

SUPPLEMENTAL INFORMATION

Motor Mart Garage



Submitted to:
Boston Planning and Development Agency
One City Hall Square
Boston, MA 02201

Submitted by:
201 Stuart Street Owner, LLC
c/o CIM Group, LLC
540 Madison Avenue, 8th Floor
New York, NY 10022

Prepared by:
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In Association with:
Boston Global Investors, LLC
CBT Architects
Goulston & Storrs
Howard Stein Hudson
Nitsch Engineering
The Green Engineer
R. G. Vanderweil Engineers, LLP
Haley & Aldrich, Inc.

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Chapter 1.0

Introduction/Project Description

1.0 INTRODUCTION/ PROJECT DESCRIPTION

1.1 Introduction

On September 10, 2018, 201 Stuart Street Owner, LLC (the Proponent), an affiliate of CIM Group LLC, together with its development partner Boston Global Investors, LLC, submitted an Expanded Project Notification Form (Project PNF) to the Boston Planning and Development Agency (BPDA) outlining a proposal to redevelop the existing eight-story Motor Mart Garage. The proposal will transform the Garage into a vibrant, mixed-use building by adding basement level retail space, reducing parking, constructing new residential apartments within the western portion of the existing building, and constructing new residential apartments and condominiums within a 20-story residential tower rising out of the existing building (the Project).

After submitting the Expanded PNF, the Project team met with the Impact Advisory Group (IAG) and community, as well as with the BPDA, City agencies, and elected officials. On December 5, 2018, the BPDA issued a request for supplemental information. This Supplemental Information submission is being submitted in response to that request.

1.2 Project Identification

Address/Location:	201 Stuart Street
Developer:	201 Stuart Street Owner, LLC c/o CIM Group LLC 540 Madison Avenue, 8 th Floor New York, NY 10022 (646) 783-4600 Kate Perez
Development Partner:	Boston Global Investors, LLC 55 Seaport Boulevard, 4 th Floor Boston, MA 02210 (617) 350-7577 John Hynes Dave Wamester
Architect:	CBT Architects 110 Canal Street Boston, MA 02114 (617) 262-4354 Phil Casey Henry Celli

Legal Counsel:	Goulston & Storrs 400 Atlantic Avenue Boston, MA 02110 Matthew Kiefer Michael Flannery
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Cindy Schlessinger Talya Moked
Transportation Consultant:	Howard Stein Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080 Elizabeth Peart
Civil Engineer	Nitsch Engineering 2 Center Plaza, Suite 430 Boston, MA 02108 (617) 338-0063 John Schmid Zuki Mahmuljin
Sustainability Consultant	The Green Engineer 23 Bradford Street, 1 st Floor Concord, MA 01742 (978) 369-8978 Sarah Michelman Ryan Montoni
MEP Engineer	R. G. Vanderweil Engineers, LLP 274 Summer Street Boston, MA 02210 (617) 574-8132 Alex Vanderweil
Geotechnical Consultant:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Boston, MA 02129 (617) 886-7400 Marya Gorczyca

1.3 Project Description

1.3.1 *Project Site*

The Project Site is a 1.2-acre parcel bounded by Stuart Street to the south, Park Plaine to the east, Columbus Avenue to the northwest, Eliot Street to the northeast and Church Street to the west. The Project Site is located at the western edge of the Midtown Cultural District, with the Theatre District to the east and the Back Bay to the west. See Figure 1-1 for an aerial locus map.

The entirety of the Project Site is occupied by the existing approximately 421,000 square feet (sf), eight-story Motor Mart parking garage containing 1,037 parking spaces. A large portion of the existing ground floor contains retail, with restaurants anchoring the corners and smaller retail uses (such as car rental agencies) in between. The existing building has three curb cuts: the garage entrances on Stuart Street and at the corner of Eliot Street and Columbus Avenue, and the loading area on Columbus Avenue. The basement level is used partly for a vehicle rental agency and accessory retail spaces. Figures 1-2 and 1-3 present existing conditions of the Garage.

1.3.2 *Area Context*

The Project Site is surrounded by large residential and hotel buildings on three sides and opens towards Statler Park to the west. To the east is the existing One Charles Condominium building. To the north and south, the site is flanked by the Park Plaza Hotel and the Revere Hotel, respectively. Directly across Stuart Street and adjacent to the Revere Hotel is the site of a BPDA-approved, approximately 200-foot-tall residential building known as 212 Stuart Street (see Figure 1-4).

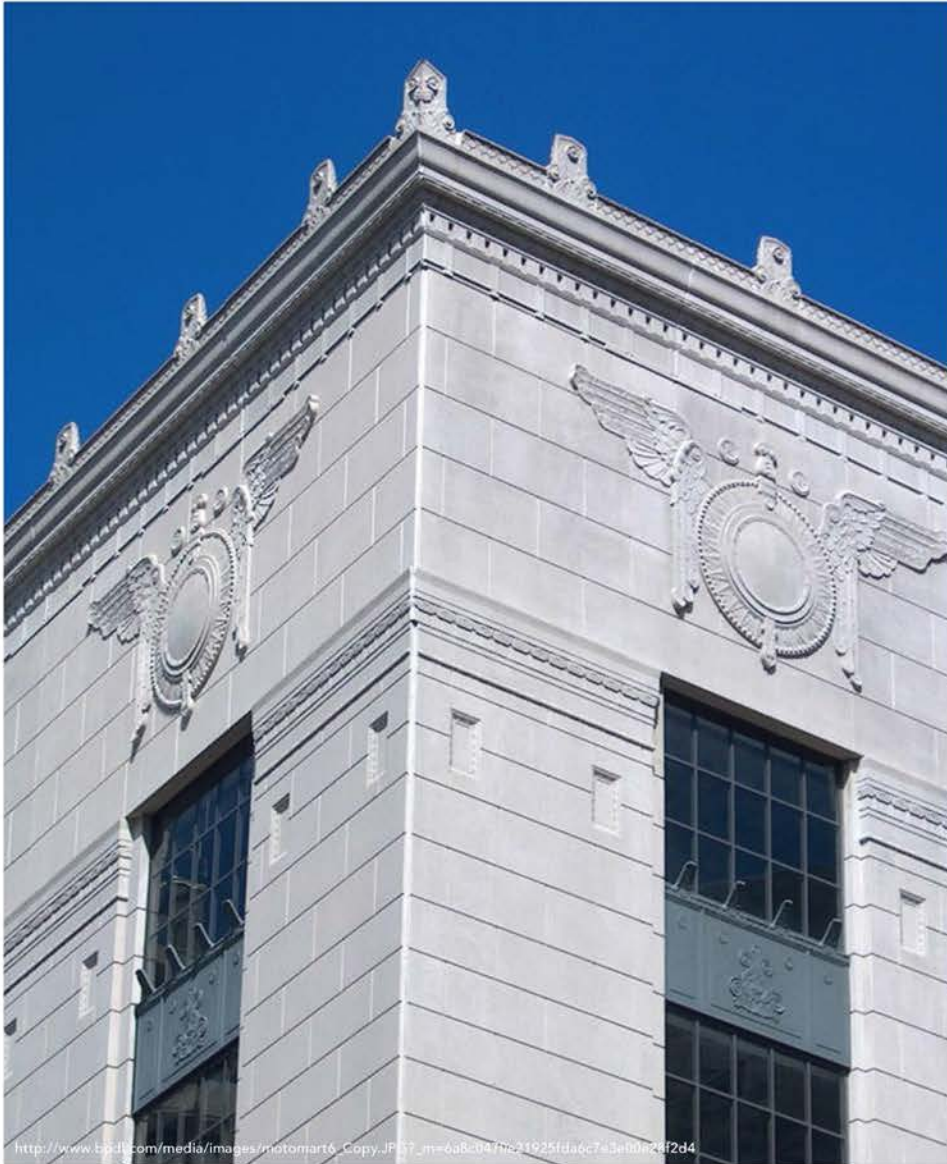
The Project Site is well served by public transportation, making it an ideal site for transit-oriented development. Approximately a half-mile from the site are the Arlington Street and Boylston Street stations on the Green Line, and the Tufts Medical Center Station on the Orange Line, which collectively provide access to all branches of the MBTA. The area is also served by multiple bus routes, including the Route 39 bus which stops near the Project Site and serves points to the west. The Project Site also neighbors a number of cultural and recreational attractions including the Theatre District, Boston Common and Boston Public Garden. Tufts Medical Center is located less than a half mile from the Project Site, as are several educational institutions including Emerson College.



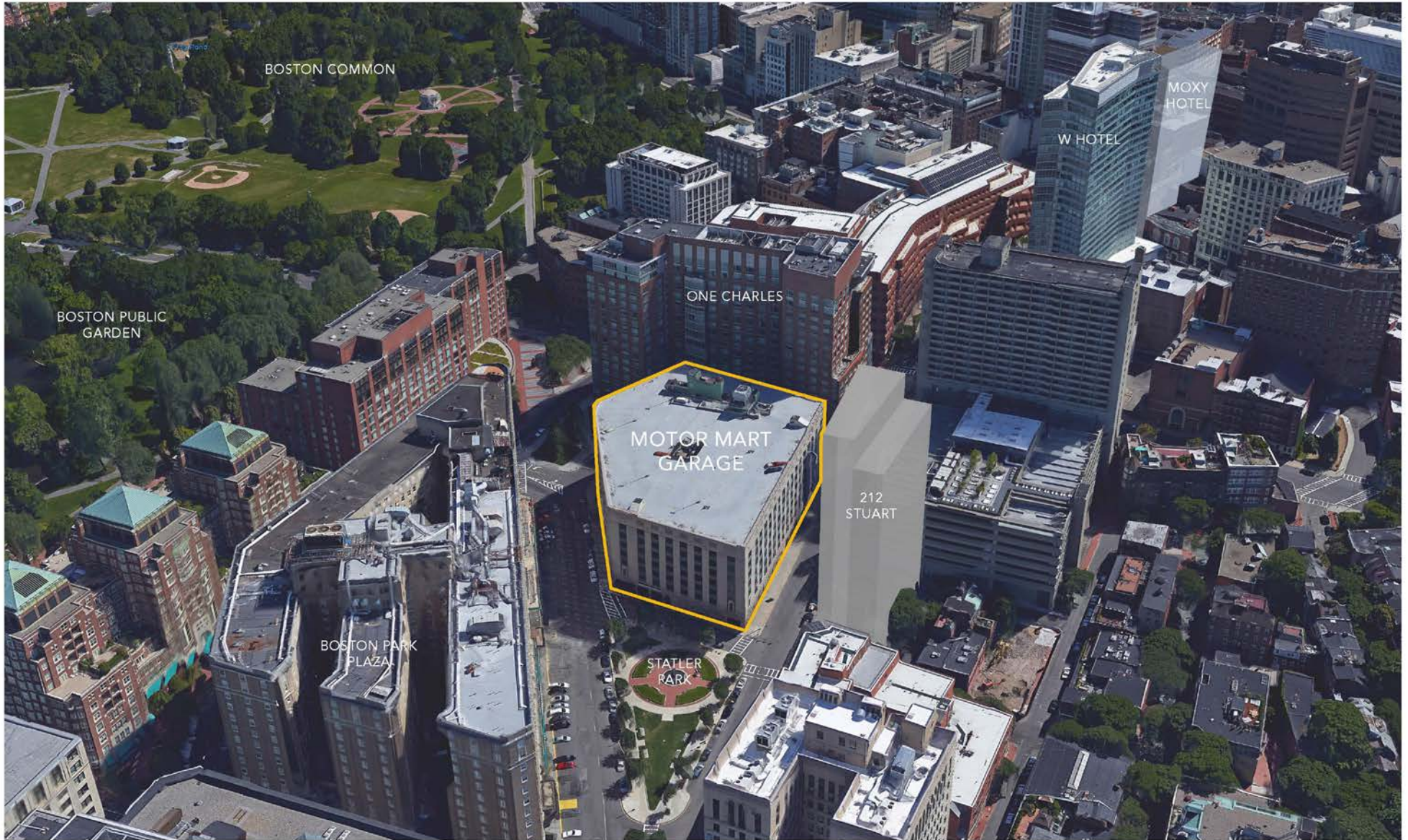
Motor Mart Garage Boston, Massachusetts



Motor Mart Garage Boston, Massachusetts



Motor Mart Garage Boston, Massachusetts



Motor Mart Garage Boston, Massachusetts

1.3.3 *Proposed Project*

The Project consists of the redevelopment of the existing building and the construction of a 20-story residential tower rising out of the existing building. The western portion of the parking levels will be converted into approximately 84 new residential units. The new residential tower will rise out of the eighth floor of the existing building and contain apartment and condominium units. The Project will create approximately 306 new residential units ranging in size from studios to three-bedroom units. In addition, the Project will provide residential amenity spaces including a fitness center, a small exterior pool, and a vegetated roof on the ninth floor. As shown in the proposed Site Plan (see Figure 1-5), the Project has been designed to accommodate loading within the building. A parking plan is presented in Figure 1-6, and a landscape plan is presented in Figure 1-7.

Of the current 1,037 parking spaces in the garage, the Project will retain approximately 672 parking spaces, designating approximately 144 spaces for residential use and the remaining approximately 528 spaces primarily for public use. The Proponent is exploring the feasibility of including an approximately 15,000 sf grocery store in the basement. The Project will include approximately 31,000 sf of commercial space. Table 1-1 below presents the Project program.

Table 1-1 Project Program

Project Element	Existing Dimension	Proposed Dimension
Residential	None	306 units
Commercial	50,712 sf	31,000 sf
Grocery Store*	None	15,000 sf
Total Square Footage**	421,000 sf	685,000 sf
Parking	1,037 spaces	672 spaces
Zoning Height*	93 feet	310 feet
Parcel Area	52,323 sf	52,323 sf
FAR	8.0	13.1

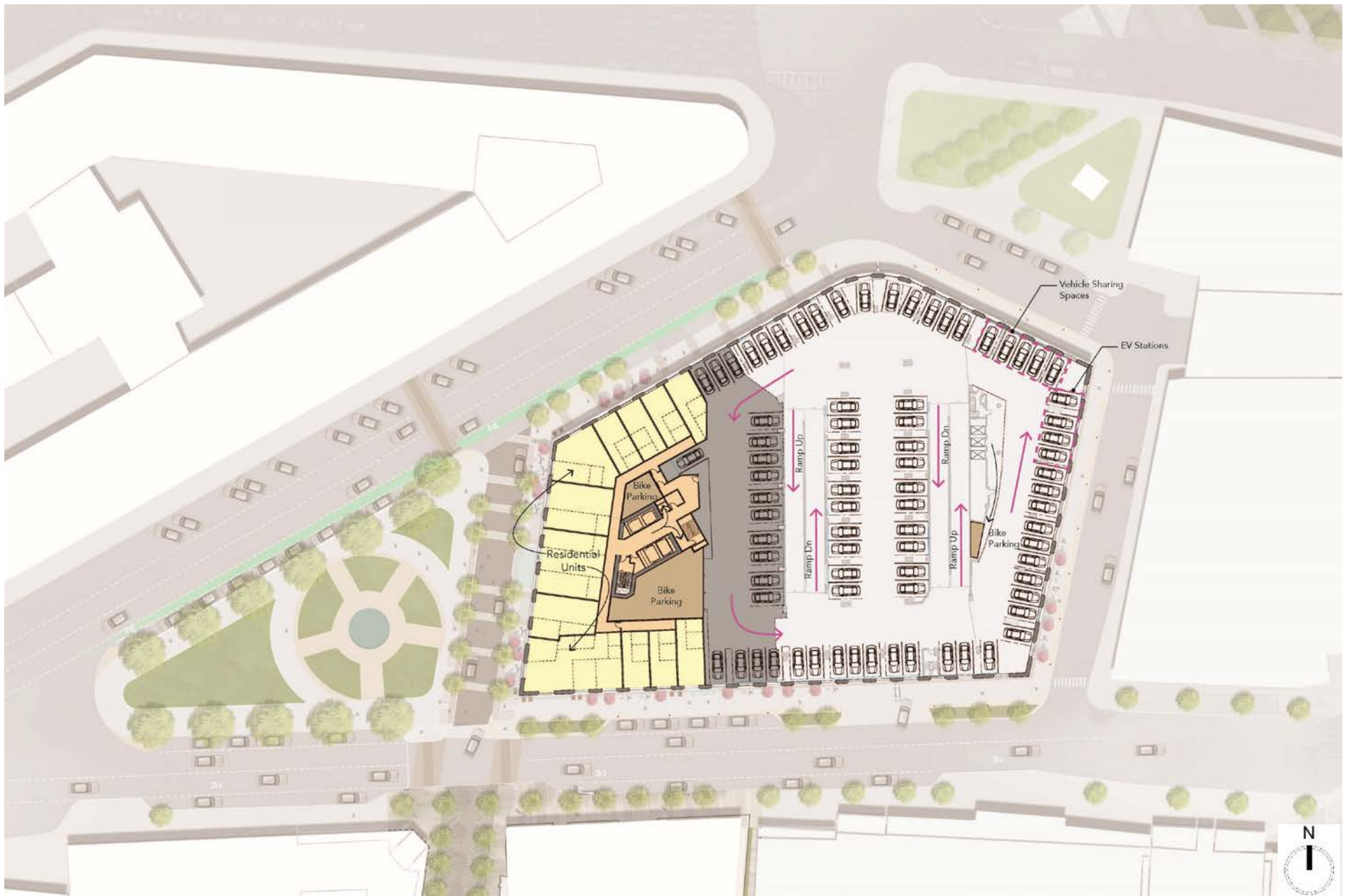
*The Proponent is exploring the feasibility of including the grocery store use as part of the Project. For the purposes of the traffic analysis, the grocery store was included as part of the Project program.

* As defined in Article 2 of the Boston Zoning Code.

