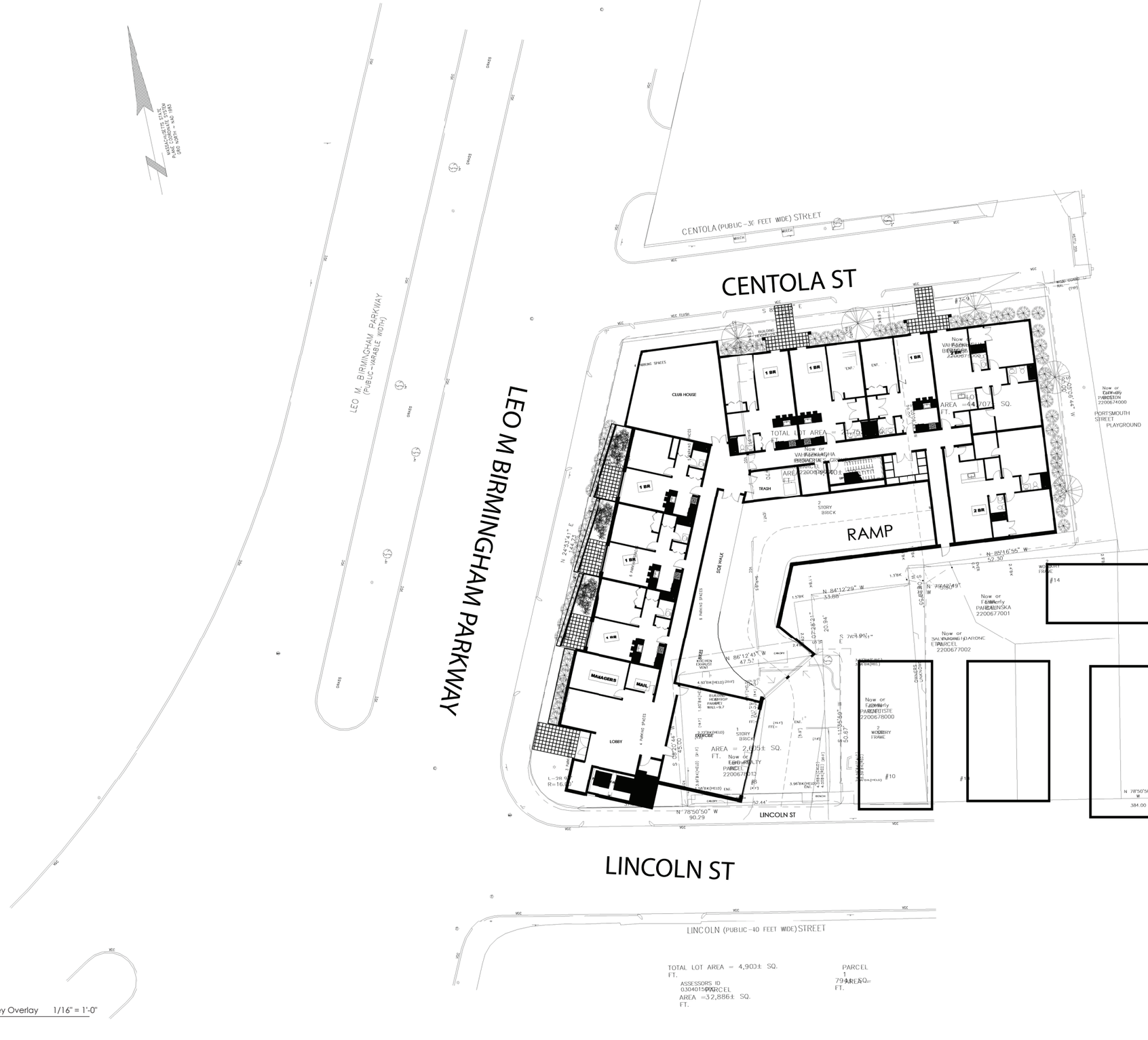
Regional Priority-

- Indoor Water Use (yes)
- Regional Priority: Optimize Energy (maybe)
- Regional Priority: Renewable Energy (maybe)

3.5 Urban Design Drawings

Urban design drawings and renderings depicting the Proposed Project and the LEED Checklist include:

Figure 3-0	Site Plan
Figure 3-1	Ground Floor/Site Plan
Figure 3-2	Landscape Plan
Figure 3-3	Lower Level Garage
Figure 3-4	L2 Garage
Figure 3-5	1st Floor Plan
Figure 3-6	2nd Floor Plan
Figure 3-7	3rd Floor Plan
Figure 3-8	4th Floor Plan
Figure 3-9	5th Floor Plan
Figure 3-10	West and South Elevation
Figure 3-11	East and North Elevation
Figure 3-12	East and South Elevation 2
Figure 3-13	Eye-Level Perspective North Towards WGBH
Figure 3-14	Eye-Level Perspective South Towards Soldiers Field Road
Figure 3-15	Overall Site Section
Figure 3-16	Site Section 1
Figure 3-17	Site Section 2
Figure 3-18	LEED v4 for BD+C: New Construction and Major Renovation



TOTAL LOT AREA = 4,900± SQ. FT.

ASSESSORS ID 0304015000 PARCEL AREA =32,886± SQ. FT.

PARCEL 1 AREA = 794± SQ. FT.

1 Site Plan With Survey Overlay 1/16" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS		
NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:

Site Plan

DATE: 08/29/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

Figure 3-0

1 GROUND FLOOR 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

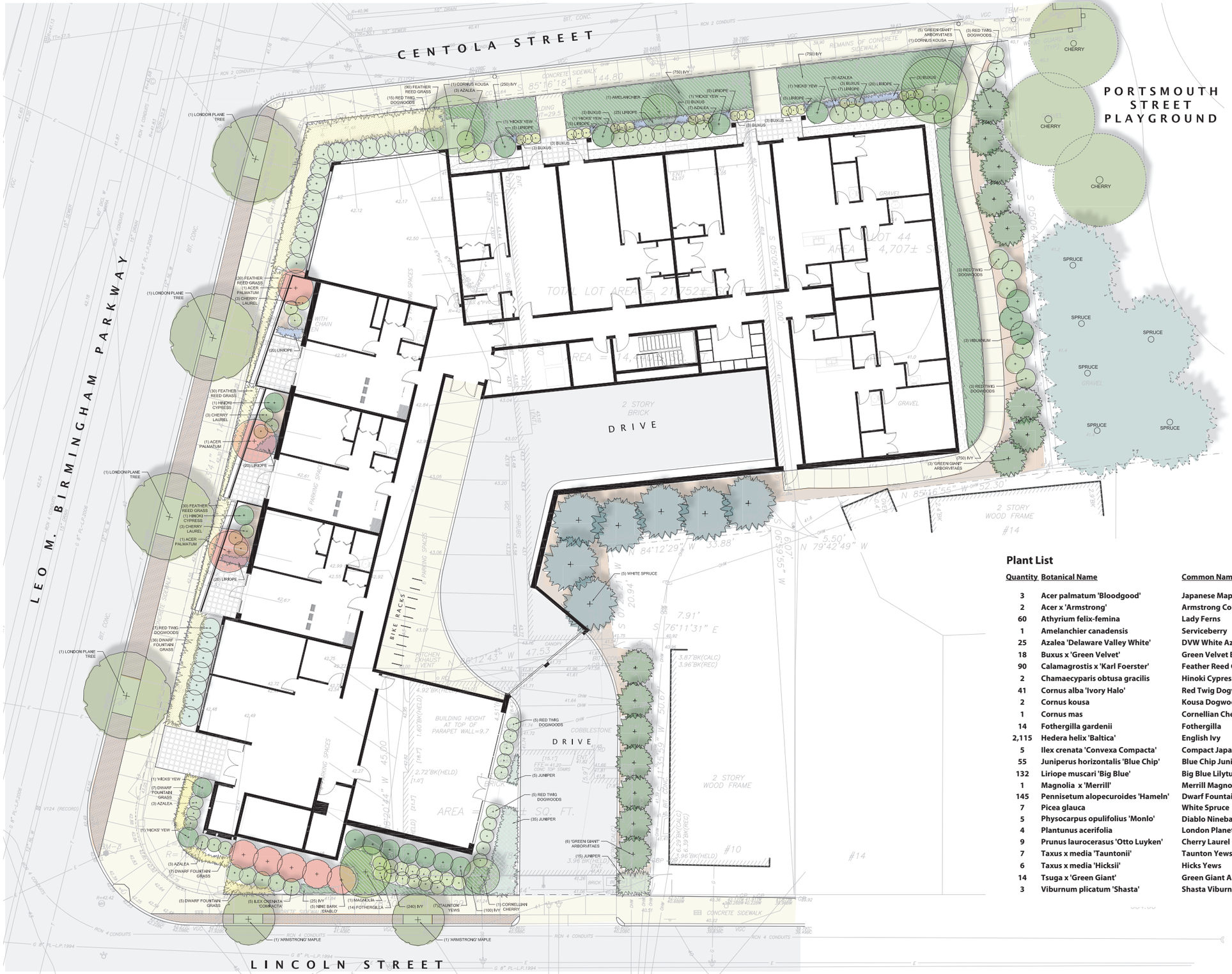
REVISIONS

NO.	DATE	ISSUE / DESCRIPTION

SHEET TITLE:
GROUND FLOOR/ SITE PLAN

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

Figure 3-1



Plant List

Quantity	Botanical Name	Common Name	Size	Notes
3	Acer palmatum 'Bloodgood'	Japanese Maple	6'-8' HT.	B&B
2	Acer x 'Armstrong'	Armstrong Columnar Maple	2"-2 1/2" Caliper	B&B
60	Athyrium felix-femina	Lady Ferns	2 Quart	Patio filler plants
1	Amelanchier canadensis	Serviceberry	10' HT. - Multistemmed	B&B
25	Azalea 'Delaware Valley White'	DVW White Azalea	#7 Containers	
18	Buxus x 'Green Velvet'	Green Velvet Boxwood	18"-24" HT/Spread	
90	Calamagrostis x 'Karl Foerster'	Feather Reed Grass	1 Gallon	
2	Chamaecyparis obtusa gracilis	Hinoki Cypress	4'-5' HT.	B&B
41	Cornus alba 'Ivory Halo'	Red Twig Dogwood	#5 Container	
2	Cornus kousa	Kousa Dogwood	12' HT. - Multistemmed	B&B
1	Cornus mas	Cornellian Cherry	8' HT. - Multistemmed	B&B
14	Fothergilla gardenii	Fothergilla	#5 Container	
2,115	Hedera helix 'Baltica'	English Ivy	2" Pots	Space 3 plants per SF
5	Ilex crenata 'Convexa Compacta'	Compact Japanese Holly	30"-36" HT.	
55	Juniperus horizontalis 'Blue Chip'	Blue Chip Juniper	3 Gallon	
132	Liriope muscari 'Big Blue'	Big Blue Lilyturf	1 Gallon	
1	Magnolia x 'Merrill'	Merrill Magnolia	10' HT. - Multistemmed	B&B
145	Pennisetum alopecuroides 'Hameln'	Dwarf Fountain Grass	2 Gallon	
7	Picea glauca	White Spruce	10'-12' HT.	B&B
5	Physocarpus opulifolius 'Monlo'	Diablo Ninebark Shrub	#7 Containers - 48" HT.	
4	Plantunus acerifolia	London Planetree	2 1/2"-3" Caliper	B&B
9	Prunus laurocerasus 'Otto Luyken'	Cherry Laurel	7 Gallon	
7	Taxus x media 'Tauntonii'	Taunton Yews	32"-36"Height & Spread	B&B
6	Taxus x media 'Hicksii'	Hicks Yews	4'-5' HT	B&B
14	Tsuga x 'Green Giant'	Green Giant Arborvitae	12'-14' HT.	B&B
3	Viburnum plicatum 'Shasta'	Shasta Viburnum	3'-4' HT	

1″=10′-0″

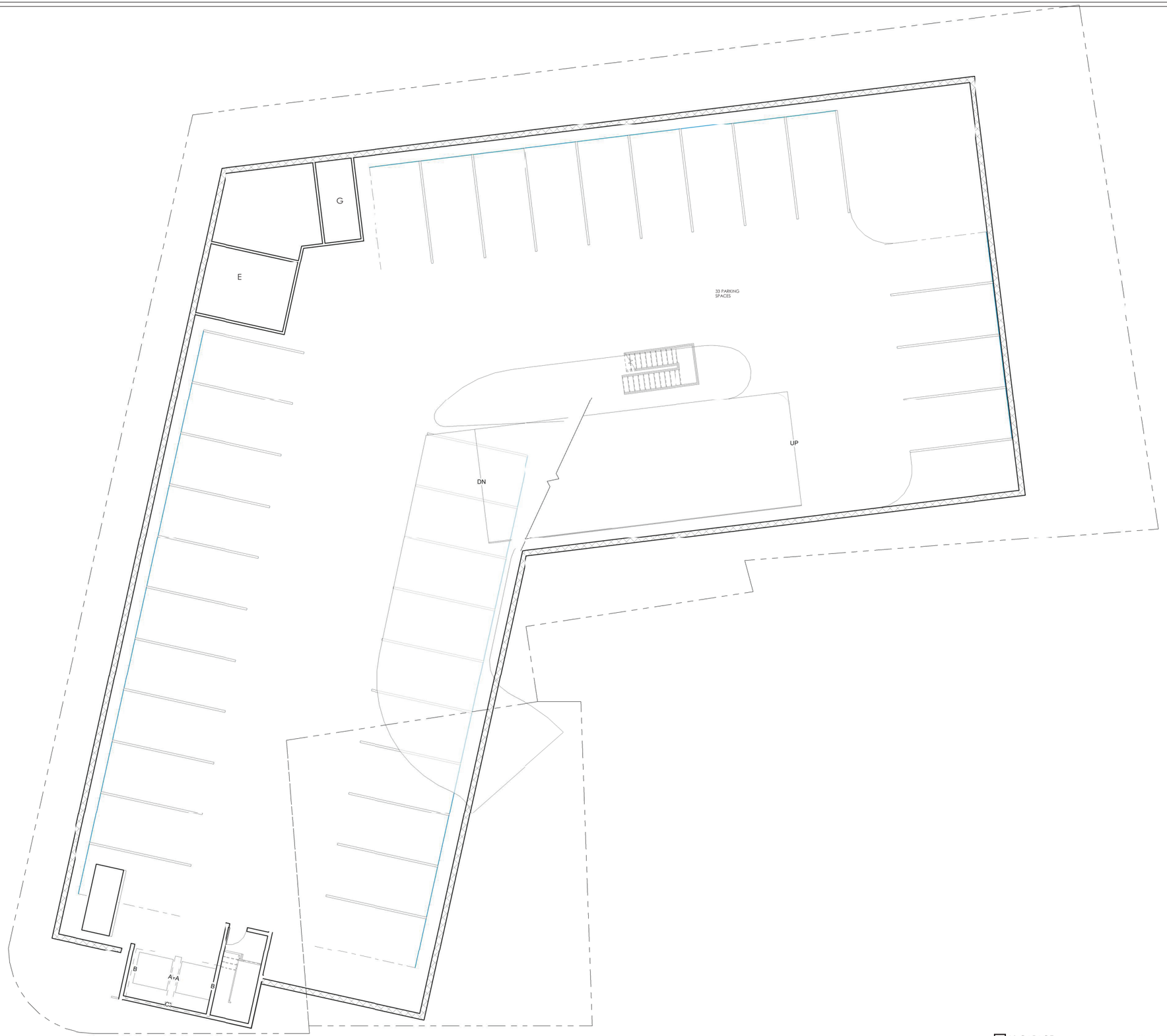
0′ 30′

September 8, 2017

Marc Mazzarelli Associates LLC
Landscape Architecture + Planning
284 Concord Avenue
Cambridge, MA 02138 USA
www.mmazz.com

Residences at Birmingham Condominium | 70 Leo M. Birmingham Parkway
Boston, Massachusetts

Landscape Plan
Figure 3-2



1 L1 GARAGE 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

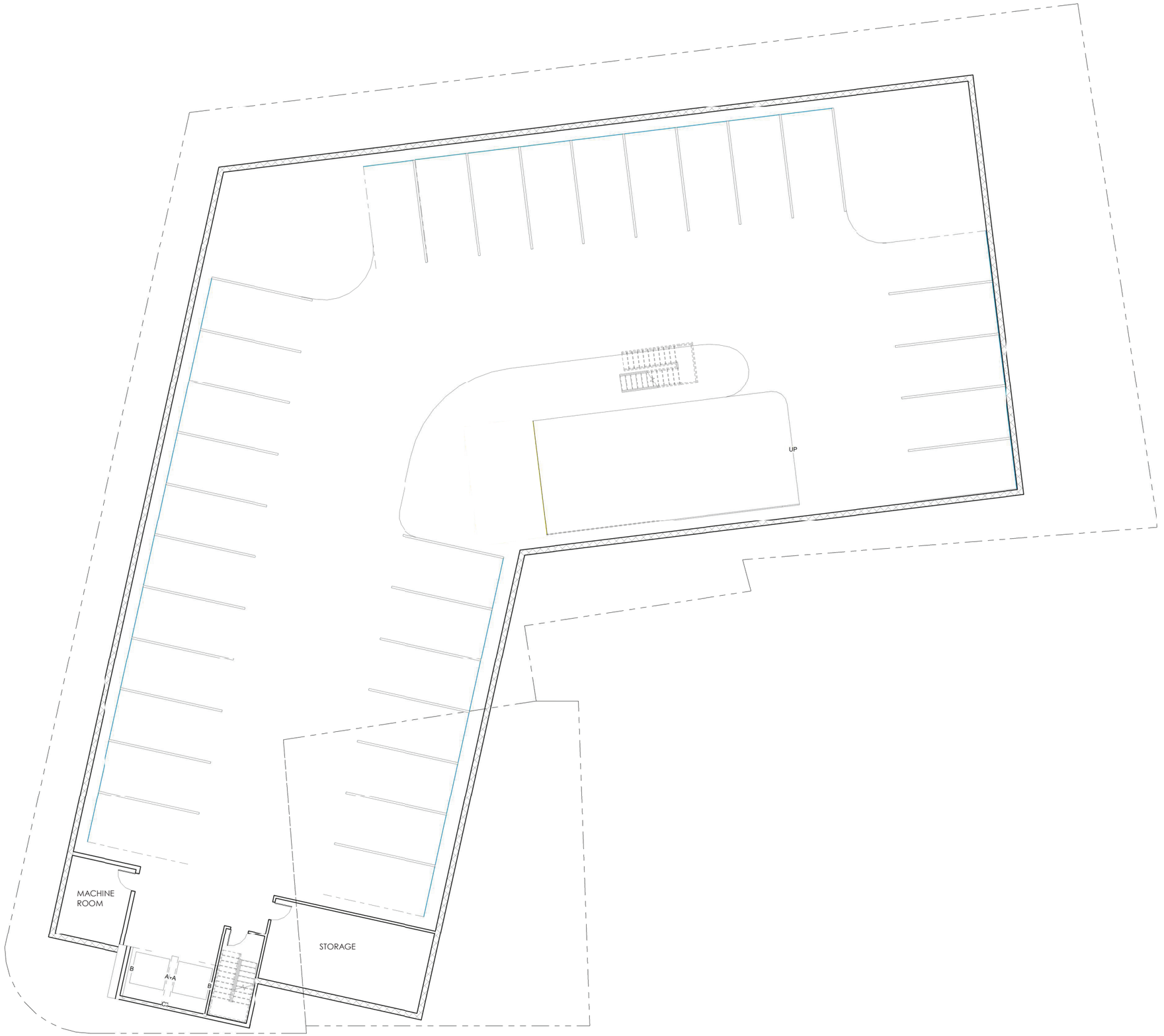
THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
LOWER LEVEL GARAGE

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

Figure 3-3



1 L2 GARAGE 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
L2 Garage

DATE: 05/23/17
DRAWN BY: Author
CHK'D. BY: Checker
JOB NO.:
DWG. NO.:
Figure 3-4

1 1st Floor OPT-A 2-2BEDROOM 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
1st FLOOR

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

Figure 3-5

1 2nd Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
2ND FLOOR

DATE: 05/22/17
DRAWN BY: Author
CHK'D. BY: Checker
JOB NO.:
DWG. NO.:

Figure 3-6

1 3rd Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
3rd FLOOR

DATE: 06/02/17
DRAWN BY: Author
CHK'D. BY: Checker
JOB NO.:
DWG. NO.:

Figure 3-7

1 4th Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT
BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE / DESCRIPTION

SHEET TITLE:
4th Floor

DATE: 05/22/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

Figure
3-8

1 5th Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE / DESCRIPTION

SHEET TITLE:
5th FLOOR

DATE: 05/22/17
DRAWN BY: P.D
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

Figure 3-9

1 West Elevation 1/8" = 1'-0"

2 South Elevation 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT
BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
WEST AND SOUTH ELEVATION

DATE: 02/09/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

Figure 3-10

2 East Elevation 1/8" = 1'-0"

1 North Elevation 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT
BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
EAST AND NORTH ELEV

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

Figure 3-11

1 East Elevation 2 1/8" = 1'-0"

2 South Elevation 2 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
EAST AND SOUTH ELEVATION 2

DATE: 04/14/17
DRAWN BY: Author
CHK'D. BY: Checker
JOB NO.:
DWG. NO.:

Figure 3-12

HENDREN ASSOCIATES ARCHITECTS + PLANNERS	70 Leo M. Birmingham Parkway Boston, MA	Eye-Level Perspective North towards WGBH	Figure 3-13

HENDREN ASSOCIATES ARCHITECTS + PLANNERS	70 Leo M. Birmingham Parkway Boston, MA	Eye- Level Perspective South towards Soldiers Field Rd.	Figure 3-14

HENDREN ASSOCIATES ARCHITECTS + PLANNERS	70 Leo M. Birmingham Parkway Boston, MA	Overall Site Section	Figure 3-15

HENDREN ASSOCIATES ARCHITECTS + PLANNERS	70 Leo M. Birmingham Parkway Boston, MA	Site Section 1	Figure 3-16

HENDREN ASSOCIATES ARCHITECTS + PLANNERS	70 Leo M. Birmingham Parkway Boston, MA	Site Section 2	Figure 3-17

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name: 70 Leo Birmingham Parkway
Date: 21-Aug-17

Y	?	N			
	1		Credit	Integrative Process	1

12	4	0	Location and Transportation		16
			Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
	2		Credit	High Priority Site	2
5			Credit	Surrounding Density and Diverse Uses	5
5			Credit	Access to Quality Transit	5
1			Credit	Bicycle Facilities	1
	1		Credit	Reduced Parking Footprint	1
	1		Credit	Green Vehicles	1

4	0	6	Sustainable Sites		10
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
		1	Credit	Open Space	1
		3	Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1

7	2	2	Water Efficiency		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1	1		Credit	Outdoor Water Use Reduction	2
6			Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
	1		Credit	Water Metering	1

14	13	6	Energy and Atmosphere		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
4	2		Credit	Enhanced Commissioning	6
8	4	6	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
	2		Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

2	5	6	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
	3	2	Credit	Building Life-Cycle Impact Reduction	5
	1	1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	1	1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

7	8	1	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
	2	1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1	1		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
	3		Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

6	0	0	Innovation		6
5			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

2	1	1	Regional Priority		4
1			Credit	Regional Priority: Indoor Water Use	1
		1	Credit	Regional Priority: High Priority Site	1
1			Credit	Regional Priority: Optimize Energy	1
	1		Credit	Regional Priority: Renewable	1

54	34	22	TOTALS	Possible Points:	110

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

Figure 3-18. LEED v4 BD+C: New Construction and Major Renovation

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Shadow Impacts Analysis

4.1.1 Introduction

The following shadow study describes and graphically depicts anticipated new shadow impacts from the Project compared to shadows from existing buildings. The study presents the existing and built conditions for the proposed Project for the hours 9:00 AM, 12:00 Noon, and 3:00 PM for the vernal equinox, summer solstice, autumnal equinox, and winter solstice. In addition, shadows are depicted for 6:00 PM during the summer solstice and autumnal equinox.

4.1.2 Vernal Equinox (March 21)

Figures 4.1-1 through **4.1-3** depict shadows on March 21.

At 9:00 AM, shadows are cast in a northwesterly direction onto portions of Leo M. Birmingham Parkway and across Centola Street onto a corner of adjacent 50 Leo M. Birmingham Parkway.

At 12:00 Noon, new shadow is cast in a northerly direction onto a portion of 58 Leo M. Birmingham Parkway's structure.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction onto a portion of 58 Leo M. Birmingham Parkway's structure, onto a small portion of the adjacent City of Boston's Portsmouth Street Playground, and onto the western sides of some of the houses along Lincoln Street.

4.1.3 Summer Solstice (June 21)

Figures 4.1-4 through **4.1-7** depict shadow impacts on June 21.

At 9:00 AM, shadows are cast in a northwesterly direction onto portions of Leo M. Birmingham Parkway.

At 12:00 Noon, new shadow is cast in a northerly direction onto a small portion of Centola Street.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction onto an edge portion of the Park, not used by the public.

At 6:00 PM, new shadow from the Project is cast in an easterly direction and limited to the sides of the structure along Lincoln Street.

4.1.4 Autumnal Equinox (September 21)

Figures 4.1-8 through **4.1-11** depict shadow impacts on September 21.

At 9:00 AM, shadows are cast in a northwesterly direction onto portions of Leo M. Birmingham Parkway and across Centola Street onto a corner of adjacent 50 Leo M. Birmingham Parkway.

At 12:00 Noon, new shadow is cast in a northerly direction onto a portion of 58 Leo M. Birmingham Parkway's structure.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction onto a portion of 58 Leo M. Birmingham Parkway's structure, onto a small portion of the adjacent City of Boston's Portsmouth Street Playground, and onto the western sides of some of the houses along Lincoln Street.

At 6:00 PM, new shadow from the Project is cast in an easterly direction and limited to the sides of the structures along Lincoln Street, and a portion of the Park.

4.1.5 Winter Solstice (December 21)

Figures 4.1-12 through **4.1-14** depict shadow impacts on December 21. Winter sun casts the longest shadows of the year.

At 9:00 AM, are cast in a northwesterly direction onto portions of Leo M. Birmingham Parkway, on the other side of the Parkway close to the access road from Soldiers Field Road.

At 12:00 Noon, new shadow is cast in a northerly direction onto a portion of 58 Leo M. Birmingham Parkway's structure.

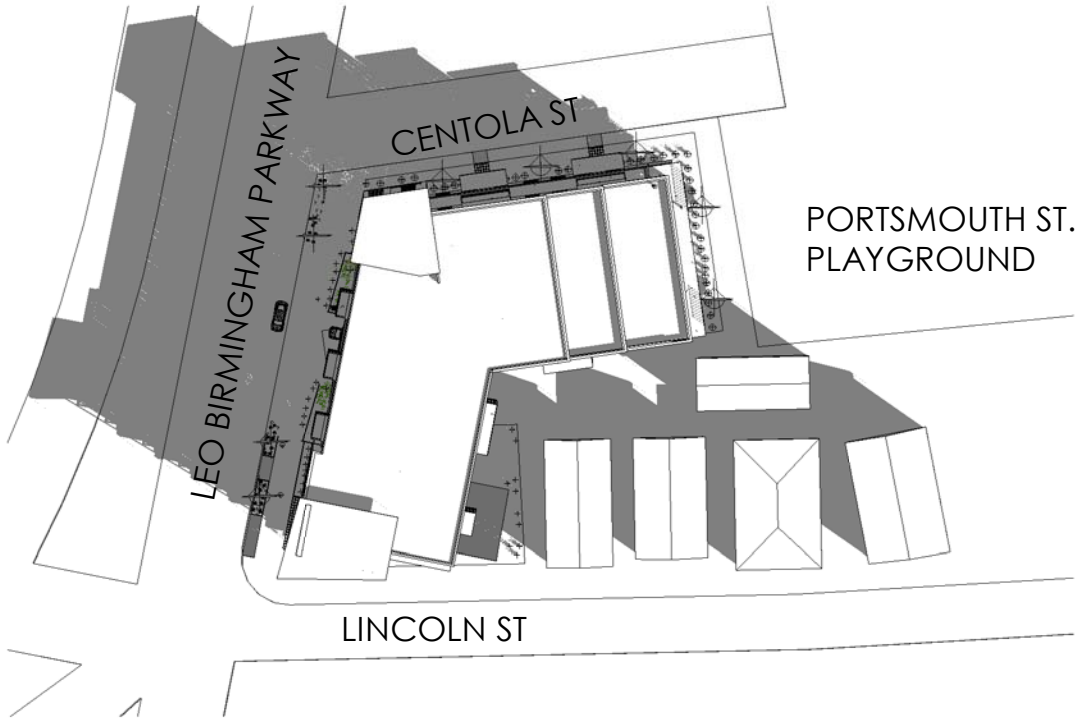
At 3:00 PM, new shadow from the Project is cast onto a portion of 58 Leo M. Birmingham Parkway's structure, the sides of the structures along Lincoln Street, and a portion of the Park.

4.1.6 Summary

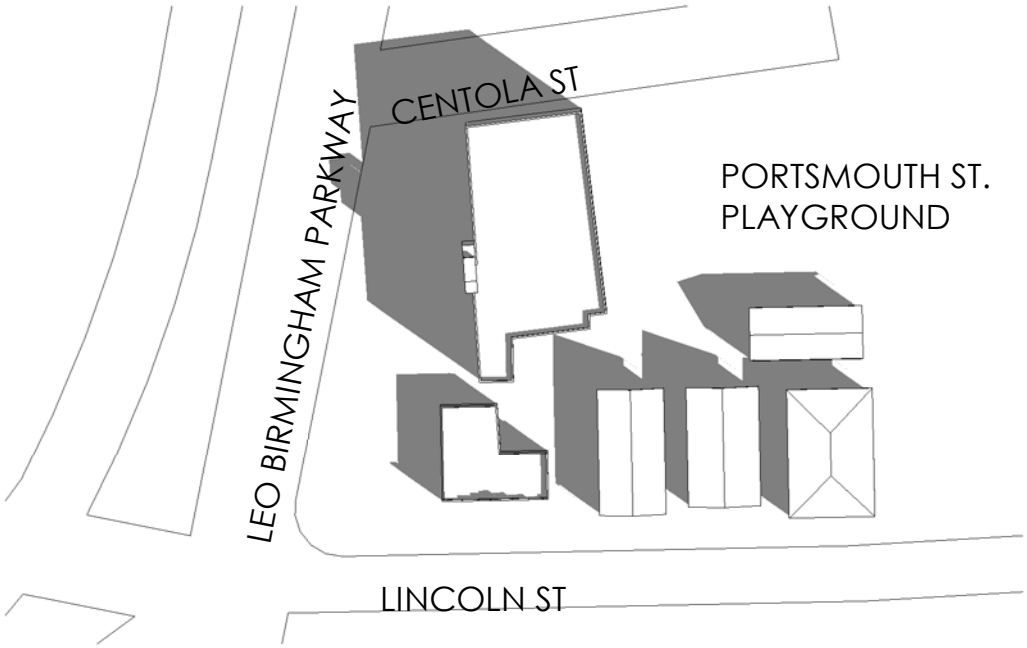
The proposed re-development is situated on a half acre parcel at the south-west corner of the block with the 7- lane divided Leo Birmingham Parkway to the east, the 3-acre Portsmouth Playground to the west, Lincoln Street and the Massachusetts Turnpike to the south and a four-story office building across Centola Street and a parking lot to the north. The building massing has been loaded to the westerly edge of the site along Leo Birmingham Parkway and then steps down from 6- stories to 3 stories as it approaches the playground. There is also a 20-foot setback from the playground to further reduce any shadow impacts.

New shadow is generally limited to the streets surrounding the Site. Late afternoon and evening shadows will extend in an easterly/northeasterly direction toward the Portsmouth Street Playground during the winter sunsets when there will be minimal activity in the playground and

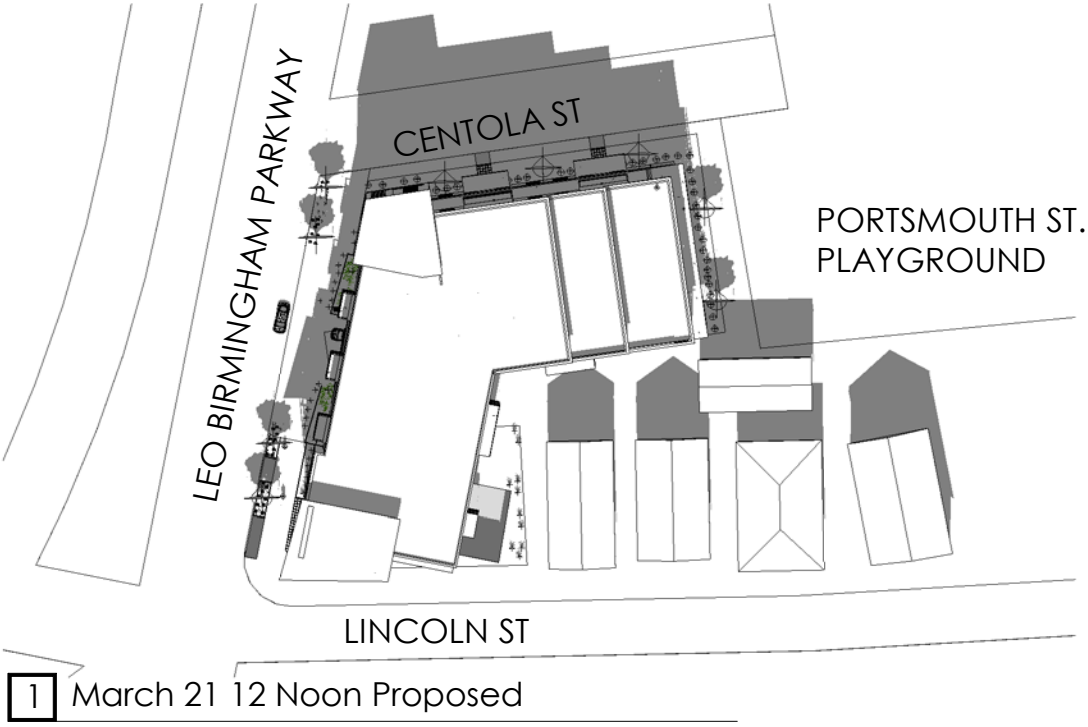
onto the nearby structures along Lincoln Street. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings.



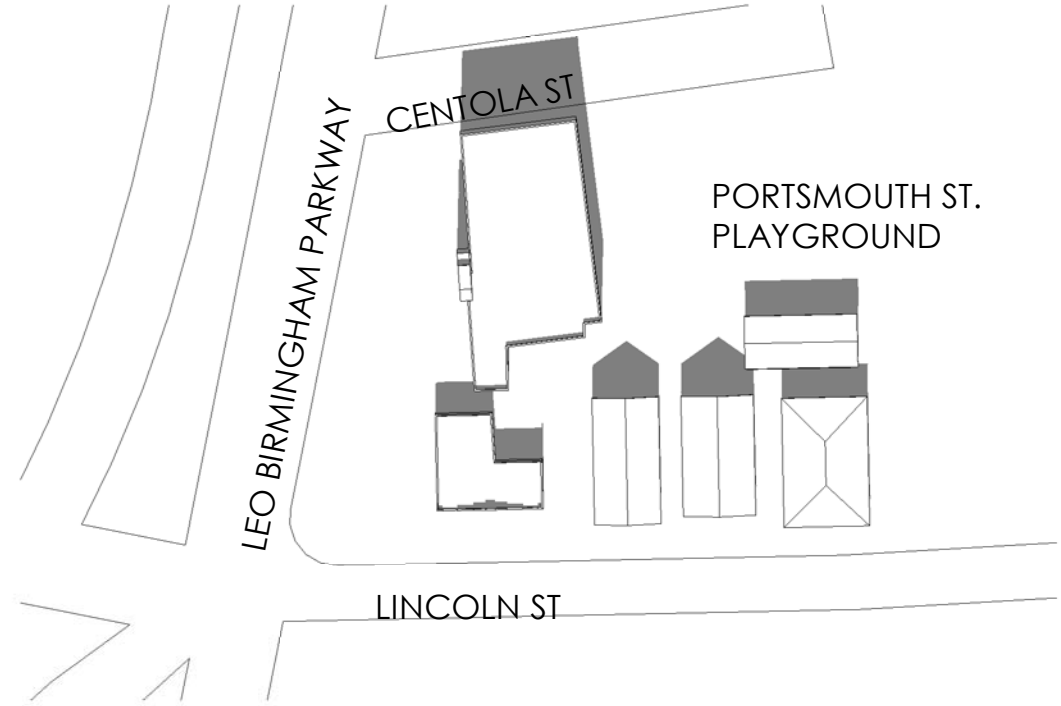
1 March 21 9AM Proposed



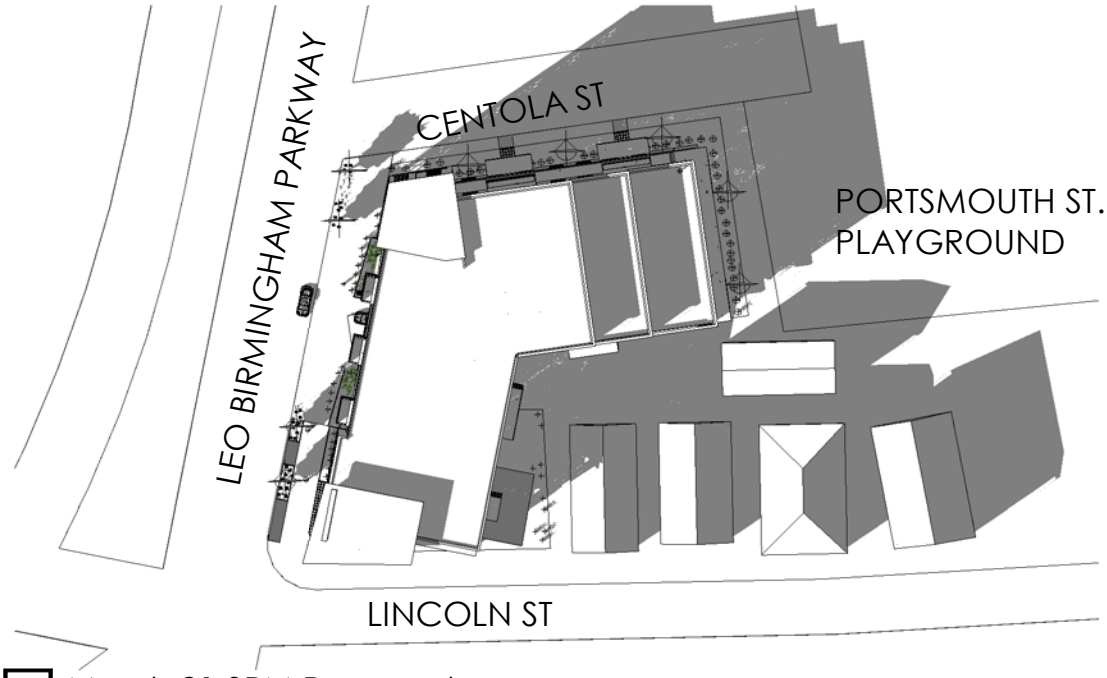
2 March 21 9AM Existing



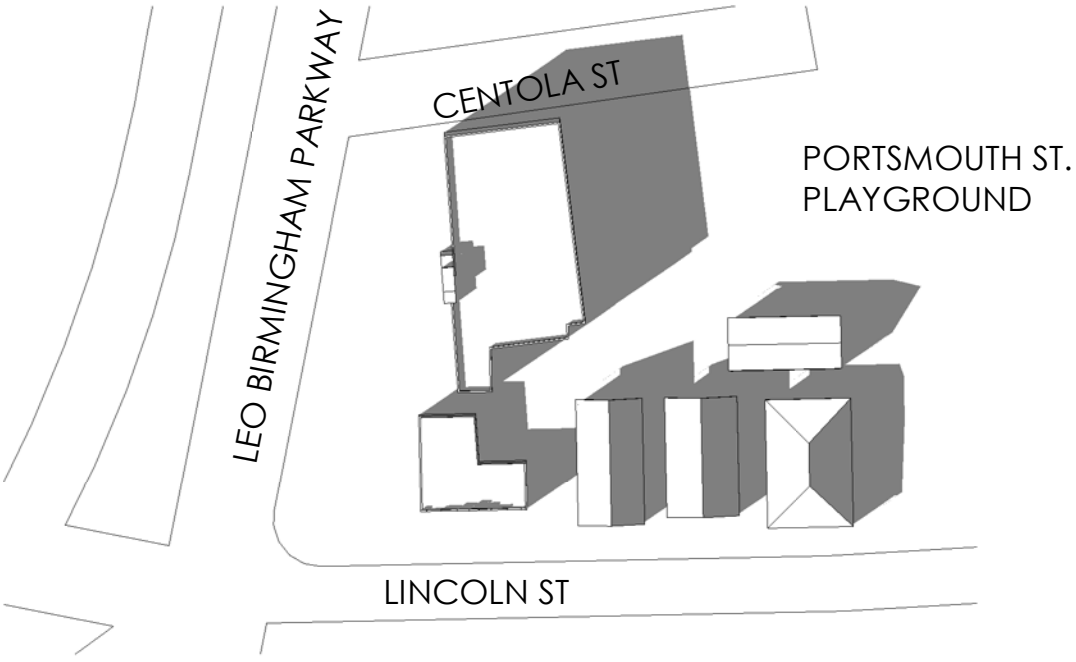
1 March 21 12 Noon Proposed



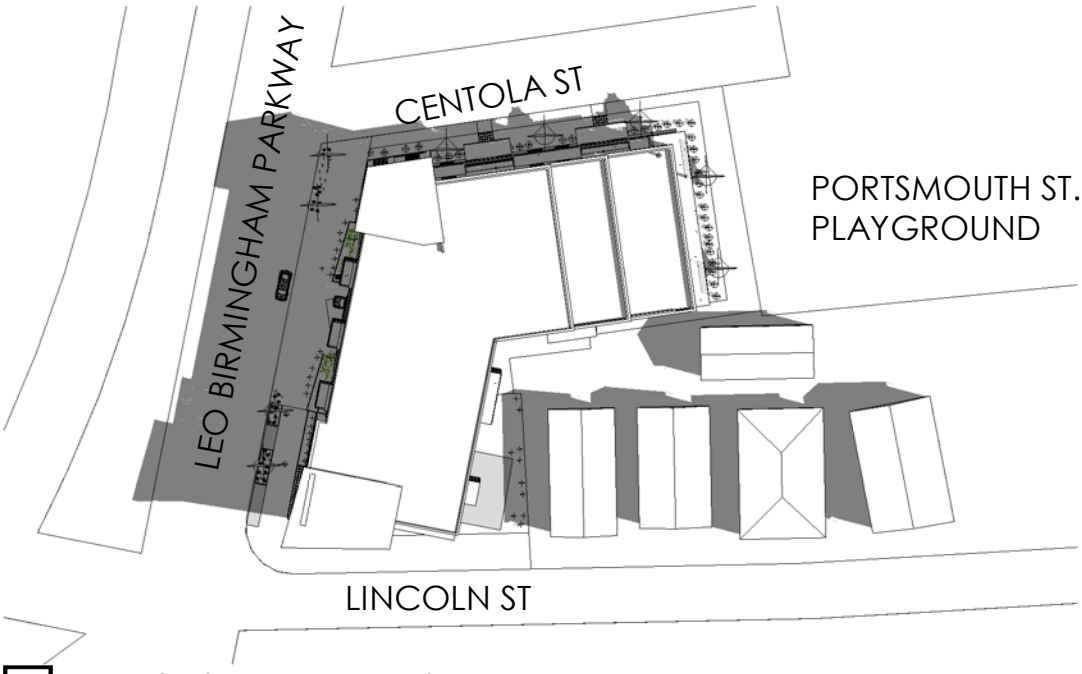
2 March 21 12 Noon Existing



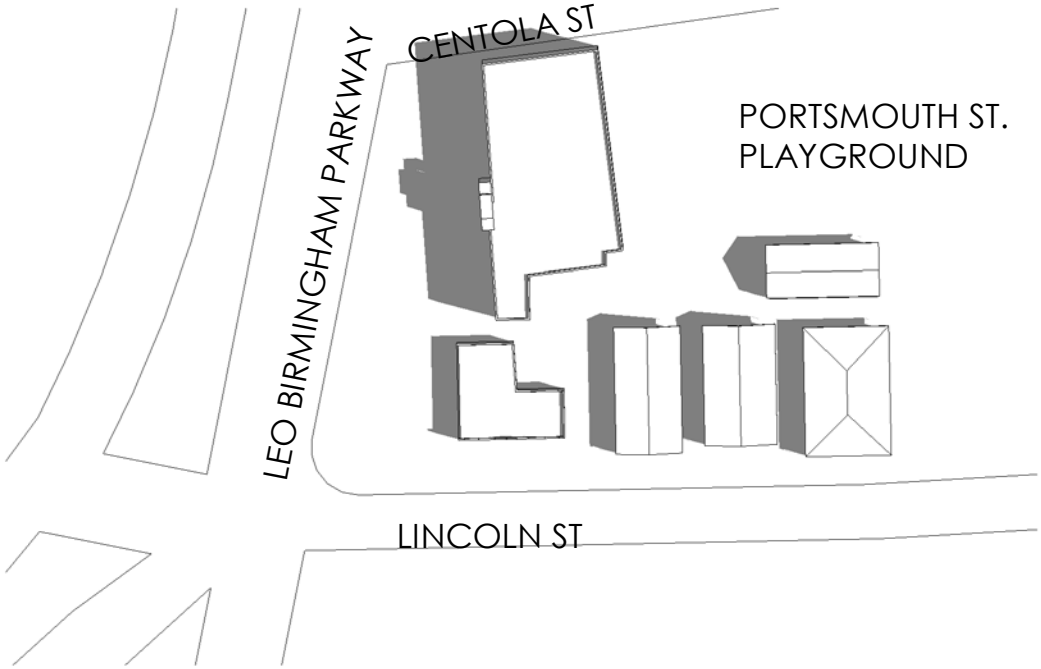
1 March 21 3PM Proposed



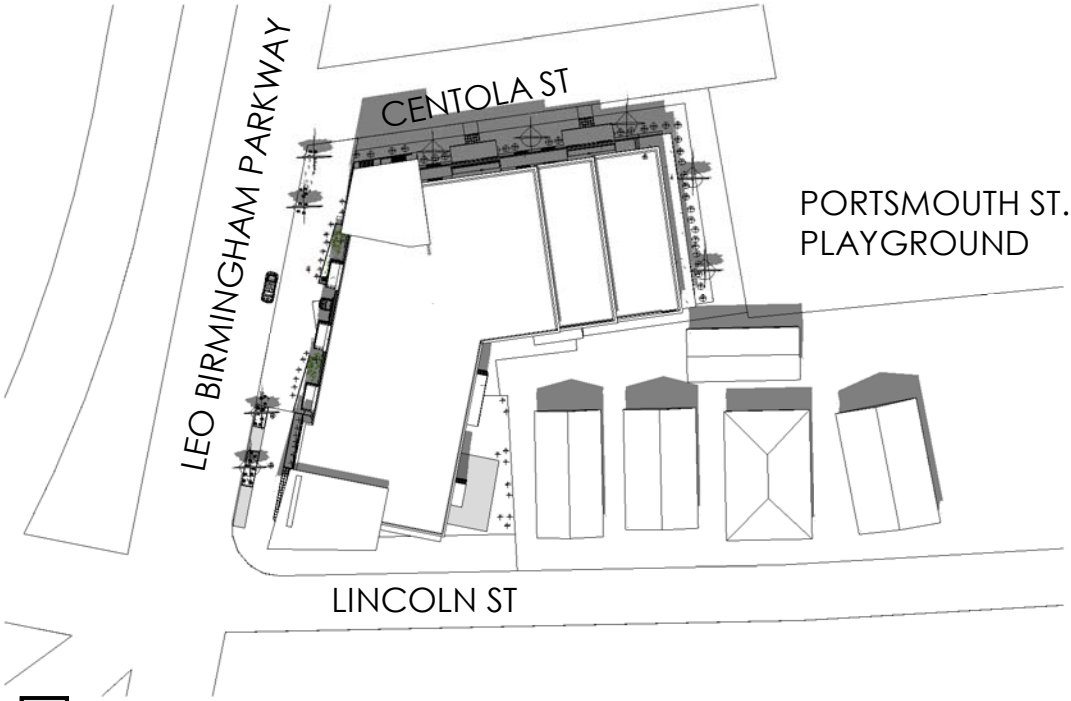
2 March 21 3PM Existing



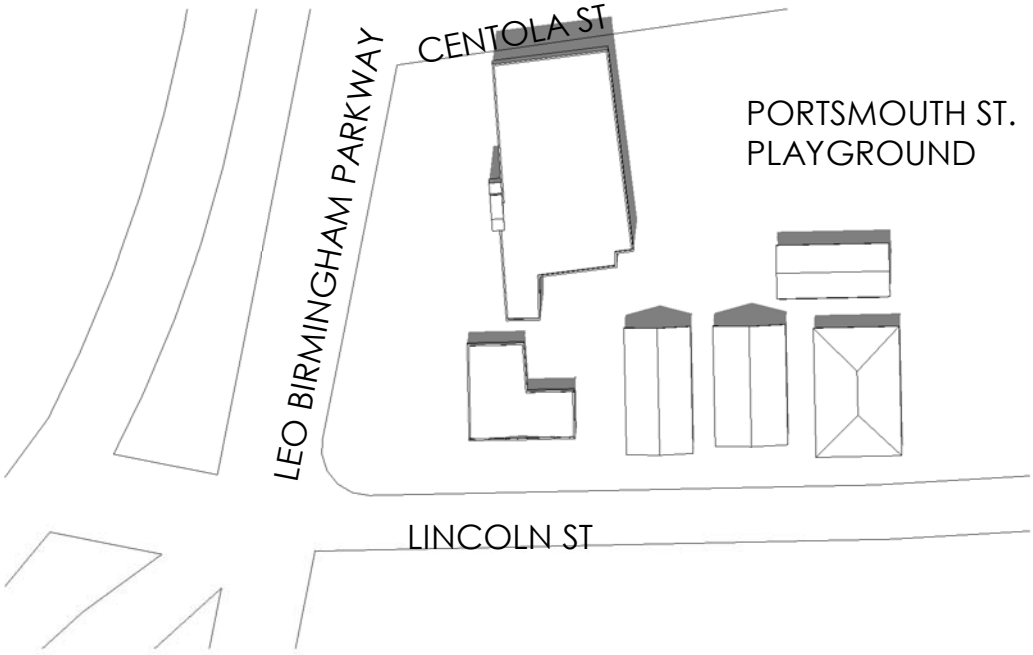
1 June 21 9AM Proposed



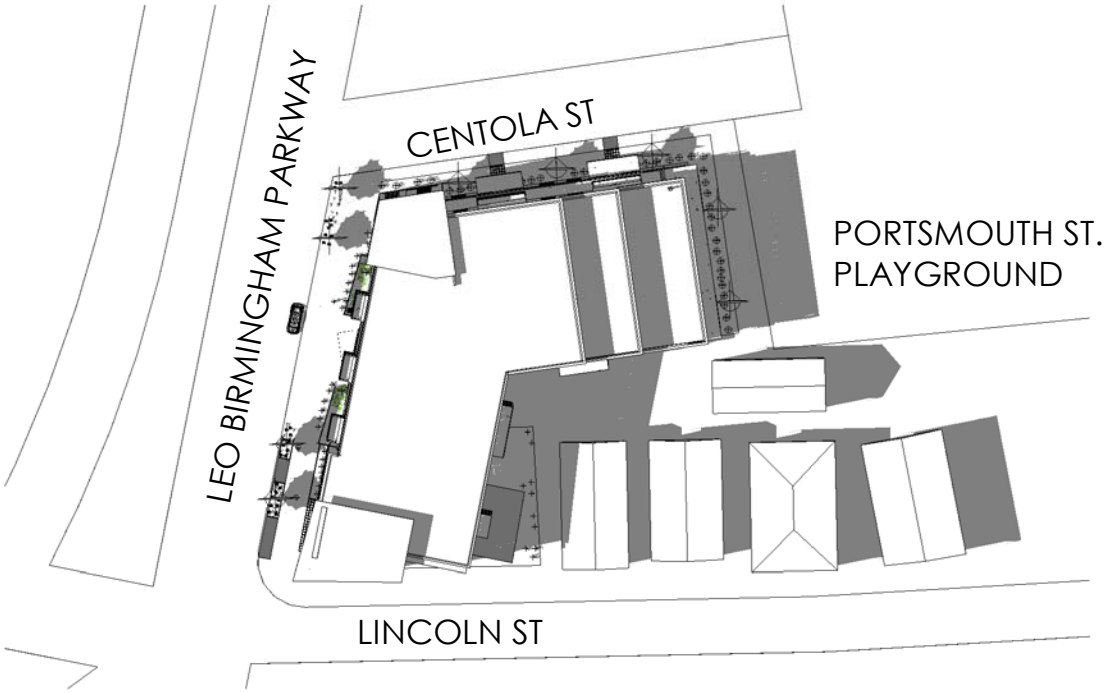
2 June 21 9AM Existing



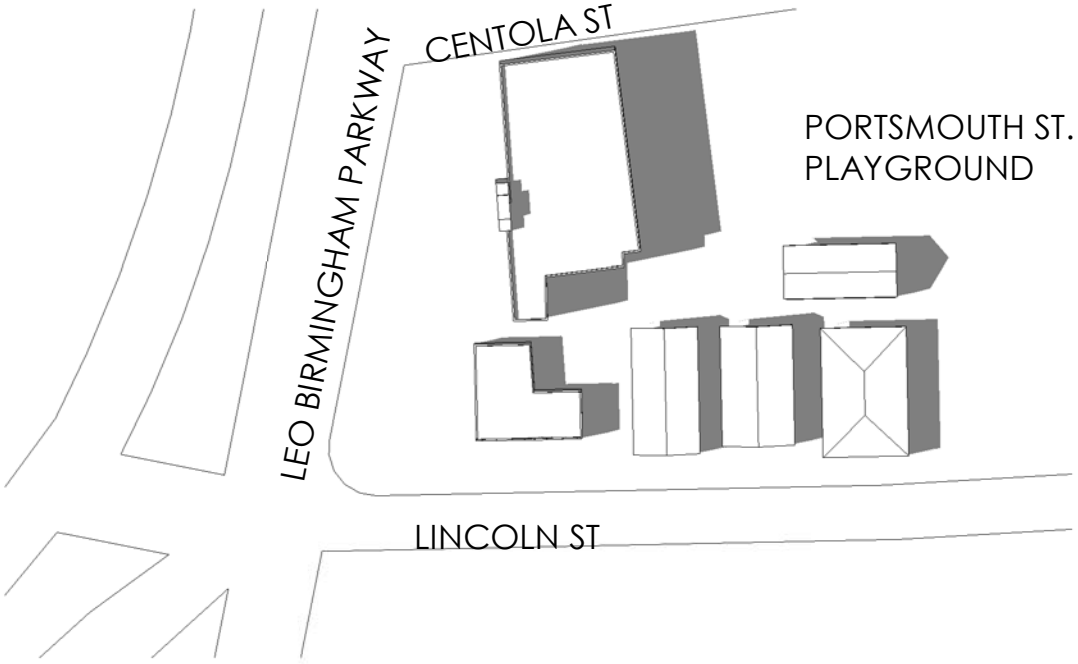
1 June 21 12 Noon Proposed



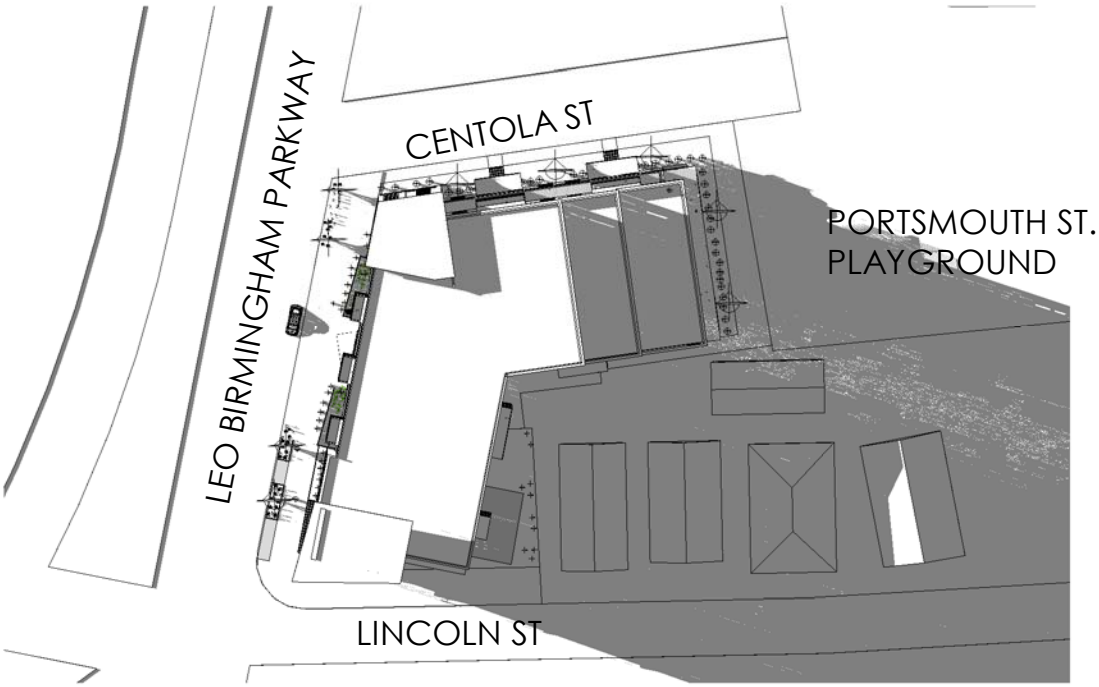
2 June 21 12 Noon Existing



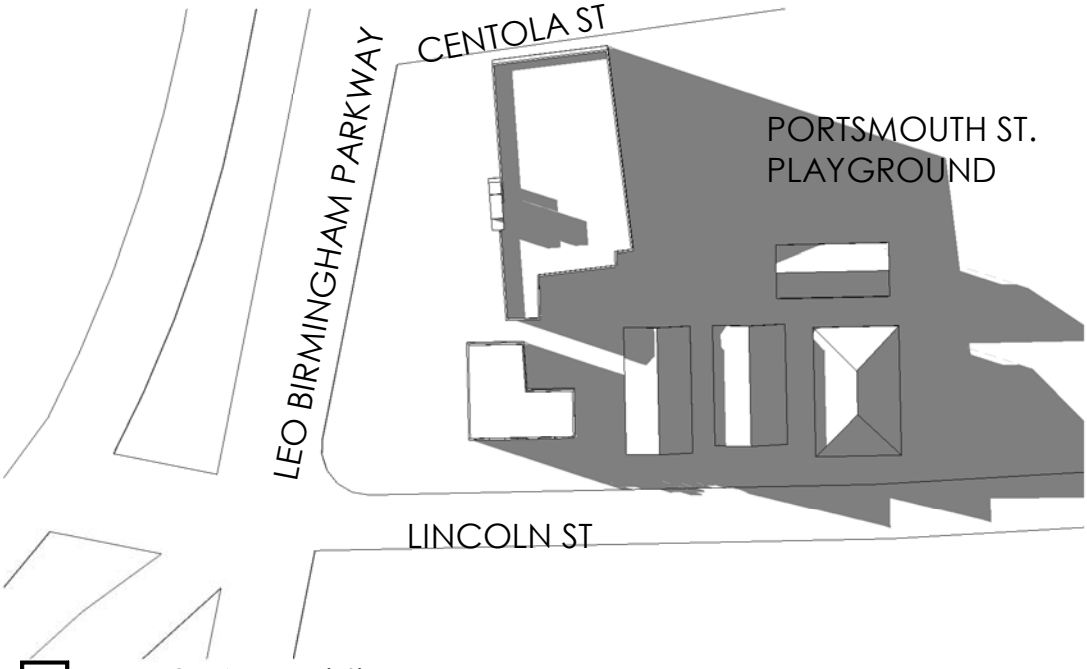
1 June 21 3PM Proposed



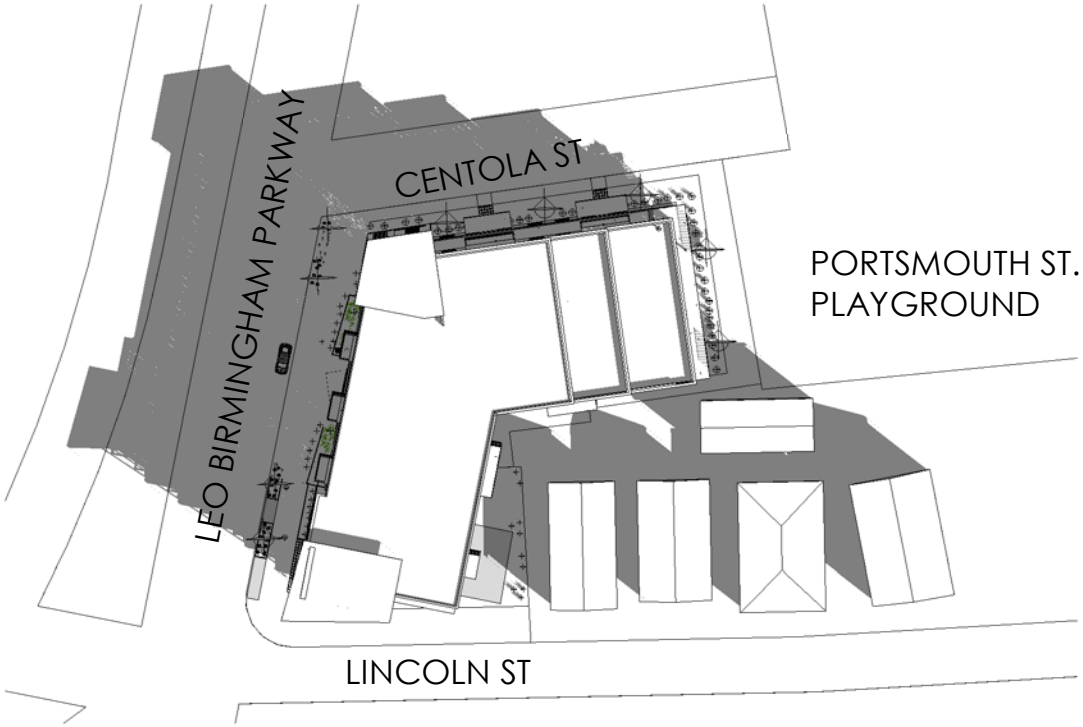
2 June 21 3PM Existing



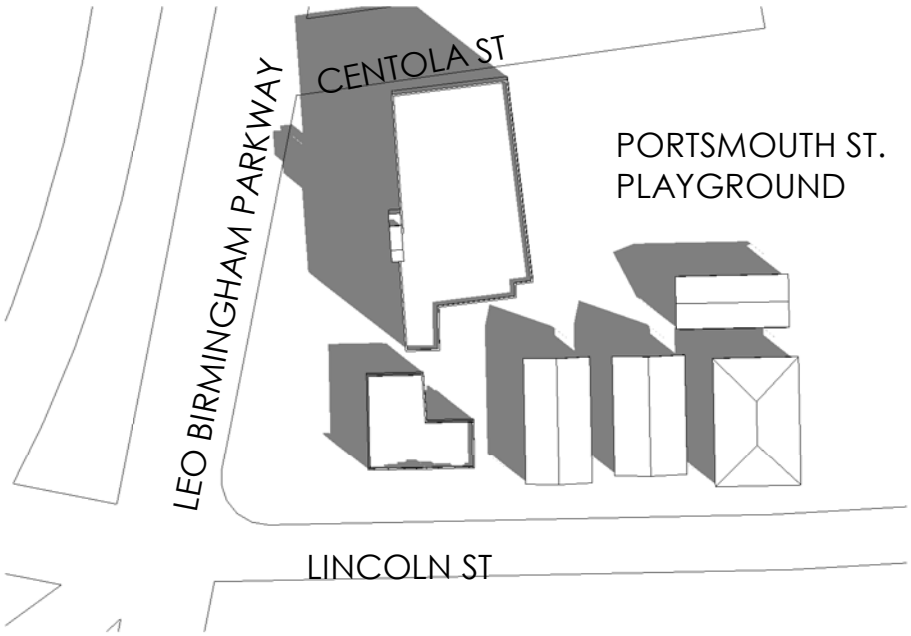
1 June 21 6PM Proposed



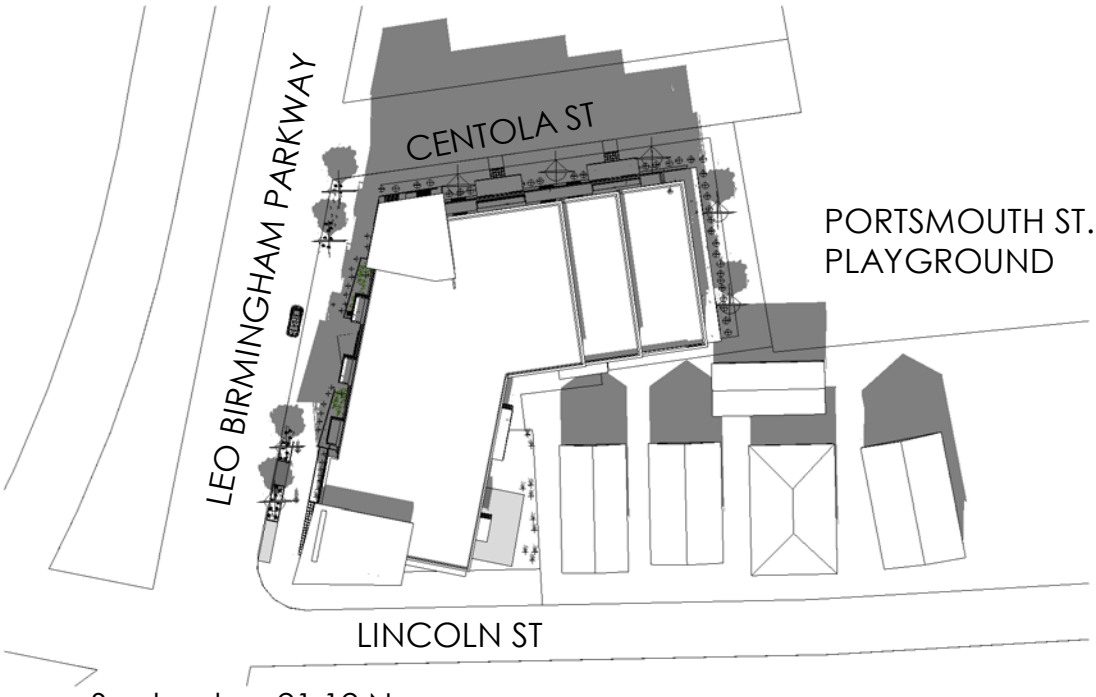
2 June 21 6PM Existing



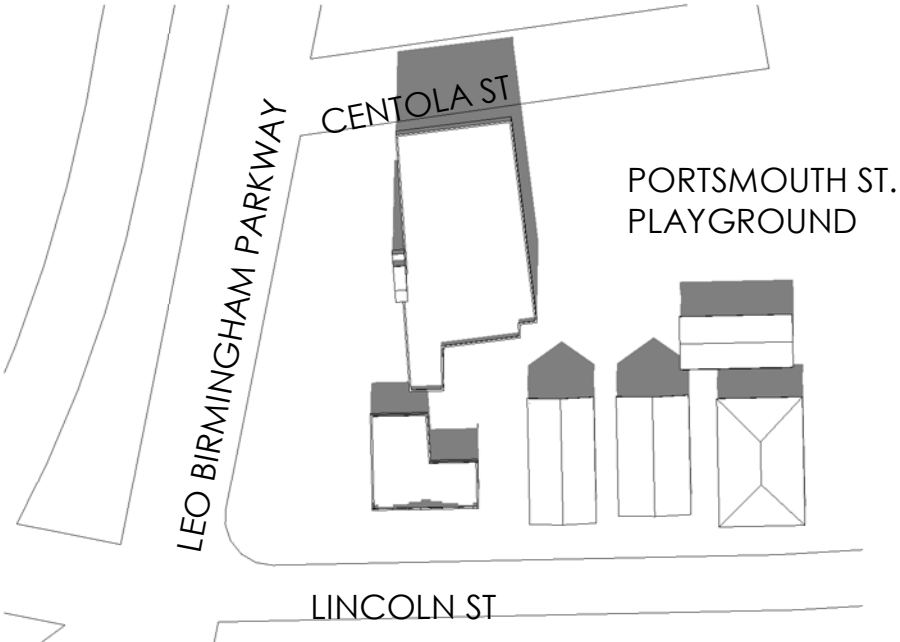
1 September 21 9AM Proposed



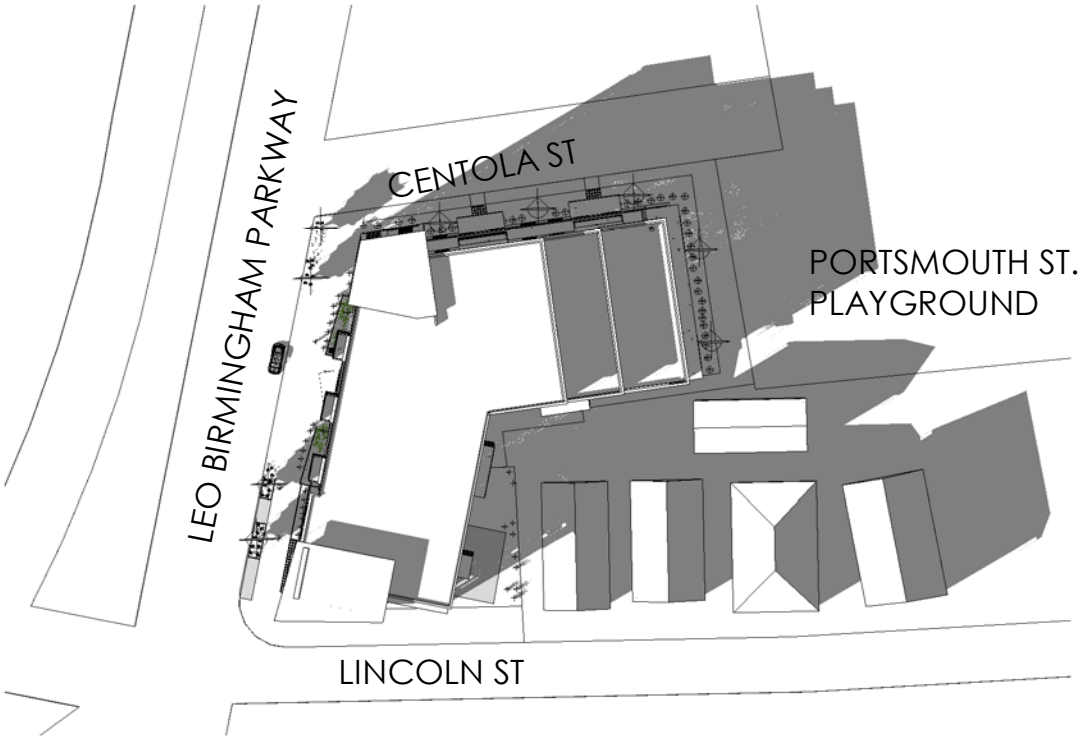
2 September 21 9AM Existing



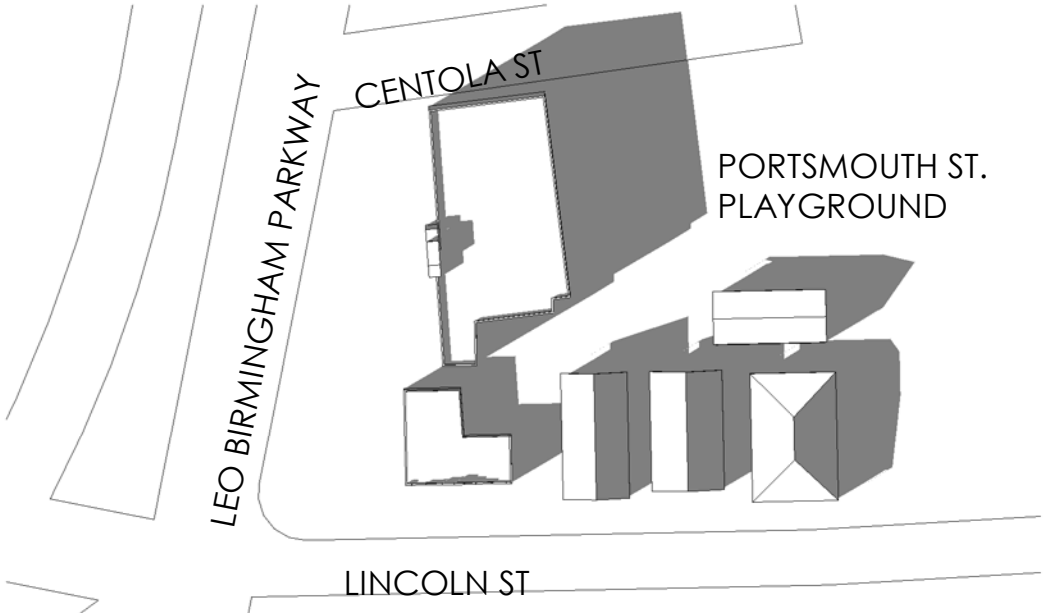
1 September 21 12 Noon Proposed



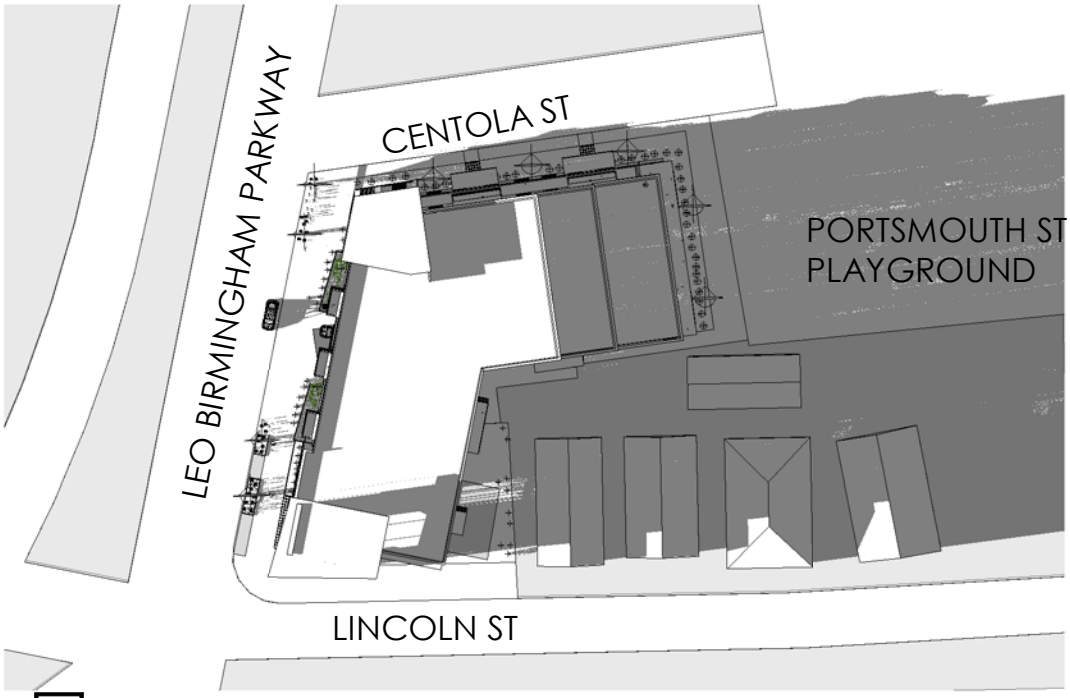
2 September 21 12 Noon Existing



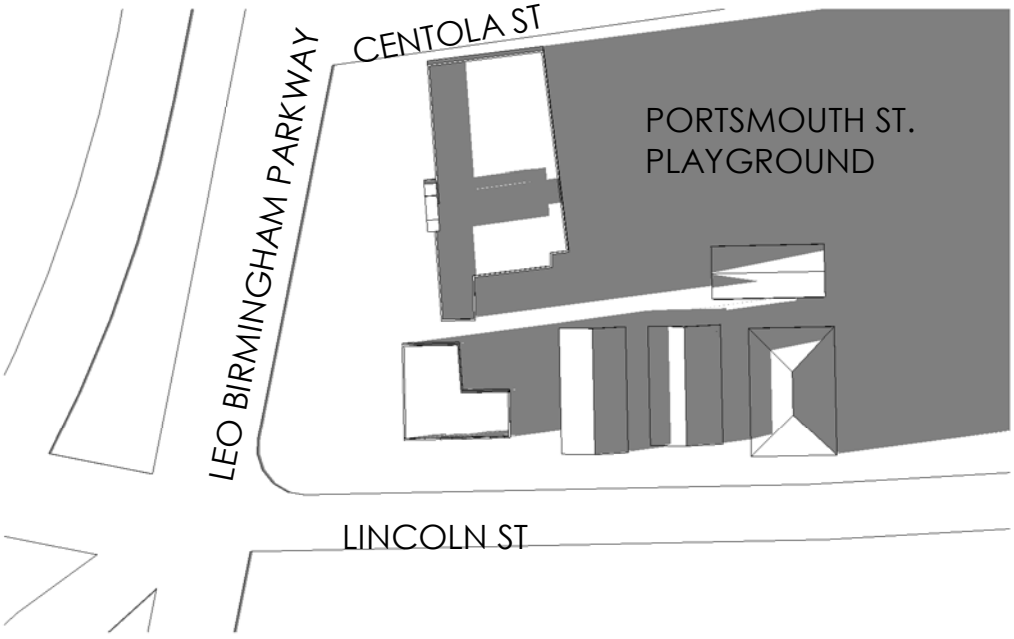
1 September 21 3PM Proposed



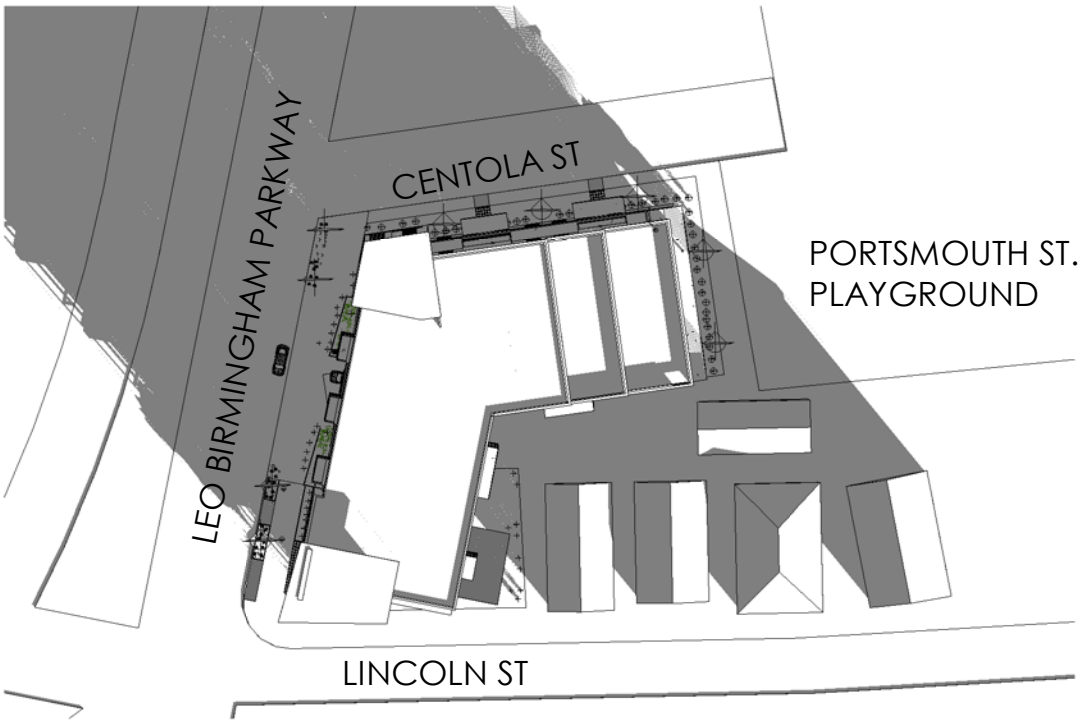
2 September 21 3PM Existing



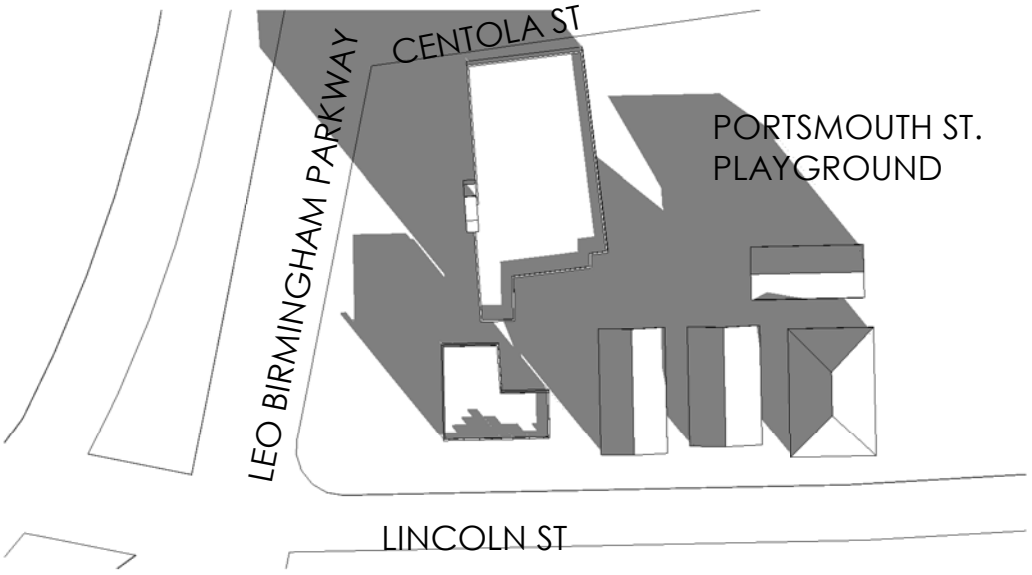
1 September 21 6PM Proposed



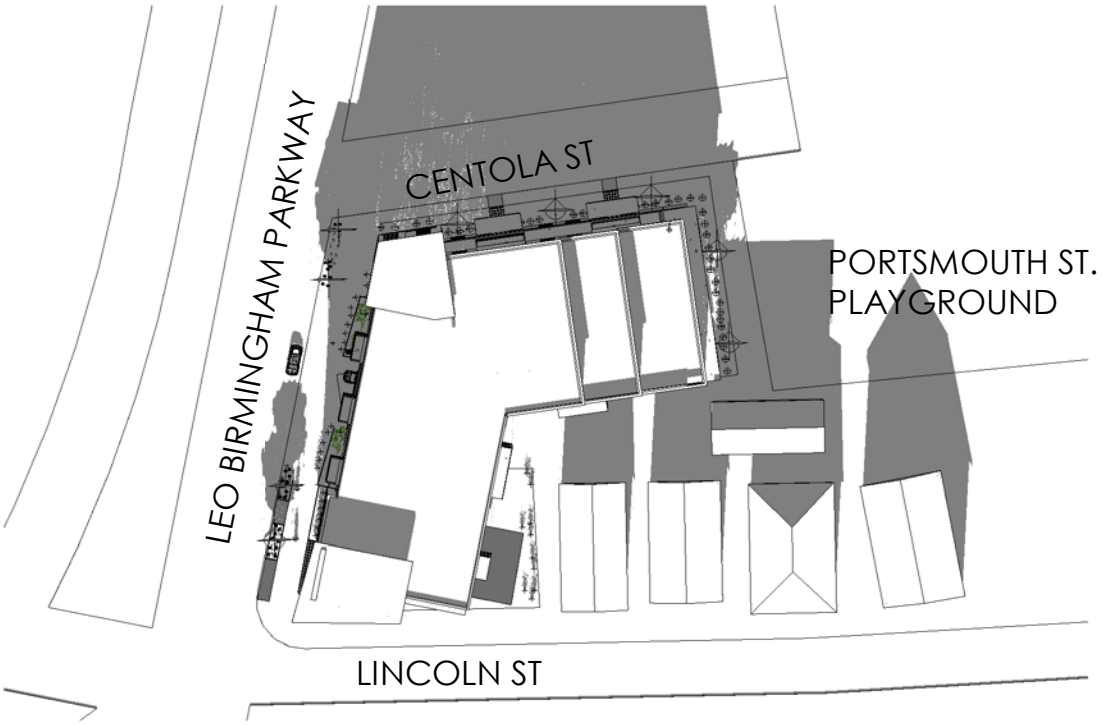
2 September 21 6PM Existing



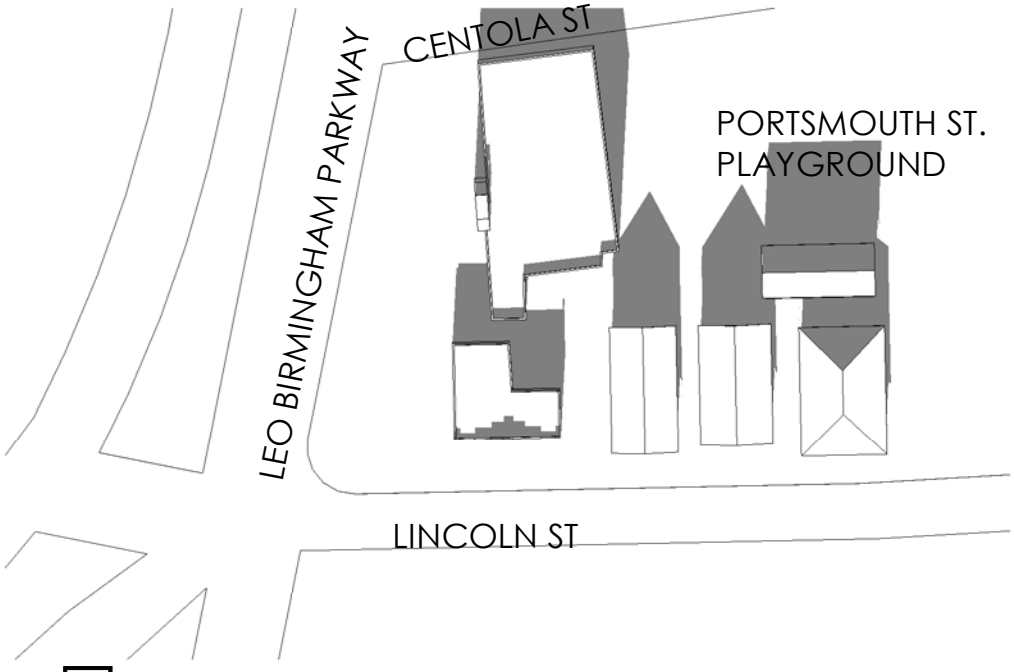
1 December21 9AM Proposed



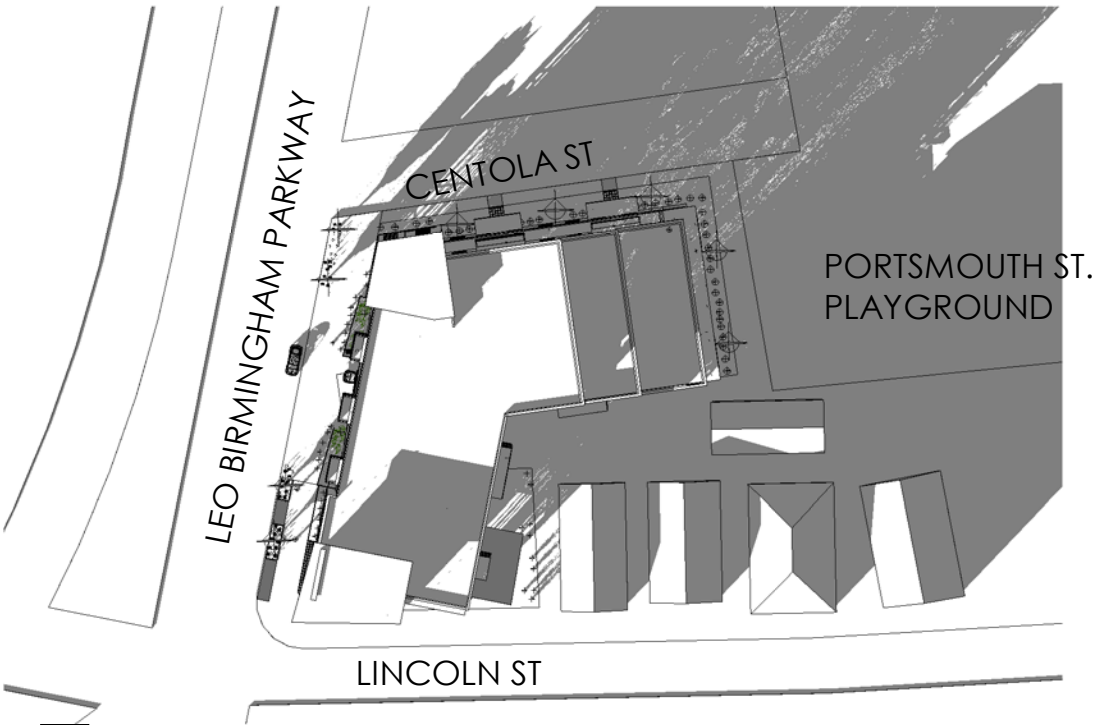
2 December 21 9AM Existing



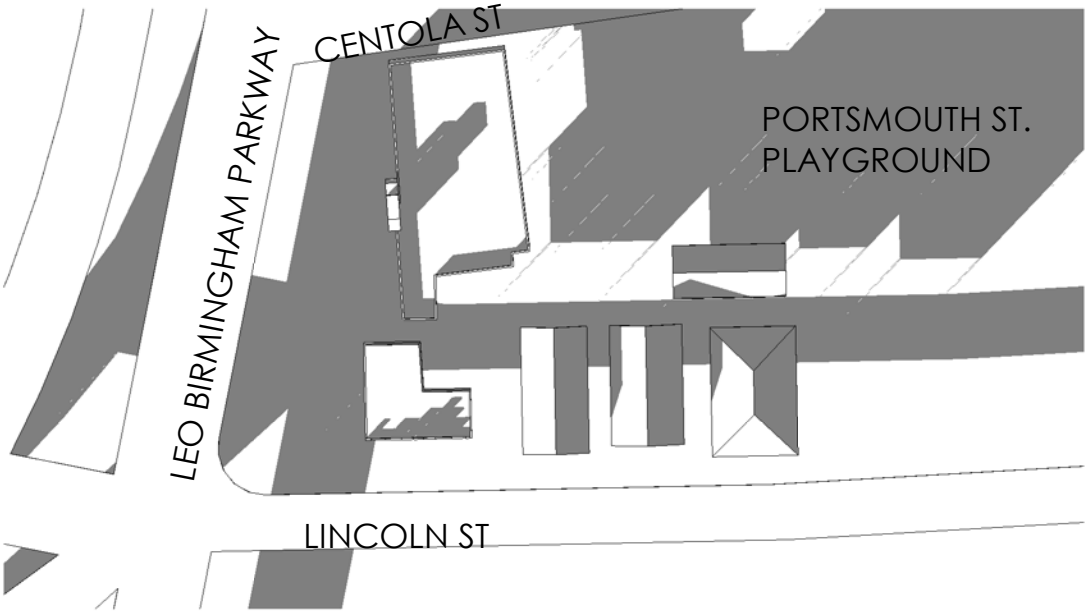
1 December21 12 Noon Proposed



2 December 21 12 Noon Existing



1 December21 3PM Proposed



2 December 21 3PM Existing

4.2 Air Quality

Tech Environmental, Inc. performed air quality analyses for the Proposed Project (the "Project") to be located at 70 Leo M. Birmingham Parkway in the Brighton. These analyses consisted of: 1) an evaluation of existing air quality; 2) an evaluation of potential carbon monoxide (CO) impacts from the operation of the Project's enclosed parking garage, and 3) a microscale CO analysis for intersections in the Project area that meet the BRA criteria for requiring such an analysis.