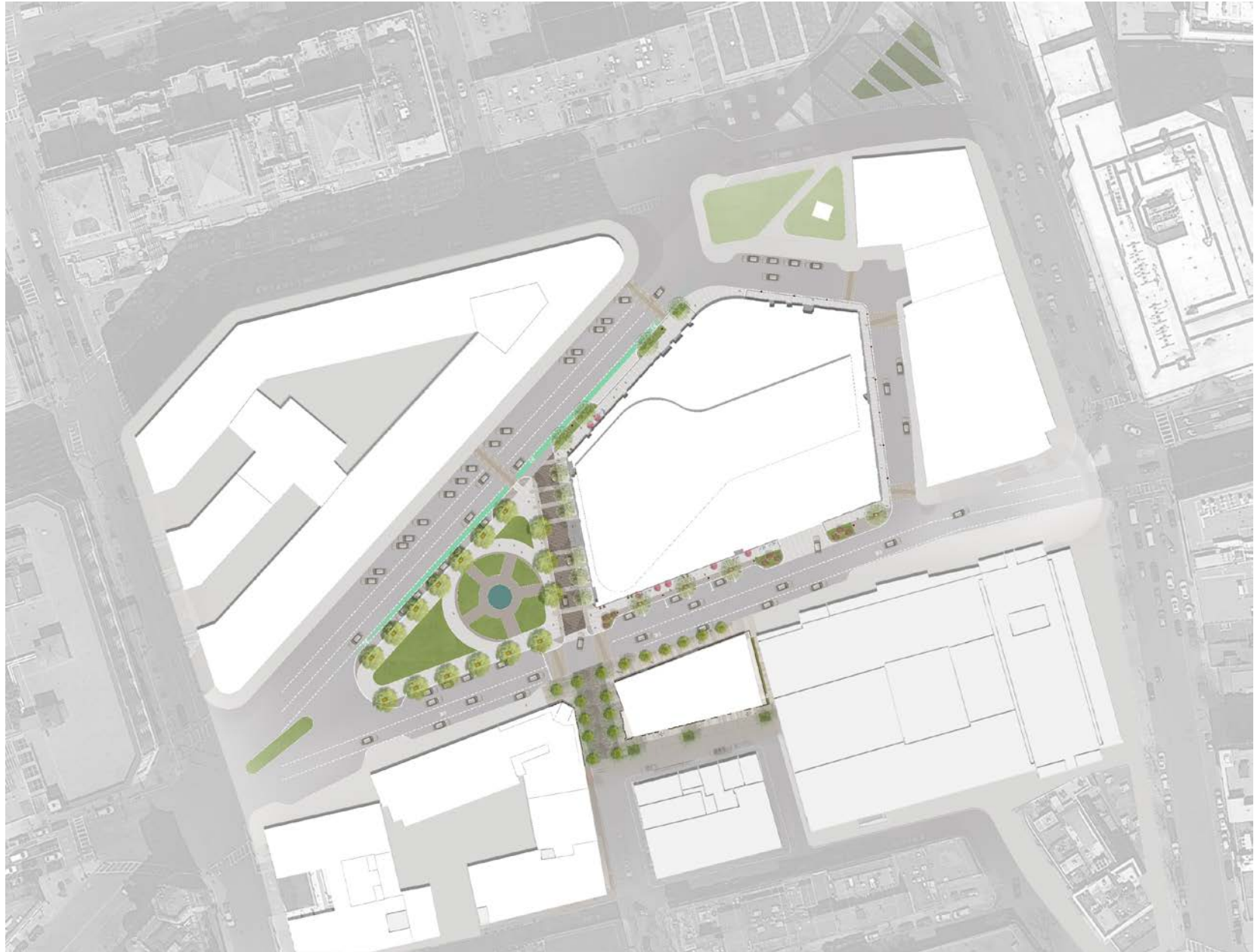
As part of the overall revitalization of the existing building, the ground floor will be rehabilitated. The four major corners of the building will continue to be anchored by retail with some smaller infill retail spaces along Stuart Street, Columbus Avenue, and Park Plaice. Part of the basement floor will also be improved to accommodate a shell space for future retail such as the market, with street presence to gain direct access to the basement. In addition, the Project will include a new residential building entry along Church Street,



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fronting Statler Park. Loading for the Project will remain along Columbus Avenue. The existing garage entries on Columbus Avenue and at the corner of Elliot Street and Columbus Avenue will remain.

1.3.4 *Evolution of Design*

As part of the BPDA and Boston Civic Design Commission (BCDC) process, the design of the building has continued to evolve based on comments received. Moreover, feedback from public and abutter groups have also been considered and implemented where feasible.

The massing of the building has been revised in response to comments from both the BCDC and the public. The geometry of the building was such that a few of the corners of the building were orthogonal while others were rounded to reference existing context buildings such as Park Plaza as well as the existing building itself. The tower portion of the building is now contemplated as having all corners rounded in order to create a more unified language with the existing building and context as well as to create a more slender volume rising above the existing building. Additionally, the design team has investigated the multi-tiered “tail” on the eastern edge of the building, namely the eastern portion of floors 9 through 12, and has recently proposed and presented a simplified scheme which eliminates one of the tiers and adjusts the program to align a second tier to accommodate and align two setbacks as opposed to three.

The façade design has also evolved in response to comments from the BCDC and Boston Preservation Alliance. The approach previously taken by the design team of not simply thumping down a glass tower on top of the existing building was overwhelmingly positive. This was done by incorporating stone like material into the façade that relied heavily on the reference to the existing façade. The design team was further encouraged to incorporate stone into the very upper portion of the tower façade while still alluding to the tower transitioning from a heavy masonry building to that of a lighter building ascending upwards. The current proposal incorporates more of the stone material at the top of the tower façade but does so by thinning the material as it moves upwards on the building.

The design team is committed to continuing the refinement of the building and façade with the productive feedback of city agencies and representative constituents.

1.4 Public Benefits

The Project will provide many public benefits for the surrounding neighborhood and the City of Boston as a whole, both during construction and on an ongoing basis upon its completion. These benefits include housing creation, urban design and public realm improvements, job opportunities, and additional tax revenues. Specific public benefits include:

Urban Design and Public Realm Benefits

- ◆ Sidewalks surrounding the site will be improved in accordance with Boston Complete Streets guidelines, including new street lighting and new street trees where feasible.
- ◆ The Project will introduce residential uses to the Project Site, creating more activity in the area throughout the day.
- ◆ The Project will improve existing retail storefronts and signage in order to further activate the site.
- ◆ The Project will include enhanced car sharing opportunities within the garage for use by the neighborhood.
- ◆ The Project will enhance Church Street in order to visually extend through to Church Street Plaza and Statler Park.

Economic and Community Benefits

- ◆ In keeping with Mayor Walsh's goal of adding significant new housing in the city, the Project will create approximately 306 new residential units, including both ownership and rental housing, in close proximity to public transit.
- ◆ The Project will create new affordable housing units consistent with the BPDA's December 2015 Inclusionary Development Policy.
- ◆ The Project will create approximately 613 construction jobs and approximately ten to fifteen permanent jobs upon stabilization.
- ◆ The Project will result in increased tax revenues compared to the existing condition.

1.5 City of Boston Zoning

The Project site is located within the Midtown Cultural District ("MCD") governed by Article 38 of the Boston Zoning Code (the "Code"). The Project Site is also located within the Groundwater Conservation Overlay District ("GCOD") governed by Article 32 of the Code and the Restricted Parking Overlay District ("RPOD") governed by Article 3 of the Code.

The Project will require relief from certain requirements of the Code as more particularly described in this Section, and the Proponent will seek relief in the form of variances and conditional use permits from the Boston Zoning Board of Appeal.

Large Project Review

Because the Project will add more than 50,000 square feet of gross floor area to the Project Site and is located in a downtown zoning district, it is subject to Large Project Review by the BPDA pursuant to Article 80B of the Boston Zoning Code. The Large Project Review process was commenced by the filing of a Letter of Intent with the BPDA on March 1, 2018, continued with the filing of the Expanded Project Notification Form on September 10, 2018, and continues with the filing of this Supplemental Information Document.

Uses

The Project will include upper-floor multifamily dwelling use (with accessory parking), general retail use, and restaurant use, all of which are allowed as of right. The Project also proposes ground floor retail uses, commercial parking and parking accessory to retail and restaurant uses. These are conditional uses—either under MCD zoning or under RPOD requirements. All of these proposed uses currently exist at the Project site with the exception of multi-family dwelling use and its accessory parking.

The Proponent will seek conditional use permits if and to the extent required for the continuation of these uses as part of the Project.

Dimensional Requirements

For Projects subject to Large Project Review, Article 38 of the Code sets a maximum building height of 155 feet and a maximum floor area ratio (“FAR”) of 10.0. Section 38-19 of the Code establishes specific design requirements relating to street wall continuity, street wall height, sky plan setbacks, display windows, and maximum floor plates above a building height of 125 feet.

The Project will exceed the maximum FAR and height allowed, and may require relief from the design requirements set forth in Section 38-19 of the Code.

Off-Street Parking and Loading

Within the RPOD, off-street parking for any non-residential uses is a conditional use. The Proponent will seek conditional use permits if and to the extent required for the continuation of these uses as part of the Project. Loading requirements for projects within the MCD may be determined during Large Project Review.

Groundwater Conservation Overlay District

The Project is subject to the requirements of minimum groundwater infiltration and a conditional use permit under Article 32 of the Code.

Inclusionary Housing

The City of Boston's Inclusionary Development Policy ("IDP") requires any residential project of 10 or more units requiring zoning relief (including a PDA Plan) to set aside at least 13 percent of its market rate units as affordable to households at specified levels of income. Alternatively, in the Zone A within which the Project site is located, a project may create the equivalent of 18 percent of the total number of units off-site, or contribute to a housing creation fund at a per-unit subsidy equal to 18 percent of the total number of project units.

Subject to BPDA approval and mindful of community input, the Proponent will work with the BPDA to determine a method for compliance with the IDP.

Park Plaza Urban Renewal Plan

The Project Site is designated a disposition parcel pursuant to the Park Plaza Urban Renewal Plan (the "Park Plaza Plan"). Accordingly, any redevelopment of the Project Site undertaken pursuant to the Park Plaza Plan is subject to certain controls. The Proponent's proposed redevelopment of the Project Site, however, is a private project that does not require any urban renewal actions and does not otherwise implicate any requirements under the Park Plaza Plan. Accordingly, the Project is not subject to the Park Plaza Plan.

1.6 Legal Information

1.6.1 Legal Judgments Adverse to the Proposed Project

The Proponent is not aware of any legal judgments in effect or legal actions pending that are adverse to the Project.

1.6.2 History of Tax Arrears on Property

The Proponent does not have a history of tax arrears on any property owned within the City of Boston.

1.6.3 Site Control/Public Easements

The Proponent is the fee owner of the Project site, and title research indicates that there are no public easements through or surrounding the Project Site. The Project Site is adjacent to public ways on all sides.

1.7 Anticipated Permits

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

Table 1-2 Anticipated Permits and Approvals

Agency	Permit, Review or Approval
<i>City Agencies</i>	
Boston Planning & Development Agency	Article 80B Large Project Review and Execution of Related Agreements Design Review Certification of Compliance
Boston Zoning Board of Appeal	Zoning relief as applicable, including conditional use permit pursuant to Article 32 of the Zoning Code
Boston Civic Design Commission	Schematic Design Review
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Boston Water and Sewer Commission	Site Plan Review Approval Water and Sewer Connection Permits Temporary Construction Dewatering Permit (issued jointly with MWRA) Groundwater Trust Certification
Public Improvement Commission/Public Works Department	Subsurface Discontinuities (as required) Specific Repair Plan/Curb Cut Permit Agreement for Temporary Earth Retention Systems, Tie-Back Systems and Temporary Support of Subsurface Construction (as required) Permits/Canopy Licenses for signs and awnings (as required)
Tree Warden (Boston Parks Department)	Approval of Cutting of Public Shade Trees (as required)
Public Safety Commission/Boston Committee on Licenses	Permit to Erect and Maintain Parking Structure / amendment to permit Inflammables License / amendment to license
Boston Air Pollution Control Commission	Confirmation of exemptions / amendment to parking freeze permit
Boston Fire Department	Plan review approval Approval of fire safety equipment

Table 1-2 Anticipated Permits and Approvals (Continued)

Agency	Permit, Review or Approval
Boston Inspectional Services Department	Building Permit Other construction-related permits Certificates of Occupancy
Parks and Recreation Commission	Approval of construction within 100' of park or parkway
<i>State Agencies</i>	
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (issued jointly with BWSC)
<i>Federal</i>	
Federal Aviation Administration	Determination of No Hazard to Air Navigation

1.8 Public Participation

Since filing the Project PNF, the Proponent has continued to meet with elected officials, public agencies, nearby neighbors, residents, and representatives of neighborhood groups to gather input on the Project.

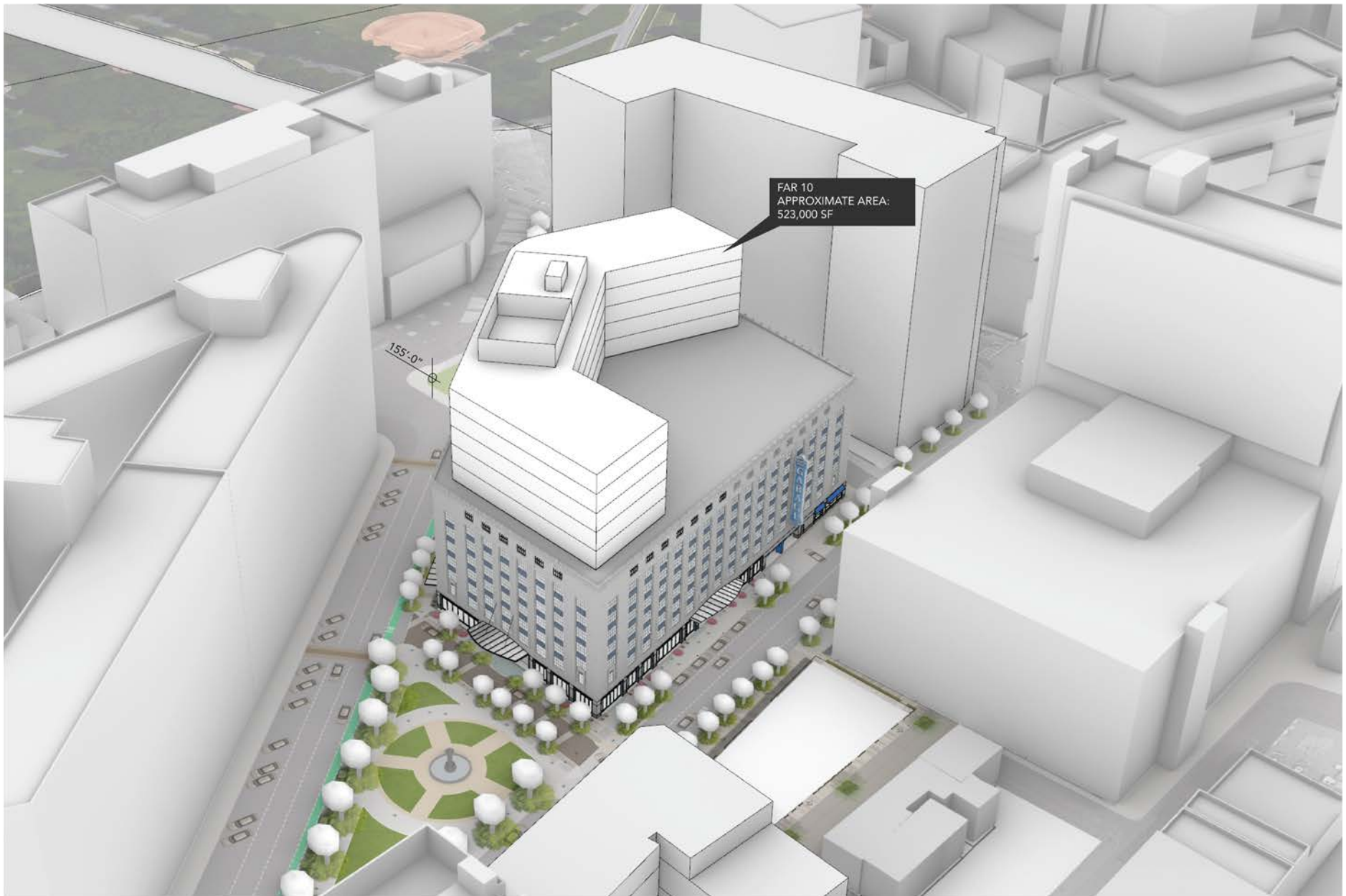
The Proponent continues to be committed to a comprehensive and effective community outreach and will continue to engage the community to ensure public input on the Project. The Proponent looks forward to working with the BPDA and city agencies, local officials, neighbors, and others as the design and review processes move forward.

1.9 Schedule

It is anticipated that construction will begin in the fourth quarter of 2019. Once begun, construction is expected to last approximately 30 months.

1.10 As-of-right Alternative

As described in Section 1.5, the existing zoning within the Midtown Cultural District provides for an FAR of 10.0 and a maximum height of 155 feet. An alternative massing that would be consistent with these dimensions is presented in Figure 1-8. Although this massing would result in less density, many of the public benefits associated with the Project would not be realized. The public realm improvements would not be financially feasible, and the basement would not be converted for a potential grocery store because this would create additional FAR. Economic benefits would be less as well, including construction jobs, new residential units including affordable housing units, and less real estate taxes generated.



Motor Mart Garage Boston, Massachusetts

Chapter 2.0

Transportation

2.0 TRANSPORTATION

2.1 Overview

This transportation section presents additional data and analyses required to satisfy comments received from City agencies, community organizations, and residents. Additionally, since the completion of the traffic analysis for the September 10, 2018 Project PNF, the Proponent has begun to explore the feasibility of including a grocery store/market in the basement level and a portion of the first floor.

This transportation incorporates additional intersections as requested by the Boston Transportation Department (BTD) and presents a revised future analysis that includes traffic generation rates associated specifically with a grocery store/market land use in order to provide an assessment of the highest potential traffic impacts as a result of the Project.

As in the Project PNF, the transportation evaluation contained in this section is prepared in accordance with the City of Boston's Transportation Access Plan Guidelines. In addition, as noted in the Project PNF, none of the study intersections will experience a change in level of service from the No-Build Condition to Build Condition, indicating that the Project will have no significant impact to area traffic operations.

2.1.1 Project Description

The Project will include approximately 306 residential units, approximately 46,000 sf of commercial space on the ground and basement floors, and 672 parking spaces. In the Project PNF, the 46,000 sf of commercial space was designated as restaurant and retail space. Since completion of the traffic analysis for the Project PNF, the Proponent has begun to explore the feasibility of including an approximately 15,000 sf grocery store/market in the basement level and a portion of the first floor. The Project will include approximately 31,000 sf of other retail and restaurant uses. For purposes of this analysis, the grocery store use was used to calculate trip generation in order to provide an assessment of the highest potential traffic impacts as a result of the Project.

A summary of the development program for the existing site, Project PNF and Proposed Project is shown in Table 2-1.

Table 2-1 Project Development Program

Land Use	Existing Site	Project PNF	Proposed Project
Residential	0 units	306 units	306 units
Commercial Uses			
Restaurant/retail	50,712 sf	46,000 sf	31,000 sf
Grocery Store/Market	0 sf	0 sf	15,000 sf
Total	50,712 sf	46,000 sf	46,000 sf
Parking spaces			
Commercial/Public	1,037	528	528
Residential	0	144	144
Total	1,037	672	672

While the overall square footage for the Project remains the same as in the Project PNF, Section 2.4.7 includes an updated trip generation associated with the Project that reflects the inclusion of a grocery store/market.

2.1.2 Transportation Evaluation Summary

As noted above, none of the study intersections will experience a change in level of service from the No-Build Condition to Build Condition, indicating that the Project will have no significant impact to area traffic operations. Residential developments generate far fewer trips per square foot than comparably sized office or retail developments and do not produce a large proportion of daily trips during commuter travel periods, thereby minimizing the Project's impacts during peak hours. Additionally, the convenience of the nearby MBTA subway stations at Arlington Street, Boylston Street, and Tufts Medical Center will encourage transit travel to and from the Project Site by Project residents. Key transportation characteristics of the Project and analysis results include:

- ◆ During the a.m. peak hour, the Project will generate 26 new entering vehicle trips and 19 new exiting vehicle trips and during the p.m. peak hour, the Project will generate three new entering trips and 25 new exiting trips. Vehicle trips include automobiles, taxicabs, and transportation network company services such as Uber and Lyft. This is a gross calculation and does not account for any reduction in trips caused by the elimination of parking spaces within the Garage.
- ◆ Of the 672 parking spaces retained by the Project, approximately 144 will be designated for residents. The parking ratio for residents will be approximately 0.47 spaces/residential unit, assuming 100% residential utilization of the allocated parking spaces. It is expected that many residents will not own an automobile and will instead rely on car sharing services, taxicabs, or Uber/Lyft, for trips requiring a vehicle.

- ◆ The Project proposes to table Church Street between Stuart Street and Columbus Avenue to be flush with the adjacent sidewalks and Statler Park. The Project also proposes to widen sidewalks along Church Street by removing the existing metered street parking. Church Street will remain open to vehicular traffic and will remain one-way northbound.
- ◆ The Proponent will construct new sidewalks in accordance with Boston Complete Streets guidelines and requirements of the Americans with Disabilities Act and Massachusetts Architectural Access Board (ADA/AAB) to the extent feasible.
- ◆ In accordance with the City of Boston Bicycle Guidelines, and to encourage bicycling as an alternative mode of transportation, the Proponent will provide secure bicycle storage capacity for residents and employees. Residential bicycle storage capacity will be provided at a ratio of one per residential unit.
- ◆ The Proponent is coordinating with BTM staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site, generally between Arlington Street and Park Plaza. The team continues to work on developing a concept plan that will not only accommodate bicycle activity but will provide better delineation for all appropriate curbside uses and potentially improve safety for bicycles and pedestrians at the Stuart Street/Arlington Street/ Columbus Avenue intersection.
- ◆ The Project will have four loading bays on Columbus Avenue, accessed from a single curb cut. Delivery activity and trash pick-up will occur at these loading bays and be managed by an on-site transportation coordinator and subject to City regulation.
- ◆ The Proponent is committed to implementing Transportation Demand Management (TDM) measures to reduce residents' dependence on automobiles. TDM measures to be undertaken by the Proponent include: promoting transit services in marketing and orientation materials, providing adequate secure bicycle storage, joining the local Transportation Management Association, and designating an on-site transportation coordinator.
- ◆ A Transportation Access Plan Agreement (TAPA) will be entered into between the Proponent and BTM and will set forth the specific TDM measures and agreements between the Proponent and the City of Boston.

2.1.3 Study Area

In response to the City's request, the following intersections have been added to the study area:

- ◆ Stuart Street/Tremont Street (signalized);
- ◆ Stuart Street/Kneeland Street/Washington Street (signalized);
- ◆ Church Street/Columbus Avenue (unsignalized); and
- ◆ Stuart Street/Motor Mart Garage Driveway (unsignalized).

All study intersections, including the initial set of seven intersections from the Project PNF and the four additional intersections, are shown in Figure 2-1.

2.2 Existing Condition

This section addresses the existing conditions at the four additional study intersections and includes descriptions of geometrics and traffic controls, peak hour traffic counts of vehicles, bicycles, and pedestrians, intersection traffic operations, and the on-street loading and parking conditions adjacent to the site along Columbus Avenue.

Descriptions of existing conditions at the initial set of study intersections can be found in the Project PNF.

2.2.1 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.

Stuart Street/Tremont Street is a four-leg, signalized intersection with three approaches. The Stuart Street eastbound approach has three lanes: two exclusive through lanes and one right-turn only lane. The Stuart Street westbound approach has three lanes: one left-turn only lane with approximately 100 feet of storage and two exclusive through lanes. The Tremont Street southbound approach has four lanes: one exclusive left-turn lane with approximately 170 feet of storage, two exclusive through lanes, and an exclusive right-turn lane. On-street parking is provided on both sides of Tremont Street to the south of the intersection. No on-street parking is allowed on Tremont Street on the north side of the intersection. Parking is provided on the north side of Stuart Street to the west of the intersection and is restricted for approximately 50-feet to the east of the intersection. Sidewalks, crosswalks, wheelchair ramps, pedestrian signal heads, and push buttons are provided for all legs of the intersection. New ramps will be constructed at the northeast, northwest, and southwest corners of the intersection as part of the Moxy Hotel project.

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Stuart Street/Kneeland Street/Washington Street is a four-leg, signalized intersection with three approaches. The Stuart Street eastbound approach has three lanes: one exclusive left-turn only lane with approximately 195 feet of storage, one exclusive through lane, and one shared through/right-turn lane. The Kneeland Street westbound approach has three lanes: one shared left-turn/through lane, one through lane, and an exclusive right-turn lane with approximately 80 feet of storage. The Washington Street northbound approach has two lanes: one shared left-turn/through lane and one shared through/right-turn lane. On-street parking is provided on the south side of the Kneeland Street westbound approach and on both sides of the Washington Street northbound approach. Sidewalks, crosswalks, wheelchair ramps, pedestrian signal heads, and push buttons are provided across all legs of the intersection.

Church Street/Columbus Avenue is a three-leg, unsignalized intersection with two approaches. The Columbus Avenue south-westbound approach consists of two exclusive through lanes. The Church Street northbound approach consists of a single left-turn lane. On-street parking and loading is provided on both the north and south sides of Columbus Avenue and on the east and west sides of Church Street. Sidewalks are provided along all approaches and a marked crosswalk with wheelchair ramps at each end is provided across Church Street.

Stuart Street/Motor Mart Garage Driveway is a three-leg, unsignalized intersection with two approaches. The Stuart Street eastbound approach consists of one shared left-turn/through lane and one exclusive through lane. The Motor Mart Garage approach consists of one left-turn only lane. LED warning signs exist on the exterior of the structure to warn pedestrians of exiting vehicles. An overhead warning sign just prior to the exit warns drivers of the potential for crossing pedestrians. Parking is provided on the south side of Stuart Street. There are sidewalks on both sides Stuart Street.

2.2.2 Existing Traffic Data

Turning Movement Counts (TMCs) and vehicle classification counts were conducted at the additional intersections during the weekday a.m. and weekday p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) on Wednesday, February 6, 2019. The traffic classification counts included car, heavy vehicle, pedestrian, and bicycle movements. The detailed traffic counts for the study area intersections are provided in Appendix A.

To account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT was reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the February 2019 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6) in the month of February is 1.01. This indicates that average month traffic volumes are approximately one percent higher than the traffic volumes that were collected. Therefore, the traffic counts were increased by 1% to provide volumes consistent with the average season traffic volumes. The MassDOT 2011 Weekday Seasonal Factors table is provided in Appendix A.

For ease of reference to the Project PNF, the Existing Condition year is still designated as 2018 although the additional volumes were collected in early 2019.

2.2.3 *Existing Vehicular Traffic Volumes*

The Existing (2018) weekday a.m. peak hour and weekday p.m. peak hour traffic volumes for all study intersections are shown in Figure 2-2 and Figure 2-3, respectively.

2.2.4 *Existing Condition Bicycle Volumes*

To determine the amount of bicycle activity within the study area, bicycle counts at the additional intersections were conducted concurrent with the TMCs at all study area intersections and are presented in Figure 2-4. An updated map of bicycle sharing locations is shown in Figure 2-5.

2.2.5 *Existing Condition Pedestrian Volumes*

To determine the amount of pedestrian activity within the study area, pedestrian counts at the additional intersections were conducted concurrent with the TMCs at the study area intersections and are presented in Figure 2-6.

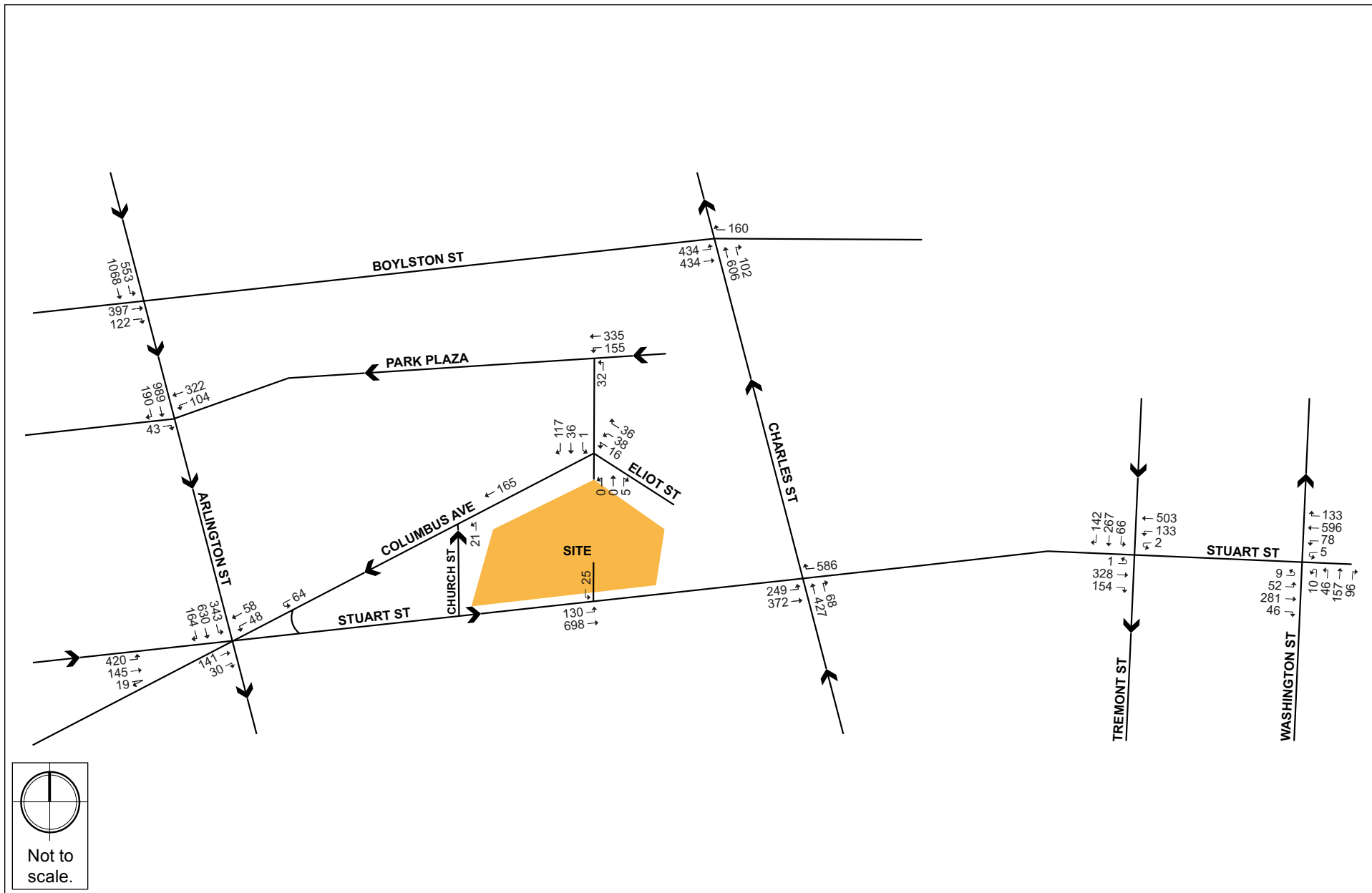
2.3 No-Build (2025) Condition

2.3.1 *Background Traffic Growth*

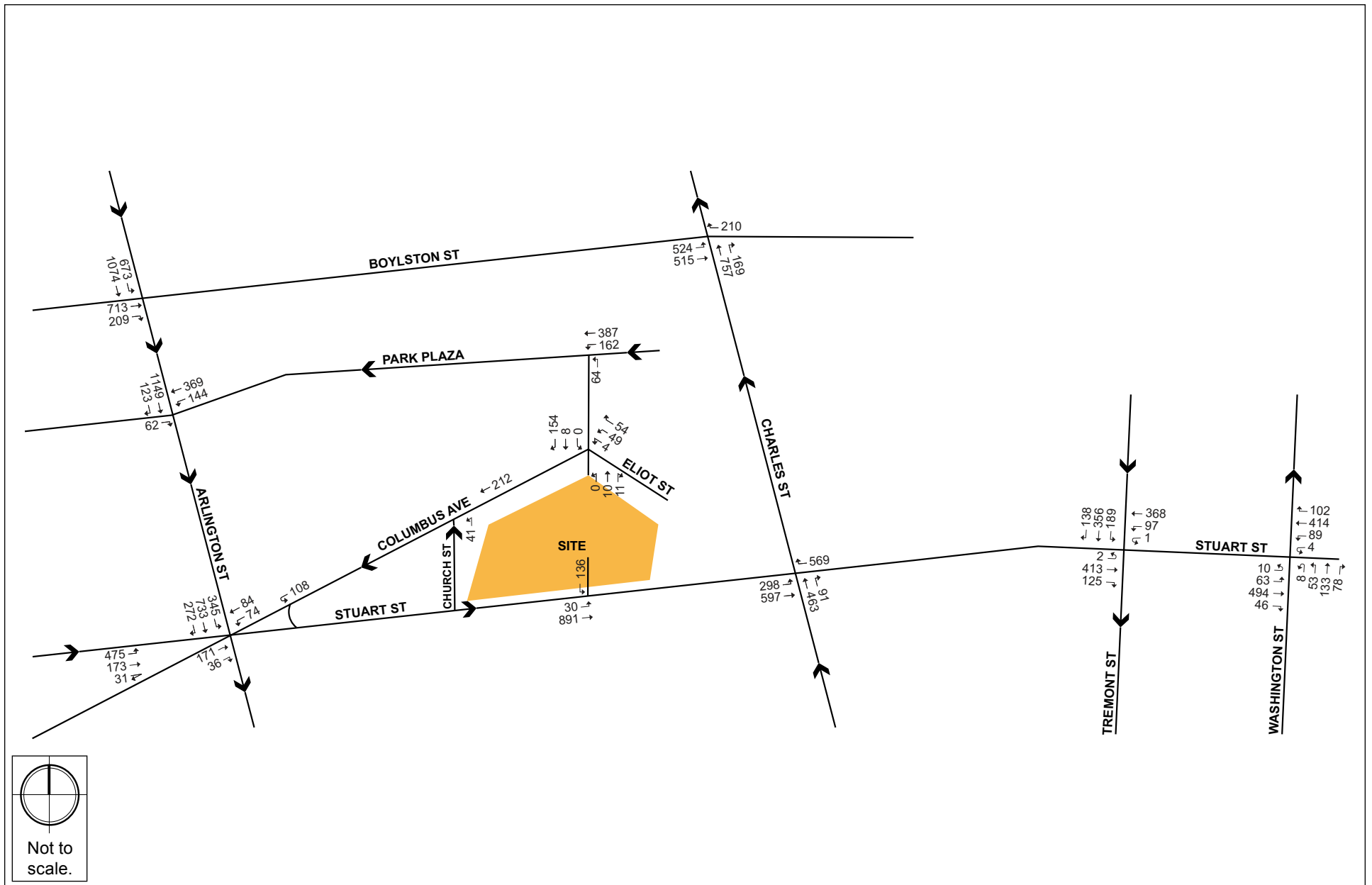
The methodologies outlined in the Project PNF were used to develop the future conditions for the additional four intersections. These included a 0.5 percent annual background growth rate and traffic volumes associated with the following specific planned development projects in the study area:

- ◆ 350 Boylston Street;
- ◆ 380 Stuart Street;
- ◆ 40 Trinity Place;
- ◆ Back Bay/South End Gateway;
- ◆ 212-222 Stuart Street; and
- ◆ 240 Tremont Street (Parcel P-7A).