4.2.1 Existing Air Quality

The City of Boston is currently classified as being in attainment of the Massachusetts and National Ambient Air Quality Standards ("NAAQS") for all of the criteria air pollutants except ozone (see **Table 4.2-1**). These air quality standards have been established to protect the public health and welfare in ambient air, with a margin for safety.

The Massachusetts Department of Environmental Protection ("DEP") currently operates air monitors in various locations throughout the city. The closest, most representative, DEP monitors for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), fine particulate matter ($PM_{2.5}$), coarse particulate matter (PM_{10}), and lead are located at Dudley Square (Harrison Avenue). Harrison Avenue, Boston, MA. The closest, most representative, DEP monitor for ozone is located at Dudley Square (Harrison Avenue).

Table 4.2-2 summarizes the DEP air monitoring data, for the most recent available, complete, three-year period (2013-2015), that are considered to be representative of the project area. **Table 4.2-2** shows that the existing air quality in the Project area is generally much better than the NAAQS. The highest impacts relative to a NAAQS are for ozone and $PM_{2.5}$. Ozone is a regional air pollutant on which the small amount of additional traffic generated by this Project will have an insignificant impact. The Project's operations will not have a significant impact on local $PM_{2.5}$ concentrations.

Table 4.2-1. Massachusetts and National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	NAAQS (µg/m^3)
Sulfur Dioxide ($SO_{2)}$	1-hour^P 3-hour^S Annual^P (Arithmetic Mean)	196[a] 1,300[b] 80
Carbon Monoxide (CO)	1-hour^P 8-hour^P	40,000[b] 10,000[b]
Nitrogen Dioxide ($NO_{2)}$	1-hour^P Annual$^{P/S}$ (Arithmetic Mean)	188[c] 100
Coarse Particulate Matter ($PM_{10)}$	24-hour$^{P/S}$	150
Fine Particulate Matter ($PM_{2.5)}$	24-hour$^{P/S}$ Annual^P (Arithmetic Mean) Annual^S (Arithmetic Mean)	35[d] 12[e,f] 15
Ozone ($O_{3)}$	8-hour$^{P/S}$	137[g]
Lead (Pb)	Rolling 3-Month Avg.$^{P/S}$	0.15

P = primary standard; S = secondary standard.
[a] 99th percentile 1-hour concentrations in a year (average over three years).
[b] One exceedance per year is allowed.
[c] 98th percentile 1-hour concentrations in a year (average over three years).
[d] 98th percentile 24-hour concentrations in a year (average over three years).
[e] Three-year average of annual arithmetic means.
[f] As of March 18, 2013, the U.S. EPA lowered the $PM_{2.5}$ annual standard from 15 ug/m^3 to 12 ug/m^3.
[g] Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m^3) (effective December 28, 2015); the annual PM_{10} standard was revoked in 2006.

Table 4.2-2. Representative Existing Air Quality in the Project Area

Pollutant, Averaging Period	Monitor Location	Value ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
CO, 1-hour	Kenmore Square & Harrison Avenue, Boston	1,559 (1.4 ppm)	40,000	4%
CO, 8-hour	Kenmore Square & Harrison Avenue, Boston	1,031 (0.9 ppm)	10,000	1%
NO_2, 1-hour	Kenmore Square, Boston	95.9	188	51%
NO_2, Annual	Kenmore Square, Boston	33.4	100	33%
Ozone, 8-hour	Kenmore Square, Boston	110	137	80%
PM_{10}, 24-hour	Kenmore Square, Boston	53	150	35%
$PM_{2.5}$, 24-hour	Kenmore Square, Boston	15.7	35	45%
$PM_{2.5}$, Annual	Kenmore Square, Boston	6.8	12	57%
Lead, Quarterly	Harrison Avenue, Boston	0.016	0.15	11%
SO_2, 1-hour	Kenmore Square, Boston	23.7	196	12%

Source: MassDEP, http://www.mass.gov/dep/air/priorities/aqreports.htm., downloaded January 30, 2017.

Notes:

(1) Annual averages are highest measured during the most recent three-year period for which data are available (2014 - 2015). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.

(2) The eight-hour ozone value is the 3-year average of the annual fourth-highest values, the 24-hour $PM_{2.5}$ value is the 3-year average of the 98th percentile values, the annual PM2.5 value is the 3-year average of the annual values – these are the values used to determine compliance with the NAAQS for these air pollutants.

(3) The one-hour NO_2 value is the -year average of the 98th percentile values and the one-hour SO_2 value is the -year average of the 99th percentile values

(4) The one-hour ozone standard was revoked by the US EPA in 2005; the annual PM_{10} standard was revoked in 2006 and the 3-hour SO_2 standard was revoked by the US EPA in 2010.

4.2.2 Impacts from Parking Garage

The Project also includes a two-floor parking garage designed to provide parking spaces for 65 vehicles. An analysis of the worst-case air quality impacts from the proposed parking garage was performed (see **Appendix B**). The procedures used for this analysis are consistent with U.S. EPA's Volume 9 guidance.[1] The objective of this analysis was to determine the maximum CO concentrations inside the garage and at the closest sensitive receptors surrounding the Project. These closest sensitive receptors include: air intakes located on the proposed building and nearby existing buildings and pedestrians at ground level anywhere near the Project. CO emissions from motor vehicles operating inside the garage were calculated and the CO concentrations inside the garage and surrounding the Project were based on morning and afternoon peak traffic periods.

The objective of this analysis was to determine the maximum CO concentrations at the closest sensitive receptors surrounding the Project. These closest sensitive receptors include: air intakes located on the proposed building and nearby existing buildings, and pedestrians at ground level anywhere near the Project. The parking garage CO emissions were modeled using an U.S. EPA-approved air model.

Garage Ventilation System

The proposed parking garage will require mechanical ventilation. The garage ventilation system will be designed to provide adequate dilution of the motor vehicle emissions before they are vented outside. The design of the garage ventilation system will meet all building code requirements. Full ventilation of the garage will require a maximum flow of approximately 14,500 cubic feet per minute (cfm) of fresh air in the lower level of the garage, and 15,600 cfm of fresh air in the 2nd level of the garage. This quantity of air is designed to meet the building code and will be more than adequate to dilute the emissions inside the parking garage to safe levels before they are vented outside. The garage ventilation exhausts will likely be located at two side vents.

Peak Garage Traffic Volumes

The peak morning and afternoon one-hour entering and exiting traffic volumes for the garage are shown in **Table 4.2-3**.

[1] US EPA, "Guidelines for Air Quality Maintenance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources," EPA-450/4-78-001, September 1978.

Table 4.2-3. Peak-Hour Garage Traffic Volumes

Period	Entering (vehicles/hour)	Exiting (vehicles/hour)	Total (vehicles/hour)
Morning Peak Hour	3	14	17
Afternoon Peak Hour	14	6	20

Source: Howard Stein Hudson

Motor Vehicle Emission Rates

The U.S. Environmental Protection Agency (EPA) MOVES2014 emission factor model was used to calculate single vehicle CO emissions rates, for a vehicle speed of 5 mph. The inputs to the MOVES2014 model followed the latest guidance from the Massachusetts Department of Environmental Protection (DEP) and were performed for the future traffic year of 2024. The CO emission rate calculated by MOVES2014, for vehicles moving at 5 miles per hour (mph), was 2.976 grams per vehicle-mile for each entering and exiting vehicle. These emission rates apply to wintertime conditions when motor vehicle CO emissions are greatest due to cold temperatures. MOVES2014 model output is provided in the **Appendix B.**

To determine the maximum one-hour CO emissions inside the garage it was necessary to estimate the amount of time each motor vehicle will be in the parking garage with its engine running. To be conservative, it was assumed that every car entering or leaving the garage will be operating during that peak hour and traveling to or from the 2nd level of the garage at the furthest parking spot. The calculations in **Appendix B** show how long each vehicle will be operating in the garage for both the morning and afternoon peak periods.

Peak Garage CO Emission Rate and CO Concentration Inside the Garage

The peak one-hour CO emission rate for the parking garage was calculated to be 0.083 grams per minute for the morning peak hour and 0.097 grams per minute for the afternoon peak hour. Applying the maximum volumetric garage ventilation flow rate for the parking garage, the peak one-hour CO concentration inside the garage was calculated to be 0.16 parts of CO per million parts of air (ppm) for the morning peak hour and 0.19 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 0.19 ppm with a peak one-hour emission rate of 0.097 grams/minute (0.0016 grams/second), corresponding to the afternoon peak period. These predictions represent conservative estimates of the peak garage CO emissions and concentrations.

Peak Ambient CO Concentration

Worst-case concentrations of CO from the parking garage was predicted for locations around the building using AERMOD model (Version16216r) in screening-mode. The results of the air quality analysis for locations outside and around the building are summarized in **Table 4.2-4**. The results in **Table 4.2-4** represent all outside locations on and near the Project Site, including nearby building air intakes and nearby residences. **Appendix B** contains the AERMOD model output.

The AERMOD model in screening-mode was used to predict the maximum concentration of CO by modeling the parking garage emissions as volume sources using worst-case meteorological conditions for an urban area. The screening-mode option simulates modeling results predicted by AERMOD. The predicted concentrations presented here represent the worst-case air quality impacts from the parking garage at all locations on and around the Project. AERMOD predicted one-hour average concentrations of air pollutants.

AERMOD predicted that the maximum one-hour CO concentration from the parking garage will be 0.0058 ppm (6.72 $\mu g/m^3$). This concentration represents the maximum CO concentration at any location surrounding the Project. AERSCREEN guidance allows the maximum eight-hour CO impact to be conservatively estimated by multiplying the maximum one-hour impact by a factor of 0.9 (i.e. the eight-hour impact is 90% of the one-hour impact). The maximum predicted eight-hour CO concentration was determined to be approximately 0.0052 ppm (0.0058 ppm x 0.9).

The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare in ambient air, with a margin for safety. The NAAQS for CO are 35 ppm for a one-hour average and 9 ppm for an eight-hour average. The Commonwealth of Massachusetts has established the same standards for CO. The CO background values of 1.9 ppm for a one-hour period and 1.1 ppm for an eight-hour period were added to the maximum predicted garage ambient impacts to represent the CO contribution from other, more distant, sources. With the background concentration added, the peak, total, one-hour and eight-hour CO impacts from the parking garage, at any location around the building, will be no larger than 1.9058 ppm and 1.1052 ppm, respectively. These maximum predicted total CO concentrations (garage exhaust impacts plus background) are safely in compliance with the NAAQS. This analysis demonstrates that the operation of the parking garage will not have an adverse impact on air quality.

Table 4.2-4. Peak Predicted Parking Garage Air Quality Impacts

Location	Peak Predicted One-Hour Impact (ppm)	One-Hour NAAQS (ppm)	Peak Predicted Eight-Hour Impact (ppm)	Eight-Hour NAAQS (ppm)
Outside – Surrounding the Building* (Parking Garage)	1.9058**	35 (NAAQS)	1.1052**	9 (NAAQS)

NAAQS = Massachusetts and National Ambient Air Quality Standards for CO (ppm = parts per million)
* Representative of maximum CO impact at all nearby residences, buildings, and sidewalks.
** Includes background concentrations of 1.9 ppm for the one-hour period and 1.1 ppm for the eight-hour period.

4.2.3 Microscale CO Analysis for Selected Intersections

The Boston Redevelopment Authority (BRA) and the Massachusetts DEP typically require a microscale air quality analysis for any intersection in the Project study area where the level of service (LOS) is expected to deteriorate to D and the proposed project causes a 10% increase in traffic or where the level of service is E or F and the project contributes to a reduction in LOS. For such intersections, a microscale air quality analysis is required to examine the carbon monoxide (CO) concentrations at sensitive receptors near the intersection.

A microscale air quality analysis was not performed for this Project due to the Project trip generation having minimal impacts on the overall delays at the four intersections. The Project will generate approximately 17 motor vehicle trips during the morning peak traffic hour and approximately 20 motor vehicle trips during the afternoon traffic hour. Under the Build scenario, the overall LOS will be the same during the morning peak traffic hour for all intersections, except for Leo Birmingham Parkway /Soldiers Field EB Off-Ramp/Lothrop Street here the overall LOS degrades from A to B. Under the Build scenario, the overall LOS will be the same during the afternoon peak traffic hour for all intersections, except for the Leo Birmingham Parkway /Market Street/Lincoln Street intersection where the overall LOS degrades from D to F. This degradation is due increases in future background traffic. Furthermore, the increase in traffic at this intersection is less than 10%. **Table 4.2-5** shows a comparison of the Existing (2017) and Build (2024) LOS at the six intersections. The motor vehicle trip generation from the Project will not have a significant impact on motor vehicle delays and air pollutant emissions at the analyzed intersections. Therefore, the motor vehicle traffic generated by the Project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project.

Table 4.2-5. Summary of Build Case Level of Service

Intersection	Existing LOS (AM/PM)	Build LOS (AM/PM)	Requires Analysis?
Leo M. Birmingham Parkway /Market Street/Lincoln Street – signalized	D/D	D/F	NO*
Leo M. Birmingham Parkway /Soldiers Field EB Off-Ramp/Lothrop Street – signalized	A/B	B/B	NO
Leo M. Birmingham Parkway/Waverly Street – unsignalized	A/A	A/A	NO
Waverly Street/Mackin Street/Portsmouth Street – unsignalized	B/B	B/B	NO
Lincoln Street/Portsmouth Street – unsignalized	B/B	B/B	NO
Lincoln Street/Site Driveway – unsignalized	A/A	A/A	NO

The LOS shown represents the overall delay at each intersection
*Project does not contribute to reduction in level of service.

Source: Howard/Stein-Hudson Associates, Inc.

Conclusions

The microscale CO air quality dispersion modeling analysis clearly indicates that the worst-case traffic generated by the Project will not cause or contribute to any violations of the NAAQS for CO, and will not significantly affect air quality. Total CO impacts at the intersections with the largest delays and at the Project site, including the impacts from the parking garage, are predicted to be safely in compliance with the NAAQS for CO.

4.3 Noise Impacts

Tech Environmental, Inc., performed a noise study to determine whether the operation of the proposed Project will comply with the City of Boston Noise Regulations and the Massachusetts Department of Environmental Protection ("DEP") Noise Policy.

4.3.1 Common Measures of Community Noise

The unit of sound pressure is the decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 70 dB is added to another sound of 70 dB, the total is only a 3-decibel increase (or 73 dB), not a doubling to 140 dB. Thus, every 3 dB increase represents a doubling of sound energy. For broadband sounds, a 3 dB change is the minimum change perceptible to the

human ear. **Table 4.3-1** gives the perceived change in loudness of different changes in sound pressure levels.[2]

Table 4.3-1. Subjective Effects of Changes in Sound Pressure Levels

Change in Sound Level	Apparent Change in Loudness
3 dB	Just perceptible
5 dB	Noticeable
10 dB	Twice (or half) as loud

Non-steady noise exposure in a community is commonly expressed in terms of the A-weighted sound level (dBA); A-weighting approximates the frequency response of the human ear. Levels of many sounds change from moment to moment. Some are sharp impulses lasting 1 second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L_{90} metric, which is the sound level exceeded 90 percent of the time, is typically used. The L_{90} can also be thought of as the level representing the quietest 10 percent of any time period. Similarly, the L_{10} can also be thought of as the level representing the quietest 90 percent of any time period. The L_{10} and L_{90} are broadband sound pressure measures, i.e., they include sounds at all frequencies.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines nine octave bands from 32 Hz to 8,000 Hz. A source is said to create a pure tone if acoustic energy is concentrated in a narrow frequency range and one octave band has a sound level 3 dB greater than both adjacent octave bands.

The acoustic environment in an urban area such as the Project area results from numerous sources. Observations show that major contributors to the background sound level in the Project area include motor vehicle traffic on local and distant streets, aircraft over-flights, mechanical equipment on nearby buildings, nature noises such as insects, tree frogs, small animals, and general city noises such as street sweepers and police/fire sirens. Typical sound levels associated with various activities and environments are presented in **Table 4.4-2**.

4.3.2 Noise Regulations

Commonwealth Noise Policy

The DEP regulates noise through 310 CMR 7.00, "Air Pollution Control." In these regulations "air contaminant" is defined to include sound and a condition of "air pollution" includes the

[2] American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1989 ASHRAE Handbook--Fundamentals (I-P) Edition, Atlanta, GA, 1989.

presence of an air contaminant in such concentration and duration as to "cause a nuisance" or "unreasonably interfere with the comfortable enjoyment of life and property."

Regulation 7.10 prohibits "unnecessary emissions" of noise. The DEP DAQC Policy Statement 90-001 (February 1, 1990) interprets a violation of this noise regulation to have occurred if the noise source causes either:

1. An increase in the broadband sound pressure level of more than 10 dBA above the ambient level; or
2. A "pure tone" condition.

The ambient background level is defined as the L_{90} level as measured during equipment operating hours. A "pure tone" condition occurs when any octave band sound pressure level exceeds both of the two adjacent octave band sound pressure levels by 3 dB or more.

The DEP does not regulate noise from motor vehicles accessing a site or the equipment backup notification alarms. Therefore, the provisions described above only apply to a portion of the sources that may generate sound following construction of the Project.

Local Regulations

The City of Boston Environment Department regulates noise through the Regulations for the Control of Noise as administered by the Air Pollution Control Commission. The Project is located in an area consisting of commercial and residential uses. The Project will have low-rise residential uses to the north, east, and south. The Project must comply with Regulation 2.2 for noise levels in Residential Zoning Districts at these residential locations**. Table 4.3-3** lists the maximum allowable octave band and broadband sound pressure levels for residential and business districts. Daytime is defined by the City of Boston Noise Regulations as occurring between the hours of 7:00 a.m. and 6:00 p.m. daily except Sunday. Compliance with the most restrictive nighttime residential limits will ensure compliance for other land uses with equal or higher noise limits.

Table 4.3-2. Common Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Pressure (μPa)	Sound Level (dBA)	Indoor Sound Levels
	6,324,555	110	Rock Band at 5 m
Jet Over-Flight at 300 m		105	
	2,000,000	100	Inside New York Subway Train
Gas Lawn Mower at 1 m		95	
	632,456	90	Food Blender at 1 m
Diesel Truck at 15 m		85	
Noisy Urban Area—Daytime	200,000	80	Garbage Disposal at 1 m
		75	Shouting at 1 m
Gas Lawn Mower at 30 m	63,246	70	Vacuum Cleaner at 3 m
Suburban Commercial Area		65	Normal Speech at 1 m
	20,000	60	
Quiet Urban Area—Daytime		55	Quiet Conversation at 1m
	6,325	50	Dishwasher Next Room
Quiet Urban Area—Nighttime		45	
	2,000	40	Empty Theater or Library
Quiet Suburb—Nighttime		35	
	632	30	Quiet Bedroom at Night
Quiet Rural Area—Nighttime		25	Empty Concert Hall
Rustling Leaves	200	20	Average Whisper
		15	Broadcast and Recording Studios
	63	10	
		5	Human Breathing
Reference Pressure Level	20	0	Threshold of Hearing

Notes: μPa, or micro-Pascals, describes sound pressure levels (force/area). DBA, or A-weighted decibels, describes sound pressure on a logarithmic scale with respect to 20 μPa (reference pressure level).

Table 4.3-3. Maximum Allowable Sound Pressure Levels (dB) City of Boston

Octave Band (Hz)	Zoning District		
	Residential (Daytime)	Residential (All Other Times)	Business (anytime)
32 Hz	76	68	79
63 Hz	75	67	78
125 Hz	69	61	73
250 Hz	62	52	68
500 Hz	56	46	62
1000 Hz	50	40	56
2000 Hz	45	33	51
4000 Hz	40	28	47
8000 Hz	38	26	44
Broadband (dBA)	**60**	**50**	**65**

4.3.3 Pre-Construction Sound Level Measurements

Existing baseline sound levels in the Project area were measured during the quietest overnight period when human activity and street traffic were at a minimum, and when the Project's mechanical equipment (the principal sound sources) could be operating. Since the Project's mechanical equipment may operate at any time during a 24-hour day, a weekday between 11:00 p.m. and 4:00 a.m. was selected as the worst-case time period, i.e., the time period when Project-related sounds may be most noticeable due to the quieter background sound levels. Establishing an existing background (L_{90}) during the quietest hours of the facility operation is a conservative approach for noise impact assessment and is required by the DEP Noise Policy.

The nighttime noise measurement locations are as follows (see the Figure 1 in the **Appendix C**):

Monitoring Location #1: 14 Lincoln St.

Monitoring Location #2: 32 Portsmouth St.

Monitoring Location #3: 11 Lothrop St.

Broadband (dBA) and octave band sound level measurements were made with a Larson Davis Type 831 environmental sound level analyzer, at each monitoring location, for a duration of approximately thirty minutes. The full octave band frequency analysis was performed on the frequencies spanning 16 to 16,000 Hertz. A time-integrated statistical analysis of the data used to quantify the sound variation was also performed, including the calculation of the L_{90}, which is used to set the ambient background sound level.

The Larson Davis 831 is equipped with a ½" precision condenser microphone and has an operating range of 5 dB to 140 dB and an overall frequency range of 3.5 Hz to 20,000 Hz. This meter meets or exceeds all requirements set forth in the ANSI S1.4-1983 Standards for Type 1 quality and accuracy and the State and City requirements for sound level instrumentation. Prior to any measurements, this sound analyzer was calibrated with an ANSI Type 1 calibrator that has an accuracy traceable to the National Institute of Standards and Technology (NIST). During all measurements, the B&K 2250 was tripod mounted at approximately five feet above the ground in open areas away from vertical reflecting surfaces.

The sound level monitoring was conducted Monday night, July 10, into Tuesday morning, July 11, 2017. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was 64^{o}F, the skies were partly cloudy, and the winds were 0 to 3 mph, from the northwest. The microphone of the sound level analyzer was fitted with a 3-inch windscreen to negate any effects of wind-generated noise.

The nighttime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. A significant source of existing sound at all locations is motor vehicle traffic on nearby highways and local streets, residential and commercial air handling equipment, crickets and other insects/animals and aircraft over-flights.

The results of the nighttime baseline sound level measurements are presented in **Table 4.3-4**, and the complete measurement printouts are provided in **Appendix C**. The nighttime background L_{90} level was 59.8 dBA at Location #1, 53.1 dBA at Location #2, and 50.5 at Location #3. The octave band data in **Table 4.3-4** show that pure tones were detected in the nighttime noise measurements at Locations #1 and #2 due to local traffic on the adjacent Massachusetts turnpike.

Noise monitoring at the Project Site during the morning peak traffic period was used to evaluate the existing ambient sound levels and to evaluate conformance with the Site Acceptability Standards established by HUD for residential development. The purpose of the HUD guidelines is to provide standards for determining the acceptability of residential project locations with regards to existing sound levels. The HUD criteria regarding the day-night average sound level (L_{dn}) are listed below. These standards apply to L_{dn} measurements taken several feet from the building in the direction of the predominant source of noise.

- Normally Acceptable – L_{dn} not exceeding 65 dBA
- Normally Unacceptable – L_{dn} above 65 dBA but not exceeding 75 dBA
- Unacceptable – L_{dn} above 75 dBA.

These HUD standards do not apply to this Project, but are used as guidance regarding the suitability of the Project area with regard to background sound levels.

Daytime sound level measurements were taken to help estimate the L_{dn} for the Project Site. A 30-minute sound level measurement was taken during the afternoon, on Wednesday, June 28, 2017

between 10:00 am. and 10: 30 a.m. at 8 Lincoln Street (Location #1) representing the closest location to the Project Site. The weather conditions during the sound survey were conducive to accurate sound level monitoring: the skies were overcast, and the winds were 5-10 mph. The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The daytime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. The main sources of noise during the peak morning traffic period sound level measurement were motor vehicle traffic on the Massachusetts Turn Pike, nearby local streets, construction vehicles in the distance, adjacent MBTA Commuter line activity, and aircraft over-flights. The L_{eq} measured during the morning period was 71.4 dBA. The L_{eq} sound level measured during the nighttime at the same location was 66.8 dBA. Using both the daytime and nighttime L_{eq} sound levels, the calculated L_{dn} for the site is 74.2 dBA, which is above the HUD guideline noise limit of 65 dBA primarily due to the constant traffic on the Massachusetts Turnpike.

It is assumed that standard building construction practices will result in at least a 30 dBA reduction of sound from outdoor sound levels. The Proponent will incorporate sound mitigation, as necessary, to assure that motor vehicle sound sources from Leo Birmingham Parkway and I90 do not result in noise impacts greater than 45 dBA inside the residential units closest to the neighboring streets.

Table 4.3-4. Nighttime Baseline Sound Level Measurements, July 10-11, 2017

Sound Level Measurement	(Location #1) 14 Lincoln St 11:00 p.m. - 11:30 p.m.	(Location #2) 11 Lothrop St 12:03 a.m. - 12:33 a.m.	(Location #3) 32 Portsmouth St 11:31 p.m.- 12:01 a.m.
Broadband (dBA)			
Background (L_{90})	59.8	50.5	53.1
Octave Band L_{90} (dB)			
16 Hz	60.0	53.6	53.9
32 Hz	60.1	54.0	55.3
63 Hz	59.4	54.7	56.4
125 Hz	56.5	51.0	51.6
250 Hz	52.2	46.4	45.4
500 Hz	51.0	44.9	46.4
1000 Hz	57.5	47.4	50.8
2000 Hz	52.7	41.8	43.4
4000 Hz	40.5	33.4	31.8
8000 Hz	29.8	26.2	24.7
16000 Hz	18.5	18.3	18.9
Pure Tone?	Yes	No	Yes

4.3.4 Reference Data and Candidate Mitigation Measures

The mechanical systems for the Proposed Project are in the early design stage. Typical sound power data for the equipment of the expected size and type for the Project have been used in the acoustic model to represent the Project's mechanical equipment. The sound levels from all potential significant Project noise sources are discussed in this section.

The design for the Proposed Project is expected to include the following significant mechanical equipment:

- Eighty-three (83) Goodman Model SS-GSZ13 or equivalent rooftop 2.5 ton condensing units.
- 2 Exhaust Fans

The equipment listed above, which will be located on the building rooftop, was included in the noise impact analysis. The Project's traffic was not included in the noise analysis because motor vehicles are exempt under both the City of Boston and Massachusetts DEP noise regulations.

The sound generation profiles for the mechanical equipment noise sources operating concurrently under full-load conditions were used to determine the maximum possible resultant sound levels from the Project Site as a whole, to define a worst-case scenario. To be in compliance with City

and DEP regulations, the resultant sound level must not exceed the allowable octave band limits in the City of Boston noise regulation and must be below the allowable incremental noise increase, relative to existing noise levels, as required in the DEP Noise Policy.

This sound level impact analysis was performed using sound generation data for representative equipment to demonstrate compliance with noise regulations. As the building design evolves, the sound generation for the actual equipment selected may differ from the values that were utilized for the analysis.

4.3.5 Calculated Future Sound Levels

Methodology

Future maximum sound levels at the upper floors of all existing residences bordering the Project, and at the nearest residential property lines, were calculated with acoustic modeling software assuming simultaneous operation of all mechanical equipment at their maximum loads.

The Cadna-A computer program, a comprehensive 3-dimensional acoustical modeling software package was used to calculate Project generated sound propagation and attenuation.[3] The model is based on ISO 9613, an internationally recognized standard specifically developed to ensure the highly accurate calculation of environmental noise in an outdoor environment. ISO 9613 standard incorporates the propagation and attenuation of sound energy due to divergence with distance, surface and building reflections, air and ground absorption, and sound wave diffraction and shielding effects caused by barriers, buildings, and ground topography.

Receptors

The closest/worst-case sensitive (residential) location is to the east of the project area at 8 Lincoln St. This location was selected based on the proximity of the equipment (smaller distances correspond to larger noise impacts) and the amount of shielding by the project (residences further from the project will experience less shielding from the Project's rooftop mechanical equipment, which may result in larger potential noise impacts from the Project). This location is expected to receive the largest sound level impacts from the Project's rooftop mechanical equipment. It can be classified as a residential zone.

The sound level impacts from the building's mechanical equipment were predicted at the closest residential location, as well as additional residential uses to the South (14 & 16 & 20 Lincoln St), East (37 Portsmouth St), and North (7 & 11 Lothrop Street). Figure 1 in Appendix C shows the locations of the modeled noise receptors. Noise impacts at other nearby noise-sensitive locations (residences, parks, etc.) farther from the Project Site will be less than those predicted for these receptors.

[3] Cadna-A Computer Aided Noise Abatement Program, Version 4.3

4.3.6 Compliance with State and Local Noise Standards

The City of Boston and DEP noise standards apply to the operation of the mechanical equipment at the proposed Project. The details of the noise predictions are presented in **Tables 4.4-5** through **4.4-11**. The sound impact analysis includes the simultaneous operation of the Project's rooftop HVAC equipment. The predicted sound levels are worst-case predictions that represent all hours of the day, as the analysis assumes full operation of the mechanical equipment 24-hours a day. The typical sound level impacts from the mechanical equipment will likely be lower than what is presented here, since most of the mechanical equipment will operate at full-load only during certain times of the day and during the warmer months of the year, it is not likely that all of the mechanical equipment will operate at the same time. Sound level impacts at locations farther from the Project (e.g. other residences, etc.) will be lower than those presented in this report.

City of Boston Noise Standards

The noise impact analysis results, presented in **Tables 4.3-5** through **4.3-11**, reveal that the sound level impact at the upper floors of the closest residences will be between 31.8 and 43.6 dBA. The smallest sound level impact of 33.5 dBA is predicted to occur at 7 Lothrop St. The largest sound level impact of 43.7 dBA is predicted to occur at 14 Lincoln St. Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. Note that sound levels from the Project will be below the residential nighttime limits at all times. The results also demonstrate compliance with the City of Boston, residential, non-daytime, octave band noise limits at both closest locations.

The City of Boston noise limits for business areas are significantly higher than the nighttime noise limits for residential areas (see **Table 4.3-3**). The Project will also easily comply with the City of Boston business area noise limits at all surrounding commercial properties.

Massachusetts DEP Noise Regulations

The predicted sound level impacts at the worst-case residential locations were added to the measured L_{90} value of the quietest daily hour to test compliance with DEP's noise criteria. Assuming the Project's mechanical noise is constant throughout the day, the Project will cause the largest increase in sound levels during the period when the lowest background noise occurs. Minimum background sound levels (diurnal) typically occur between 12:00 a.m. and 5:00 a.m.

The predicted sound level impacts at the upper floors of the closest residences were added to the L_{90} values measured during the period with the least amount of background noise to test compliance with DEP's noise criteria. The predicted noise impacts at the property line and the closest residences were added to the most-representative measured L_{90} values to determine the largest possible increase in the sound level at each location during the quietest hour at the Project Site.

As shown in **Tables 4.3-5** through **4.3-11**, the Project is predicted to produce a less than 2 dBA change in the background sound levels at all modeled locations. Therefore, the Project's worst-case sound level impacts during the quietest nighttime periods will be in compliance with the Massachusetts DEP allowed noise increase of 10 dBA. The noise predictions for each octave band indicate that the mechanical equipment will not create a pure tone condition at any location.

Table 4.3-5. Estimated Future Sound Level Impacts – Anytime, 8 Lincoln St (Closest/Worst Case Residence) – Location R1

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	55
63 Hz	67	54
125 Hz	61	49
250 Hz	52	43
500 Hz	46	38
1000 Hz	40	33
2000 Hz	33	27
4000 Hz	28	20
8000 Hz	26	15
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	59.8
70 Leo Birmingham Project*	40.5
Calculated Combined Future Sound Level	59.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-6. Estimated Future Sound Level Impacts – Anytime, 14 Lincoln St– Location R2

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	55
63 Hz	67	54
125 Hz	61	50
250 Hz	52	43
500 Hz	46	39
1000 Hz	40	35
2000 Hz	33	30
4000 Hz	28	23
8000 Hz	26	16
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	59.8
70 Leo Birmingham Project*	41.4
Calculated Combined Future Sound Level	59.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA.

Table 4.3-7. Estimated Future Sound Level Impacts – Anytime, 16 Lincoln Street – Location R3

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	52
63 Hz	67	51
125 Hz	61	47
250 Hz	52	41
500 Hz	46	48
1000 Hz	40	35
2000 Hz	33	31
4000 Hz	28	24
8000 Hz	26	18
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	59.8
70 Leo Birmingham Project*	40.6
Calculated Combined Future Sound Level	59.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA.

Table 4.3-8. Estimated Future Sound Level Impacts – Anytime, 11 Lothrop Street – Location R4

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	39
63 Hz	67	39
125 Hz	61	36
250 Hz	52	32
500 Hz	46	31
1000 Hz	40	29
2000 Hz	33	24
4000 Hz	28	16
8000 Hz	26	1
Broadband (dBA)	**50**	**33**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	53.1
70 Leo Birmingham Project*	33.2
Calculated Combined Future Sound Level	53.1
Calculated Incremental Increase	0.0
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.

Table 4.3-9. Estimated Future Sound Level Impacts – Anytime, 37 Portsmouth St– Location R5

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	38
63 Hz	67	38
125 Hz	61	34
250 Hz	52	31
500 Hz	46	30
1000 Hz	40	27
2000 Hz	33	22
4000 Hz	28	13
8000 Hz	26	-5.2
Broadband (dBA)	**50**	**32**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	50.5
70 Leo Birmingham Project*	31.5
Calculated Combined Future Sound Level	50.6
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.

Table 4.3-10. Estimated Future Sound Level Impacts – 20 Lincoln St– Location R6

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	51
63 Hz	67	50
125 Hz	61	46
250 Hz	52	42
500 Hz	46	39
1000 Hz	40	36
2000 Hz	33	31
4000 Hz	28	25
8000 Hz	26	18
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	59.8
70 Leo Birmingham Project*	41.3
Calculated Combined Future Sound Level	59.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.

Table 4.3-11. Estimated Future Sound Level Impacts – Anytime, 7 Lothrop St– Location R7

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	40
63 Hz	67	40
125 Hz	61	36
250 Hz	52	33
500 Hz	46	31
1000 Hz	40	29
2000 Hz	33	25
4000 Hz	28	16
8000 Hz	26	3
Broadband (dBA)	**50**	**34**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	59.8
70 Leo Birmingham Project*	33.7
Calculated Combined Future Sound Level	59.8
Calculated Incremental Increase	0
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.

4.3.7 Conclusions

Sound levels at all nearby sensitive locations and at all property lines will fully comply with the most stringent City of Boston and DEP daytime and nighttime sound level limits.

This acoustic analysis demonstrates that the Project's design will meet the applicable acoustic criteria.

4.5 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The Project will result in an increase in impervious area, but will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged.

In addition to the installation of an on-site infiltration system, stormwater runoff will be treated through the use of deep sump catch basins and water quality treatment units. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

Erosion and sediment controls will be used during construction to protect adjacent properties, the municipal storm drain system and the on-site storm drain system. A pollution prevention plan, if required, will be prepared for use during construction including during demolition activity.

4.6 Solid and Hazardous Waste Materials

4.6.1 Solid Waste

The proposed re-development parcels currently contain two buildings; a 2-story 20,000 SF brick / slab on-grade office building constructed in 1960 and small wood frame bar/restaurant. The buildings will be demolished to make way for the proposed 6-story apartment building with underground parking. During demolition, all debris will be sorted for re-cycling or proper disposal of light bulbs and hazardous materials will be performed and in conformance to the City's and DEP Regulations for Solid Waste. Dust control procedures such as misting will be used to reduce any potential disturbance of pedestrian or vehicular traffic.

During construction of the proposed new building, the General Contractor will be directed to minimize waste through good stewardship practices such as panelization of non-load bearing walls and exterior wall fabrications, pre-cut framing members and efficient material utilization practices. There will also be segregated dumpsters on-site to promote recycling of all possible waste materials and to be in conformance with the Boston Environmental Department and the LEED rating system.

Upon completion of construction, the Project is estimated to generate approximately 115 tons of solid waste per year, based on the assumption that each of the 82 units will each generate approximately 1.4 tons per year. A significant portion of the waste will be recycled. The recycling program will meet or exceed the City's guidelines for waste paper and newspaper, metal glass and plastics (21 through 27, co-mingled).

4.6.2 Hazardous Waste and Materials

Based on the IES, Inc. Study, the following summarizes the potential and / or existing environmental threats and/or releases:

1. The listing of the site as the location of a DEP Spill (N93-0851) and a CERCLIS-SEMS Site (MAD985318542).
2. The former presence of a fuel oil UST that was removed from the site in 1988 with no confirmatory soil sampling.
3. The southerly abutting DEP Site at 8 Lincoln Street (RTN 3-13233) and the nearby RCRA Generator at 12 Market Street (MAD039318241), which is located approximately 200 feet southwest of the site.

The project proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or off-site disposal of contaminated soil and groundwater encountered during construction. If necessary, the LSP will also prepare the required Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) regulatory submittals.

4.7 Geotechnical/Groundwater Impacts Analysis

4.7.1 Introduction

This section summarizes the subsurface conditions and geotechnical impacts at the 70 Leo M. Birmingham site. Excavation, temporary excavation support, dewatering and other geotechnical aspects of the proposed foundation construction, which may impact adjacent structures and utilities, are also discussed.

4.7.2 Soil and Groundwater Conditions

Initial borings conducted at the site indicate the existing ground surface to be underlain by a loose to compact granular fill deposit that extends approximately 8 to 10 feet below the existing ground surface. The fill is underlain by a compact to dense natural glacial outwash sand deposit that extends to a depth of at least 30 feet below the existing ground surface. The outwash deposit was not penetrated by the initial borings.

Groundwater was not encountered in any of the initial borings. However, groundwater at the site is anticipated to be relatively coincident with the nearby Charles River, which level typically fluctuates between approximately Elevation +7.5 and Elevation +8.5, corresponding to about 32 to 35 feet below the existing ground surface.

4.7.3 Excavation and Foundation Construction

The proposed two-level, deep garage will extend approximately 25 feet below the existing grade and the bottom of the excavation will likely terminate in the granular outwash deposit. The footprint of the garage will likely extend to within close proximity to the existing streets, utilities and structures. A steel soldier pile and timber lagging system is anticipated to be used to provide temporary support of the excavation and protection of the surrounding streets and structures.

Interior columns and perimeter foundation walls will be supported by reinforced concrete spread footings bearing directly on the glacial outwash deposit. The lowest level floor slab will be designed as a slab-on-grade with a foundation underdrain system to reduce hydrostatic uplift pressure and control groundwater infiltration into the permanent structure.

4.7.4 Impacts on Adjacent Structures, utilities, and Groundwater

Monitoring of the performance of the temporary earth support system will be performed, and will include offset monitoring points on the temporary earth support system and horizontal and vertical monitoring points that will be established on nearby structures. Due to the anticipated location of pre-construction groundwater levels, which are anticipated to be well below the bottom of the lowest level garage, the foundation drainage system is not anticipated to impact existing groundwater levels surrounding the site.

4.8 Construction Impact

The following section describes impacts likely to result from the 70 Leo M. Birmingham Parkway Proposed Project construction, and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager that will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

4.8.1 Construction Management Plan

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractor comply with the Construction Management Plan, ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD") and the Massachusetts Department of Conservation and Recreation ("DCR"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Proper pre-construction planning with the neighborhood will be essential to the successful construction of this Project. Construction methodologies that will ensure safety will be employed, signage will include construction manager contact information with emergency contact numbers.

The Proponent will also coordinate construction with other ongoing projects in the neighborhood.

4.8.2 Proposed Construction Program

Construction Activity Schedule

The construction period for the Proposed Project is expected to last approximately 18 months, beginning in the 1st Quarter 2018 and reaching completion in the 1st Quarter 2020. The City of Boston Noise and Work Ordinances will dictate the normal work hours, which will be from 7:00 AM to 6:00 PM, Monday through Friday.

Perimeter Protection/Public Safety

The CMP will describe any necessary sidewalk closures, pedestrian re-routings, and barrier placements and/or fencing deemed necessary to ensure safety around the Site perimeter. If possible, the sidewalk will remain open to pedestrian traffic during the construction period. Barricades and secure fencing will be used to isolate construction areas from pedestrian traffic. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to ensure pedestrian safety.

Proper signage will be placed at every corner of the Project as well as those areas that may be confusing to pedestrians and automobile traffic.

The Proponent will continue to coordinate with all pertinent regulatory agencies and representatives of the surrounding neighborhoods to ensure they are informed of any changes in construction activities.

4.8.3 Construction Traffic Impacts

Construction Vehicle Routes

Estimated truck deliveries and routes will be identified in the CMP. Specific truck routes will be established with BTD through the CMP. These established truck routes will prohibit travel on any residential side streets. Construction contracts will include clauses restricting truck travel to BTD requirements. Maps showing approved truck routes will be provided to all suppliers, contractors, and subcontractors. It is anticipated that all deliveries will be via Leo M. Birmingham Parkway direct to the site, not passing through any residential areas.

Construction Worker Parking

The number of workers required for construction of the Project will vary during the construction period. However, it is anticipated that all construction workers will arrive and depart prior to peak traffic periods.

Limited parking in designated areas of the Project Site and lay-down area(s) will be allowed. Parking will be discouraged in the immediate neighborhood. Further, public transit use will be encouraged with the Proponent and construction manager working to ensure the construction workers are informed of the public transportation options serving the area. Terms and conditions related to worker parking will be written into each subcontractor's contract. The contractor will provide a weekly orientation with all new personnel to ensure enforcement of this policy.

Pedestrian Traffic

The Site abuts sidewalks on two streets. Pedestrian traffic may be temporarily impacted in these areas. The Construction Manager will minimize the impact the construction of the proposed building will have and the adjacent sidewalks. The contractor will implement a plan that will clearly denote all traffic patterns. Safety measures such as jersey barriers, fencing, and signage will be used to direct pedestrian traffic around the construction site and to secure the work area.

4.8.4 Construction Environmental Impacts and Mitigation

Construction Air Quality

Construction activities may generate fugitive dust, which will result in a localized increase of airborne particle levels. Fugitive dust emission from construction activities will depend on such factors as the properties of the emitting surface (e.g. moisture content), meteorological variables, and construction practices employed.

To reduce the emission of fugitive dust and minimize impacts on the local environment the construction contractor will adhere to a number of strictly enforceable mitigation measures. These measures may include:

- Using wetting agents to control and suppress dust from construction debris;
- Ensuring that all trucks traveling to and from the Project Site will be fully covered;
- Removing construction debris regularly;
- Monitoring construction practices closely to ensure any emissions of dust are negligible;
- Cleaning streets and sidewalks to minimize dust and dirt accumulation;

- Monitoring construction activities by the job site superintendent and safety officer; and
- Wheel-washing trucks before they leave the Project Site during the excavation phase.

Construction Noise Impacts

To reduce the noise impacts of construction on the surrounding neighborhood, a number of noise mitigation measures will be included in the CMP. Some of the measures that may be taken to ensure a low level of noise emissions include:

- Initiating a proactive program for compliance to the City of Boston's noise limitation impact;
- Scheduling of work during regular working hours as much as possible;
- Using mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously operating equipment, such as air compressors and welding generators;
- Scheduling construction activities so as to avoid the simultaneous operation of the noisiest construction activities;
- Turning off all idling equipment;
- Reminding truck drivers that trucks cannot idle more than five (5) minutes unless the engine is required to operate lifts of refrigeration units;
- Locating noisy equipment at locations that protect sensitive locations and neighborhoods through shielding or distance;
- Installing a site barricade at certain locations;
- Identifying and maintaining truck routes to minimize traffic and noise throughout the project;
- Replacing specific construction techniques by less noisy ones where feasible-e.g., using vibration pile driving instead of impact driving if practical and mixing concrete off-site instead of on-site; and
- Maintaining all equipment to have proper sound attenuation devices.

4.8.5 Rodent Control

The City of Boston enforces the requirements established under Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550. This policy establishes that the elimination of rodents is required for issuance of any building permits. During construction, rodent control service visits will be made by a certified rodent control firm to monitor the situation.

4.8.6 Utility Protection During Construction

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

5.0 HISTORIC RESOURCES COMPONENT

This section provides a discussion of the history of the Project Site and the historic resources/ districts in the Project vicinity.

5.1 Historic Resources on the Project Site and Property History

Based on the historical records completed by IES, Inc. for the ASTM Screen/Limited Site Assessment, a review of the Sanborn Fire Insurance Atlases of Boston, revealed in 1884 that the southern portion of the 70 Leo M. Birmingham Parkway site contained a stable associated with an abutting dwelling. In 1898, the site was occupied by several stores, a tin shop and flats. In 1925 and 1950, the site contained several stores, a residential building (flats), and a garage used to store an automobile. By 1964, there was a gasoline filling station on the site. Previous research by IES for another investigation revealed an automobile dealership operating the site between 1978 and 1988. The existing office building has been identified as being located on the site since 1989.

According to files at the Massachusetts Historical Commission, no on-site structures are listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth. It is not expected that the Project will cause adverse impacts on any historic or architectural elements of nearby historic resources outside the Project Site (see **Figure 5-1** for identifications of historic resources in the Project vicinity).

5.2 Historic Districts and Resources

The Project Site is not within, nor does it directly abut, any listed historic districts or resources.

The area directly surrounding the Project Site is characterized by mostly residential with commercial and office uses. On the other side of Leo M. Birmingham Parkway, there are offices, and on the other side of the Massachusetts Turnpike are WGBH offices and mixed uses within the Boston Landing complex, which has been completed over the last 7-8 years.

Leo M. Birmingham Parkway (Shown as "B" in **Figure 5-1**) is listed on the State and National Register of Historic Places.

The nearby property at 58 Leo M. Birmingham Parkway (shown as No. 5 in **Figure 5-1**) was completed in 1895, is referenced in a Boston Landmarks Commission (BLC) Information Form as an intact example of a late 19th century club/storefront building with arcaded triple windows with keystone on third story, with a gable front, in a highly visible location. Another nearby property, and group of buildings, at 1420-1440 Soldiers Field Road, completed in 1890-1899 (shown as "A" in **Figure 5-1**) was occupied by the former Metropolitan District Commission Offices and more recently the MDC police and maintenance offices. Based on a BLC Information Form, the remaining buildings are a rambling, horizontally massed shingle-style complex around a central courtyard, representing the only extant Brighton example of

shingle style used for a municipal building. Finally, the 1938 building at 226 No. Beacon Street, within the ¼ mile site radius, Pig 'N' Whistle Diner (shown as No.6 in **Figure 5-1**), is the best Brighton example of an intact modern diner including based on the BLC Form, original neon signs, stainless steel doors, and decorative panels

These historic resources and others within one-quarter-mile radius of the Proposed Project are summarized in **Table 5-1** that follows.

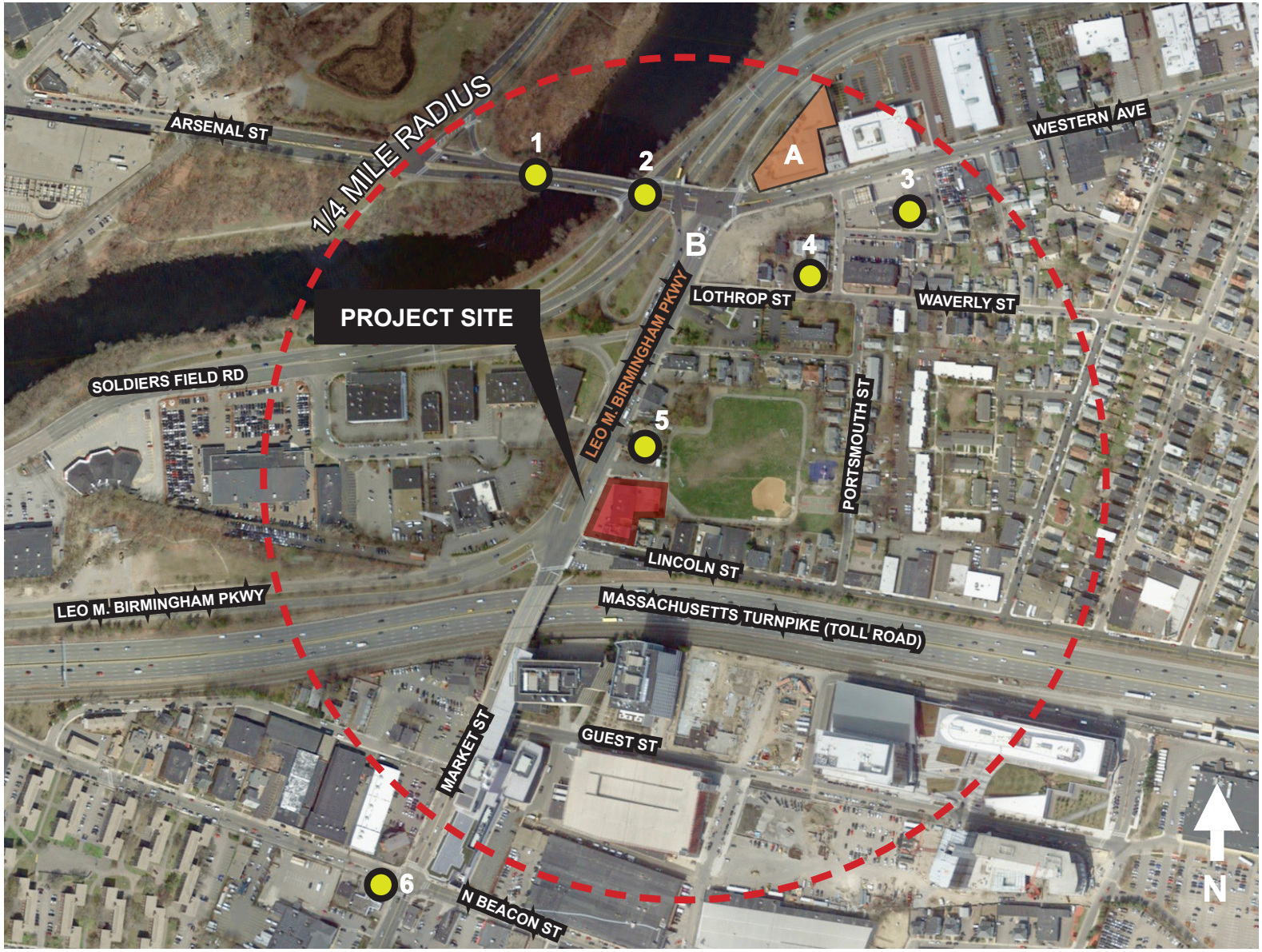
Table 5-1. Historic Resources in the Vicinity of the Project Site

Key to Historic Resources in Figure 5-1	Historic Resource	Source of Listing
Properties on the State and National Register of Historic Places		
A	**Charles River Reservation Speedway – Upper Basin Headquarters (BOS.ZQ)**	**MHC**
B	**Leo M. Birmingham Parkway (BOS. 9608)**	**MHC**
Properties Included the MA Inventory of Historical and Archaeological Assets		
1	**Charles River Reservation – Arsenal Street Bridge (WAT. 942)**	**MHC**
2	**Soldiers Field Underpass at Western Avenue (BOS. 9605)**	**MHC**
3	**Stanley Service Station (BOS. 8345) 500 Western Avenue**	**MHC**
4	**Storrow, James J. School (BOS. 8065) 20 Lothrop Street**	**MHC**
5	**Roddy Hall (BOS. 8108) 58 Leo M. Birmingham Parkway**	**MHC**
6	**Pig & Whistle Diner (BOS. 8284) 226 North Beacon Street**	**MHC**

The Proposed Project is not expected to have effects on any of the listed historically significant resources in **Table 5-1.**

5.3 Archaeological Resources

No known archaeological resources were located within the Project site during the review of Massachusetts Historic Commission files and MACRIS, therefore no impacts to archaeological resources are anticipated.



Project Site

.25 mi Radius

Properties on the National Register of Historic Places

Properties included in the Massachusetts Inventory of Historic and Archaeological Assets

MLF CONSULTING LLC

Figure 5-1. Historic Resources

6.0 INFRASTRUCTURE SYSTEMS COMPONENT

The existing infrastructure surrounding the site of 70 Leo M. Birmingham Parkway appears sufficient to service the needs of the Proposed Project. The following sections describe the existing sewer, water, and drainage systems surrounding the site and explain how these systems will service the development. The analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

A detailed infrastructure analysis will be performed when the Project proceeds into the Design Development Phase. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the new water, sanitary sewer, and storm drain connections. In addition, a Storm Water Pollution Prevention Plan will be submitted specifying best management measures for protecting the BWSC drainage systems during construction.

A Drainage Discharge Permit Application is required from BWSC for any construction dewatering. The appropriate approvals from the Massachusetts Water Resource Authority (MWRA), Massachusetts Department of Environmental Protection (MassDEP), and the U.S. Environmental Protection Agency (EPA) will also be sought.

With Leo Birmingham Parkway owned and maintained by the Massachusetts Department of Conservation and Recreation (DCR), the project may require a construction access permit for any impacts to the parkway. In conjunction with DCR's review, the Massachusetts Historical Commission (MHC) would require a review for any historic and archaeological impacts.

6.1 Sanitary Sewer System

6.1.1 Existing Sewer System

The Boston Water and Sewer Commission owns and maintains the sanitary sewer system adjacent to the site. BWSC records indicate an existing 10-inch sanitary sewer line running northwest along Centola Street to the north of the Project, an existing 15-inch sanitary sewer line running north along Leo M. Birmingham Parkway to the west of the Project, and an existing 12-inch sanitary sewer line running southeast along Lincoln Street to the south of the Project (See **Figure 6-1**).

6.1.2 Project-Generated Sewage Flow

The Proposed Project will generate an estimated 10,560 gallons per day (gpd) based on design sewer flows provided in 310 CMR 15.000-The State Environmental Code, Title 5 and the proposed building program as summarized in **Table 6-1**.

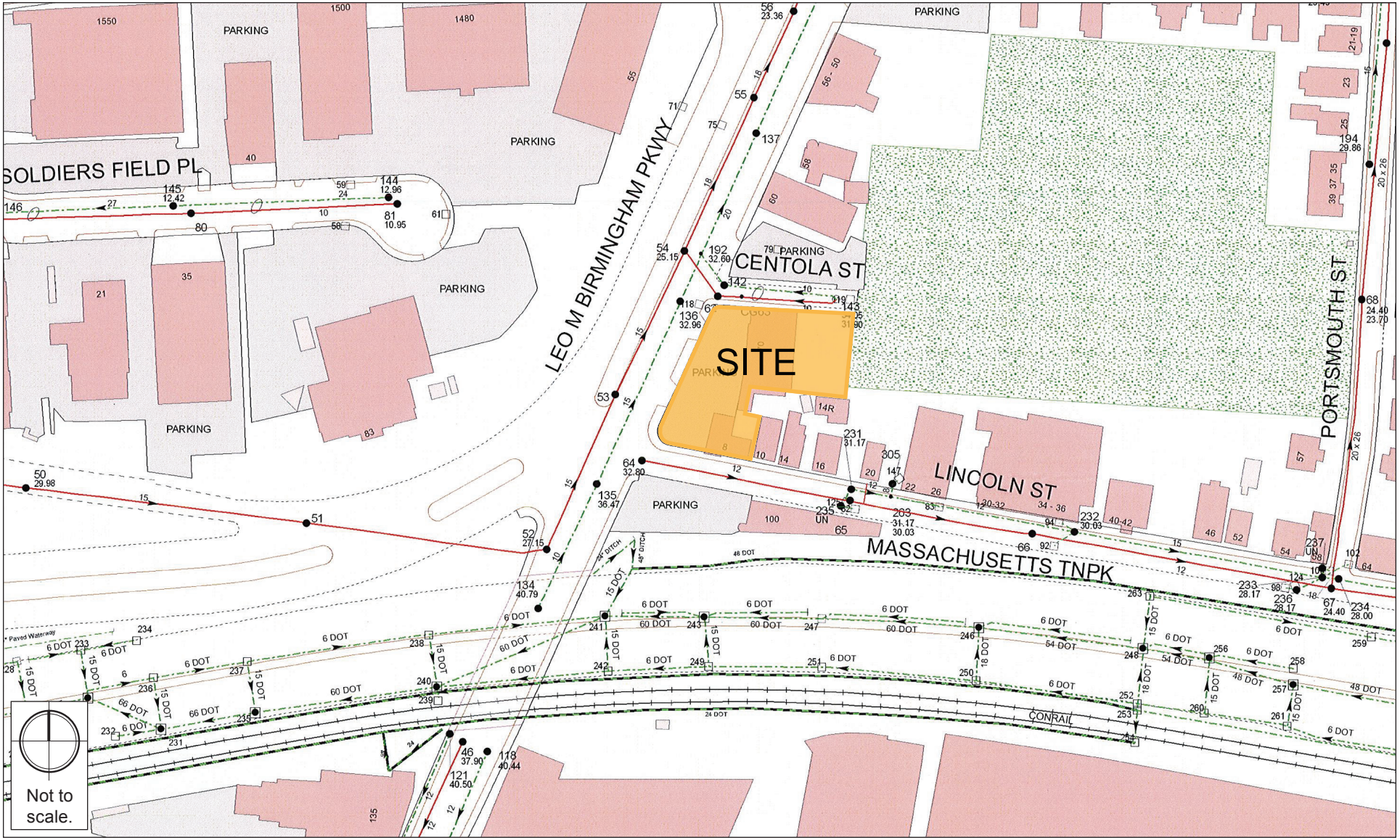


Figure 6-1.
Existing Drain and Sewer System in the Vicinity of 70 Leo Birmingham Parkway

Based on the proposed estimated sanitary flow, which is less than 15,000 gpd, it is not anticipated that BWSC will require the removal of infiltration/inflow (I/I).

Table 6-1. Projected Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Residential	96 beds	110 gpd/bedroom	10,560 gpd
Total			**10,560 gpd**

6.1.3 Sanitary Sewage Connection

It is anticipated that the proposed building's sanitary services will tie into the 10-inch sanitary sewer main in Centola Street. Parking garage floor drains will be routed through an oil and sand trap in accordance with the BWSC's Requirements for Site Plans, prior to discharge to the BWSC sanitary sewer system.

6.1.4 Sewer System Mitigation

To help conserve water and reduce the amount of wastewater generated by the Proposed Project, the Proponent will investigate the use of water conservation devices such as low-flow toilets and urinal, flow-restricting faucets, and sensor operated sinks, toilets, and urinals consistent with the Proponent's compliance at the LEED Certifiable threshold and in compliance with all pertinent Code requirements.

6.1.5 Existing Water Service

The water mains in the vicinity of the Project Site are owned and maintained by BWSC (see **Figure 6-2**). BWSC record drawings indicate there is an existing 8-inch ductile iron cement-lined (DICL) pipe installed in 2005 in Centola Street, an existing 8-inch cast iron (CI) pipe installed in 1937 and re-lined in 1991 on Lincoln Street, an existing 12-inch DICL pipe installed in 2005 on Leo M. Birmingham Parkway. MWRA separately owns and maintains a 60-inch DICL pipe on the far side of Leo M. Birmingham Parkway as part of its Northern Low water distribution system. The existing site currently has existing water services tying into the 8-inch DICL on Centola Street.

The site is within the service radius of several hydrants. There is one hydrant (H108) adjacent to the site on Centola Street, one hydrant (H78) south of the site on Leo M. Birmingham Parkway, and one hydrant (H80) north of the site on Leo M. Birmingham Parkway. The Proponent will confirm that the hydrants are sufficient for the development with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

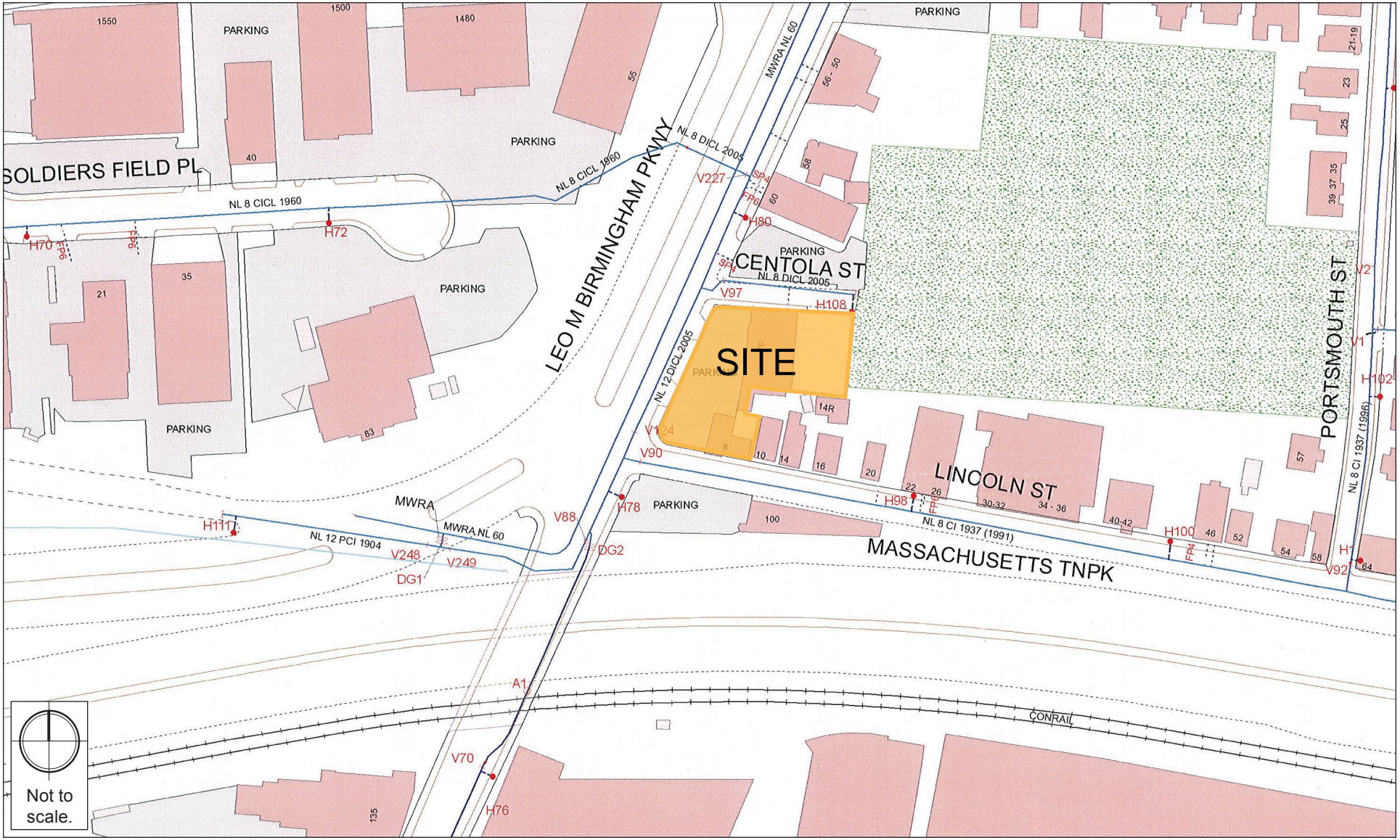


Figure 6-2.
Water Distribution System in the Vicinity of 70 Leo Birmingham Parkway

The BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the site will be requested by the Proponent. If hydrant flow data is not available for any hydrants located near the project site, as the design progresses, the Proponent will request hydrant flows be conducted by the BWSC adjacent to the site. Hydrant flow data must be less than a year old to be used as a design tool. The Proponent will confirm that the flow and pressure is sufficient for the redevelopment and coordinate any proposed changes with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

6.1.6 Anticipated Water Consumption

The Project's water demand estimate for domestic services is based on the project's estimated sewage generation, plus a factor to account for consumption, system losses, and other usages to estimate an average water demand. The total estimated water demand is 11,700 gpd.

6.1.7 Proposed Water Service

It is anticipated that the domestic water and fire protection services for the Project will be directly tapped from the 8-inch water main in Centola Street. Separate new domestic water and fire protection services will be required. The fire protection service will be provided with a backflow prevention device that will be approved though BWSC's Enforcement Section. The location of hydrants and siamese connections will be reviewed by BWSC and BFD during the design development phase of the Project. Water meters will be of a type approved by BWSC and tied into the BWSC's Automatic Meter Reading (AMR) System. Fixture counts and water meter sizing information will be provided and services will be designed and coordinated with the BWSC as part of the Site Plan review process and General Service Application.

6.2 Water Supply System Mitigation

As discussed in the Sewer System Mitigation Section, water conservation measures such as the use of water-efficient toilets, low-flow lavatory faucets, and aerated showerheads in compliance with all pertinent Code requirements are being considered to reduce potable water usage.

6.3 Storm Drainage System

6.3.1 Existing Drainage Conditions

The existing site is almost entirely covered by impervious surfaces, about half is bituminous asphalt pavement and the other half building. Stormwater runoff from the paved area flows overland to the adjacent catch basins in Centola Street, Leo Birmingham Parkway, and Lincoln Street.

The BWSC owns and maintains the storm sewer systems adjacent to the site (See **Figure 6-1**). There is an existing 10-inch storm drain main in Centola Street and an existing 15-inch storm drain main in Leo M. Birmingham Parkway.

6.3.2 Proposed Drainage Systems

The proposed stormwater management system is expected to infiltrate a volume of stormwater equivalent to one inch times the impervious area of the site, and have an overflow connecting to the BWSC-owned system. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

6.4 Water Quality

The Project proposes a stormwater management program, which will provide pretreatment and infiltration prior to discharging stormwater to the municipal drainage system. Erosion and sediment controls will be used during construction to protect adjacent properties and the municipal storm drain system. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable EPA and BWSC discharge permits. Once construction is complete, the Proposed Project will be in compliance with BWSC Site Plan requirements.

6.5 Electric Systems

Eversource owns and maintains the electrical transmission system in the vicinity of the Proposed Project. The electrical power supply design and loads for the building will be coordinated with Eversource during the design phase. The Proponent is investigating energy conservation measures, including energy efficient lighting and heating and cooling systems for the Project.

6.6 Telephone and Cable Systems

Verizon, Comcast, and RCN provide telephone service in the Project area. It is anticipated that telephone service can be provide by any of the providers. Any upgrades will be coordinated with the provider. Telephone systems will be reviewed with the provider as the design progresses.

Comcast and RCN provide cable and internet service in the Project area. It is expected that Comcast and/or RCN can provide services to the Project site. Any upgrade required to the services will be coordinated with the services providers.

6.7 Steam and Gas Systems

The Proposed Project is not expected to require steam service and there is no steam infrastructure in the Project area.

National Grid provides natural gas in the Project area. National Grid owns and maintains an 8-inch, carbon steel gas main in Leo Birmingham Parkway and an unknown size gas main in Centola Street. The project is expected to use natural gas for heating and domestic hot water. It is expected that there is

adequate supply of natural gas in the area. The actual size and location of the building services will be coordinated with National Grid. The existing site currently has existing gas service tying into the gas main on Centola Street.

6.8 Utility Protection During Construction

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

7.0 TRANSPORTATION COMPONENT

7.1 Introduction

Howard Stein Hudson (HSH) has conducted an evaluation of the transportation impacts of a proposed residential development to be located at 70 Leo M. Birmingham Parkway (the "Project" and/or "Site"), in Boston's Brighton neighborhood. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and the Boston Planning and Development Agency's (BPDA) Article 80 development review process. The study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, transit services, and pedestrian and bicycle activity.

7.1.1 Project Description

The Project site is bounded by Lincoln Street to the south, Leo M. Birmingham Parkway to the west, Centola Street to the north, and the Portsmouth Street Playground and residential properties to the east. The site is currently occupied by The Lincoln Bar & Grill and an existing 10,000 square feet (sf) office building. The existing uses on the site will be demolished and replaced with the Project.

The Project will include the construction of approximately 82 residential units, with approximately 59 parking spaces, consisting of 32 below-grade spaces and 27 surface spaces. Vehicular access will be provided via a curb cut along the north side of Lincoln Street. The existing curb cuts along Leo M. Birmingham Parkway that serve the site will be closed as part of the Project.

7.1.2 Study Methodology

The Existing (2017) Condition analysis includes an inventory of the existing transportation conditions such as traffic characteristics, parking, curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site conditions. Existing counts for vehicles, bicycles, and pedestrians were collected at the study area intersections. A traffic data collection effort forms the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2024, based on a seven-year horizon from the year of the filing of this traffic study.

The No-Build (2024) Condition includes both general background traffic growth, traffic growth associated with specific developments (not including this Project) and transportation improvements that are planned in the vicinity of the Project site.

The Build (2024) Condition includes a net increase in traffic volume due to the addition of Project- generated trip estimates to the traffic volumes developed as part of the No-Build (2024) Condition. Expected roadway, parking, transit, pedestrian, and bicycle accommodations, as well as loading capabilities and deficiencies are identified.

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

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

7.1.3 Study Area

The transportation study area is generally bounded by Leo M. Birmingham Parkway to the west, Lincoln Street to the south, Portsmouth Street to the east, and Waverly Street to the north. The study area includes the following intersections:

- Leo M. Birmingham Parkway/Market Street/Lincoln Street;
- Leo M. Birmingham Parkway/Soldiers Field Road Off-Ramps/Lothrop Street;
- Leo M. Birmingham Parkway/Waverly Street;
- Lincoln Street/Portsmouth Street; and
- Waverly Street/Portsmouth Street/Mackin Street.

The study area is shown in **Figure 7-1**.

7.2 Existing (2017) Condition

This section includes descriptions of existing study area roadway geometries, intersection traffic control, peak-hour vehicular and pedestrian volumes, average daily traffic volumes, transit availability, parking, curb usage, and loading conditions.

Figure 7-1.
Study Area

7.2.1 Existing Roadway Conditions

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

Leo M. Birmingham Parkway is a two-way roadway located adjacent to the west side of the Project site. Leo M. Birmingham Parkway is classified as an urban principal arterial roadway under the jurisdiction of the Department of Conservation and Recreation (DCR) and generally runs in an east-west direction between North Beacon Street to the west and Western Avenue to the east. The directions of travel are separated by a raised grass median, with each direction of travel consisting of two to three travel lanes. On-street parking is allowed on the east (northbound) side of the roadway between Market Street and Lothrop Street and on both sides of the roadway west of Market Street. Sidewalks are provided north of Lincoln Street and not provided west of Market Street.

Market Street is a two-way, four-lane roadway located south of the Project site. Market Street is classified as an urban minor arterial roadway under City of Boston jurisdiction and generally runs in a north-south direction between Leo M. Birmingham Parkway/Lincoln Street to the north and Washington Street to the south. On-street parking is not permitted along Market Street in the vicinity of the Project site. Sidewalks are provided along both sides of the roadway.

Lincoln Street is located adjacent to the south side of the Project site and is a one-way roadway in the westbound direction between Leo M. Birmingham Parkway and Portsmouth Street and a two-way roadway east of Portsmouth Street. Lincoln Street is classified as an urban collector roadway under City of Boston jurisdiction and generally runs in an east-west direction between Leo M. Birmingham Parkway to the west and Cambridge Street to the east. On-street parking is allowed along the north side of Lincoln Street. Sidewalks are provided along both sides of Lincoln Street.

Centola Street is located adjacent to the north side of the Project site and accommodates two-way travel. Centola Street is classified as a local roadway under City of Boston jurisdiction and runs in an east-west direction between Leo M. Birmingham Parkway and the Portsmouth Street Playground, where it terminates. Centola Street serves as the access road for the Portsmouth Street Playground and for the parking lots on the north and south sides of the roadway. Parking is allowed and sidewalks are provided on both sides of the roadway.

Portsmouth Street is located east of the Project site and accommodates two-way travel. Portsmouth Street is classified as a local roadway under City of Boston jurisdiction and runs in a north-south direction between Waverly Street to the north and Lincoln Street to the south. On-street parking is allowed along the east side of Portsmouth Street. Sidewalks are provided along both sides of the roadway.

Lothrop Street is located north of the Project site and is one-way in the westbound direction. Lothrop Street is classified as a local roadway under City of Boston jurisdiction and runs in an east-west direction between Portsmouth Street to the east and Leo M. Birmingham Parkway to the west. On-street parking is allowed along the south side of Lothrop Street. Sidewalks are provided along both sides of the roadway.

7.2.2 Existing Intersection Conditions

The existing study area intersections are described below. Intersection characteristics such as traffic control, lane usage, pedestrian facilities, pavement markings, and adjacent land use are described.

Leo M. Birmingham Parkway/Market Street/Lincoln Street is a signalized intersection with four approaches. The Leo M. Birmingham Parkway southbound approach consists of two through lanes and an exclusive right-turn lane. The Market Street northbound approach consists of a shared left-turn/through lane, a through lane, and a bicycle lane. The Leo M. Birmingham Parkway eastbound approach consists of two travel lanes. The Lincoln Street westbound approach consists of a through/right-turn lane and an exclusive left-turn lane. Lincoln Street is one-way in the westbound direction entering the intersection. Sidewalks are provided along both sides of Market Street and Lincoln Street and along the east side of Leo M. Birmingham Parkway north of the intersection. Crosswalks and pedestrian signal equipment are provided across the Market Street and Lincoln Street legs of the intersection.

Leo M. Birmingham Parkway/Soldiers Field Road Off-ramps/Lothrop Street is a signalized intersection with four approaches. The Leo M. Birmingham Parkway northbound approach consists of three through lanes. The Leo M. Birmingham Parkway southbound approach consists of two through lanes. The Soldiers Field Road off-ramp eastbound approach consists of two exclusive left-turn lanes. Right turns exit the Soldiers Field Road off-ramp prior to the intersection by way of a channelized, right-turn slip-ramp. The Soldiers Field Road off-ramp accommodates eastbound vehicles only (vehicles entering the intersection). The Lothrop Street westbound approach consists of a general purpose travel lane. Lothrop Street is a one-way roadway accommodating westbound vehicles only (vehicles entering the intersection). Sidewalks are provided along the east side of Leo M. Birmingham Parkway; along the west side of Leo M. Birmingham Parkway south of the Soldiers Field Road off-ramp; along both sides of Lothrop Street; and along the south side of the Soldiers Field Road off-ramp. Crosswalks are not provided at the intersection. An MBTA bus stop is located along the east side of Leo M. Birmingham Parkway, south of Lothrop Street.

Leo M. Birmingham Parkway/Waverly Street is a three legged, unsignalized intersection with two approaches located adjacent to the southwest of the Project site. The Leo M. Birmingham Parkway northbound approach consists of three through lanes and one shared through/right-turn lane. The Leo M. Birmingham Parkway southbound approach consists of two through lanes. The directions of travel along Leo M. Birmingham Parkway are separated by a raised median.

Waverly Street is one-way in the eastbound direction, departing the intersection. On-street parking is restricted along both Leo M. Birmingham Parkway approaches and permitted on Waverly Street. Wheelchair ramps are provided along the eastern leg of the intersection however there is no crosswalk present.

Lincoln Street/Portsmouth Street is a three legged intersection with two approaches, located east of the Project site. The Lincoln Street westbound approach and Portsmouth Street southbound approaches each consist of a single travel lane. Lincoln Street is one-way in the westbound direction departing the intersection. The Portsmouth Street southbound approach is under stop control. Sidewalks are provided along both sides of Lincoln Street and Portsmouth Street, with wheelchair ramps provided for crossing Portsmouth Street.

Waverly Street/Mackin Street/Portsmouth Street is a four legged, offset unsignalized intersection with three approaches, located to the southeast of the Project site. The Waverly Street eastbound approach consists of a shared through/right-turn lane. Waverly Street is one-way eastbound at the intersection. The Portsmouth street northbound and Mackin Street southbound approaches both consist of a single lane. Mackin Street is one-way southbound at the intersection. On-street parking is permitted along all of the approaches. Wheelchair ramps are provided along the northern and southern legs of the intersection.

7.2.3 Existing Parking and Curb Use

An inventory of the on-street parking in the vicinity of the Project was collected. Parking regulations in the area consist of a mix of no parking, two-hour parking, and unrestricted parking. Centola Street has unrestricted parking, and Leo M. Birmingham Parkway has existing two-hour parking spaces available for general use. The on-street parking regulations within the study area are shown in **Figure 7-2.**

7.2.4 Car Sharing Services

Car sharing services enable easy access to short term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. Pick-up/drop-off locations are typically in existing parking lots or other parking areas throughout neighborhoods as a convenience to users of the services. Nearby car sharing services provide an important transportation option and reduce the need for private vehicle ownership.

The nearby car and bicycle sharing locations within a half-mile of the Project site are shown in **Figure 7-3.**

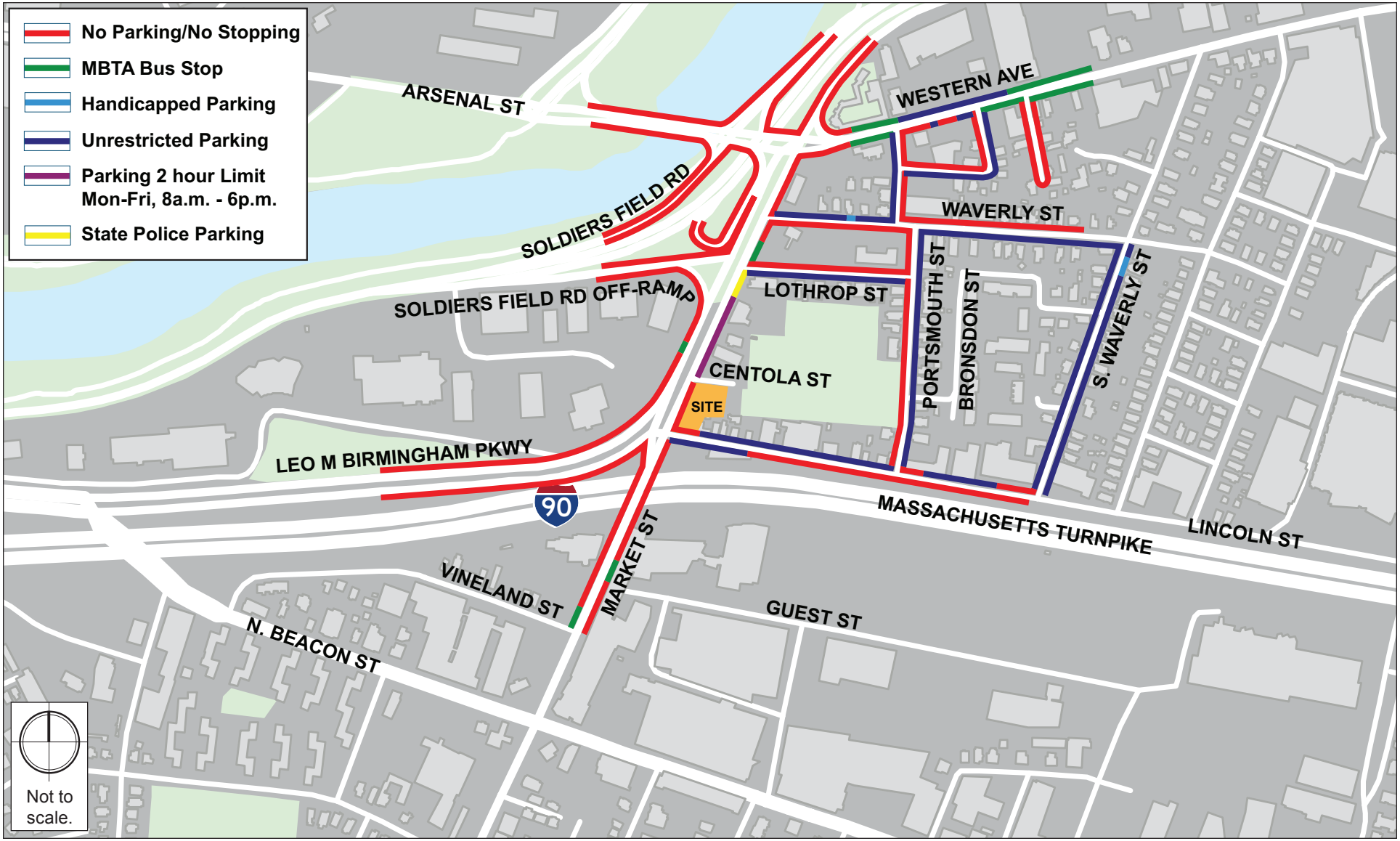


Figure 7-2.
On-street Parking

Figure 7-3.
Car Sharing Services

7.2.5 Existing Traffic Data

Turning movement counts (TMCs) were conducted during the weekday a.m. and p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively). The counts were conducted in September 2015, October 2016, and June 2017. The TMCs included traffic classification including car, heavy vehicle, pedestrian, and bicycle movements. The detailed traffic counts are provided in the Appendix.

Seasonal Adjustment

In order to account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6) during the months of September, October, and June are all below 1.00, which indicates that average month traffic volumes are less than the traffic volumes that were collected. The traffic counts were not adjusted downward to reflect average month conditions in order to provide a conservatively high analysis.

An annual growth rate of 0.5 percent was applied to the 2015 and 2016 TMCs to develop the 2017 volumes. The 2017 Existing Condition weekday a.m. peak hour and weekday p.m. peak hour traffic volumes are shown in **Figure 7-4** and **Figure 7-5**, respectively.

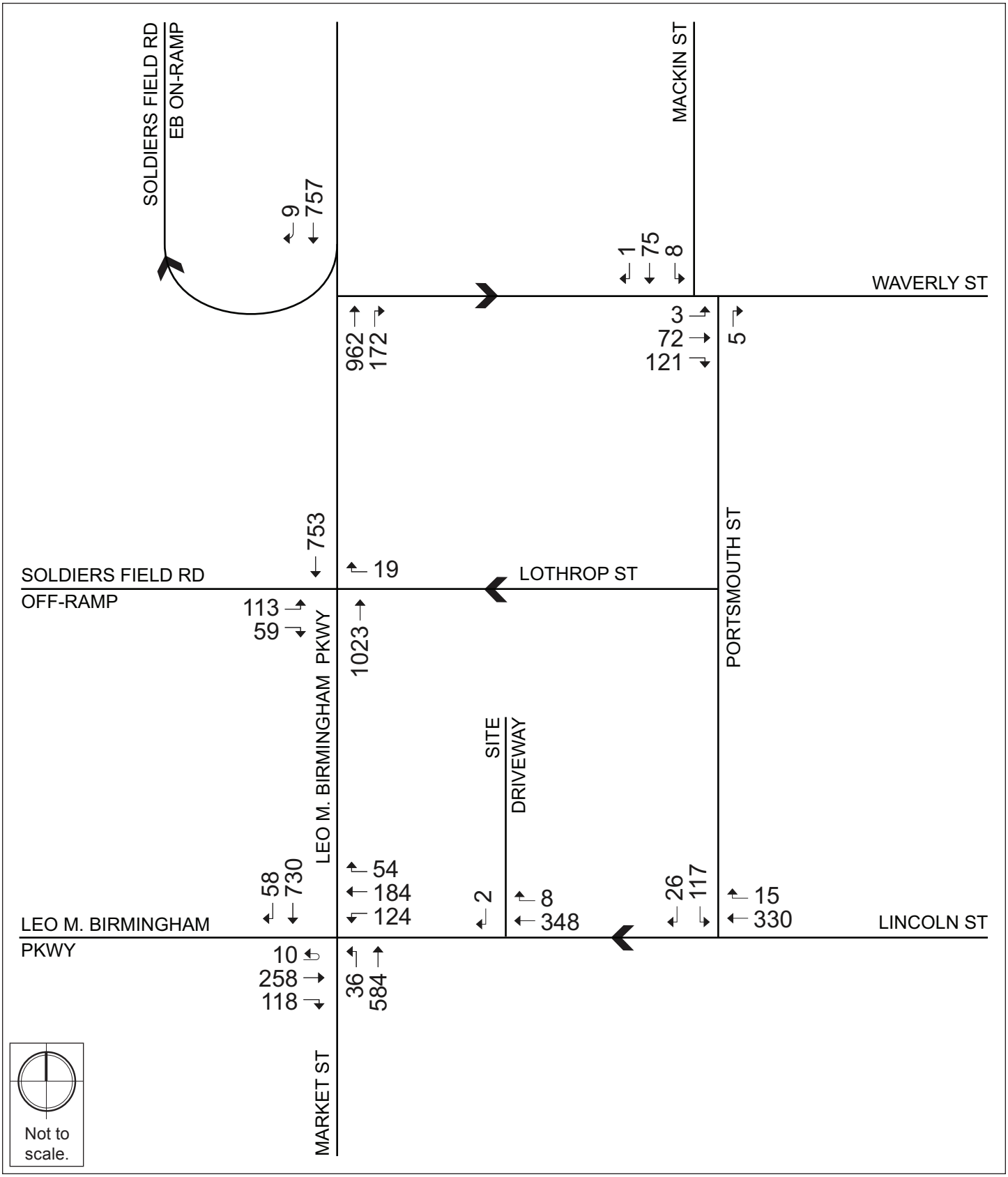


Figure 7-4.
Existing (2017) Condition Traffic Volumes Weekday a.m. Peak Hour

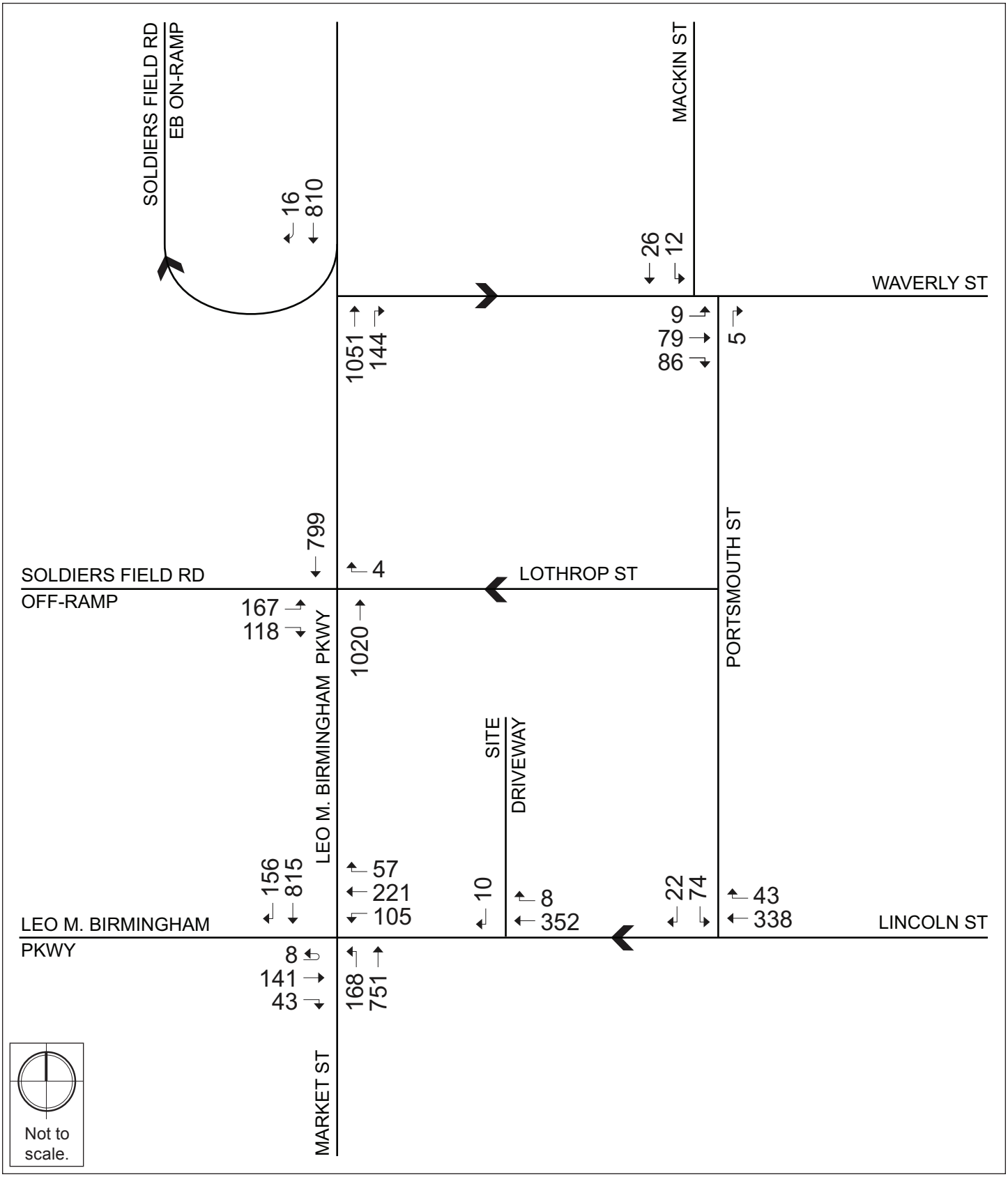


Figure 7-5.
Existing (2017) Condition Traffic Volumes Weekday p.m. Peak Hour

7.2.6 Existing Pedestrian Conditions

In general, the sidewalks that are provided along the roadways are in good condition. The sidewalks along the south side of Lincoln Street are substandard in width and are not ADA accessible. However, the south side of Lincoln Street is adjacent to the Massachusetts Turnpike and does not provide access to any properties. The signalized intersection of Leo M. Birmingham Parkway/Market Street/Lincoln Street has pedestrian signal equipment, crosswalks, and wheelchair ramps to cross the east (Lincoln Street) and south (Market Street) legs of the intersection.

To determine the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersection. The weekday a.m. Peak Hour and weekday p.m. Peak Hour pedestrian volumes are presented in **Figure 7-6**.

7.2.7 Existing Bicycle Conditions

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located in close proximity to several bicycle facilities. The City of Boston's "Bike Routes of Boston" map indicates that the following facilities in the vicinity of the Project site are listed as bicycle routes:

- **Lincoln Street** is designated as an "intermediate" bicycle route, suitable for riders with some on-road experience.
- **Leo M. Birmingham Parkway** is designated as an "intermediate" bicycle route, suitable for riders with some on-road experience.
- **Market Street** is designated as an "intermediate" bicycle route, suitable for riders with some on-road experience. Bicycle pavement markings are provided along Market Street.
- **Western Avenue** is designated as an "advanced" bicycle route, suitable for riders with some on-road experience.
- **Paul Dudley White Mixed-Use Path** is a shared path that runs along the Charles River between Watertown to the west and downtown Boston to the east and is designated as a "beginner" route, suitable for riders of all experience levels.

Bicycle volumes were collected during the TMCs. The weekday a.m. Peak Hour and weekday p.m. Peak Hour bicycle volumes are presented in **Figure 7-7**.

Bicycle Sharing Services

The Project is also located in proximity to a bicycle sharing station provided by Hubway south of the site along Guest Street. Hubway is the bicycle sharing system in the Boston area, which was launched in 2011 and consists of over 140 stations and 1,300 bicycles. **Figure 7-8** shows the location of the nearby Hubway stations.

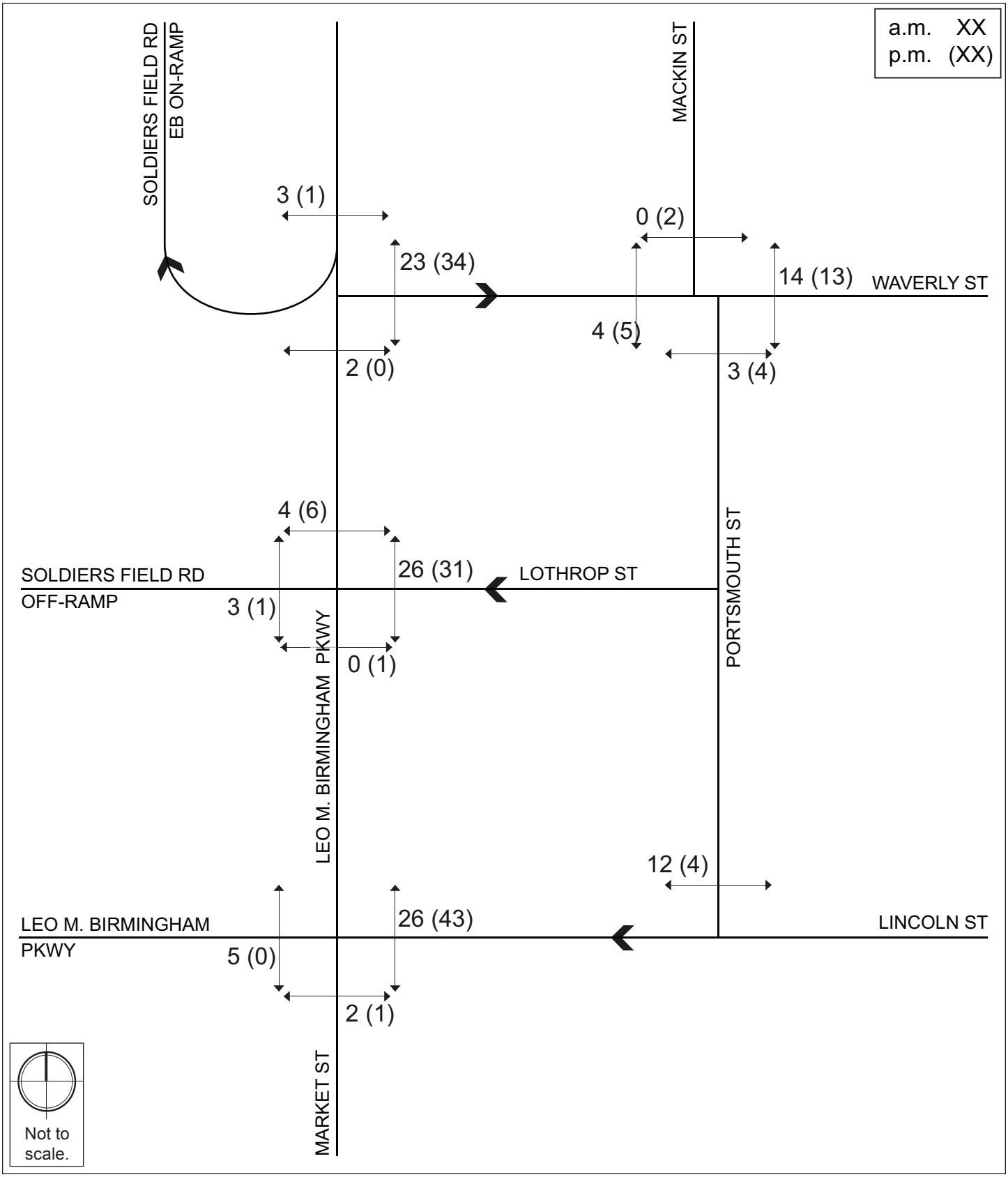


Figure 7-6.
Existing (2017) Condition Pedestrian Volumes Weekday a.m. and p.m. Peak Hour

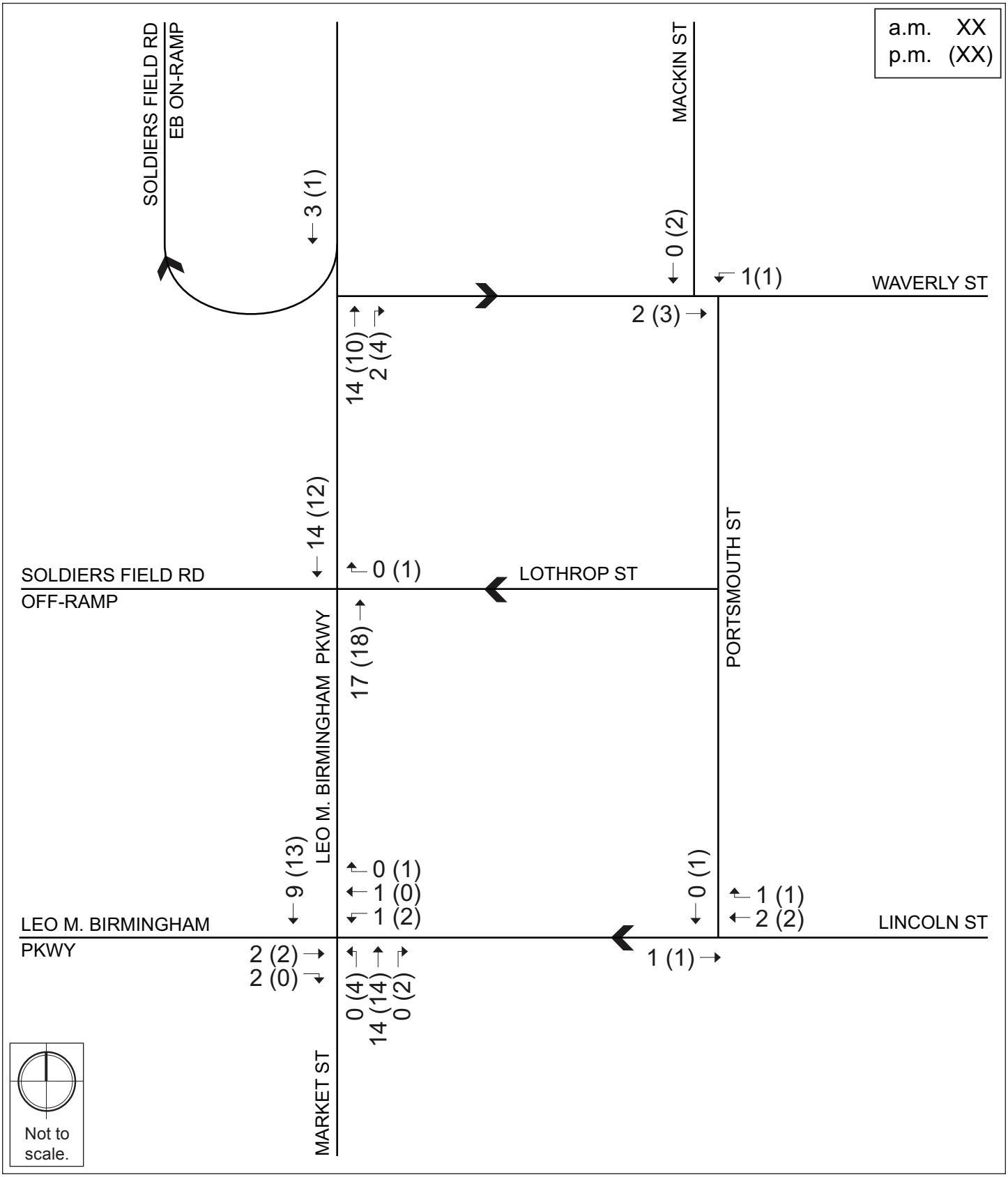


Figure 7-7.
Existing (2017) Condition Bicycle Volumes weekday a.m. and p.m. Peak Hour

Figure 7-8.
Bicycle Share Locations

7.2.8 Existing Public Transportation

The site is located in proximity to several public transportation opportunities. The Framingham/Worcester Line of the MBTA Commuter Rail stops at Boston Landing Station, located less than a half-mile east of the Project site. The MBTA also operates five bus routes that can be accessed within a short walk from the Project site. **Figure 7-9** shows all of the public transportation options located in the vicinity of the site. **Table 7-1** provides a summary of all transit routes. The existing MBTA bus lines that run in proximity to the Project site also provide access to both Harvard Square and Central Square, where the MBTA Red Line can be accessed to travel to points in Cambridge and downtown Boston.

Table 7-1. Existing Public Transportation

Route	Description	Peak-hour Headway (mins)*
Commuter Rail Line		
Framingham/Worcester		40
MBTA Bus Routes		
64	Oak Square – University Park, Cambridge or Kendall/MIT via North Beacon Street	20
66	Harvard Square – Dudley Station via Allston & Brookline Village	9
70	Cedarwood, North Waltham or Watertown Square – University Park via Central Square, Cambridge, Arsenal Street & Western Avenue	20
70A	Cedarwood, North Waltham or Watertown Square – University Park via Central Square, Cambridge, Arsenal Street & Western Avenue	25
86	Sullivan Square Station – Reservoir (Cleveland Circle) via Harvard	8

* Source: MBTA.com, July 2017. Headways are approximate.

Figure 7-10.
Background Projects

7.2.9 Traffic Operations Analysis Methodology

Trafficware's Synchro (version 9) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 7-2** displays the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition, with significant traffic delay. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

Table 7-2. Vehicle 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.

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

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

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

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

percentile queue throughout the course of the peak hour. It is also unlikely that the 95th percentile queues for each approach to the intersection will occur simultaneously.

7.2.10 Existing (2017) Condition Traffic Operations Analysis

Table 7-3 and **Table 7-4** summarize the Existing (2017) Condition capacity analysis for the study area intersection during the weekday a.m. Peak Hour and the weekday p.m. Peak Hour. The detailed analysis sheets are provided in the **Appendix.**

Table 7-3. Existing (2017) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Leo M. Birmingham Parkway/ Market Street/ Lincoln Street	**D**	**36.4**	**-**	**-**	**-**
Leo M. Birmingham Parkway EB left	F	81.6	0.93	117	#254
Leo M. Birmingham Parkway EB left/thru/right	B	11.1	0.46	17	82
Lincoln Street WB left	D	41.8	0.50	71	129
Lincoln Street WB thru | right	E	69.6	0.90	138	#279
Market Street NB left/thru | thru	C	22.8	0.61	136	184
Leo M. Birmingham Parkway SB thru | thru	C	34.5	0.76	216	286
Leo M. Birmingham Parkway SB right	A	0.5	0.07	0	3
Leo M. Birmingham Parkway/ Soldiers Field EB Off-Ramp/ Lothrop Street	**A**	**9.9**	**-**	**-**	**-**
Soldiers Field Off-Ramp EB left | left	C	24.5	0.25	26	42
Soldiers Field Off-Ramp EB right	A	2.9	0.20	0	1
Lothrop Street WB right	A	0.2	0.05	0	0
Leo M. Birmingham Parkway NB thru | thru | thru	B	13.8	0.47	101	162
Leo M. Birmingham Parkway SB thru | thru	A	4.0	0.35	57	78

Table 7-3. Existing (2017) Condition Capacity Analysis Summary, Weekday a.m. Peak Hr (Continued)

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Unsignalized Intersections					
Leo M. Birmingham Parkway/ Waverly Street	**-**	**-**	**-**	**-**	**-**
Leo M. Birmingham Parkway NB thru | thru | thru | thru/right	A	0.0	0.17	-	0
Leo M. Birmingham Parkway SB thru | thru	A	0.0	0.28	-	0
Leo M. Birmingham Parkway SB right	A	0.0	0.01	-	0
Waverly Street/ Mackin Street/ Portsmouth Street	-	-	-	-	-
Waverly Street EB thru/right	A	0.0	0.000	-	0
Portsmouth Street NB right	A	9.1	0.009	-	0
Mackin Street SB left/thru	B	11	0.153	-	13
Lincoln Street/ Portsmouth Street	-	-	-	-	-
Lincoln Street WB thru/right	A	0.0	0.21	-	0
Portsmouth Street SB left/right	B	12.1	0.22	-	21
Lincoln Street/ Site Driveway	-	-	-	-	-
Lincoln Street WB thru	A	0.0	0.15	-	0
Lincoln Street WB thru/right	A	0.0	0.08	-	0
Site Driveway SB right	A	9.4	0.00	-	0

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Grey shading indicates LOS E or F.

Table 7-4. Existing (2017) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Leo M. Birmingham Parkway/ Market Street/ Lincoln Street	**D**	**45.8**	**-**	**-**	**-**
Leo M. Birmingham Parkway EB left	E	64.7	0.72	69	128
Leo M. Birmingham Parkway EB left/thru/right	A	2.6	0.27	0	8
Lincoln Street WB left	D	41.1	0.38	65	119
Lincoln Street WB thru | right	F	82.4	0.96	186	#356
Market Street NB left/thru | thru	D	54.9	1.00	~238	#441
Leo M. Birmingham Parkway SB thru | thru	C	34.4	0.73	262	#355
Leo M. Birmingham Parkway SB right	A	3.9	0.21	12	31
Leo M. Birmingham Parkway/ Soldiers Field EB Off-Ramp/ Lothrop Street	**B**	**10.9**	**-**	**-**	**-**
Soldiers Field Off-Ramp EB left | left	C	23.9	0.29	29	57
Soldiers Field Off-Ramp EB right	A	7.1	0.32	0	36
Lothrop Street WB right	A	0.0	0.03	0	0
Leo M. Birmingham Parkway NB thru | thru | thru	B	14.3	0.52	105	166
Leo M. Birmingham Parkway SB thru | thru	A	4.4	0.35	51	85

Table 7-4. Existing (2017) Condition Capacity Analysis Summary, Weekday p.m. Peak Hr (Continued)

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Unsignalized Intersections					
Leo M. Birmingham Parkway/ Waverly Street	**-**	**-**	**-**	**-**	**-**
Leo M. Birmingham Parkway NB thru | thru | thru |thru/right	A	0.0	0.20	-	0
Leo M. Birmingham Parkway SB thru | thru	A	0.0	0.27	-	0
Leo M. Birmingham Parkway SB right	A	0.0	0.01	-	0
Waverly Street/ Mackin Street/ Portsmouth Street	-	-	-	-	-
Waverly Street EB thru/right	A	0.0	0.00	-	0
Portsmouth Street NB right	A	9.1	0.009	-	0
Mackin Street SB left/thru	B	10.2	0.06	-	5
Lincoln Street/ Portsmouth Street	-	-	-	-	-
Lincoln Street WB thru/right	A	0.0	0.23	-	0
Portsmouth Street SB left/right	B	11.6	0.16	-	14
Lincoln Street/ Site Driveway	-	-	-	-	-
Lincoln Street WB thru	A	0.0	0.15	-	0
Lincoln Street WB thru/right	A	0.0	0.08	-	0
Site Driveway SB right	A	9.5	0.01	-	1

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

~ 50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles

Grey shading indicates LOS E or F.

The signalized intersection of **Leo M. Birmingham Parkway/Market Street/Lincoln Street** currently operates at an overall LOS D during both the weekday a.m. and p.m. peak hours, with movements along the Leo M. Birmingham Parkway eastbound and Lincoln Street westbound operating at LOS E or worse. The intersection experiences moderate queuing during the peak periods. Queues occasionally require more than one signal cycle to clear.

All movements at the remainder of the study area intersections operate at LOS C or better, with little congestion and delay.

7.3 No-Build (2024) Condition

The No-Build (2024) Condition reflects a future scenario that incorporates anticipated traffic volume changes associated with background traffic growth independent of any specific project, traffic associated with other planned specific developments, and planned infrastructure improvements that will affect travel

patterns throughout the study area. The No-Build (2024) Condition does not include the impact of the Project. Planned infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements.

7.3.1 Background Traffic Growth

The methodology to account for generic future background traffic growth, independent of large development projects, may be affected by changes in demographics, smaller scale development projects, or projects unforeseen at this time. Based on a review of recent and historic traffic data collected recently and to account for any additional unforeseen traffic growth, a half percent per year annual traffic growth rate was used.

7.3.2 Specific Development Traffic Growth

Traffic volumes associated with the larger or closer known development projects can affect traffic patterns throughout the study area within the future analysis time horizon. Nearby development projects were identified in the vicinity of the Project and are shown in **Figure 7-10**. Traffic volumes associated with the following projects were directly incorporated into the future conditions traffic volumes:

530 Western Avenue: This project calls for the construction of 132 residential units and ground floor retail space at the corner of Leo M. Birmingham Parkway and Western Avenue. This project is located north of the site and is currently under construction.

Boston Landing: This project consists of 250,000 sf for the New Balance world headquarters, 350,000 sf for a new sports complex, 140,000 sf of hotel uses, 650,000 sf of general office uses, and 65,000 sf of retail space. This project is located south of the site and is partially constructed and occupied.

Joseph M. Smith Community Health Center: This project consists of a new health care facility of approximately 48,000 sf including a retail pharmacy, vision clinic, eye shop, dental clinic, office space and 99 parking spaces. This project is located north of the site and is fully constructed.

7.3.3 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. There is currently an ongoing planning study of Leo M. Birmingham Parkway between the Project site and Western Avenue. This planning study is in the early stages and is expected to analyze and recommend improvements for Leo M. Birmingham Parkway. It is not expected that recommendations from this study will be implemented within the study period time horizon and accordingly, were not included in the future conditions scenarios.

There are also various improvements throughout the study area proposed as part of the Boston Landing project. However, due to the ongoing planning study, it is expected that the findings of the study will supersede the proposed improvements related to the Boston Landing project.

7.3.4 No-Build (2024) Condition Traffic Volumes

The half percent per year annual growth rate was applied to the Existing (2017) Condition traffic volumes, then the traffic volumes associated with the background development project listed above was added to develop the No-Build (2024) Condition traffic volumes. The No-Build (2024) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on **Figure 7-11** and **Figure 7-12**, respectively.

7.3.5 No-Build (2024) Condition Traffic Operations Analysis

The No-Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis. **Table 7-5** and **Table 7-6** present the No-Build (2024) Condition capacity analysis for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in the Appendix.

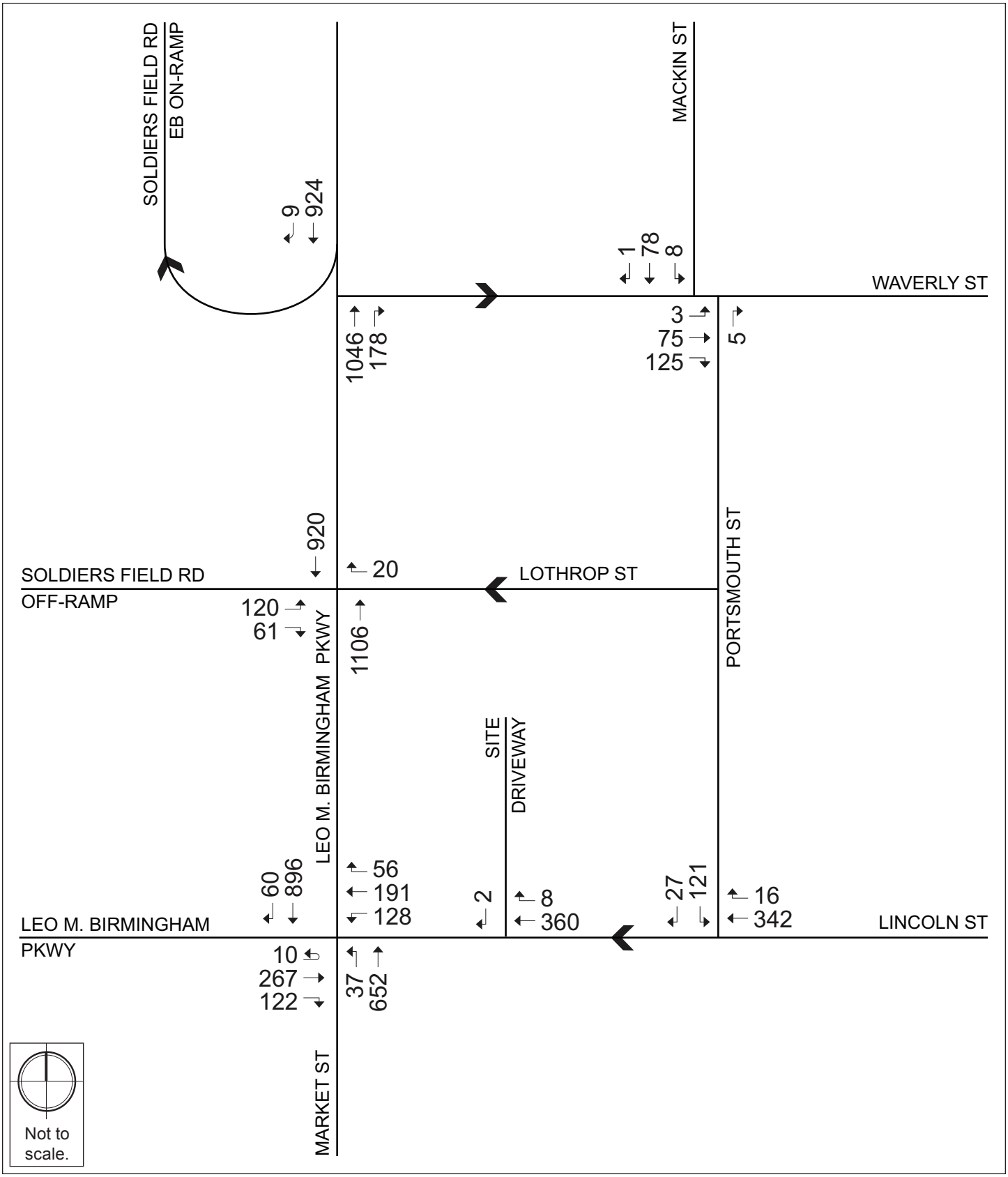


Figure 7-11.
No-Build (2024) Condition Traffic Volumes Weekday a.m. Peak Hour

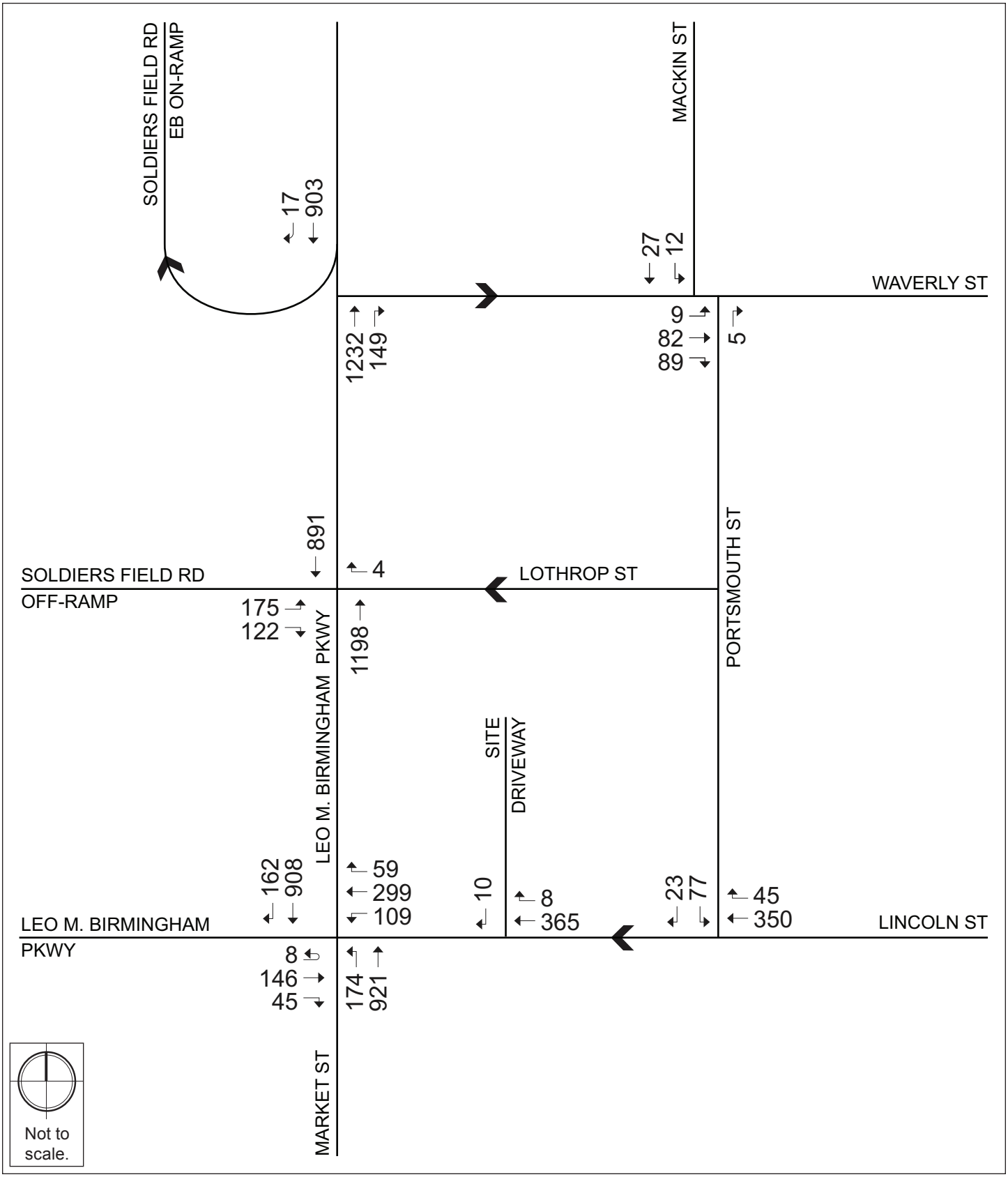


Figure 7-12.
No-Build (2024) Condition Traffic Volumes Weekday p.m. Peak Hour

Table 7-5. No-Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Leo M. Birmingham Parkway/ Market Street/ Lincoln Street	**D**	**44.3**	**-**	**-**	**-**
Leo M. Birmingham Parkway EB left	F	85.6	0.95	123	#265
Leo M. Birmingham Parkway EB left/thru/right	B	11.7	0.47	22	88
Lincoln Street WB left	D	42.0	0.51	73	132
Lincoln Street WB thru | right	E	74.1	0.92	145	#294
Market Street NB left/thru | thru	C	27.8	0.76	156	207
Leo M. Birmingham Parkway SB thru | thru	D	50.8	0.95	284	#413
Leo M. Birmingham Parkway SB right	A	0.6	0.08	0	4
Leo M. Birmingham Parkway/ Soldiers Field EB Off-Ramp/ Lothrop Street	**B**	**11.3**	**-**	**-**	**-**
Soldiers Field Off-Ramp EB left | left	C	25.6	0.29	30	44
Soldiers Field Off-Ramp EB right	A	3.3	0.22	0	2
Lothrop Street WB right	A	0.2	0.05	0	0
Leo M. Birmingham Parkway NB thru | thru | thru	B	16.2	0.56	126	179
Leo M. Birmingham Parkway SB thru | thru	A	5.2	0.46	79	103

Table 7-5. No-Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hr (Continued)

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Unsignalized Intersections					
Leo M. Birmingham Parkway/ Waverly Street	**-**	**-**	**-**	**-**	**-**
Leo M. Birmingham Parkway NB thru | thru | thru | thru/right	A	0.0	0.18	-	0
Leo M. Birmingham Parkway SB thru | thru	A	0.0	0.34	-	0
Leo M. Birmingham Parkway SB right	A	0.0	0.01	-	0
Waverly Street/ Mackin Street/ Portsmouth Street	-	-	-	-	-
Waverly Street EB thru/right	A	0.0	0.000	-	0
Portsmouth Street NB right	A	9.1	0.009	-	0
Mackin Street SB left/thru	B	11.1	0.160	-	15
Lincoln Street/ Portsmouth Street	-	-	-	-	-
Lincoln Street WB thru/right	A	0.0	0.21	-	0
Portsmouth Street SB left/right	B	12.4	0.23	-	23
Lincoln Street/ Site Driveway	-	-	-	-	-
Lincoln Street WB thru	A	0.0	0.15	-	0
Lincoln Street WB thru/right	A	0.0	0.08	-	0
Site Driveway SB right	A	9.5	0.00	-	0

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Table 7-6. No-Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Birmingham Parkway/ Market Street/ Lincoln Street	**F**	**82.4**	**-**	**-**	**-**
Birmingham Parkway EB left	E	66.6	0.73	71	#133
Birmingham Parkway EB left/thru/right	A	3.0	0.27	0	11
Lincoln Street WB left	D	41.4	0.39	68	123
Lincoln Street WB thru | right	F	90.7	0.99	195	#372
Market Street NB left/thru | thru	F	140.7	1.24	~420	#653
Birmingham Parkway SB thru | thru	D	38.5	0.83	306	#446
Birmingham Parkway SB right	A	4.0	0.21	13	32
Birmingham Parkway/ Soldiers Field EB Off-Ramp/ Lothrop Street	**B**	**12.1**	**-**	**-**	**-**
Soldiers Field Off-Ramp EB left | left	C	24.7	0.31	32	61
Soldiers Field Off-Ramp EB right	A	7.6	0.34	0	39
Lothrop Street WB right	A	0.0	0.03	0	0
Birmingham Parkway NB thru | thru | thru	B	16.2	0.62	136	215
Birmingham Parkway SB thru | thru	A	4.7	0.38	60	100

Table 7-6. No-Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hr (Continued)

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Unsignalized Intersections					
Birmingham Parkway/ Waverly Street	**-**	**-**	**-**	**-**	**-**
Birmingham Parkway NB thru | thru | thru |thru/right	A	0.0	0.23	-	0
Birmingham Parkway SB thru | thru	A	0.0	0.30	-	0
Birmingham Parkway SB right	A	0.0	0.01	-	0
Waverly Street/ Mackin Street/ Portsmouth Street	-	-	-	-	-
Waverly Street EB thru/right	A	0.0	0.000	-	0
Portsmouth Street NB right	A	9.1	0.009	-	0
Mackin Street SB left/thru	B	10.2	0.062	-	5
Lincoln Street/ Portsmouth Street	-	-	-	-	-
Lincoln Street WB thru/right	A	0.0	0.23	-	0
Portsmouth Street SB left/right	B	11.8	0.16	-	15
Lincoln Street/ Site Driveway	-	-	-	-	-
Lincoln Street WB thru	A	0.0	0.16	-	0
Lincoln Street WB thru/right	A	0.0	0.08	-	0
Site Driveway SB right	A	9.5	0.01	-	1

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

~ 50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Grey shading indicates a decrease to LOS E or F from Existing (2017) Condition.

The signalized intersection of **Leo M. Birmingham Parkway/Market Street/Lincoln Street** is expected to continue to operate at an overall LOS D during the weekday a.m. peak hour and expected to worsen to LOS F during the weekday p.m. peak hour. The deterioration in operations at this location is primarily caused by the increase in traffic volumes created by nearby developments and general traffic growth. As previously mentioned, this intersection is included in a larger planning study geared toward transportation improvements. This intersection was also included in the overall mitigation package for the Boston Landing project. Due to the ongoing studies, it is likely that improvements will be implemented at this intersection to improve operations and increase capacity.

All movements at the remainder of the study area intersections continue to operate at LOS C or better, with little congestion and delay.

7.4 Build (2024) Condition

As previously summarized, the Project will include the construction of approximately 82 residential units, with 65 parking spaces, consisting of two underground levels of 32 and 33 parking spaces. The existing office and restaurant uses on the site will be removed as part of the Project.

7.4.1 Vehicle Site Access and Circulation

As shown in the Project site plan in **Figure 7-13**, vehicular access will be provided via a curb cut along the north side of Lincoln Street. The curb cut will serve a garage with two underground levels of 32 and 33 parking spaces. Lincoln Street is one-way in the westbound direction at the proposed curb cut, and movements will be limited to right-turns only entering and exiting the driveway. The existing curb cuts along Leo M. Birmingham Parkway that serve the site will be closed as part of the Project. An alternative vehicular access is also being evaluated from Leo M. Birmingham Parkway.

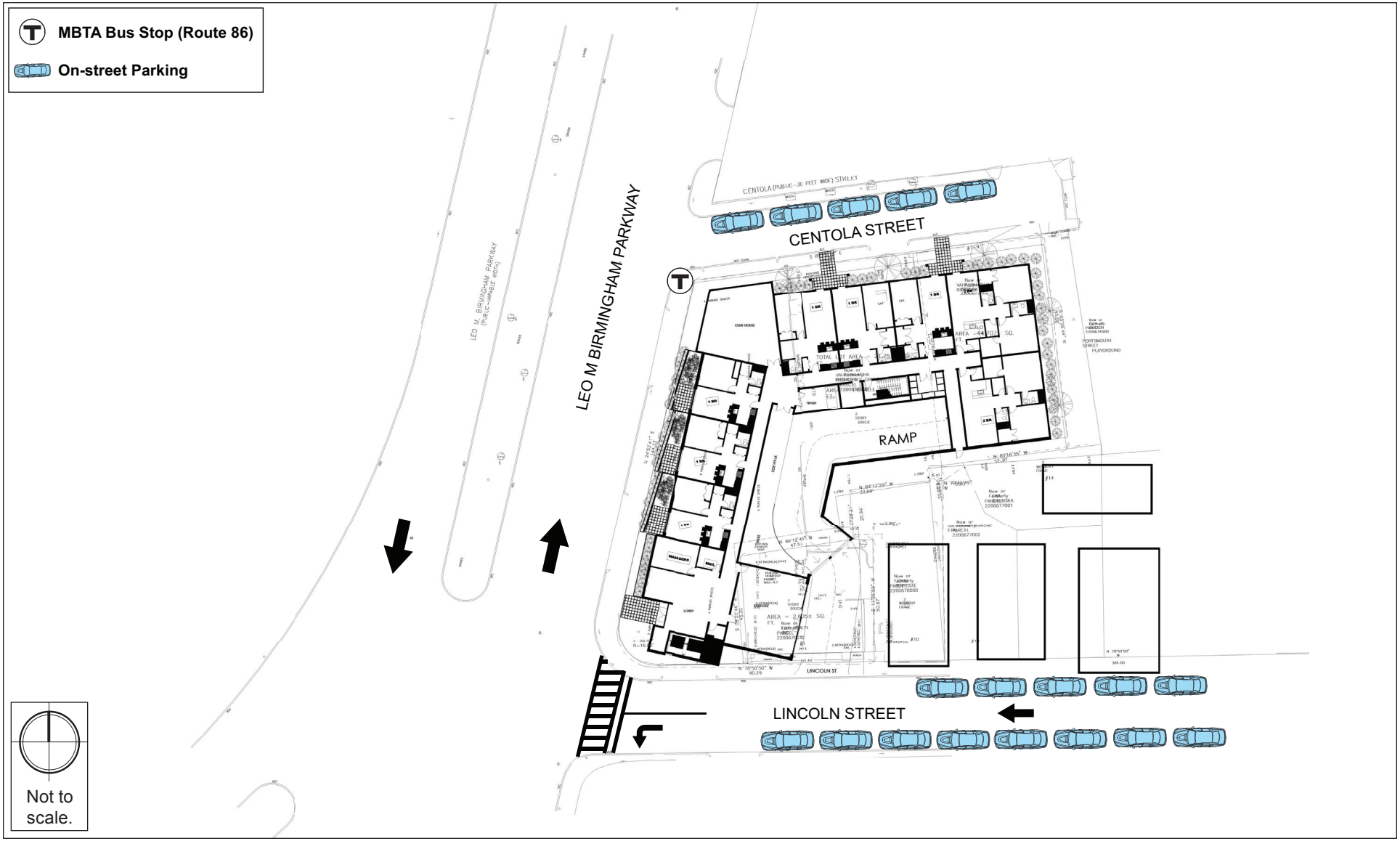


Figure 7-13.
Site Access Plan

7.4.2 Parking

This section presents the Project's parking supply and an evaluation of the Project's parking demand. As previously mentioned, the Project will contain 65 parking spaces. This results in a parking ratio of approximately 0.79 parking spaces per dwelling units, consistent with the BTD maximum parking goals for Brighton.

7.4.3 Loading and Service Accommodations

Loading and service operations will occur on-site, however a designated loading area will not be provided. Residential move-in/move-out activity will take place within the site on the ground-floor level.

Truck trip estimates for the residential element of the Project are based on data provided in the Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area report[4]. Deliveries to the Project site will likely be SU-36 trucks and smaller delivery vehicles. Residential units primarily generate delivery trips related to small packages and prepared food. Based on the CTPS report, the Project is expected to generate one light truck trip per day to the Site.

7.4.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and short-term bicycle racks for visitors. Based on BTD guidelines, the Project will supply a minimum of 82 secure bicycle parking/storage spaces within the parking garage.

7.4.5 Trip Generation Methodology

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

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[5] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

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

5 Trip Generation Manual, 9th Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

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

Land Use Code 220 – Apartment. This land use code refers to dwelling units located within the same building with at least three other dwelling units. Trip generation estimates are based on average trips rates per dwelling unit.

Trip generation estimates were also calculated for the existing uses on the Project site. To estimate the number of vehicular trips related to the existing uses on the site, the following ITE LUCs were used:

Land Use Code 710 – General Office Building. This land use code refers to an office building that houses multiple tenants including commercial or industrial organizations and professional firms. Trip generation estimates are based on average trips rates per 1,000 sf of gross floor area.

Land Use Code 925 – Drinking Place. This land use code refers to an establishment with a bar where beverages and food are sold, with various forms of entertainment such as music and television screens. Trip generation estimates are based on average trips rates per 1,000 sf of gross floor area.

7.4.6 Mode Share

BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. Project is located within designated Area 17 – North Allston. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[6]. The person trips were then distributed to different modes according to the mode shares shown in **Table 7-7**.

Table 7-7. Travel Mode Shares

Time Period		Vehicle Occupancy Rate[a]	Walk/Bike Share[b]	Transit Share[b]	Vehicle Share[b]
Daily	In	1.13	31%	22%	47%
	Out	1.13	31%	22%	47%
a.m. Peak Hour	In	1.13	33%	30%	37%
	Out	1.13	36%	21%	43%
p.m. Peak Hour	In	1.13	36%	21%	43%
	Out	1.13	33%	30%	37%

a 2009 National Household Travel Survey.
b Based on rates published by the Boston Transportation Department for Area 17 – North Allston.

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

As shown in Table 7-7, the majority of peak hour trips are made by non-vehicular modes of transportation (transit or walk/bike). It is expected that the Project will experience higher non-vehicular mode shares than the overall Brighton community based on the nature of the development and its proximity to several public transportation routes.

7.4.7 Project Trip Generation

The mode share percentages shown in **Table 7-7** were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The trip generation for the Project by mode is shown in **Table 7-8**. The detailed trip generation information is provided in the **Appendix**.

Table 7-8. Trip Generation Summary

Time Period		Walk/Bicycle Trips	Transit Trips	Primary Vehicle Trips
Daily				
Apartment [a]	In	97	69	129
	Out	97	69	129
	Total	**194**	**138**	**258**
a.m. Peak Hour				
Apartment	In	3	3	3
	Out	14	8	14
	Total	**17**	**11**	**17**
p.m. Peak Hour				
Apartment	In	13	8	14
	Out	7	6	6
	Total	**20**	**14**	**20**

a Based on ITE LUC 220 – 82 Apartment units, average rate.

As shown in **Table 7-8**, the Project is expected to generate approximately 19 vehicular trips during the weekday a.m. peak hour and 23 vehicular trips during the weekday p.m. peak hour. **Table 7-9** shows the expected vehicular trip generation when compared to the existing uses that currently occupy the Project site.

Table 7-9. Trip Generation Comparison

Peak Hour Vehicle Trips		Existing Site Trips	Proposed Site Trip Generation	Difference
a.m. Peak Hour	In	8	3	-5
	Out	2	14	+12
	Total	**10**	**17**	**+7**
p.m. Peak Hour	In	8	14	+6
	Out	10	6	-4
	Total	**18**	**20**	**+2**

As shown in **Table 7-9**, the existing uses on the Project site currently generate approximately 10 vehicular trips during the weekday a.m. peak hour and 18 vehicular trips during the weekday p.m. peak hour. When compared to the existing uses, the proposed Project is expected to generate approximately 7 new vehicular trips during the weekday a.m. peak hour and 2 new vehicular trips during the weekday p.m. peak hour. The expected increases in traffic related to the Project are minimal in nature and will not have a material impact on the operations of the surrounding roadway network.

7.4.8 Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the Project were based on BTD's origin-destination data and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in **Figure 7-14**.

7.4.9 Build (2024) Traffic Volumes

The vehicle trips were distributed through the study area. The Project-generated trips for the weekday a.m. Peak Hour and weekday p.m. Peak Hour are shown in **Figure 7-15** and **Figure 7-16**, respectively. The trip assignments were added to the No-Build (2024) Condition vehicular traffic volumes to develop the Build (2024) Condition vehicular traffic volumes. The Build (2024) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on **Figure 7-17** and **Figure 7-18**, respectively.

7.4.10 Build (2024) Condition Traffic Operations Analysis

The Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis and the No-Build (2024) Condition capacity analysis. **Table 7-10** and **Table 7-11** present the Build (2024) Condition capacity analysis for the weekday a.m. Peak Hour and weekday p.m. Peak Hour, respectively. The detailed analysis sheets are provided in the Appendix.

Figure 7-14.
Trip Distribution

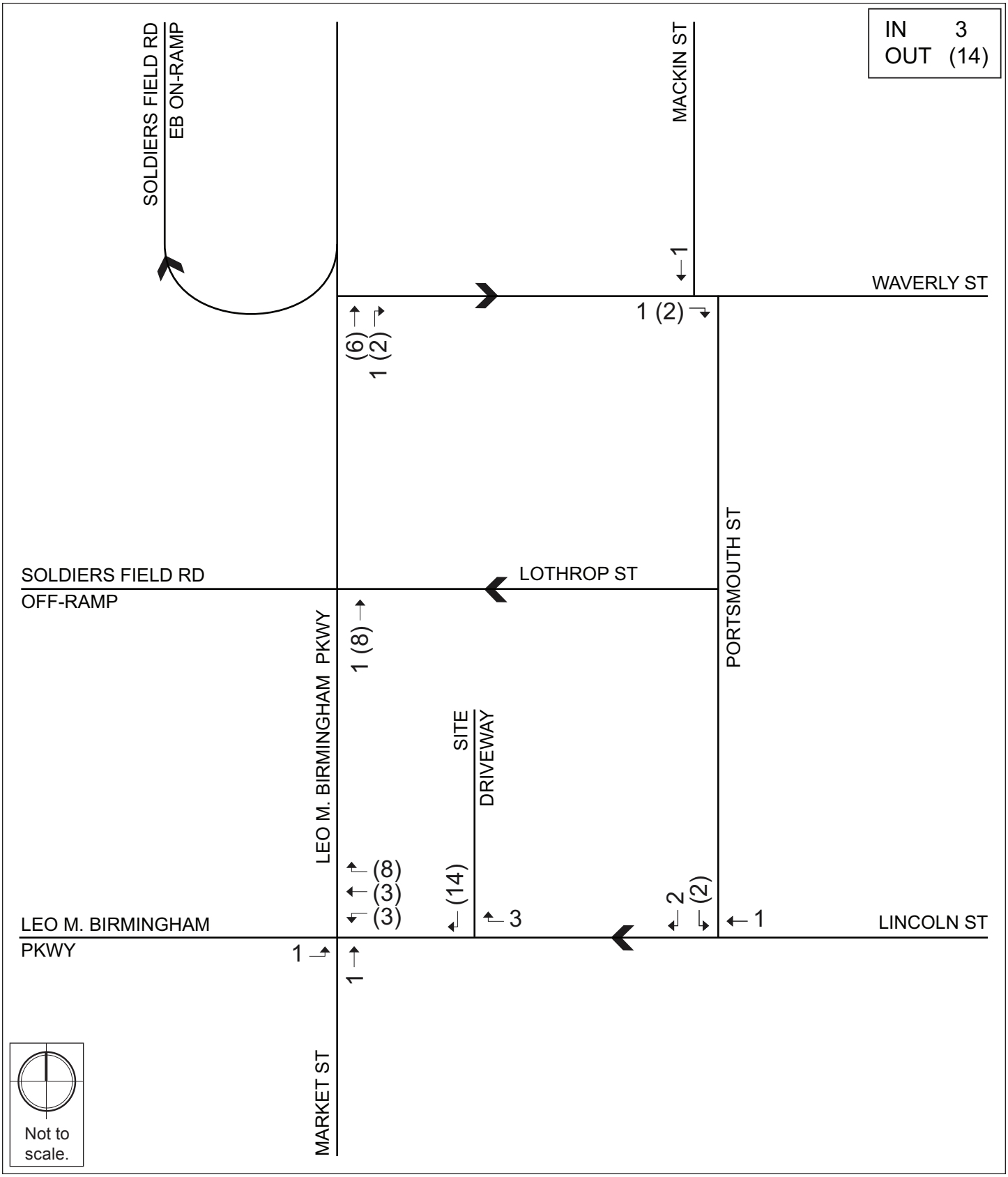


Figure 7-15.
Project-generated Vehicle Trips, Weekday a.m. Peak Hour

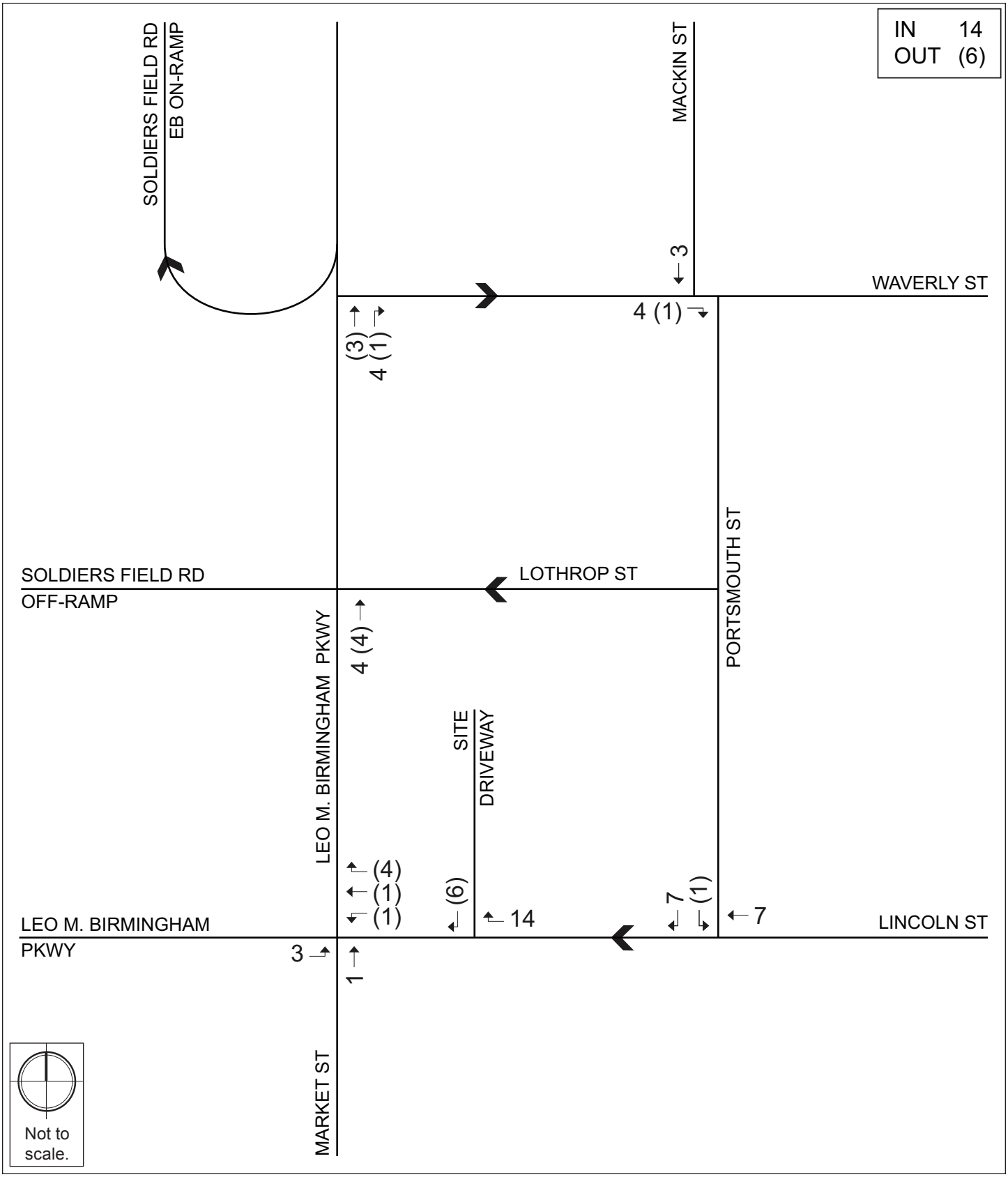


Figure 7-16.
Project-generated Vehicle Trips, Weekday p.m. Peak Hour

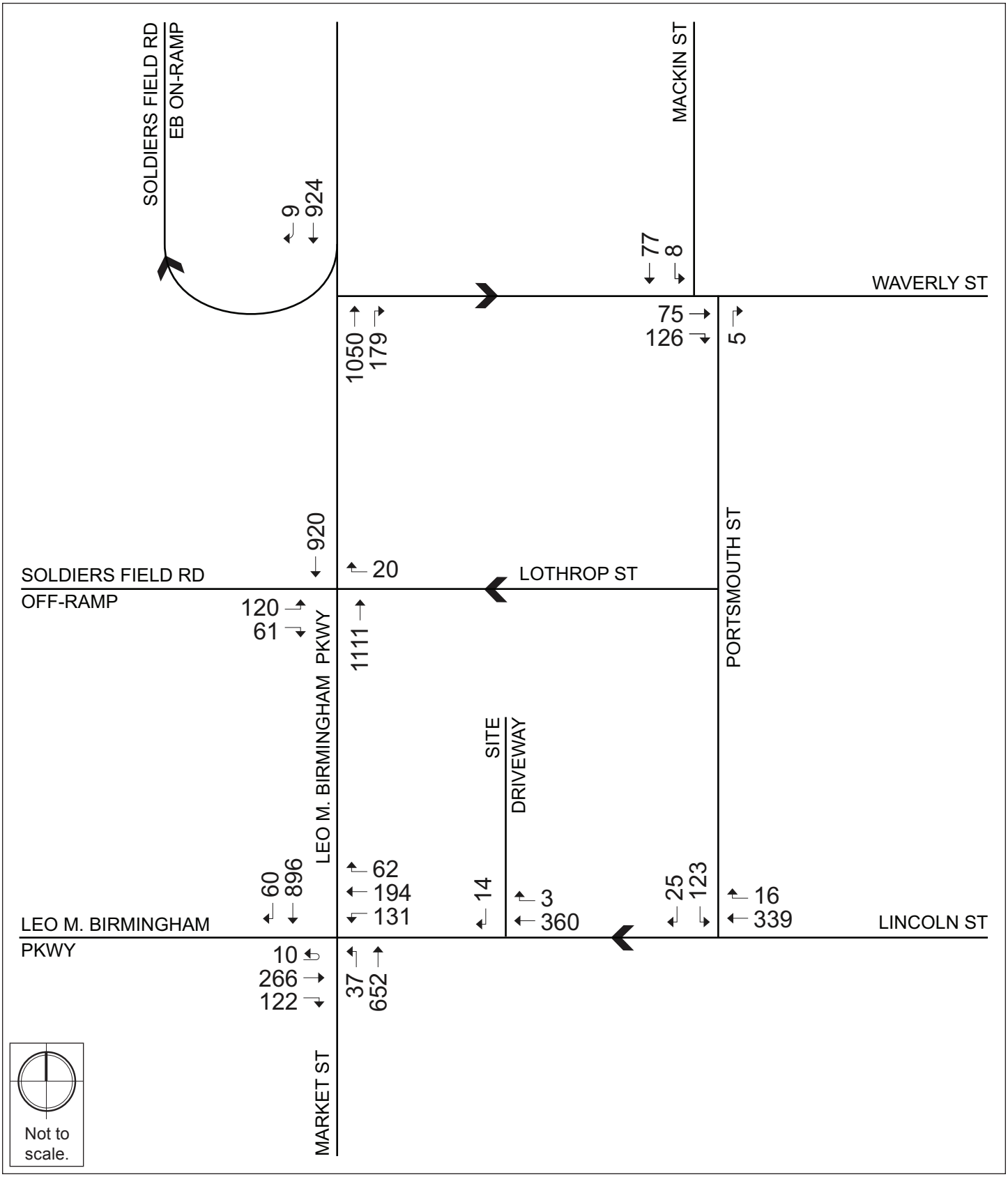


Figure 7-17.
Build (2024) Condition Traffic Volumes Weekday a.m. Peak Hour

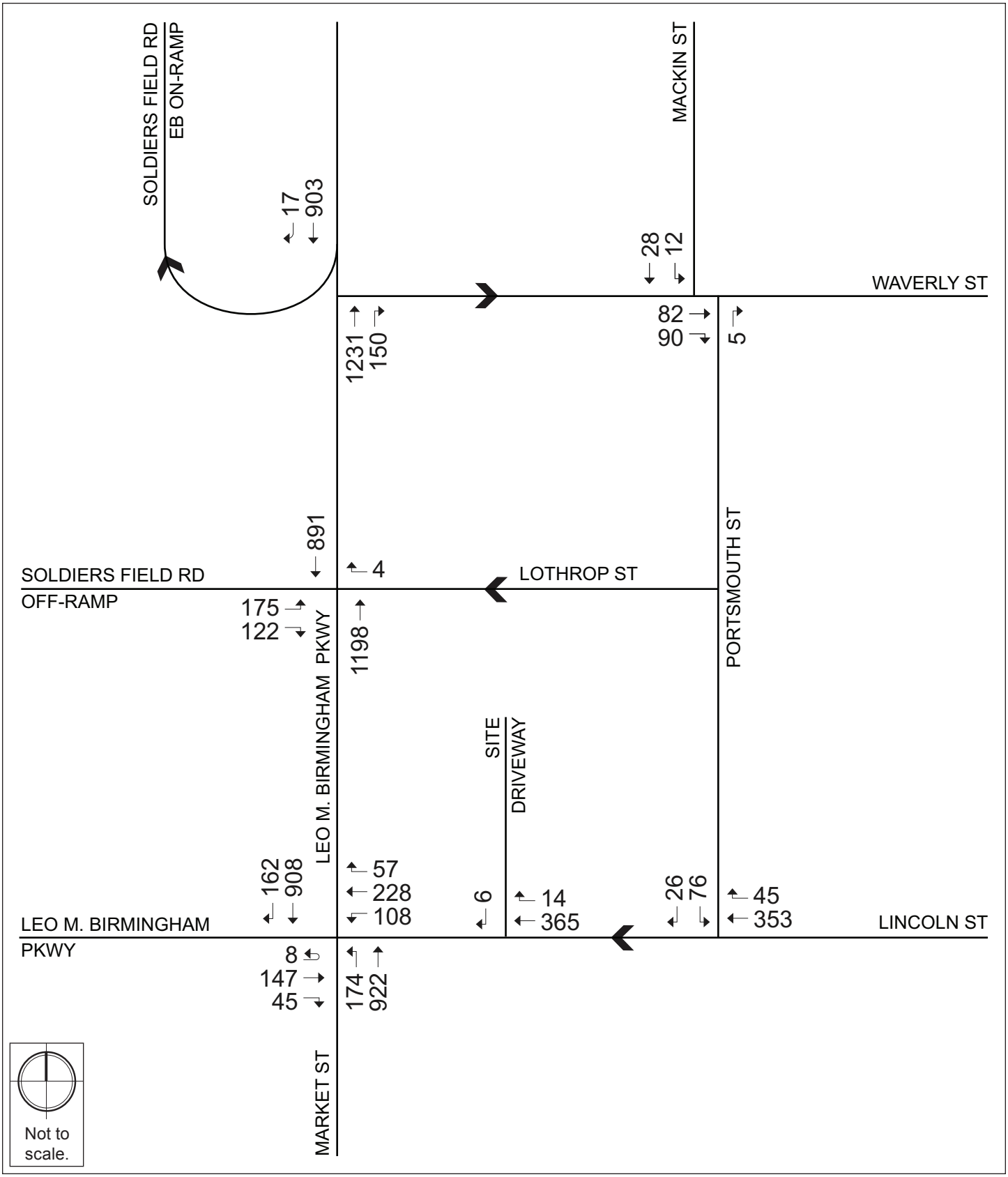


Figure 7-18.
Build (2024) Condition Traffic Volumes Weekday p.m. Peak Hour

Table 7-10. Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Leo M. Birmingham Parkway/ Market Street/ Lincoln Street	**D**	**45.4**	**-**	**-**	**-**
Leo M. Birmingham Parkway EB left	F	87.0	0.95	123	#266
Leo M. Birmingham Parkway EB left/thru/right	B	11.6	0.47	21	87
Lincoln Street WB left	D	42.4	0.52	75	134
Lincoln Street WB thru | right	E	79.6	0.95	151	#306
Market Street NB left/thru | thru	C	27.9	0.77	156	207
Leo M. Birmingham Parkway SB thru | thru	D	51.4	0.95	284	#413
Leo M. Birmingham Parkway SB right	A	0.6	0.08	0	4
Leo M. Birmingham Parkway/ Soldiers Field EB Off-Ramp/ Lothrop Street	**B**	**11.3**	**-**	**-**	**-**
Soldiers Field Off-Ramp EB left | left	C	25.6	0.29	30	44
Soldiers Field Off-Ramp EB right	A	3.3	0.22	0	2
Lothrop Street WB right	A	0.2	0.05	0	0
Leo M. Birmingham Parkway NB thru | thru | thru	B	16.2	0.56	127	179
Leo M. Birmingham Parkway SB thru | thru	A	5.2	0.46	79	103

Table 7-10. Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hr (Continued)

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Unsignalized Intersections					
Leo M. Birmingham Parkway/ Waverly Street	**-**	**-**	**-**	**-**	**-**
Leo M. Birmingham Parkway NB thru | thru | thru | thru/right	A	0.0	0.18	-	0
Leo M. Birmingham Parkway SB thru | thru	A	0.0	0.34	-	0
Leo M. Birmingham Parkway SB right	A	0.0	0.01	-	0
Waverly Street/ Mackin Street/ Portsmouth Street	-	-	-	-	-
Waverly Street EB thru/right	A	0.0	0.000	-	0
Portsmouth Street NB right	A	9.1	0.009	-	0
Mackin Street SB left/thru	B	11.1	0.158	-	15
Lincoln Street/ Portsmouth Street	-	-	-	-	-
Lincoln Street WB thru/right	A	0.0	0.21	-	0
Portsmouth Street SB left/right	B	12.3	0.23	-	22
Lincoln Street/ Site Driveway	-	-	-	-	-
Lincoln Street WB thru	A	0.0	0.15	-	0
Lincoln Street WB thru/right	A	0.0	0.08	-	0
Site Driveway SB right	A	9.5	0.02	-	1

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Grey shading indicates a decrease to LOS E or F from No-Build (2024) Condition

Table 7-11. Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Leo M. Birmingham Parkway/ Market Street/ Lincoln Street	**F**	**82.4**	**-**	**-**	**-**
Leo M. Birmingham Parkway EB left	E	66.6	0.73	72	#136
Leo M. Birmingham Parkway EB left/thru/right	A	3.0	0.27	0	11
Lincoln Street WB left	D	41.3	0.39	67	122
Lincoln Street WB thru | right	F	87.5	0.98	193	#368
Market Street NB left/thru | thru	F	141.6	1.24	~422	#654
Leo M. Birmingham Parkway SB thru | thru	D	38.6	0.83	307	#446
Leo M. Birmingham Parkway SB right	A	4.0	0.21	13	32
Leo M. Birmingham Parkway/ Soldiers Field EB Off-Ramp/ Lothrop Street	**B**	**12.1**	**-**	**-**	**-**
Soldiers Field Off-Ramp EB left | left	C	24.7	0.31	32	61
Soldiers Field Off-Ramp EB right	A	7.6	0.34	0	39
Lothrop Street WB right	A	0.0	0.03	0	0
Leo M. Birmingham Parkway NB thru | thru | thru	B	16.2	0.62	136	215
Leo M. Birmingham Parkway SB thru | thru	A	4.7	0.38	60	100

Table 7-11. Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hr (Continued)

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Unsignalized Intersections					
Leo M. Birmingham Parkway/ Waverly Street	**-**	**-**	**-**	**-**	**-**
Leo M. Birmingham Parkway NB thru | thru | thru | thru/right	A	0.0	0.23	-	0
Leo M. Birmingham Parkway SB thru | thru	A	0.0	0.30	-	0
Leo M. Birmingham Parkway SB right	A	0.0	0.01	-	0
Waverly Street/ Mackin Street/ Portsmouth Street	-	-	-	-	-
Waverly Street EB thru/right	A	0.0	0.000	-	0
Portsmouth Street NB right	A	9.1	0.009	-	0
Mackin Street SB left/thru	B	10.3	0.065	-	5
Lincoln Street/ Portsmouth Street	-	-	-	-	-
Lincoln Street WB thru/right	A	0.0	0.24	-	0
Portsmouth Street SB left/right	B	11.8	0.17	-	15
Lincoln Street/ Site Driveway	-	-	-	-	-
Lincoln Street WB thru	A	0.0	0.16	-	0
Lincoln Street WB thru/right	A	0.0	0.09	-	0
Site Driveway SB right	A	9.5	0.01	-	1

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

~ 50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles

Grey shading indicates a decrease to LOS E or F from No-Build (2024) Condition

As shown in **Table 7-10** and **Table 7-11**, operations throughout the study area are expected to remain at the same levels of service, with minimal impacts from the Project-generated trips. Delays and queues throughout the study area will experience negligible increases due to the small number of trips expected to be generated by the Project.

Based on the traffic operations analysis, the Project will have negligible impact on traffic operations throughout the study area and can be constructed without the need for additional roadway or intersection improvements or upgrades.