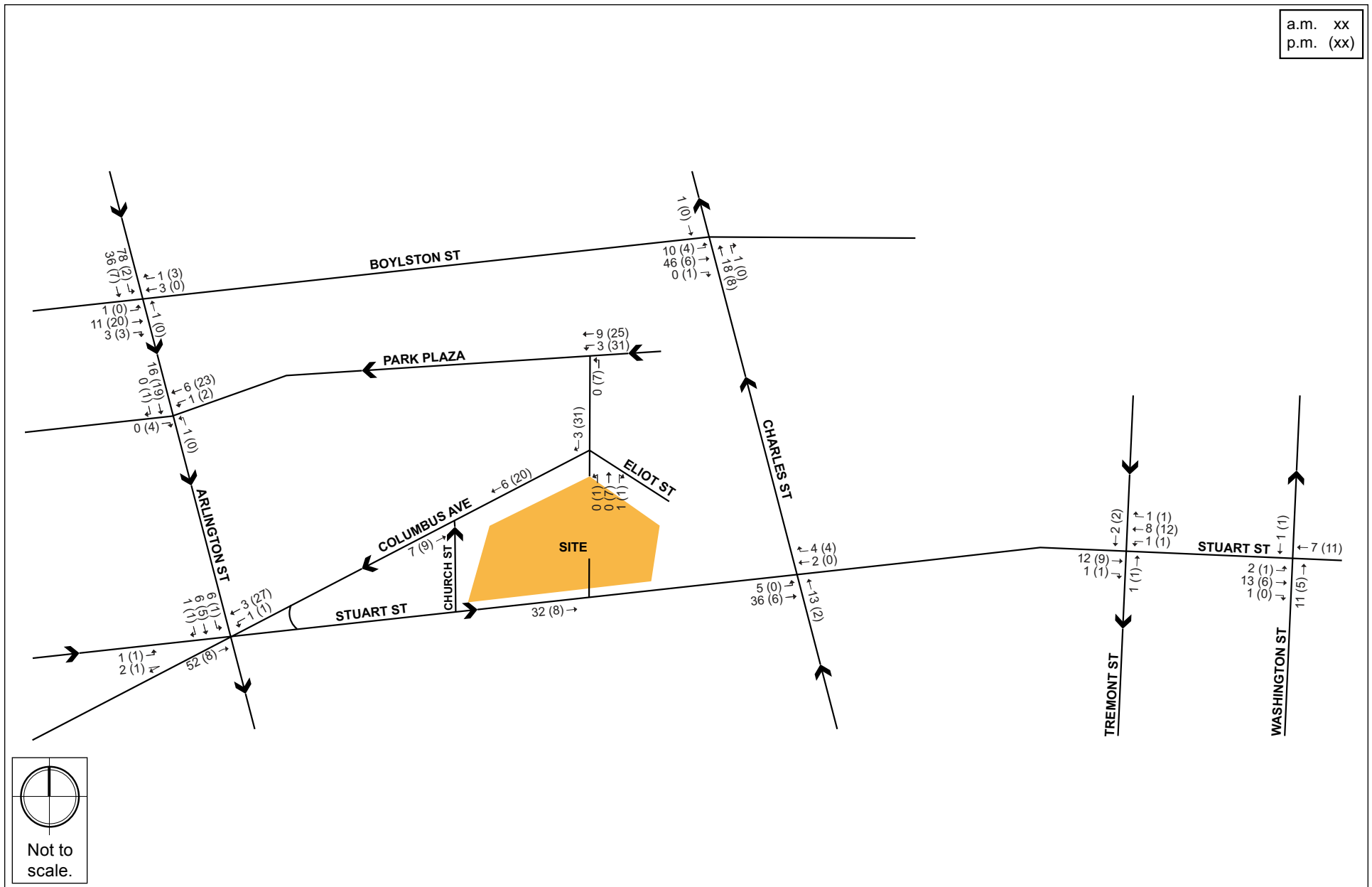
Detailed descriptions of these projects and other proposed infrastructure improvements in the area were presented in the Project PNF.



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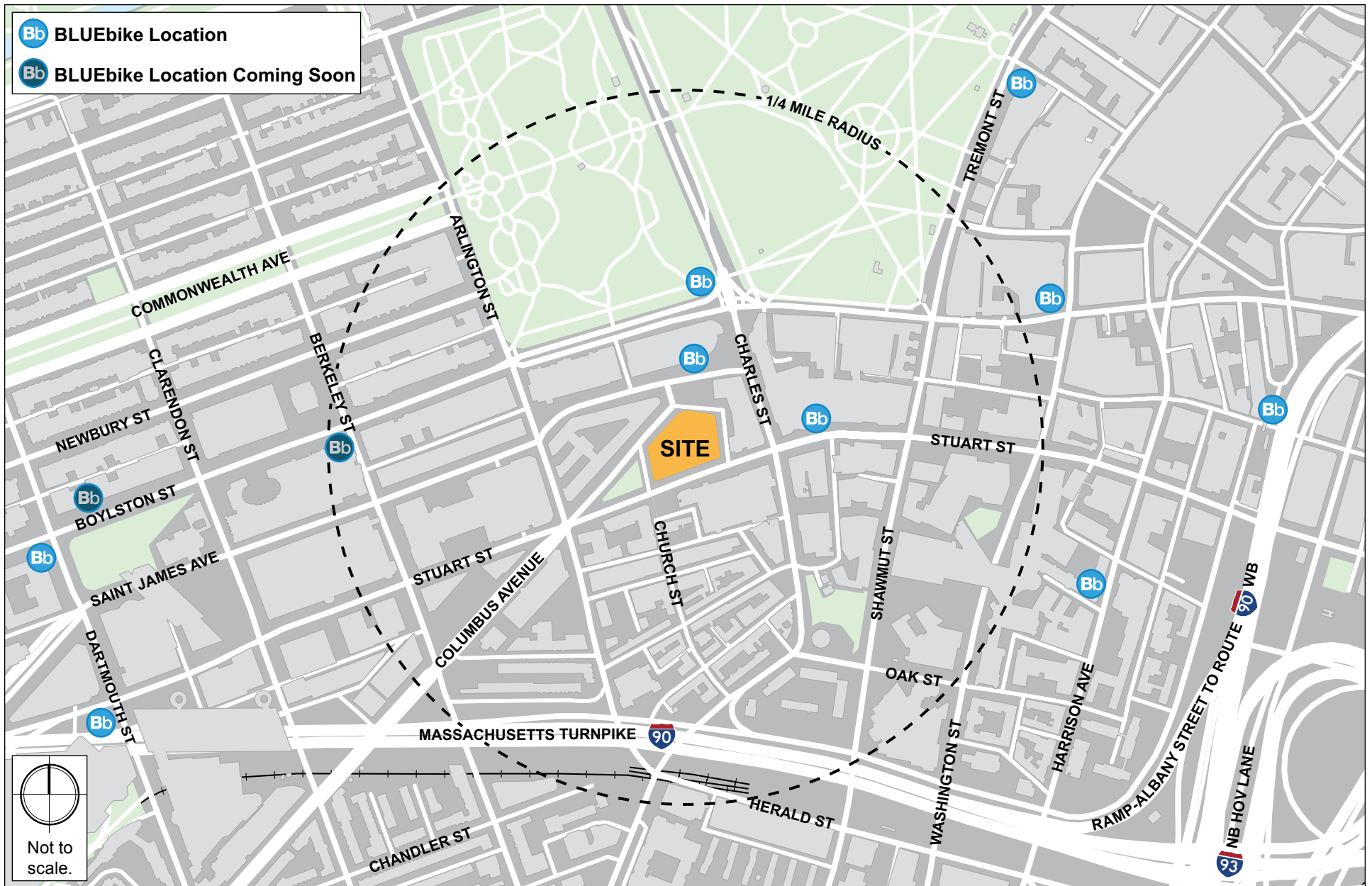
Motor Mart Garage Boston, Massachusetts



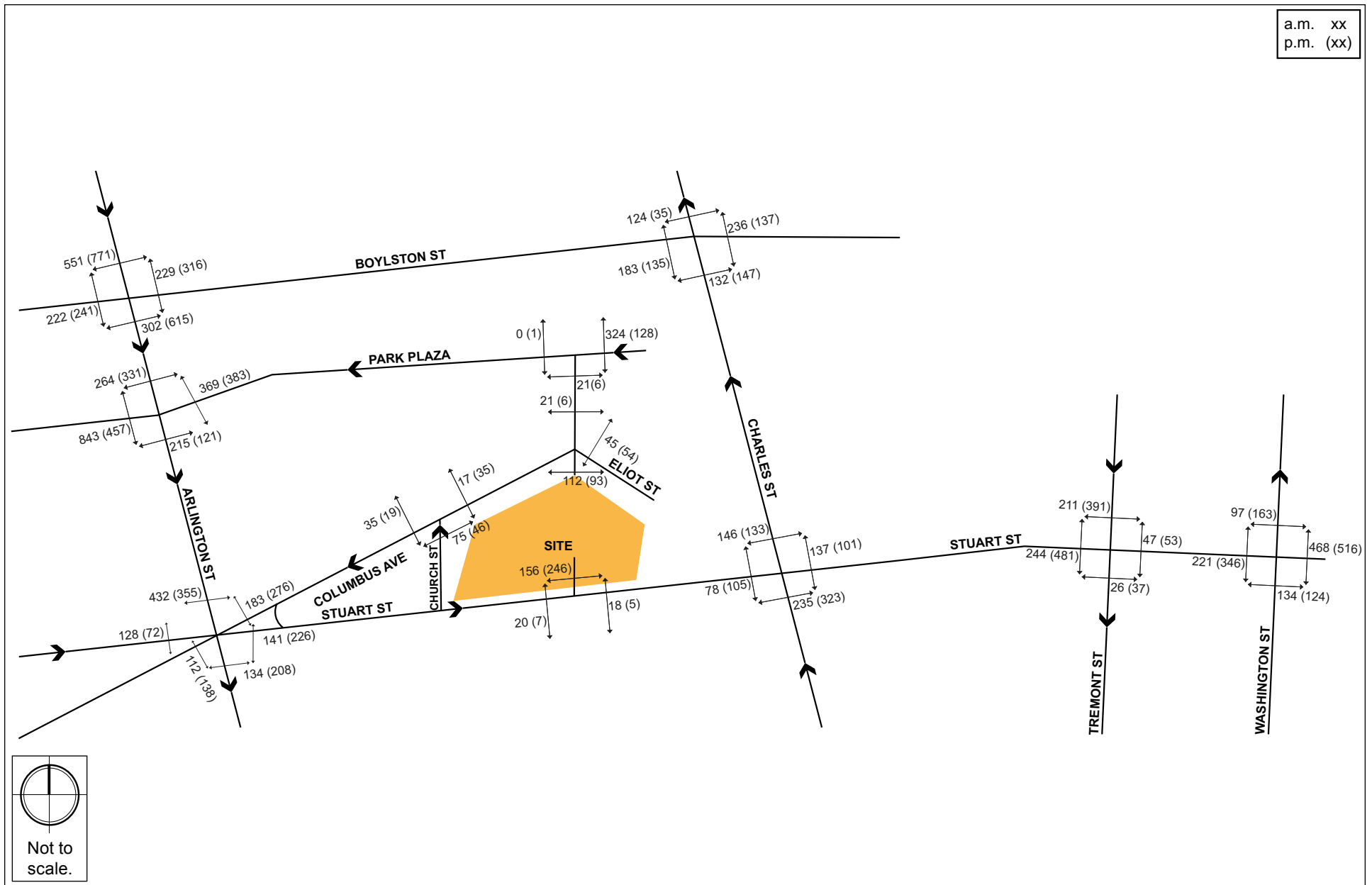
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Figure 2-4

Existing (2018) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hours



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Motor Mart Garage Boston, Massachusetts

2.3.2 *No-Build Traffic Volumes*

The No-Build (2025) Condition weekday a.m. and p.m. peak hour traffic volumes at all study intersections are shown in Figure 2-7 and Figure 2-8, respectively.

2.4 Build Condition

Of the existing 50,712 sf of commercial (retail/restaurant) space on the ground and basement floors, approximately 46,000 sf will be retained and the rest will be replaced by new interior lobby spaces and internal circulation hallways.

2.4.1 *Site Access and Vehicle Circulation*

The ground-floor site plan in Figure 2-9, shows vehicle and pedestrian access, loading area, and walking connection paths to nearby MBTA services. See also Figure 1-6, which shows the location of on-site vehicle charging stations and secure bicycle storage.

The primary pedestrian entrance to the Project will be located on Church Street and connect with new interior walkways to the residential lobby. The ground floor retail uses will continue to have exterior doorways along the perimeter of the Project.

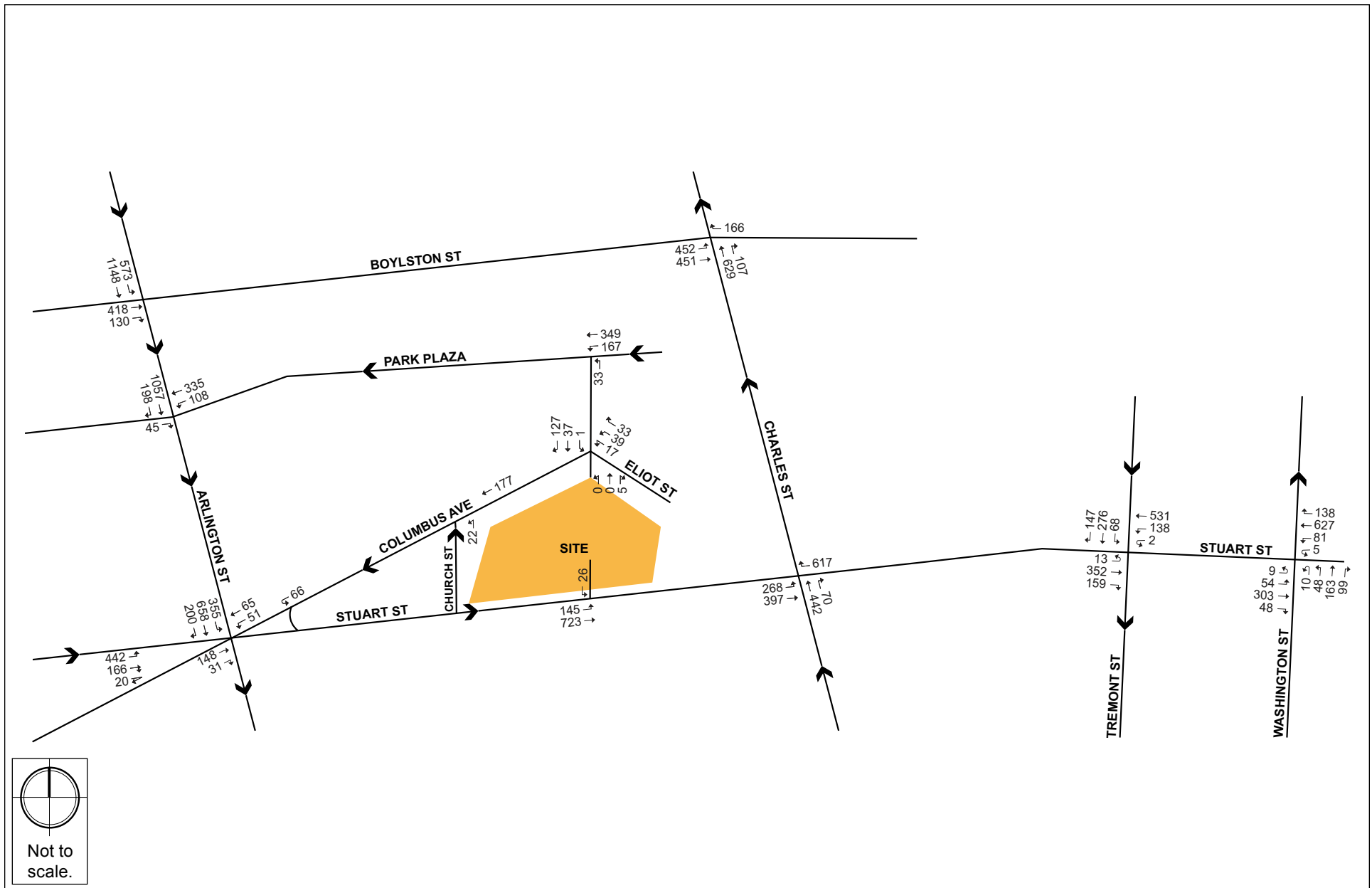
Vehicles will, as under current conditions, continue to access the garage driveways on either Stuart Street or at the corner of Eliot Street and Columbus Avenue. The Project will also include widening of sidewalks along Church Street by removing the existing metered street parking.

A drop-off/pick-up zone for two cars will be incorporated along Church Street, in front of the doorway to the residential lobby. These proposed changes will be reviewed by the City as part of the Project's Transportation Access Plan Agreement.

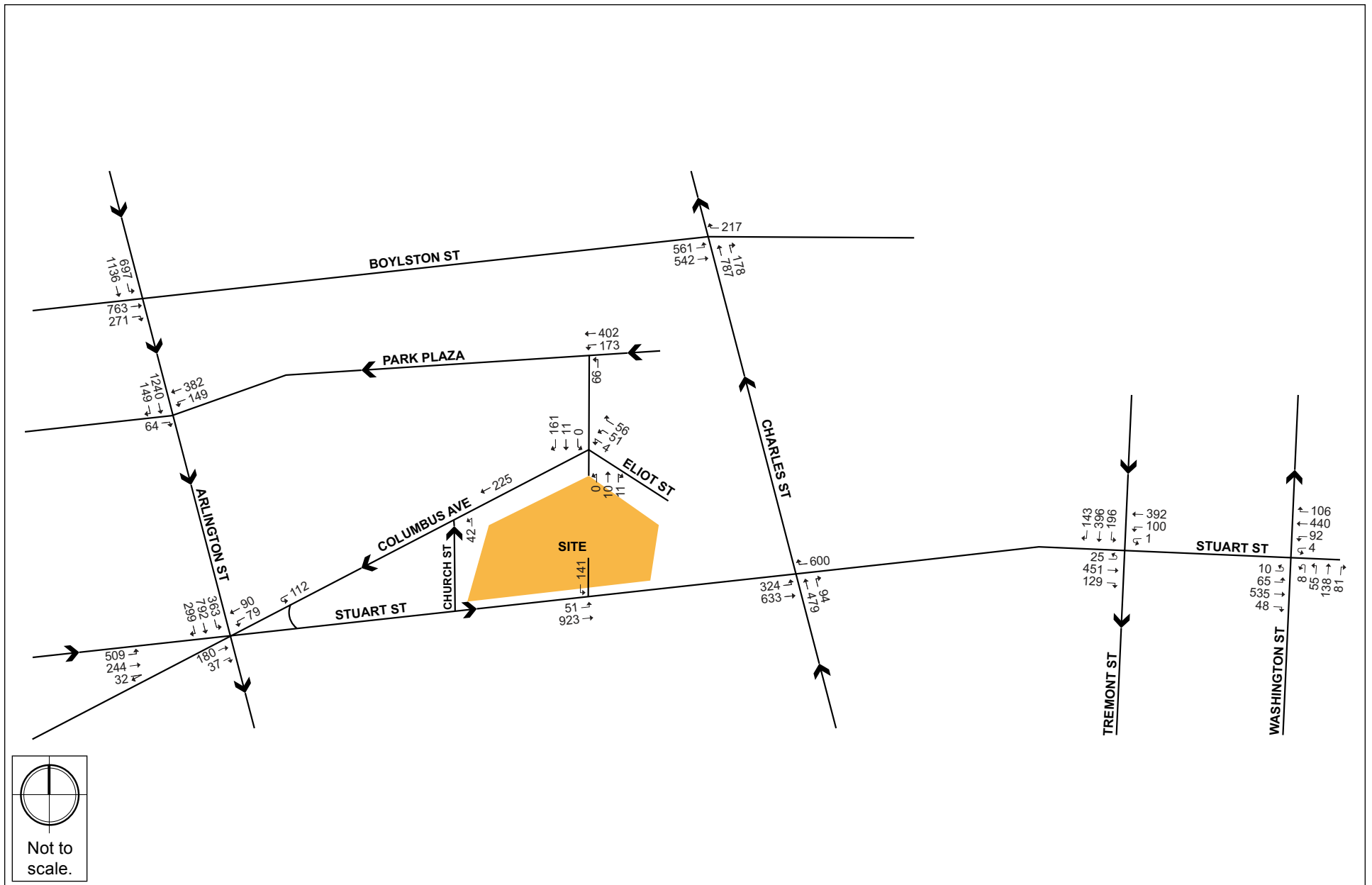
2.4.2 *Loading and Service Accommodations*

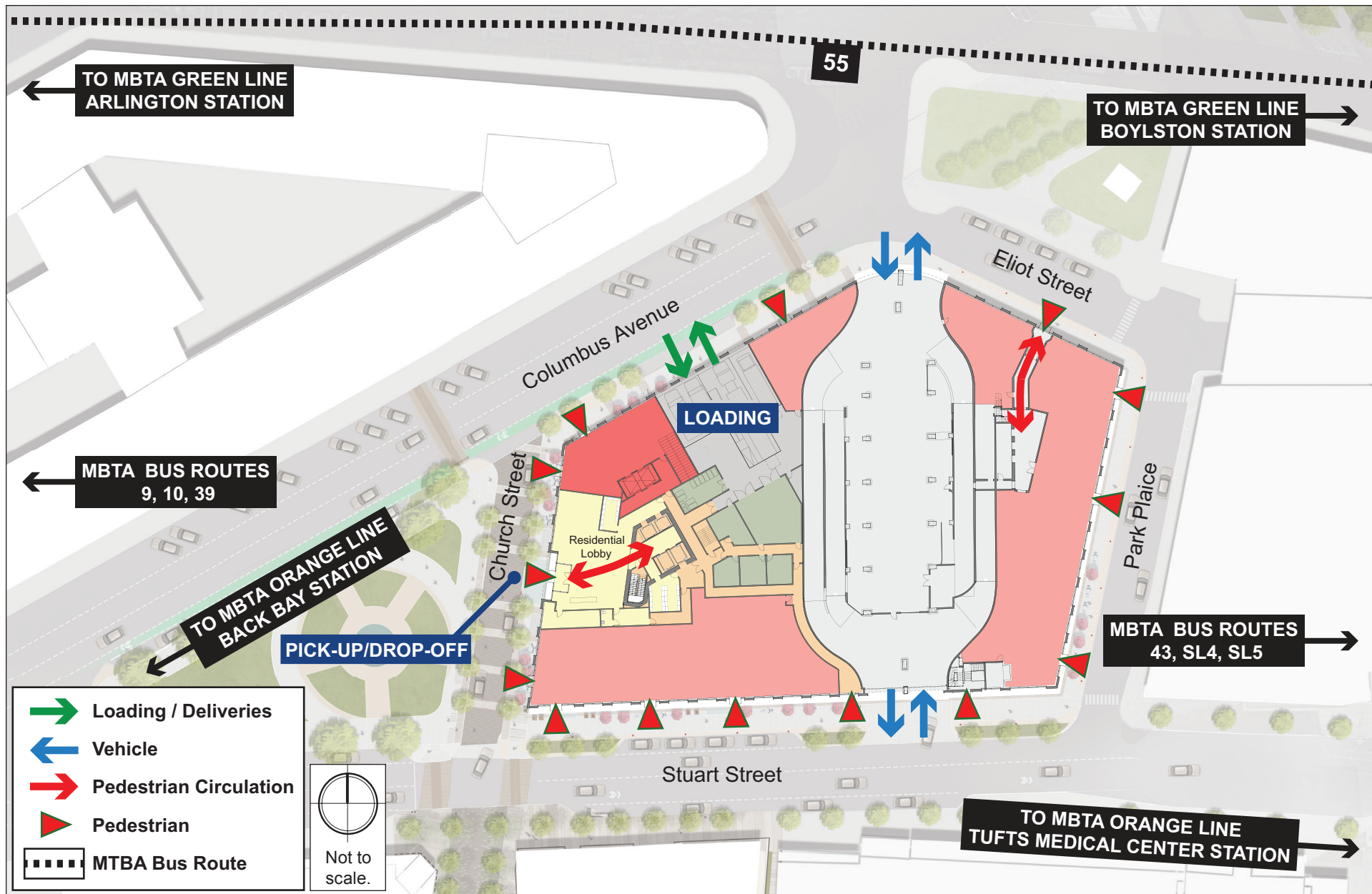
Two types of delivery activity are anticipated at the Project:

- ◆ Loading area/docks – Activity such as package delivery (USPS, UPS, Fed-Ex), furniture delivery, deliveries for on-site retail/restaurant/grocery businesses, and move-in/move-out will occur here. Typically, about 50% of loading dock deliveries occur via autos/vans and about 50% via Single Unit 30-foot (SU30) trucks.
- ◆ Residential Lobby – Activity related to laundry/dry cleaning pick-up/drop-off, single small package delivery, housecleaning services, dog walkers, water delivery, cable company service, and food delivery will occur in the residential lobby. Typically, about 90% of this activity occurs via autos/vans and about 10% via walking/bicycle.



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The Project will have four bays in the single loading area located off-street along Columbus Avenue where deliveries and trash pick-up will occur. Delivery vehicles to the Project's loading dock will back in from the street into one of the bays. Vehicles will exit onto Columbus Avenue. The Proponent will designate a transportation coordinator to manage loading and service activities. One bay will accommodate a wide body, 40 foot (WB-40) truck and one bay will accommodate a single unit 36 foot (SU-36) box truck. The two trash bays can accommodate smaller delivery vehicles (vans, pick-up trucks, and passenger vehicles) when trash is not actively being picked-up, which occurs early in the morning.

Based on observations at other downtown residential buildings with ground floor retail (not including grocery) space, it is expected that about ten deliveries per day will use the loading area. Typically, vehicles associated with such deliveries occupy a loading bay for about 15 minutes. In addition, the grocery store/market is expected to receive about five deliveries per day, with each delivery occupying a bay for 30 minutes.

In the lobby, it is expected that about 21 deliveries will occur throughout the day, lasting, on average, about four minutes each. The vehicles associated with these deliveries will use either the loading area or available on-street parking.

The four, off-street loading bays will be sufficient to service the delivery activity at the Project.

2.4.3 Project Parking

The Project will retain approximately 672 parking spaces in the garage, designating approximately 144 spaces for residential use and the remaining approximately 528 spaces primarily for public use. A small number of these spaces may continue to be used by Zipcar, by rental car companies, or by monthly permit holders. The parking goals developed by the BTD for the Park Plaza/Bay Village neighborhood reflect a maximum of 0.5-1.0 residential parking spaces per unit. With approximately 306 residential units and 144 parking residential spaces, the Project anticipates having a parking ratio of approximately 0.47 spaces per unit, a rate consistent with City guidelines.

When Project residents arrive to park, they will stop inside the garage and leave their vehicles with an attendant, who will take and park the vehicle. Garage attendants will also retrieve vehicles for departing residents.

2.4.4 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, and walk/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 site.

As in the Project PNF, to estimate the number of trips expected to be generated by the new residential uses of the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*¹ 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 modes such as walking, bicycling, and transit. To estimate the unadjusted number of vehicular trips for the Project, the following ITE land use code (LUC) was used:

Land Use Code 222 – Multifamily Housing (High Rise). A High Rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have more than 10 levels (floors). They are likely to have one or more elevators. Calculations of the number of trips use ITE's average rate per dwelling units.

Land Use Code 820—Retail/Shopping Center. A retail shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. Of the ITE retail categories, this one best suits the retail component proposed within the Project. Calculations of the number of trips use ITE's average rate per 1,000 square feet.

Land Use Code 850—Supermarket. A supermarket is a free-standing retail store selling a complete assortment of food, food preparation and wrapping materials, and household cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies, and video rental areas. Some facilities may be open 24 hours a day. Calculations of the number of supermarket trips use ITE's average rate per 1,000 square feet.

Land Use Code 931—Quality Restaurant. This land use consists of high quality, full-service eating establishments with a typical duration of stay of at least one hour. Quality restaurants do not serve breakfast; some do not serve lunch; all serve dinner. This type of restaurant often requests and sometimes requires reservations and is generally not part of a chain. Patrons commonly wait to be seated, are served by wait-staff, order from menus, and pay for meals after they eat. Calculations of the number of restaurant trips use ITE's average rate per 1,000 square feet.

¹ Trip Generation Manual, 10th Edition; Institute of Transportation Engineers; Washington, D.C.; 2017.

2.4.5 Travel Mode Share

BTD provides vehicle, transit, and walking mode share rates for different areas of Boston. The Project is in designated Area 3 – Park Plaza/Bay Village. The unadjusted vehicular trips were converted to person-trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)². The person-trips were then distributed to different modes according to the travel mode shares shown in Table 2-2.

Table 2-2 Travel Mode Shares

Land Use		Walk/Bicycle Share	Transit Share	Vehicle Share	Vehicle Occupancy Rate
Daily					
Multifamily Housing (High Rise)	In	49%	17%	34%	1.13
	Out	49%	17%	34%	1.13
Retail/Shopping Center	In	43%	17%	40%	1.78
	Out	43%	17%	40%	1.78
Supermarket	In	43%	17%	40%	1.78
	Out	43%	17%	40%	1.78
Quality Restaurant	In	43%	17%	40%	2.20
	Out	43%	17%	40%	2.20
Weekday a.m. Peak Hour					
Multifamily Housing (High Rise)	In	38%	17%	45%	1.13
	Out	65%	13%	22%	1.13
Retail/Shopping Center	In	33%	16%	51%	1.78
	Out	79%	8%	13%	1.78
Supermarket	In	33%	16%	51%	1.78
	Out	79%	8%	13%	1.78
Quality Restaurant	In	33%	16%	51%	2.20
	Out	79%	8%	13%	2.20

² Summary of Travel Trends: 2009 National Household Travel Survey; FHWA; Washington, D.C.; June 2011.

Table 2-2 Travel Mode Shares (Continued)

Land Use		Walk/Bicycle Share	Transit Share	Vehicle Share	Vehicle Occupancy Rate
Weekday p.m. Peak Hour					
Multifamily Housing (High Rise)	In	65%	13%	22%	1.13
	Out	38%	17%	45%	1.13
Retail/Shopping Center	In	79%	8%	13%	1.78
	Out	33%	16%	51%	1.78
Supermarket	In	79%	8%	13%	1.78
	Out	33%	16%	51%	1.78
Quality Restaurant	In	79%	8%	13%	2.20
	Out	33%	16%	51%	2.20

2.4.6 Existing Trip Generation

When assessing a site with existing, active land uses, it is standard practice to estimate existing trips and subtract those trips from the projected new future trips. The result of this process yields “net new” trips that become the basis for traffic analysis.

In addition to the 306 new residential units, the Build Condition with the grocery store/market will replace 15,000 square feet of existing quality restaurant use with the grocery store and another 14,479 square feet of quality restaurant use with retail use. With the Project, trip activity associated with public parking in the existing garage will decrease as parking spaces are reduced from 1,037 to 672. However, as described in the Project PNF, no credit (reduction) for existing trips associated with the public parking use has been taken under the Build Condition. The land uses of the existing site and the proposed development program with the grocery store/market are summarized in Table 2-3.

Table 2-3 Project Program

Land Use	Existing Site	Proposed Project	Net Change
Commercial (square feet)	50,712 sf	46,000 sf	-4,712 sf
Shopping Center/Retail	1,809 sf	16,288 sf	+ 14,479 sf
Grocery/Market	0	15,000 sf	+ 15,000 sf
Quality Restaurant	48,903 sf	14,712 sf	-34,191 sf
Residential (units)	0	306	+ 306
Parking (spaces)			
Commercial/Public	1,037	528	-509
Residential	0	144	+ 144
Total	1,037	672	-365

2.4.7 Project Trip Generation

The travel mode share percentages shown in Table 2-2 were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates for the Project. It was assumed that 10% of residential vehicle trips will occur via taxicab/rideshare (such as Uber or Lyft). The trip generation for the Project by travel mode is shown in Table 2-4. The detailed trip generation information is provided in Appendix A.

Table 2-4 Project Trip Generation

Land Use			Walk/Bicycle Trips	Transit Trips	Vehicle Trips		
					Private Vehicle	Taxicab/ Rideshare	Total Vehicle Trips
Daily							
Multifamily Housing (High Rise)	In	377	131	209	22	231	
	Out	<u>377</u>	<u>131</u>	<u>209</u>	<u>22</u>	<u>231</u>	
	Total	754	262	418	44	462	
Retail/Shopping Center	In	209	83	107	3	110	
	Out	<u>209</u>	<u>83</u>	<u>107</u>	<u>3</u>	<u>110</u>	
	Total	418	166	214	6	220	
Supermarket	In	614	242	314	9	323	
	Out	<u>614</u>	<u>242</u>	<u>314</u>	<u>9</u>	<u>323</u>	
	Total	1228	484	628	18	646	
Quality Restaurant	In	-1,356	-536	-562	-21	-583	
	Out	<u>-1,356</u>	<u>-536</u>	<u>-562</u>	<u>-21</u>	<u>-583</u>	
	Total	-2,712	-1,072	-1,124	-42	-1,166	
Total	In	-156	-80	68	13	81	
	Out	<u>-156</u>	<u>-80</u>	<u>68</u>	<u>13</u>	<u>81</u>	
	Total	-312	-160	136	26	162	
a.m. Peak Hour							
Multifamily Housing (High Rise)	In	10	4	10	1	11	
	Out	<u>52</u>	<u>11</u>	<u>14</u>	<u>2</u>	<u>16</u>	
	Total	62	15	24	3	27	
Retail/Shopping Center	In	5	2	4	0	4	
	Out	<u>7</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>1</u>	
	Total	12	3	5	0	5	
Supermarket	In	20	10	17	1	18	
	Out	<u>33</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>3</u>	
	Total	53	13	20	2	21	
Quality Restaurant	In	-10	-5	-7	0	-7	
	Out	<u>-19</u>	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>-1</u>	
	Total	-29	-7	-8	0	-8	
Total	In	25	11	24	2	26	
	Out	<u>73</u>	<u>13</u>	<u>17</u>	<u>3</u>	<u>19</u>	
	Total	98	24	41	5	45	

Table 2-4 Project Trip Generation (Continued)

Land Use			Walk/Bicycle Trips	Transit Trips	Vehicle Trips		
					Private Vehicle	Taxicab/ Rideshare	Total Vehicle Trips
p.m. Peak Hour							
Multifamily Housing (High Rise)	In		49	10	13	2	15
	Out		<u>19</u>	<u>8</u>	<u>18</u>	<u>2</u>	<u>20</u>
	Total		68	18	31	4	35
Retail/Shopping Center	In		36	4	3	0	3
	Out		<u>17</u>	<u>8</u>	<u>15</u>	<u>1</u>	<u>16</u>
	Total		<u>53</u>	<u>12</u>	<u>18</u>	<u>1</u>	<u>19</u>
Supermarket	In		100	10	9	0	9
	Out		<u>40</u>	<u>19</u>	<u>34</u>	<u>1</u>	<u>35</u>
	Total		140	29	43	1	44
Quality Restaurant	In		-375	-32	-23	-1	-24
	Out		<u>-311</u>	<u>-31</u>	<u>-44</u>	<u>-2</u>	<u>-46</u>
	Total		-686	-63	-67	-3	-70
Total	In		-126	-8	2	1	3
	Out		<u>12</u>	<u>4</u>	<u>23</u>	<u>2</u>	<u>25</u>
	Total		-114	-4	25	3	28

As shown in Table 2-4, the Project is expected to generate approximately 45 new vehicle trips (26 in and 19 out) during the weekday a.m. peak hour and 28 new vehicle trips (3 in and 25 out) during the weekday p.m. peak hour. See Section 2.5 for traffic capacity analysis.