7.5 Transportation Demand Management

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

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

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

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

- Orientation Packets: The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby vehicle sharing and bicycle sharing locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.
- Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options.
- Transportation Coordinator: The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries, and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.
- Provide information on travel alternatives for employees and visitors via the Internet and in the building lobby.
- Electric Vehicle Charging: The Proponent will explore the feasibility of providing electric vehicle charging station(s) within the garage.
- Vehicle Sharing Program: The Proponent will explore the feasibility of providing spaces in the garage for a car sharing service.

7.6 Transportation Mitigation Measures

The Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the

reconstruction and widening of the sidewalks where possible, the installation of new, accessible ramps, improvements to street lighting where necessary, planting of street trees, and providing bicycle storage racks surrounding the site, where appropriate.

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

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

7.7 Evaluation of Short-term Construction Impacts

Most construction activities will be accommodated within the current site boundaries. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan to be filed with BTD in accordance with the City's transportation maintenance plan requirements.

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

- Limited construction worker parking on-site;
- Encouragement of worker carpooling;
- Consideration of a subsidy for MBTA passes for full-time employees; and
- Providing secure spaces on-site for workers' supplies and tools so they do not have to be brought to the site each day.

The Construction Management Plan to be executed with the City prior to commencement of construction will document all committed measures.

8.0 COORDINATION WITH GOVERNMENTAL AGENCIES

8.1 Architectural Access Board Requirements

This Project will comply with the requirements of the Architectural Access Board. The Project will also be designed to comply with the Standards of the Americans with Disabilities Act.

8.2 Massachusetts Environmental Policy Act

Based on information currently available, development of the Proposed Project will not result in a state permit/state agency action and meet a review threshold that would require MEPA review by the MEPA Office of the Executive Office of Energy and Environmental Affairs.

8.3 Boston Civic Design Commission

The Project is not expected to exceed the 100,000 gross square feet size threshold requirement for automatic review by the Boston Civic Design Commission.

8.4 Boston Parks Commission

As the Proposed Project is adjacent to the City of Boston's Portsmouth Street Playground and within the Soldiers Field Road Greenbelt Protection Overlay District (GPOD), review by the Boston Parks Commission will be required.

9.0 PROJECT CERTIFICATION

This form has been circulated to the Boston Planning and Development Agency as required by Article 80 of the Boston Zoning Code.

Residences at Birmingham Condominium LLC

Barry S. Polack — Date: August 30, 2017

Patrick Maloney — Date: 08/30/17

Mitchell L. Fischman (MLF) Consulting LLC

Signature of Preparer — Date: 08/28/17

Mitchell L. Fischman, Principal

APPENDIX A – LETTER OF INTENT TO FILE PNF, AUGUST 4, 2017

McDERMOTT
QUILTY &
MILLER LLP

28 STATE STREET, SUITE 802
BOSTON, MA 02109

30 ROWES WHARF, SUITE 600
Boston, MA 02110

August 4, 2017 **VIA HAND DELIVERY**

Mr. Brian Golden, Director
Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201
Attn: Lance Campbell, Project Manager

RE: Letter of Intent to File Project Notification Form
Article 80 - Large Project Review
70 Leo M. Birmingham Parkway, Ward 22, Brighton

Dear Director Golden:

Our office represents Residences at Birmingham Condominium LLC (the "Proponent"), as owner-developer of three (3) contiguous parcels of land at 6-8 Lincoln Street and 70 Leo M. Birmingham Parkway in the City of Boston's Brighton neighborhood (the "Project Site"). The purpose of this letter is to notify the Boston Planning and Development Agency (the "BPDA") of the Proponent's intent to file a Project Notification Form (the "PNF") with the BPDA, pursuant to Article 80-B of the City's Zoning Code (the "Code") and in accordance with the Mayor's Executive Order Relative to the Provision of Mitigation by Development Projects in Boston, as amended.

The Proponent envisions revitalizing this under-utilized Project Site with a new development of approximately 82 residential units, including on-site garaged parking and related building, site and infrastructure upgrades to better integrate with the expanding growth of North Brighton. In particular, the proposed project will combine three (3) contiguous parcels of land, raze and replace two (2) existing underutilized commercial structures and revitalize the Project Site with a new six-story (6) residential condominium building of approximately 87,000 gross square feet, including 82 units of home-ownership, on-site garage parking for 66 vehicles and related open space, sidewalk and site improvements (the "Proposed Project").

Consistent with the policy goals of Boston Mayor Martin J. Walsh's 2030 Housing Plan, the scope and scale of the Proponent's residential program would also help balance Allston-Brighton's disproportionate share of rental housing, by providing a much-needed condominium home-ownership program of market-rate and affordable on-

site housing at a well-designed development. Pursuant the City's Inclusionary Development Policy (the "IDP"), the Proposed Project of 82 total residential units would result in the creation of 11 new on-site affordable units for expanded home-ownership in Allston-Brighton, each with a variety of square-footage, bedroom count and location within the new building, commensurate with the median of development program.

With a combined land area of approximately 21,752 square feet, the Project Site consists of a single-story bar and restaurant building and a two-story commercial office structure surrounded by surface parking with multiple curb cuts off Leo Birmingham Parkway, Lincoln and Centola Streets, leading to the City's Portsmouth Street playground at the rear. Uniquely situated within a short walk to the new MBTA Boston Landing Commuter Rail station and its dynamic retail, office and hospitality amenities, the Project Site is an ideal location for the creation of much-needed residential home-ownership in Allston-Brighton. Surrounded by several abutting and nearby structures of similar or greater massing and building height, including that of the adjacent and taller WGBH headquarters and a new six-story residential apartment building at the intersection of Western Avenue, the context of the immediate area is also supportive and well-suited for the proposed scale and scope of the Proposed Project, which has been carefully designed with certain building set-backs and related development measures to respond to and comport with the character and future growth of the immediate area. (*See Figure 1. Project Locus- 70 Leo Birmingham Parkway, Brighton*).

As the Proposed Project exceeds 50,000 square-feet of new construction at this particular location in the Brighton neighborhood, it is subject to the BPDA's Large Project Review regulations, pursuant to Article 80 of the Code. The Expanded PNF filing is expected to address many issues normally presented in a Draft Project Impact Report ("DPIR"), including a transportation analysis and air and noise, shadow, infrastructure, historic resources and other environmental evaluations of potential project impacts and any needed mitigation measures. The Project Site is also located in the City's Community Commercial 1 and 3F-4000 Subdistricts of the Allston-Brighton Neighborhood Zoning District and the applicable Greenbelt Protection Overlay District, which restrict the new Multi-Family Residential Use and limit certain dimensional, density, lot, floor area, off-street parking/loading and other requirements for the Proposed Project, pursuant to Article 51 and other sections of the Code. Thus, the Proponent will seek relief from the Code as necessary and required for the Proposed Project, by Variance and/or Conditional Use(s) from the City's Board of Appeal.

Prior to submitting this Letter of Intent (the "LOI"), the Proponent conducted extensive preliminary community outreach to seek initial input and support for the Proposed Project; voluntarily canvassed the neighborhood for its own sponsored initial abutters meeting and hosted site visits with community leadership. The Proponent and its development team also presented the Proposed Project at a community meeting before the Brighton/Allston Improvement Association and with the executive leadership of the Allston Civic Association, to receive preliminary community-wide input from these two (2) applicable neighborhood organizations. With guidance from the BPDA design staff,

the Proponent has integrated the articulated input and community values into its overall development program, and it looks forward to continuing to process and shape the Proposed Project with these most important constituencies.

Thank you for your time and attention to this Proposed Project, and our team looks forward to working with you, the BPDA staff, members of the to be formed Impact Advisory Group, local elected officials and the community at large towards a successful outcome for the City of Boston. Please contact me at your convenience if you have any questions for the Proponent regarding the Proposed Project.

Very truly yours,

Joseph P. Hanley, Esq.,
Partner -- McDermott, Quilty & Miller, LLP

Attachment: Figure 1. Project Locus

cc: Lance Campbell, BPDA Project Manager
Jonathan Greeley, BPDA Director of Development Review and Policy
Michael Christopher, BPDA Intergovernmental Liaison
District City Councilor Ciommo
Warren O'Reilly, Mayor's Office of Neighborhood Services
State Senator Brownsberger
State Representative Moran

Figure 1. Project Locus
70 Leo M. Birmingham Pkwy, Brighton, MA

APPENDIX B – AIR QUALITY APPENDIX

APPENDIX B
AIR QUALITY

70 LEO M. BIRMINGHAM PARKWAY
PROJECT NOTIFICATION FORM

 *** MODELOPTs: NonDFAULT CONC FLAT NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN NoUrbTran

                                          ***   MODEL SETUP OPTIONS SUMMARY   ***
 -
 **Model Is Setup For Calculation of Average CONCentration Values.

   -- DEPOSITION LOGIC --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION. DRYDPLT = F
 **Model Uses NO WET DEPLETION. WETDPLT = F

 **Model Uses URBAN Dispersion Algorithm for the SBL for   1 Source(s),
   for Total of   1 Urban Area(s):
   Urban Population =   2370.0 ; Urban Roughness Length = 1.000 m
 **Non-DFAULT option to ignore morning transition from nighttime urban boundary layer (NoUrbTran) selected.

 **Model Allows User-Specified Options:
         1. Stack-tip Downwash.
         2. Model Assumes Receptors on FLAT Terrain.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.
         6. Urban Roughness Length of 1.0 Meter Used.

 **Other Options Specified:
         NOCHKD   - Suppresses checking of date sequence in meteorology files
         SCREEN   - Use screening option
 which forces calculation of centerline values

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of: CO

 **Model Calculates 1 Short Term Average(s) of: 1-HR

 **This Run Includes: 1 Source(s);   1 Source Group(s); and   555 Receptor(s)

                with: 0 POINT(s), including
                           0 POINTCAP(s) and   0 POINTHOR(s)
                 and: 1 VOLUME source(s)
                 and: 0 AREA type source(s)
                 and: 0 LINE source(s)
                 and: 0 OPENPIT source(s)
                 and: 0 BUOYANT LINE source(s) with   0 line(s)

 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date: 16126

 **Output Options Selected:
          Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

```
**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     5.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      3.6 MB of RAM.

**Input Runstream File:          CO_5yrs_CO.DTA
**Output Print File:             CO_5yrs_CO.LST

**Detailed Error/Message File:   W:\Apps\aermod\4239\Error
**File for Summary of Results:   W:\Apps\aermod\4239\CO_5yrs_CO.SUM
```

```
*** AERMOD - VERSION 16216r ***   *** Leo Birmingham Project                                        ***        08/04/17
*** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                  ***        16:41:25
                                                                                                               PAGE   2
*** MODELOPTs:    NonDFAULT  CONC  FLAT  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran
```

```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                                 1.54,   3.09,   5.14,   8.23,  10.80,
```

```
*** AERMOD - VERSION 16216r ***   *** Leo Birmingham Project                                        ***        08/04/17
*** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                  ***        16:41:25
                                                                                                               PAGE   3
*** MODELOPTs:    NonDFAULT  CONC  FLAT  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran
```

```
                                    *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   Urban.sfc                                                                   Met Version: 16126
  Profile file:   Urban.PFL
  Surface format: FREE
  Profile format: FREE
  Surface station no.:    11111                Upper air station no.:    22222
                Name: UNKNOWN                                 Name: UNKNOWN
                Year:   2010                                  Year:   2010
```

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	10.	10.0	255.2	2.0
10	01	02	2	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	20.	10.0	255.2	2.0
10	01	03	3	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	30.	10.0	255.2	2.0
10	01	04	4	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	40.	10.0	255.2	2.0
10	01	05	5	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	50.	10.0	255.2	2.0
10	01	06	6	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	60.	10.0	255.2	2.0
10	01	07	7	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	70.	10.0	255.2	2.0
10	01	08	8	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	80.	10.0	255.2	2.0
10	01	09	9	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	90.	10.0	255.2	2.0
10	01	10	10	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	100.	10.0	255.2	2.0
10	01	11	11	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	110.	10.0	255.2	2.0

```
10 01 12  12 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  120.   10.0  255.2    2.0
10 01 13  13 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  130.   10.0  255.2    2.0
10 01 14  14 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  140.   10.0  255.2    2.0
10 01 15  15 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  150.   10.0  255.2    2.0
10 01 16  16 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  160.   10.0  255.2    2.0
10 01 17  17 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  170.   10.0  255.2    2.0
10 01 18  18 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  180.   10.0  255.2    2.0
10 01 19  19 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  190.   10.0  255.2    2.0
10 01 20  20 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  200.   10.0  255.2    2.0
10 01 21  21 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  210.   10.0  255.2    2.0
10 01 22  22 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  220.   10.0  255.2    2.0
10 01 23  23 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  230.   10.0  255.2    2.0
10 01 24  24 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  240.   10.0  255.2    2.0


First hour of profile data
YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
10 01 01 01   10.0 1   10.    0.50   255.3   99.0  -99.00  -99.00

F indicates top of profile (=1) or below (=0)
*** AERMOD - VERSION 16216r ***   *** Leo Birmingham Project                                              ***        08/04/17
*** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                        ***        16:41:25
                                                                                                                     PAGE   4
*** MODELOPTs:    NonDFAULT  CONC  FLAT  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran

                                               *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***

                                   ** CONC OF CO       IN MICROGRAMS/M**3                         **

                                                    DATE                                                                NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL      HIGH   1ST HIGH VALUE IS       6.72401  ON 10020102: AT (  229067.20,   901013.00,     5.00,     5.00,    0.00)  DC


*** RECEPTOR TYPES:  GC = GRIDCART
                     GP = GRIDPOLR
                     DC = DISCCART
                     DP = DISCPOLR
*** AERMOD - VERSION 16216r ***   *** Leo Birmingham Project                                              ***        08/04/17
*** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                        ***        16:41:25
                                                                                                                     PAGE   5
*** MODELOPTs:    NonDFAULT  CONC  FLAT  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran

*** Message Summary : AERMOD Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           3 Warning Message(s)
A Total of           0 Informational Message(s)

A Total of       18504 Hours Were Processed

A Total of           0 Calm Hours Identified

A Total of           0 Missing Hours Identified (  0.00 Percent)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***
```

INDOOR GARAGE ANALYSIS PROGRAM

PROJECT: 70 LEO BIRMINGHAM PARKWAY GARAGE PEAK PM HOUR - YEAR: 2017

DISTANCE IN: 158 METERS
DISTANCE OUT: 158 METERS

NUMBER OF EXIT LANES: 1 LANE(S)
PEAK VOLUME: 20 VEH/HOUR

CO RATE: 2.976 GRAMS CO/MILE

SPEED IN GARAGE: 5.0 M.P.H.

VENT CFM: 30,108 CFM

TOTAL CO EMISSIONS = 0.097 GRAMS/MIN = 0.0016 GRAMS/SEC
TOTAL VENTILATION = 853 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 0.10 PPM

MOVES2014 OUTPUT

Road Type ID	Link Length (miles)	Link Volume (Vehicles/Hr)	Link Avg Speed (Miles/Hr)	Pollutant	Emission Factor (Grams/veh-mi)
5	0.098	17	5	CO	2.976
5	0.098	20	5	CO	2.976

APPENDIX C – NOISE APPENDIX

APPENDIX C
NOISE

70 LEO BIRMINGHAM PARKWAY
PROJECT NOTIFICATION FORM

Page **Contents**

FIGURE 1
Sound Monitoring & Modeling Locations
70 Leo Birmingham Street
Brighton, MA

tech environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Cadna Noise Modeling Results

City of Boston Noise Ordinance Analysis

Name	ID	Level Lr	Octave Band Day										Height	Coordinates		
		Day	Night	31	63	125	250	500	1000	2000	4000	8000		X	Y	Z
		(dBA)	(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(m)	(m)	(m)	(m)
10 Lincoln St	Receptor	40.5	40.5	55.1	54.1	49.4	42.6	37.8	33.4	27.1	19.8	14.6	8	229093.6	900993.32	19.88
14 Lincoln St	Receptor	41.4	41.4	54.7	54	49.4	43	38.7	35.1	29.5	22.5	16	8	229103.51	900992.02	19.89
16 Lincoln St	Receptor	40.6	40.6	51.6	51.1	46.9	41.3	37.9	35.1	30.7	24.4	17.6	8	229116.36	900989.63	19.88
11 Lothrop St	Receptor	33.2	33.2	38.8	38.9	35.6	32.2	30.9	28.9	24.1	15.4	0.9	7	229201.2	901138.06	19.15
37 Portsmouth St	Receptor	31.5	31.5	37.9	37.8	34.2	30.8	29.3	27.2	22.1	12.6	-5.2	8	229281.21	901078.38	19.51
20 Lincoln St	Receptor	41.3	41.3	50.5	50.2	46.4	41.4	38.8	36.3	31.4	24.7	17.8	10	229126.86	900987.04	21.87
7 Lothrop St	Receptor	33.7	33.7	39.6	39.6	36.2	32.8	31.3	29.4	24.5	16	2.7	5	229183.86	901136.06	16.83

MassDEP Noise Policy Analysis

	Nighttime					
	Name	**ID**	**Project Level (dBA)**	**Background Level (dBA)**	**Total New Level (dBA)**	**Increase Over Existing (dBA)**
R1	10 Lincoln St	Top_Floor	40.5	59.8	59.9	0.1
R2	14 Lincoln St	Top_Floor	41.4	59.8	59.9	0.1
R3	16 Lincoln St	Top_Floor	40.6	59.8	59.9	0.1
R4	11 Lothrop St	Top_Floor	33.2	53.1	53.1	0.0
R5	37 Portsmouth St	Top_Floor	31.5	50.5	50.6	0.1
R6	20 Lincoln St	Top_Floor	41.3	59.8	59.9	0.1
R7	7 Lothrop St	Top_Floor	33.7	59.8	59.8	0.0
	Daytime					
	Name	**ID**	**Project Level (dBA)**	**Background Level (dBA)**	**Total New Level (dBA)**	**Increase Over Existing (dBA)**
R1	10 Lincoln St	Top_Floor	37	53.6	53.7	0.1
R2	14 Lincoln St	Top_Floor	36.1	53.6	53.7	0.1
R3	16 Lincoln St	Top_Floor	34.7	53.6	53.7	0.1
R4	20 Lincoln St	Top_Floor	34.9	53.6	53.7	0.1
R5	20 Lincoln St	Top_Floor	34.2	53.6	53.6	0.0
R6	7 Lothrop St	Top_Floor	34.9	53.6	53.7	0.1
R7	11 Lothrop St	Top_Floor	33.1	53.6	53.6	0.0
R8	21 Lothrop St	Top_Floor	31.3	53.6	53.6	0.0
R9	27 Lothrop St	Top_Floor	31.4	48.5	48.6	0.1
R10	33 Lothrop St	Top_Floor	30.1	48.5	48.6	0.1
R11	20 Lincoln St	Top_Floor	29.8	42.6	42.8	0.2
R12	20 Lincoln St	Top_Floor	29	42.6	42.8	0.2
R13	25 Portsmouth St	Top_Floor	30.2	42.6	42.8	0.2
R14	421 River St	Top_Floor	31.6	53.6	53.6	0.0
R15	449 River St	Top_Floor	38.3	53.6	53.7	0.1

APPENDIX D – TRANSPORTATION APPENDIX

Vehicle, Pedestrian, and Bicycle

Counts Trip Generation

- Existing Trip Generation
- Proposed Trip Generation

Synchro Intersection Level of Service Reports

- Existing (2017) Condition
- No-Build (2024) Condition

Vehicle, Pedestrian, and Bicycle Counts

Accurate Counts

978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Trucks

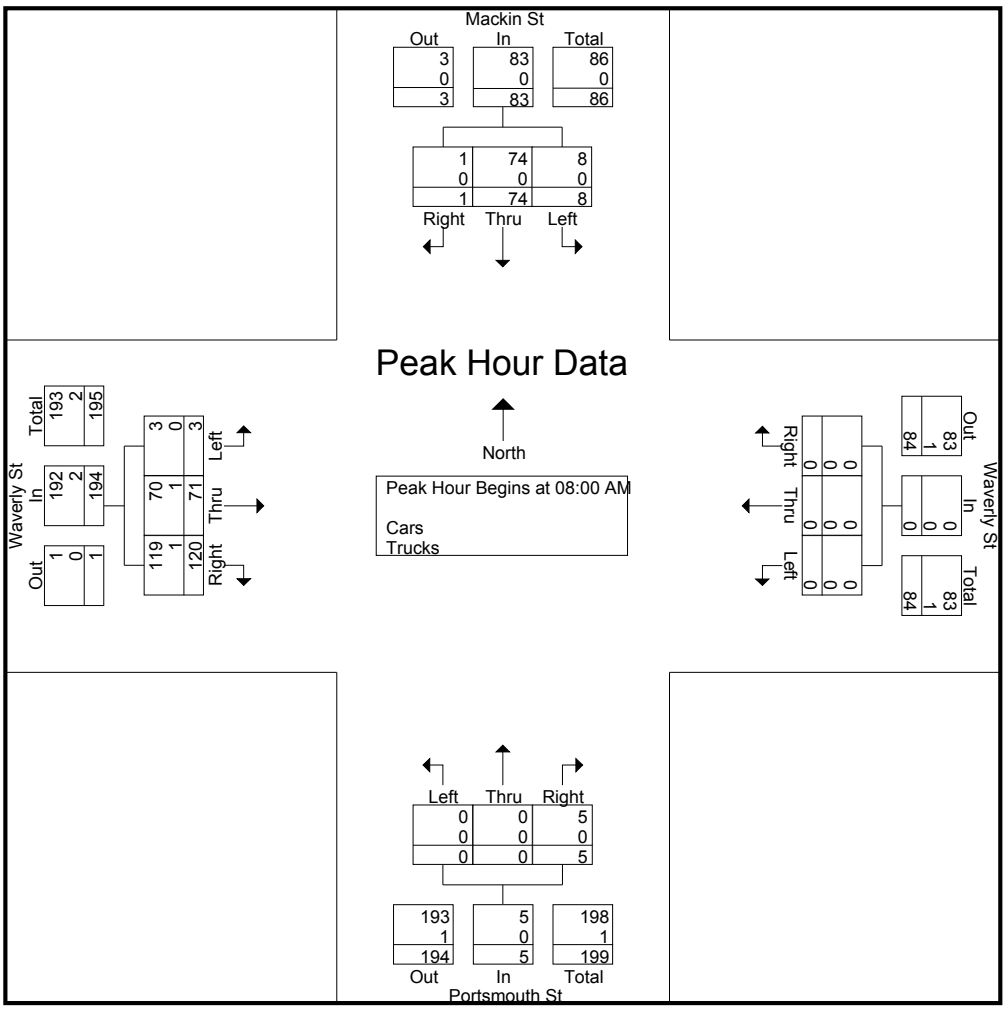
	Mackin St From North			Waverly St From East			Portsmouth St From South			Waverly St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	1	3	0	0	0	0	0	0	1	0	9	6	20
07:15 AM	3	11	0	0	0	0	0	0	1	0	5	16	36
07:30 AM	1	7	0	0	0	0	0	0	0	0	13	9	30
07:45 AM	4	7	0	0	0	0	0	0	0	0	13	29	53
Total	9	28	0	0	0	0	0	0	2	0	40	60	139
08:00 AM	2	14	0	0	0	0	0	0	2	0	21	25	64
08:15 AM	1	16	0	0	0	0	0	0	2	0	18	31	68
08:30 AM	2	21	0	0	0	0	0	0	0	2	17	30	72
08:45 AM	3	23	1	0	0	0	0	0	1	1	15	34	78
Total	8	74	1	0	0	0	0	0	5	3	71	120	282
Grand Total	17	102	1	0	0	0	0	0	7	3	111	180	421
Apprch %	14.2	85	0.8	0	0	0	0	0	100	1	37.8	61.2	
Total %	4	24.2	0.2	0	0	0	0	0	1.7	0.7	26.4	42.8	
Cars	17	98	1	0	0	0	0	0	7	3	110	177	413
% Cars	100	96.1	100	0	0	0	0	0	100	100	99.1	98.3	98.1
Trucks	0	4	0	0	0	0	0	0	0	0	1	3	8
% Trucks	0	3.9	0	0	0	0	0	0	0	0	0.9	1.7	1.9

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	2	14	0	16	0	0	0	0	0	0	2	2	0	21	25	46	64
08:15 AM	1	16	0	17	0	0	0	0	0	0	2	2	0	18	31	49	68
08:30 AM	2	21	0	23	0	0	0	0	0	0	0	0	2	17	30	49	72
08:45 AM	3	23	1	27	0	0	0	0	0	0	1	1	1	15	34	50	78
Total Volume	8	74	1	83	0	0	0	0	0	0	5	5	3	71	120	194	282
% App. Total	9.6	89.2	1.2		0	0	0		0	0	100		1.5	36.6	61.9		
PHF	.667	.804	.250	.769	.000	.000	.000	.000	.000	.000	.625	.625	.375	.845	.882	.970	.904
Cars	8	74	1	83	0	0	0	0	0	0	5	5	3	70	119	192	280
% Cars	100	100	100	100	0	0	0	0	0	0	100	100	100	98.6	99.2	99.0	99.3
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	0.8	1.0	0.7

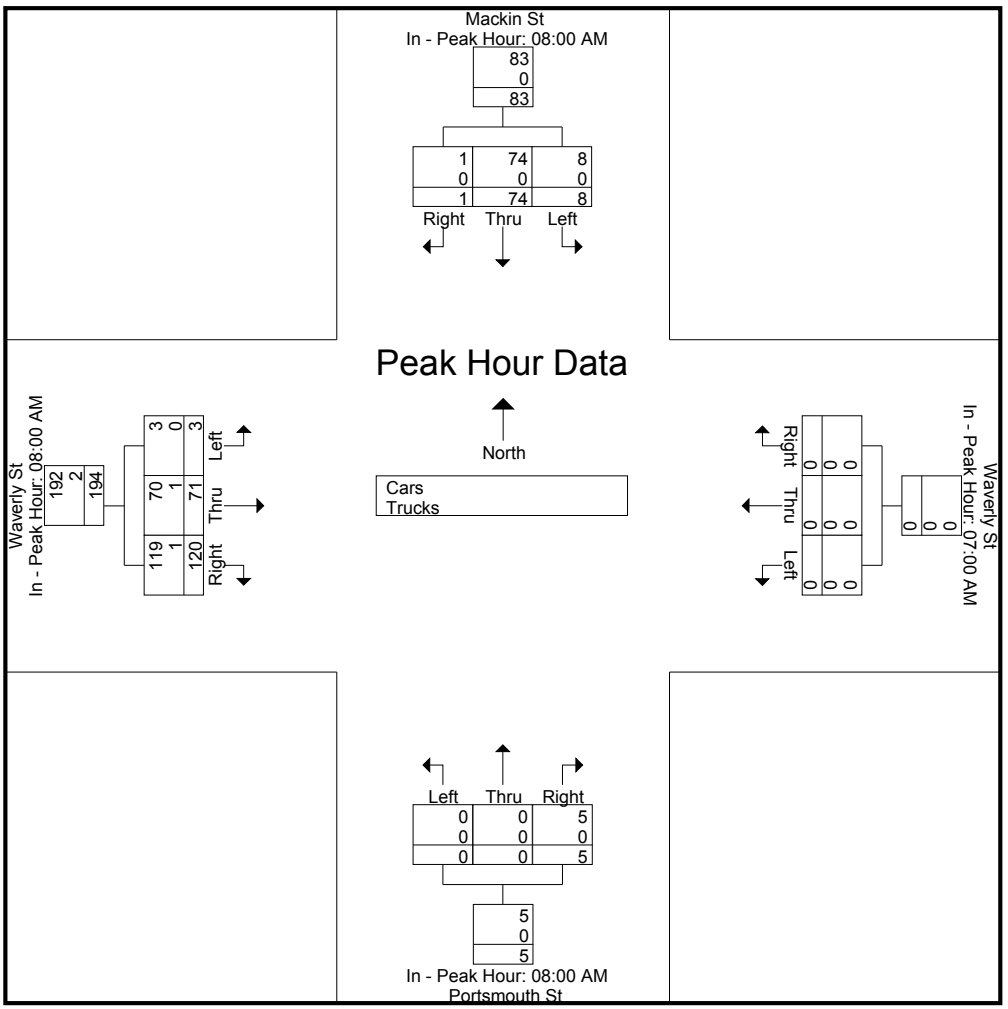


Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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 Each Approach Begins at:																	
	08:00 AM				07:00 AM				08:00 AM				08:00 AM				
+0 mins.	2	14	0	16	0	0	0	0	0	0	2	2	0	21	25	46	
+15 mins.	1	16	0	17	0	0	0	0	0	0	2	2	0	18	31	49	
+30 mins.	2	21	0	23	0	0	0	0	0	0	0	0	2	17	30	49	
+45 mins.	3	23	1	27	0	0	0	0	0	0	1	1	1	15	34	50	
Total Volume	8	74	1	83	0	0	0	0	0	0	5	5	3	71	120	194	
% App. Total	9.6	89.2	1.2		0	0	0		0	0	100		1.5	36.6	61.9		
PHF	.667	.804	.250	.769	.000	.000	.000	.000	.000	.000	.625	.625	.375	.845	.882	.970	
Cars	8	74	1	83	0	0	0	0	0	0	5	5	3	70	119	192	
% Cars	100	100	100	100	0	0	0	0	0	0	100	100	100	98.6	99.2	99	
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	0.8	1	



Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

Groups Printed- Cars

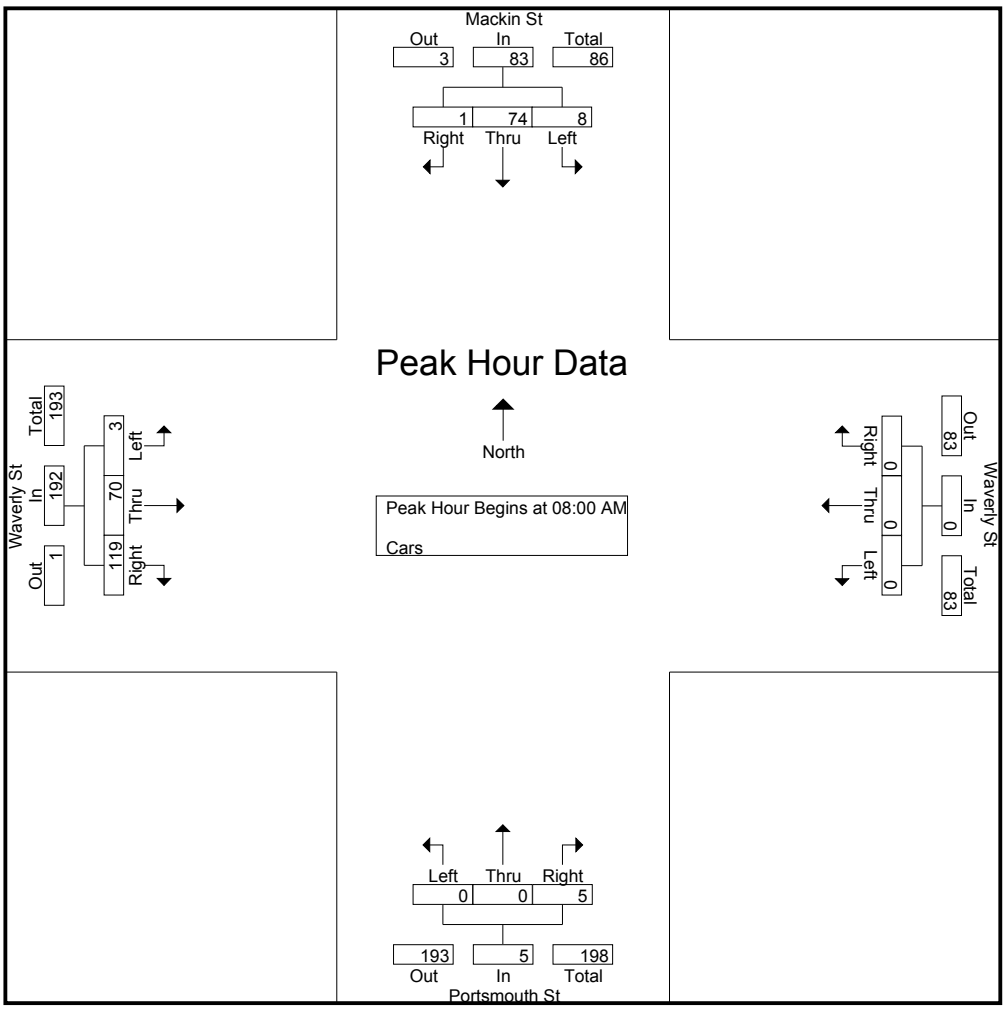
	Mackin St From North			Waverly St From East			Portsmouth St From South			Waverly St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	1	2	0	0	0	0	0	0	1	0	9	6	19
07:15 AM	3	8	0	0	0	0	0	0	1	0	5	15	32
07:30 AM	1	7	0	0	0	0	0	0	0	0	13	9	30
07:45 AM	4	7	0	0	0	0	0	0	0	0	13	28	52
Total	9	24	0	0	0	0	0	0	2	0	40	58	133
08:00 AM	2	14	0	0	0	0	0	0	2	0	21	25	64
08:15 AM	1	16	0	0	0	0	0	0	2	0	18	31	68
08:30 AM	2	21	0	0	0	0	0	0	0	2	16	29	70
08:45 AM	3	23	1	0	0	0	0	0	1	1	15	34	78
Total	8	74	1	0	0	0	0	0	5	3	70	119	280
Grand Total	17	98	1	0	0	0	0	0	7	3	110	177	413
Apprch %	14.7	84.5	0.9	0	0	0	0	0	100	1	37.9	61	
Total %	4.1	23.7	0.2	0	0	0	0	0	1.7	0.7	26.6	42.9	

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	2	14	0	16	0	0	0	0	0	0	2	2	0	21	25	46	64
08:15 AM	1	16	0	17	0	0	0	0	0	0	2	2	0	18	31	49	68
08:30 AM	2	21	0	23	0	0	0	0	0	0	0	0	2	16	29	47	70
08:45 AM	3	23	1	27	0	0	0	0	0	0	1	1	1	15	34	50	78
Total Volume	8	74	1	83	0	0	0	0	0	0	5	5	3	70	119	192	280
% App. Total	9.6	89.2	1.2		0	0	0		0	0	100		1.6	36.5	62		
PHF	.667	.804	.250	.769	.000	.000	.000	.000	.000	.000	.625	.625	.375	.833	.875	.960	.897



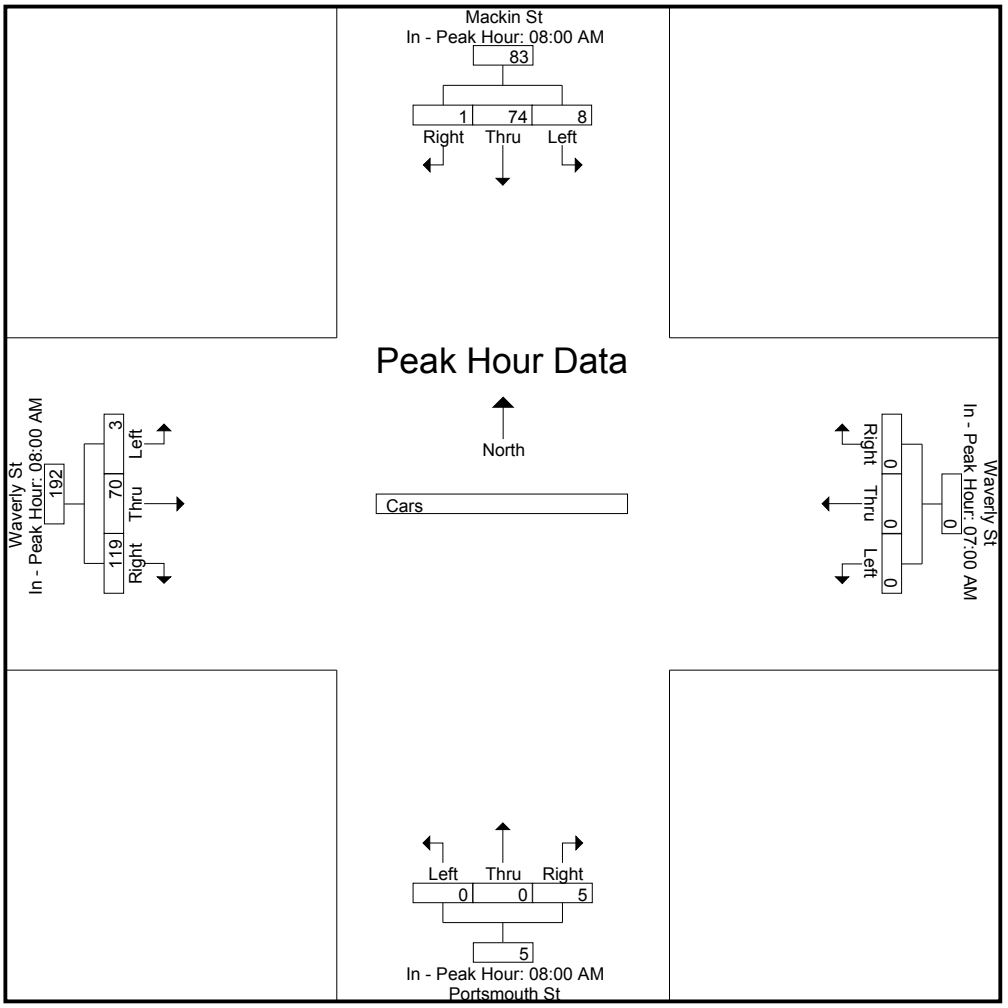
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				08:00 AM				08:00 AM			
+0 mins.	2	14	0	16	0	0	0	0	0	0	2	2	0	21	25	46
+15 mins.	1	16	0	17	0	0	0	0	0	0	2	2	0	18	31	49
+30 mins.	2	21	0	23	0	0	0	0	0	0	0	0	2	16	29	47
+45 mins.	3	23	1	27	0	0	0	0	0	0	1	1	1	15	34	50
Total Volume	8	74	1	83	0	0	0	0	0	0	5	5	3	70	119	192
% App. Total	9.6	89.2	1.2		0	0	0		0	0	100		1.6	36.5	62	
PHF	.667	.804	.250	.769	.000	.000	.000	.000	.000	.000	.625	.625	.375	.833	.875	.960

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

Groups Printed- Trucks

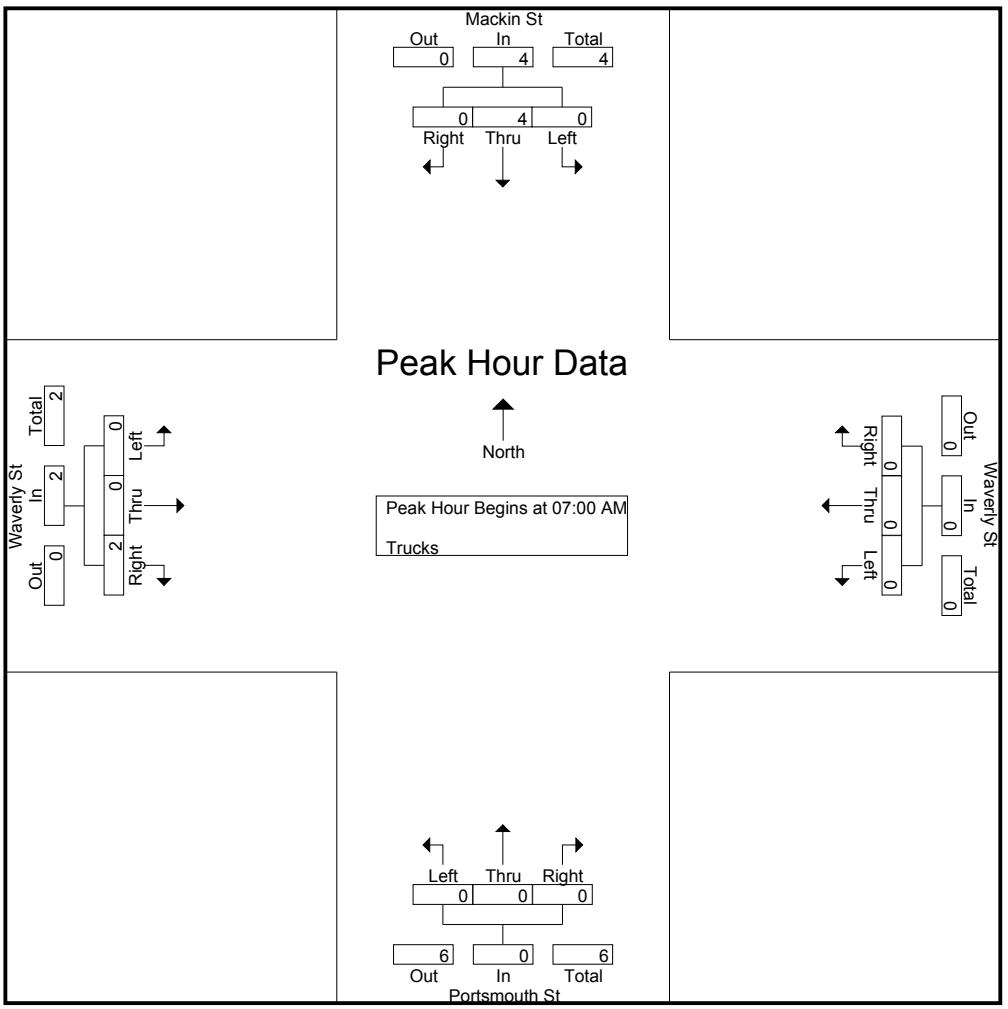
	Mackin St From North			Waverly St From East			Portsmouth St From South			Waverly St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	3	0	0	0	0	0	0	0	0	0	1	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	4	0	0	0	0	0	0	0	0	0	2	6
08:00 AM	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
08:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	1	2
Grand Total	0	4	0	0	0	0	0	0	0	0	1	3	8
Apprch %	0	100	0	0	0	0	0	0	0	0	25	75	
Total %	0	50	0	0	0	0	0	0	0	0	12.5	37.5	

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1	1	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	4	0	4	0	0	0	0	0	0	0	0	0	0	2	2	6
% App. Total	0	100	0		0	0	0		0	0	0		0	0	100		
PHF	.000	.333	.000	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.375



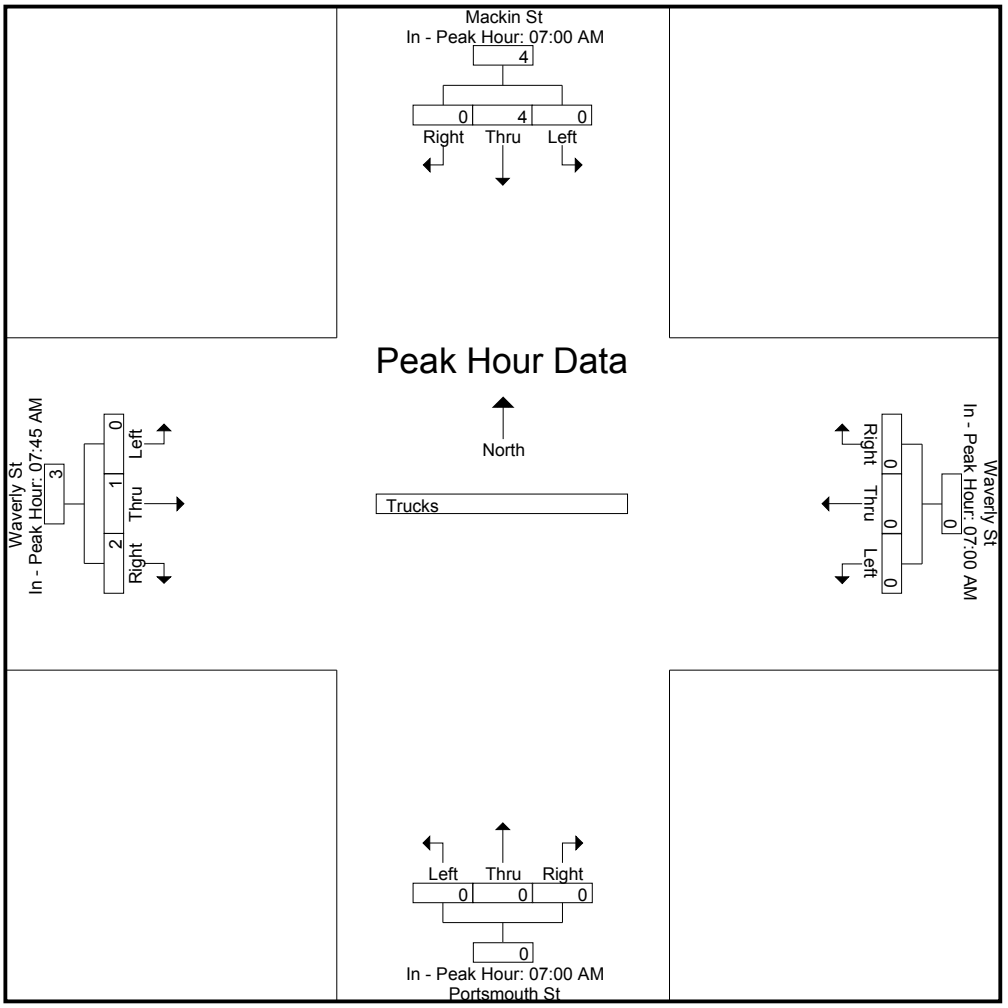
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1
+15 mins.	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Total Volume	0	4	0	4	0	0	0	0	0	0	0	0	0	1	2	3
% App. Total	0	100	0		0	0	0		0	0	0		0	33.3	66.7	
PHF	.000	.333	.000	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.500	.375

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

Groups Printed- Bikes Peds

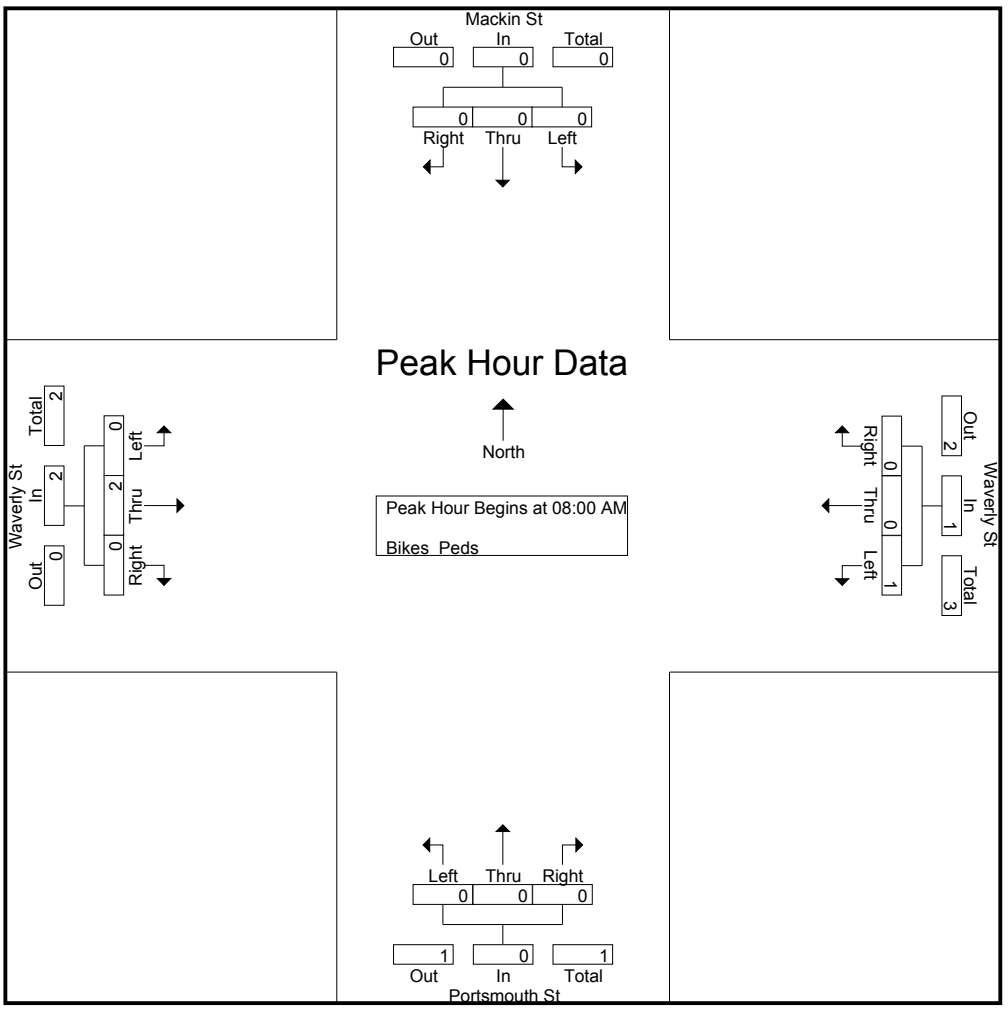
	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	3	1	4
07:15 AM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3	0	3
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	2	1	3
07:45 AM	0	0	0	2	0	0	0	6	0	0	0	1	0	0	0	1	10	0	10
Total	0	0	0	2	0	0	0	12	0	0	0	2	0	2	0	2	18	2	20
08:00 AM	0	0	0	0	0	0	0	7	0	0	0	0	0	1	0	0	7	1	8
08:15 AM	0	0	0	0	0	0	0	5	0	0	0	1	0	0	0	0	6	0	6
08:30 AM	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	1	3	1	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	5	1	6
Total	0	0	0	0	1	0	0	14	0	0	0	3	0	2	0	4	21	3	24
Grand Total	0	0	0	2	1	0	0	26	0	0	0	5	0	4	0	6	39	5	44
Apprch %	0	0	0		100	0	0		0	0	0		0	100	0				
Total %	0	0	0		20	0	0		0	0	0		0	80	0		88.6	11.4	

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	1	0	1	1
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	1	0	0	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2	3
% App. Total	0	0	0		100	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.750



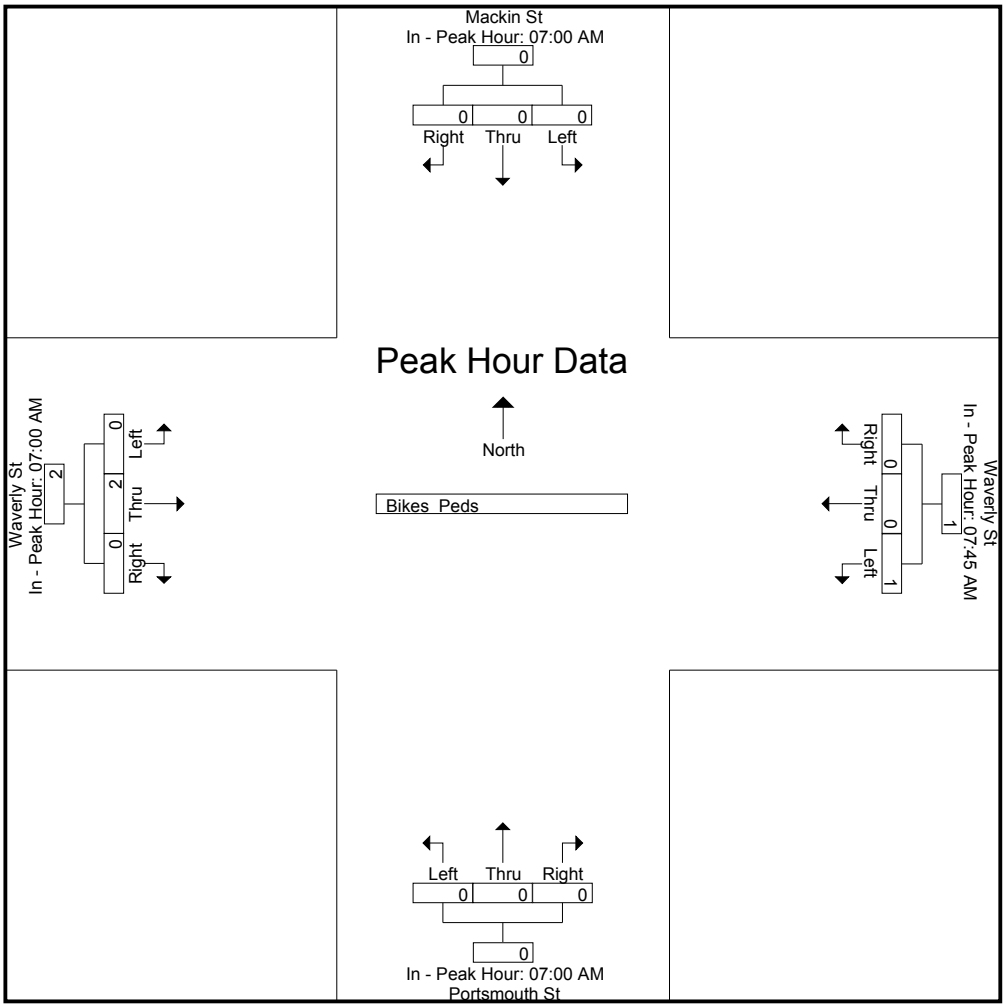
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:45 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	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
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2
% App. Total	0	0	0		100	0	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Trucks

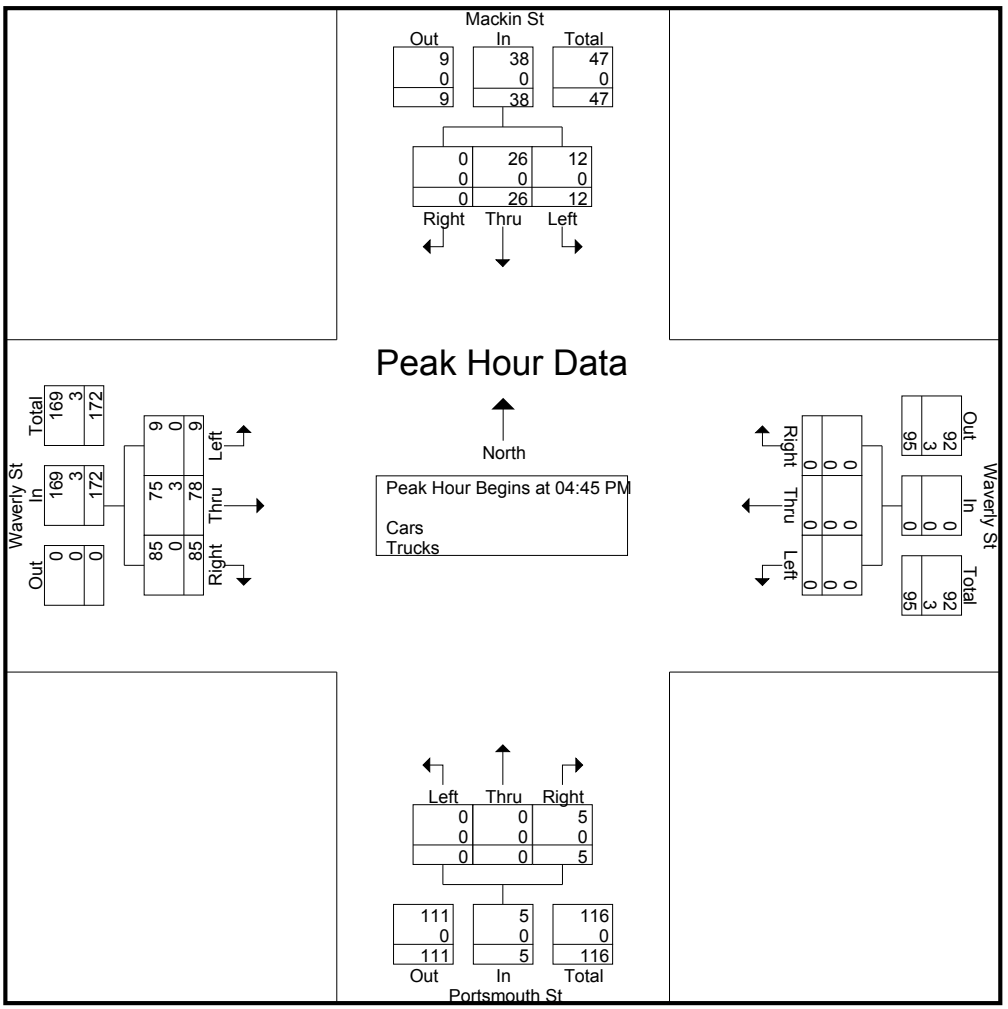
	Mackin St From North			Waverly St From East			Portsmouth St From South			Waverly St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	10	0	0	0	0	0	0	2	2	17	10	43
04:15 PM	4	8	0	0	0	0	0	0	4	2	20	19	57
04:30 PM	2	5	0	0	0	0	0	0	0	0	17	21	45
04:45 PM	5	4	0	0	0	0	0	0	1	2	23	17	52
Total	13	27	0	0	0	0	0	0	7	6	77	67	197
05:00 PM	3	6	0	0	0	0	0	0	2	4	22	21	58
05:15 PM	2	7	0	0	0	0	0	0	0	3	17	15	44
05:30 PM	2	9	0	0	0	0	0	0	2	0	16	32	61
05:45 PM	2	8	0	0	0	0	0	0	2	1	12	10	35
Total	9	30	0	0	0	0	0	0	6	8	67	78	198
Grand Total	22	57	0	0	0	0	0	0	13	14	144	145	395
Apprch %	27.8	72.2	0	0	0	0	0	0	100	4.6	47.5	47.9	
Total %	5.6	14.4	0	0	0	0	0	0	3.3	3.5	36.5	36.7	
Cars	22	57	0	0	0	0	0	0	12	14	140	144	389
% Cars	100	100	0	0	0	0	0	0	92.3	100	97.2	99.3	98.5
Trucks	0	0	0	0	0	0	0	0	1	0	4	1	6
% Trucks	0	0	0	0	0	0	0	0	7.7	0	2.8	0.7	1.5

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 2

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	5	4	0	9	0	0	0	0	0	0	1	1	2	23	17	42	52
05:00 PM	3	6	0	9	0	0	0	0	0	0	2	2	4	22	21	47	58
05:15 PM	2	7	0	9	0	0	0	0	0	0	0	0	3	17	15	35	44
05:30 PM	2	9	0	11	0	0	0	0	0	0	2	2	0	16	32	48	61
Total Volume	12	26	0	38	0	0	0	0	0	0	5	5	9	78	85	172	215
% App. Total	31.6	68.4	0		0	0	0		0	0	100		5.2	45.3	49.4		
PHF	.600	.722	.000	.864	.000	.000	.000	.000	.000	.000	.625	.625	.563	.848	.664	.896	.881
Cars	12	26	0	38	0	0	0	0	0	0	5	5	9	75	85	169	212
% Cars	100	100	0	100	0	0	0	0	0	0	100	100	100	96.2	100	98.3	98.6
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8	0	1.7	1.4

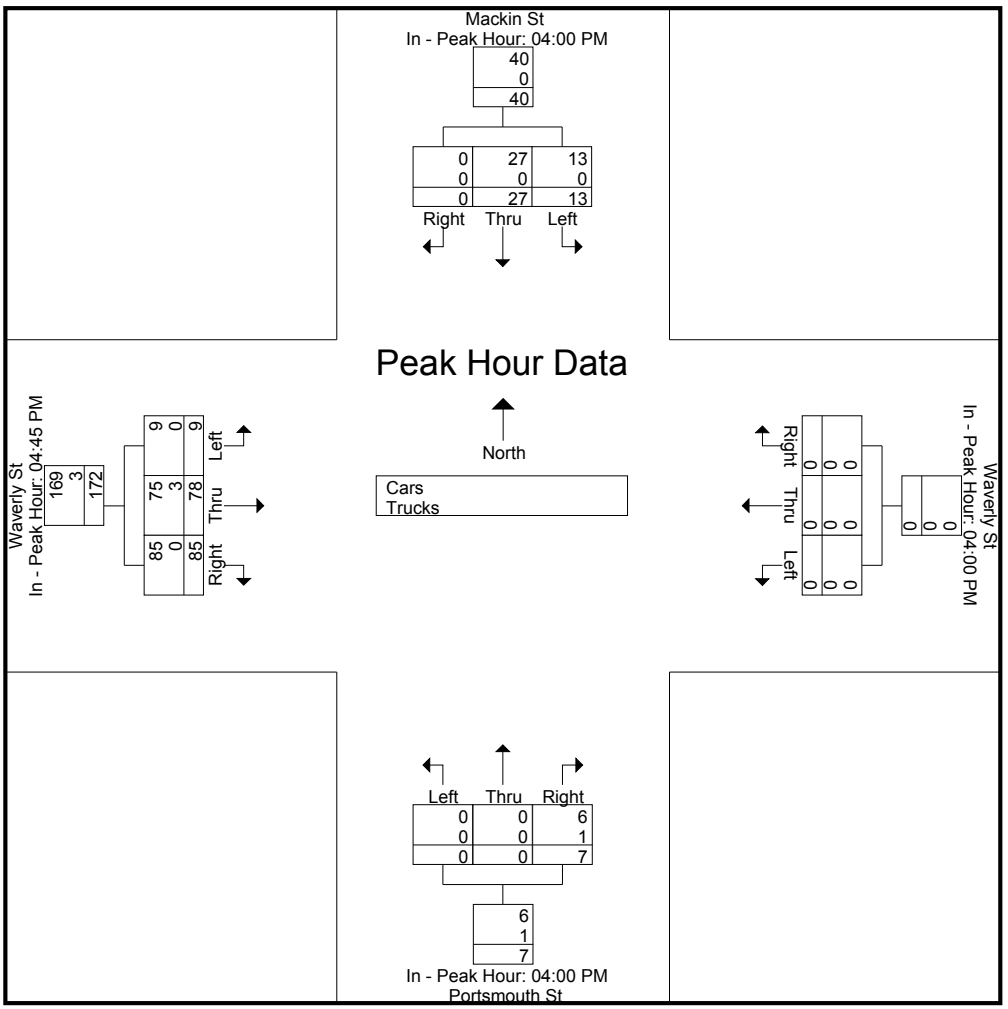


Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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 Each Approach Begins at:																	
	04:00 PM				04:00 PM				04:00 PM				04:45 PM				
+0 mins.	2	10	0	12	0	0	0	0	0	0	2	2	2	23	17	42	
+15 mins.	4	8	0	12	0	0	0	0	0	0	4	4	4	22	21	47	
+30 mins.	2	5	0	7	0	0	0	0	0	0	0	0	3	17	15	35	
+45 mins.	5	4	0	9	0	0	0	0	0	0	1	1	0	16	32	48	
Total Volume	13	27	0	40	0	0	0	0	0	0	7	7	9	78	85	172	
% App. Total	32.5	67.5	0		0	0	0		0	0	100		5.2	45.3	49.4		
PHF	.650	.675	.000	.833	.000	.000	.000	.000	.000	.000	.438	.438	.563	.848	.664	.896	
Cars	13	27	0	40	0	0	0	0	0	0	6	6	9	75	85	169	
% Cars	100	100	0	100	0	0	0	0	0	0	85.7	85.7	100	96.2	100	98.3	
Trucks	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0	3	
% Trucks	0	0	0	0	0	0	0	0	0	0	14.3	14.3	0	3.8	0	1.7	



Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 4

Groups Printed- Cars

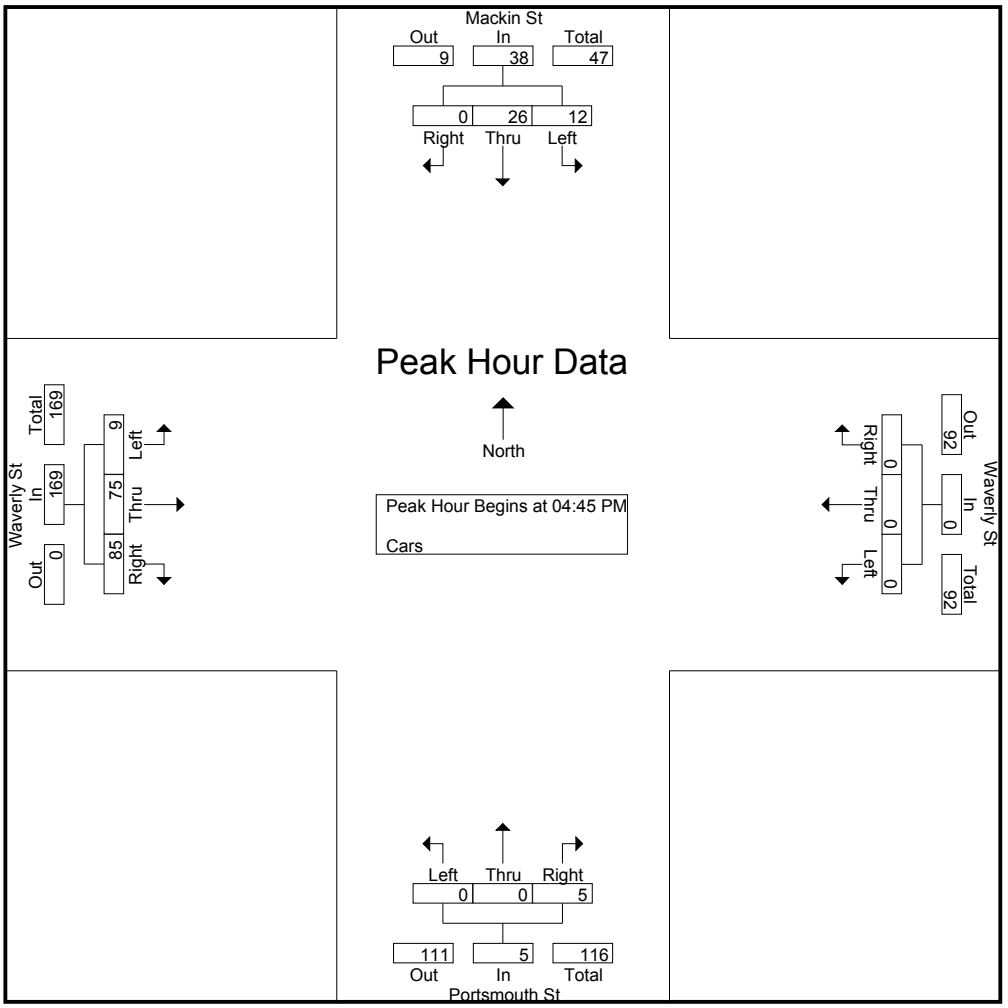
	Mackin St From North			Waverly St From East			Portsmouth St From South			Waverly St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	10	0	0	0	0	0	0	2	2	17	10	43
04:15 PM	4	8	0	0	0	0	0	0	3	2	19	18	54
04:30 PM	2	5	0	0	0	0	0	0	0	0	17	21	45
04:45 PM	5	4	0	0	0	0	0	0	1	2	20	17	49
Total	13	27	0	0	0	0	0	0	6	6	73	66	191
05:00 PM	3	6	0	0	0	0	0	0	2	4	22	21	58
05:15 PM	2	7	0	0	0	0	0	0	0	3	17	15	44
05:30 PM	2	9	0	0	0	0	0	0	2	0	16	32	61
05:45 PM	2	8	0	0	0	0	0	0	2	1	12	10	35
Total	9	30	0	0	0	0	0	0	6	8	67	78	198
Grand Total	22	57	0	0	0	0	0	0	12	14	140	144	389
Apprch %	27.8	72.2	0	0	0	0	0	0	100	4.7	47	48.3	
Total %	5.7	14.7	0	0	0	0	0	0	3.1	3.6	36	37	

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	5	4	0	9	0	0	0	0	0	0	1	1	2	20	17	39	49
05:00 PM	3	6	0	9	0	0	0	0	0	0	2	2	4	22	21	47	58
05:15 PM	2	7	0	9	0	0	0	0	0	0	0	0	3	17	15	35	44
05:30 PM	2	9	0	11	0	0	0	0	0	0	2	2	0	16	32	48	61
Total Volume	12	26	0	38	0	0	0	0	0	0	5	5	9	75	85	169	212
% App. Total	31.6	68.4	0		0	0	0		0	0	100		5.3	44.4	50.3		
PHF	.600	.722	.000	.864	.000	.000	.000	.000	.000	.000	.625	.625	.563	.852	.664	.880	.869



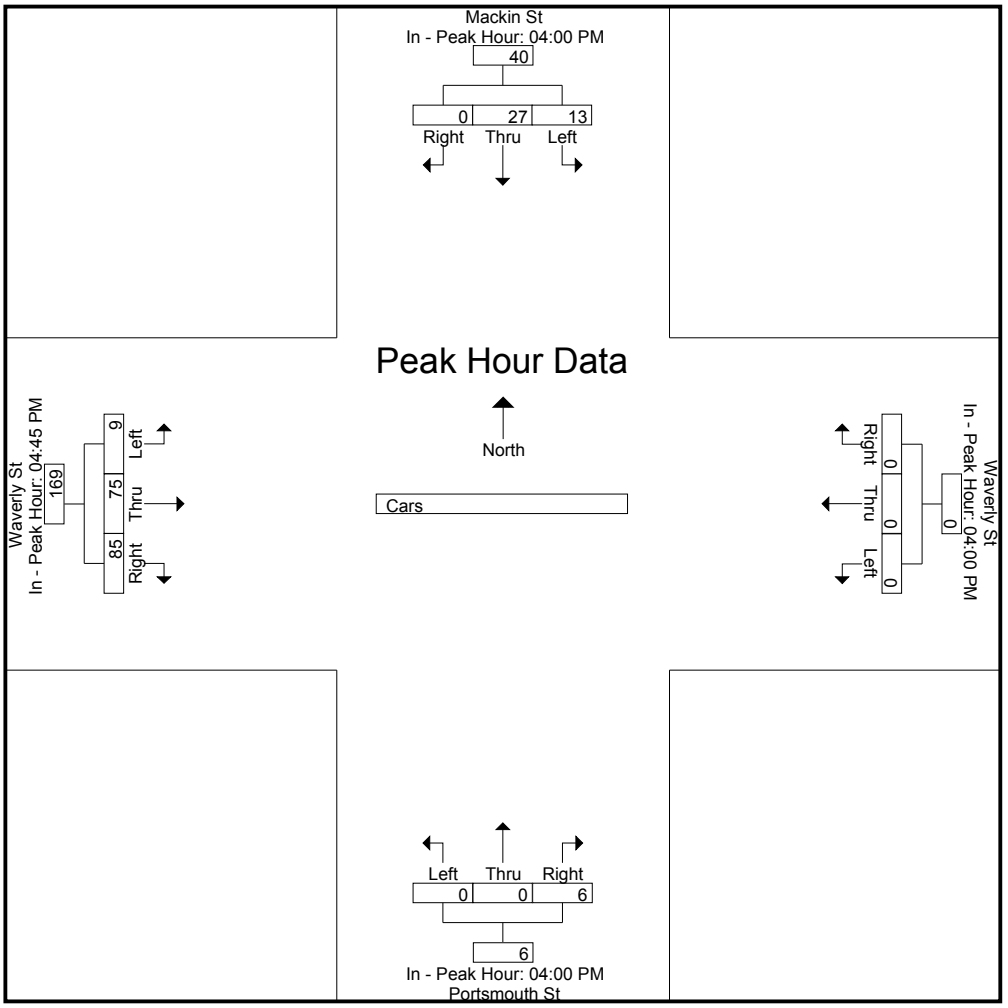
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	2	10	0	12	0	0	0	0	0	0	2	2	2	20	17	39
+15 mins.	4	8	0	12	0	0	0	0	0	0	3	3	4	22	21	47
+30 mins.	2	5	0	7	0	0	0	0	0	0	0	0	3	17	15	35
+45 mins.	5	4	0	9	0	0	0	0	0	0	1	1	0	16	32	48
Total Volume	13	27	0	40	0	0	0	0	0	0	6	6	9	75	85	169
% App. Total	32.5	67.5	0		0	0	0		0	0	100		5.3	44.4	50.3	
PHF	.650	.675	.000	.833	.000	.000	.000	.000	.000	.000	.500	.500	.563	.852	.664	.880

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

Groups Printed- Trucks

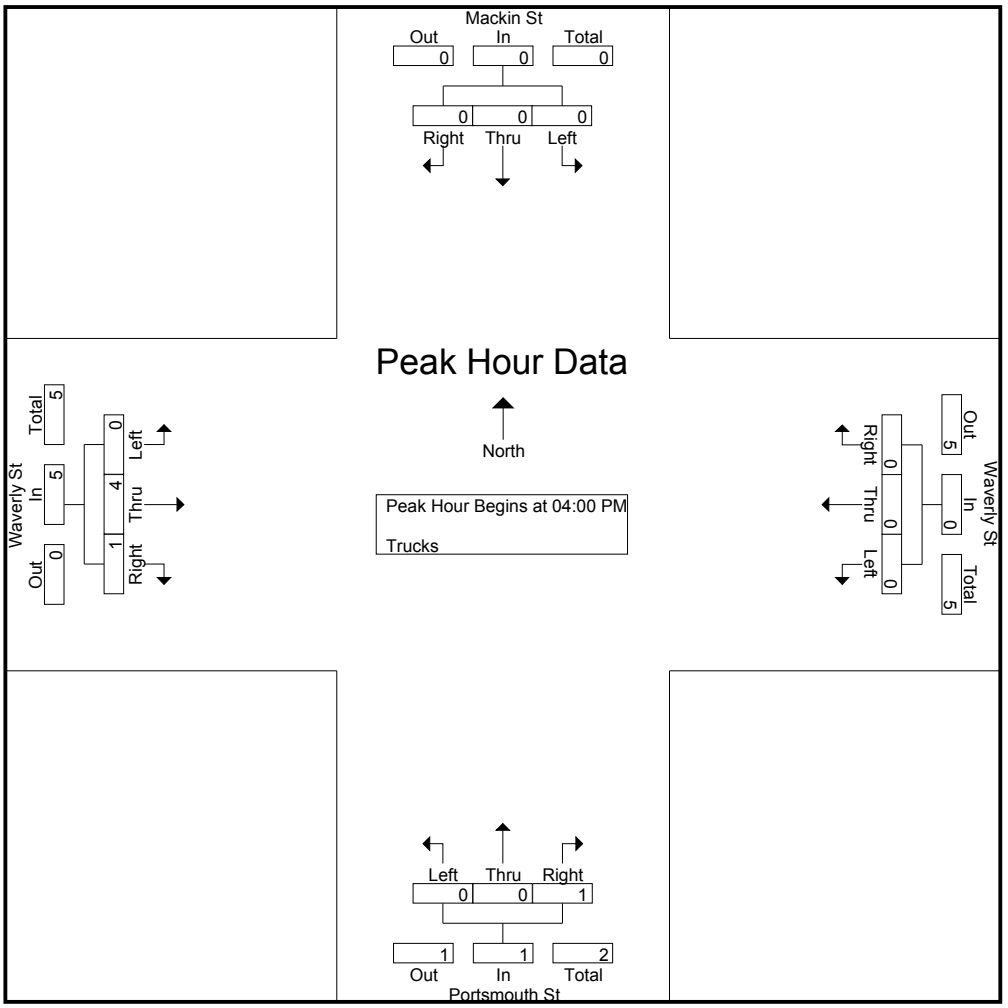
	Mackin St From North			Waverly St From East			Portsmouth St From South			Waverly St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	1	0	1	1	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	3
Total	0	0	0	0	0	0	0	0	1	0	4	1	6
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	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	1	0	4	1	6
Apprch %	0	0	0	0	0	0	0	0	100	0	80	20	
Total %	0	0	0	0	0	0	0	0	16.7	0	66.7	16.7	

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 8

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	2	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	4	1	5	6
% App. Total	0	0	0		0	0	0		0	0	100		0	80	20		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.333	.250	.417	.500



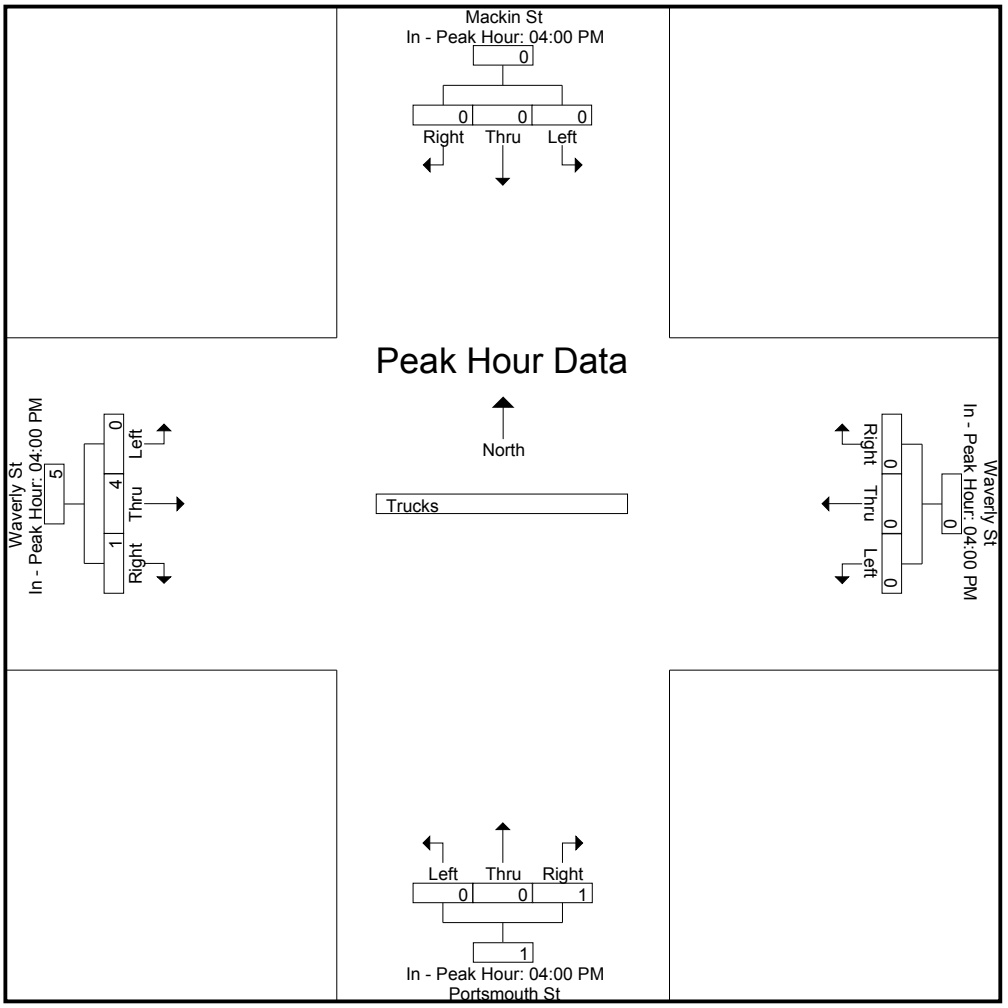
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	2
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	4	1	5
% App. Total	0	0	0		0	0	0		0	0	100		0	80	20	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.333	.250	.417

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

Groups Printed- Bikes Peds

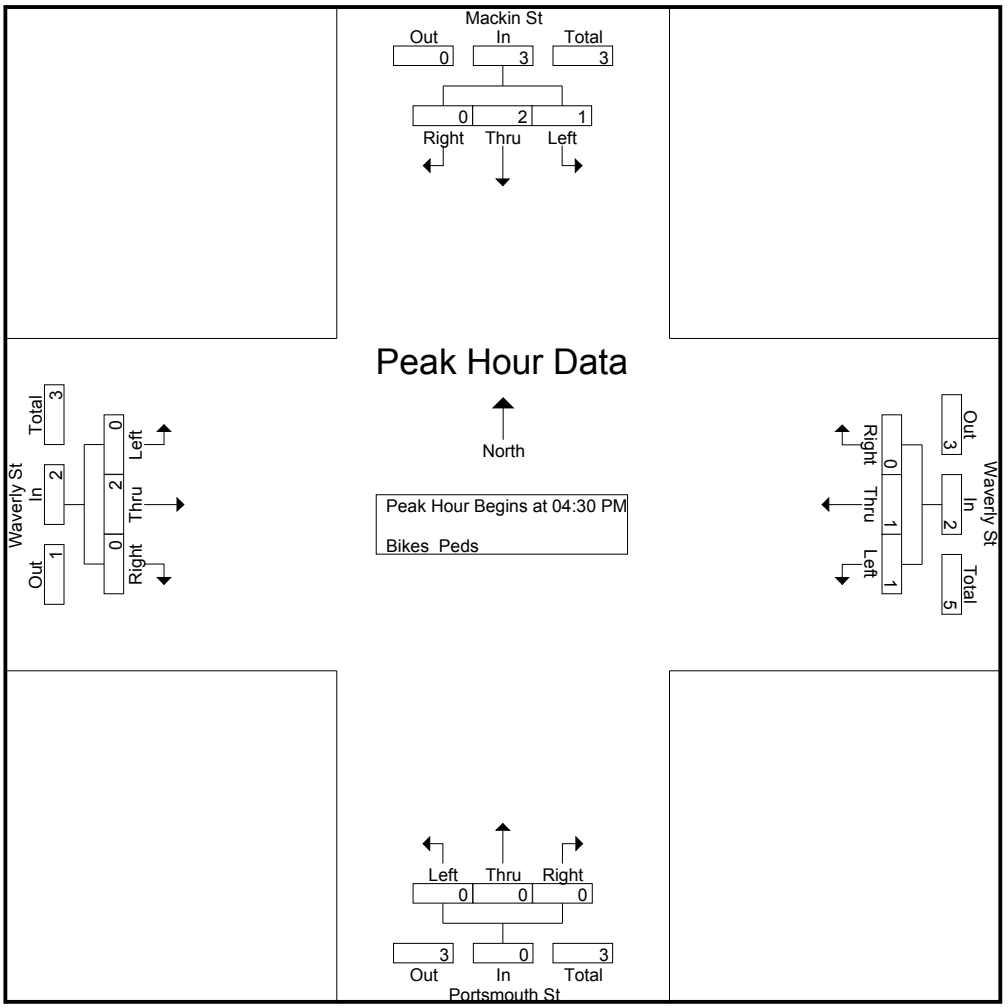
	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4	0	4
04:15 PM	0	0	0	0	0	0	0	5	0	0	0	4	0	0	0	3	12	0	12
04:30 PM	1	0	0	1	0	1	0	4	0	0	0	0	0	0	0	2	7	2	9
04:45 PM	0	1	0	0	0	0	0	3	0	0	0	1	0	0	0	1	5	1	6
Total	1	1	0	1	0	1	0	12	0	0	0	6	0	0	0	9	28	3	31
05:00 PM	0	1	0	0	0	0	0	1	0	0	0	2	0	0	0	1	4	1	5
05:15 PM	0	0	0	1	1	0	0	4	0	0	0	1	0	2	0	1	7	3	10
05:30 PM	0	0	0	1	0	0	0	5	0	0	0	0	0	1	0	2	8	1	9
05:45 PM	2	0	0	1	0	0	0	8	0	0	0	1	0	0	0	1	11	2	13
Total	2	1	0	3	1	0	0	18	0	0	0	4	0	3	0	5	30	7	37
Grand Total	3	2	0	4	1	1	0	30	0	0	0	10	0	3	0	14	58	10	68
Apprch %	60	40	0		50	50	0		0	0	0		0	100	0				
Total %	30	20	0		10	10	0		0	0	0		0	30	0		85.3	14.7	

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015

	Mackin St From North				Waverly St From East				Portsmouth St From South				Waverly 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	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	2	3
Total Volume	1	2	0	3	1	1	0	2	0	0	0	0	0	2	0	2	7
% App. Total	33.3	66.7	0		50	50	0		0	0	0		0	100	0		
PHF	.250	.500	.000	.750	.250	.250	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.583



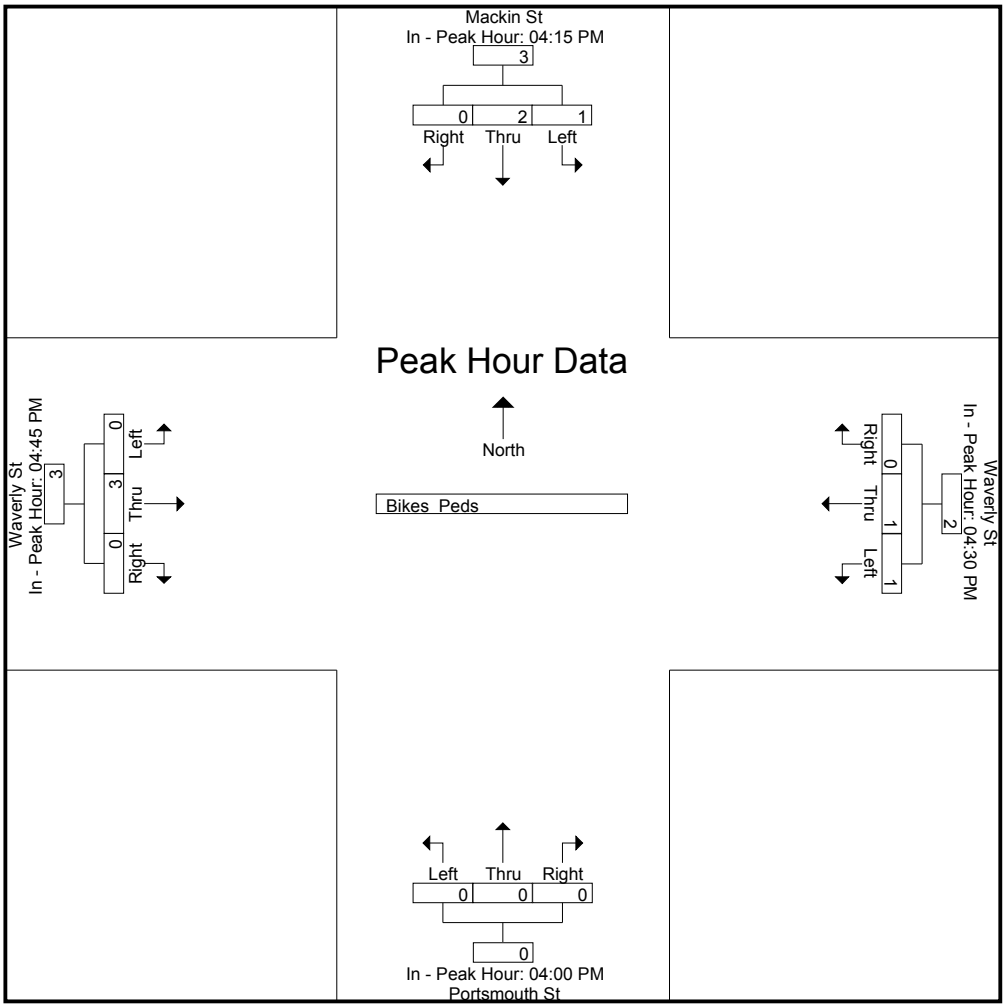
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				04:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+15 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2
+45 mins.	0	1	0	1	1	0	0	1	0	0	0	0	0	1	0	1
Total Volume	1	2	0	3	1	1	0	2	0	0	0	0	0	3	0	3
% App. Total	33.3	66.7	0		50	50	0		0	0	0		0	100	0	
PHF	.250	.500	.000	.750	.250	.250	.000	.500	.000	.000	.000	.000	.000	.375	.000	.375

Accurate Counts
978-664-2565

N/S Street : Mackin St / Portsmouth St
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090002
Site Code : 15090002
Start Date : 9/15/2015
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Cars - Trucks

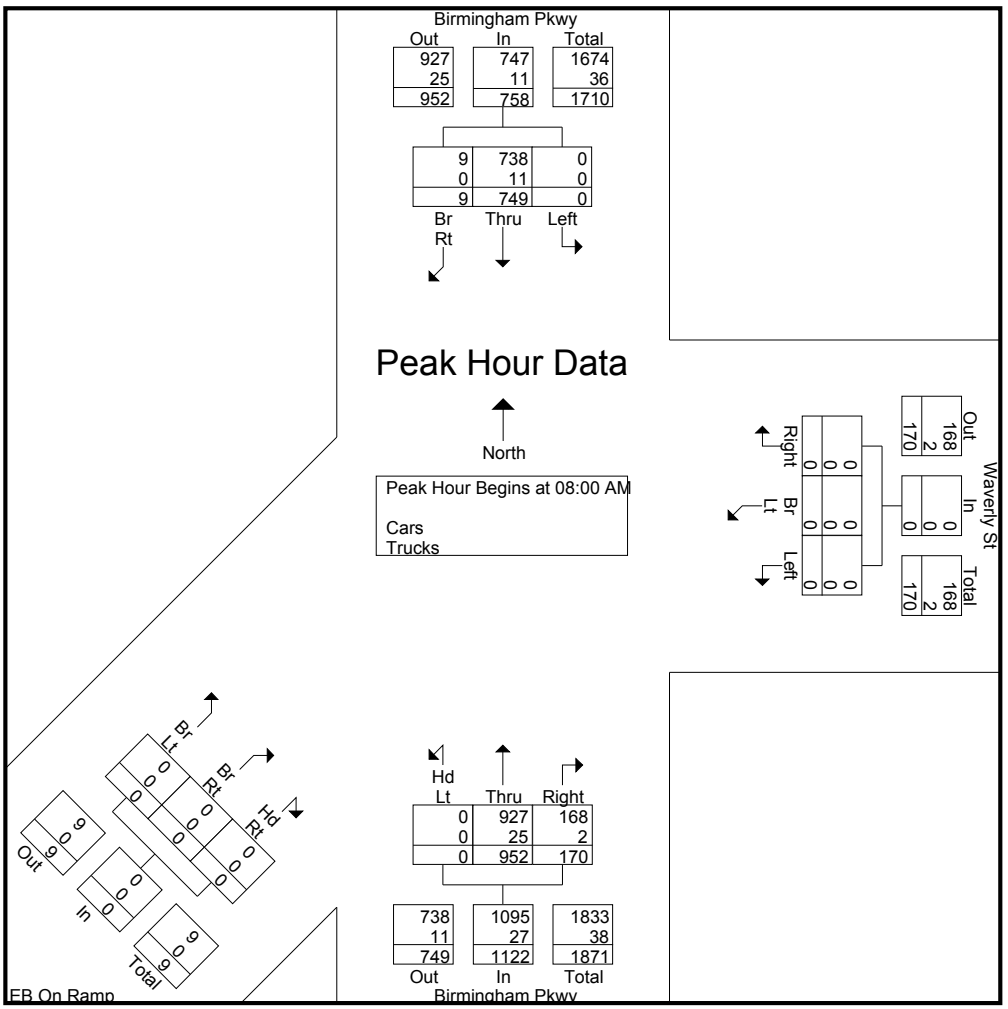
	Birmingham Pkwy From North			Waverly St From East			Birmingham Pkwy From South			EB On Ramp From Southwest			
Start Time	Left	Thru	Br Rt	Left	Br Lt	Right	Hd Lt	Thru	Right	Br Lt	Br Rt	Hd Rt	Int. Total
07:00 AM	0	133	1	0	0	0	0	156	14	0	0	0	304
07:15 AM	0	182	4	0	0	0	0	196	14	0	0	0	396
07:30 AM	0	179	1	0	0	0	0	230	25	0	0	0	435
07:45 AM	0	163	3	0	0	0	0	237	39	0	0	0	442
Total	0	657	9	0	0	0	0	819	92	0	0	0	1577
08:00 AM	0	146	2	0	0	0	0	233	42	0	0	0	423
08:15 AM	0	158	3	0	0	0	0	234	45	0	0	0	440
08:30 AM	0	206	3	0	0	0	0	247	45	0	0	0	501
08:45 AM	0	239	1	0	0	0	0	238	38	0	0	0	516
Total	0	749	9	0	0	0	0	952	170	0	0	0	1880
Grand Total	0	1406	18	0	0	0	0	1771	262	0	0	0	3457
Apprch %	0	98.7	1.3	0	0	0	0	87.1	12.9	0	0	0	
Total %	0	40.7	0.5	0	0	0	0	51.2	7.6	0	0	0	
Cars	0	1378	18	0	0	0	0	1735	258	0	0	0	3389
% Cars	0	98	100	0	0	0	0	98	98.5	0	0	0	98
Trucks	0	28	0	0	0	0	0	36	4	0	0	0	68
% Trucks	0	2	0	0	0	0	0	2	1.5	0	0	0	2

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 2

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	146	2	148	0	0	0	0	0	233	42	275	0	0	0	0	423
08:15 AM	0	158	3	161	0	0	0	0	0	234	45	279	0	0	0	0	440
08:30 AM	0	206	3	209	0	0	0	0	0	247	45	292	0	0	0	0	501
08:45 AM	0	239	1	240	0	0	0	0	0	238	38	276	0	0	0	0	516
Total Volume	0	749	9	758	0	0	0	0	0	952	170	1122	0	0	0	0	1880
% App. Total	0	98.8	1.2		0	0	0		0	84.8	15.2		0	0	0		
PHF	.000	.783	.750	.790	.000	.000	.000	.000	.000	.964	.944	.961	.000	.000	.000	.000	.911
Cars	0	738	9	747	0	0	0	0	0	927	168	1095	0	0	0	0	1842
% Cars	0	98.5	100	98.5	0	0	0	0	0	97.4	98.8	97.6	0	0	0	0	98.0
Trucks	0	11	0	11	0	0	0	0	0	25	2	27	0	0	0	0	38
% Trucks	0	1.5	0	1.5	0	0	0	0	0	2.6	1.2	2.4	0	0	0	0	2.0

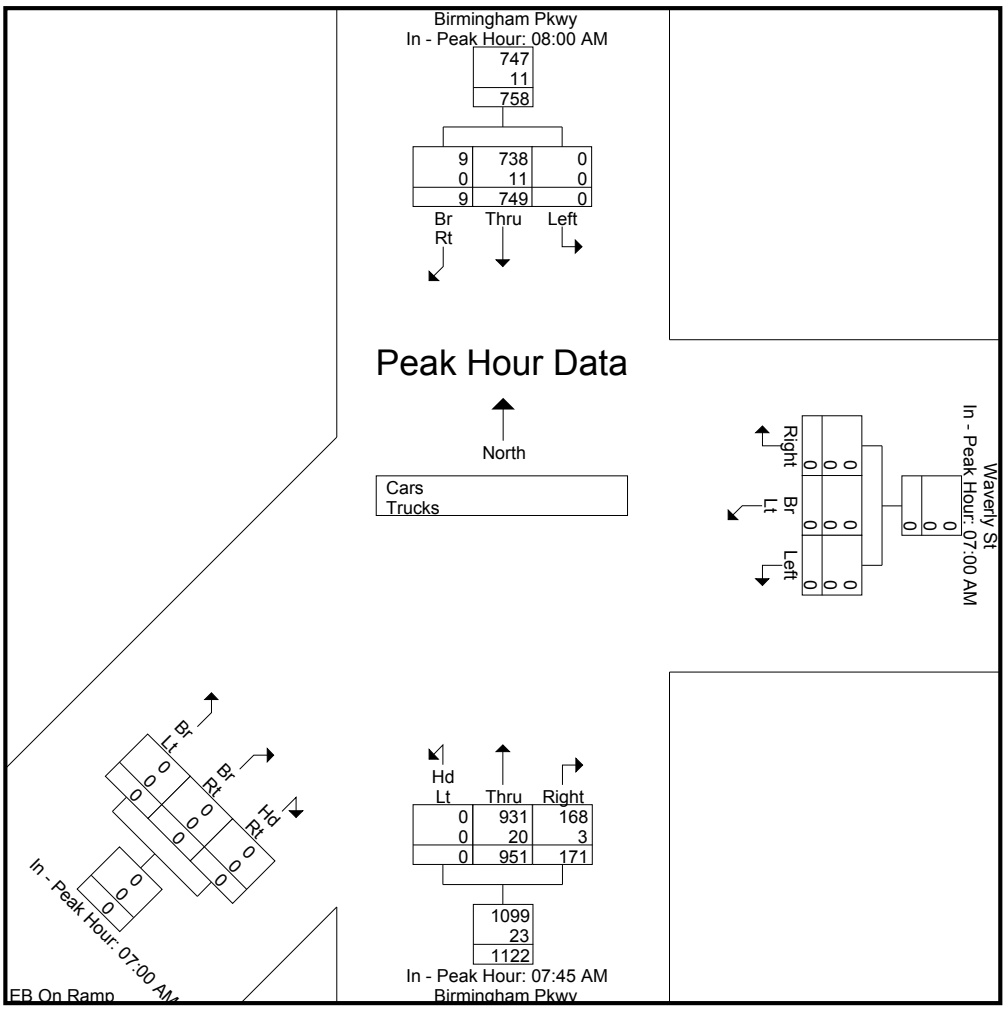


Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
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				07:00 AM				
+0 mins.	0	146	2	148	0	0	0	0	0	237	39	276	0	0	0	0	
+15 mins.	0	158	3	161	0	0	0	0	0	233	42	275	0	0	0	0	
+30 mins.	0	206	3	209	0	0	0	0	0	234	45	279	0	0	0	0	
+45 mins.	0	239	1	240	0	0	0	0	0	247	45	292	0	0	0	0	
Total Volume	0	749	9	758	0	0	0	0	0	951	171	1122	0	0	0	0	
% App. Total	0	98.8	1.2		0	0	0		0	84.8	15.2		0	0	0		
PHF	.000	.783	.750	.790	.000	.000	.000	.000	.000	.963	.950	.961	.000	.000	.000	.000	
Cars	0	738	9	747	0	0	0	0	0	931	168	1099	0	0	0	0	
% Cars	0	98.5	100	98.5	0	0	0	0	0	97.9	98.2	98	0	0	0	0	
Trucks	0	11	0	11	0	0	0	0	0	20	3	23	0	0	0	0	
% Trucks	0	1.5	0	1.5	0	0	0	0	0	2.1	1.8	2	0	0	0	0	



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Cars

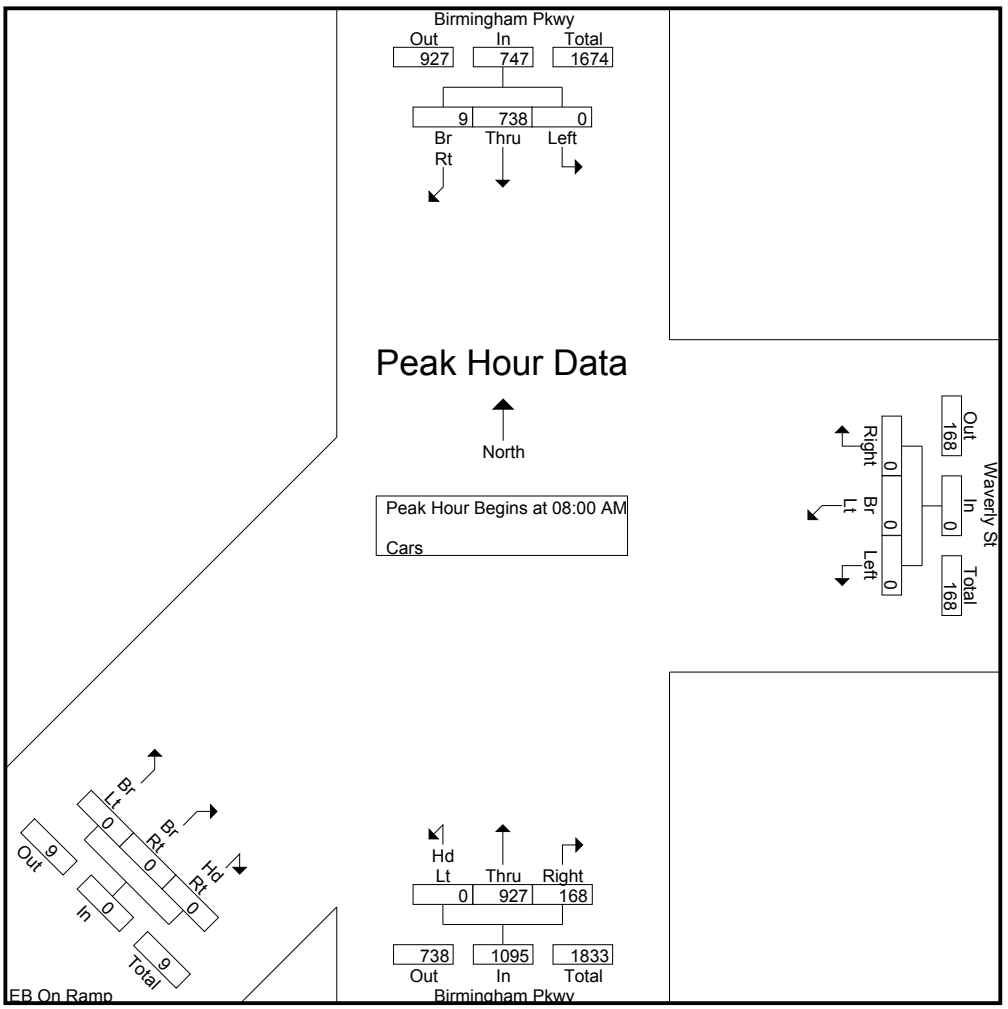
	Birmingham Pkwy From North			Waverly St From East			Birmingham Pkwy From South			EB On Ramp From Southwest			
Start Time	Left	Thru	Br Rt	Left	Br Lt	Right	Hd Lt	Thru	Right	Br Lt	Br Rt	Hd Rt	Int. Total
07:00 AM	0	130	1	0	0	0	0	154	14	0	0	0	299
07:15 AM	0	178	4	0	0	0	0	196	14	0	0	0	392
07:30 AM	0	174	1	0	0	0	0	224	24	0	0	0	423
07:45 AM	0	158	3	0	0	0	0	234	38	0	0	0	433
Total	0	640	9	0	0	0	0	808	90	0	0	0	1547
08:00 AM	0	145	2	0	0	0	0	226	42	0	0	0	415
08:15 AM	0	156	3	0	0	0	0	231	45	0	0	0	435
08:30 AM	0	201	3	0	0	0	0	240	43	0	0	0	487
08:45 AM	0	236	1	0	0	0	0	230	38	0	0	0	505
Total	0	738	9	0	0	0	0	927	168	0	0	0	1842
Grand Total	0	1378	18	0	0	0	0	1735	258	0	0	0	3389
Apprch %	0	98.7	1.3	0	0	0	0	87.1	12.9	0	0	0	
Total %	0	40.7	0.5	0	0	0	0	51.2	7.6	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 5

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	145	2	147	0	0	0	0	0	226	42	268	0	0	0	0	415
08:15 AM	0	156	3	159	0	0	0	0	0	231	45	276	0	0	0	0	435
08:30 AM	0	201	3	204	0	0	0	0	0	240	43	283	0	0	0	0	487
08:45 AM	0	236	1	237	0	0	0	0	0	230	38	268	0	0	0	0	505
Total Volume	0	738	9	747	0	0	0	0	0	927	168	1095	0	0	0	0	1842
% App. Total	0	98.8	1.2		0	0	0		0	84.7	15.3		0	0	0		
PHF	.000	.782	.750	.788	.000	.000	.000	.000	.000	.966	.933	.967	.000	.000	.000	.000	.912



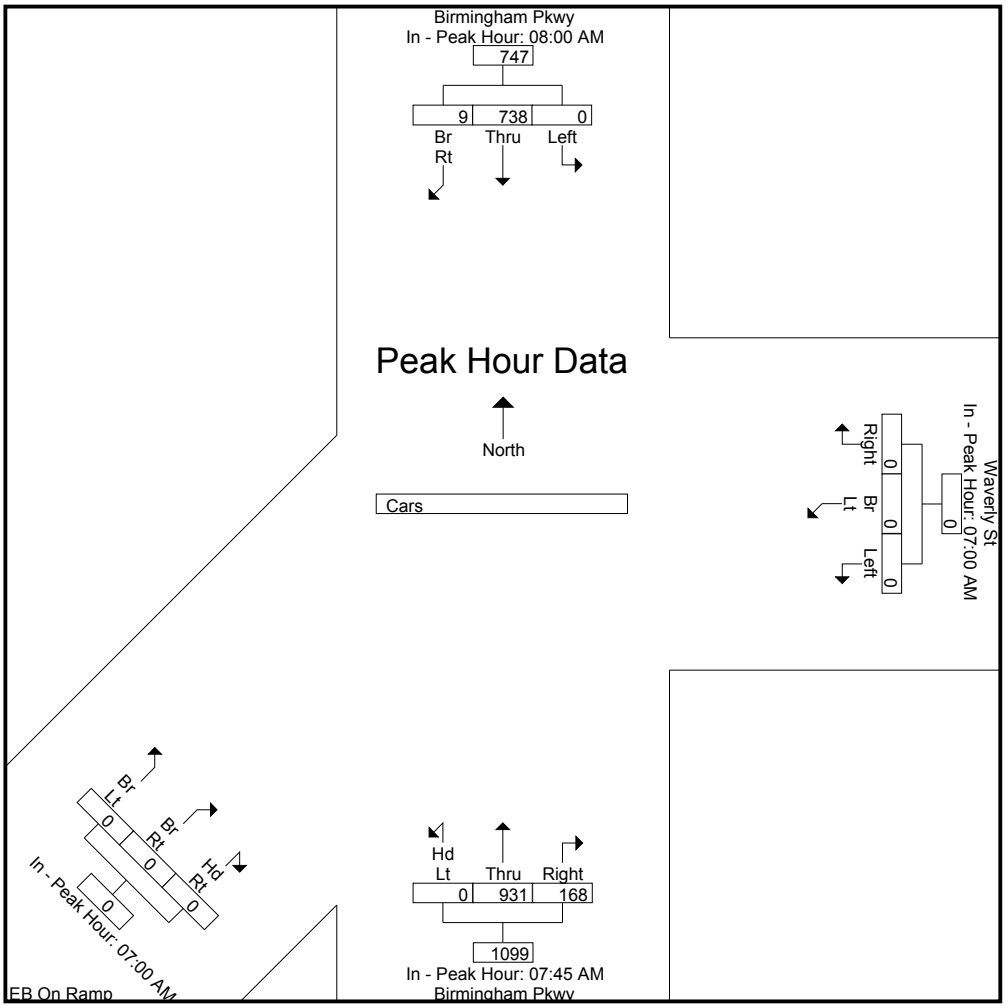
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	145	2	147	0	0	0	0	0	234	38	272	0	0	0	0
+15 mins.	0	156	3	159	0	0	0	0	0	226	42	268	0	0	0	0
+30 mins.	0	201	3	204	0	0	0	0	0	231	45	276	0	0	0	0
+45 mins.	0	236	1	237	0	0	0	0	0	240	43	283	0	0	0	0
Total Volume	0	738	9	747	0	0	0	0	0	931	168	1099	0	0	0	0
% App. Total	0	98.8	1.2		0	0	0		0	84.7	15.3		0	0	0	
PHF	.000	.782	.750	.788	.000	.000	.000	.000	.000	.970	.933	.971	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Trucks

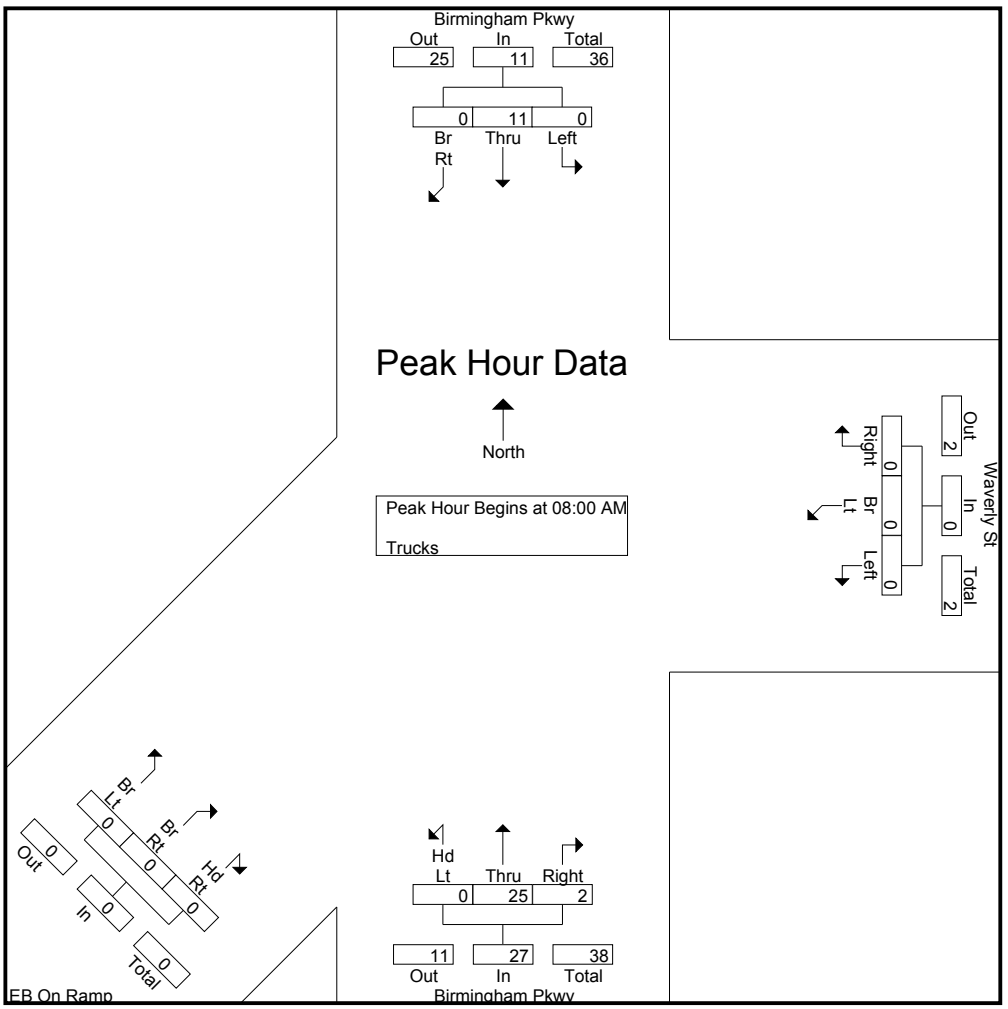
	Birmingham Pkwy From North			Waverly St From East			Birmingham Pkwy From South			EB On Ramp From Southwest			
Start Time	Left	Thru	Br Rt	Left	Br Lt	Right	Hd Lt	Thru	Right	Br Lt	Br Rt	Hd Rt	Int. Total
07:00 AM	0	3	0	0	0	0	0	2	0	0	0	0	5
07:15 AM	0	4	0	0	0	0	0	0	0	0	0	0	4
07:30 AM	0	5	0	0	0	0	0	6	1	0	0	0	12
07:45 AM	0	5	0	0	0	0	0	3	1	0	0	0	9
Total	0	17	0	0	0	0	0	11	2	0	0	0	30
08:00 AM	0	1	0	0	0	0	0	7	0	0	0	0	8
08:15 AM	0	2	0	0	0	0	0	3	0	0	0	0	5
08:30 AM	0	5	0	0	0	0	0	7	2	0	0	0	14
08:45 AM	0	3	0	0	0	0	0	8	0	0	0	0	11
Total	0	11	0	0	0	0	0	25	2	0	0	0	38
Grand Total	0	28	0	0	0	0	0	36	4	0	0	0	68
Apprch %	0	100	0	0	0	0	0	90	10	0	0	0	
Total %	0	41.2	0	0	0	0	0	52.9	5.9	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 8

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	1	0	1	0	0	0	0	0	7	0	7	0	0	0	0	8
08:15 AM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	0	0	5
08:30 AM	0	5	0	5	0	0	0	0	0	7	2	9	0	0	0	0	14
08:45 AM	0	3	0	3	0	0	0	0	0	8	0	8	0	0	0	0	11
Total Volume	0	11	0	11	0	0	0	0	0	25	2	27	0	0	0	0	38
% App. Total	0	100	0		0	0	0		0	92.6	7.4		0	0	0		
PHF	.000	.550	.000	.550	.000	.000	.000	.000	.000	.781	.250	.750	.000	.000	.000	.000	.679



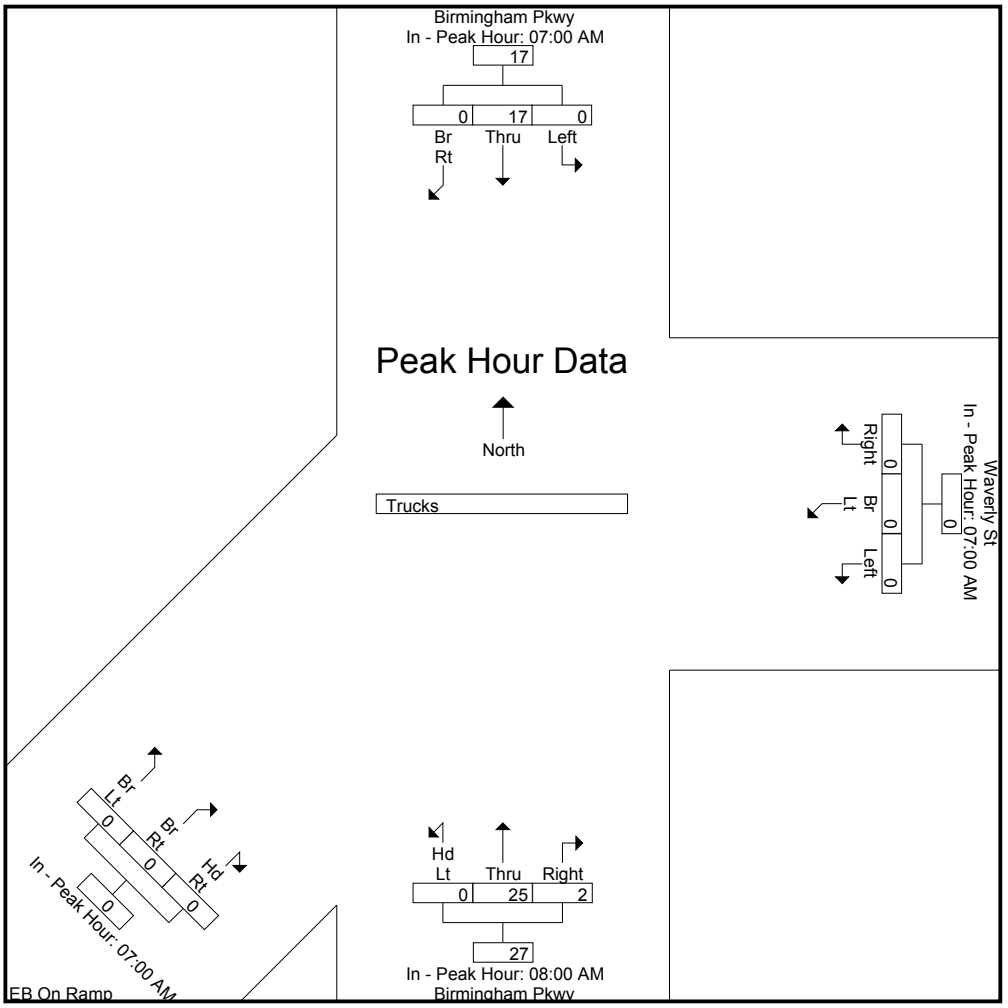
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	3	0	3	0	0	0	0	0	7	0	7	0	0	0	0
+15 mins.	0	4	0	4	0	0	0	0	0	3	0	3	0	0	0	0
+30 mins.	0	5	0	5	0	0	0	0	0	7	2	9	0	0	0	0
+45 mins.	0	5	0	5	0	0	0	0	0	8	0	8	0	0	0	0
Total Volume	0	17	0	17	0	0	0	0	0	25	2	27	0	0	0	0
% App. Total	0	100	0		0	0	0		0	92.6	7.4		0	0	0	
PHF	.000	.850	.000	.850	.000	.000	.000	.000	.000	.781	.250	.750	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Bikes Peds

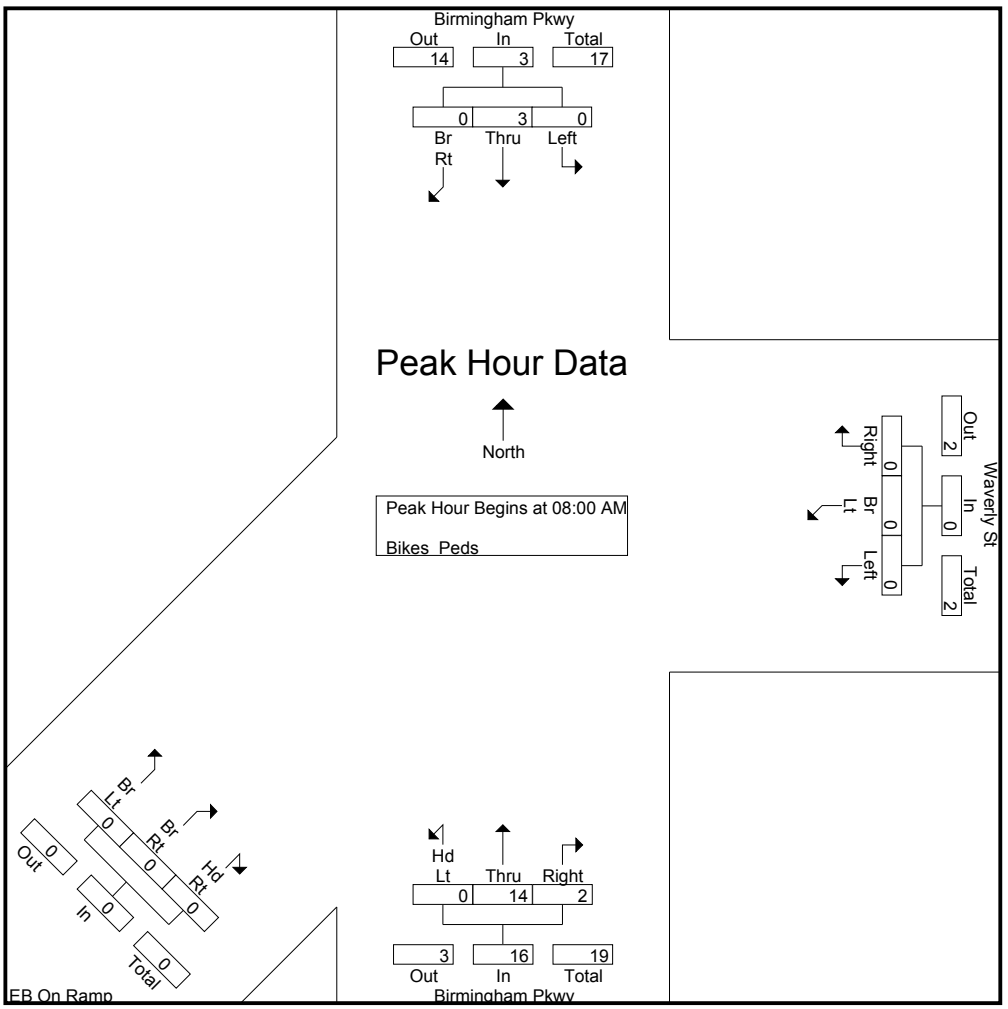
	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest						
Start Time	Left	Thru	Br Rt	Peds	Left	Br Lt	Right	Peds	Hd Lt	Thru	Right	Peds	Br Lt	Br Rt	Hd Rt	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	6	0	2	1	1	0	0	0	0	7	3	10
07:15 AM	0	0	0	0	0	0	0	2	0	3	0	1	0	0	0	0	3	3	6
07:30 AM	0	0	0	1	0	0	0	5	0	4	0	0	0	0	0	0	6	4	10
07:45 AM	0	1	0	1	0	0	0	7	0	3	0	0	0	0	0	0	8	4	12
Total	0	1	0	2	0	0	0	20	0	12	1	2	0	0	0	0	24	14	38
08:00 AM	0	2	0	2	0	0	0	10	0	2	1	1	0	0	0	0	13	5	18
08:15 AM	0	0	0	0	0	0	0	8	0	5	0	0	0	0	0	0	8	5	13
08:30 AM	0	0	0	1	0	0	0	4	0	1	0	1	0	0	0	0	6	1	7
08:45 AM	0	1	0	0	0	0	0	1	0	6	1	0	0	0	0	0	1	8	9
Total	0	3	0	3	0	0	0	23	0	14	2	2	0	0	0	0	28	19	47
Grand Total	0	4	0	5	0	0	0	43	0	26	3	4	0	0	0	0	52	33	85
Apprch %	0	100	0		0	0	0		0	89.7	10.3		0	0	0				
Total %	0	12.1	0		0	0	0		0	78.8	9.1		0	0	0		61.2	38.8	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 11

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	2	0	2	0	0	0	0	0	2	1	3	0	0	0	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	5
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:45 AM	0	1	0	1	0	0	0	0	0	6	1	7	0	0	0	0	8
Total Volume	0	3	0	3	0	0	0	0	0	14	2	16	0	0	0	0	19
% App. Total	0	100	0		0	0	0		0	87.5	12.5		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	.583	.500	.571	.000	.000	.000	.000	.594



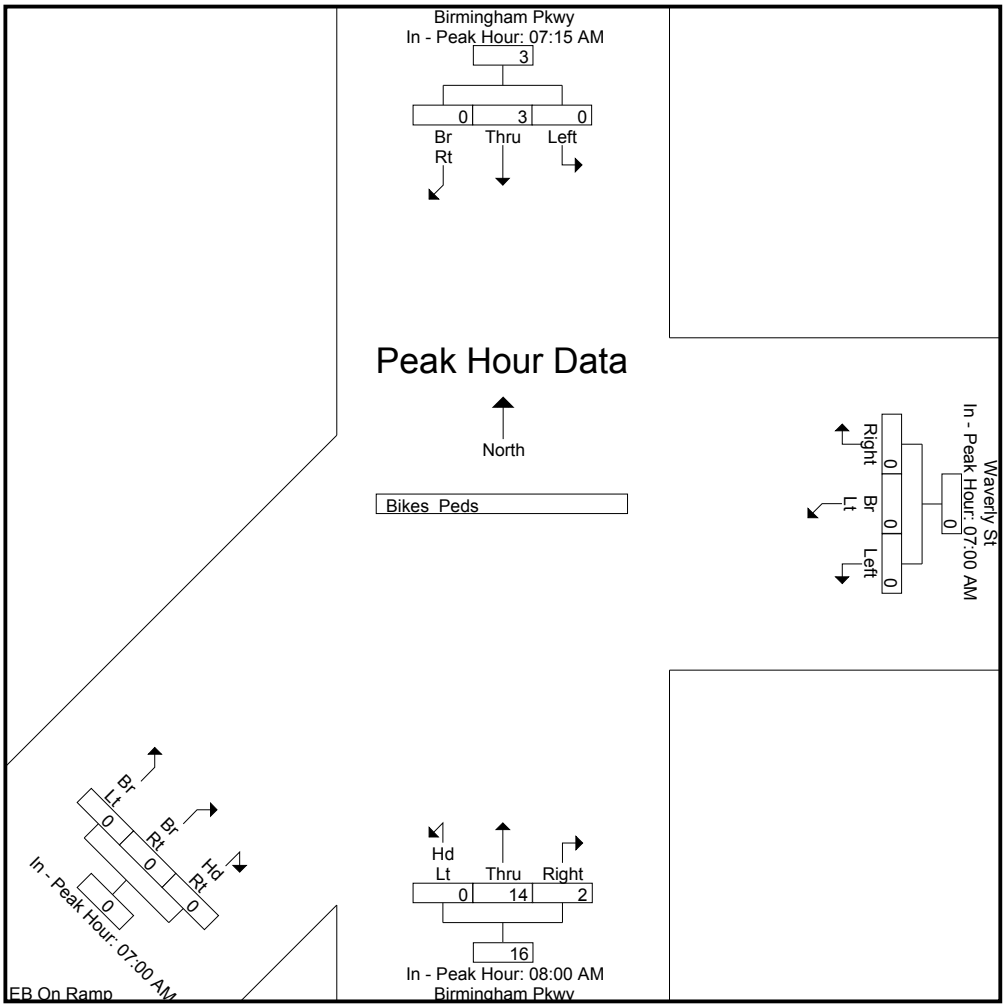
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	2	0	2	0	0	0	0	0	6	1	7	0	0	0	0
Total Volume	0	3	0	3	0	0	0	0	0	14	2	16	0	0	0	0
% App. Total	0	100	0		0	0	0		0	87.5	12.5		0	0	0	
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	.583	.500	.571	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Cars - Trucks

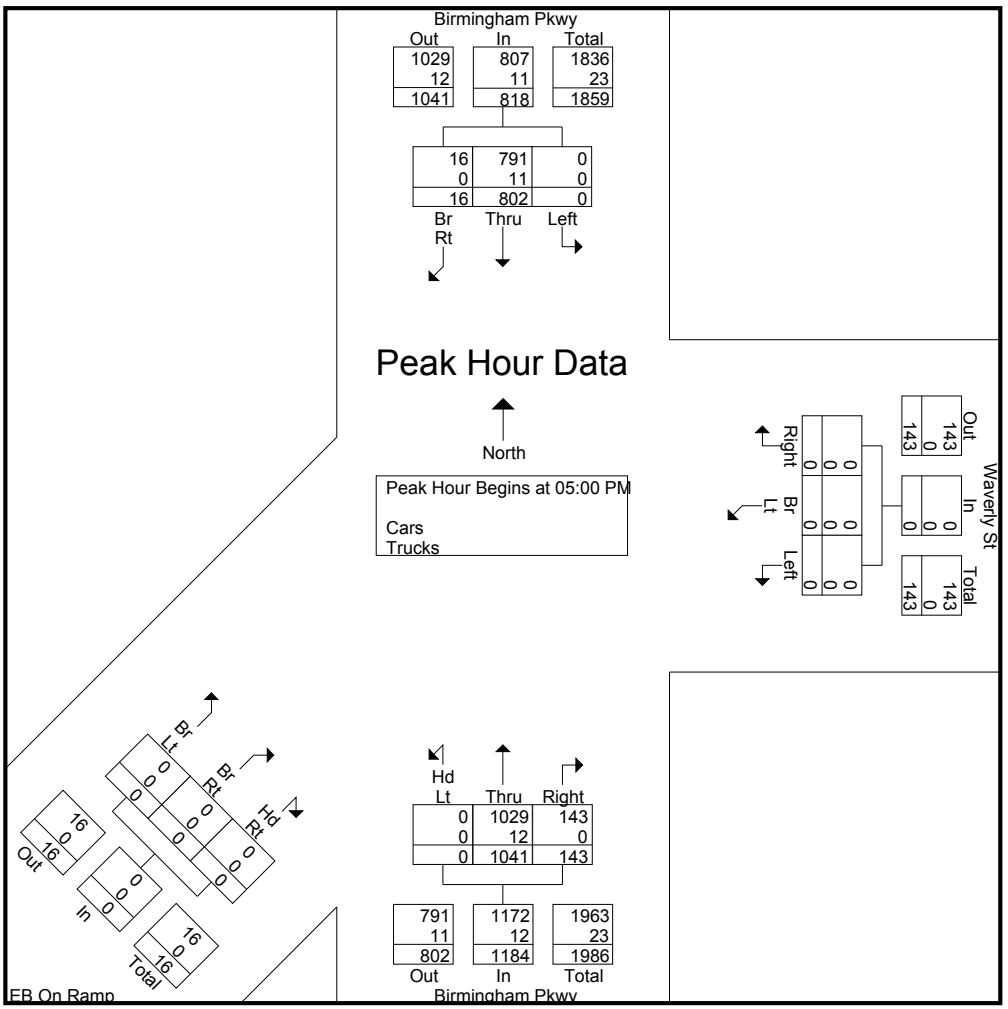
	Birmingham Pkwy From North			Waverly St From East			Birmingham Pkwy From South			EB On Ramp From Southwest			
Start Time	Left	Thru	Br Rt	Left	Br Lt	Right	Hd Lt	Thru	Right	Br Lt	Br Rt	Hd Rt	Int. Total
04:00 PM	0	194	1	0	0	0	0	249	25	0	0	0	469
04:15 PM	0	156	3	0	0	0	0	249	27	0	0	0	435
04:30 PM	0	197	4	0	0	0	0	180	40	0	0	0	421
04:45 PM	0	175	5	0	0	0	0	227	33	0	0	0	440
Total	0	722	13	0	0	0	0	905	125	0	0	0	1765
05:00 PM	0	184	1	0	0	0	0	233	47	0	0	0	465
05:15 PM	0	204	5	0	0	0	0	295	38	0	0	0	542
05:30 PM	0	190	5	0	0	0	0	243	38	0	0	0	476
05:45 PM	0	224	5	0	0	0	0	270	20	0	0	0	519
Total	0	802	16	0	0	0	0	1041	143	0	0	0	2002
Grand Total	0	1524	29	0	0	0	0	1946	268	0	0	0	3767
Apprch %	0	98.1	1.9	0	0	0	0	87.9	12.1	0	0	0	
Total %	0	40.5	0.8	0	0	0	0	51.7	7.1	0	0	0	
Cars	0	1507	29	0	0	0	0	1922	264	0	0	0	3722
% Cars	0	98.9	100	0	0	0	0	98.8	98.5	0	0	0	98.8
Trucks	0	17	0	0	0	0	0	24	4	0	0	0	45
% Trucks	0	1.1	0	0	0	0	0	1.2	1.5	0	0	0	1.2

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 2

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	184	1	185	0	0	0	0	0	233	47	280	0	0	0	0	465
05:15 PM	0	204	5	209	0	0	0	0	0	295	38	333	0	0	0	0	542
05:30 PM	0	190	5	195	0	0	0	0	0	243	38	281	0	0	0	0	476
05:45 PM	0	224	5	229	0	0	0	0	0	270	20	290	0	0	0	0	519
Total Volume	0	802	16	818	0	0	0	0	0	1041	143	1184	0	0	0	0	2002
% App. Total	0	98	2		0	0	0		0	87.9	12.1		0	0	0		
PHF	.000	.895	.800	.893	.000	.000	.000	.000	.000	.882	.761	.889	.000	.000	.000	.000	.923
Cars	0	791	16	807	0	0	0	0	0	1029	143	1172	0	0	0	0	1979
% Cars	0	98.6	100	98.7	0	0	0	0	0	98.8	100	99.0	0	0	0	0	98.9
Trucks	0	11	0	11	0	0	0	0	0	12	0	12	0	0	0	0	23
% Trucks	0	1.4	0	1.3	0	0	0	0	0	1.2	0	1.0	0	0	0	0	1.1

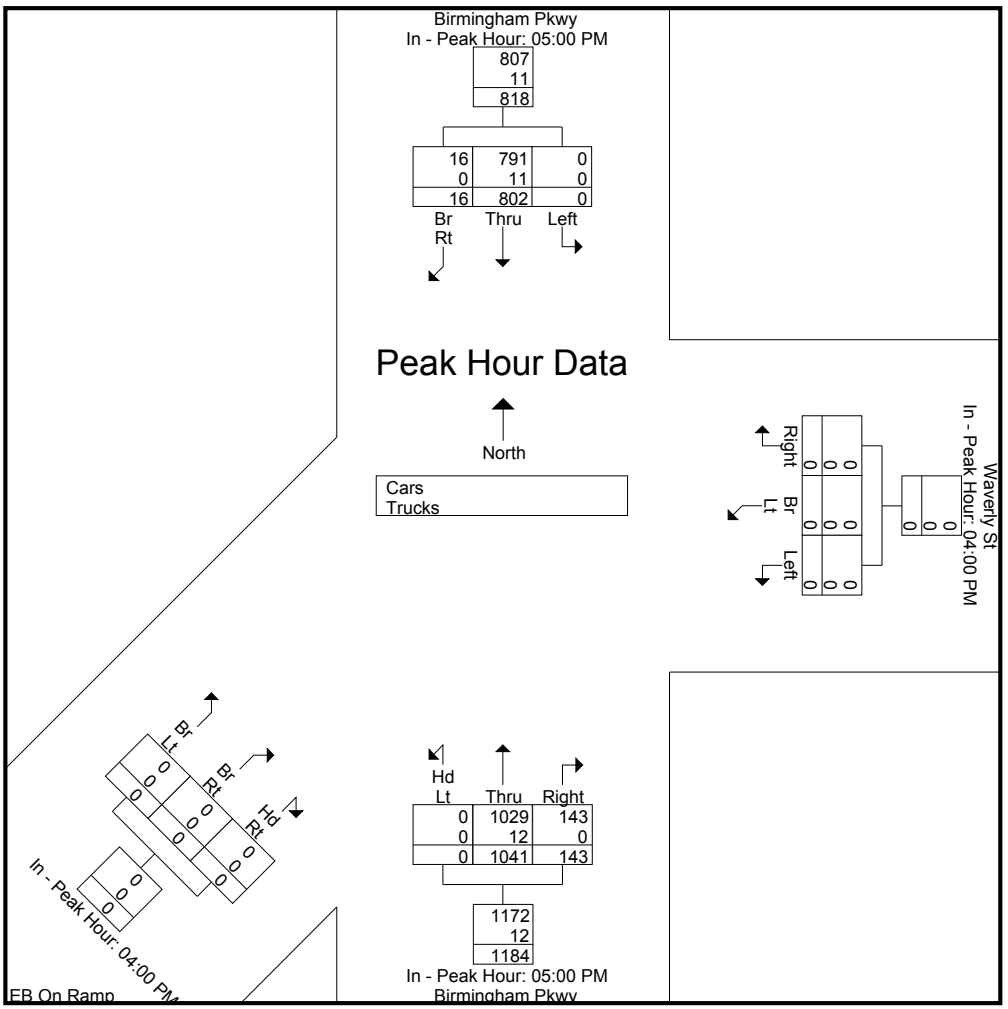


Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
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				05:00 PM				04:00 PM				
+0 mins.	0	184	1	185	0	0	0	0	0	233	47	280	0	0	0	0	
+15 mins.	0	204	5	209	0	0	0	0	0	295	38	333	0	0	0	0	
+30 mins.	0	190	5	195	0	0	0	0	0	243	38	281	0	0	0	0	
+45 mins.	0	224	5	229	0	0	0	0	0	270	20	290	0	0	0	0	
Total Volume	0	802	16	818	0	0	0	0	0	1041	143	1184	0	0	0	0	
% App. Total	0	98	2		0	0	0		0	87.9	12.1		0	0	0		
PHF	.000	.895	.800	.893	.000	.000	.000	.000	.000	.882	.761	.889	.000	.000	.000	.000	
Cars	0	791	16	807	0	0	0	0	0	1029	143	1172	0	0	0	0	
% Cars	0	98.6	100	98.7	0	0	0	0	0	98.8	100	99	0	0	0	0	
Trucks	0	11	0	11	0	0	0	0	0	12	0	12	0	0	0	0	
% Trucks	0	1.4	0	1.3	0	0	0	0	0	1.2	0	1	0	0	0	0	



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Cars

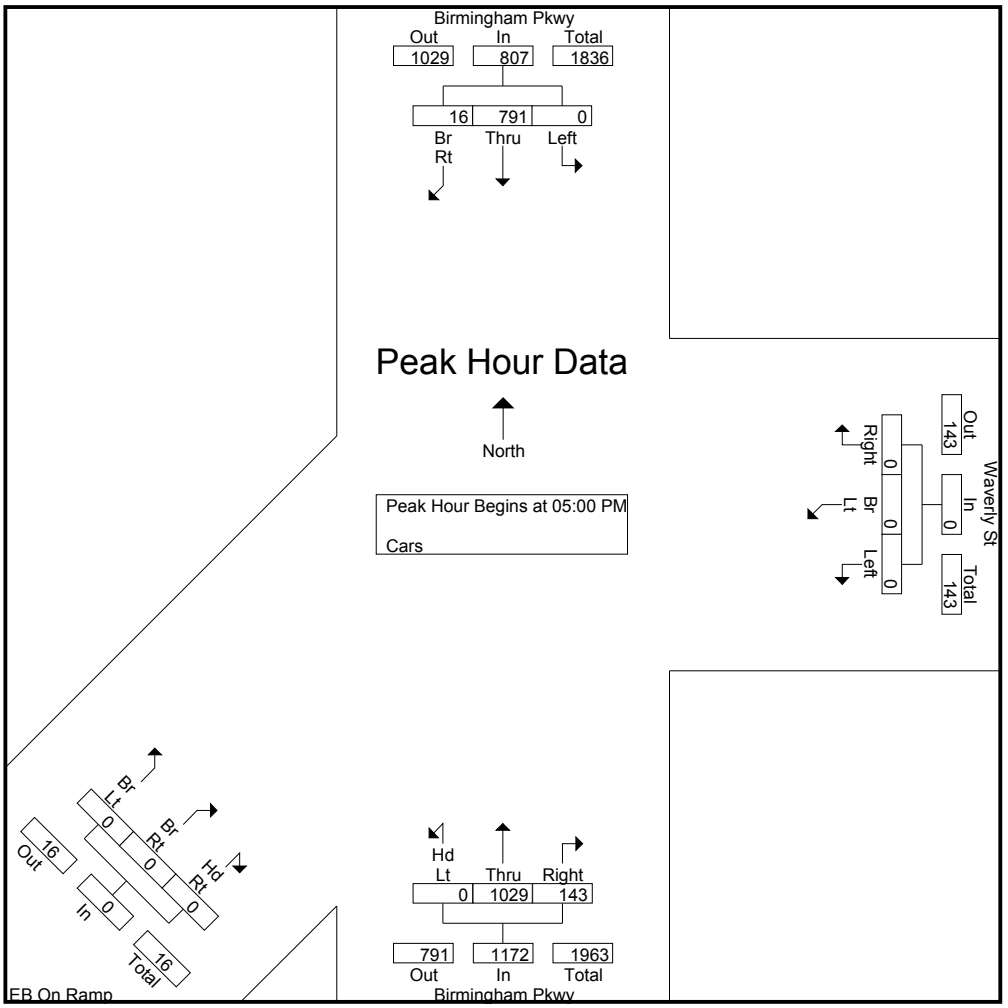
	Birmingham Pkwy From North			Waverly St From East			Birmingham Pkwy From South			EB On Ramp From Southwest			
Start Time	Left	Thru	Br Rt	Left	Br Lt	Right	Hd Lt	Thru	Right	Br Lt	Br Rt	Hd Rt	Int. Total
04:00 PM	0	191	1	0	0	0	0	244	25	0	0	0	461
04:15 PM	0	154	3	0	0	0	0	246	26	0	0	0	429
04:30 PM	0	196	4	0	0	0	0	179	39	0	0	0	418
04:45 PM	0	175	5	0	0	0	0	224	31	0	0	0	435
Total	0	716	13	0	0	0	0	893	121	0	0	0	1743
05:00 PM	0	180	1	0	0	0	0	231	47	0	0	0	459
05:15 PM	0	201	5	0	0	0	0	290	38	0	0	0	534
05:30 PM	0	187	5	0	0	0	0	240	38	0	0	0	470
05:45 PM	0	223	5	0	0	0	0	268	20	0	0	0	516
Total	0	791	16	0	0	0	0	1029	143	0	0	0	1979
Grand Total	0	1507	29	0	0	0	0	1922	264	0	0	0	3722
Apprch %	0	98.1	1.9	0	0	0	0	87.9	12.1	0	0	0	
Total %	0	40.5	0.8	0	0	0	0	51.6	7.1	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 5

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	180	1	181	0	0	0	0	0	231	47	278	0	0	0	0	459
05:15 PM	0	201	5	206	0	0	0	0	0	290	38	328	0	0	0	0	534
05:30 PM	0	187	5	192	0	0	0	0	0	240	38	278	0	0	0	0	470
05:45 PM	0	223	5	228	0	0	0	0	0	268	20	288	0	0	0	0	516
Total Volume	0	791	16	807	0	0	0	0	0	1029	143	1172	0	0	0	0	1979
% App. Total	0	98	2		0	0	0		0	87.8	12.2		0	0	0		
PHF	.000	.887	.800	.885	.000	.000	.000	.000	.000	.887	.761	.893	.000	.000	.000	.000	.926



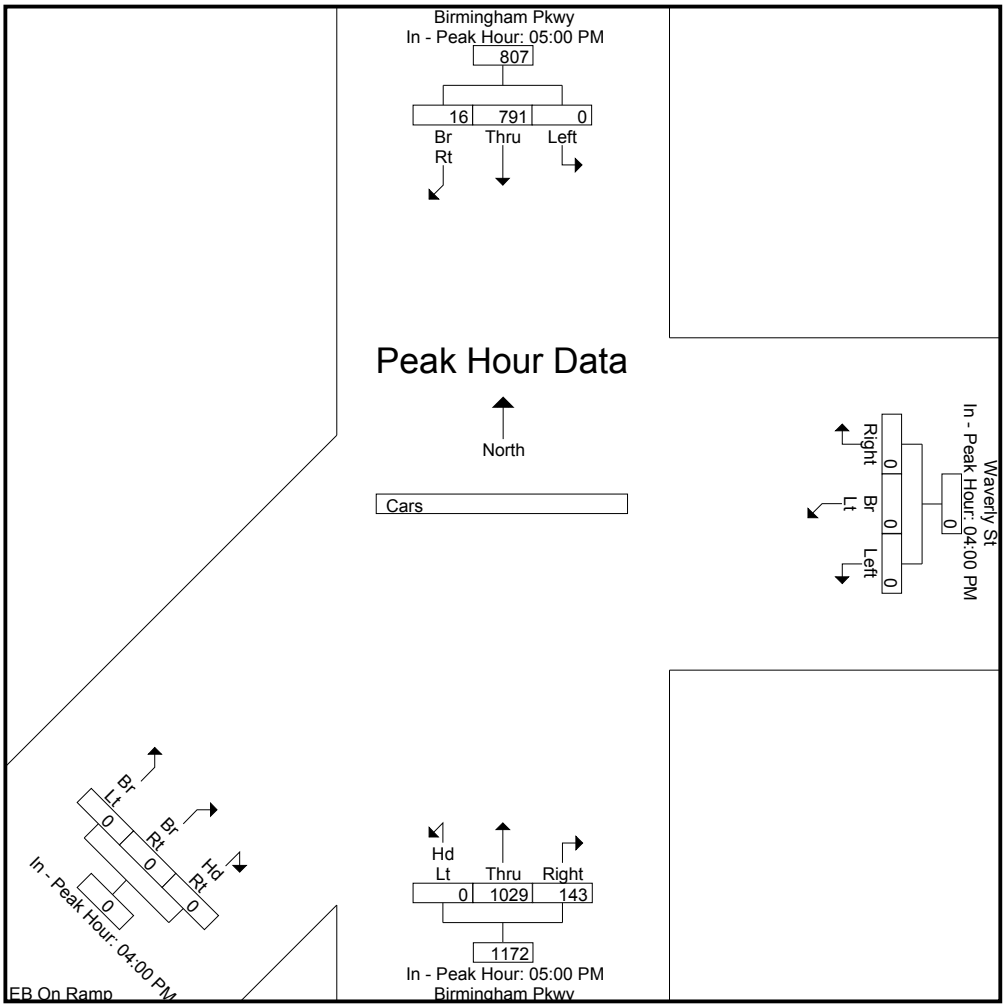
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	180	1	181	0	0	0	0	0	231	47	278	0	0	0	0
+15 mins.	0	201	5	206	0	0	0	0	0	290	38	328	0	0	0	0
+30 mins.	0	187	5	192	0	0	0	0	0	240	38	278	0	0	0	0
+45 mins.	0	223	5	228	0	0	0	0	0	268	20	288	0	0	0	0
Total Volume	0	791	16	807	0	0	0	0	0	1029	143	1172	0	0	0	0
% App. Total	0	98	2		0	0	0		0	87.8	12.2		0	0	0	
PHF	.000	.887	.800	.885	.000	.000	.000	.000	.000	.887	.761	.893	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Trucks

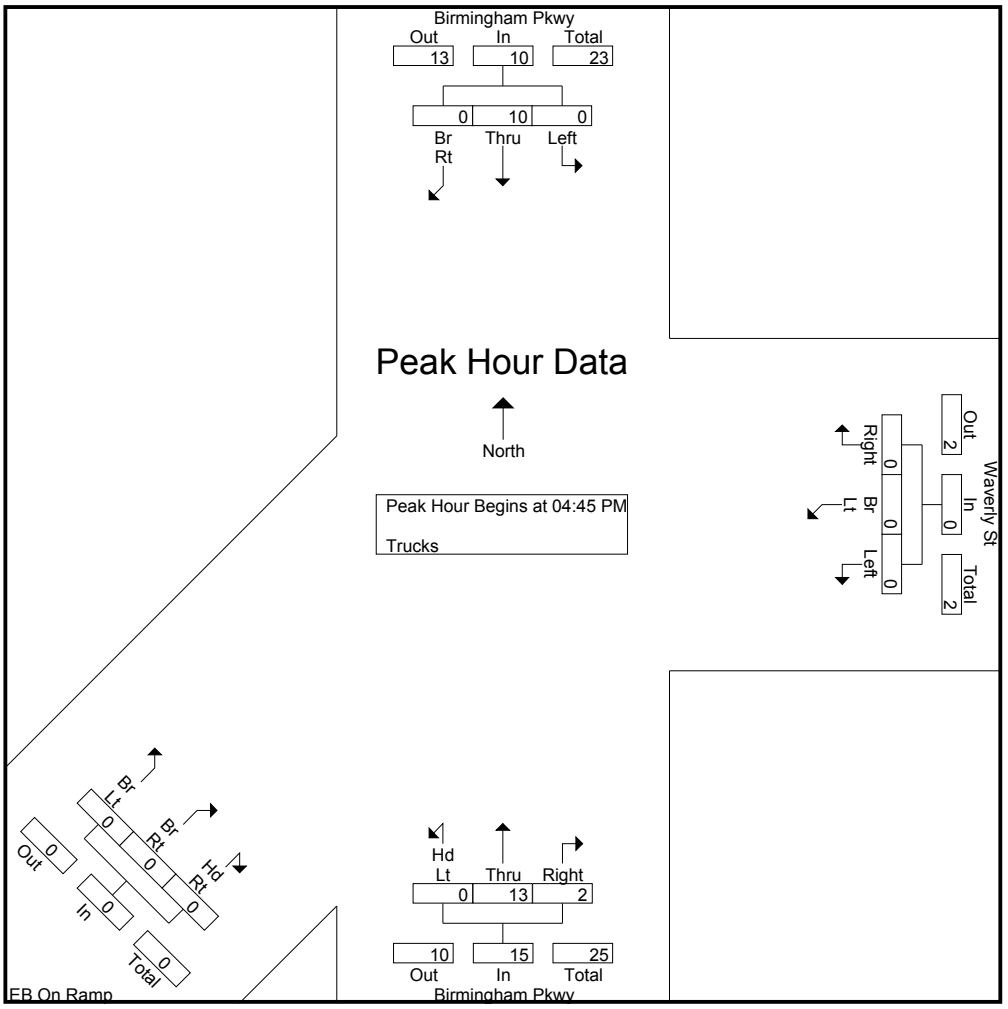
	Birmingham Pkwy From North			Waverly St From East			Birmingham Pkwy From South			EB On Ramp From Southwest			
Start Time	Left	Thru	Br Rt	Left	Br Lt	Right	Hd Lt	Thru	Right	Br Lt	Br Rt	Hd Rt	Int. Total
04:00 PM	0	3	0	0	0	0	0	5	0	0	0	0	8
04:15 PM	0	2	0	0	0	0	0	3	1	0	0	0	6
04:30 PM	0	1	0	0	0	0	0	1	1	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	3	2	0	0	0	5
Total	0	6	0	0	0	0	0	12	4	0	0	0	22
05:00 PM	0	4	0	0	0	0	0	2	0	0	0	0	6
05:15 PM	0	3	0	0	0	0	0	5	0	0	0	0	8
05:30 PM	0	3	0	0	0	0	0	3	0	0	0	0	6
05:45 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
Total	0	11	0	0	0	0	0	12	0	0	0	0	23
Grand Total	0	17	0	0	0	0	0	24	4	0	0	0	45
Apprch %	0	100	0	0	0	0	0	85.7	14.3	0	0	0	
Total %	0	37.8	0	0	0	0	0	53.3	8.9	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 8

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	3	2	5	0	0	0	0	5
05:00 PM	0	4	0	4	0	0	0	0	0	2	0	2	0	0	0	0	6
05:15 PM	0	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0	8
05:30 PM	0	3	0	3	0	0	0	0	0	3	0	3	0	0	0	0	6
Total Volume	0	10	0	10	0	0	0	0	0	13	2	15	0	0	0	0	25
% App. Total	0	100	0		0	0	0		0	86.7	13.3		0	0	0		
PHF	.000	.625	.000	.625	.000	.000	.000	.000	.000	.650	.250	.750	.000	.000	.000	.000	.781



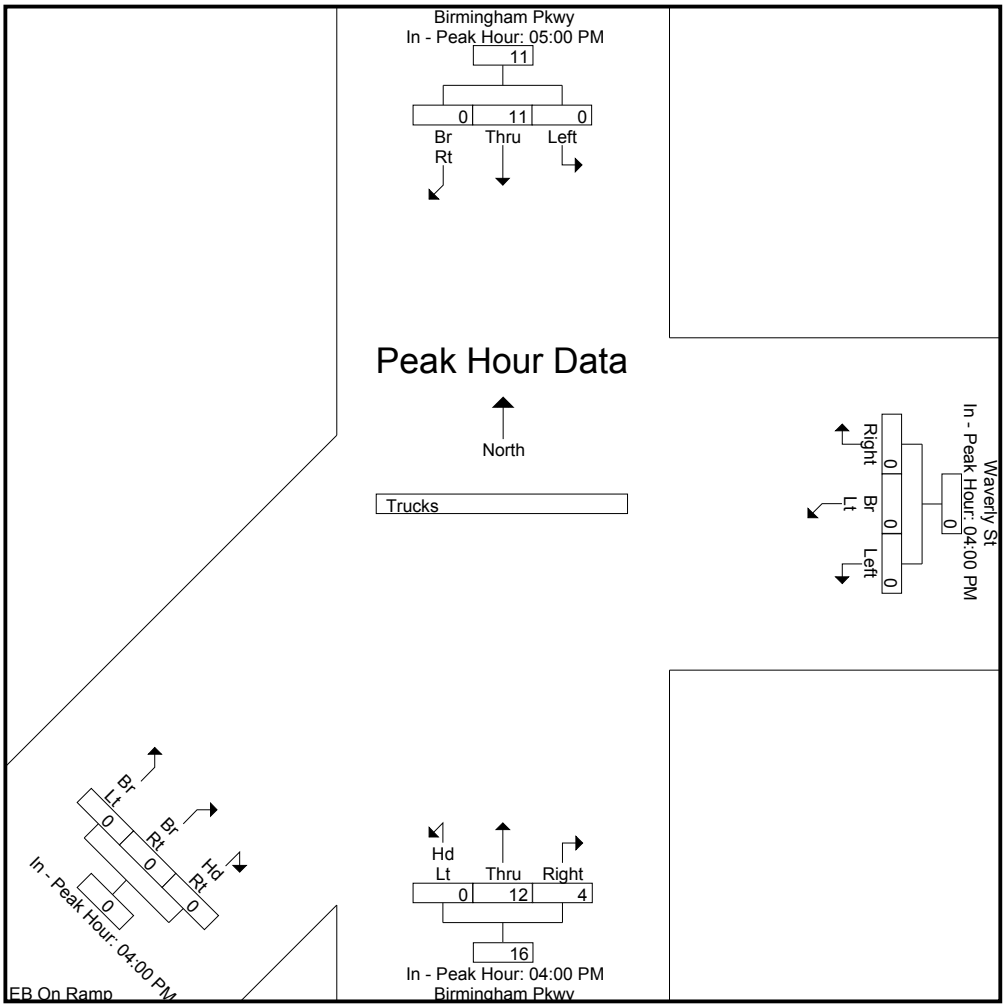
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	4	0	4	0	0	0	0	0	5	0	5	0	0	0	0
+15 mins.	0	3	0	3	0	0	0	0	0	3	1	4	0	0	0	0
+30 mins.	0	3	0	3	0	0	0	0	0	1	1	2	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	3	2	5	0	0	0	0
Total Volume	0	11	0	11	0	0	0	0	0	12	4	16	0	0	0	0
% App. Total	0	100	0		0	0	0		0	75	25		0	0	0	
PHF	.000	.688	.000	.688	.000	.000	.000	.000	.000	.600	.500	.800	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015

Groups Printed- Bikes Peds

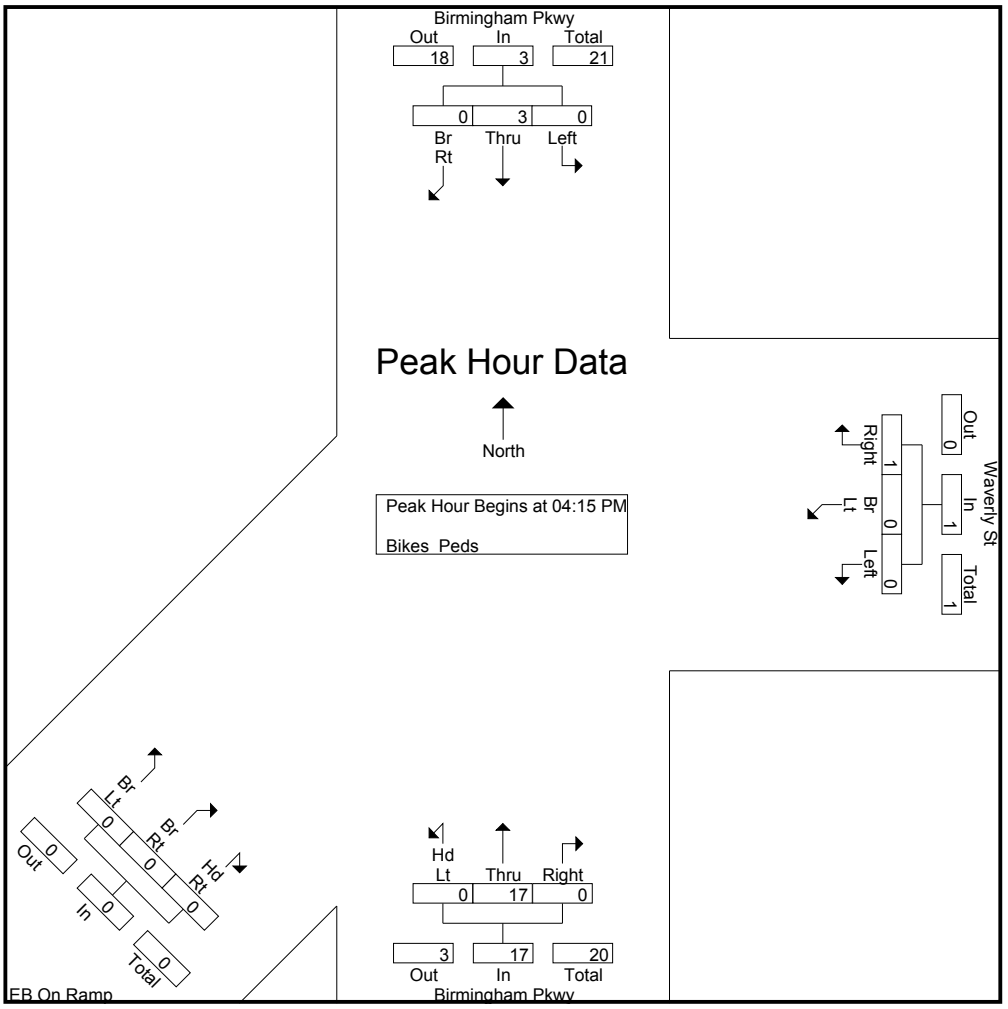
	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest						
Start Time	Left	Thru	Br Rt	Peds	Left	Br Lt	Right	Peds	Hd Lt	Thru	Right	Peds	Br Lt	Br Rt	Hd Rt	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	1	0	0	0	7	0	0	0	0	0	0	0	0	8	0	8
04:15 PM	0	0	0	0	0	0	0	6	0	9	0	0	0	0	0	0	6	9	15
04:30 PM	0	2	0	0	0	0	1	9	0	2	0	0	0	0	0	0	9	5	14
04:45 PM	0	0	0	0	0	0	0	4	0	1	0	3	0	0	0	0	7	1	8
Total	0	2	0	1	0	0	1	26	0	12	0	3	0	0	0	0	30	15	45
05:00 PM	0	1	0	1	0	0	0	10	0	5	0	0	0	0	0	0	11	6	17
05:15 PM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	9	0	9
05:30 PM	0	0	0	0	0	0	0	6	0	2	2	0	0	0	0	0	6	4	10
05:45 PM	0	0	0	0	0	0	0	9	0	3	2	0	0	0	0	0	9	5	14
Total	0	1	0	1	0	0	0	34	0	10	4	0	0	0	0	0	35	15	50
Grand Total	0	3	0	2	0	0	1	60	0	22	4	3	0	0	0	0	65	30	95
Apprch %	0	100	0		0	0	100		0	84.6	15.4		0	0	0				
Total %	0	10	0		0	0	3.3		0	73.3	13.3		0	0	0		68.4	31.6	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 11

	Birmingham Pkwy From North				Waverly St From East				Birmingham Pkwy From South				EB On Ramp From Southwest				
Start Time	Left	Thru	Br Rt	App. Total	Left	Br Lt	Right	App. Total	Hd Lt	Thru	Right	App. Total	Br Lt	Br Rt	Hd Rt	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	0	0	0	0	0	0	9	0	9	0	0	0	0	9
04:30 PM	0	2	0	2	0	0	1	1	0	2	0	2	0	0	0	0	5
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:00 PM	0	1	0	1	0	0	0	0	0	5	0	5	0	0	0	0	6
Total Volume	0	3	0	3	0	0	1	1	0	17	0	17	0	0	0	0	21
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.250	.250	.000	.472	.000	.472	.000	.000	.000	.000	.583



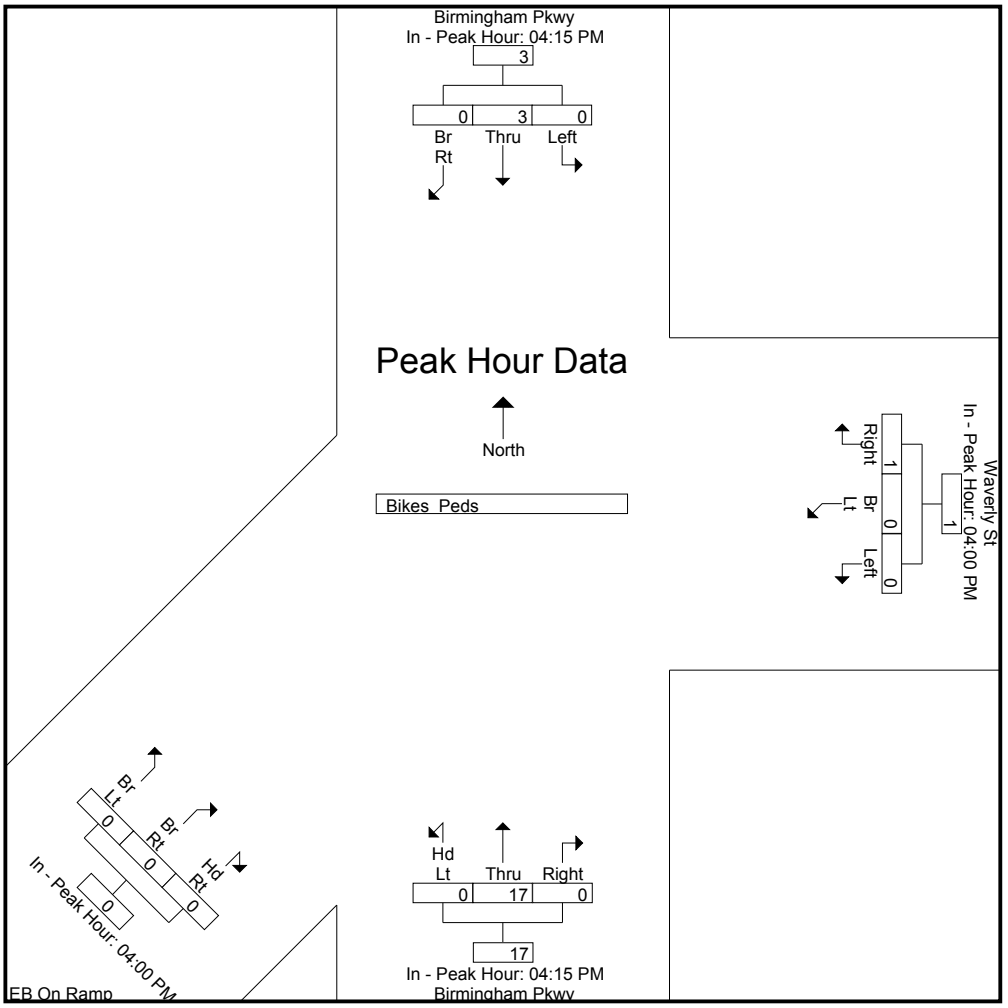
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:15 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	9	0	9	0	0	0	0
+15 mins.	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0
+30 mins.	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	5	0	5	0	0	0	0
Total Volume	0	3	0	3	0	0	1	1	0	17	0	17	0	0	0	0
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0	
PHF	.000	.375	.000	.375	.000	.000	.250	.250	.000	.472	.000	.472	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Waverly Street
City/State : Brighton, MA
Weather : Clear

File Name : 15090004
Site Code : 15090004
Start Date : 9/15/2015
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Trucks