Overall, the number of transit trips is expected to increase by about 24 trips during the a.m. peak hour and decrease by about 4 trips during the p.m. peak hour. The modest decrease is caused by the change in ground floor commercial space from restaurant to other retail types. See Section 2.6 for additional transit analysis.

2.4.8 Trip Distribution

The trip distribution identifies the various travel paths for vehicles associated with the Project. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 3 and trip distribution patterns presented in traffic studies for nearby projects. As indicated in the Project PNF, the one-way circulation patterns in this area also determine the likely distribution of trip distribution into and out of the Project Aite.

2.4.9 Build Traffic Volumes

The new Project-generated vehicle trips were distributed throughout the study area according to the trip distribution patterns.

The Project-generated trips at study area intersections are shown for the weekday a.m. peak hour and the weekday p.m. peak hour in Figure 2-10 and Figure 2-11, respectively. The trip assignments were added to the No-Build (2025) Condition vehicular traffic volumes to produce the Build (2025) Condition vehicular traffic volumes.

The Build (2025) Condition weekday a.m. and p.m. peak hour traffic volumes are shown in Figure 2-12 and Figure 2-13, respectively.

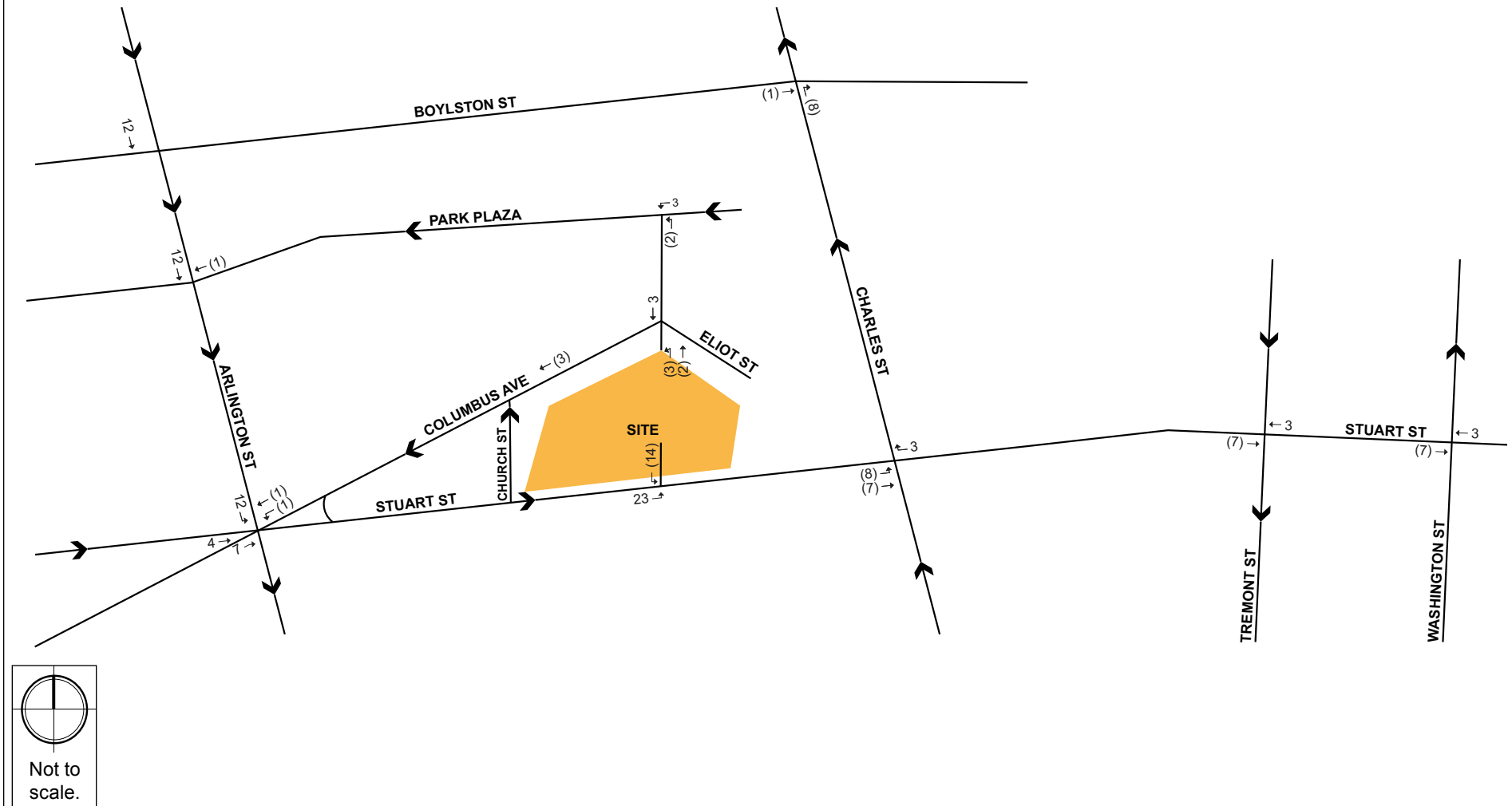
2.4.10 On-Site Bicycle Accommodations

In accordance with BTB guidelines, the Proponent will provide one secure/covered bicycle parking spaces for each residential unit and one for every 5,000 sf of retail, for retail employees.

Bicycle storage will be provided in the garage and bicycle racks will be provided near primary entrances. Bicycle racks, signs, and parking areas will conform to BTB standards. See Figure 1-6 which shows the location of the interior bicycle storage area.

Although the closest existing Blue Bikes bicycle-sharing station is only about 500 feet from the Project Site (on Stuart Street, east of Charles Street), the Proponent will explore the possibility of incorporating a new Blue Bikes station along Church Street, adjacent to Statler Park.

IN: 26
OUT: (19)

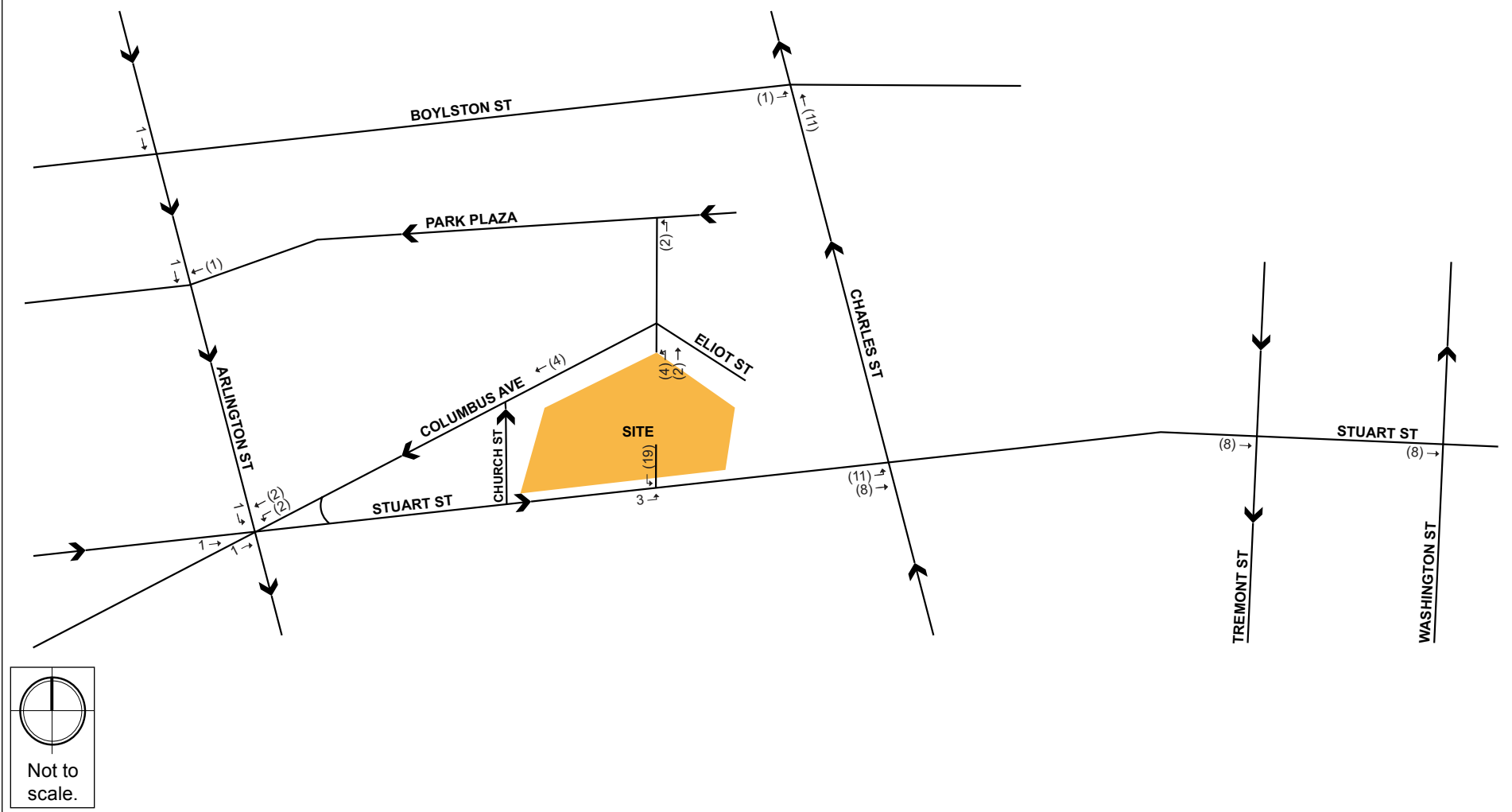


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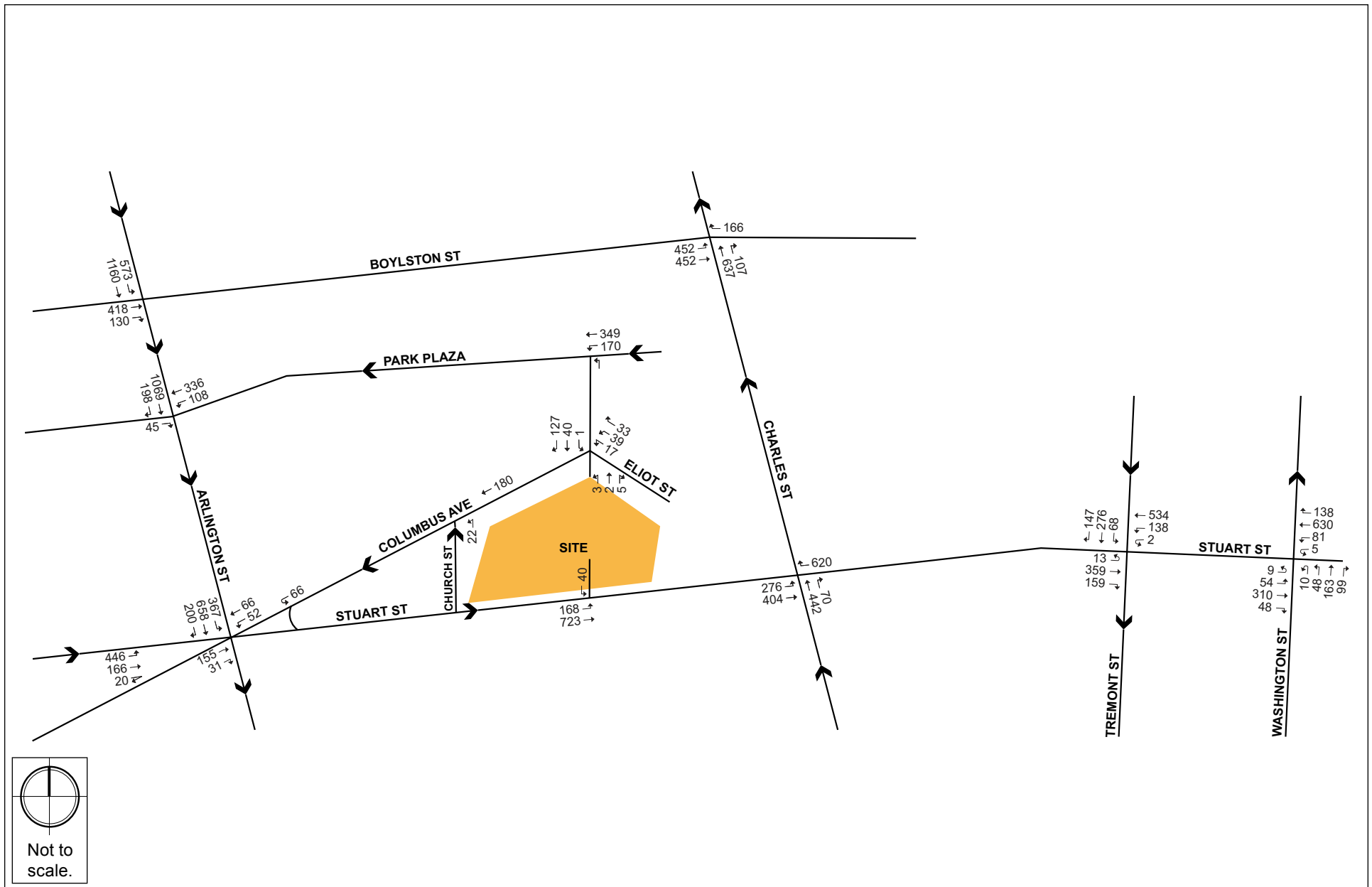
Figure 2-10

Project-Generated Vehicle Trips, Weekday a.m. Peak Hour

IN: 3
OUT: (25)



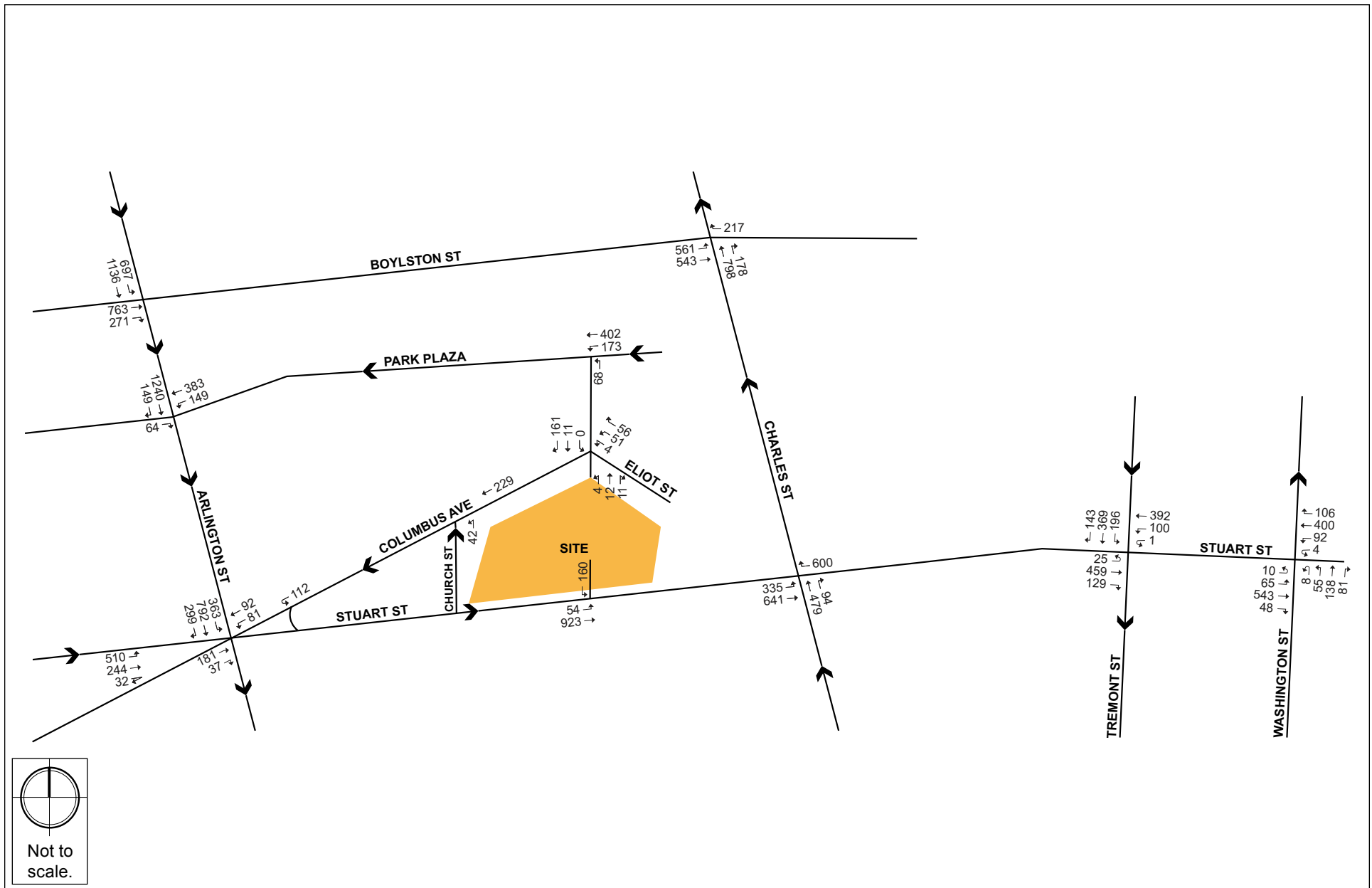
Motor Mart Garage Boston, Massachusetts



Motor Mart Garage Boston, Massachusetts

Figure 2-12

Build (2025) Condition Traffic Volumes, Weekday a.m. Peak Hour



2.5 Traffic Capacity Analysis

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay experienced by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 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 2-5 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.