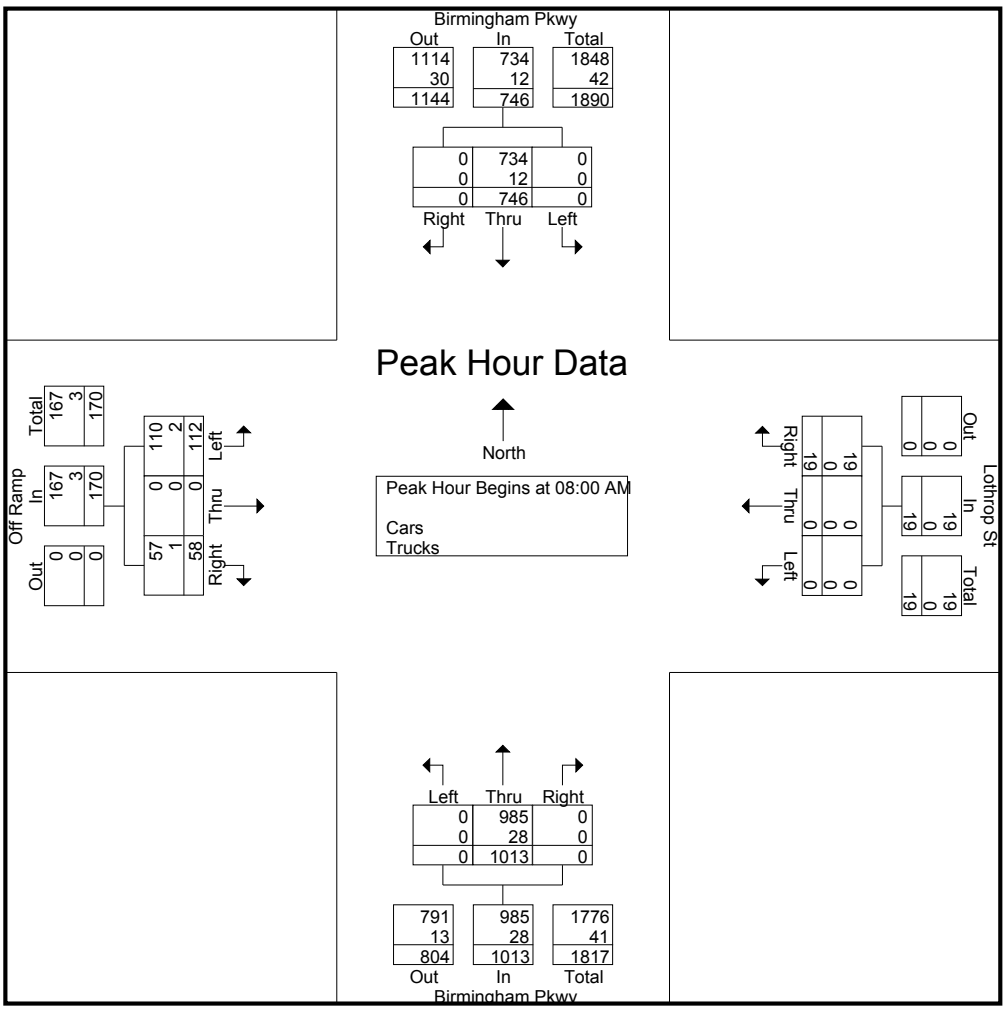
	Birmingham Pkwy From North			Lothrop St From East			Birmingham Pkwy From South			Off Ramp From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	138	0	0	0	3	0	140	0	21	0	14	316
07:15 AM	0	182	0	0	0	6	0	167	0	15	0	13	383
07:30 AM	0	175	0	0	0	4	0	250	0	20	0	12	461
07:45 AM	0	167	0	0	0	6	0	251	0	20	0	8	452
Total	0	662	0	0	0	19	0	808	0	76	0	47	1612
08:00 AM	0	147	0	0	0	5	0	262	0	16	0	8	438
08:15 AM	0	162	0	0	0	5	0	241	0	30	0	10	448
08:30 AM	0	200	0	0	0	6	0	266	0	33	0	25	530
08:45 AM	0	237	0	0	0	3	0	244	0	33	0	15	532
Total	0	746	0	0	0	19	0	1013	0	112	0	58	1948
Grand Total	0	1408	0	0	0	38	0	1821	0	188	0	105	3560
Apprch %	0	100	0	0	0	100	0	100	0	64.2	0	35.8	
Total %	0	39.6	0	0	0	1.1	0	51.2	0	5.3	0	2.9	
Cars	0	1377	0	0	0	38	0	1779	0	186	0	100	3480
% Cars	0	97.8	0	0	0	100	0	97.7	0	98.9	0	95.2	97.8
Trucks	0	31	0	0	0	0	0	42	0	2	0	5	80
% Trucks	0	2.2	0	0	0	0	0	2.3	0	1.1	0	4.8	2.2

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 2

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	147	0	147	0	0	5	5	0	262	0	262	16	0	8	24	438
08:15 AM	0	162	0	162	0	0	5	5	0	241	0	241	30	0	10	40	448
08:30 AM	0	200	0	200	0	0	6	6	0	266	0	266	33	0	25	58	530
08:45 AM	0	237	0	237	0	0	3	3	0	244	0	244	33	0	15	48	532
Total Volume	0	746	0	746	0	0	19	19	0	1013	0	1013	112	0	58	170	1948
% App. Total	0	100	0		0	0	100		0	100	0		65.9	0	34.1		
PHF	.000	.787	.000	.787	.000	.000	.792	.792	.000	.952	.000	.952	.848	.000	.580	.733	.915
Cars	0	734	0	734	0	0	19	19	0	985	0	985	110	0	57	167	1905
% Cars	0	98.4	0	98.4	0	0	100	100	0	97.2	0	97.2	98.2	0	98.3	98.2	97.8
Trucks	0	12	0	12	0	0	0	0	0	28	0	28	2	0	1	3	43
% Trucks	0	1.6	0	1.6	0	0	0	0	0	2.8	0	2.8	1.8	0	1.7	1.8	2.2

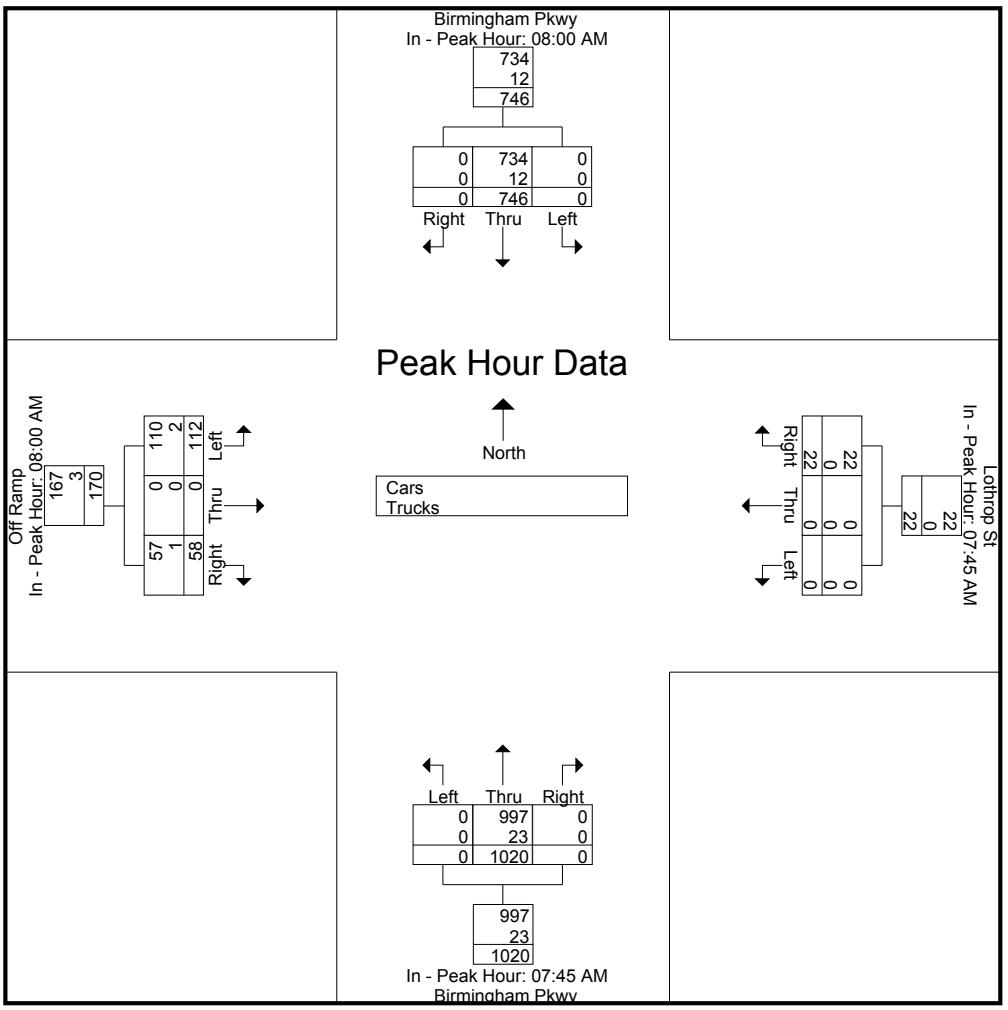


Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 3

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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 Each Approach Begins at:																	
	08:00 AM				07:45 AM				07:45 AM				08:00 AM				
+0 mins.	0	147	0	147	0	0	6	6	0	251	0	251	16	0	8	24	
+15 mins.	0	162	0	162	0	0	5	5	0	262	0	262	30	0	10	40	
+30 mins.	0	200	0	200	0	0	5	5	0	241	0	241	33	0	25	58	
+45 mins.	0	237	0	237	0	0	6	6	0	266	0	266	33	0	15	48	
Total Volume	0	746	0	746	0	0	22	22	0	1020	0	1020	112	0	58	170	
% App. Total	0	100	0		0	0	100		0	100	0		65.9	0	34.1		
PHF	.000	.787	.000	.787	.000	.000	.917	.917	.000	.959	.000	.959	.848	.000	.580	.733	
Cars	0	734	0	734	0	0	22	22	0	997	0	997	110	0	57	167	
% Cars	0	98.4	0	98.4	0	0	100	100	0	97.7	0	97.7	98.2	0	98.3	98.2	
Trucks	0	12	0	12	0	0	0	0	0	23	0	23	2	0	1	3	
% Trucks	0	1.6	0	1.6	0	0	0	0	0	2.3	0	2.3	1.8	0	1.7	1.8	



Accurate Counts

978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015

Groups Printed- Cars

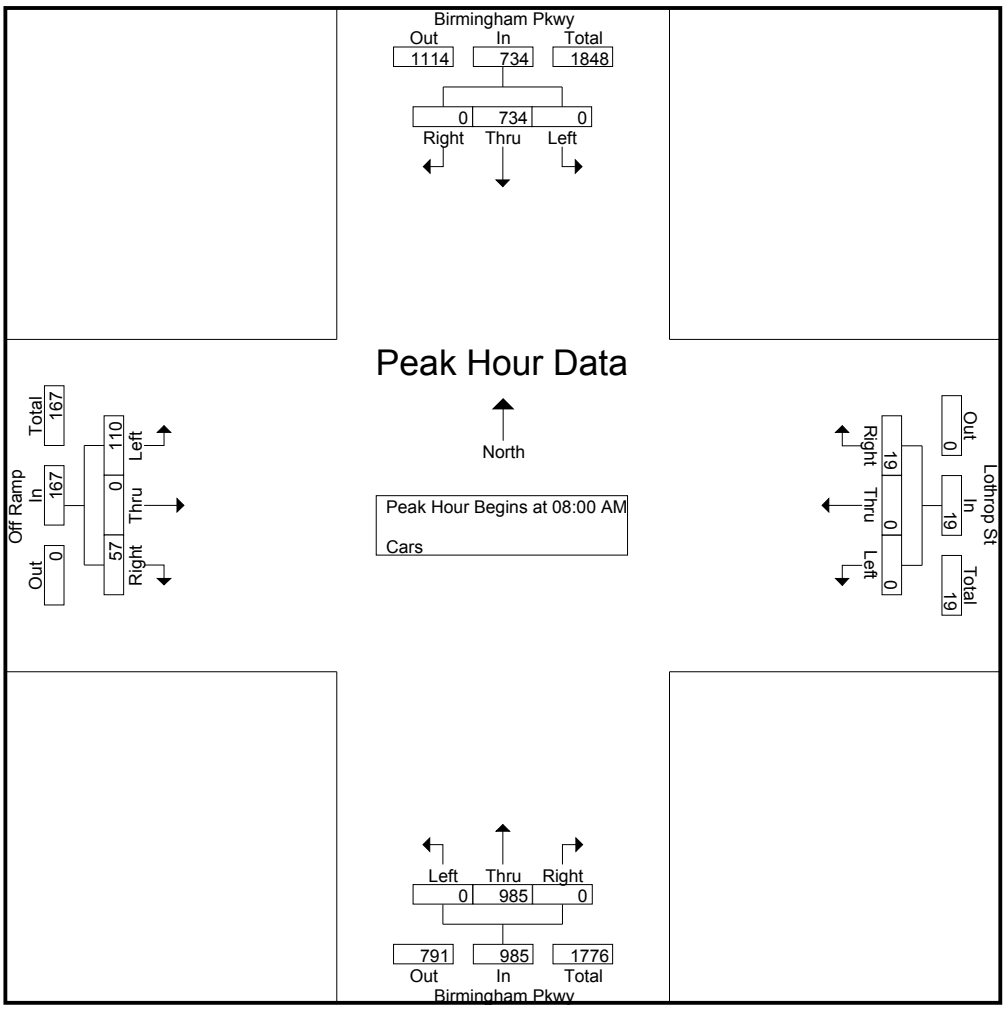
	Birmingham Pkwy From North			Lothrop St From East			Birmingham Pkwy From South			Off Ramp From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	134	0	0	0	3	0	137	0	21	0	11	306
07:15 AM	0	177	0	0	0	6	0	167	0	15	0	12	377
07:30 AM	0	170	0	0	0	4	0	243	0	20	0	12	449
07:45 AM	0	162	0	0	0	6	0	247	0	20	0	8	443
Total	0	643	0	0	0	19	0	794	0	76	0	43	1575
08:00 AM	0	145	0	0	0	5	0	255	0	15	0	8	428
08:15 AM	0	160	0	0	0	5	0	239	0	30	0	10	444
08:30 AM	0	195	0	0	0	6	0	256	0	32	0	24	513
08:45 AM	0	234	0	0	0	3	0	235	0	33	0	15	520
Total	0	734	0	0	0	19	0	985	0	110	0	57	1905
Grand Total	0	1377	0	0	0	38	0	1779	0	186	0	100	3480
Apprch %	0	100	0	0	0	100	0	100	0	65	0	35	
Total %	0	39.6	0	0	0	1.1	0	51.1	0	5.3	0	2.9	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 5

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	145	0	145	0	0	5	5	0	255	0	255	15	0	8	23	428
08:15 AM	0	160	0	160	0	0	5	5	0	239	0	239	30	0	10	40	444
08:30 AM	0	195	0	195	0	0	6	6	0	256	0	256	32	0	24	56	513
08:45 AM	0	234	0	234	0	0	3	3	0	235	0	235	33	0	15	48	520
Total Volume	0	734	0	734	0	0	19	19	0	985	0	985	110	0	57	167	1905
% App. Total	0	100	0		0	0	100		0	100	0		65.9	0	34.1		
PHF	.000	.784	.000	.784	.000	.000	.792	.792	.000	.962	.000	.962	.833	.000	.594	.746	.916



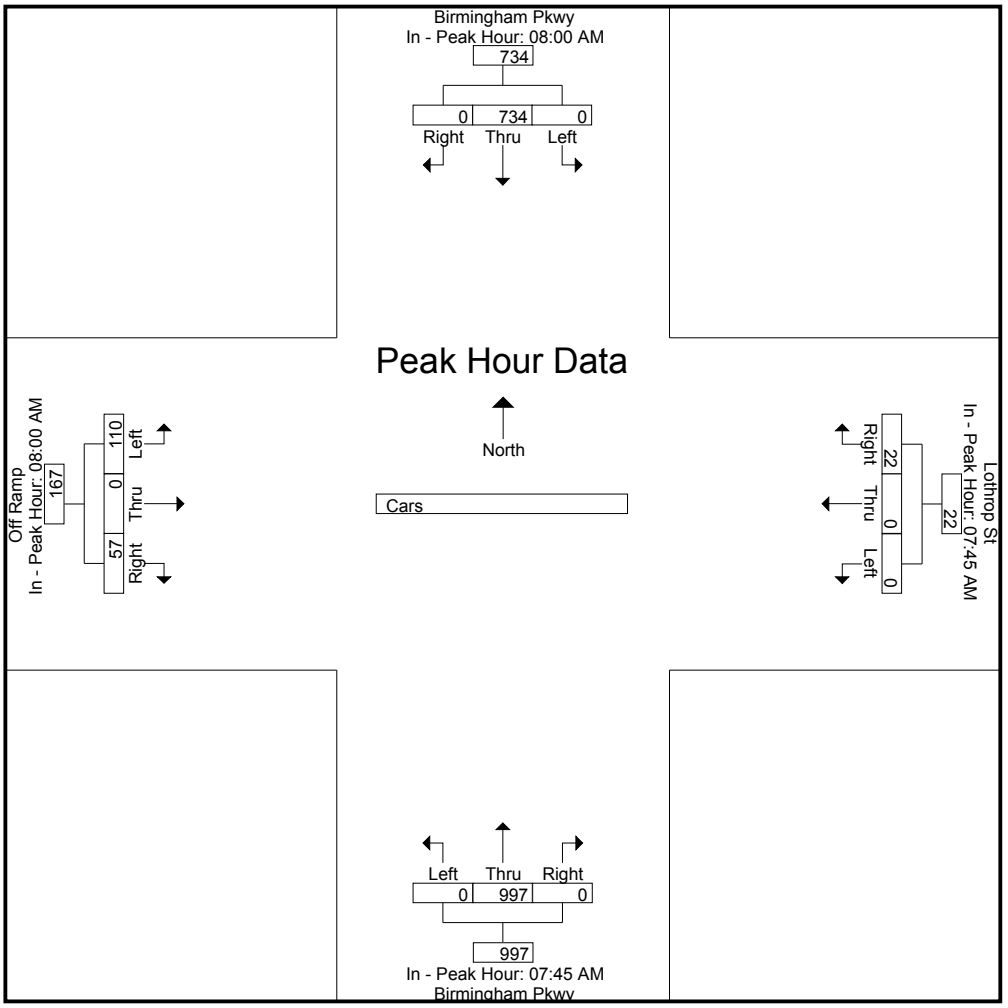
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				07:45 AM				08:00 AM			
+0 mins.	0	145	0	145	0	0	6	6	0	247	0	247	15	0	8	23
+15 mins.	0	160	0	160	0	0	5	5	0	255	0	255	30	0	10	40
+30 mins.	0	195	0	195	0	0	5	5	0	239	0	239	32	0	24	56
+45 mins.	0	234	0	234	0	0	6	6	0	256	0	256	33	0	15	48
Total Volume	0	734	0	734	0	0	22	22	0	997	0	997	110	0	57	167
% App. Total	0	100	0		0	0	100		0	100	0		65.9	0	34.1	
PHF	.000	.784	.000	.784	.000	.000	.917	.917	.000	.974	.000	.974	.833	.000	.594	.746

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015

Groups Printed- Trucks

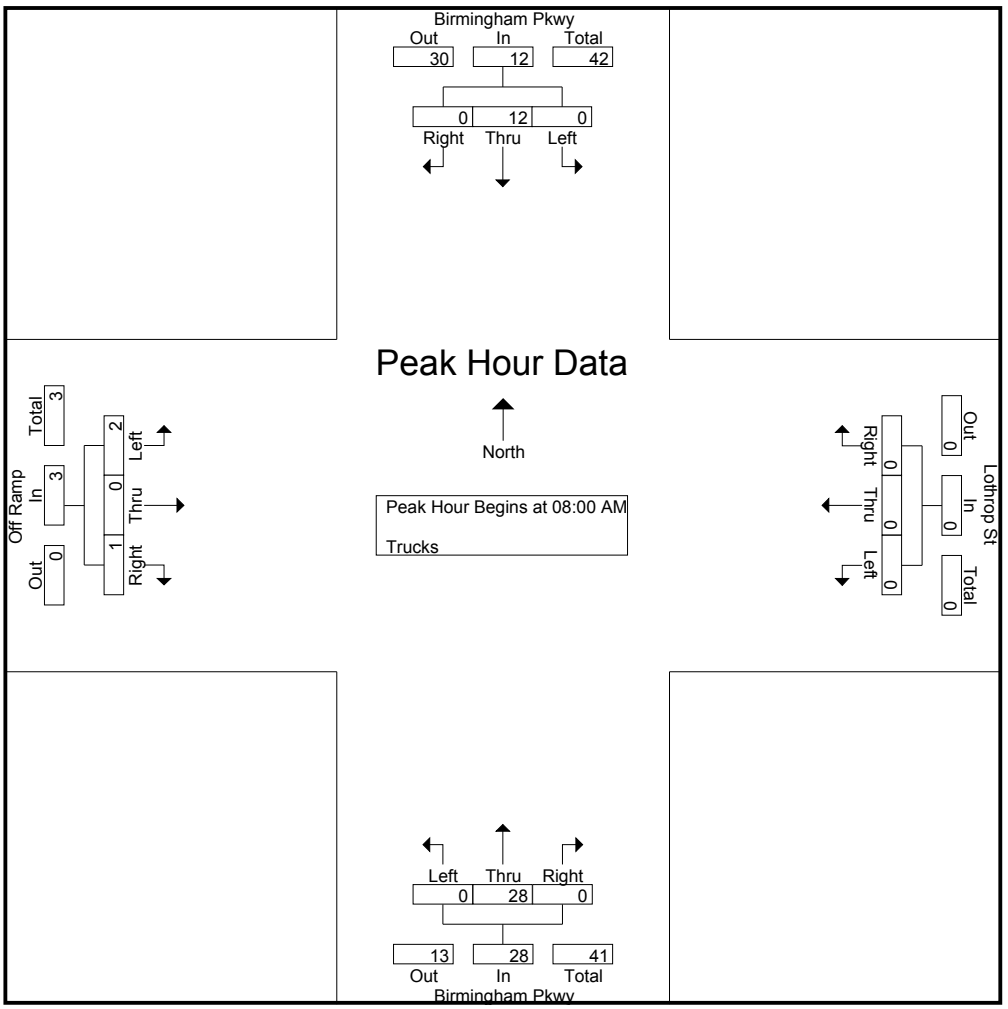
	Birmingham Pkwy From North			Lothrop St From East			Birmingham Pkwy From South			Off Ramp From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	4	0	0	0	0	0	3	0	0	0	3	10
07:15 AM	0	5	0	0	0	0	0	0	0	0	0	1	6
07:30 AM	0	5	0	0	0	0	0	7	0	0	0	0	12
07:45 AM	0	5	0	0	0	0	0	4	0	0	0	0	9
Total	0	19	0	0	0	0	0	14	0	0	0	4	37
08:00 AM	0	2	0	0	0	0	0	7	0	1	0	0	10
08:15 AM	0	2	0	0	0	0	0	2	0	0	0	0	4
08:30 AM	0	5	0	0	0	0	0	10	0	1	0	1	17
08:45 AM	0	3	0	0	0	0	0	9	0	0	0	0	12
Total	0	12	0	0	0	0	0	28	0	2	0	1	43
Grand Total	0	31	0	0	0	0	0	42	0	2	0	5	80
Apprch %	0	100	0	0	0	0	0	100	0	28.6	0	71.4	
Total %	0	38.8	0	0	0	0	0	52.5	0	2.5	0	6.2	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 8

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	2	0	2	0	0	0	0	0	7	0	7	1	0	0	1	10
08:15 AM	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
08:30 AM	0	5	0	5	0	0	0	0	0	10	0	10	1	0	1	2	17
08:45 AM	0	3	0	3	0	0	0	0	0	9	0	9	0	0	0	0	12
Total Volume	0	12	0	12	0	0	0	0	0	28	0	28	2	0	1	3	43
% App. Total	0	100	0		0	0	0		0	100	0		66.7	0	33.3		
PHF	.000	.600	.000	.600	.000	.000	.000	.000	.000	.700	.000	.700	.500	.000	.250	.375	.632



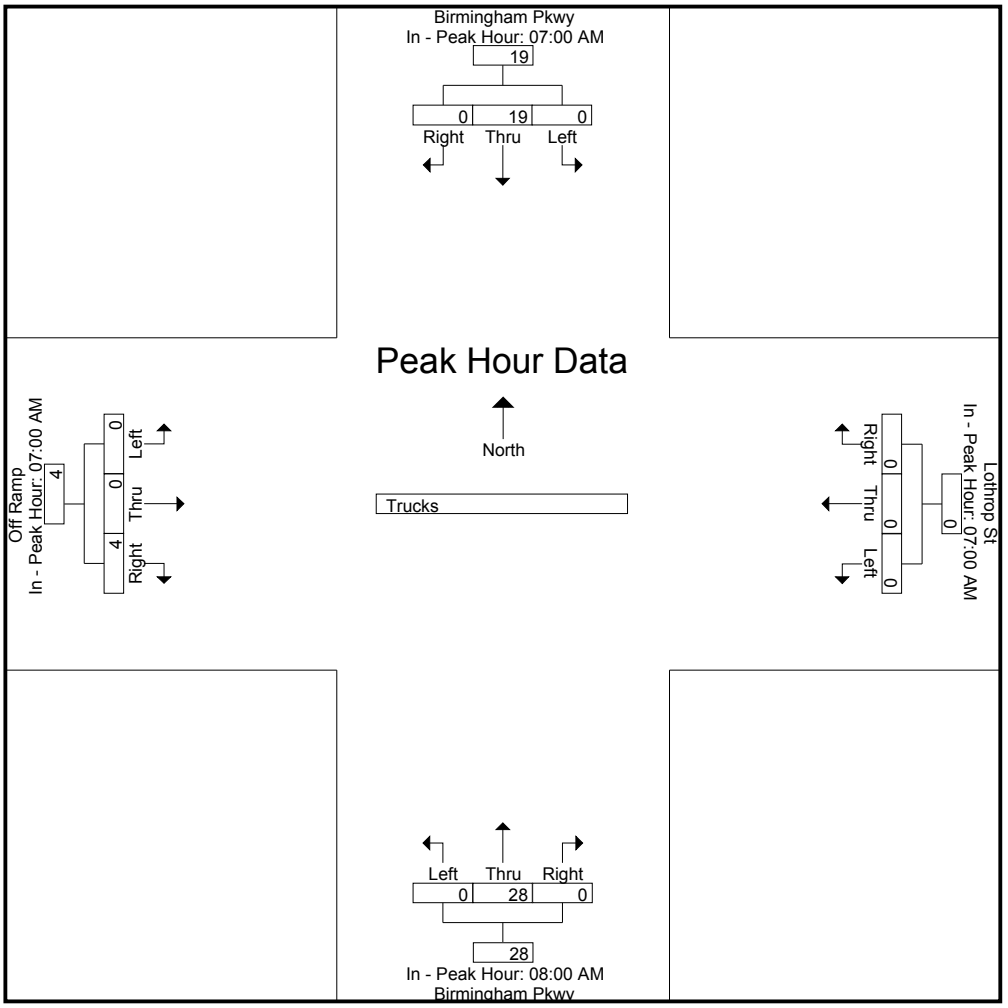
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	4	0	4	0	0	0	0	0	7	0	7	0	0	3	3
+15 mins.	0	5	0	5	0	0	0	0	0	2	0	2	0	0	1	1
+30 mins.	0	5	0	5	0	0	0	0	0	10	0	10	0	0	0	0
+45 mins.	0	5	0	5	0	0	0	0	0	9	0	9	0	0	0	0
Total Volume	0	19	0	19	0	0	0	0	0	28	0	28	0	0	4	4
% App. Total	0	100	0		0	0	0		0	100	0		0	0	100	
PHF	.000	.950	.000	.950	.000	.000	.000	.000	.000	.700	.000	.700	.000	.000	.333	.333

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 10

Groups Printed- Bikes Peds

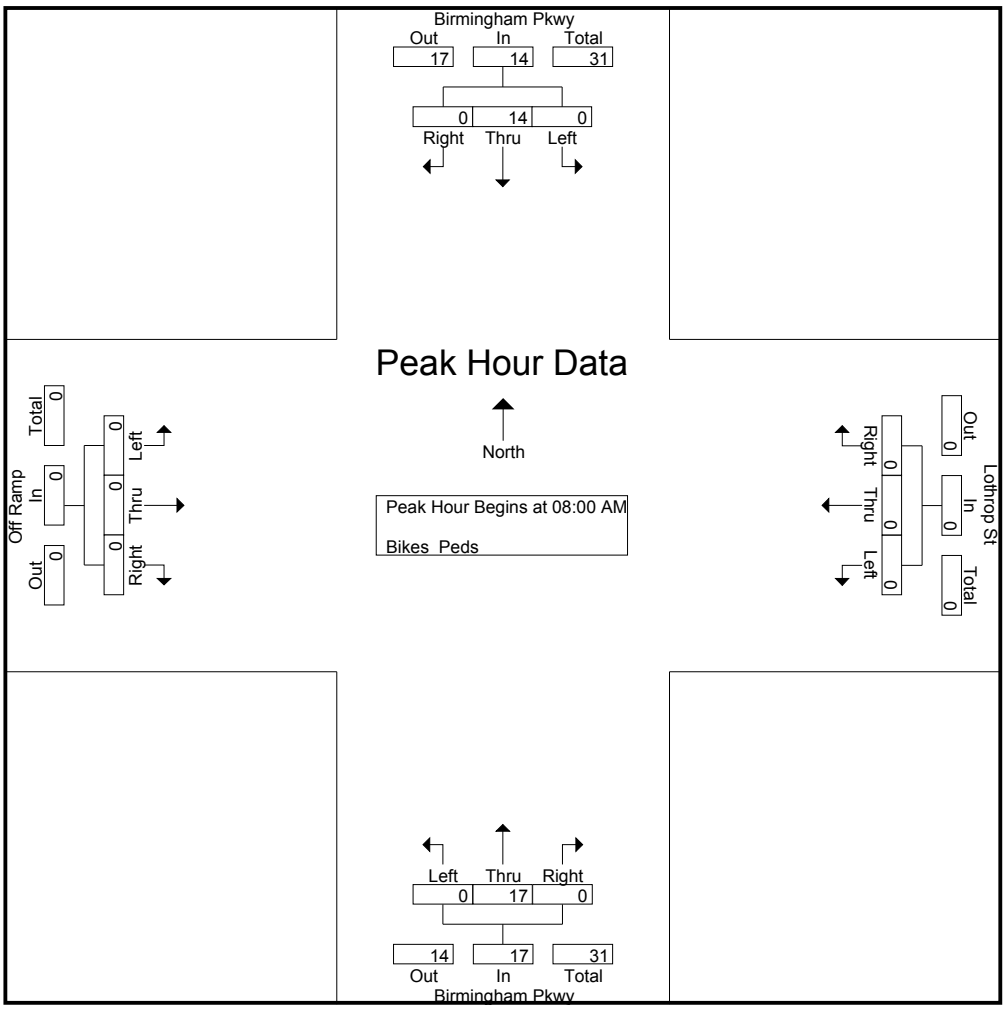
	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	1	0	0	0	10	0	3	0	1	0	0	1	0	12	4	16
07:15 AM	0	1	0	1	0	0	0	3	0	4	0	0	0	0	0	0	4	5	9
07:30 AM	0	1	0	1	0	0	0	7	0	4	0	1	0	0	0	0	9	5	14
07:45 AM	0	3	0	3	0	0	0	7	0	6	0	0	0	0	0	1	11	9	20
Total	0	5	0	6	0	0	0	27	0	17	0	2	0	0	1	1	36	23	59
08:00 AM	0	3	0	2	0	0	0	10	0	4	0	0	0	0	0	0	12	7	19
08:15 AM	0	3	0	0	0	0	0	9	0	4	0	0	0	0	0	1	10	7	17
08:30 AM	0	3	0	2	0	0	0	4	0	0	0	0	0	0	0	1	7	3	10
08:45 AM	0	5	0	0	0	0	0	3	0	9	0	0	0	0	0	1	4	14	18
Total	0	14	0	4	0	0	0	26	0	17	0	0	0	0	0	3	33	31	64
Grand Total	0	19	0	10	0	0	0	53	0	34	0	2	0	0	1	4	69	54	123
Apprch %	0	100	0		0	0	0		0	100	0		0	0	100				
Total %	0	35.2	0		0	0	0		0	63	0		0	0	1.9		56.1	43.9	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 11

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0	7
08:15 AM	0	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0	7
08:30 AM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
08:45 AM	0	5	0	5	0	0	0	0	0	9	0	9	0	0	0	0	14
Total Volume	0	14	0	14	0	0	0	0	0	17	0	17	0	0	0	0	31
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.700	.000	.700	.000	.000	.000	.000	.000	.472	.000	.472	.000	.000	.000	.000	.554



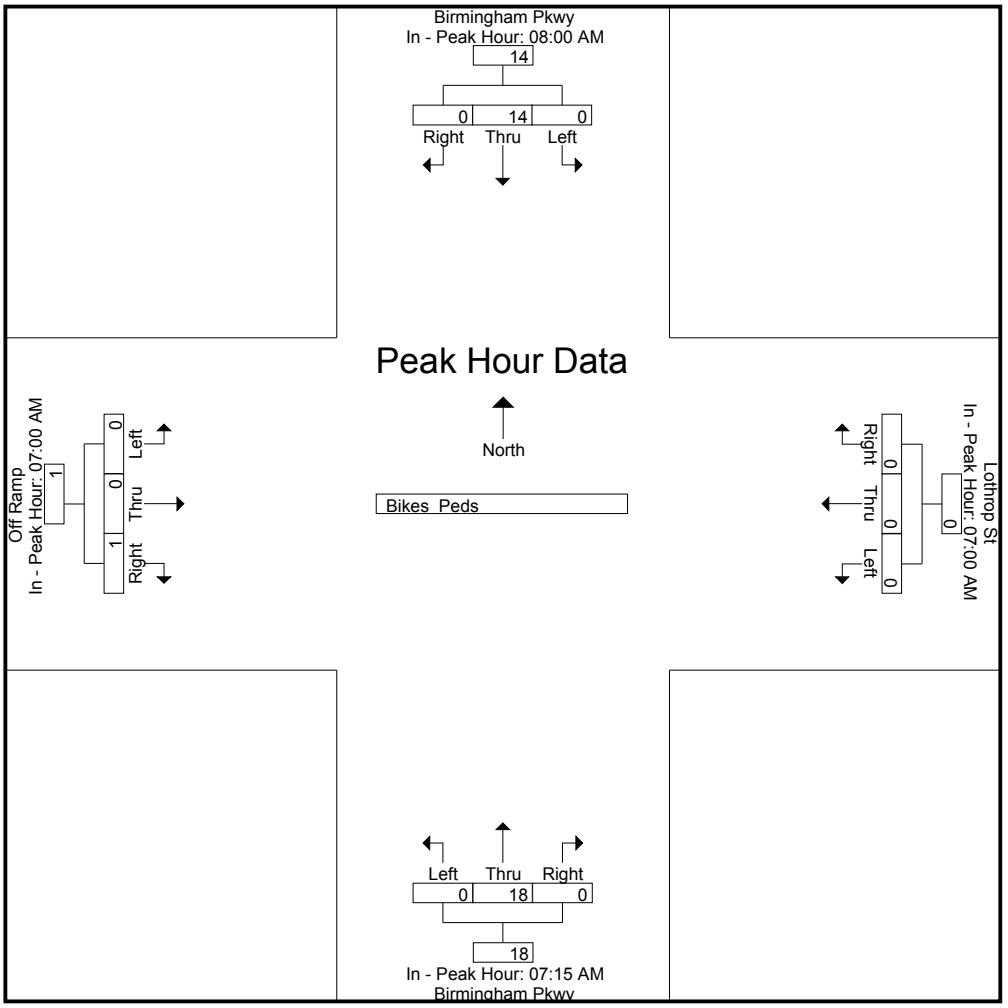
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:15 AM				07:00 AM			
+0 mins.	0	3	0	3	0	0	0	0	0	4	0	4	0	0	1	1
+15 mins.	0	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0
+30 mins.	0	3	0	3	0	0	0	0	0	6	0	6	0	0	0	0
+45 mins.	0	5	0	5	0	0	0	0	0	4	0	4	0	0	0	0
Total Volume	0	14	0	14	0	0	0	0	0	18	0	18	0	0	1	1
% App. Total	0	100	0		0	0	0		0	100	0		0	0	100	
PHF	.000	.700	.000	.700	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.250	.250

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Trucks

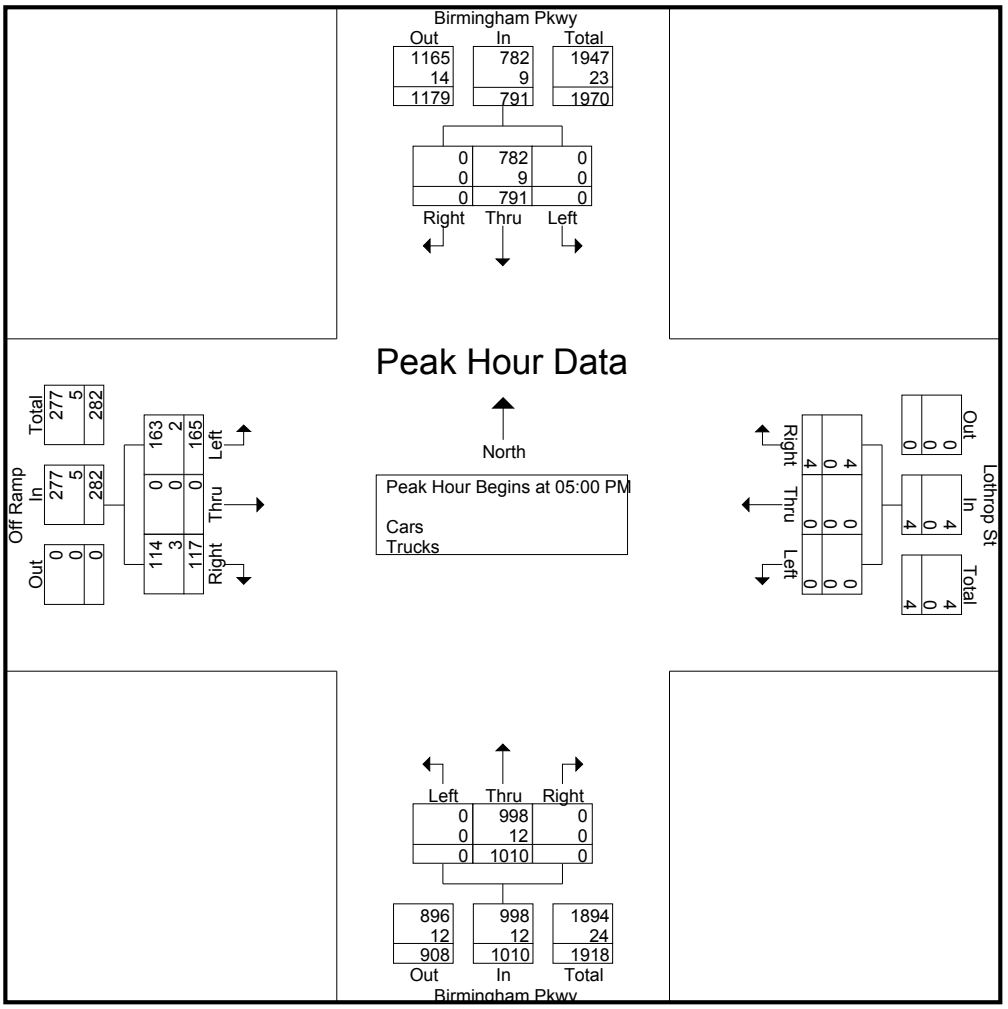
	Birmingham Pkwy From North			Lothrop St From East			Birmingham Pkwy From South			Off Ramp From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	189	0	0	0	2	0	242	0	52	0	27	512
04:15 PM	0	159	0	1	0	6	0	216	0	43	0	24	449
04:30 PM	0	190	0	0	0	2	0	202	0	31	0	24	449
04:45 PM	0	190	0	0	0	0	0	220	0	28	0	14	452
Total	0	728	0	1	0	10	0	880	0	154	0	89	1862
05:00 PM	0	183	0	0	0	1	0	248	0	41	0	27	500
05:15 PM	0	193	0	0	0	3	0	280	0	42	0	24	542
05:30 PM	0	205	0	0	0	0	0	245	0	40	0	35	525
05:45 PM	0	210	0	0	0	0	0	237	0	42	0	31	520
Total	0	791	0	0	0	4	0	1010	0	165	0	117	2087
Grand Total	0	1519	0	1	0	14	0	1890	0	319	0	206	3949
Apprch %	0	100	0	6.7	0	93.3	0	100	0	60.8	0	39.2	
Total %	0	38.5	0	0	0	0.4	0	47.9	0	8.1	0	5.2	
Cars	0	1501	0	1	0	14	0	1863	0	316	0	201	3896
% Cars	0	98.8	0	100	0	100	0	98.6	0	99.1	0	97.6	98.7
Trucks	0	18	0	0	0	0	0	27	0	3	0	5	53
% Trucks	0	1.2	0	0	0	0	0	1.4	0	0.9	0	2.4	1.3

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 2

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	183	0	183	0	0	1	1	0	248	0	248	41	0	27	68	500
05:15 PM	0	193	0	193	0	0	3	3	0	280	0	280	42	0	24	66	542
05:30 PM	0	205	0	205	0	0	0	0	0	245	0	245	40	0	35	75	525
05:45 PM	0	210	0	210	0	0	0	0	0	237	0	237	42	0	31	73	520
Total Volume	0	791	0	791	0	0	4	4	0	1010	0	1010	165	0	117	282	2087
% App. Total	0	100	0		0	0	100		0	100	0		58.5	0	41.5		
PHF	.000	.942	.000	.942	.000	.000	.333	.333	.000	.902	.000	.902	.982	.000	.836	.940	.963
Cars	0	782	0	782	0	0	4	4	0	998	0	998	163	0	114	277	2061
% Cars	0	98.9	0	98.9	0	0	100	100	0	98.8	0	98.8	98.8	0	97.4	98.2	98.8
Trucks	0	9	0	9	0	0	0	0	0	12	0	12	2	0	3	5	26
% Trucks	0	1.1	0	1.1	0	0	0	0	0	1.2	0	1.2	1.2	0	2.6	1.8	1.2

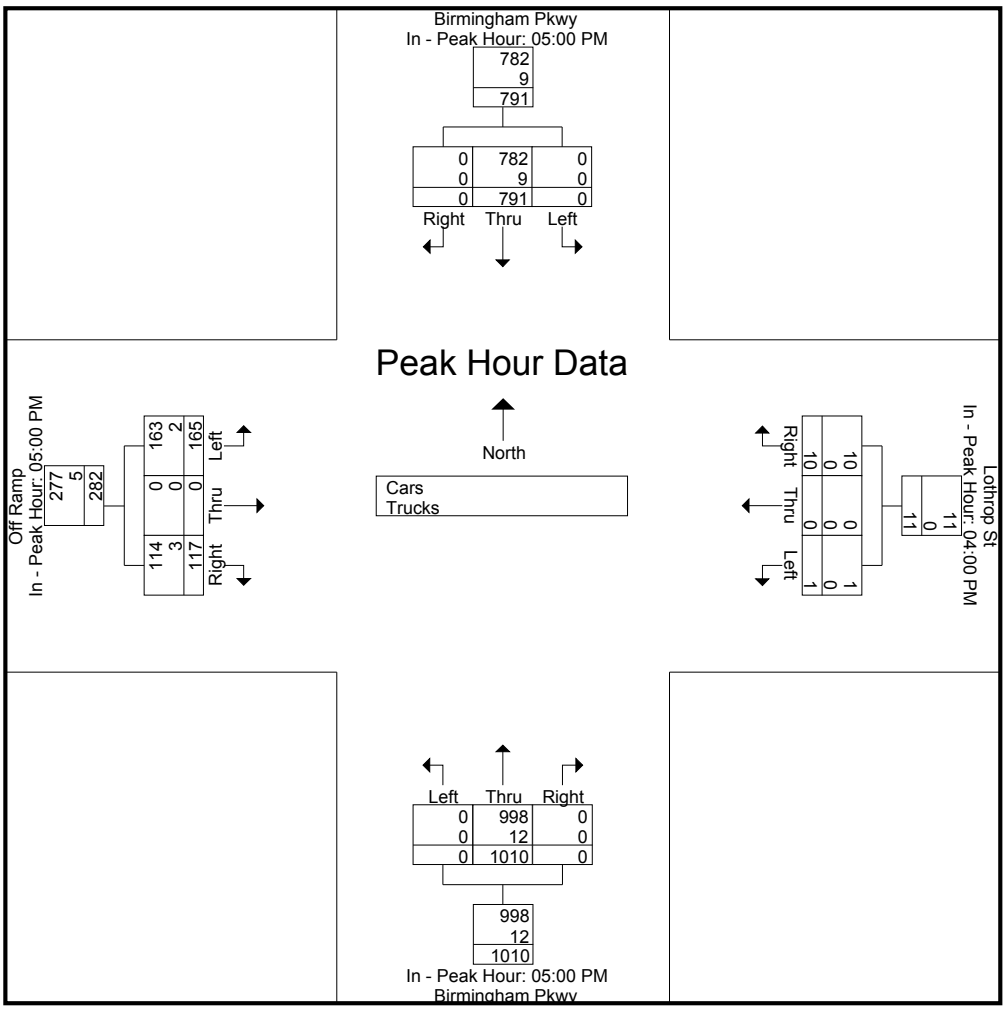


Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 3

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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 Each Approach Begins at:																	
	05:00 PM				04:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	183	0	183	0	0	2	2	0	248	0	248	41	0	27	68	
+15 mins.	0	193	0	193	1	0	6	7	0	280	0	280	42	0	24	66	
+30 mins.	0	205	0	205	0	0	2	2	0	245	0	245	40	0	35	75	
+45 mins.	0	210	0	210	0	0	0	0	0	237	0	237	42	0	31	73	
Total Volume	0	791	0	791	1	0	10	11	0	1010	0	1010	165	0	117	282	
% App. Total	0	100	0		9.1	0	90.9		0	100	0		58.5	0	41.5		
PHF	.000	.942	.000	.942	.250	.000	.417	.393	.000	.902	.000	.902	.982	.000	.836	.940	
Cars	0	782	0	782	1	0	10	11	0	998	0	998	163	0	114	277	
% Cars	0	98.9	0	98.9	100	0	100	100	0	98.8	0	98.8	98.8	0	97.4	98.2	
Trucks	0	9	0	9	0	0	0	0	0	12	0	12	2	0	3	5	
% Trucks	0	1.1	0	1.1	0	0	0	0	0	1.2	0	1.2	1.2	0	2.6	1.8	



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015

Groups Printed- Cars

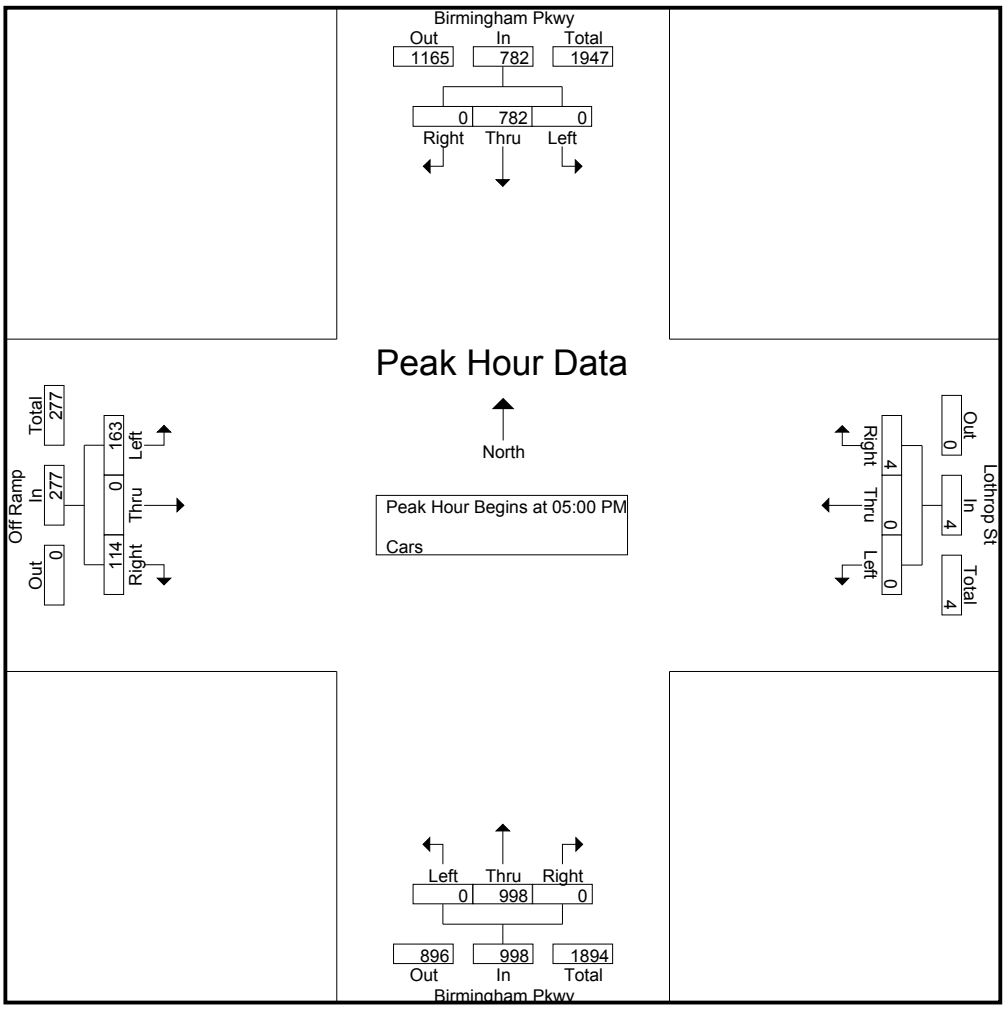
	Birmingham Pkwy From North			Lothrop St From East			Birmingham Pkwy From South			Off Ramp From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	187	0	0	0	2	0	237	0	52	0	25	503
04:15 PM	0	156	0	1	0	6	0	212	0	43	0	24	442
04:30 PM	0	189	0	0	0	2	0	200	0	31	0	24	446
04:45 PM	0	187	0	0	0	0	0	216	0	27	0	14	444
Total	0	719	0	1	0	10	0	865	0	153	0	87	1835
05:00 PM	0	181	0	0	0	1	0	246	0	40	0	26	494
05:15 PM	0	190	0	0	0	3	0	275	0	42	0	22	532
05:30 PM	0	202	0	0	0	0	0	242	0	39	0	35	518
05:45 PM	0	209	0	0	0	0	0	235	0	42	0	31	517
Total	0	782	0	0	0	4	0	998	0	163	0	114	2061
Grand Total	0	1501	0	1	0	14	0	1863	0	316	0	201	3896
Apprch %	0	100	0	6.7	0	93.3	0	100	0	61.1	0	38.9	
Total %	0	38.5	0	0	0	0.4	0	47.8	0	8.1	0	5.2	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 5

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	181	0	181	0	0	1	1	0	246	0	246	40	0	26	66	494
05:15 PM	0	190	0	190	0	0	3	3	0	275	0	275	42	0	22	64	532
05:30 PM	0	202	0	202	0	0	0	0	0	242	0	242	39	0	35	74	518
05:45 PM	0	209	0	209	0	0	0	0	0	235	0	235	42	0	31	73	517
Total Volume	0	782	0	782	0	0	4	4	0	998	0	998	163	0	114	277	2061
% App. Total	0	100	0		0	0	100		0	100	0		58.8	0	41.2		
PHF	.000	.935	.000	.935	.000	.000	.333	.333	.000	.907	.000	.907	.970	.000	.814	.936	.969



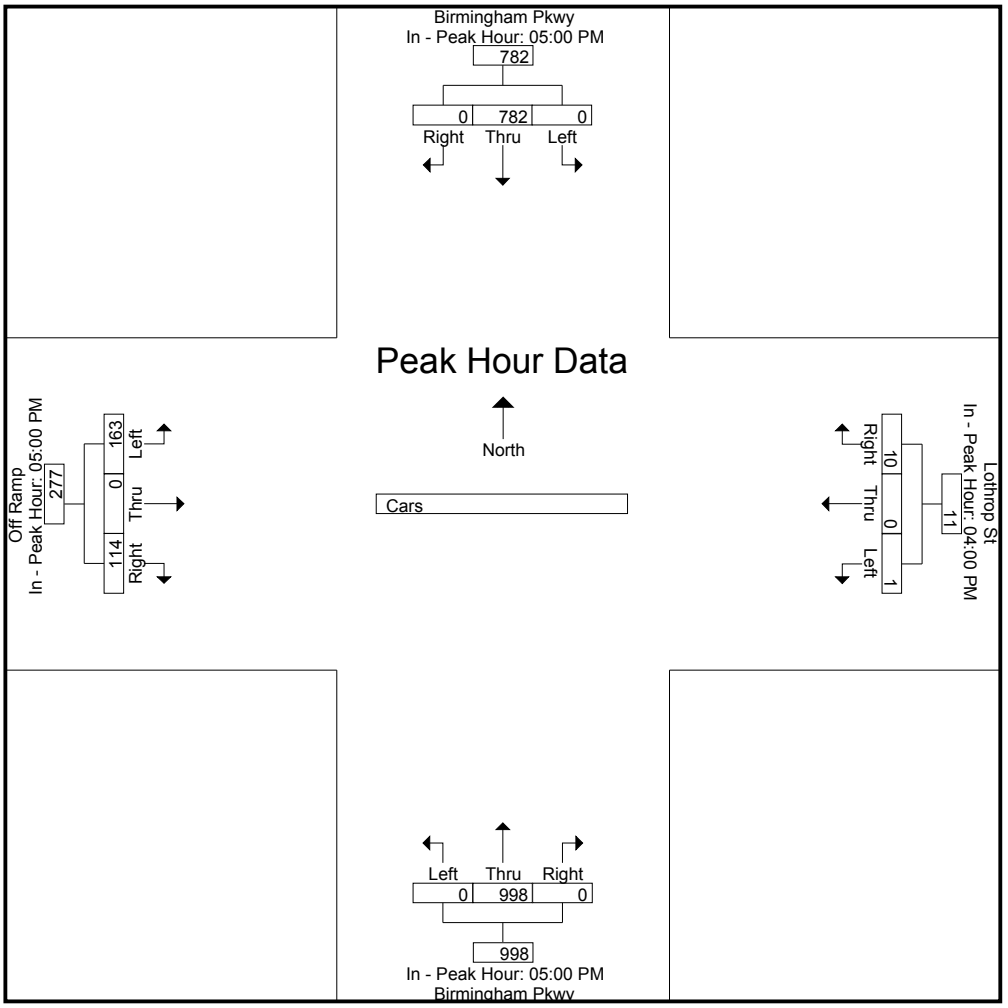
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	181	0	181	0	0	2	2	0	246	0	246	40	0	26	66
+15 mins.	0	190	0	190	1	0	6	7	0	275	0	275	42	0	22	64
+30 mins.	0	202	0	202	0	0	2	2	0	242	0	242	39	0	35	74
+45 mins.	0	209	0	209	0	0	0	0	0	235	0	235	42	0	31	73
Total Volume	0	782	0	782	1	0	10	11	0	998	0	998	163	0	114	277
% App. Total	0	100	0		9.1	0	90.9		0	100	0		58.8	0	41.2	
PHF	.000	.935	.000	.935	.250	.000	.417	.393	.000	.907	.000	.907	.970	.000	.814	.936

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015

Groups Printed- Trucks

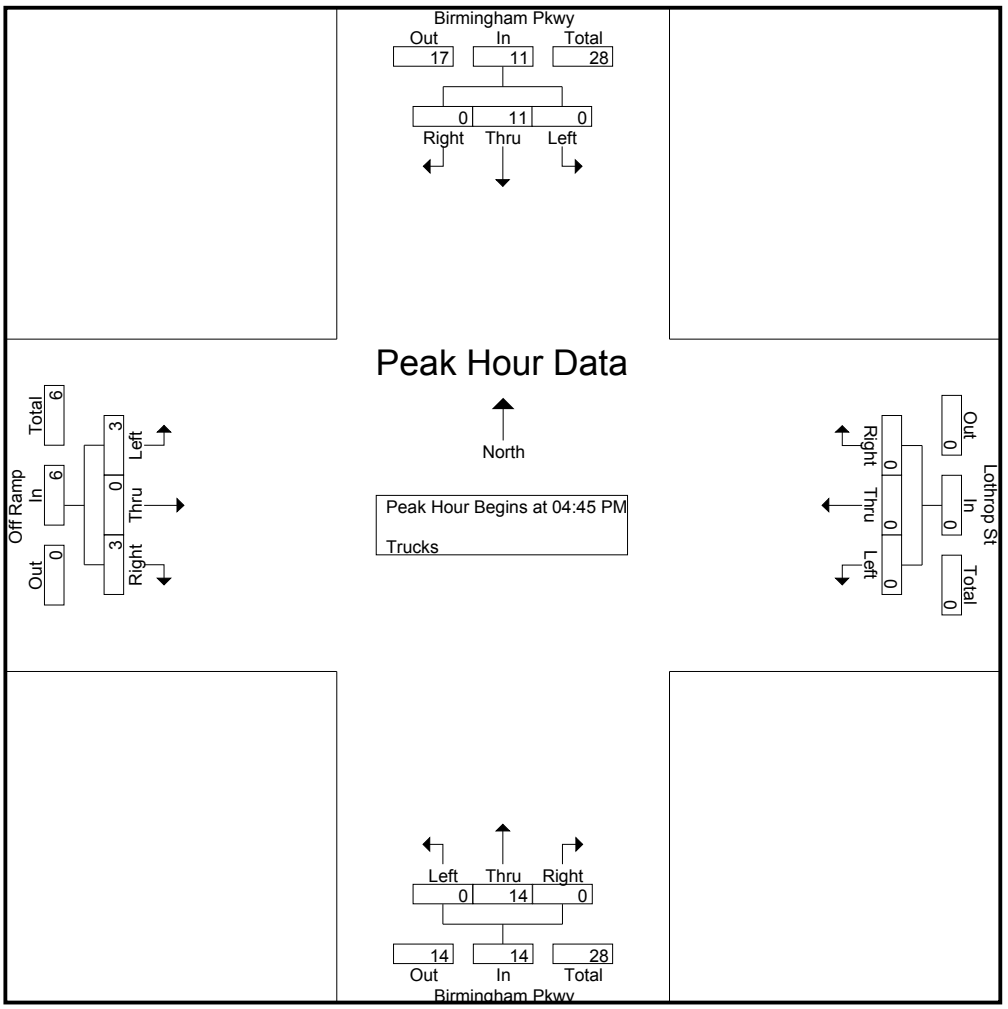
	Birmingham Pkwy From North			Lothrop St From East			Birmingham Pkwy From South			Off Ramp From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	2	0	0	0	0	0	5	0	0	0	2	9
04:15 PM	0	3	0	0	0	0	0	4	0	0	0	0	7
04:30 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
04:45 PM	0	3	0	0	0	0	0	4	0	1	0	0	8
Total	0	9	0	0	0	0	0	15	0	1	0	2	27
05:00 PM	0	2	0	0	0	0	0	2	0	1	0	1	6
05:15 PM	0	3	0	0	0	0	0	5	0	0	0	2	10
05:30 PM	0	3	0	0	0	0	0	3	0	1	0	0	7
05:45 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
Total	0	9	0	0	0	0	0	12	0	2	0	3	26
Grand Total	0	18	0	0	0	0	0	27	0	3	0	5	53
Apprch %	0	100	0	0	0	0	0	100	0	37.5	0	62.5	
Total %	0	34	0	0	0	0	0	50.9	0	5.7	0	9.4	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 8

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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	3	0	3	0	0	0	0	0	4	0	4	1	0	0	1	8
05:00 PM	0	2	0	2	0	0	0	0	0	2	0	2	1	0	1	2	6
05:15 PM	0	3	0	3	0	0	0	0	0	5	0	5	0	0	2	2	10
05:30 PM	0	3	0	3	0	0	0	0	0	3	0	3	1	0	0	1	7
Total Volume	0	11	0	11	0	0	0	0	0	14	0	14	3	0	3	6	31
% App. Total	0	100	0		0	0	0		0	100	0		50	0	50		
PHF	.000	.917	.000	.917	.000	.000	.000	.000	.000	.700	.000	.700	.750	.000	.375	.750	.775



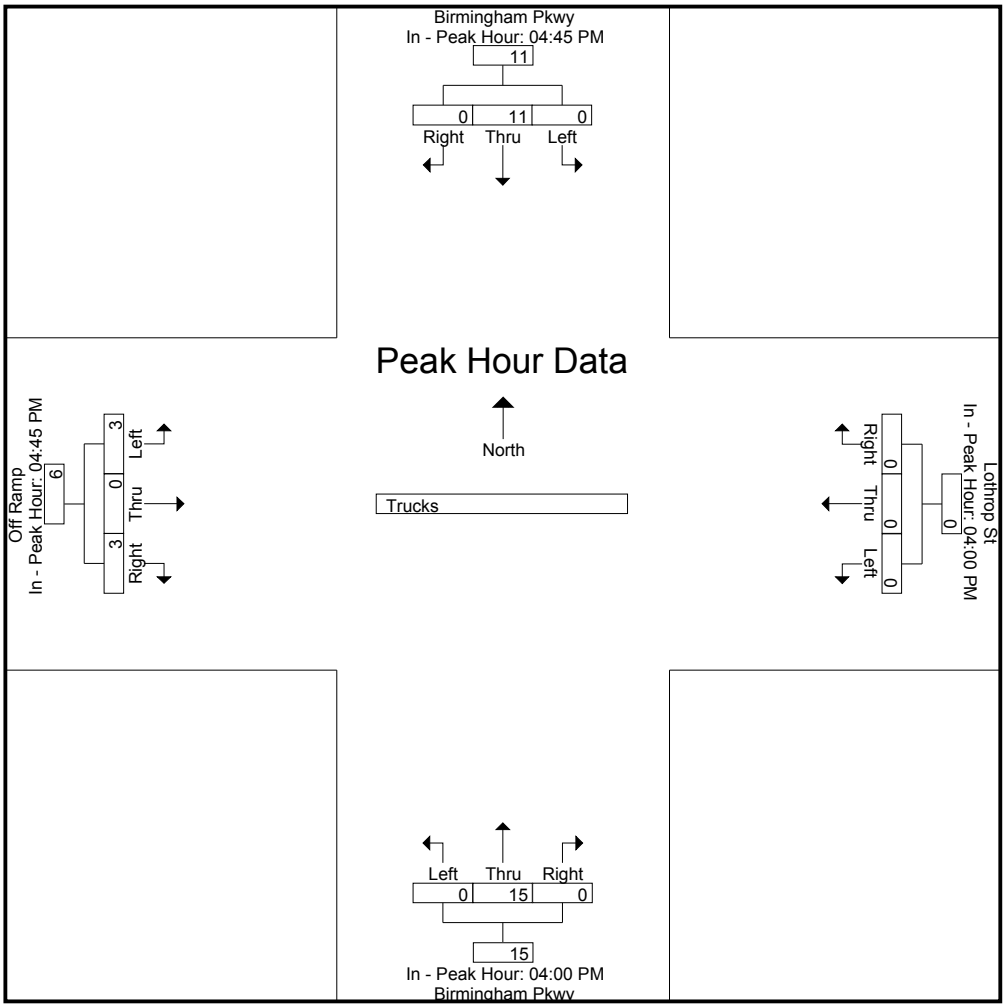
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	0	3	0	3	0	0	0	0	0	5	0	5	1	0	0	1
+15 mins.	0	2	0	2	0	0	0	0	0	4	0	4	1	0	1	2
+30 mins.	0	3	0	3	0	0	0	0	0	2	0	2	0	0	2	2
+45 mins.	0	3	0	3	0	0	0	0	0	4	0	4	1	0	0	1
Total Volume	0	11	0	11	0	0	0	0	0	15	0	15	3	0	3	6
% App. Total	0	100	0		0	0	0		0	100	0		50	0	50	
PHF	.000	.917	.000	.917	.000	.000	.000	.000	.000	.750	.000	.750	.750	.000	.375	.750

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 10

Groups Printed- Bikes Peds

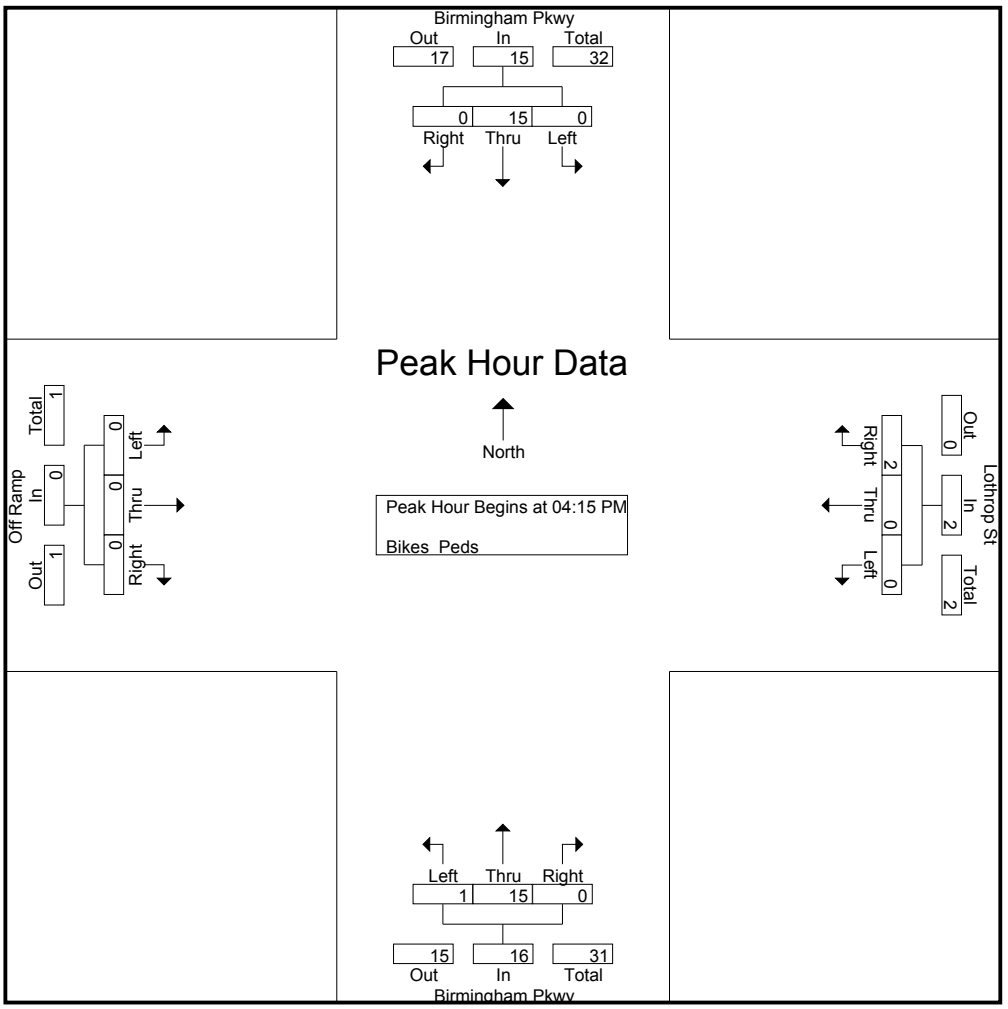
	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	3	0	2	0	0	0	6	0	0	0	1	0	0	0	2	11	3	14
04:15 PM	0	3	0	0	0	0	1	6	0	7	0	0	0	0	0	0	6	11	17
04:30 PM	0	7	0	3	0	0	0	3	0	2	0	1	0	0	0	1	8	9	17
04:45 PM	0	3	0	4	0	0	0	6	1	1	0	0	0	0	0	0	10	5	15
Total	0	16	0	9	0	0	1	21	1	10	0	2	0	0	0	3	35	28	63
05:00 PM	0	2	0	5	0	0	1	9	0	5	0	1	0	0	0	0	15	8	23
05:15 PM	0	5	0	0	0	0	0	5	0	6	0	0	0	0	0	0	5	11	16
05:30 PM	0	0	0	1	0	0	0	6	0	5	0	0	0	0	0	0	7	5	12
05:45 PM	0	5	0	0	0	0	0	11	0	2	0	0	0	0	0	1	12	7	19
Total	0	12	0	6	0	0	1	31	0	18	0	1	0	0	0	1	39	31	70
Grand Total	0	28	0	15	0	0	2	52	1	28	0	3	0	0	0	4	74	59	133
Apprch %	0	100	0		0	0	100		3.4	96.6	0		0	0	0				
Total %	0	47.5	0		0	0	3.4		1.7	47.5	0		0	0	0		55.6	44.4	

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 11

	Birmingham Pkwy From North				Lothrop St From East				Birmingham Pkwy From South				Off Ramp 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 04:15 PM																	
04:15 PM	0	3	0	3	0	0	1	1	0	7	0	7	0	0	0	0	11
04:30 PM	0	7	0	7	0	0	0	0	0	2	0	2	0	0	0	0	9
04:45 PM	0	3	0	3	0	0	0	0	1	1	0	2	0	0	0	0	5
05:00 PM	0	2	0	2	0	0	1	1	0	5	0	5	0	0	0	0	8
Total Volume	0	15	0	15	0	0	2	2	1	15	0	16	0	0	0	0	33
% App. Total	0	100	0		0	0	100		6.2	93.8	0		0	0	0		
PHF	.000	.536	.000	.536	.000	.000	.500	.500	.250	.536	.000	.571	.000	.000	.000	.000	.750



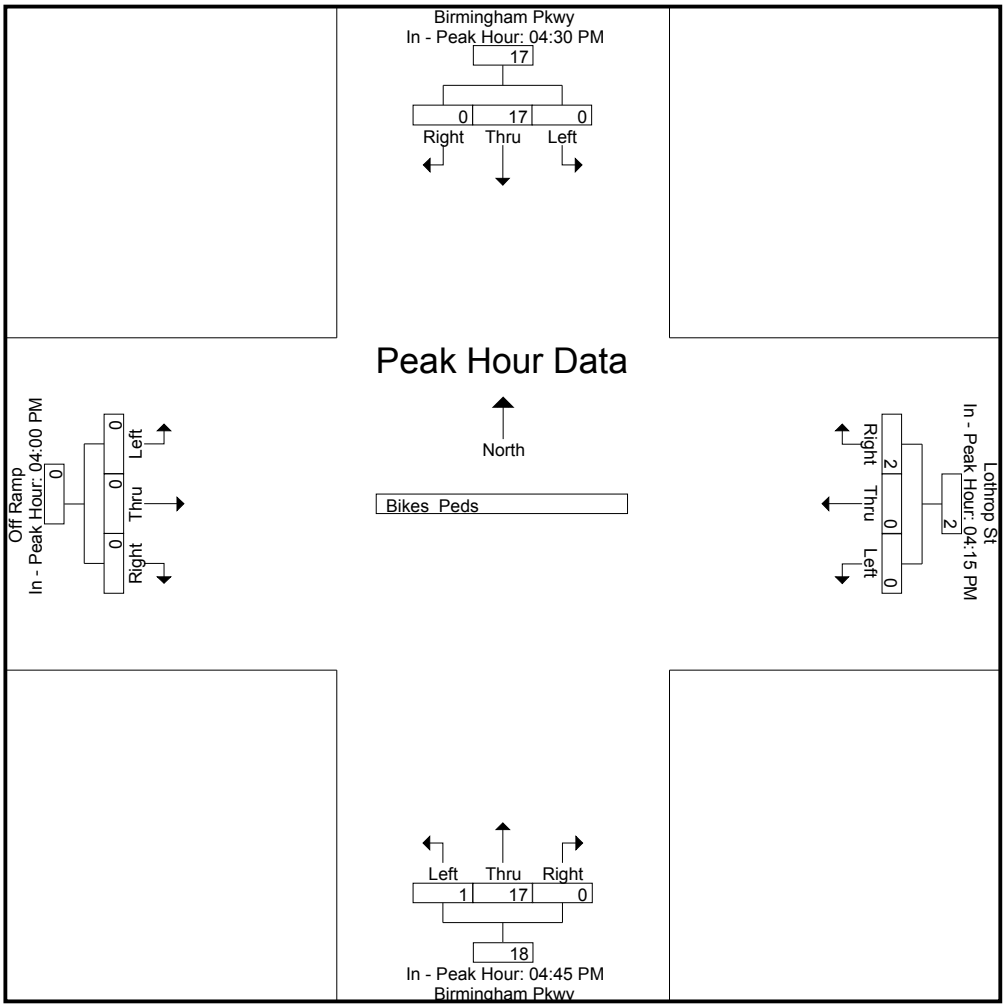
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:15 PM				04:45 PM				04:00 PM			
+0 mins.	0	7	0	7	0	0	1	1	1	1	0	2	0	0	0	0
+15 mins.	0	3	0	3	0	0	0	0	0	5	0	5	0	0	0	0
+30 mins.	0	2	0	2	0	0	0	0	0	6	0	6	0	0	0	0
+45 mins.	0	5	0	5	0	0	1	1	0	5	0	5	0	0	0	0
Total Volume	0	17	0	17	0	0	2	2	1	17	0	18	0	0	0	0
% App. Total	0	100	0		0	0	100		5.6	94.4	0		0	0	0	
PHF	.000	.607	.000	.607	.000	.000	.500	.500	.250	.708	.000	.750	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Birmingham Parkway
E/W Street : Lothrop St / Off Ramp
City/State : Brighton, MA
Weather : Clear

File Name : 15090005
Site Code : 15090005
Start Date : 9/15/2015
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Cars - Trucks

	Birmingham Pkwy From North			Lincoln St From East			Market St From South			Birmingham Pkwy From West				
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
07:00 AM	0	148	9	24	29	10	6	117	0	25	0	14	1	383
07:15 AM	0	129	17	27	37	10	7	120	0	40	0	21	1	409
07:30 AM	0	146	18	34	39	9	8	171	0	57	0	22	1	505
07:45 AM	0	144	13	26	37	15	14	156	0	82	0	18	0	505
Total	0	567	57	111	142	44	35	564	0	204	0	75	3	1802
08:00 AM	0	157	9	21	42	11	10	168	0	72	0	25	2	517
08:15 AM	0	184	19	31	50	16	9	143	0	70	0	28	1	551
08:30 AM	0	170	18	40	54	14	6	140	0	62	0	34	5	543
08:45 AM	0	215	12	31	37	13	11	130	0	53	0	30	2	534
Total	0	726	58	123	183	54	36	581	0	257	0	117	10	2145
Grand Total	0	1293	115	234	325	98	71	1145	0	461	0	192	13	3947
Apprch %	0	91.8	8.2	35.6	49.5	14.9	5.8	94.2	0	69.2	0	28.8	2	
Total %	0	32.8	2.9	5.9	8.2	2.5	1.8	29	0	11.7	0	4.9	0.3	
Cars	0	1268	113	228	323	95	71	1110	0	457	0	192	13	3870
% Cars	0	98.1	98.3	97.4	99.4	96.9	100	96.9	0	99.1	0	100	100	98
Trucks	0	25	2	6	2	3	0	35	0	4	0	0	0	77
% Trucks	0	1.9	1.7	2.6	0.6	3.1	0	3.1	0	0.9	0	0	0	2

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

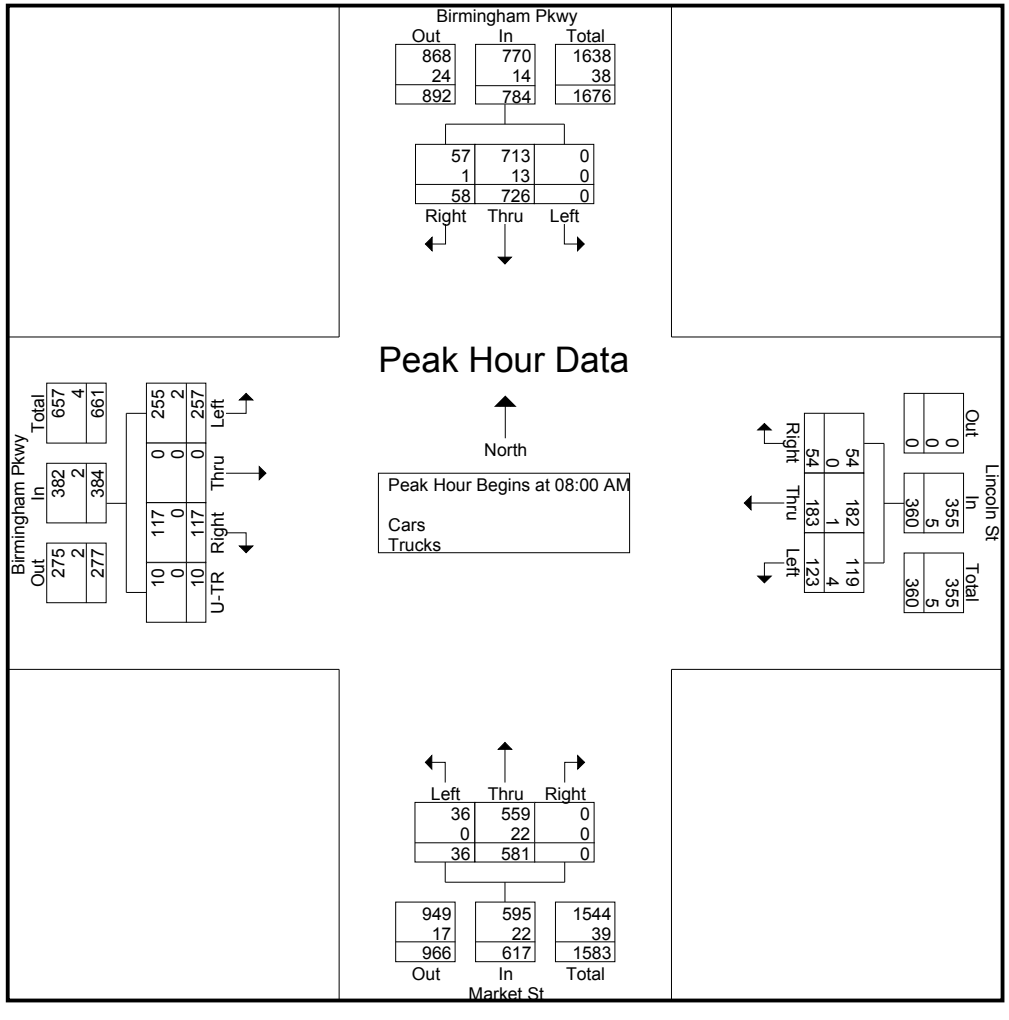
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 2

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	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	157	9	166	21	42	11	74	10	168	0	178	72	0	25	2	99	517
08:15 AM	0	184	19	203	31	50	16	97	9	143	0	152	70	0	28	1	99	551
08:30 AM	0	170	18	188	40	54	14	108	6	140	0	146	62	0	34	5	101	543
08:45 AM	0	215	12	227	31	37	13	81	11	130	0	141	53	0	30	2	85	534
Total Volume	0	726	58	784	123	183	54	360	36	581	0	617	257	0	117	10	384	2145
% App. Total	0	92.6	7.4		34.2	50.8	15		5.8	94.2	0		66.9	0	30.5	2.6		
PHF	.000	.844	.763	.863	.769	.847	.844	.833	.818	.865	.000	.867	.892	.000	.860	.500	.950	.973
Cars	0	713	57	770	119	182	54	355	36	559	0	595	255	0	117	10	382	2102
% Cars	0	98.2	98.3	98.2	96.7	99.5	100	98.6	100	96.2	0	96.4	99.2	0	100	100	99.5	98.0
Trucks	0	13	1	14	4	1	0	5	0	22	0	22	2	0	0	0	2	43
% Trucks	0	1.8	1.7	1.8	3.3	0.5	0	1.4	0	3.8	0	3.6	0.8	0	0	0	0.5	2.0

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

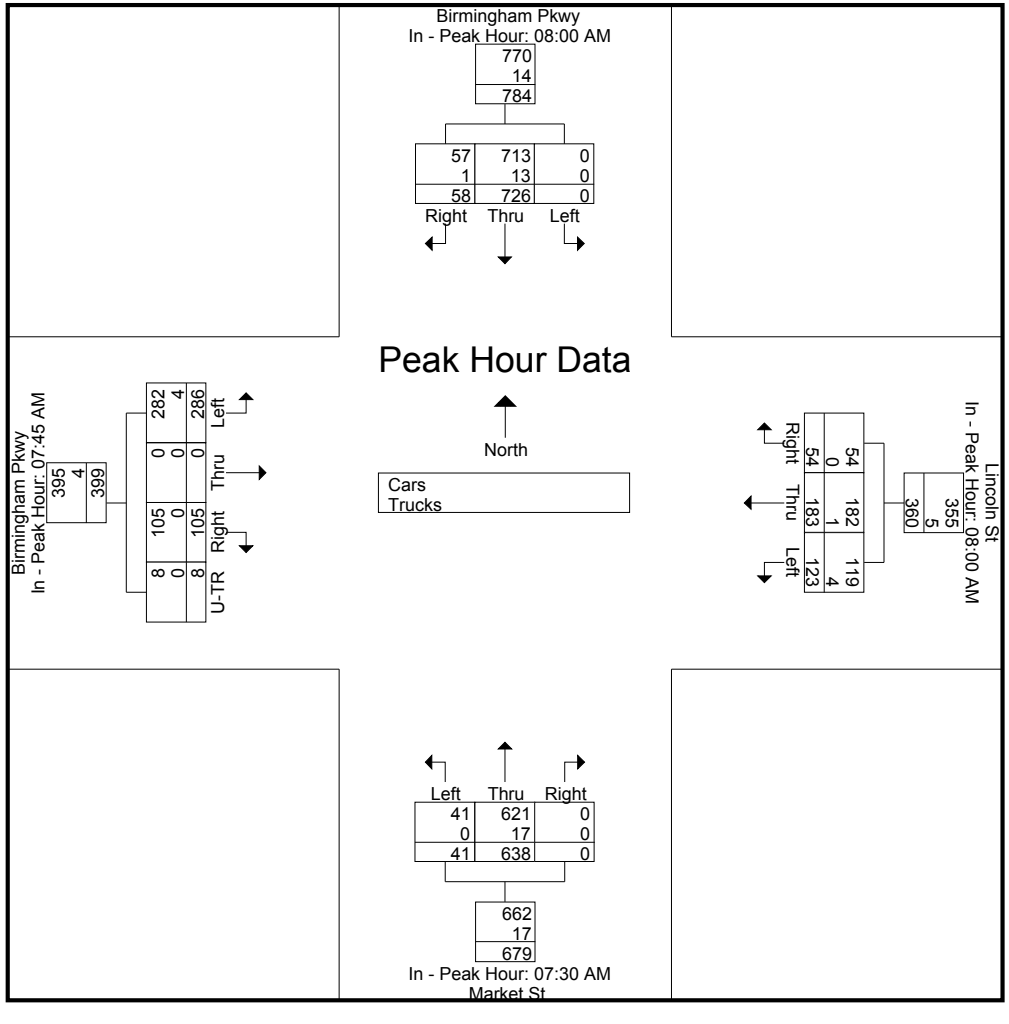
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:30 AM				07:45 AM			
+0 mins.	0	157	9	166	21	42	11	74	8	171	0	179	82	0	18	0	100
+15 mins.	0	184	19	203	31	50	16	97	14	156	0	170	72	0	25	2	99
+30 mins.	0	170	18	188	40	54	14	108	10	168	0	178	70	0	28	1	99
+45 mins.	0	215	12	227	31	37	13	81	9	143	0	152	62	0	34	5	101
Total Volume	0	726	58	784	123	183	54	360	41	638	0	679	286	0	105	8	399

Accurate Counts

978-664-2565

% App. Total	0	92.6	7.4		34.2	50.8	15		6	94	0		71.7	0	26.3	2		
PHF	.000	.844	.763	.863	.769	.847	.844	.833	.732	.933	.000	.948	.872	.000	.772	.400	.988	
Cars	0	713	57	770	119	182	54	355	41	621	0	662	282	0	105	8	395	
% Cars	0	98.2	98.3	98.2	96.7	99.5	100	98.6	100	97.3	0	97.5	98.6	0	100	100	99	
Trucks	0	13	1	14	4	1	0	5	0	17	0	17	4	0	0	0	4	
% Trucks	0	1.8	1.7	1.8	3.3	0.5	0	1.4	0	2.7	0	2.5	1.4	0	0	0	1	



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Cars

	Birmingham Pkwy From North			Lincoln St From East			Market St From South			Birmingham Pkwy From West				
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
07:00 AM	0	145	9	23	29	8	6	114	0	25	0	14	1	374
07:15 AM	0	127	17	27	37	10	7	118	0	40	0	21	1	405
07:30 AM	0	142	17	33	39	9	8	168	0	57	0	22	1	496
07:45 AM	0	141	13	26	36	14	14	151	0	80	0	18	0	493
Total	0	555	56	109	141	41	35	551	0	202	0	75	3	1768
08:00 AM	0	153	9	19	42	11	10	162	0	71	0	25	2	504
08:15 AM	0	180	18	29	50	16	9	140	0	70	0	28	1	541
08:30 AM	0	167	18	40	53	14	6	134	0	61	0	34	5	532
08:45 AM	0	213	12	31	37	13	11	123	0	53	0	30	2	525
Total	0	713	57	119	182	54	36	559	0	255	0	117	10	2102
Grand Total	0	1268	113	228	323	95	71	1110	0	457	0	192	13	3870
Apprch %	0	91.8	8.2	35.3	50	14.7	6	94	0	69	0	29	2	
Total %	0	32.8	2.9	5.9	8.3	2.5	1.8	28.7	0	11.8	0	5	0.3	

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

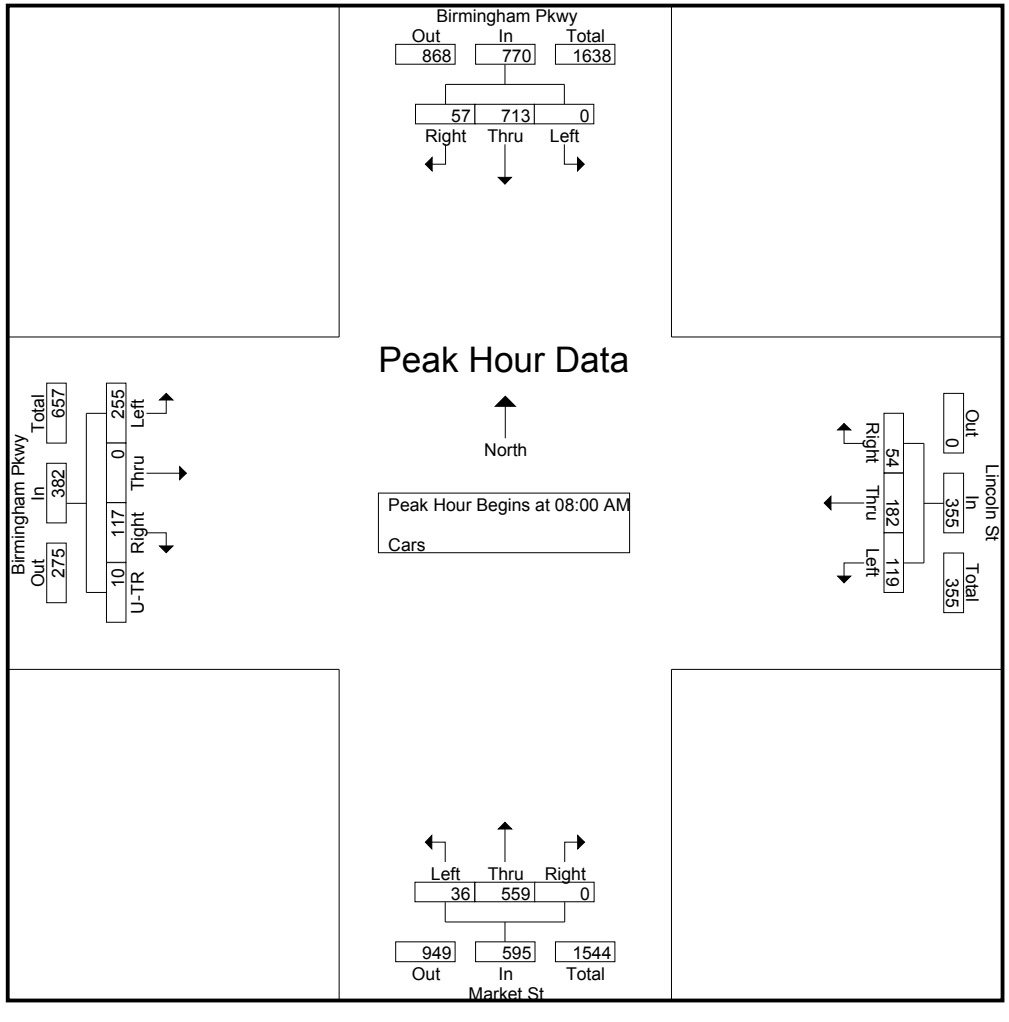
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	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	153	9	162	19	42	11	72	10	162	0	172	71	0	25	2	98	504
08:15 AM	0	180	18	198	29	50	16	95	9	140	0	149	70	0	28	1	99	541
08:30 AM	0	167	18	185	40	53	14	107	6	134	0	140	61	0	34	5	100	532
08:45 AM	0	213	12	225	31	37	13	81	11	123	0	134	53	0	30	2	85	525
Total Volume	0	713	57	770	119	182	54	355	36	559	0	595	255	0	117	10	382	2102
% App. Total	0	92.6	7.4		33.5	51.3	15.2		6.1	93.9	0		66.8	0	30.6	2.6		
PHF	.000	.837	.792	.856	.744	.858	.844	.829	.818	.863	.000	.865	.898	.000	.860	.500	.955	.971

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

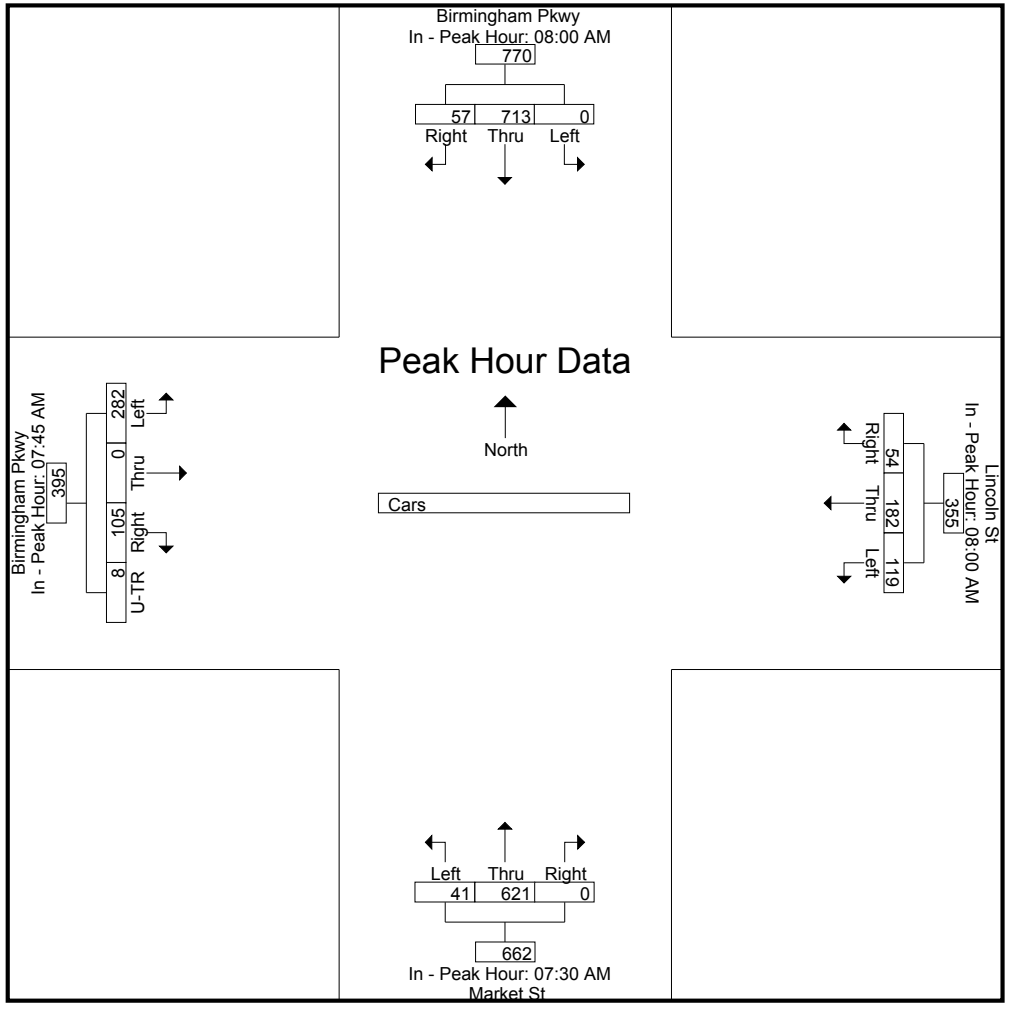
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:30 AM				07:45 AM				
+0 mins.	0	153	9	162	19	42	11	72	8	168	0	176	80	0	18	0	98
+15 mins.	0	180	18	198	29	50	16	95	14	151	0	165	71	0	25	2	98
+30 mins.	0	167	18	185	40	53	14	107	10	162	0	172	70	0	28	1	99
+45 mins.	0	213	12	225	31	37	13	81	9	140	0	149	61	0	34	5	100
Total Volume	0	713	57	770	119	182	54	355	41	621	0	662	282	0	105	8	395

Accurate Counts

978-664-2565

% App. Total	0	92.6	7.4		33.5	51.3	15.2		6.2	93.8	0		71.4	0	26.6	2	
PHF	.000	.837	.792	.856	.744	.858	.844	.829	.732	.924	.000	.940	.881	.000	.772	.400	.988



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Trucks

	Birmingham Pkwy From North			Lincoln St From East			Market St From South			Birmingham Pkwy From West				
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
07:00 AM	0	3	0	1	0	2	0	3	0	0	0	0	0	9
07:15 AM	0	2	0	0	0	0	0	2	0	0	0	0	0	4
07:30 AM	0	4	1	1	0	0	0	3	0	0	0	0	0	9
07:45 AM	0	3	0	0	1	1	0	5	0	2	0	0	0	12
Total	0	12	1	2	1	3	0	13	0	2	0	0	0	34
08:00 AM	0	4	0	2	0	0	0	6	0	1	0	0	0	13
08:15 AM	0	4	1	2	0	0	0	3	0	0	0	0	0	10
08:30 AM	0	3	0	0	1	0	0	6	0	1	0	0	0	11
08:45 AM	0	2	0	0	0	0	0	7	0	0	0	0	0	9
Total	0	13	1	4	1	0	0	22	0	2	0	0	0	43
Grand Total	0	25	2	6	2	3	0	35	0	4	0	0	0	77
Apprch %	0	92.6	7.4	54.5	18.2	27.3	0	100	0	100	0	0	0	
Total %	0	32.5	2.6	7.8	2.6	3.9	0	45.5	0	5.2	0	0	0	

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

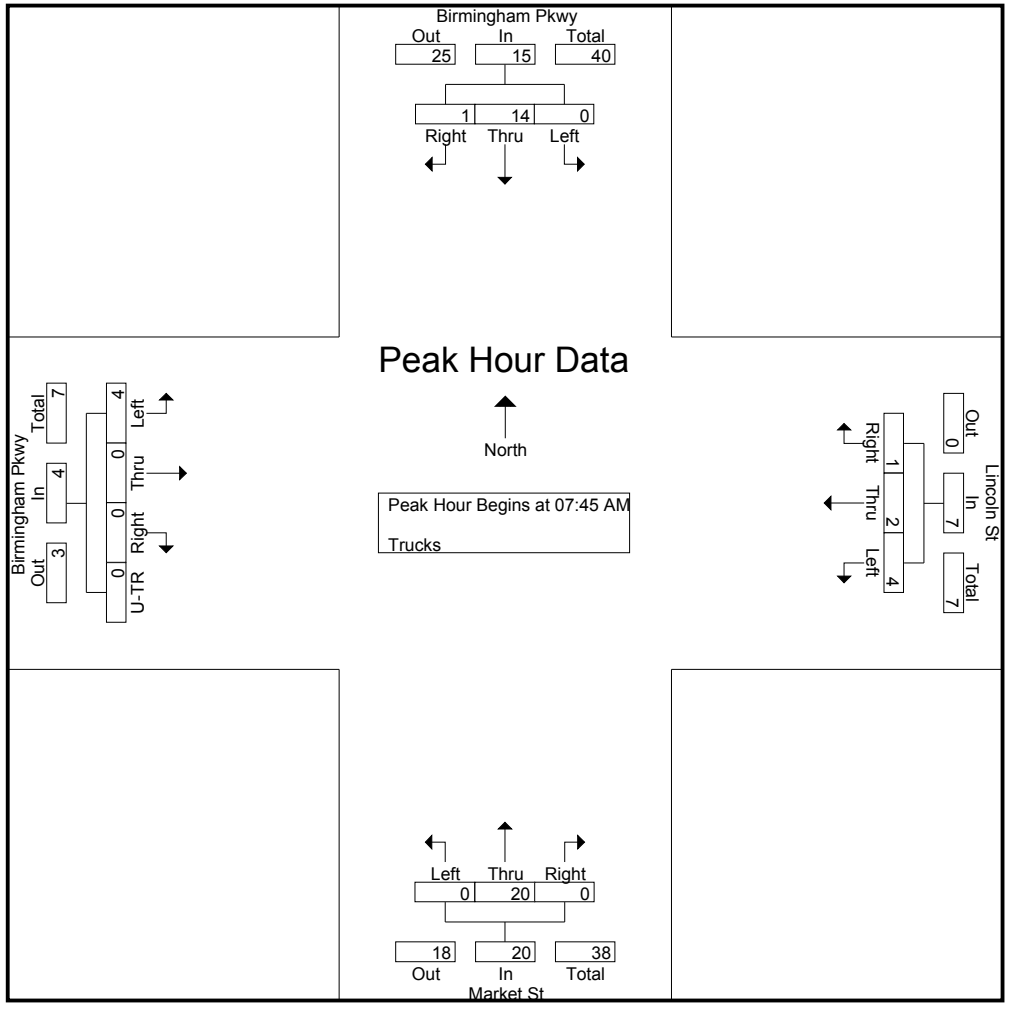
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	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	0	3	0	1	1	2	0	5	0	5	2	0	0	0	2	12
08:00 AM	0	4	0	4	2	0	0	2	0	6	0	6	1	0	0	0	1	13
08:15 AM	0	4	1	5	2	0	0	2	0	3	0	3	0	0	0	0	0	10
08:30 AM	0	3	0	3	0	1	0	1	0	6	0	6	1	0	0	0	1	11
Total Volume	0	14	1	15	4	2	1	7	0	20	0	20	4	0	0	0	4	46
% App. Total	0	93.3	6.7		57.1	28.6	14.3		0	100	0		100	0	0	0		
PHF	.000	.875	.250	.750	.500	.500	.250	.875	.000	.833	.000	.833	.500	.000	.000	.000	.500	.885

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

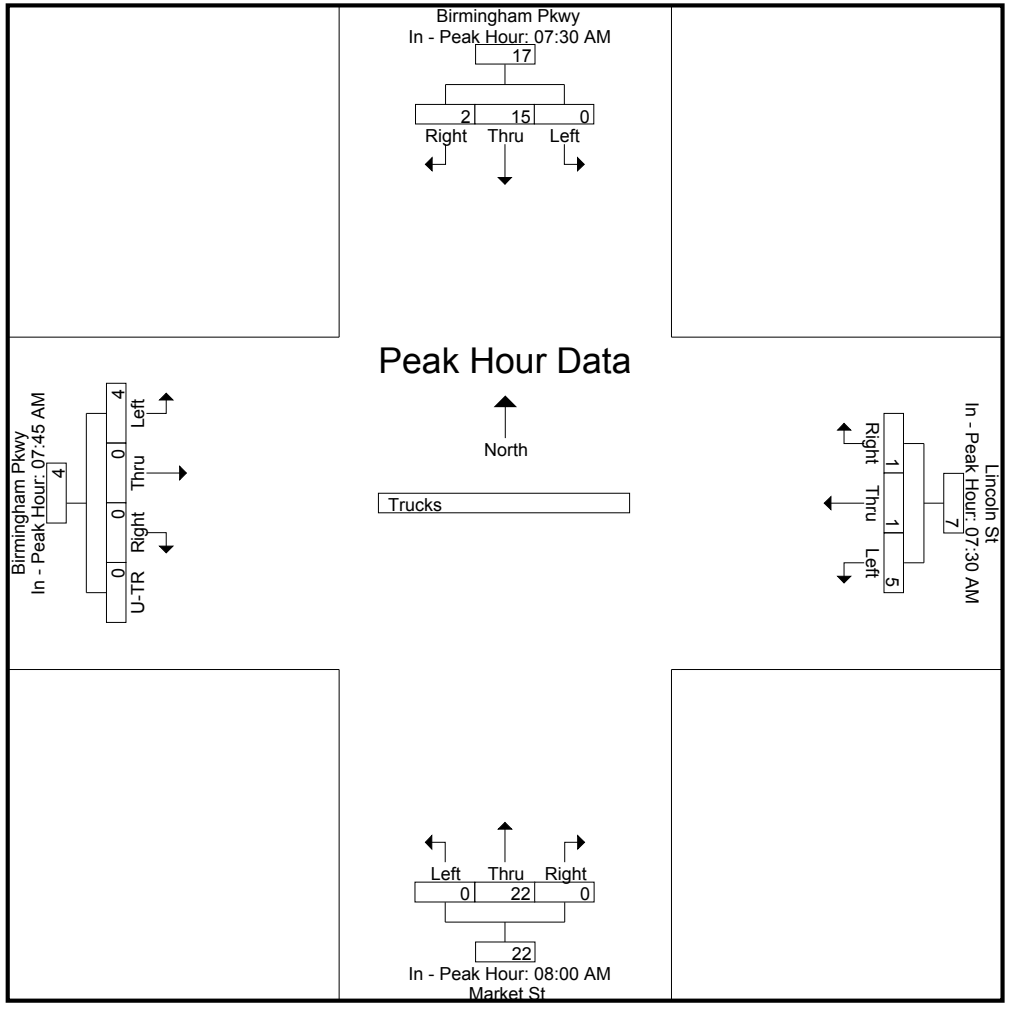
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				08:00 AM				07:45 AM				
+0 mins.	0	4	1	5	1	0	0	1	0	6	0	6	2	0	0	0	2
+15 mins.	0	3	0	3	0	1	1	2	0	3	0	3	1	0	0	0	1
+30 mins.	0	4	0	4	2	0	0	2	0	6	0	6	0	0	0	0	0
+45 mins.	0	4	1	5	2	0	0	2	0	7	0	7	1	0	0	0	1
Total Volume	0	15	2	17	5	1	1	7	0	22	0	22	4	0	0	0	4

Accurate Counts

978-664-2565

% App. Total	0	88.2	11.8		71.4	14.3	14.3		0	100	0		100	0	0	0	
PHF	.000	.938	.500	.850	.625	.250	.250	.875	.000	.786	.000	.786	.500	.000	.000	.000	.500



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Bikes Peds

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	0	0	0	0	6	0	0	0	3	0	0	0	0	9	1	10
07:15 AM	0	1	0	1	0	0	0	4	0	3	0	0	0	0	1	0	5	5	10
07:30 AM	0	1	0	0	0	0	0	5	0	2	0	1	0	0	0	1	7	3	10
07:45 AM	0	3	0	0	0	0	0	8	0	4	0	2	0	0	0	1	11	7	18
Total	0	6	0	1	0	0	0	23	0	9	0	6	0	0	1	2	32	16	48
08:00 AM	0	0	0	0	0	0	0	3	0	6	0	0	1	0	1	1	4	8	12
08:15 AM	0	2	0	0	0	1	0	9	0	0	0	1	1	0	1	1	11	5	16
08:30 AM	0	5	0	0	0	0	0	9	0	6	0	0	0	0	0	1	10	11	21
08:45 AM	0	2	0	0	1	0	0	5	0	2	0	1	0	0	0	2	8	5	13
Total	0	9	0	0	1	1	0	26	0	14	0	2	2	0	2	5	33	29	62
Grand Total	0	15	0	1	1	1	0	49	0	23	0	8	2	0	3	7	65	45	110
Apprch %	0	100	0		50	50	0		0	100	0		40	0	60				
Total %	0	33.3	0		2.2	2.2	0		0	51.1	0		4.4	0	6.7		59.1	40.9	

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

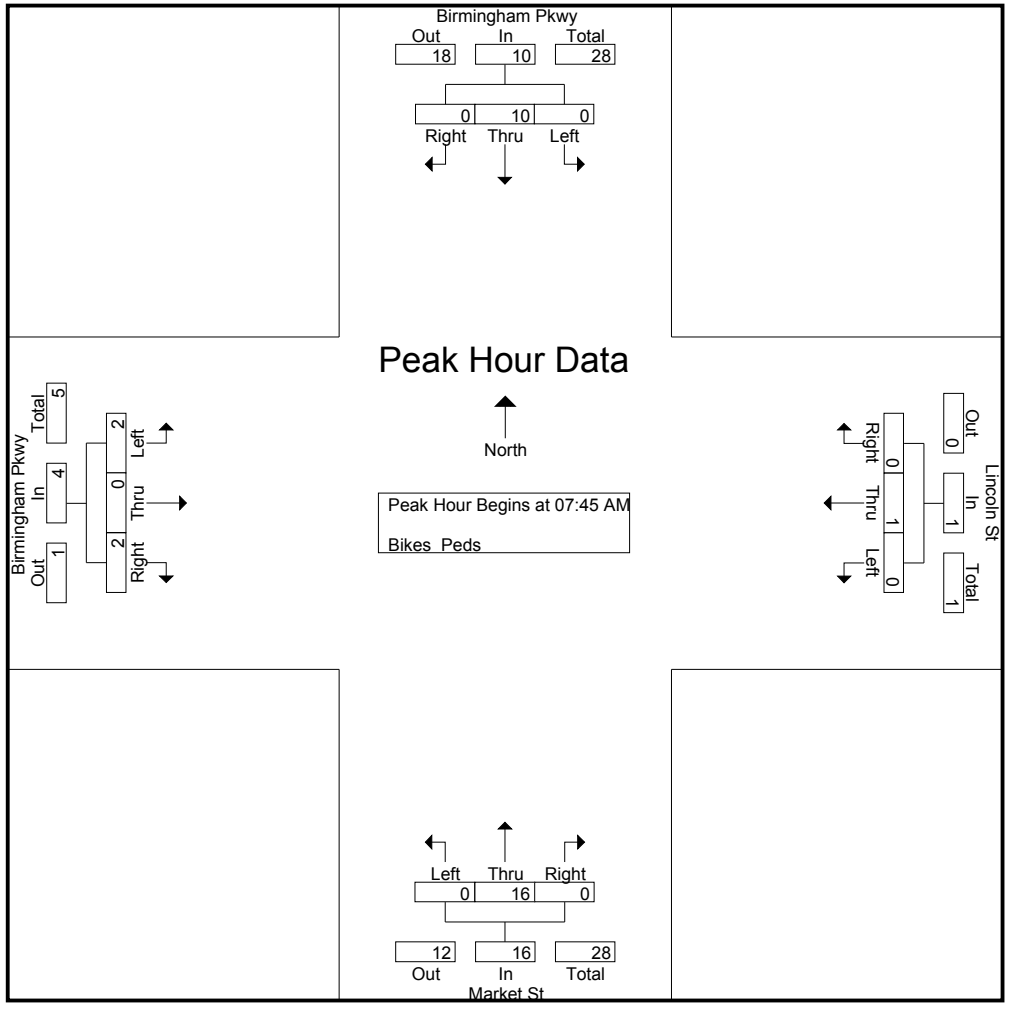
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 2

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy 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	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0	7
08:00 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	0	1	2	8
08:15 AM	0	2	0	2	0	1	0	1	0	0	0	0	1	0	1	2	5
08:30 AM	0	5	0	5	0	0	0	0	0	6	0	6	0	0	0	0	11
Total Volume	0	10	0	10	0	1	0	1	0	16	0	16	2	0	2	4	31
% App. Total	0	100	0		0	100	0		0	100	0		50	0	50		
PHF	.000	.500	.000	.500	.000	.250	.000	.250	.000	.667	.000	.667	.500	.000	.500	.500	.705

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

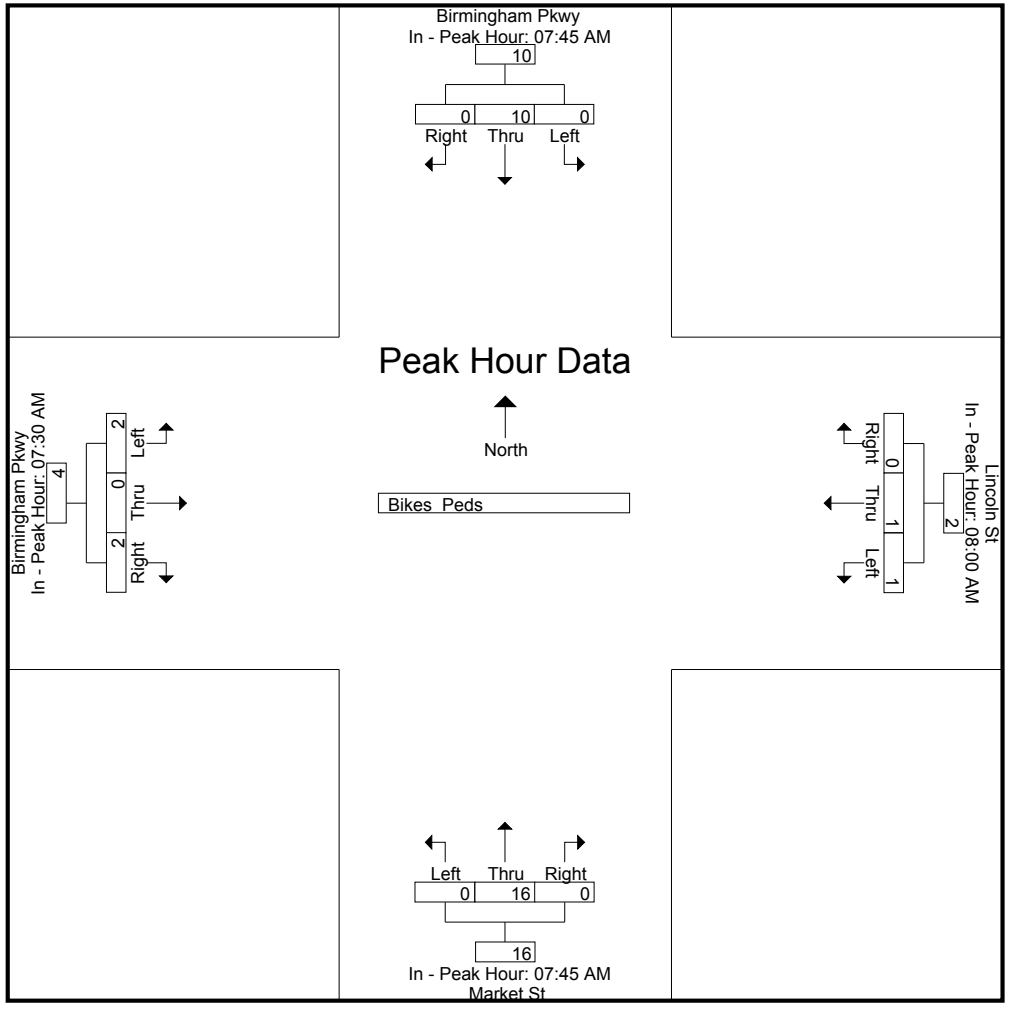
Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:45 AM				07:30 AM			
+0 mins.	0	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0
+15 mins.	0	0	0	0	0	1	0	1	0	6	0	6	0	0	0	0
+30 mins.	0	2	0	2	0	0	0	0	0	0	0	0	1	0	1	2
+45 mins.	0	5	0	5	1	0	0	1	0	6	0	6	1	0	1	2
Total Volume	0	10	0	10	1	1	0	2	0	16	0	16	2	0	2	4

Accurate Counts

978-664-2565

% App. Total	0	100	0		50	50	0		0	100	0		50	0	50	
PHF	.000	.500	.000	.500	.250	.250	.000	.500	.000	.667	.000	.667	.500	.000	.500	.500



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Cars - Trucks

	Birmingham Pkwy From North			Lincoln St From East			Market St From South			Birmingham Pkwy From West				
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	181	10	11	48	13	39	206	0	19	0	7	1	535
04:15 PM	0	183	29	24	44	17	42	211	0	22	0	3	1	576
04:30 PM	0	206	31	26	42	10	38	205	0	26	0	12	0	596
04:45 PM	0	183	28	23	52	12	34	195	0	30	0	8	0	565
Total	0	753	98	84	186	52	153	817	0	97	0	30	2	2272
05:00 PM	0	173	28	21	54	18	44	201	0	26	0	8	2	575
05:15 PM	0	213	45	27	56	14	47	196	0	27	0	14	0	639
05:30 PM	0	222	36	33	52	15	45	187	0	46	0	15	3	654
05:45 PM	0	203	46	23	58	10	30	163	0	41	0	6	3	583
Total	0	811	155	104	220	57	166	747	0	140	0	43	8	2451
Grand Total	0	1564	253	188	406	109	319	1564	0	237	0	73	10	4723
Apprch %	0	86.1	13.9	26.7	57.8	15.5	16.9	83.1	0	74.1	0	22.8	3.1	
Total %	0	33.1	5.4	4	8.6	2.3	6.8	33.1	0	5	0	1.5	0.2	
Cars	0	1548	251	186	405	107	316	1546	0	237	0	73	10	4679
% Cars	0	99	99.2	98.9	99.8	98.2	99.1	98.8	0	100	0	100	100	99.1
Trucks	0	16	2	2	1	2	3	18	0	0	0	0	0	44
% Trucks	0	1	0.8	1.1	0.2	1.8	0.9	1.2	0	0	0	0	0	0.9

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

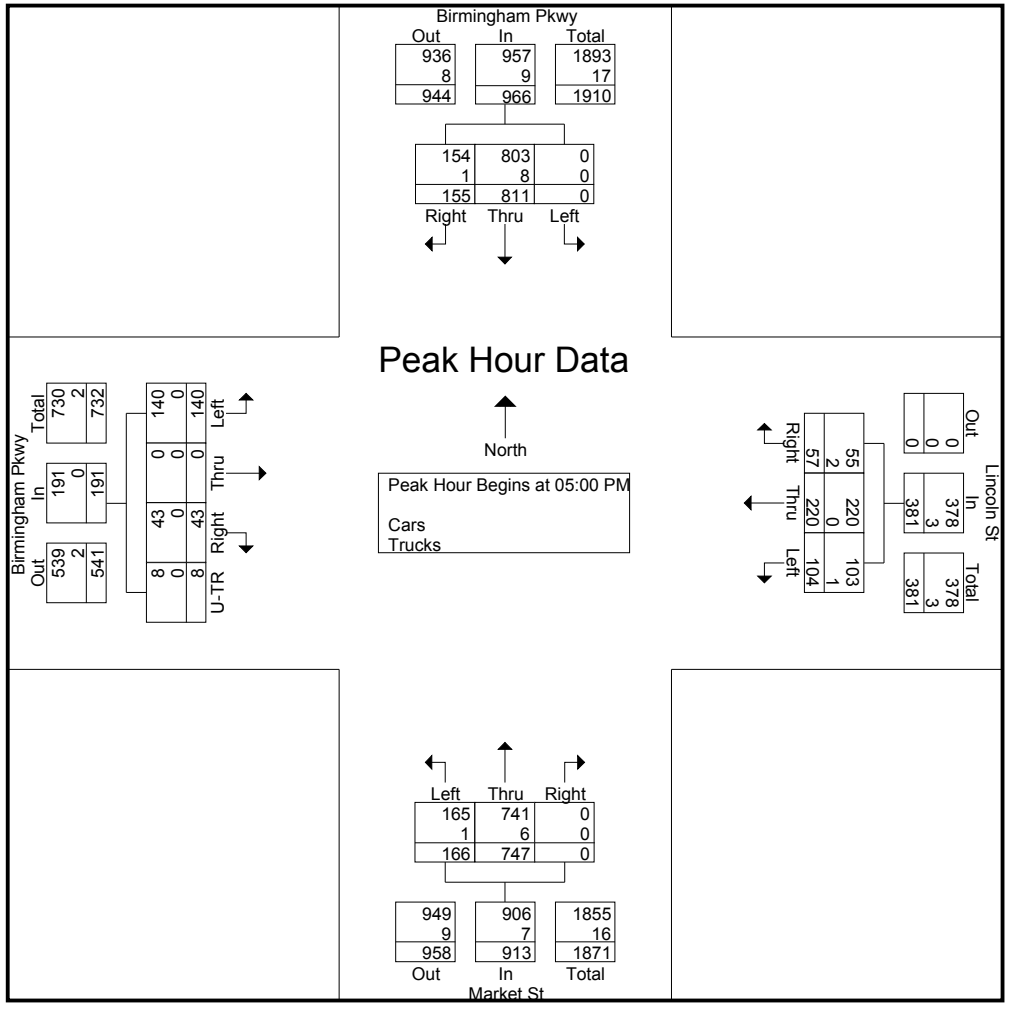
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 2

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	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	173	28	201	21	54	18	93	44	201	0	245	26	0	8	2	36	575
05:15 PM	0	213	45	258	27	56	14	97	47	196	0	243	27	0	14	0	41	639
05:30 PM	0	222	36	258	33	52	15	100	45	187	0	232	46	0	15	3	64	654
05:45 PM	0	203	46	249	23	58	10	91	30	163	0	193	41	0	6	3	50	583
Total Volume	0	811	155	966	104	220	57	381	166	747	0	913	140	0	43	8	191	2451
% App. Total	0	84	16		27.3	57.7	15		18.2	81.8	0		73.3	0	22.5	4.2		
PHF	.000	.913	.842	.936	.788	.948	.792	.953	.883	.929	.000	.932	.761	.000	.717	.667	.746	.937
Cars	0	803	154	957	103	220	55	378	165	741	0	906	140	0	43	8	191	2432
% Cars	0	99.0	99.4	99.1	99.0	100	96.5	99.2	99.4	99.2	0	99.2	100	0	100	100	100	99.2
Trucks	0	8	1	9	1	0	2	3	1	6	0	7	0	0	0	0	0	19
% Trucks	0	1.0	0.6	0.9	1.0	0	3.5	0.8	0.6	0.8	0	0.8	0	0	0	0	0	0.8

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016



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

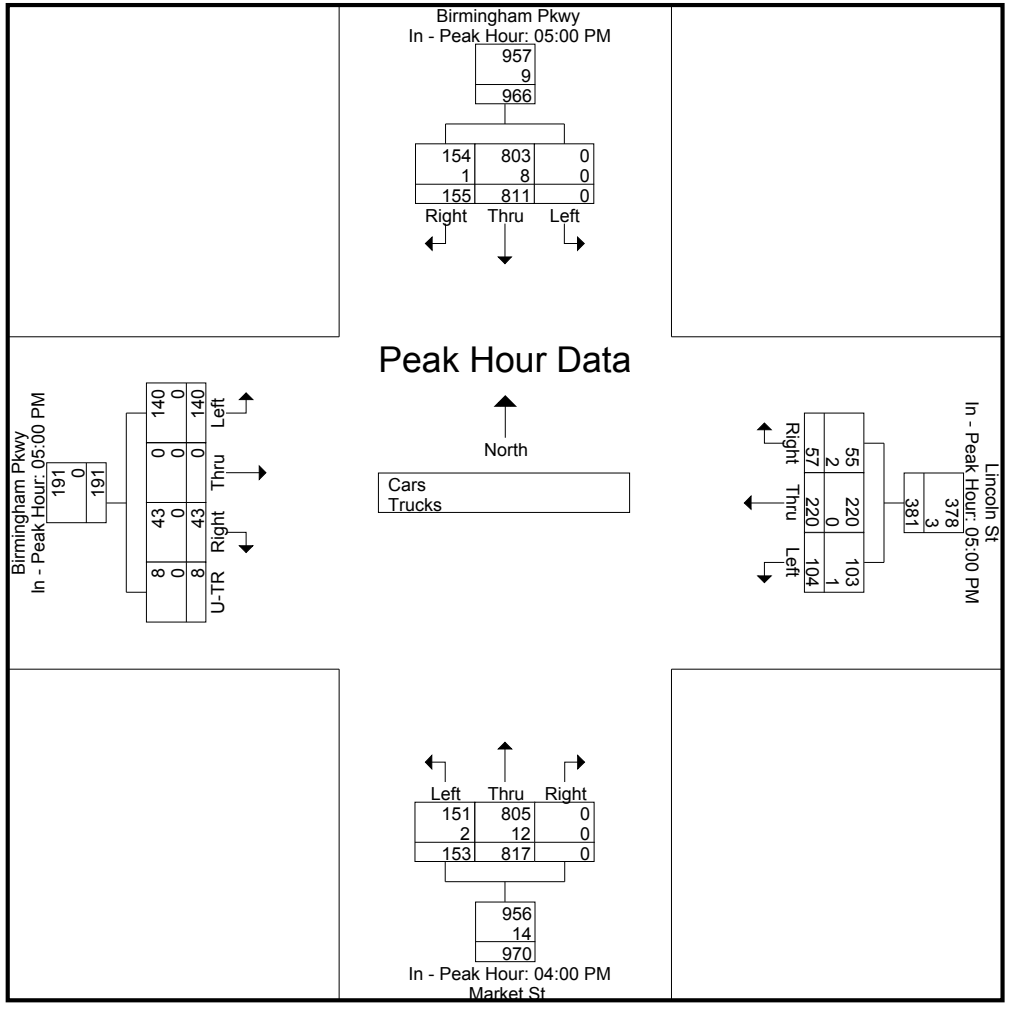
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				05:00 PM				
+0 mins.	0	173	28	201	21	54	18	93	39	206	0	245	26	0	8	2	36
+15 mins.	0	213	45	258	27	56	14	97	42	211	0	253	27	0	14	0	41
+30 mins.	0	222	36	258	33	52	15	100	38	205	0	243	46	0	15	3	64
+45 mins.	0	203	46	249	23	58	10	91	34	195	0	229	41	0	6	3	50
Total Volume	0	811	155	966	104	220	57	381	153	817	0	970	140	0	43	8	191

Accurate Counts

978-664-2565

% App. Total	0	84	16		27.3	57.7	15		15.8	84.2	0		73.3	0	22.5	4.2	
PHF	.000	.913	.842	.936	.788	.948	.792	.953	.911	.968	.000	.958	.761	.000	.717	.667	.746
Cars	0	803	154	957	103	220	55	378	151	805	0	956	140	0	43	8	191
% Cars	0	99	99.4	99.1	99	100	96.5	99.2	98.7	98.5	0	98.6	100	0	100	100	100
Trucks	0	8	1	9	1	0	2	3	2	12	0	14	0	0	0	0	0
% Trucks	0	1	0.6	0.9	1	0	3.5	0.8	1.3	1.5	0	1.4	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Cars

	Birmingham Pkwy From North			Lincoln St From East			Market St From South			Birmingham Pkwy From West				
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	178	10	11	48	13	39	203	0	19	0	7	1	529
04:15 PM	0	182	28	23	43	17	41	210	0	22	0	3	1	570
04:30 PM	0	204	31	26	42	10	37	200	0	26	0	12	0	588
04:45 PM	0	181	28	23	52	12	34	192	0	30	0	8	0	560
Total	0	745	97	83	185	52	151	805	0	97	0	30	2	2247
05:00 PM	0	170	28	21	54	17	43	199	0	26	0	8	2	568
05:15 PM	0	212	45	27	56	13	47	195	0	27	0	14	0	636
05:30 PM	0	220	35	33	52	15	45	185	0	46	0	15	3	649
05:45 PM	0	201	46	22	58	10	30	162	0	41	0	6	3	579
Total	0	803	154	103	220	55	165	741	0	140	0	43	8	2432
Grand Total	0	1548	251	186	405	107	316	1546	0	237	0	73	10	4679
Apprch %	0	86	14	26.6	58	15.3	17	83	0	74.1	0	22.8	3.1	
Total %	0	33.1	5.4	4	8.7	2.3	6.8	33	0	5.1	0	1.6	0.2	

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

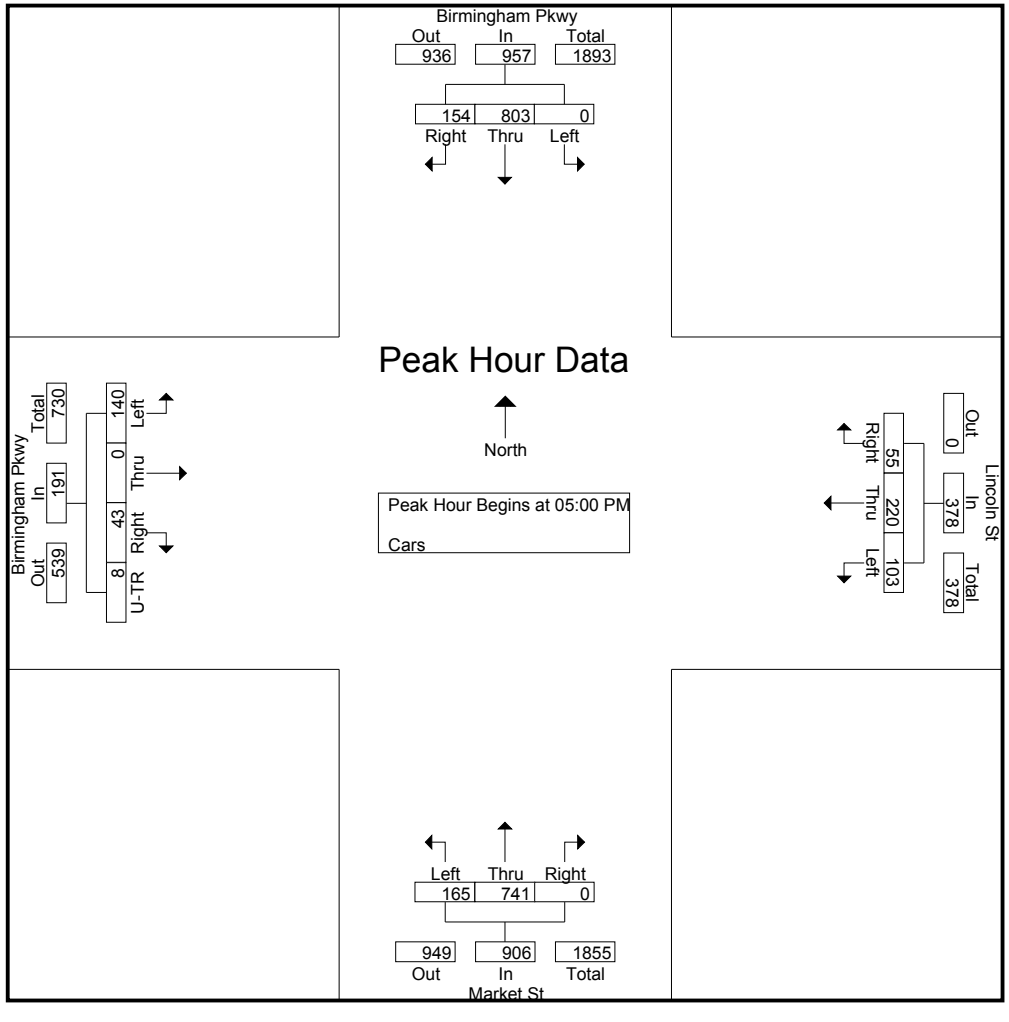
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 2

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	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	170	28	198	21	54	17	92	43	199	0	242	26	0	8	2	36	568
05:15 PM	0	212	45	257	27	56	13	96	47	195	0	242	27	0	14	0	41	636
05:30 PM	0	220	35	255	33	52	15	100	45	185	0	230	46	0	15	3	64	649
05:45 PM	0	201	46	247	22	58	10	90	30	162	0	192	41	0	6	3	50	579
Total Volume	0	803	154	957	103	220	55	378	165	741	0	906	140	0	43	8	191	2432
% App. Total	0	83.9	16.1		27.2	58.2	14.6		18.2	81.8	0		73.3	0	22.5	4.2		
PHF	.000	.913	.837	.931	.780	.948	.809	.945	.878	.931	.000	.936	.761	.000	.717	.667	.746	.937

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

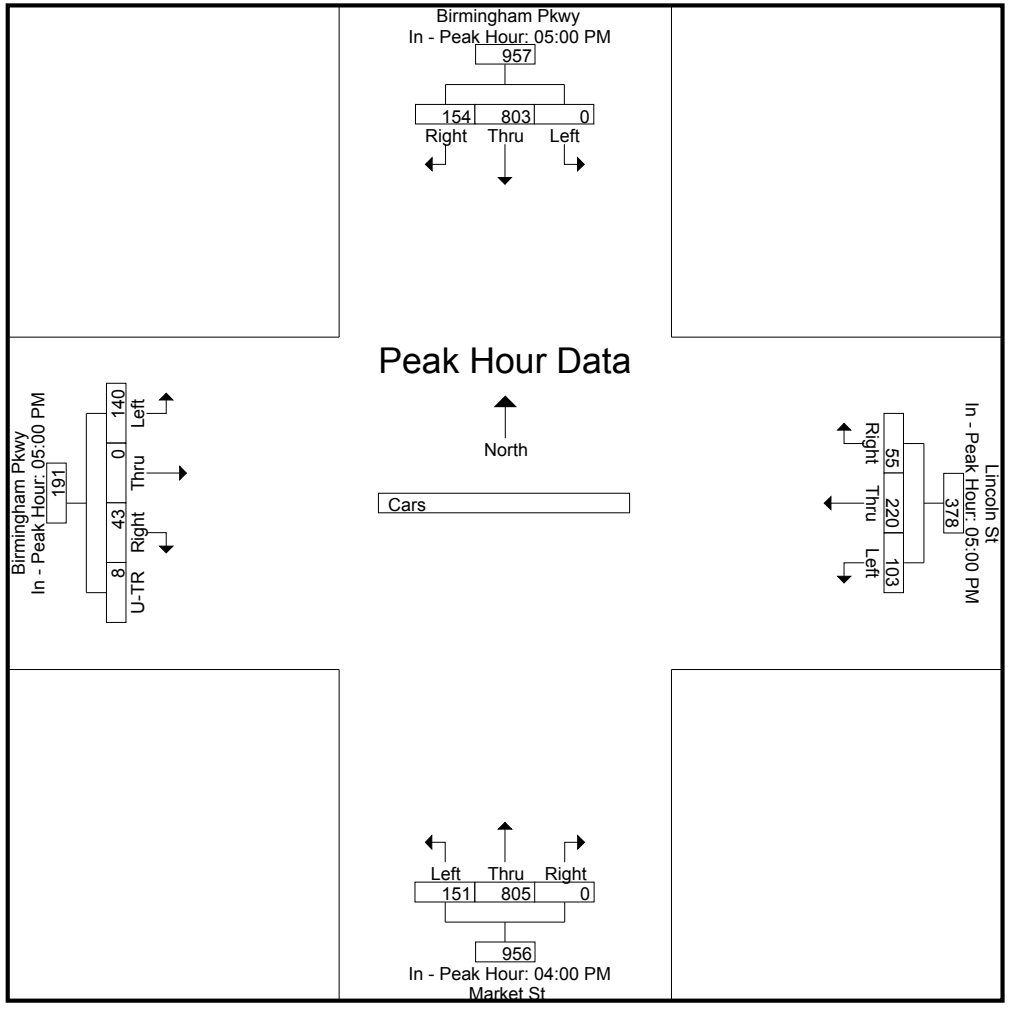
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				05:00 PM				
+0 mins.	0	170	28	198	21	54	17	92	39	203	0	242	26	0	8	2	36
+15 mins.	0	212	45	257	27	56	13	96	41	210	0	251	27	0	14	0	41
+30 mins.	0	220	35	255	33	52	15	100	37	200	0	237	46	0	15	3	64
+45 mins.	0	201	46	247	22	58	10	90	34	192	0	226	41	0	6	3	50
Total Volume	0	803	154	957	103	220	55	378	151	805	0	956	140	0	43	8	191

Accurate Counts

978-664-2565

% App. Total	0	83.9	16.1		27.2	58.2	14.6		15.8	84.2	0		73.3	0	22.5	4.2	
PHF	.000	.913	.837	.931	.780	.948	.809	.945	.921	.958	.000	.952	.761	.000	.717	.667	.746



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Trucks

	Birmingham Pkwy From North			Lincoln St From East			Market St From South			Birmingham Pkwy From West				
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	3	0	0	0	0	0	3	0	0	0	0	0	6
04:15 PM	0	1	1	1	1	0	1	1	0	0	0	0	0	6
04:30 PM	0	2	0	0	0	0	1	5	0	0	0	0	0	8
04:45 PM	0	2	0	0	0	0	0	3	0	0	0	0	0	5
Total	0	8	1	1	1	0	2	12	0	0	0	0	0	25
05:00 PM	0	3	0	0	0	1	1	2	0	0	0	0	0	7
05:15 PM	0	1	0	0	0	1	0	1	0	0	0	0	0	3
05:30 PM	0	2	1	0	0	0	0	2	0	0	0	0	0	5
05:45 PM	0	2	0	1	0	0	0	1	0	0	0	0	0	4
Total	0	8	1	1	0	2	1	6	0	0	0	0	0	19
Grand Total	0	16	2	2	1	2	3	18	0	0	0	0	0	44
Apprch %	0	88.9	11.1	40	20	40	14.3	85.7	0	0	0	0	0	
Total %	0	36.4	4.5	4.5	2.3	4.5	6.8	40.9	0	0	0	0	0	

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

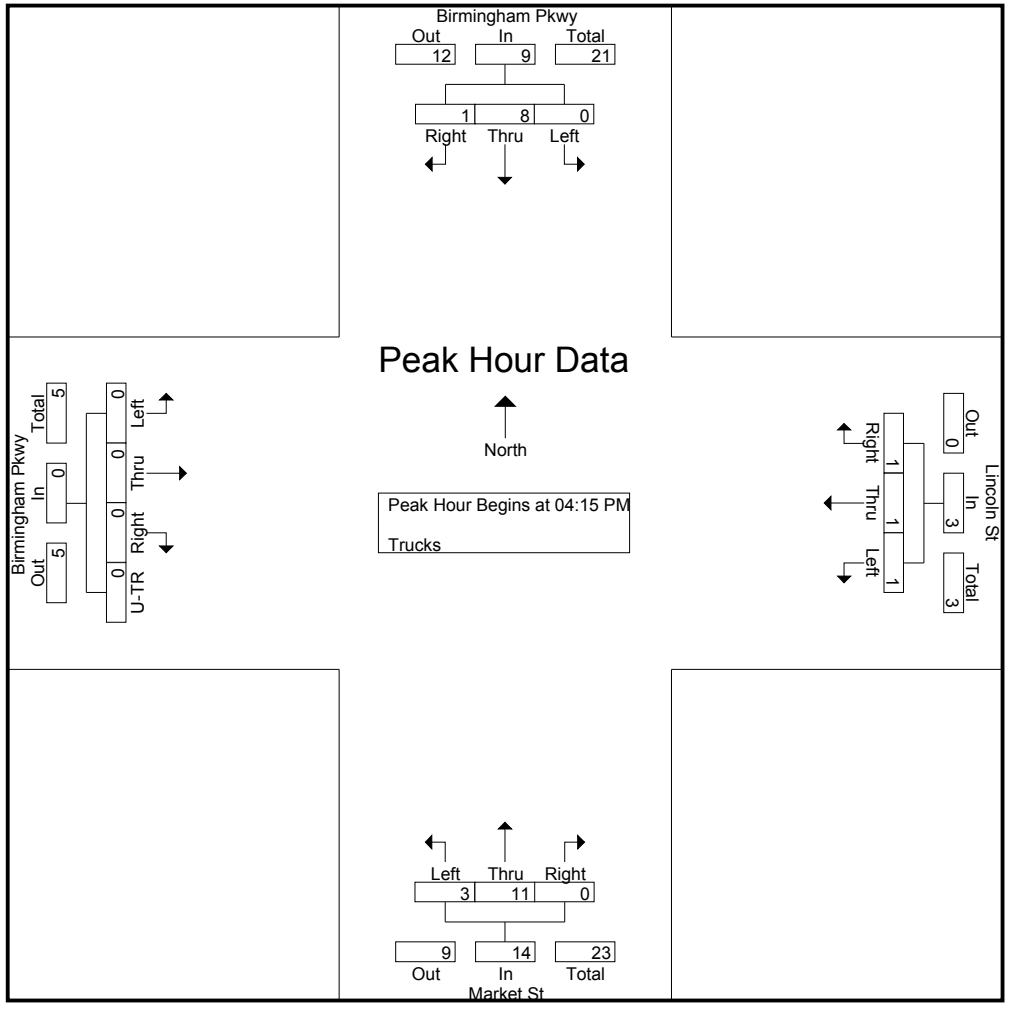
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 2

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	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	1	1	2	1	1	0	2	1	1	0	2	0	0	0	0	0	6
04:30 PM	0	2	0	2	0	0	0	0	1	5	0	6	0	0	0	0	0	8
04:45 PM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	0	0	0	5
05:00 PM	0	3	0	3	0	0	1	1	1	2	0	3	0	0	0	0	0	7
Total Volume	0	8	1	9	1	1	1	3	3	11	0	14	0	0	0	0	0	26
% App. Total	0	88.9	11.1		33.3	33.3	33.3		21.4	78.6	0		0	0	0	0		
PHF	.000	.667	.250	.750	.250	.250	.250	.375	.750	.550	.000	.583	.000	.000	.000	.000	.000	.813

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

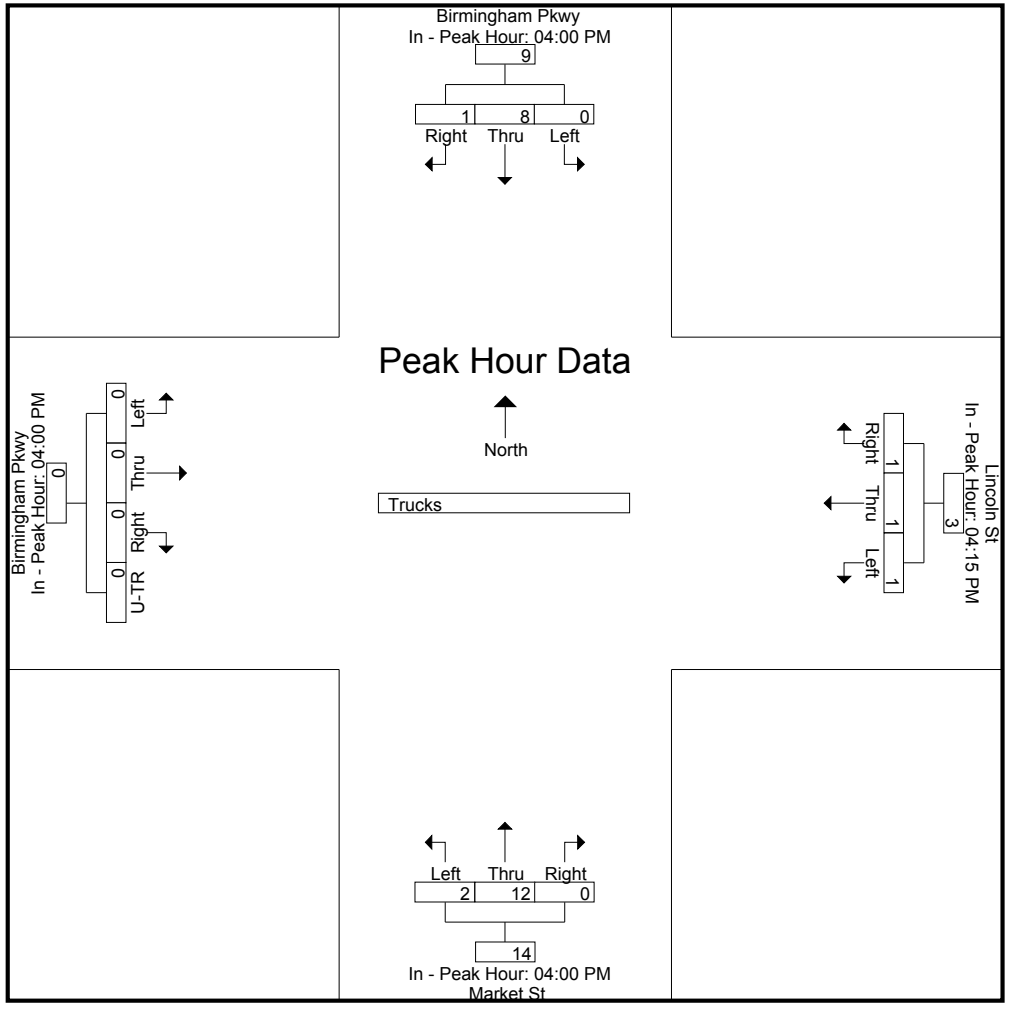
Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				04:00 PM				
+0 mins.	0	3	0	3	1	1	0	2	0	3	0	3	0	0	0	0	0
+15 mins.	0	1	1	2	0	0	0	0	1	1	0	2	0	0	0	0	0
+30 mins.	0	2	0	2	0	0	0	0	1	5	0	6	0	0	0	0	0
+45 mins.	0	2	0	2	0	0	1	1	0	3	0	3	0	0	0	0	0
Total Volume	0	8	1	9	1	1	1	3	2	12	0	14	0	0	0	0	0

Accurate Counts

978-664-2565

% App. Total	0	88.9	11.1		33.3	33.3	33.3		14.3	85.7	0		0	0	0	0		
PHF	.000	.667	.250	.750	.250	.250	.250	.375	.500	.600	.000	.583	.000	.000	.000	.000	.000	



Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 1

Groups Printed- Bikes Peds

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	1	0	0	2	0	0	7	0	4	0	1	0	0	0	0	8	7	15
04:15 PM	0	0	0	1	0	0	1	6	0	3	0	1	0	0	0	1	9	4	13
04:30 PM	0	2	0	0	0	0	0	6	1	2	0	1	1	0	0	0	7	6	13
04:45 PM	0	1	0	0	0	0	0	7	0	2	0	0	0	0	0	1	8	3	11
Total	0	4	0	1	2	0	1	26	1	11	0	3	1	0	0	2	32	20	52
05:00 PM	0	2	0	0	1	0	1	13	1	2	0	0	0	0	0	0	13	7	20
05:15 PM	0	5	0	0	1	0	0	10	2	5	1	0	1	0	0	0	10	15	25
05:30 PM	0	4	0	0	0	0	0	8	1	4	0	0	1	0	0	0	8	10	18
05:45 PM	0	2	0	0	0	0	0	12	0	3	1	1	0	0	0	0	13	6	19
Total	0	13	0	0	2	0	1	43	4	14	2	1	2	0	0	0	44	38	82
Grand Total	0	17	0	1	4	0	2	69	5	25	2	4	3	0	0	2	76	58	134
Apprch %	0	100	0		66.7	0	33.3		15.6	78.1	6.2		100	0	0				
Total %	0	29.3	0		6.9	0	3.4		8.6	43.1	3.4		5.2	0	0		56.7	43.3	

Accurate Counts

978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

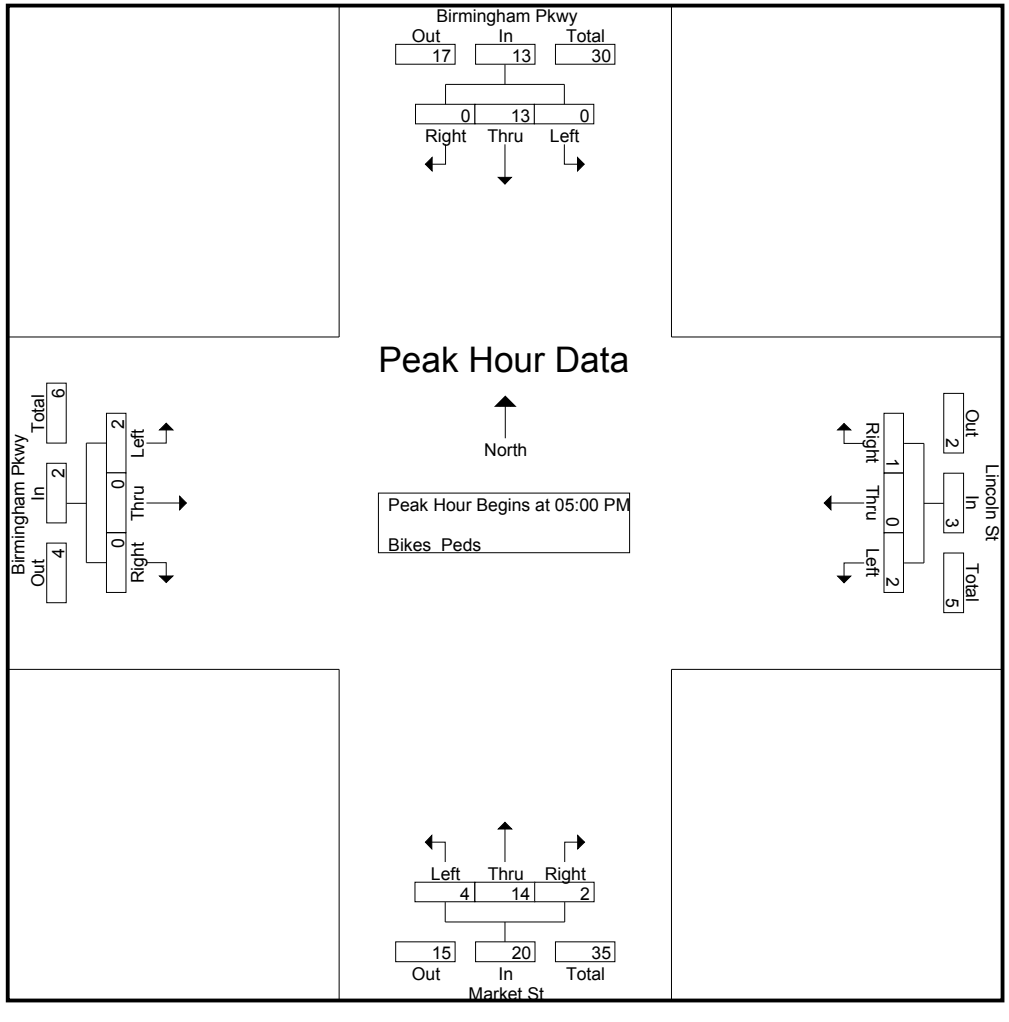
File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016

	Birmingham Pkwy From North				Lincoln St From East				Market St From South				Birmingham Pkwy 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	2	0	2	1	0	1	2	1	2	0	3	0	0	0	0	7
05:15 PM	0	5	0	5	1	0	0	1	2	5	1	8	1	0	0	1	15
05:30 PM	0	4	0	4	0	0	0	0	1	4	0	5	1	0	0	1	10
05:45 PM	0	2	0	2	0	0	0	0	0	3	1	4	0	0	0	0	6
Total Volume	0	13	0	13	2	0	1	3	4	14	2	20	2	0	0	2	38
% App. Total	0	100	0		66.7	0	33.3		20	70	10		100	0	0		
PHF	.000	.650	.000	.650	.500	.000	.250	.375	.500	.700	.500	.625	.500	.000	.000	.500	.633

Accurate Counts
978-664-2565

N/S Street : Birmingham Pkwy/ Market St
E/W Street : Lincoln St/ Birmingham Pkwy
City/State : Brighton, MA
Weather : Clear

File Name : 17380001
Site Code : 17380001
Start Date : 10/12/2016
Page No : 3



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

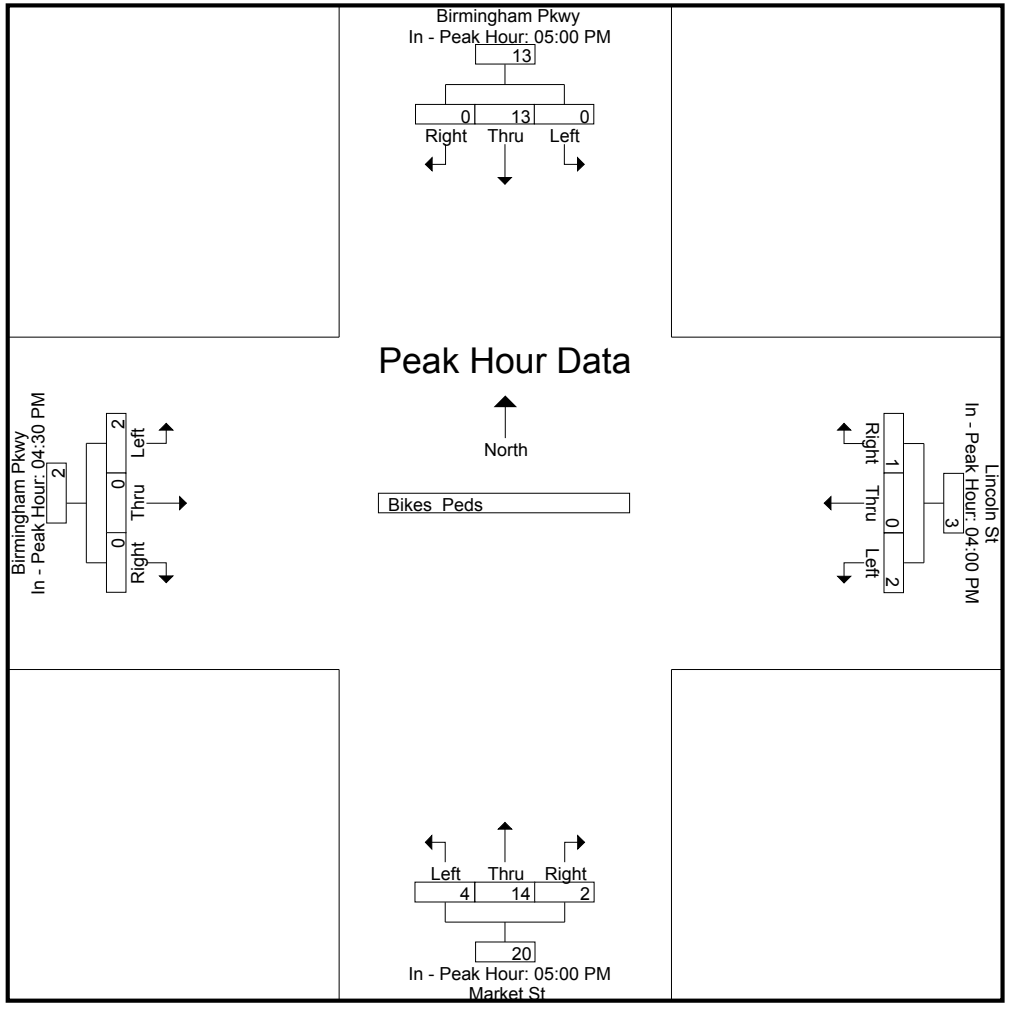
Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				05:00 PM				04:30 PM			
+0 mins.	0	2	0	2	2	0	0	2	1	2	0	3	1	0	0	1
+15 mins.	0	5	0	5	0	0	1	1	2	5	1	8	0	0	0	0
+30 mins.	0	4	0	4	0	0	0	0	1	4	0	5	0	0	0	0
+45 mins.	0	2	0	2	0	0	0	0	0	3	1	4	1	0	0	1
Total Volume	0	13	0	13	2	0	1	3	4	14	2	20	2	0	0	2

Accurate Counts

978-664-2565

% App. Total	0	100	0		66.7	0	33.3		20	70	10		100	0	0	
PHF	.000	.650	.000	.650	.250	.000	.250	.375	.500	.700	.500	.625	.500	.000	.000	.500



Client:	Michael A. Santos, P.E., PTOE
Project #:	88_029_HSH_Brighton
BTD #:	Location 1
Location:	Brighton, MA
Street 1:	Lincoln Street
Street 2:	Portsmouth Street
Count Date:	6/22/2017
Day of Week:	Thursday
Weather:	Clear, 80°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

TOTAL (CARS & TRUCKS)

	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	11	0	5	0	0	0	0	0	0	67	2
7:15 AM	0	0	0	0	0	17	0	6	0	0	0	0	0	0	71	3
7:30 AM	0	0	0	0	0	23	0	7	0	0	0	0	0	0	73	4
7:45 AM	0	0	0	0	0	27	0	8	0	0	0	0	0	0	81	5
8:00 AM	0	0	0	0	0	30	0	6	0	0	0	0	0	0	85	3
8:15 AM	0	0	0	0	0	29	0	7	0	0	0	0	0	0	83	4
8:30 AM	0	0	0	0	0	31	0	5	0	0	0	0	0	0	81	3
8:45 AM	0	0	0	0	0	28	0	5	0	0	0	0	0	0	78	3

	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	17	0	7	0	0	0	0	0	0	86	5
4:15 PM	0	0	0	0	0	18	0	7	0	0	0	0	0	0	87	8
4:30 PM	0	0	0	0	0	18	0	6	0	0	0	0	0	0	85	10
4:45 PM	0	0	0	0	0	20	0	5	0	0	0	0	0	0	84	12
5:00 PM	0	0	0	0	0	18	0	4	0	0	0	0	0	0	82	13
5:15 PM	0	0	0	0	0	19	0	5	0	0	0	0	0	0	83	12
5:30 PM	0	0	0	0	0	17	0	4	0	0	0	0	0	0	80	11
5:45 PM	0	0	0	0	0	16	0	5	0	0	0	0	0	0	77	10

AM PEAK HOUR 7:45 AM to 8:45 AM	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**117**	**0**	**26**	**0**	**0**	**0**	**0**	**0**	**0**	**330**	**15**
PHF	**0.00**				**0.99**				**0.00**				**0.98**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**74**	**0**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**338**	**43**
PHF	**0.00**				**0.96**				**0.00**				**0.99**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**

Client:	Michael A. Santos, P.E., PTOE
Project #:	88_029_HSH_Brighton
BTD #:	Location 1
Location:	Brighton, MA
Street 1:	Lincoln Street
Street 2:	Portsmouth Street
Count Date:	6/22/2017
Day of Week:	Thursday
Weather:	Clear, 80°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

TRUCKS

	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
7:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
PHF	**0.00**				**0.00**				**0.00**				**0.50**			

PM PEAK HOUR	Northbound				Portsmouth Street Southbound				Lincoln Street Eastbound				Lincoln Street Westbound			
4:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**
PHF	**0.00**				**0.00**				**0.00**				**0.25**			

Client:	Michael A. Santos, P.E., PTOE
Project #:	88_029_HSH_Brighton
BTD #:	Location 1
Location:	Brighton, MA
Street 1:	Lincoln Street
Street 2:	Portsmouth Street
Count Date:	6/22/2017
Day of Week:	Thursday
Weather:	Clear, 80°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

PEDESTRIANS & BICYCLES

	Portsmouth Street Northbound					Portsmouth Street Southbound					Lincoln Street Eastbound					Lincoln Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	0		1	0	0	1		0	1	0	0		0	0	0	0	
7:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:30 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
7:45 AM	0	0	0	0		0	0	0	3		0	0	0	0		0	0	1	0	
8:00 AM	0	0	0	0		0	0	0	5		0	1	0	0		0	1	0	0	
8:15 AM	0	0	0	0		0	0	0	3		0	0	0	0		0	1	0	0	
8:30 AM	0	0	0	0		0	0	0	1		0	0	0	0		0	0	0	0	
8:45 AM	0	0	0	0		0	0	0	2		0	0	0	0		0	0	0	0	

	Portsmouth Street Northbound					Portsmouth Street Southbound					Lincoln Street Eastbound					Lincoln Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
4:15 PM	0	0	0	0		0	0	0	2		0	1	0	0		0	0	0	0	
4:30 PM	0	0	0	0		0	0	0	1		0	0	0	0		0	1	0	0	
4:45 PM	0	0	0	0		0	0	1	0		0	0	0	0		0	0	1	0	
5:00 PM	0	0	0	0		0	0	0	1		0	0	0	0		0	1	0	0	
5:15 PM	0	0	0	0		0	0	0	1		0	0	0	0		0	1	0	0	
5:30 PM	0	0	0	0		1	0	0	2		0	0	0	0		0	0	1	0	
5:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	

AM PEAK HOUR[1] 7:45 AM to 8:45 AM	Portsmouth Street Northbound					Portsmouth Street Southbound					Lincoln Street Eastbound					Lincoln Street Westbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	0	0	0		0	0	0	12		0	1	0	0		0	2	1	0	

PM PEAK HOUR[1] 4:15 PM to 5:15 PM	Portsmouth Street Northbound					Portsmouth Street Southbound					Lincoln Street Eastbound					Lincoln Street Westbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	0	0	0		0	0	1	4		0	1	0	0		0	2	1	0	

[1] *Peak hours corresponds to vehicular peak hours.*

Trip Generation – Existing

Leo Birmingham Parkway - Brighton
Existing Trip Generation

HOWARD/STEIN-HUDSON ASSOCIATES
6-Jun-17

xx HARD CODED TO BALANCE (Manually change formatting)

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed national vehicle occupancy rate[1]	Converted to Person trips	Transit Share[2]	Transit Trips	Walk/Bike/ Other Share[2]	Walk/ Bike/ Other Trips	Vehicle Share[2]	Total Vehicle Person Trips	Assumed local auto occupancy rate for autos[3]	Total Adjusted Auto Trips
Daily Peak Hour															
General Office Building[4]	10	Total		11.030	110	1.13	**124**	12%	**14**	19%	**24**	69%	**86**	1.13	**76**
	ksf	In	50%	5.515	55	1.13	**62**	12%	**7**	19%	**12**	69%	**43**	1.13	**38**
		Out	50%	5.515	55	1.13	**62**	12%	**7**	19%	**12**	69%	**43**	1.13	**38**
Drinking Place[5]	1.8	Total		146.38	264	2.20	**580**	8%	**46**	40%	**232**	52%	**302**	2.20	**138**
	ksf	In	50%	73.19	132	2.20	**290**	8%	**23**	40%	**116**	52%	**151**	2.20	**69**
		Out	50%	73.19	132	2.20	**290**	8%	**23**	40%	**116**	52%	**151**	2.20	**69**
Total		Total			**374**		**704**		**60**		**256**		**388**		**214**
		In			**187**		**352**		**30**		**128**		**194**		**107**
		Out			**187**		**352**		**30**		**128**		**194**		**107**
AM Peak Hour															
General Office Building[4]	10	Total		1.56	16	1.13	**18**		**3**		**4**		**11**	1.13	**10**
	ksf	In	88%	1.373	14	1.13	**16**	18%	**3**	23%	**4**	59%	**9**	1.13	**8**
		Out	12%	0.187	2	1.13	**2**	12%	**0**	23%	**0**	65%	**2**	1.13	**2**
Drinking Place[5]	1.8	Total		0.00	0	2.20	**0**		**0**		**0**		**0**	2.20	**0**
	ksf	In	0%	0.00	0	2.20	**0**	11%	**0**	46%	**0**	43%	**0**	2.20	**0**
		Out	0%	0.00	0	2.20	**0**	7%	**0**	46%	**0**	47%	**0**	2.20	**0**
Total		Total			**16**		**18**		**3**		**4**		**11**		**10**
		In			**14**		**16**		**3**		**4**		**9**		**8**
		Out			**2**		**2**		**0**		**0**		**2**		**2**
PM Peak Hour															
General Office Building[4]	10	Total		1.49	15	1.13	**17**		**3**		**4**		**10**	1.13	**9**
	ksf	In	17%	0.25	3	1.13	**3**	12%	**0**	23%	**1**	65%	**2**	1.13	**2**
		Out	83%	1.24	12	1.13	**14**	18%	**3**	23%	**3**	59%	**8**	1.13	**7**
Drinking Place[5]	1.8	Total		11.34	20	2.20	**44**		**4**		**20**		**20**	2.20	**9**
	ksf	In	66%	7.48	13	2.20	**29**	7%	**2**	46%	**13**	47%	**14**	2.20	**6**
		Out	34%	3.86	7	2.20	**15**	11%	**2**	46%	**7**	43%	**6**	2.20	**3**
Total		Total			**35**		**61**		**7**		**24**		**30**		**18**
		In			**16**		**32**		**2**		**14**		**16**		**8**
		Out			**19**		**29**		**5**		**10**		**14**		**10**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Mode shares based on peak-hour BTD Data for Area 17
3. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates.
4. ITE Trip Generation Rate, 9th Edition, LUC 710 (General Office Building), average rate
5. ITE Trip Generation Rate, 9th Edition, LUC 925 (Drinking Place), average rate

Trip Generation – Proposed

Leo Birmingham Parkway - Brighton
Proposed Trip Generation

HOWARD/STEIN-HUDSON ASSOCIATES
6-Jun-17

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed national vehicle occupancy rate[1]	Converted to Person trips	Transit Share[2]	Transit Trips	Walk/Bike/ Other Share[2]	Walk/ Bike/ Other Trips	Vehicle Share[2]	Total Vehicle Person Trips	Assumed local auto occupancy rate for autos[3]	Total Adjusted Auto Trips
Daily Peak Hour															
Apartment[4]	83	Total		6.650	552	1.13	**624**	22%	**138**	31%	**194**	47%	292	1.13	**258**
	units	In	50%	3.325	276	1.13	**312**	22%	**69**	31%	**97**	47%	**146**	1.13	**129**
		Out	50%	3.325	276	1.13	**312**	22%	**69**	31%	**97**	47%	**146**	1.13	**129**
Total		Total			**552**		**624**		**138**		**194**		**292**		**258**
		In			**276**		**312**		**69**		**97**		**146**		**129**
		Out			**276**		**312**		**69**		**97**		**146**		**129**
AM Peak Hour															
Apartment[4]	83	Total		0.51	42	1.13	**47**		**11**		**17**		19	1.13	**17**
	units	In	20%	0.102	8	1.13	**9**	30%	**3**	33%	**3**	37%	**3**	1.13	**3**
		Out	80%	0.408	34	1.13	**38**	21%	**8**	36%	**14**	43%	**16**	1.13	**14**
Total		Total			**42**		**47**		**11**		**17**		**19**		**17**
		In			**8**		**9**		**3**		**3**		**3**		**3**
		Out			**34**		**38**		**8**		**14**		**16**		**14**
PM Peak Hour															
Apartment[4]	83	Total		0.62	51	1.13	**57**		**14**		**20**		23	1.13	**20**
	units	In	65%	0.40	33	1.13	**37**	21%	**8**	36%	**13**	43%	**16**	1.13	**14**
		Out	35%	0.22	18	1.13	**20**	30%	**6**	33%	**7**	37%	**7**	1.13	**6**
Total		Total			**51**		**57**		**14**		**20**		**23**		**20**
		In			**33**		**37**		**8**		**13**		**16**		**14**
		Out			**18**		**20**		**6**		**7**		**7**		**6**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Mode shares based on peak-hour BTD Data for Area 10
3. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates.
4. ITE Trip Generation Manual, 9th Edition, LUC 220 (Apartment), average rate