Table 2-5 Vehicle Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

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

- ◆ The volume-to-capacity ratio (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, measured in feet, denotes the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line. This maximum queue occurs five percent, or less, of the time during the peak hour, and typically does not

develop during off-peak hours. Since volumes fluctuate throughout the hour, the 95th percentile queue represents what can be considered a “worst case” condition. Queues at an intersection are generally below the 95th percentile length throughout most of the peak hour. It is also unlikely that 95th percentile queues for each approach to an intersection occur simultaneously.

Table 2-6 and Table 2-7 present, respectively, the weekday a.m. and p.m. peak hours capacity analysis for the study area intersections under each analysis condition: Existing (2018) Condition, No-Build (2025) Condition, and the Build (2025) Condition. The detailed analysis sheets are provided in Appendix A. The sections below present results for each condition.

2.5.1 Existing (2018) Condition Traffic Capacity Analysis

As shown under the Existing (2018) Condition of Table 2-6 and Table 2-7, a majority of the study area intersections and approaches operate at acceptable levels of service (LOS D or better) during the weekday a.m. and p.m. peak hours, with the exception of the following movements:

- ◆ The **Stuart Street/Arlington Street/Columbus Avenue** intersection operates at LOS E during both the a.m. and p.m. peak hours. The Stuart Street eastbound through movements operate at LOS E during the a.m. peak hour and LOS D during the p.m. peak hour. The Columbus Avenue northeast-bound approach operates at LOS E during both the a.m. and p.m. peak hours. The Arlington Street southbound left-turn and through movements both operate at LOS E during the a.m. and p.m. peak hours. The Arlington Street southbound left and through movements operate at LOS E during the a.m. and p.m. peak hours. The Arlington Street southbound right-turn movement operates at LOS E during the a.m. peak hour and LOS D during the p.m. peak hour. The longest queues at the intersection occur at the Arlington Street southbound left-turn movement during the a.m. peak hour and the Arlington Street southbound through movement during the p.m. peak hour.
- ◆ While the **Stuart Street/Charles Street** intersection operates at LOS B during both the a.m. and p.m. peak hours, the Charles Street northbound approach operates at LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Charles Street northbound approach during both the a.m. and the p.m. peak hours.
- ◆ While the **Stuart Street/Kneeland Street/Washington Street** intersection operates at LOS D during the a.m. peak hour and LOS C during the p.m. peak hour, the Stuart Street eastbound left-turn movement operates at LOS E during the a.m. peak hour. The longest queues at the intersection occur at the Kneeland Street westbound left-turn/through movement during the a.m. peak hour and the Stuart Street eastbound through/right-turn movement during the p.m. peak hour.

2.5.2 *No-Build (2025) Condition Traffic Capacity Analysis*

As shown under the No-Build (2025) Condition of Table 2-6 and Table 2-7, a majority of the study area intersections and approaches continue to operate at acceptable levels of service (LOS D or better) during the weekday a.m. and p.m. peak hours, with the exception of the following movements:

- ◆ The **Stuart Street/Arlington Street/Columbus Avenue** intersection continues to operate at LOS E during both the a.m. and p.m. peak hours. The Stuart Street eastbound through movements continue to operate at LOS E during the a.m. peak hour and LOS D during the p.m. peak hour. The Stuart Street eastbound right-turn movements deteriorates from a LOS D to LOS E during the p.m. peak hour. The Columbus Avenue northeast-bound approach continues to operate at LOS E during the a.m. peak hour and deteriorates from LOS E to LOS F during the p.m. peak hour. The Arlington Street southbound left-turn movement deteriorates from LOS E to LOS F during the a.m. peak hour and continues to operate at LOS E during the p.m. peak hour. The Arlington Street southbound through movements continue to operate at LOS E during the a.m. peak hour and deteriorates from LOS E to LOS F during the p.m. peak hour. The Arlington Street southbound right-turn movement continues to operate at LOS E during the a.m. peak hour and deteriorates from LOS D to LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Arlington Street southbound left-turn movement during the a.m. peak hour and at the Arlington Street southbound through movement during the p.m. peak hour.
- ◆ The **Stuart Street/Charles Street** intersection will operate at LOS B during the a.m. peak hour and LOS C during the p.m. peak hour. The Charles Street northbound approach continues to operate at LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Charles Street northbound approach during both the a.m. and the p.m. peak hours.
- ◆ The **Stuart Street/Kneeland Street/Washington Street** intersection will operate at LOS D during the a.m. and p.m. peak hour. The Stuart Street eastbound left-turn movement continues to operate at LOS E during the a.m. peak hour. The longest queues at the intersection occur at the Kneeland Street westbound left-turn/through movement during the a.m. peak hour and the Stuart Street eastbound through/right-turn movement during the p.m. peak hour.
- ◆ At the **Stuart Street/Motor Mart Garage Driveway** unsignalized intersection, the Motor Mart Driveway southbound approach deteriorates from LOS D to LOS E during the p.m. peak hour. The longest queues occur at this approach during both the a.m. and p.m. peak hour.

2.5.3 Build (2025) Condition Traffic Capacity Analysis

As shown under the Build (2025) Condition of Table 2-6 and Table 2-7, all study area intersections and approaches continue to operate at the same overall LOS during the a.m. and p.m. peak hours as in the No-Build (2025) Condition.

While these results show that the Project will not have any impact to the adjacent roadway system, the Proponent is committed to implementing comprehensive travel demand management strategies to minimize dependence on automobile travel, as outlined in the next section.

2.5.4 Church Street Modifications

The Project proposes tabling Church Street between Stuart Street and Columbus Avenue to be flush with the adjacent sidewalks and Statler Park. The Project proposes widening sidewalks along Church Street by removing the existing metered street parking. Church Street will remain open to vehicular traffic and will remain one-way northbound.

A drop-off/pick-up zone for two cars will be incorporated along Church Street, in front of the doorway to the residential lobby. These proposed changes will be reviewed by the City as part of the Project's Transportation Access Plan Agreement.

Table 2-6 Capacity Analysis Summary, a.m. Peak

Intersection/Approach	Existing (2018) Condition					No-Build (2025) Condition					Build (2025) Condition				
	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)
Signalized Intersections															
Stuart Street / Arlington Street / Columbus Avenue	E	63.3	-	-	-	E	66.4	-	-	-	E	68.0	-	-	-
Stuart St EB thru thru	E	66.0	0.92	178	#248	E	70.9	0.95	190	#269	E	71.8	0.96	193	#273
Stuart St EB hard right/right	C	28.1	0.65	52	121	C	34.5	0.73	72	149	C	34.4	0.72	72	149
Columbus Ave NEB bear right bear right/right	E	59.4	0.69	75	113	E	60.0	0.70	78	118	E	60.6	0.72	81	122
Columbus Ave SWB left/thru thru	D	48.7	0.41	48	65	D	49.2	0.45	53	71	D	48.9	0.45	54	72
Arlington St SB left	E	77.2	0.73	280	#416	F	82.7	0.77	290	#437	F	89.3	0.81	301	#459
Arlington St SB thru thru	E	67.9	0.69	269	335	E	70.2	0.73	282	348	E	70.7	0.74	282	348
Arlington St SB right	E	61.8	0.40	130	206	E	64.3	0.50	160	243	E	64.7	0.51	160	243
Stuart Street / Charles Street	B	18.2	-	-	-	B	18.8	-	-	-	B	18.7	-	-	-
Stuart St EB left	A	2.1	0.28	0	34	A	2.1	0.29	0	35	A	2.1	0.30	0	36
Stuart St EB thru thru	B	11.7	0.23	65	92	B	11.8	0.25	71	98	B	11.8	0.25	72	101
Stuart St WB right right	A	0.7	0.40	0	0	A	0.8	0.42	0	0	A	0.8	0.43	0	0
Charles Street NB thru thru thru/right	D	52.0	0.84	115	#177	D	54.8	0.87	122	#187	D	54.9	0.87	122	#187
Boylston Street / Charles Street	B	17.6	-	-	-	B	17.7	-	-	-	B	17.8	-	-	-
Boylston St EB left left	A	3.2	0.34	0	32	A	3.2	0.35	0	33	A	3.2	0.35	0	33
Boylston St EB thru thru	C	27.3	0.43	108	153	C	27.5	0.45	114	160	C	27.5	0.45	114	160
Boylston St WB right	A	0.7	0.24	0	0	A	0.7	0.25	0	0	A	0.7	0.25	0	0
Charles St NB thru thru thru/right	C	24.4	0.48	123	161	C	24.7	0.50	129	168	C	24.8	0.51	131	170
Boylston Street/Arlington Street	C	21.9	-	-	-	C	22.5	-	-	-	C	22.6	-	-	-
Boylston St EB thru thru thru thru/right	C	27.8	0.33	78	105	C	28.1	0.35	84	111	C	28.1	0.35	84	111
Arlington St SB hard left	A	3.8	0.47	0	66	A	3.9	0.49	0	68	A	3.9	0.49	0	68
Arlington St SB hard left/thru thru thru	C	25.2	0.63	263	315	C	26.1	0.43	286	341	C	26.2	0.43	290	346

Table 2-6 Capacity Analysis Summary, a.m. Peak (Continued)

Intersection/Approach	Existing (2018) Condition					No-Build (2025) Condition					Build (2025) Condition				
	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)
Arlington Street / Park Plaza / St. James Avenue	B	12.8	-	-	-	B	13.1	-	-	-	B	13.1	-	-	-
St. James Ave EB right	A	0.3	0.10	0	0	A	0.3	0.10	0	0	A	0.3	0.10	0	0
Park Plaza WB left	A	6.7	0.21	0	40	A	6.7	0.21	0	41	A	6.7	0.21	0	41
Park Plaza WB left/thru thru	C	27.7	0.38	100	140	C	28.1	0.40	105	146	C	28.2	0.40	106	146
Arlington St SB thru thru thru/right	A	9.4	0.62	45	52	A	9.8	0.66	48	55	A	9.8	0.66	48	55
Stuart Street / Tremont Street	C	23.9	-	-	-	C	25.0	-	-	-	C	25.1	-	-	-
Stuart Street EB thru thru	C	32.3	0.40	107	163	D	36.5	0.56	128	192	D	36.8	0.57	131	195
Stuart Street EB right	A	6.1	0.28	0	51	A	6.1	0.29	0	51	A	6.1	0.29	0	51
Stuart Street WB left	B	12.6	0.27	73	135	B	12.9	0.29	76	140	B	12.8	0.29	76	140
Stuart Street WB thru thru	B	13.3	0.28	146	213	B	13.6	0.30	157	226	B	13.6	0.30	158	228
Tremont Street SB left	D	46.7	0.36	46	86	D	46.5	0.36	47	88	D	46.5	0.36	47	88
Tremont Street SB thru thru	D	48.8	0.59	101	137	D	48.7	0.60	104	141	D	48.7	0.60	104	141
Tremont Street SB right	B	11.3	0.47	0	55	B	11.1	0.47	0	55	B	11.1	0.47	0	55
Stuart Street / Kneeland Street / Washington Street	D	35.6	-	-	-	D	38.3	-	-	-	D	38.5	-	-	-
Stuart Street EB left	E	58.8	0.45	44	99	E	58.2	0.48	45	m96	E	58.0	0.48	45	m94
Stuart Street EB thru thru/right	D	51.7	0.52	120	162	D	50.7	0.56	130	174	D	51.1	0.57	132	177
Kneeland Street WB left/thru thru	C	32.3	0.75	213	291	D	35.9	0.81	233	320	D	36.2	0.82	235	323
Kneeland Street WB right	A	3.8	0.18	0	35	A	3.7	0.19	0	36	A	3.7	0.19	0	36
Washington Street NB left/thru thru/right	D	38.6	0.56	91	138	D	39.4	0.58	95	144	D	39.4	0.58	95	144
Unsignalized Intersections															
Park Plaza / Columbus Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Park Plaza WB left/thru	A	3.1	0.10	-	9	A	3.2	0.11	-	10	A	3.2	0.11	-	10
Columbus Ave NB left	C	18.0	0.22	-	20	C	19.3	0.24	-	23	C	19.7	0.25	-	25

Table 2-6 Capacity Analysis Summary, a.m. Peak (Continued)

Intersection/Approach	Existing (2018) Condition					No-Build (2025) Condition					Build (2025) Condition				
	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)
Columbus Avenue / Eliot Street / Motor Mart Garage Driveway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eliot St WB left/bear left/right	B	10.5	0.17	-	15	B	10.6	0.17	-	15	B	10.7	0.17	-	16
Motor Mart Driveway NB hard left/thru/right	A	0.0	0.00	-	0	A	0.0	0.00	-	0	A	2.1	0.00	-	0
Columbus Ave SB left/thru/right	A	0.2	0.00	-	0	A	0.2	0.00	-	0	A	0.2	0.00	-	0
Church Street / Columbus Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Columbus Avenue WB thru thru	A	0.0	0.05	-	0	A	0.0	0.05	-	0	A	0.0	0.06	-	0
Church Street NB left	A	9.3	0.03	-	3	A	9.3	0.03	-	3	A	9.3	0.03	-	3
Stuart Street / Motor Mart Garage Driveway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stuart Street EB left/thru thru	A	3.7	0.11	-	9	A	3.9	0.12	-	10	A	4.3	0.14	-	12
Motor Mart Driveway SB left	C	21.5	0.11	-	9	C	23.0	0.13	-	11	D	27.0	0.22	-	20

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

- 95th percentile queues do not clear after two cycles. Queue shown is the maximum after two cycles.

Grey shading indicates LOS E or F under the Existing Condition, or deterioration into LOS E or F from the previous condition.

Table 2-7 Capacity Analysis Summary, p.m. Peak

Intersection/Approach	Existing (2018) Condition					No-Build (2025) Condition					Build (2025) Condition				
	LOS	Delay (sec.)	V/C Ratio	50th Queue (ft)	95th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50th Queue (ft)	95th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50th Queue (ft)	95th Queue (ft)
Signalized Intersections															
Stuart Street / Arlington Street / Columbus Avenue	E	55.6	-	-	-	E	69.6	-	-	-	E	69.7	-	-	-
Stuart St EB thru thru	D	53.4	0.82	176	236	D	49.9	0.79	191	255	D	50.0	0.79	191	256
Stuart St EB hard right/right	D	38.7	0.77	71	#184	E	73.7	0.97	139	#319	E	73.7	0.97	139	#319
Columbus Ave NEB bear right bear right/right	E	75.2	0.86	97	#162	F	88.5	0.93	103	#174	F	89.2	0.93	103	#175
Columbus Ave SWB left/thru thru	D	50.6	0.47	60	96	D	52.3	0.53	64	102	D	52.7	0.54	66	104
Arlington St SB left	E	58.5	0.65	266	365	E	70.2	0.72	281	381	E	70.2	0.72	281	381
Arlington St SB thru thru	E	56.5	0.70	299	366	F	83.2	0.79	325	393	F	83.2	0.79	325	393
Arlington St SB right	D	53.0	0.58	209	239	E	57.7	0.67	231	325	E	57.7	0.67	231	325
Stuart Street / Charles Street	B	20.0	-	-	-	C	20.8	-	-	-	C	20.7	-	-	-
Stuart St EB left	A	2.0	0.30	0	36	A	2.1	0.32	0	37	A	2.1	0.33	0	38
Stuart St EB thru thru	B	12.7	0.35	108	145	B	12.9	0.37	116	155	B	13.0	0.37	118	157
Stuart St WB right right	A	0.7	0.40	0	0	A	0.8	0.43	0	0	A	0.8	0.43	0	0
Charles Street NB thru thru thru/right	E	59.2	0.91	129	#198	E	63.0	0.93	135	#209	E	63.0	0.93	135	#209
Boylston Street / Charles Street	B	19.7	-	-	-	B	19.9	-	-	-	B	20.0	-	-	-
Boylston St EB left left	A	6.9	0.46	64	105	A	6.6	0.47	72	112	A	6.6	0.47	72	112
Boylston St EB thru thru	D	35.2	0.66	209	273	D	35.0	0.67	221	288	D	35.1	0.67	222	288
Boylston St WB right	A	1.3	0.34	0	0	A	1.3	0.34	0	0	A	1.4	0.34	0	0
Charles St NB thru thru thru/right	C	22.2	0.49	186	228	C	23.1	0.52	202	239	C	232	0.52	205	243
Boylston Street/Arlington Street	C	26.2	-	-	-	C	27.5	-	-	-	C	27.5	-	-	-
Boylston St EB thru thru thru thru/right	C	27.3	0.47	145	177	C	27.9	0.52	165	201	C	27.9	0.52	165	201
Arlington St SB hard left	A	5.6	0.53	12	96	A	6.9	0.56	29	126	A	6.9	0.56	29	126
Arlington St SB hard left/thru thru thru	C	32.1	0.75	313	374	C	33.9	0.78	335	399	C	33.9	0.78	335	399

Table 2-7 Capacity Analysis Summary, p.m. Peak (Continued)