Synchro Intersection Level of Service Reports

- Existing (2017) Condition

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	10	258	0	118	124	184	54	36	584	0	0	730	58
Future Volume (vph)	10	258	0	118	124	184	54	36	584	0	0	730	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	0		0	0		0	0		50
Storage Lanes		1		0	1		0	0		0	0		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00
Frt			0.912			0.966							0.850
Flt Protected		0.950	0.980		0.950				0.997				
Satd. Flow (prot)	0	1681	1582	0	1770	1799	0	0	3529	0	0	3539	1583
Flt Permitted		0.599	0.980		0.950				0.798				
Satd. Flow (perm)	0	1060	1582	0	1770	1799	0	0	2824	0	0	3539	1583
Right Turn on Red				Yes			Yes			No			Yes
Satd. Flow (RTOR)			182			14							109
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1371			700			572			691	
Travel Time (s)			31.2			15.9			13.0			15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	280	0	128	135	200	59	39	635	0	0	793	63
Shared Lane Traffic (%)		32%											
Lane Group Flow (vph)	0	201	218	0	135	259	0	0	674	0	0	793	63
Turn Type	Perm	Split	NA		Split	NA		D.P+P	NA			NA	pm+ov
Protected Phases		3	3		2	2		4	1 4			1	3!
Permitted Phases	3!							1					1
Detector Phase	3	3	3		2	2		4	1 4			1	3
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0		6.0				10.0	8.0
Minimum Split (s)	24.0	24.0	24.0		16.0	16.0		12.0				24.0	24.0
Total Split (s)	25.0	25.0	25.0		20.0	20.0		13.0				32.0	25.0
Total Split (%)	27.8%	27.8%	27.8%		22.2%	22.2%		14.4%				35.6%	27.8%
Maximum Green (s)	19.0	19.0	19.0		14.0	14.0		7.0				26.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0				4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0		2.0				2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0						6.0	6.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes				Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Recall Mode	None	None	None		None	None		None				C-Max	None
Walk Time (s)	7.0	7.0	7.0									7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0									11.0	11.0
Pedestrian Calls (#/hr)	0	0	0									0	0
Act Effct Green (s)		18.5	18.5		13.9	13.9			33.6			26.6	45.1
Actuated g/C Ratio		0.21	0.21		0.15	0.15			0.37			0.30	0.50
v/c Ratio		0.93	0.46		0.50	0.90			0.61			0.76	0.07
Control Delay		81.6	11.1		41.8	69.6			22.8			34.5	0.5
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay		81.6	11.1		41.8	69.6			22.8			34.5	0.5
LOS		F	B		D	E			C			C	A
Approach Delay			44.9			60.1			22.8			32.0	
Approach LOS			D			E			C			C	
Stops (vph)		156	45		111	196			542			646	2
Fuel Used(gal)		6	3		2	6			9			13	0
CO Emissions (g/hr)		413	199		164	402			604			883	23
NOx Emissions (g/hr)		80	39		32	78			117			172	4
VOC Emissions (g/hr)		96	46		38	93			140			205	5
Dilemma Vehicles (#)		0	0		0	0			0			0	0
Queue Length 50th (ft)		117	17		71	138			136			216	0
Queue Length 95th (ft)		#254	82		129	#279			184			286	3
Internal Link Dist (ft)			1291			620			492			611	
Turn Bay Length (ft)													50
Base Capacity (vph)		223	477		275	291			1109			1046	856
Starvation Cap Reductn		0	0		0	0			0			0	0
Spillback Cap Reductn		0	0		0	0			0			0	0
Storage Cap Reductn		0	0		0	0			0			0	0
Reduced v/c Ratio		0.90	0.46		0.49	0.89			0.61			0.76	0.07

Intersection Summary

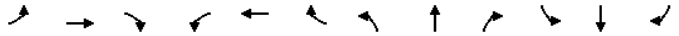
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 57 (63%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 36.4 Intersection LOS: D
Intersection Capacity Utilization 81.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 1: Market Street & Birmingham Pkwy & Lincoln Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	0	59	0	0	19	0	1023	0	0	753	0
Future Volume (vph)	113	0	59	0	0	19	0	1023	0	0	753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99											
Frt			0.850			0.865						
Flt Protected	0.950											
Satd. Flow (prot)	3433	0	1583	0	0	1644	0	5036	0	0	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	3415	0	1583	0	0	1644	0	5036	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			187						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		584			475			691			139	
Travel Time (s)		13.3			10.8			15.7			3.2	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.73	0.73	0.73	0.79	0.79	0.79	0.95	0.95	0.95	0.79	0.79	0.79
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Adj. Flow (vph)	155	0	81	0	0	24	0	1077	0	0	953	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	155	0	81	0	0	24	0	1077	0	0	953	0
Turn Type	Prot		Prot			Prot		NA			NA	
Protected Phases	3		3			2		1			1 2	
Permitted Phases												
Detector Phase	3		3			2		1			1 2	
Switch Phase												
Minimum Initial (s)	8.0		8.0			8.0		8.0				
Minimum Split (s)	14.0		14.0			14.0		14.0				
Total Split (s)	21.0		21.0			21.0		31.0				
Total Split (%)	28.8%		28.8%			28.8%		42.5%				
Maximum Green (s)	15.0		15.0			15.0		25.0				
Yellow Time (s)	4.0		4.0			4.0		4.0				
All-Red Time (s)	2.0		2.0			2.0		2.0				
Lost Time Adjust (s)	-2.0		-2.0			-2.0		-2.0				
Total Lost Time (s)	4.0		4.0			4.0		4.0				
Lead/Lag						Lag		Lead				
Lead-Lag Optimize?						Yes		Yes				
Vehicle Extension (s)	3.0		3.0			3.0		3.0				
Recall Mode	None		None			None		None				
Act Effct Green (s)	10.9		10.9			13.4		27.2			45.8	
Actuated g/C Ratio	0.18		0.18			0.22		0.45			0.76	
v/c Ratio	0.25		0.20			0.05		0.47			0.35	
Control Delay	24.5		2.9			0.2		13.8			3.9	
Queue Delay	0.0		0.0			0.0		0.0			0.1	
Total Delay	24.5		2.9			0.2		13.8			4.0	
LOS	C		A			A		B			A	
Approach Delay		17.1			0.2			13.8			4.0	
Approach LOS		B			A			B			A	
Stops (vph)	90		4			0		670			232	
Fuel Used(gal)	2		0			0		12			3	
CO Emissions (g/hr)	110		23			5		845			188	
NOx Emissions (g/hr)	21		4			1		164			37	
VOC Emissions (g/hr)	26		5			1		196			44	
Dilemma Vehicles (#)	0		0			0		0			0	
Queue Length 50th (ft)	26		0			0		101			57	
Queue Length 95th (ft)	42		1			0		162			78	
Internal Link Dist (ft)		504			395			611			59	
Turn Bay Length (ft)												
Base Capacity (vph)	997		554			610		2323			2795	
Starvation Cap Reductn	0		0			0		0			728	
Spillback Cap Reductn	0		0			0		0			0	
Storage Cap Reductn	0		0			0		0			0	
Reduced v/c Ratio	0.16		0.15			0.04		0.46			0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73			
Actuated Cycle Length: 60			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 39.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Birmingham Pkwy & Soldiers Field EB Off-Ramp/Lothrop Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	962	172	0	757	9
Future Volume (Veh/h)	0	0	0	0	0	0	0	962	172	0	757	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.96	0.96	0.96	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	0	0	0	0	0	1002	179	0	958	11
Pedestrians					23							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								139			274	
pX, platoon unblocked	0.88	0.88		0.88	0.88	0.88				0.88		
vC, conflicting volume	1208	2162	479	1594	2072	363	958			1204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	571	1651	479	1007	1550	0	958			566		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	360	88	538	175	101	963	726			897		

Direction, Lane #	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	286	286	286	322	479	479	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	179	0	0	11
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.17	0.17	0.17	0.19	0.28	0.28	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							
Approach Delay (s)	0.0				0.0		
Approach LOS							

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			24.3%	ICU Level of Service	A
Analysis Period (min)			15		

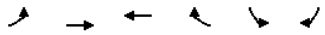
Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	72	121	0	0	0	0	0	5	8	75	0
Future Vol, veh/h	0	72	121	0	0	0	0	0	5	8	75	0
Conflicting Peds, #/hr	0	0	3	0	0	0	0	0	14	14	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	25	25	25	63	63	63	77	77	77
Heavy Vehicles, %	0	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	74	125	0	0	0	0	0	8	10	97	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	154	151	202	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	151	202	-
Critical Hdwy	-	-	-	-	-	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.5	4	-
Pot Cap-1 Maneuver	0	-	-	0	0	897	821	698	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	856	738	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	895	814	696	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	814	696	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	848	736	-

Approach	EB	NB	SB
HCM Control Delay, s	0	9.1	11
HCM LOS		A	B

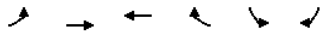
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	895	-	-	706
HCM Lane V/C Ratio	0.009	-	-	0.153
HCM Control Delay (s)	9.1	-	-	11
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0.5



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	330	15	117	26
Future Volume (Veh/h)	0	0	330	15	117	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.98	0.98	0.99	0.99
Hourly flow rate (vph)	0	0	337	15	118	26
Pedestrians					12	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		700				
pX, platoon unblocked						
vC, conflicting volume	364				356	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	364				356	356
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	96
cM capacity (veh/h)	1183				639	685

Direction, Lane #	WB 1	SB 1
Volume Total	352	144
Volume Left	0	118
Volume Right	15	26
cSH	1700	647
Volume to Capacity	0.21	0.22
Queue Length 95th (ft)	0	21
Control Delay (s)	0.0	12.1
Lane LOS		B
Approach Delay (s)	0.0	12.1
Approach LOS		B

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	33.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	348	8	0	2
Future Volume (Veh/h)	0	0	348	8	0	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	378	9	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		353				
pX, platoon unblocked						
vC, conflicting volume	387				382	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	387				382	194
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1168				593	815

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	252	135	2
Volume Left	0	0	0
Volume Right	0	9	2
cSH	1700	1700	815
Volume to Capacity	0.15	0.08	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	9.4
Lane LOS			A
Approach Delay (s)	0.0		9.4
Approach LOS			A

Intersection Summary				
Average Delay			0.0	
Intersection Capacity Utilization			19.9%	ICU Level of Service A
Analysis Period (min)			15	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	8	141	0	43	105	221	57	168	751	0	0	815	156
Future Volume (vph)	8	141	0	43	105	221	57	168	751	0	0	815	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	0		0	0		0	0		50
Storage Lanes		1		0	1		0	0		0	0		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00
Frt			0.930			0.969							0.850
Flt Protected		0.950	0.974		0.950				0.991				
Satd. Flow (prot)	0	1681	1603	0	1770	1805	0	0	3507	0	0	3539	1583
Flt Permitted		0.576	0.974		0.950				0.534				
Satd. Flow (perm)	0	1019	1603	0	1770	1805	0	0	1890	0	0	3539	1583
Right Turn on Red				Yes			Yes			No			Yes
Satd. Flow (RTOR)			164			11							98
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1371			759			572			691	
Travel Time (s)			31.2			17.3			13.0			15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	153	0	47	114	240	62	183	816	0	0	886	170
Shared Lane Traffic (%)		35%											
Lane Group Flow (vph)	0	108	101	0	114	302	0	0	999	0	0	886	170
Turn Type	Perm	Split	NA		Split	NA		pm+pt	NA			NA	pm+ov
Protected Phases		3	3		2	2		4	1 4			1	3!
Permitted Phases	3!							1 4					1
Detector Phase	3	3	3		2	2		4	1 4			1	3
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0		6.0				10.0	8.0
Minimum Split (s)	24.0	24.0	24.0		14.0	14.0		12.0				24.0	24.0
Total Split (s)	25.0	25.0	25.0		23.0	23.0		16.0				36.0	25.0
Total Split (%)	25.0%	25.0%	25.0%		23.0%	23.0%		16.0%				36.0%	25.0%
Maximum Green (s)	19.0	19.0	19.0		17.0	17.0		10.0				30.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0				4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0		2.0				2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0						6.0	6.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes				Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Recall Mode	None	None	None		None	None		None				C-Max	None
Walk Time (s)	7.0	7.0	7.0									7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0									11.0	11.0
Pedestrian Calls (#/hr)	0	0	0									0	0
Act Effct Green (s)		14.9	14.9		17.0	17.0			44.1			34.1	49.0
Actuated g/C Ratio		0.15	0.15		0.17	0.17			0.44			0.34	0.49
v/c Ratio		0.72	0.27		0.38	0.96			1.00			0.73	0.21
Control Delay		64.7	2.6		41.1	82.4			54.9			34.4	3.9
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay		64.7	2.6		41.1	82.4			54.9			34.4	3.9
LOS		E	A		D	F			D			C	A
Approach Delay			34.7			71.1			54.9			29.5	
Approach LOS			C			E			D			C	
Stops (vph)		94	2		91	232			702			693	36
Fuel Used(gal)		3	1		2	8			18			14	1
CO Emissions (g/hr)		201	74		140	531			1276			973	81
NOx Emissions (g/hr)		39	14		27	103			248			189	16
VOC Emissions (g/hr)		47	17		32	123			296			226	19
Dilemma Vehicles (#)		0	0		0	0			0			0	0
Queue Length 50th (ft)		69	0		65	186			~238			262	12
Queue Length 95th (ft)		128	8		119	#356			#441			#355	31
Internal Link Dist (ft)			1291			679			492			611	
Turn Bay Length (ft)													50
Base Capacity (vph)		193	437		300	315			995			1206	886
Starvation Cap Reductn		0	0		0	0			0			0	0
Spillback Cap Reductn		0	0		0	0			0			0	0
Storage Cap Reductn		0	0		0	0			0			0	0
Reduced v/c Ratio		0.56	0.23		0.38	0.96			1.00			0.73	0.19

Intersection Summary

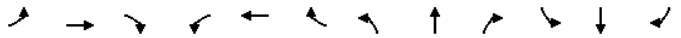
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 45.8 Intersection LOS: D
Intersection Capacity Utilization 89.9% ICU Level 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.
! Phase conflict between lane groups.

Splits and Phases: 1: Market St & Birmingham Pkwy & Lincoln St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	0	118	0	0	4	0	1020	0	0	799	0
Future Volume (vph)	167	0	118	0	0	4	0	1020	0	0	799	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99											
Frt			0.850			0.865						
Flt Protected	0.950											
Satd. Flow (prot)	3433	0	1583	0	0	1644	0	5036	0	0	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	3407	0	1583	0	0	1644	0	5036	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			163						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		584			475			691			139	
Travel Time (s)		13.3			10.8			15.7			3.2	
Confl. Peds. (#/hr)	6		1			6						
Peak Hour Factor	0.94	0.94	0.94	0.33	0.33	0.33	0.90	0.90	0.90	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Adj. Flow (vph)	178	0	126	0	0	12	0	1133	0	0	850	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	0	126	0	0	12	0	1133	0	0	850	0
Turn Type	Prot		Prot			Prot		NA			NA	
Protected Phases	3		3			2		1			1 2	
Permitted Phases												
Detector Phase	3		3			2		1			1 2	
Switch Phase												
Minimum Initial (s)	8.0		8.0			8.0		8.0				
Minimum Split (s)	14.0		14.0			14.0		14.0				
Total Split (s)	21.0		21.0			21.0		31.0				
Total Split (%)	28.8%		28.8%			28.8%		42.5%				
Maximum Green (s)	15.0		15.0			15.0		25.0				
Yellow Time (s)	4.0		4.0			4.0		4.0				
All-Red Time (s)	2.0		2.0			2.0		2.0				
Lost Time Adjust (s)	-2.0		-2.0			-2.0		-2.0				
Total Lost Time (s)	4.0		4.0			4.0		4.0				
Lead/Lag						Lag		Lead				
Lead-Lag Optimize?						Yes		Yes				
Vehicle Extension (s)	3.0		3.0			3.0		3.0				
Recall Mode	None		None			None		None				
Act Effct Green (s)	11.0		11.0			12.0		26.6			42.6	
Actuated g/C Ratio	0.18		0.18			0.19		0.43			0.69	
v/c Ratio	0.29		0.32			0.03		0.52			0.35	
Control Delay	23.9		7.1			0.0		14.3			4.4	
Queue Delay	0.0		0.0			0.0		0.0			0.0	
Total Delay	23.9		7.1			0.0		14.3			4.4	
LOS	C		A			A		B			A	
Approach Delay		17.0						14.3			4.4	
Approach LOS		B						B			A	
Stops (vph)	136		21			0		697			278	
Fuel Used(gal)	2		1			0		12			3	
CO Emissions (g/hr)	163		58			1		861			218	
NOx Emissions (g/hr)	32		11			0		168			42	
VOC Emissions (g/hr)	38		13			0		200			50	
Dilemma Vehicles (#)	0		0			0		0			0	
Queue Length 50th (ft)	29		0			0		105			51	
Queue Length 95th (ft)	57		36			0		166			85	
Internal Link Dist (ft)		504			395			611			59	
Turn Bay Length (ft)												
Base Capacity (vph)	950		535			573		2214			2716	
Starvation Cap Reductn	0		0			0		0			0	
Spillback Cap Reductn	0		0			0		0			0	
Storage Cap Reductn	0		0			0		0			0	
Reduced v/c Ratio	0.19		0.24			0.02		0.51			0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73			
Actuated Cycle Length: 61.6			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 10.9		Intersection LOS: B	
Intersection Capacity Utilization 41.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Birmingham Pkwy & Soldiers Field EB Off-Ramp/Lothrop Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	1051	144	0	810	16
Future Volume (Veh/h)	0	0	0	0	0	0	0	1051	144	0	810	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	0	0	0	0	1181	162	0	910	18
Pedestrians					34							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								139			274	
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1205	2287	455	1751	2206	410	910			1377		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434	1690	455	1068	1596	0	910			633		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	440	81	558	154	93	940	757			826		

Direction, Lane #	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	337	337	337	331	455	455	18
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	162	0	0	18
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.20	0.20	0.19	0.27	0.27	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							
Approach Delay (s)	0.0				0.0		
Approach LOS							

Intersection Summary					
Average Delay		0.0			
Intersection Capacity Utilization	25.7%	ICU Level of Service		A	
Analysis Period (min)	15				

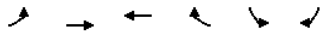
Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	79	86	0	0	0	0	0	5	12	26	0
Future Vol, veh/h	0	79	86	0	0	0	0	0	5	12	26	0
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	13	13	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	25	25	25	63	63	63	86	86	86
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	88	96	0	0	0	0	0	8	14	30	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	153	149	187	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	149	187	-
Critical Hdwy	-	-	-	-	-	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.5	4	-
Pot Cap-1 Maneuver	0	-	-	0	0	898	824	711	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	858	749	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	895	817	709	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	709	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	850	747	-

Approach	EB	NB	SB
HCM Control Delay, s	0	9.1	10.2
HCM LOS		A	B

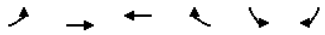
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	895	-	-	740
HCM Lane V/C Ratio	0.009	-	-	0.06
HCM Control Delay (s)	9.1	-	-	10.2
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0.2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	338	43	74	22
Future Volume (Veh/h)	0	0	338	43	74	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.99	0.99	0.96	0.96
Hourly flow rate (vph)	0	0	341	43	77	23
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		759				
pX, platoon unblocked						
vC, conflicting volume	388				366	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388				366	366
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	97
cM capacity (veh/h)	1167				635	681

Direction, Lane #	WB 1	SB 1
Volume Total	384	100
Volume Left	0	77
Volume Right	43	23
cSH	1700	645
Volume to Capacity	0.23	0.16
Queue Length 95th (ft)	0	14
Control Delay (s)	0.0	11.6
Lane LOS		B
Approach Delay (s)	0.0	11.6
Approach LOS		B

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	32.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↑↑			↱
Traffic Volume (veh/h)	0	0	352	8	0	10
Future Volume (Veh/h)	0	0	352	8	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	383	9	0	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		394				
pX, platoon unblocked						
vC, conflicting volume	392				388	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	392				388	196
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1163				588	812

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	255	137	11
Volume Left	0	0	0
Volume Right	0	9	11
cSH	1700	1700	812
Volume to Capacity	0.15	0.08	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0		9.5
Approach LOS			A

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	20.0%	ICU Level of Service	A	
Analysis Period (min)	15			

- No-Build (2024) Condition

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	10	267	0	122	128	191	56	37	652	0	0	896	60
Future Volume (vph)	10	267	0	122	128	191	56	37	652	0	0	896	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	0		0	0		0	0		50
Storage Lanes		1		0	1		0	0		0	0		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00
Frt			0.912			0.966							0.850
Flt Protected		0.950	0.980		0.950				0.997				
Satd. Flow (prot)	0	1681	1582	0	1770	1799	0	0	3529	0	0	3539	1583
Flt Permitted		0.594	0.980		0.950				0.691				
Satd. Flow (perm)	0	1051	1582	0	1770	1799	0	0	2446	0	0	3539	1583
Right Turn on Red				Yes			Yes			No			Yes
Satd. Flow (RTOR)			182			14							109
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1371			700			572			691	
Travel Time (s)			31.2			15.9			13.0			15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	290	0	133	139	208	61	40	709	0	0	974	65
Shared Lane Traffic (%)		32%											
Lane Group Flow (vph)	0	208	226	0	139	269	0	0	749	0	0	974	65
Turn Type	Perm	Split	NA		Split	NA		D.P+P	NA			NA	pm+ov
Protected Phases		3	3		2	2		4	1 4			1	3!
Permitted Phases	3!							1					1
Detector Phase	3	3	3		2	2		4	1 4			1	3
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0		6.0				10.0	8.0
Minimum Split (s)	24.0	24.0	24.0		16.0	16.0		12.0				24.0	24.0
Total Split (s)	25.0	25.0	25.0		20.0	20.0		13.0				32.0	25.0
Total Split (%)	27.8%	27.8%	27.8%		22.2%	22.2%		14.4%				35.6%	27.8%
Maximum Green (s)	19.0	19.0	19.0		14.0	14.0		7.0				26.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0				4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0		2.0				2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0						6.0	6.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes				Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Recall Mode	None	None	None		None	None		None				C-Max	None
Walk Time (s)	7.0	7.0	7.0									7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0									11.0	11.0
Pedestrian Calls (#/hr)	0	0	0									0	0
Act Effct Green (s)		18.9	18.9		14.0	14.0			33.1			26.1	45.0
Actuated g/C Ratio		0.21	0.21		0.16	0.16			0.37			0.29	0.50
v/c Ratio		0.95	0.47		0.51	0.92			0.76			0.95	0.08
Control Delay		85.6	11.7		42.0	74.1			27.8			50.8	0.6
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay		85.6	11.7		42.0	74.1			27.8			50.8	0.6
LOS		F	B		D	E			C			D	A
Approach Delay			47.1			63.2			27.8			47.7	
Approach LOS			D			E			C			D	
Stops (vph)		159	50		114	202			644			791	2
Fuel Used(gal)		6	3		2	6			11			18	0
CO Emissions (g/hr)		437	209		169	433			736			1291	24
NOx Emissions (g/hr)		85	41		33	84			143			251	5
VOC Emissions (g/hr)		101	48		39	100			171			299	6
Dilemma Vehicles (#)		0	0		0	0			0			0	0
Queue Length 50th (ft)		123	22		73	145			156			284	0
Queue Length 95th (ft)		#265	88		132	#294			207			#413	4
Internal Link Dist (ft)			1291			620			492			611	
Turn Bay Length (ft)													50
Base Capacity (vph)		221	477		275	291			983			1025	847
Starvation Cap Reductn		0	0		0	0			0			0	0
Spillback Cap Reductn		0	0		0	0			0			0	0
Storage Cap Reductn		0	0		0	0			0			0	0
Reduced v/c Ratio		0.94	0.47		0.51	0.92			0.76			0.95	0.08

Intersection Summary

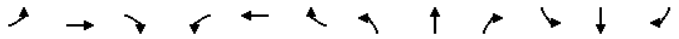
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 57 (63%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 44.3 Intersection LOS: D
Intersection Capacity Utilization 85.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 1: Market Street & Birmingham Pkwy & Lincoln Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	0	61	0	0	20	0	1106	0	0	920	0
Future Volume (vph)	120	0	61	0	0	20	0	1106	0	0	920	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99											
Frt			0.850			0.865						
Flt Protected	0.950											
Satd. Flow (prot)	3433	0	1583	0	0	1644	0	5036	0	0	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	3415	0	1583	0	0	1644	0	5036	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			174						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		584			475			691			139	
Travel Time (s)		13.3			10.8			15.7			3.2	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.73	0.73	0.73	0.79	0.79	0.79	0.95	0.95	0.95	0.79	0.79	0.79
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Adj. Flow (vph)	164	0	84	0	0	25	0	1164	0	0	1165	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	0	84	0	0	25	0	1164	0	0	1165	0
Turn Type	Prot		Prot			Prot		NA			NA	
Protected Phases	3		3			2		1			1 2	
Permitted Phases												
Detector Phase	3		3			2		1			1 2	
Switch Phase												
Minimum Initial (s)	8.0		8.0			8.0		8.0				
Minimum Split (s)	14.0		14.0			14.0		14.0				
Total Split (s)	21.0		21.0			21.0		31.0				
Total Split (%)	28.8%		28.8%			28.8%		42.5%				
Maximum Green (s)	15.0		15.0			15.0		25.0				
Yellow Time (s)	4.0		4.0			4.0		4.0				
All-Red Time (s)	2.0		2.0			2.0		2.0				
Lost Time Adjust (s)	-2.0		-2.0			-2.0		-2.0				
Total Lost Time (s)	4.0		4.0			4.0		4.0				
Lead/Lag						Lag		Lead				
Lead-Lag Optimize?						Yes		Yes				
Vehicle Extension (s)	3.0		3.0			3.0		3.0				
Recall Mode	None		None			None		None				
Act Effct Green (s)	10.9		10.9			15.2		27.1			46.3	
Actuated g/C Ratio	0.17		0.17			0.23		0.42			0.71	
v/c Ratio	0.29		0.22			0.05		0.56			0.46	
Control Delay	25.6		3.3			0.2		16.2			4.9	
Queue Delay	0.0		0.0			0.0		0.0			0.3	
Total Delay	25.6		3.3			0.2		16.2			5.2	
LOS	C		A			A		B			A	
Approach Delay		18.0			0.2			16.2			5.2	
Approach LOS		B			A			B			A	
Stops (vph)	100		4			0		791			345	
Fuel Used(gal)	2		0			0		14			4	
CO Emissions (g/hr)	121		24			5		977			267	
NOx Emissions (g/hr)	23		5			1		190			52	
VOC Emissions (g/hr)	28		6			1		226			62	
Dilemma Vehicles (#)	0		0			0		0			0	
Queue Length 50th (ft)	30		0			0		126			79	
Queue Length 95th (ft)	44		2			0		179			103	
Internal Link Dist (ft)		504			395			611			59	
Turn Bay Length (ft)												
Base Capacity (vph)	897		512			558		2090			2611	
Starvation Cap Reductn	0		0			0		0			719	
Spillback Cap Reductn	0		0			0		0			0	
Storage Cap Reductn	0		0			0		0			0	
Reduced v/c Ratio	0.18		0.16			0.04		0.56			0.62	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73			
Actuated Cycle Length: 65.2			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 11.3		Intersection LOS: B	
Intersection Capacity Utilization 41.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Birmingham Pkwy & Soldiers Field EB Off-Ramp/Lothrop Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	1046	178	0	924	9
Future Volume (Veh/h)	0	0	0	0	0	0	0	1046	178	0	924	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.96	0.96	0.96	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	0	0	0	0	0	1090	185	0	1170	11
Pedestrians					23							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								139			274	
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1442	2468	585	1790	2376	388	1170			1298		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	675	1873	585	1081	1765	0	1170			506		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	294	62	459	150	73	934	604			915		

Direction, Lane #	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	311	311	311	341	585	585	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	185	0	0	11
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.18	0.20	0.34	0.34	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							
Approach Delay (s)	0.0				0.0		
Approach LOS							

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			28.9%	ICU Level of Service	A
Analysis Period (min)			15		

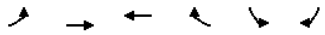
Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	75	125	0	0	0	0	0	5	8	78	0
Future Vol, veh/h	0	75	125	0	0	0	0	0	5	8	78	0
Conflicting Peds, #/hr	0	0	3	0	0	0	0	0	14	14	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	25	25	25	63	63	63	77	77	77
Heavy Vehicles, %	0	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	77	129	0	0	0	0	0	8	10	101	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	159	156	209	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	156	209	-
Critical Hdwy	-	-	-	-	-	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.5	4	-
Pot Cap-1 Maneuver	0	-	-	0	0	892	815	692	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	851	733	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	890	808	690	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	808	690	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	843	731	-

Approach	EB	NB	SB
HCM Control Delay, s	0	9.1	11.1
HCM LOS		A	B

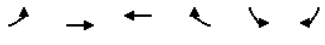
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	890	-	-	700
HCM Lane V/C Ratio	0.009	-	-	0.16
HCM Control Delay (s)	9.1	-	-	11.1
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0.6



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	342	16	121	27
Future Volume (Veh/h)	0	0	342	16	121	27
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.98	0.98	0.99	0.99
Hourly flow rate (vph)	0	0	349	16	122	27
Pedestrians					12	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		700				
pX, platoon unblocked						
vC, conflicting volume	377				369	369
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	377				369	369
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				81	96
cM capacity (veh/h)	1170				629	674

Direction, Lane #	WB 1	SB 1
Volume Total	365	149
Volume Left	0	122
Volume Right	16	27
cSH	1700	637
Volume to Capacity	0.21	0.23
Queue Length 95th (ft)	0	23
Control Delay (s)	0.0	12.4
Lane LOS		B
Approach Delay (s)	0.0	12.4
Approach LOS		B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	34.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	360	8	0	2
Future Volume (Veh/h)	0	0	360	8	0	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	391	9	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		353				
pX, platoon unblocked						
vC, conflicting volume	400				396	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	400				396	200
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1155				582	808

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	261	139	2
Volume Left	0	0	0
Volume Right	0	9	2
cSH	1700	1700	808
Volume to Capacity	0.15	0.08	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0		9.5
Approach LOS			A

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		20.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	8	146	0	45	109	229	59	174	921	0	0	908	162
Future Volume (vph)	8	146	0	45	109	229	59	174	921	0	0	908	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	0		0	0		0	0		50
Storage Lanes		1		0	1		0	0		0	0		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00
Frt			0.930			0.969							0.850
Flt Protected		0.950	0.974		0.950				0.992				
Satd. Flow (prot)	0	1681	1603	0	1770	1805	0	0	3511	0	0	3539	1583
Flt Permitted		0.570	0.974		0.950				0.510				
Satd. Flow (perm)	0	1009	1603	0	1770	1805	0	0	1805	0	0	3539	1583
Right Turn on Red				Yes			Yes			No			Yes
Satd. Flow (RTOR)			164			11							98
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1371			759			572			691	
Travel Time (s)			31.2			17.3			13.0			15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	159	0	49	118	249	64	189	1001	0	0	987	176
Shared Lane Traffic (%)		35%											
Lane Group Flow (vph)	0	112	105	0	118	313	0	0	1190	0	0	987	176
Turn Type	Perm	Split	NA		Split	NA		pm+pt	NA			NA	pm+ov
Protected Phases		3	3		2	2		4	1 4			1	3!
Permitted Phases	3!							1 4					1
Detector Phase	3	3	3		2	2		4	1 4			1	3
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0		6.0				10.0	8.0
Minimum Split (s)	24.0	24.0	24.0		14.0	14.0		12.0				24.0	24.0
Total Split (s)	25.0	25.0	25.0		23.0	23.0		16.0				36.0	25.0
Total Split (%)	25.0%	25.0%	25.0%		23.0%	23.0%		16.0%				36.0%	25.0%
Maximum Green (s)	19.0	19.0	19.0		17.0	17.0		10.0				30.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0				4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0		2.0				2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0						6.0	6.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes				Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Recall Mode	None	None	None		None	None		None				C-Max	None
Walk Time (s)	7.0	7.0	7.0									7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0									11.0	11.0
Pedestrian Calls (#/hr)	0	0	0									0	0
Act Effct Green (s)		15.2	15.2		17.0	17.0			43.8			33.8	49.0
Actuated g/C Ratio		0.15	0.15		0.17	0.17			0.44			0.34	0.49
v/c Ratio		0.73	0.27		0.39	0.99			1.24			0.83	0.21
Control Delay		66.6	3.0		41.4	90.7			140.7			38.5	4.0
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay		66.6	3.0		41.4	90.7			140.7			38.5	4.0
LOS		E	A		D	F			F			D	A
Approach Delay			35.8			77.2			140.7			33.3	
Approach LOS			D			E			F			C	
Stops (vph)		96	3		95	237			790			771	38
Fuel Used(gal)		3	1		2	8			41			16	1
CO Emissions (g/hr)		212	78		146	583			2838			1138	85
NOx Emissions (g/hr)		41	15		28	113			552			221	17
VOC Emissions (g/hr)		49	18		34	135			658			264	20
Dilemma Vehicles (#)		0	0		0	0			0			0	0
Queue Length 50th (ft)		71	0		68	195			~420			306	13
Queue Length 95th (ft)		#133	11		123	#372			#653			#446	32
Internal Link Dist (ft)			1291			679			492			611	
Turn Bay Length (ft)													50
Base Capacity (vph)		191	437		300	315			961			1196	882
Starvation Cap Reductn		0	0		0	0			0			0	0
Spillback Cap Reductn		0	0		0	0			0			0	0
Storage Cap Reductn		0	0		0	0			0			0	0
Reduced v/c Ratio		0.59	0.24		0.39	0.99			1.24			0.83	0.20

Intersection Summary

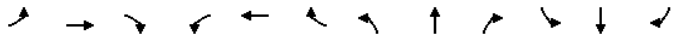
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 82.4 Intersection LOS: F
Intersection Capacity Utilization 97.9% ICU Level of Service F
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.
! Phase conflict between lane groups.

Splits and Phases: 1: Market St & Birmingham Pkwy & Lincoln St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	0	122	0	0	4	0	1198	0	0	891	0
Future Volume (vph)	175	0	122	0	0	4	0	1198	0	0	891	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99											
Frt			0.850			0.865						
Flt Protected	0.950											
Satd. Flow (prot)	3433	0	1583	0	0	1644	0	5036	0	0	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	3407	0	1583	0	0	1644	0	5036	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			150						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		584			475			691			139	
Travel Time (s)		13.3			10.8			15.7			3.2	
Confl. Peds. (#/hr)	6		1			6						
Peak Hour Factor	0.94	0.94	0.94	0.33	0.33	0.33	0.90	0.90	0.90	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Adj. Flow (vph)	186	0	130	0	0	12	0	1331	0	0	948	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	0	130	0	0	12	0	1331	0	0	948	0
Turn Type	Prot		Prot			Prot		NA			NA	
Protected Phases	3		3			2		1			1 2	
Permitted Phases												
Detector Phase	3		3			2		1			1 2	
Switch Phase												
Minimum Initial (s)	8.0		8.0			8.0		8.0				
Minimum Split (s)	14.0		14.0			14.0		14.0				
Total Split (s)	21.0		21.0			21.0		31.0				
Total Split (%)	28.8%		28.8%			28.8%		42.5%				
Maximum Green (s)	15.0		15.0			15.0		25.0				
Yellow Time (s)	4.0		4.0			4.0		4.0				
All-Red Time (s)	2.0		2.0			2.0		2.0				
Lost Time Adjust (s)	-2.0		-2.0			-2.0		-2.0				
Total Lost Time (s)	4.0		4.0			4.0		4.0				
Lead/Lag						Lag		Lead				
Lead-Lag Optimize?						Yes		Yes				
Vehicle Extension (s)	3.0		3.0			3.0		3.0				
Recall Mode	None		None			None		None				
Act Effct Green (s)	11.1		11.1			13.2		27.1			44.3	
Actuated g/C Ratio	0.18		0.18			0.21		0.43			0.70	
v/c Ratio	0.31		0.34			0.03		0.62			0.38	
Control Delay	24.7		7.6			0.0		16.2			4.6	
Queue Delay	0.0		0.0			0.0		0.0			0.1	
Total Delay	24.7		7.6			0.0		16.2			4.7	
LOS	C		A			A		B			A	
Approach Delay		17.7						16.2			4.7	
Approach LOS		B						B			A	
Stops (vph)	143		23			0		877			318	
Fuel Used(gal)	2		1			0		15			4	
CO Emissions (g/hr)	173		61			1		1067			248	
NOx Emissions (g/hr)	34		12			0		208			48	
VOC Emissions (g/hr)	40		14			0		247			58	
Dilemma Vehicles (#)	0		0			0		0			0	
Queue Length 50th (ft)	32		0			0		136			60	
Queue Length 95th (ft)	61		39			0		215			100	
Internal Link Dist (ft)		504			395			611			59	
Turn Bay Length (ft)												
Base Capacity (vph)	923		523			551		2151			2687	
Starvation Cap Reductn	0		0			0		0			722	
Spillback Cap Reductn	0		0			0		0			0	
Storage Cap Reductn	0		0			0		0			0	
Reduced v/c Ratio	0.20		0.25			0.02		0.62			0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73			
Actuated Cycle Length: 63.4			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Birmingham Pkwy & Soldiers Field EB Off-Ramp/Lothrop Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	1232	149	0	903	17
Future Volume (Veh/h)	0	0	0	0	0	0	0	1232	149	0	903	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	0	0	0	0	1384	167	0	1015	19
Pedestrians					34							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								139			274	
pX, platoon unblocked	0.82	0.82		0.82	0.82	0.82				0.82		
vC, conflicting volume	1361	2600	508	2009	2516	464	1015			1585		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	338	1850	508	1129	1748	0	1015			611		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	489	62	516	132	71	894	691			801		

Direction, Lane #	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	395	395	395	365	508	508	19
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	167	0	0	19
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.23	0.23	0.23	0.21	0.30	0.30	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							
Approach Delay (s)	0.0				0.0		
Approach LOS							

Intersection Summary					
Average Delay		0.0			
Intersection Capacity Utilization	28.3%	ICU Level of Service		A	
Analysis Period (min)		15			

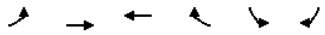
Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	82	89	0	0	0	0	0	5	12	27	0
Future Vol, veh/h	0	82	89	0	0	0	0	0	5	12	27	0
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	13	13	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	25	25	25	63	63	63	86	86	86
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	91	99	0	0	0	0	0	8	14	31	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	158	154	194	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	154	194	-
Critical Hdwy	-	-	-	-	-	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.5	4	-
Pot Cap-1 Maneuver	0	-	-	0	0	893	817	705	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	853	744	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	890	810	703	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	810	703	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	845	742	-

Approach	EB	NB	SB
HCM Control Delay, s	0	9.1	10.2
HCM LOS		A	B

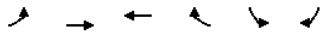
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	890	-	-	733
HCM Lane V/C Ratio	0.009	-	-	0.062
HCM Control Delay (s)	9.1	-	-	10.2
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0.2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	350	45	77	23
Future Volume (Veh/h)	0	0	350	45	77	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.99	0.99	0.96	0.96
Hourly flow rate (vph)	0	0	354	45	80	24
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		759				
pX, platoon unblocked						
vC, conflicting volume	403				380	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	403				380	380
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	96
cM capacity (veh/h)	1152				624	669

Direction, Lane #	WB 1	SB 1
Volume Total	399	104
Volume Left	0	80
Volume Right	45	24
cSH	1700	633
Volume to Capacity	0.23	0.16
Queue Length 95th (ft)	0	15
Control Delay (s)	0.0	11.8
Lane LOS		B
Approach Delay (s)	0.0	11.8
Approach LOS		B

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	33.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	365	8	0	10
Future Volume (Veh/h)	0	0	365	8	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	397	9	0	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		435				
pX, platoon unblocked						
vC, conflicting volume	406				402	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406				402	203
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1149				577	804

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	265	141	11
Volume Left	0	0	0
Volume Right	0	9	11
cSH	1700	1700	804
Volume to Capacity	0.16	0.08	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0		9.5
Approach LOS			A

Intersection Summary				
Average Delay			0.3	
Intersection Capacity Utilization			20.3%	ICU Level of Service A
Analysis Period (min)			15	

- Build (2024) Condition

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	10	266	0	122	131	194	62	37	652	0	0	896	60
Future Volume (vph)	10	266	0	122	131	194	62	37	652	0	0	896	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	0		0	0		0	0		50
Storage Lanes		1		0	1		0	0		0	0		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00
Frt			0.911			0.964							0.850
Flt Protected		0.950	0.980		0.950				0.997				
Satd. Flow (prot)	0	1681	1580	0	1770	1796	0	0	3529	0	0	3539	1583
Flt Permitted		0.589	0.980		0.950				0.689				
Satd. Flow (perm)	0	1042	1580	0	1770	1796	0	0	2439	0	0	3539	1583
Right Turn on Red				Yes			Yes			No			Yes
Satd. Flow (RTOR)			182			15							109
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1371			373			572			691	
Travel Time (s)			31.2			8.5			13.0			15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	289	0	133	142	211	67	40	709	0	0	974	65
Shared Lane Traffic (%)		32%											
Lane Group Flow (vph)	0	208	225	0	142	278	0	0	749	0	0	974	65
Turn Type	Perm	Split	NA		Split	NA		D.P+P	NA			NA	pm+ov
Protected Phases		3	3		2	2		4	1 4			1	3!
Permitted Phases	3!							1					1
Detector Phase	3	3	3		2	2		4	1 4			1	3
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0		6.0				10.0	8.0
Minimum Split (s)	24.0	24.0	24.0		16.0	16.0		12.0				24.0	24.0
Total Split (s)	25.0	25.0	25.0		20.0	20.0		13.0				32.0	25.0
Total Split (%)	27.8%	27.8%	27.8%		22.2%	22.2%		14.4%				35.6%	27.8%
Maximum Green (s)	19.0	19.0	19.0		14.0	14.0		7.0				26.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0				4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0		2.0				2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0						6.0	6.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes				Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Recall Mode	None	None	None		None	None		None				C-Max	None
Walk Time (s)	7.0	7.0	7.0									7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0									11.0	11.0
Pedestrian Calls (#/hr)	0	0	0									0	0
Act Effct Green (s)		19.0	19.0		14.0	14.0			33.0			26.0	45.0
Actuated g/C Ratio		0.21	0.21		0.16	0.16			0.37			0.29	0.50
v/c Ratio		0.95	0.47		0.52	0.95			0.77			0.95	0.08
Control Delay		87.0	11.6		42.4	79.6			27.9			51.4	0.6
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay		87.0	11.6		42.4	79.6			27.9			51.4	0.6
LOS		F	B		D	E			C			D	A
Approach Delay			47.8			67.0			27.9			48.2	
Approach LOS			D			E			C			D	
Stops (vph)		158	50		118	206			645			792	2
Fuel Used(gal)		6	3		2	6			11			19	0
CO Emissions (g/hr)		440	208		151	422			738			1299	24
NOx Emissions (g/hr)		86	40		29	82			144			253	5
VOC Emissions (g/hr)		102	48		35	98			171			301	6
Dilemma Vehicles (#)		0	0		0	0			0			0	0
Queue Length 50th (ft)		123	21		75	151			156			284	0
Queue Length 95th (ft)		#266	87		134	#306			207			#413	4
Internal Link Dist (ft)			1291			293			492			611	
Turn Bay Length (ft)													50
Base Capacity (vph)		219	477		275	292			979			1022	846
Starvation Cap Reductn		0	0		0	0			0			0	0
Spillback Cap Reductn		0	0		0	0			0			0	0
Storage Cap Reductn		0	0		0	0			0			0	0
Reduced v/c Ratio		0.95	0.47		0.52	0.95			0.77			0.95	0.08

Intersection Summary

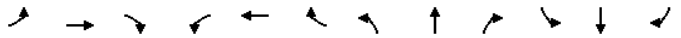
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 57 (63%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 45.4 Intersection LOS: D
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 1: Market Street & Birmingham Pkwy & Lincoln Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	0	61	0	0	20	0	1111	0	0	920	0
Future Volume (vph)	120	0	61	0	0	20	0	1111	0	0	920	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99											
Frt			0.850			0.865						
Flt Protected	0.950											
Satd. Flow (prot)	3433	0	1583	0	0	1644	0	5036	0	0	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	3415	0	1583	0	0	1644	0	5036	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			174						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		584			475			691			139	
Travel Time (s)		13.3			10.8			15.7			3.2	
Confl. Peds. (#/hr)	4					4						
Peak Hour Factor	0.73	0.73	0.73	0.79	0.79	0.79	0.95	0.95	0.95	0.79	0.79	0.79
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Adj. Flow (vph)	164	0	84	0	0	25	0	1169	0	0	1165	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	0	84	0	0	25	0	1169	0	0	1165	0
Turn Type	Prot		Prot			Prot		NA			NA	
Protected Phases	3		3			2		1			1 2	
Permitted Phases												
Detector Phase	3		3			2		1			1 2	
Switch Phase												
Minimum Initial (s)	8.0		8.0			8.0		8.0				
Minimum Split (s)	14.0		14.0			14.0		14.0				
Total Split (s)	21.0		21.0			21.0		31.0				
Total Split (%)	28.8%		28.8%			28.8%		42.5%				
Maximum Green (s)	15.0		15.0			15.0		25.0				
Yellow Time (s)	4.0		4.0			4.0		4.0				
All-Red Time (s)	2.0		2.0			2.0		2.0				
Lost Time Adjust (s)	-2.0		-2.0			-2.0		-2.0				
Total Lost Time (s)	4.0		4.0			4.0		4.0				
Lead/Lag						Lag		Lead				
Lead-Lag Optimize?						Yes		Yes				
Vehicle Extension (s)	3.0		3.0			3.0		3.0				
Recall Mode	None		None			None		None				
Act Effct Green (s)	10.9		10.9			15.2		27.1			46.3	
Actuated g/C Ratio	0.17		0.17			0.23		0.42			0.71	
v/c Ratio	0.29		0.22			0.05		0.56			0.46	
Control Delay	25.6		3.3			0.2		16.2			4.9	
Queue Delay	0.0		0.0			0.0		0.0			0.3	
Total Delay	25.6		3.3			0.2		16.2			5.2	
LOS	C		A			A		B			A	
Approach Delay		18.0			0.2			16.2			5.2	
Approach LOS		B			A			B			A	
Stops (vph)	100		4			0		796			345	
Fuel Used(gal)	2		0			0		14			4	
CO Emissions (g/hr)	121		24			5		982			267	
NOx Emissions (g/hr)	23		5			1		191			52	
VOC Emissions (g/hr)	28		6			1		228			62	
Dilemma Vehicles (#)	0		0			0		0			0	
Queue Length 50th (ft)	30		0			0		127			79	
Queue Length 95th (ft)	44		2			0		179			103	
Internal Link Dist (ft)		504			395			611			59	
Turn Bay Length (ft)												
Base Capacity (vph)	897		512			558		2090			2611	
Starvation Cap Reductn	0		0			0		0			719	
Spillback Cap Reductn	0		0			0		0			0	
Storage Cap Reductn	0		0			0		0			0	
Reduced v/c Ratio	0.18		0.16			0.04		0.56			0.62	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73			
Actuated Cycle Length: 65.2			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 11.3		Intersection LOS: B	
Intersection Capacity Utilization 41.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Birmingham Pkwy & Soldiers Field EB Off-Ramp/Lothrop Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	1050	179	0	924	9
Future Volume (Veh/h)	0	0	0	0	0	0	0	1050	179	0	924	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.96	0.96	0.96	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	0	0	0	0	0	1094	186	0	1170	11
Pedestrians					23							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								139			274	
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1444	2473	585	1795	2380	390	1170			1303		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	669	1874	585	1081	1765	0	1170			505		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	297	62	459	150	73	932	604			915		

Direction, Lane #	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	313	313	313	342	585	585	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	186	0	0	11
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.18	0.20	0.34	0.34	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							
Approach Delay (s)	0.0				0.0		
Approach LOS							

Intersection Summary					
Average Delay		0.0			
Intersection Capacity Utilization	28.9%	ICU Level of Service		A	
Analysis Period (min)	15				

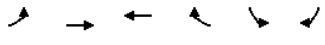
Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	75	126	0	0	0	0	0	5	8	77	0
Future Vol, veh/h	0	75	126	0	0	0	0	0	5	8	77	0
Conflicting Peds, #/hr	0	0	3	0	0	0	0	0	14	14	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	25	25	25	63	63	63	77	77	77
Heavy Vehicles, %	0	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	77	130	0	0	0	0	0	8	10	100	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	159	156	210	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	156	210	-
Critical Hdwy	-	-	-	-	-	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.5	4	-
Pot Cap-1 Maneuver	0	-	-	0	0	892	815	691	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	851	732	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	890	808	689	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	808	689	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	843	730	-

Approach	EB	NB	SB
HCM Control Delay, s	0	9.1	11.1
HCM LOS		A	B

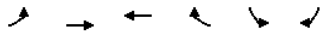
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	890	-	-	699
HCM Lane V/C Ratio	0.009	-	-	0.158
HCM Control Delay (s)	9.1	-	-	11.1
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0.6



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	339	16	123	25
Future Volume (Veh/h)	0	0	339	16	123	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.98	0.98	0.99	0.99
Hourly flow rate (vph)	0	0	346	16	124	25
Pedestrians					12	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		701				
pX, platoon unblocked						
vC, conflicting volume	374				366	366
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374				366	366
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				80	96
cM capacity (veh/h)	1173				631	677

Direction, Lane #	WB 1	SB 1
Volume Total	362	149
Volume Left	0	124
Volume Right	16	25
cSH	1700	639
Volume to Capacity	0.21	0.23
Queue Length 95th (ft)	0	22
Control Delay (s)	0.0	12.3
Lane LOS		B
Approach Delay (s)	0.0	12.3
Approach LOS		B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	33.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	360	3	0	14
Future Volume (Veh/h)	0	0	360	3	0	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	391	3	0	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		373				
pX, platoon unblocked						
vC, conflicting volume	394				392	197
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	394				392	197
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1161				584	811

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	261	133	15
Volume Left	0	0	0
Volume Right	0	3	15
cSH	1700	1700	811
Volume to Capacity	0.15	0.08	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0		9.5
Approach LOS			A

Intersection Summary				
Average Delay			0.3	
Intersection Capacity Utilization			20.0%	ICU Level of Service A
Analysis Period (min)			15	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	8	147	0	45	108	228	57	174	922	0	0	908	162
Future Volume (vph)	8	147	0	45	108	228	57	174	922	0	0	908	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	0		0	0		0	0		50
Storage Lanes		1		0	1		0	0		0	0		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00
Frt			0.930			0.970							0.850
Flt Protected		0.950	0.974		0.950				0.992				
Satd. Flow (prot)	0	1681	1603	0	1770	1807	0	0	3511	0	0	3539	1583
Flt Permitted		0.572	0.974		0.950				0.510				
Satd. Flow (perm)	0	1012	1603	0	1770	1807	0	0	1805	0	0	3539	1583
Right Turn on Red				Yes			Yes			No			Yes
Satd. Flow (RTOR)			164			11							98
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1371			361			572			691	
Travel Time (s)			31.2			8.2			13.0			15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	160	0	49	117	248	62	189	1002	0	0	987	176
Shared Lane Traffic (%)		35%											
Lane Group Flow (vph)	0	113	105	0	117	310	0	0	1191	0	0	987	176
Turn Type	Perm	Split	NA		Split	NA		pm+pt	NA			NA	pm+ov
Protected Phases		3	3		2	2		4	1 4			1	3!
Permitted Phases	3!							1 4					1
Detector Phase	3	3	3		2	2		4	1 4			1	3
Switch Phase													
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0		6.0				10.0	8.0
Minimum Split (s)	24.0	24.0	24.0		14.0	14.0		12.0				24.0	24.0
Total Split (s)	25.0	25.0	25.0		23.0	23.0		16.0				36.0	25.0
Total Split (%)	25.0%	25.0%	25.0%		23.0%	23.0%		16.0%				36.0%	25.0%
Maximum Green (s)	19.0	19.0	19.0		17.0	17.0		10.0				30.0	19.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0		4.0				4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0		2.0				2.0	2.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0						0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0						6.0	6.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag		Lag				Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes		Yes				Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Recall Mode	None	None	None		None	None		None				C-Max	None
Walk Time (s)	7.0	7.0	7.0									7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0									11.0	11.0
Pedestrian Calls (#/hr)	0	0	0									0	0
Act Effct Green (s)		15.2	15.2		17.0	17.0			43.8			33.8	49.0
Actuated g/C Ratio		0.15	0.15		0.17	0.17			0.44			0.34	0.49
v/c Ratio		0.73	0.27		0.39	0.98			1.24			0.83	0.21
Control Delay		66.6	3.0		41.3	87.5			141.6			38.6	4.0
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay		66.6	3.0		41.3	87.5			141.6			38.6	4.0
LOS		E	A		D	F			F			D	A
Approach Delay			36.0			74.8			141.6			33.4	
Approach LOS			D			E			F			C	
Stops (vph)		98	3		94	235			791			771	38
Fuel Used(gal)		3	1		2	7			41			16	1
CO Emissions (g/hr)		214	78		121	502			2855			1139	85
NOx Emissions (g/hr)		42	15		24	98			555			222	17
VOC Emissions (g/hr)		50	18		28	116			662			264	20
Dilemma Vehicles (#)		0	0		0	0			0			0	0
Queue Length 50th (ft)		72	0		67	193			~422			307	13
Queue Length 95th (ft)		#136	11		122	#368			#654			#446	32
Internal Link Dist (ft)			1291			281			492			611	
Turn Bay Length (ft)													50
Base Capacity (vph)		192	437		300	316			960			1195	881
Starvation Cap Reductn		0	0		0	0			0			0	0
Spillback Cap Reductn		0	0		0	0			0			0	0
Storage Cap Reductn		0	0		0	0			0			0	0
Reduced v/c Ratio		0.59	0.24		0.39	0.98			1.24			0.83	0.20

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 82.4 Intersection LOS: F
Intersection Capacity Utilization 97.8% ICU Level of Service F
Analysis Period (min) 15

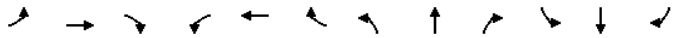
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 1: Market St & Birmingham Pkwy & Lincoln St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	0	122	0	0	4	0	1198	0	0	891	0
Future Volume (vph)	175	0	122	0	0	4	0	1198	0	0	891	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Ped Bike Factor	0.99											
Frt			0.850			0.865						
Flt Protected	0.950											
Satd. Flow (prot)	3433	0	1583	0	0	1644	0	5036	0	0	3539	0
Flt Permitted	0.950											
Satd. Flow (perm)	3407	0	1583	0	0	1644	0	5036	0	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			150						
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		584			475			691			139	
Travel Time (s)		13.3			10.8			15.7			3.2	
Confl. Peds. (#/hr)	6		1			6						
Peak Hour Factor	0.94	0.94	0.94	0.33	0.33	0.33	0.90	0.90	0.90	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Adj. Flow (vph)	186	0	130	0	0	12	0	1331	0	0	948	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	0	130	0	0	12	0	1331	0	0	948	0
Turn Type	Prot		Prot			Prot		NA			NA	
Protected Phases	3		3			2		1			1 2	
Permitted Phases												
Detector Phase	3		3			2		1			1 2	
Switch Phase												
Minimum Initial (s)	8.0		8.0			8.0		8.0				
Minimum Split (s)	14.0		14.0			14.0		14.0				
Total Split (s)	21.0		21.0			21.0		31.0				
Total Split (%)	28.8%		28.8%			28.8%		42.5%				
Maximum Green (s)	15.0		15.0			15.0		25.0				
Yellow Time (s)	4.0		4.0			4.0		4.0				
All-Red Time (s)	2.0		2.0			2.0		2.0				
Lost Time Adjust (s)	-2.0		-2.0			-2.0		-2.0				
Total Lost Time (s)	4.0		4.0			4.0		4.0				
Lead/Lag						Lag		Lead				
Lead-Lag Optimize?						Yes		Yes				
Vehicle Extension (s)	3.0		3.0			3.0		3.0				
Recall Mode	None		None			None		None				
Act Effct Green (s)	11.1		11.1			13.2		27.1			44.3	
Actuated g/C Ratio	0.18		0.18			0.21		0.43			0.70	
v/c Ratio	0.31		0.34			0.03		0.62			0.38	
Control Delay	24.7		7.6			0.0		16.2			4.6	
Queue Delay	0.0		0.0			0.0		0.0			0.1	
Total Delay	24.7		7.6			0.0		16.2			4.7	
LOS	C		A			A		B			A	
Approach Delay		17.7						16.2			4.7	
Approach LOS		B						B			A	
Stops (vph)	143		23			0		877			318	
Fuel Used(gal)	2		1			0		15			4	
CO Emissions (g/hr)	173		61			1		1067			248	
NOx Emissions (g/hr)	34		12			0		208			48	
VOC Emissions (g/hr)	40		14			0		247			58	
Dilemma Vehicles (#)	0		0			0		0			0	
Queue Length 50th (ft)	32		0			0		136			60	
Queue Length 95th (ft)	61		39			0		215			100	
Internal Link Dist (ft)		504			395			611			59	
Turn Bay Length (ft)												
Base Capacity (vph)	923		523			551		2151			2687	
Starvation Cap Reductn	0		0			0		0			722	
Spillback Cap Reductn	0		0			0		0			0	
Storage Cap Reductn	0		0			0		0			0	
Reduced v/c Ratio	0.20		0.25			0.02		0.62			0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 73			
Actuated Cycle Length: 63.4			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Birmingham Pkwy & Soldiers Field EB Off-Ramp/Lothrop Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	1231	150	0	903	17
Future Volume (Veh/h)	0	0	0	0	0	0	0	1231	150	0	903	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	0	0	0	0	0	0	1383	169	0	1015	19
Pedestrians					34							
Lane Width (ft)					0.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								139			274	
pX, platoon unblocked	0.82	0.82		0.82	0.82	0.82				0.82		
vC, conflicting volume	1361	2601	508	2009	2516	464	1015			1586		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	338	1851	508	1129	1748	0	1015			613		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	489	61	516	132	71	894	691			800		

Direction, Lane #	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	395	395	395	367	508	508	19
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	169	0	0	19
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.23	0.23	0.23	0.22	0.30	0.30	0.01
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							
Approach Delay (s)	0.0				0.0		
Approach LOS							

Intersection Summary					
Average Delay	0.0				
Intersection Capacity Utilization	28.3%	ICU Level of Service		A	
Analysis Period (min)	15				

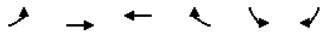
Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	82	90	0	0	0	0	0	5	12	28	0
Future Vol, veh/h	0	82	90	0	0	0	0	0	5	12	28	0
Conflicting Peds, #/hr	0	0	4	0	0	0	0	0	13	13	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	25	25	25	63	63	63	86	86	86
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	91	100	0	0	0	0	0	8	14	33	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	158	154	195	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	154	195	-
Critical Hdwy	-	-	-	-	-	6.2	7.1	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	-	-	-	-	-	3.3	3.5	4	-
Pot Cap-1 Maneuver	0	-	-	0	0	893	817	704	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	853	743	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	890	810	702	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	810	702	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	845	741	-

Approach	EB	NB	SB
HCM Control Delay, s	0	9.1	10.3
HCM LOS		A	B

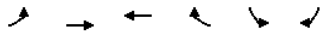
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	890	-	-	731
HCM Lane V/C Ratio	0.009	-	-	0.064
HCM Control Delay (s)	9.1	-	-	10.3
HCM Lane LOS	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	0.2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	353	45	76	26
Future Volume (Veh/h)	0	0	353	45	76	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.99	0.99	0.96	0.96
Hourly flow rate (vph)	0	0	357	45	79	27
Pedestrians					4	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		759				
pX, platoon unblocked						
vC, conflicting volume	406				384	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406				384	384
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	96
cM capacity (veh/h)	1149				621	666

Direction, Lane #	WB 1	SB 1
Volume Total	402	106
Volume Left	0	79
Volume Right	45	27
cSH	1700	632
Volume to Capacity	0.24	0.17
Queue Length 95th (ft)	0	15
Control Delay (s)	0.0	11.8
Lane LOS		B
Approach Delay (s)	0.0	11.8
Approach LOS		B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	33.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	365	14	0	6
Future Volume (Veh/h)	0	0	365	14	0	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	397	15	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		361				
pX, platoon unblocked						
vC, conflicting volume	412				404	206
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	412				404	206
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1143				574	800

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	265	147	7
Volume Left	0	0	0
Volume Right	0	15	7
cSH	1700	1700	800
Volume to Capacity	0.16	0.09	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0		9.5
Approach LOS			A

Intersection Summary				
Average Delay			0.2	
Intersection Capacity Utilization			20.5%	ICU Level of Service A
Analysis Period (min)			15	

APPENDIX E – RESPONSE TO CLIMATE CHANGE QUESTIONNAIRE

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

A.1 - Project Information

Project Name:	**70 Leo M. Birmingham Parkway**
Project Address Primary:	**70 Leo M. Birmingham Parkway**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	

A.2 - Team Description

Owner / Developer:	**Barry Polack, Patrick Maloney**
Architect:	**Hendren Associates, Architects & Planners**
Engineer (building systems):	**TBD**
Sustainability / LEED:	**Soden Sustainability Consulting**
Permitting:	**MLF Consulting. (Mitch Fischman)**
Construction Management:	**TBD**
Climate Change Expert:	**Soden Sustainability Consulting (Colleen Soden)**

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

☑ PNF / Expanded PNF Submission	☐ Draft / Final Project Impact Report Submission	☐ BRA Board Approved	☐ Notice of Project Change
☐ Planned Development Area	☐ BRA Final Design Approved	☐ Under Construction	☐ Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	Multi-family Residential
List the First Floor Uses:	*Lobby, Community room, bicycle storage and residential apartments*

What is the principal Construction Type – select most appropriate type?

☐ Wood Frame	☐ Masonry	☑ Steel Frame	☐ Concrete

Describe the building?

Site Area:	*21,752 SF*	Building Area:	*82,000 SF*
Building Height:	*68 Ft.*	Number of Stories:	*6 Flrs.*
First Floor Elevation (reference Boston City Base):	*: 41.50±Elev LP 39.92, HP 43.05.*	Are there below grade spaces/levels, if yes how many:	*Yes, 2 levels, 65 spaces Number of Levels*

A.5 - Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)?

Select by Primary Use:	☑ New Construction	☐ Core & Shell	☐ Healthcare	☐ Schools
	☐ Retail	☐ Homes Midrise	☐ Homes	☐ Other
Select LEED Outcome:	☐ Certified	✓ Silver	☐ Gold	☐ Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	*Yes / **No***	Certified:	*Yes / **No***

A.6 - Building Energy- TO BE DETERMINED WITH UTILITY

What are the base and peak operating energy loads for the building?

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
What is the planned building Energy Use Intensity:	*(kWh/SF)*	Cooling:	*(Tons/hr)*

What are the peak energy demands of your critical systems in the event of a service interruption?

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
		Cooling:	*(Tons/hr)*

What is nature and source of your back-up / emergency generators?

Electrical Generation:	*(kW)*		Fuel Source:	
System Type and Number of Units:	☐ Combustion Engine	☐ Gas Turbine	☐ Combine Heat and Power	*(Units)*

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

What is the full expected operational life of key building systems (e.g. heating, cooling, ventilation)?

Select most appropriate:	☐ 10 Years	25 Years	✓ 50 Years	☐ 75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

8/91 Deg.

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

95 Deg.	*5 Days*	*6 Events / yr.*

What Drought characteristics will be used for project planning – Duration and Frequency?

30-90 Days	*0.2 Events / yr.*

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

45 Inches / yr.	*4 Inches*	*0.5 Events / yr.*

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

130 Peak Wind	*10 Hours*	*0.25 Events / yr.*

B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:	***20%***
How is performance determined:	Energy Model

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:	✓ High performance building envelop	✓ High performance lighting & controls	✓ Building day lighting	✓ EnergyStar equip. / appliances
	☐ High performance HVAC equipment	☐ Energy recovery ventilation	☐ No active cooling	☐ No active heating
Describe any added measures:				

What are the insulation (R) values for building envelop elements?

Roof:	*R = 30*	Walls / Curtain Wall Assembly:	*R = 20BATTS + R8 continuous insulation*
Foundation:	*R = 15*	Basement / Slab:	*R =30*
Windows:	*R = / U =0.4*	Doors:	*R = / U =0.7*

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

☐ On-site clean energy / CHP system(s)	✓ Building-wide power dimming	✓ Thermal energy storage systems	☐ Ground source heat pump
✓ On-site Solar PV	☐ On-site Solar Thermal	☐ Wind power	☐ None
Describe any added measures:			

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate: ☐ Connected to local distributed electrical	✓ Building will be Smart Grid ready	☐ Connected to distributed steam, hot, chilled water	☐ Distributed thermal energy ready

Will the building remain operable without utility power for an extended period?

*Yes / **No***	If yes, for how long:	*Days*	
If Yes, is building "Islandable?			
If Yes, describe strategies:			

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate: ✓ Solar oriented – longer south walls	☐ Prevailing winds oriented	✓ External shading devices	✓ Tuned glazing,
☐ Building cool zones	✓ Operable windows	✓ Natural ventilation	✓ Building shading
☐ Potable water for drinking / food preparation	☐ Potable water for sinks / sanitary systems	☐ Waste water storage capacity	✓ High Performance Building Envelope
Describe any added measures:			

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate: ✓ High reflective paving materials	✓ Shade trees & shrubs	✓ High reflective roof materials	☐ Vegetated roofs
Describe other strategies:			

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate: ☐ On-site retention systems & ponds	✓ Infiltration galleries & areas	☐ Vegetated water capture systems	☐ Vegetated roofs
Describe other strategies:			

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	✓ Hardened building structure & elements	✓ Buried utilities & hardened infrastructure	☐ Hazard removal & protective landscapes	☐ Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

*Yes / **No***

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base Elev.(Ft. LP 39.92, HP 43.05)*
Building Proximity to Water:	*720 Ft.*

Is the site or building located in any of the following?

Coastal Zone:	*Yes / **No***	Velocity Zone:	*Yes / **No***
Flood Zone:	*Yes / **No***	Area Prone to Flooding:	*Yes / **No***

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*Yes / **No***	Future floodplain delineation updates:	*Yes / **No***

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

720 Ft.

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. Otherwise you have completed the questionnaire; thank you!

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*3 Ft.*	Frequency of storms:	*0.25 per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	Yes / No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

☐ Systems located above 1st Floor.	☑ Water tight utility conduits	☐ Waste water back flow prevention	☐ Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No	If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	Yes / No
If Yes, describe:	

Will the building remain occupiable without utility power during an extended period of inundation:

Yes / No	If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:	*Yes / No*	☐ Hardened / Resilient Ground Floor Construction	☐ Temporary shutters and or barricades	☐ Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	*Yes / No*	☐ Surrounding site elevation can be raised	☐ Building ground floor can be raised	☐ Construction been engineered
Describe additional strategies:				

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	*Yes / No*	☐ Solar PV	☐ Solar Thermal	☐ Clean Energy / CHP System(s)
		☐ Potable water storage	☐ Wastewater storage	☐ Back up energy systems & fuel
Describe any specific or additional strategies:				

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov

APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

APPENDIX F - Article 80 – Accessibility Checklist

A requirement of the Boston Planning & Development Agency (BPDA)
Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm

2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html

3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html

4. Massachusetts Office of Disability – Disabled Parking Regulations

   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf

5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/

6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/

7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf

9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

1. ***Accessible Route*** – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. ***Accessible Group 2 Units*** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4

3. ***Accessible Guestrooms*** – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. ***Inclusionary Development Policy (IDP)*** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. ***Public Improvement Commission (PIC)*** – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. ***Visitability*** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

1. Project Information:

If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.

Project Name:	**70 Leo M. Birmingham Parkway**
Primary Project Address:	**70 Leo M. Birmingham Parkway**
Total Number of Phases/Buildings:	**One Phase**
Primary Contact (Name / Title / Company / Email / Phone):	**Residences at Birmingham Condominium LLC** 70 Leo M. Birmingham Parkway Brighton, MA 02135 Tel: 617-232-9000 Barry S. Polack Barry@polack.us Patrick Maloney pat@park-property.com
Owner / Developer:	**Same**
Architect:	**Hendren Associates,** 119 Braintree Street Suite 209 Allston, MA 02134 Tel: 617-782-6003 Gary Hendren architect@hendrenassociates.com
Civil Engineer:	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Richard Latini, P.E. rlatini@hshassoc.com James Downing, P.E. jdowning@hshassoc.com Jay Carroll, P.E. jcarroll@hshassoc.com

Landscape Architect:	**Marc Mazzarelli Associates** 284 Concord Avenue Cambridge, MA 02138 Tel: 617-227-2312 Marc Mazzarelli, Principal mazzarelli@verizon.net
Permitting:	**Mitchell L. Fischman Consulting ("MLF Consulting") LLC** 41 Brush Hill Road Newton, MA 02461 Tel : 781-760-1726 Mitchell L. Fischman mitchfischman@gmail.com
Construction Management:	**TBD**

At what stage is the project at time of this questionnaire? Select below:

	PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	No

2. Building Classification and Description:

This section identifies preliminary construction information about the project including size and uses.

What are the dimensions of the project?

Site Area:	0.5 acres (21,752 *SF)*	Building Area:	Approx. 82,000 *GSF*
Building Height:	*FT.*	Number of Stories:	*6 Flrs.*
First Floor Elevation:	42.82	Is there below grade space:	***Yes*** */ No*

What is the Construction Type? (Select most appropriate type)

	Wood Frame	Masonry	Steel Frame	Concrete

What are the principal building uses? (IBC definitions are below – select all appropriate that apply)

	Residential – One - Three Unit	**Residential - Multi-unit, Four +**	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory /	Storage, Utility and		

	Medical	Other	
List street-level uses of the building:	Main Lobby and on-site management office, mail/package room, resident social room, and an exercise room with outdoor patio		

3. Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	The nearby neighborhood is a mix of commercial/retail, residential, and office uses. This building is the second major development within the Leo M. Birmingham Parkway section between the termination of Market Street at the Mass Pike bridge/overpass and the entrance to Soldiers Field Road at Western Avenue. This proposal will effectively "book end" this defined stretch of parkway and continue the revitalization of this prominent introduction to the Brighton/ Allston district of Boston. The proposed building also serves to balance the scale of buildings framing the bridge over the depressed Mass Pike by addressing the height and materials of the WGBH/ Channel 2 Headquarters building on the Market Street side of the bridge.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	The site is located in proximity to several public transportation opportunities. The Framingham/Worcester Line of the MBTA Commuter Rail stops at Boston Landing Station, a 5-10 minute walk and located less than a half-mile east of the Project site. The MBTA also operates five bus routes that can be accessed within a short walk from the Project site. The existing MBTA bus lines that run in proximity to the Project site also provide access to both Harvard Square and Central Square, where the MBTA Red Line can be accessed to travel to points in Cambridge and downtown Boston.
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	Public Housing: Watertown Community Housing Cambridge Community Housing Schools: Harvard University Boston College Saint Columbkille Partnership School Saint Joseph Preparatory High School Jackson Mann K-8 School Horace Mann School for the Deaf German International School

List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	Public Library: Boston Public Library Honan-Allston Branch of the Boston Public Library Faneuil Branch of the Boston Public Library Police: Boston Police District D-14 Brighton/ Allston Boston University Police Department Hospital: Saint Elizabeth's Medical Office Mass General Hospital
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? ***If yes,*** identify which district:	No
Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Yes; Leo Birmingham -10ft. Lincoln St -7 ft.
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	Yes

5. Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes (pending confirmation of existing cross slopes and clearances)
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	48" wide
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	The paving material for the sidewalks will be poured in place concrete
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	No
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	No
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	PIC actions/approvals not identified at the present time

6. Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations.

What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	65 in below level garage
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle?	3. No van required.
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No
Where is the accessible visitor parking located?	Underground
Has a drop-off area been identified? ***If yes,*** will it be accessible?	Yes

7. Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.

Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	Flush Condition at most if not at all entryway locations. Ramps to be added where/if needed. This will enable access and promote "Visit-ability". The apartment building is serviced by an elevator and flush condition at the entryway. All common areas are accessible and all units will have good "Visit-ability".
Are the accessible entrances and standard entrance integrated? ***If yes,***	Yes. Flush conditions at entrances that lead to elevators.

*describe. **If no**,* what is the reason?	
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	See F-1 thru F-8 attached
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	82
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	82 (of which 11 are IDP required units)
If a residential development, how many accessible Group 2 units are being proposed?	NA
If a residential development, how many accessible Group 2 units will also be IDP units? ***If none***, describe reason.	NA
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? ***If yes,*** provide amount and location of equipment.	
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes,*** provide reason.	No
Are there interior elevators, ramps or	

lifts located in the development for access around architectural barriers and/or to separate floors? ***If yes,*** describe:	NA
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community*.	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	New Sidewalks; Coordination with Parks Commission on adjacent parkland.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	To Be Developed; Early in Process
Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? ***If no***, explain why not.	To Be Developed; Early in Process
Has the proponent reviewed the	Staff member from the City of Boston Disability Commission attended BPDA

proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments?	pre-filing meeting and scoping session.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible?	No

10. Attachments

Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances.

The accessible route is along the Leo M. Birmingham Parkway, Lincoln Street and sidewalks. All entryways to the building will be accessible. See F-1 thru F-8 attached for reference.

Provide a diagram of the accessible route connections through the site, including distances. *SEE ABOVE*

Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) *SEE ABOVE*

Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. *SEE ABOVE*

Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. *SEE ABOVE*

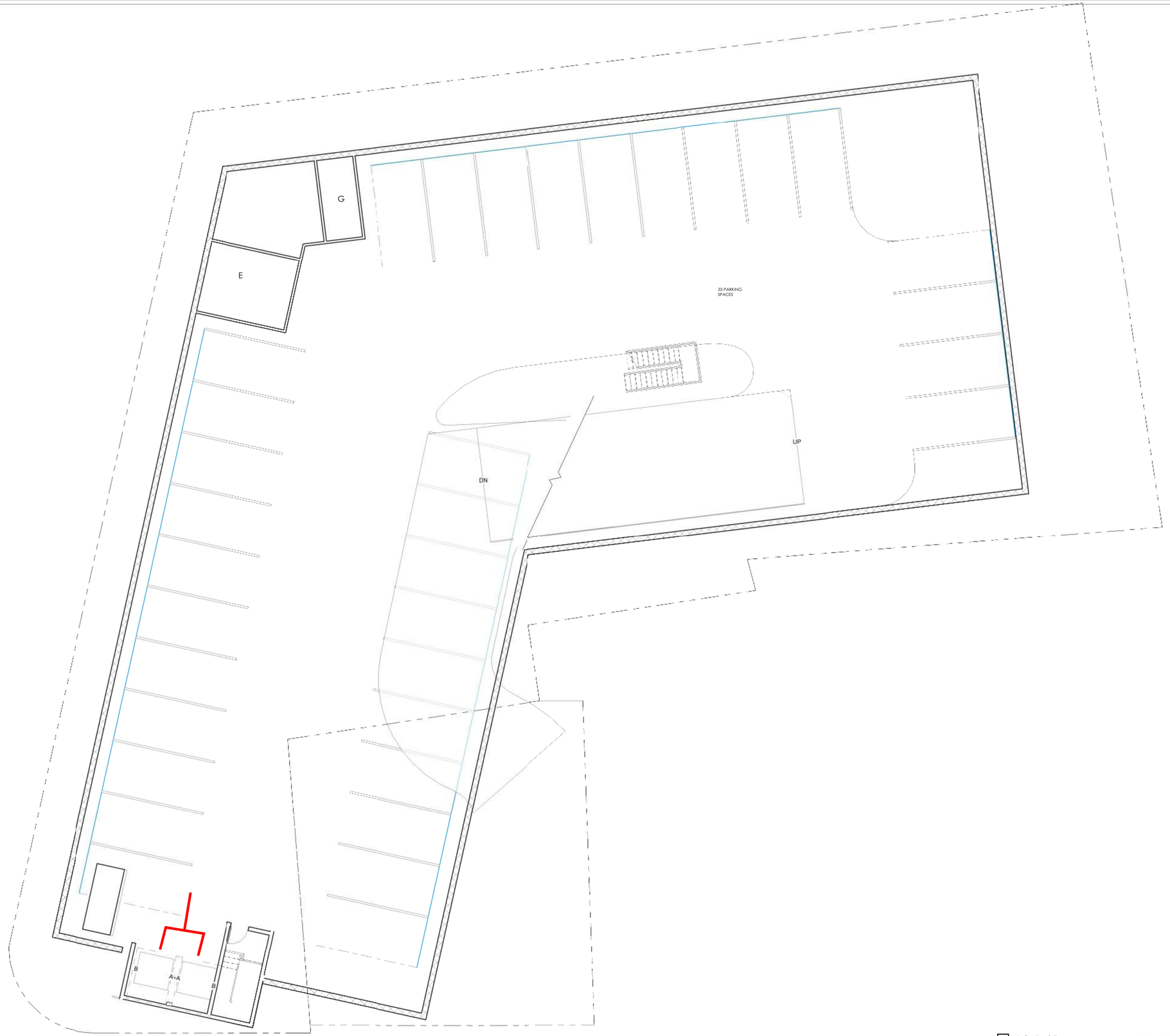
This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682



1 L1 GARAGE 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS

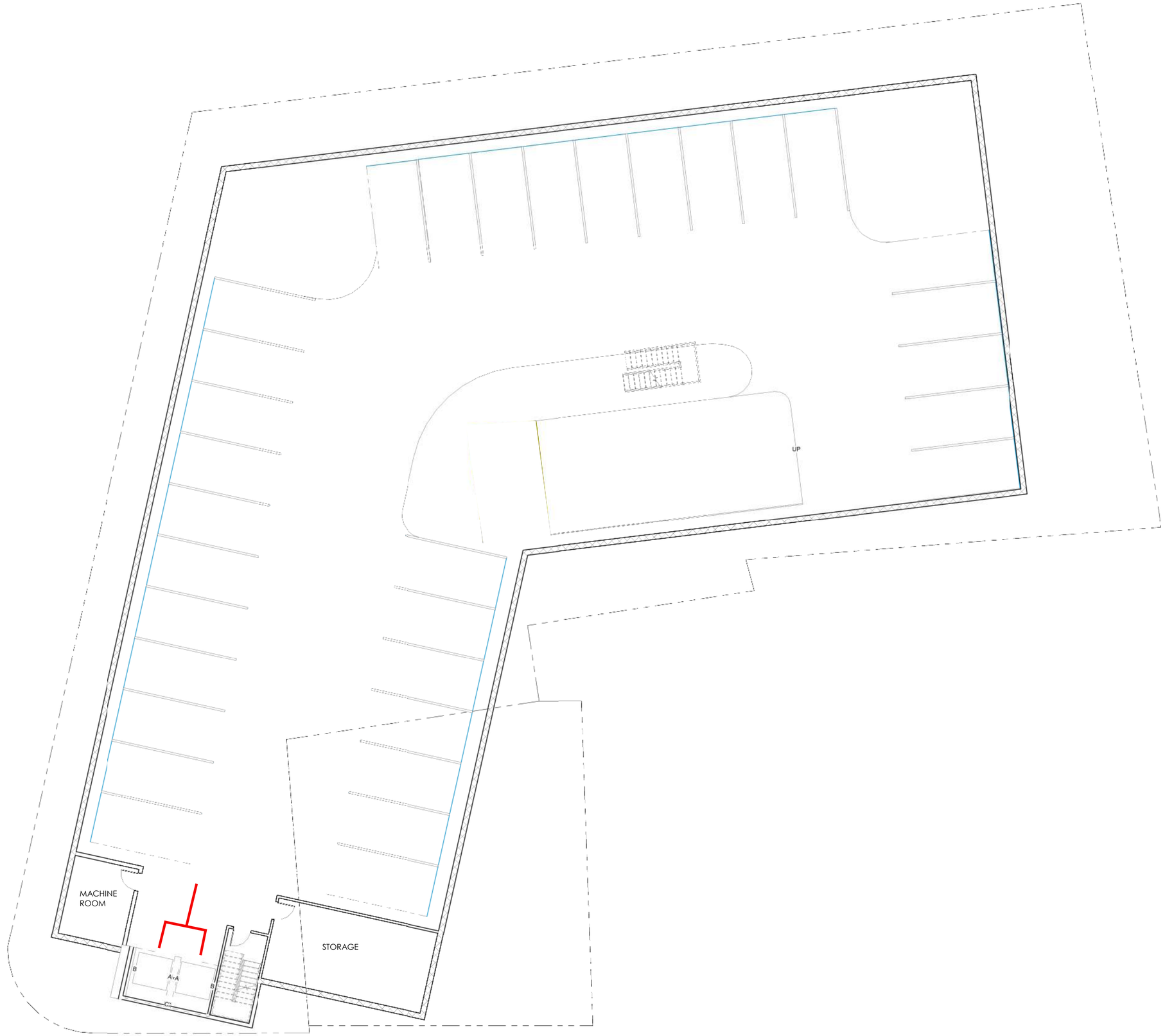
NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:

ACCESSIBILITY PLAN

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

F-1



1 L2 GARAGE 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
ACCESSIBILITY PLAN

DATE: 05/23/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

F-2

1 GROUND FLOOR 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT
BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
ACCESSIBILITY PLAN

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

F-3

1 1st Floor OPT-A 2-2BEDROOM 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:

ACCESSIBILITY PLAN

DATE: 05/5/17
DRAWN BY: EM
CHKD. BY: GH
JOB NO.:
DWG. NO.:

F-4

1 2nd Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:
ACCESSIBILITY PLAN

DATE: 05/22/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

F-5

1 3rd Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:

ACCESSIBILITY 3RD FLOOR PLAN

DATE: 06/02/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

F-6

1 4th Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT
BIRMINGHAM
BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:

ACCESSIBILITY
4TH FLOOR
PLAN

DATE: 05/22/17
DRAWN BY: Author
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

F-7

1 5th Floor 1/8" = 1'-0"

HENDREN ASSOCIATES
ARCHITECTS + PLANNERS

GARY W. HENDREN, AIA
ARCHITECT

119 BRAINTREE STREET
SUITE 315
BOSTON, MA 02134

T 617 782 6003
F 617 782 6063
ARCHITECT@HENDRENASSOCIATES.COM

THE RESIDENCE AT BIRMINGHAM

BRIGHTON MA

REVISIONS

NO.	DATE	ISSUE/DESCRIPTION

SHEET TITLE:

ACCESSIBILITY 5TH FLOOR PLAN

DATE: 05/22/17
DRAWN BY: P.D
CHKD. BY: Checker
JOB NO.:
DWG. NO.:

F-8

70 Leo M. Birmingham Parkway, Brighton, MA

MLF
CONSULTING LLC