Intersection/Approach	Existing (2018) Condition					No-Build (2025) Condition					Build (2025) Condition				
	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)
Arlington Street / Park Plaza / St. James Avenue	B	15.6	-	-	-	B	18.1	-	-	-	B	18.1	-	-	-
St. James Ave EB right	A	0.4	0.11	0	0	A	0.4	0.11	0	0	A	0.4	0.11	0	0
Park Plaza WB left	A	6.6	0.27	0	46	A	7.0	0.27	0	47	A	7.0	0.28	0	47
Park Plaza WB left/thru thru	C	31.2	0.46	125	167	C	33.2	0.48	131	173	C	33.2	0.48	131	173
Arlington St SB thru thru thru/right	B	12.4	0.65	67	76	B	15.5	0.71	84	106	B	15.5	0.71	84	106
Stuart Street / Tremont Street	C	29.9	-	-	-	C	33.6	-	-	-	C	33.9	-	-	-
Stuart Street EB thru thru	C	34.8	0.51	144	202	D	47.9	0.81	187	#292	D	48.8	0.82	192	#299
Stuart Street EB right	A	6.4	0.23	0	47	A	6.4	0.25	0	48	A	6.4	0.25	0	48
Stuart Street WB left	C	20.6	0.26	42	85	C	21.3	0.29	44	87	C	21.3	0.29	44	87
Stuart Street WB thru thru	B	19.6	0.25	87	136	B	20.0	0.26	94	145	B	20.0	0.26	94	145
Tremont Street SB left	D	49.3	0.64	134	197	D	49.6	0.65	139	204	D	49.6	0.65	139	204
Tremont Street SB thru thru	D	43.5	0.58	132	167	D	43.5	0.59	136	173	D	43.5	0.59	136	173
Tremont Street SB right	A	8.3	0.38	0	50	A	8.2	0.38	0	51	A	8.2	0.38	0	51
Stuart Street / Kneeland Street / Washington Street	C	34.3	-	-	-	D	35.8	-	-	-	D	36.0	-	-	-
Stuart Street EB left	D	41.5	0.37	48	97	D	42.4	0.39	50	100	D	42.4	0.39	50	100
Stuart Street EB thru thru/right	D	42.3	0.67	199	262	D	44.0	0.72	219	285	D	44.4	0.73	223	290
Kneeland Street WB left/thru thru	C	26.3	0.60	145	205	C	28.0	0.93dl	159	225	C	28.1	0.97dl	160	225
Kneeland Street WB right	A	3.7	0.13	0	30	A	3.7	0.14	0	31	A	3.7	0.14	0	31
Washington Street NB left/thru thru/right	D	42.0	0.55	89	135	D	42.7	0.57	93	141	D	42.7	0.57	93	141
Unsignalized Intersections															
Park Plaza / Columbus Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Park Plaza WB left/thru	A	3.1	0.12	-	10	A	3.2	0.13	-	11	A	3.2	0.13	-	11
Columbus Ave NB left	C	22.5	0.29	-	30	C	24.6	0.32	-	34	C	24.9	0.34	-	36

Table 2-7 Capacity Analysis Summary, p.m. Peak (Continued)

Intersection/Approach	Existing (2018) Condition					No-Build (2025) Condition					Build (2025) Condition				
	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)	LOS	Delay (sec.)	V/C Ratio	50 th Queue (ft)	95 th Queue (ft)
Columbus Avenue / Eliot Street / Motor Mart Garage Driveway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eliot St WB left/bear left/right	B	10.1	0.16	-	14	B	10.2	0.17	-	15	B	10.3	0.17	-	15
Motor Mart Driveway NB hard left/thru/right	A	0.0	0.00	-	0	A	0.0	0.00	-	0	A	1.0	0.00	-	0
Columbus Ave SB left/thru/right	A	0.0	0.00	-	0	A	0.0	0.11	-	0	A	0.0	0.00	-	0
Church Street / Columbus Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Columbus Avenue WB thru thru	A	0.0	0.07	-	0	A	0.0	0.07	-	0	A	0.0	0.07	-	0
Church Street NB left	A	9.4	0.05	-	4	A	9.5	0.05	-	4	A	9.5	0.05	-	4
Stuart Street / Motor Mart Garage Driveway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stuart Street EB left/thru thru	A	1.1	0.03	-	3	A	1.8	0.05	-	4	A	1.8	0.06	-	5
Motor Mart Driveway SB left	D	29.1	0.51	-	69	E	35.6	0.59	-	85	E	42.4	0.67	-	110

dl – Defacto Left Lane. Shared left-turn/through lane mainly utilized as a left-turn lane.

- 95th percentile queues do not clear after two cycles. Queue shown is the maximum after two cycles.

Grey shading indicates LOS E or F under the Existing Condition, or deterioration into LOS E or F from the previous condition.

2.6 Transit Impact Analysis

The Project is well served by transit with nearby connections to the MBTA Orange and Green Lines. The transit analysis was performed using existing 2016 railflow data provided by the MBTA which provides passenger entrances and estimates of exits at each station broken down into 15-minute intervals. The data is broken down in each direction by the maximum hourly rail load leaving the Site and going to the Site for the a.m. and p.m. peak periods between 7:00-9:00 a.m. and 4:00-6:00 p.m.

To establish the capacity of each of these routes, headways posted by the MBTA were used to determine the number of trains per hour and the MBTA's Service Delivery Policy was referenced to establish the train car capacity. Based on these, the Orange Line runs at six-minute peak hour headways (ten trains per hour) with a train car capacity of 846 passengers, resulting in an 8,460-passenger maximum hourly capacity. The Green Line operates along four different routes, but since the study area is within the service area of all four routes, there are approximately 38 trains during the peak hour with a capacity of 200 passengers, resulting in a 7,600-passenger maximum hourly capacity.

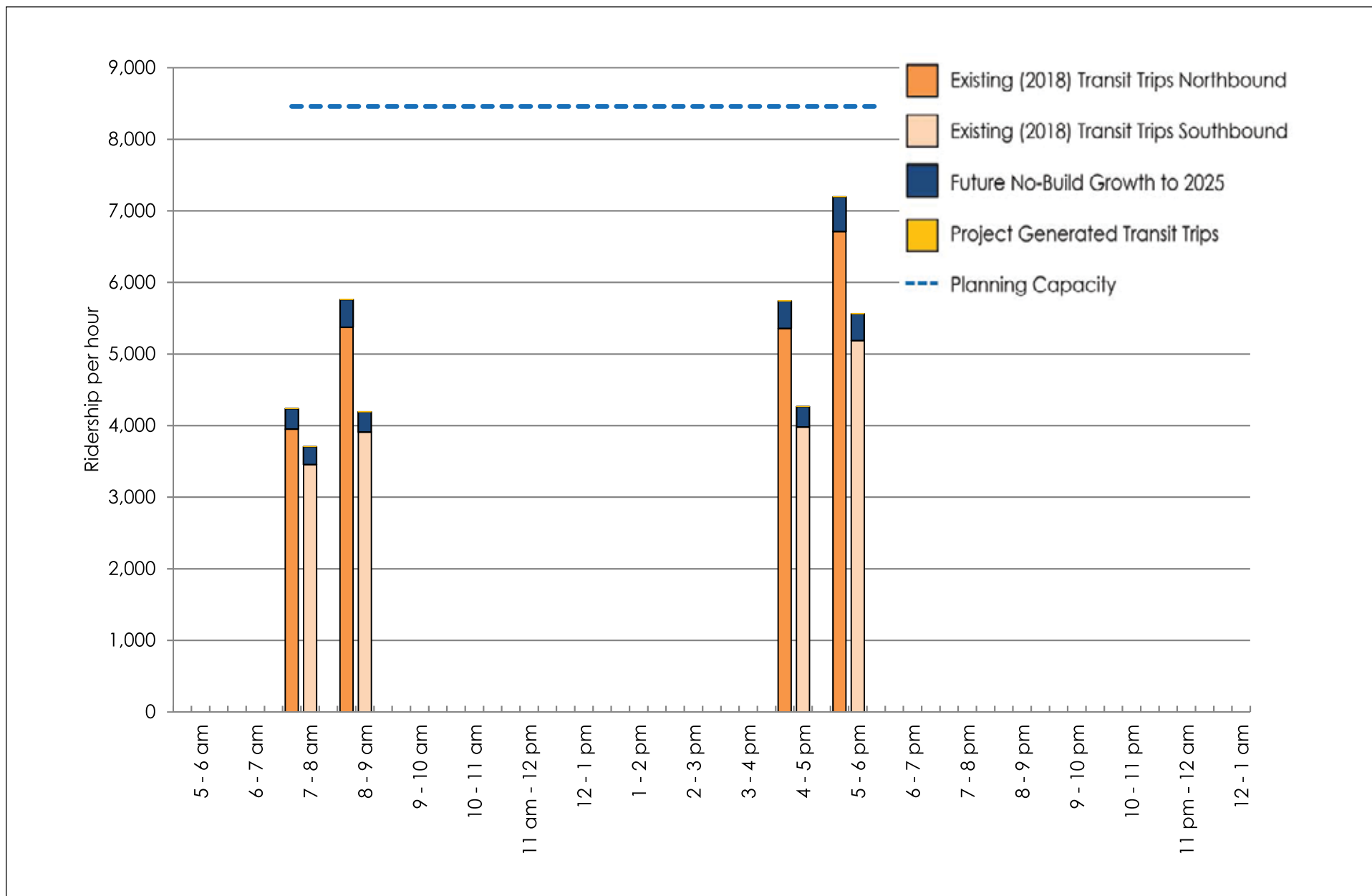
To account for future growth of ridership along these routes, growth rates published by the Central Transportation Planning Staff (CTPS) in the 2040 Long Range Transportation Plan (LRTP) were used. These rates approximate to one percent growth of rail transit ridership per year and were applied for two years from 2016 to 2018 to establish the Existing Condition ridership and then applied for seven years to establish the No-Build Condition ridership.

The commercial use program changes associated with the Project include a decrease in restaurant/retail uses and the addition of a grocery store/market use. Because the net change in transit trips generated by commercial uses is negligible between existing and future conditions, only the increase in transit trips associated with the residential use was adopted for the transit analysis, resulting in a conservative (higher impact) evaluation.

To assess the impact on the public transportation network, the Project-generated trips associated with the residential space were added to the No-Build Condition ridership to establish the Build (2025) Condition ridership. The trips were added proportionally based on existing ridership to each of the transit lines. Figures 2-14 through 2-17 present the transit ridership graphically. As shown, the Project will have a minimal impact on transit capacities.

2.7 Columbus Avenue Circulation

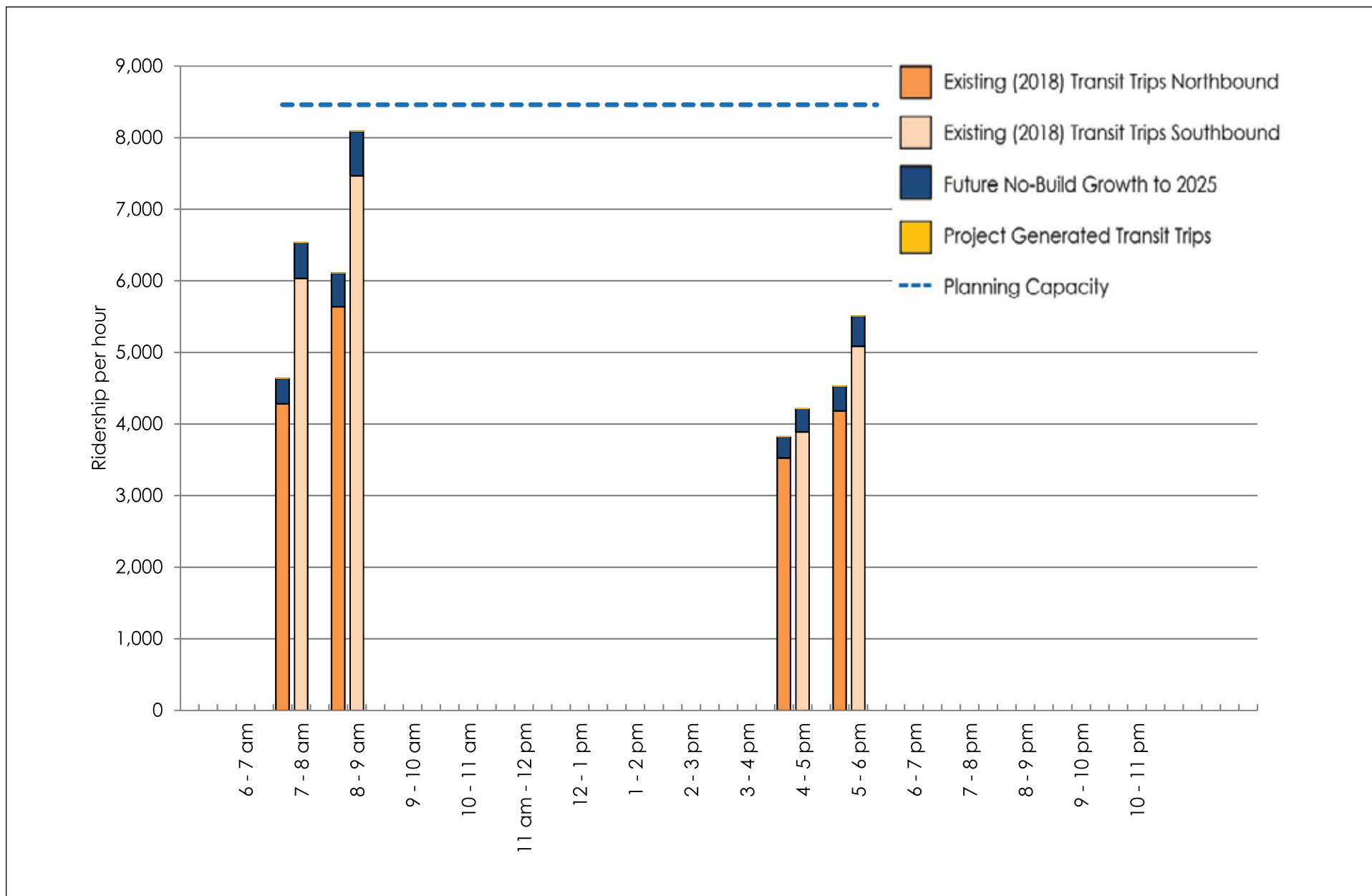
The Project team completed observations of vehicle circulation and curbside activity along Columbus Avenue between Arlington Street and Eliot Street, Church Street, and Eliot Street. Observations were completed on Thursday, February 14, 2019. Figure 2-18 and Figure 2-19 show the curbside regulations and key observations during the a.m. peak period and p.m. peak period, respectively. Table 2-8 presents additional observation details.



Motor Mart Garage Boston, Massachusetts

Figure 2-14

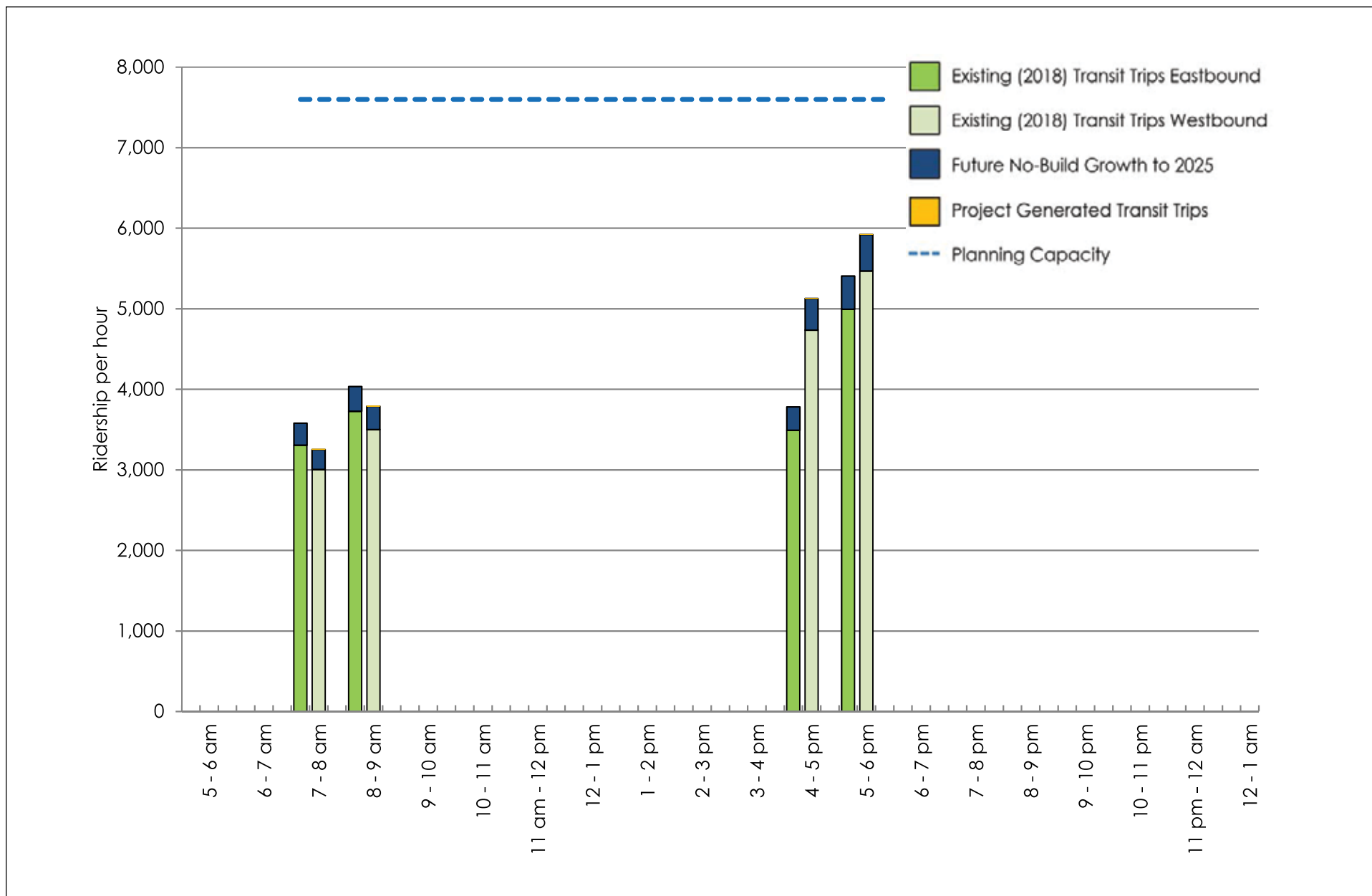
Orange Line from Site - Build (2025) Condition, Hourly Ridership, Weekday



Motor Mart Garage Boston, Massachusetts

Figure 2-15

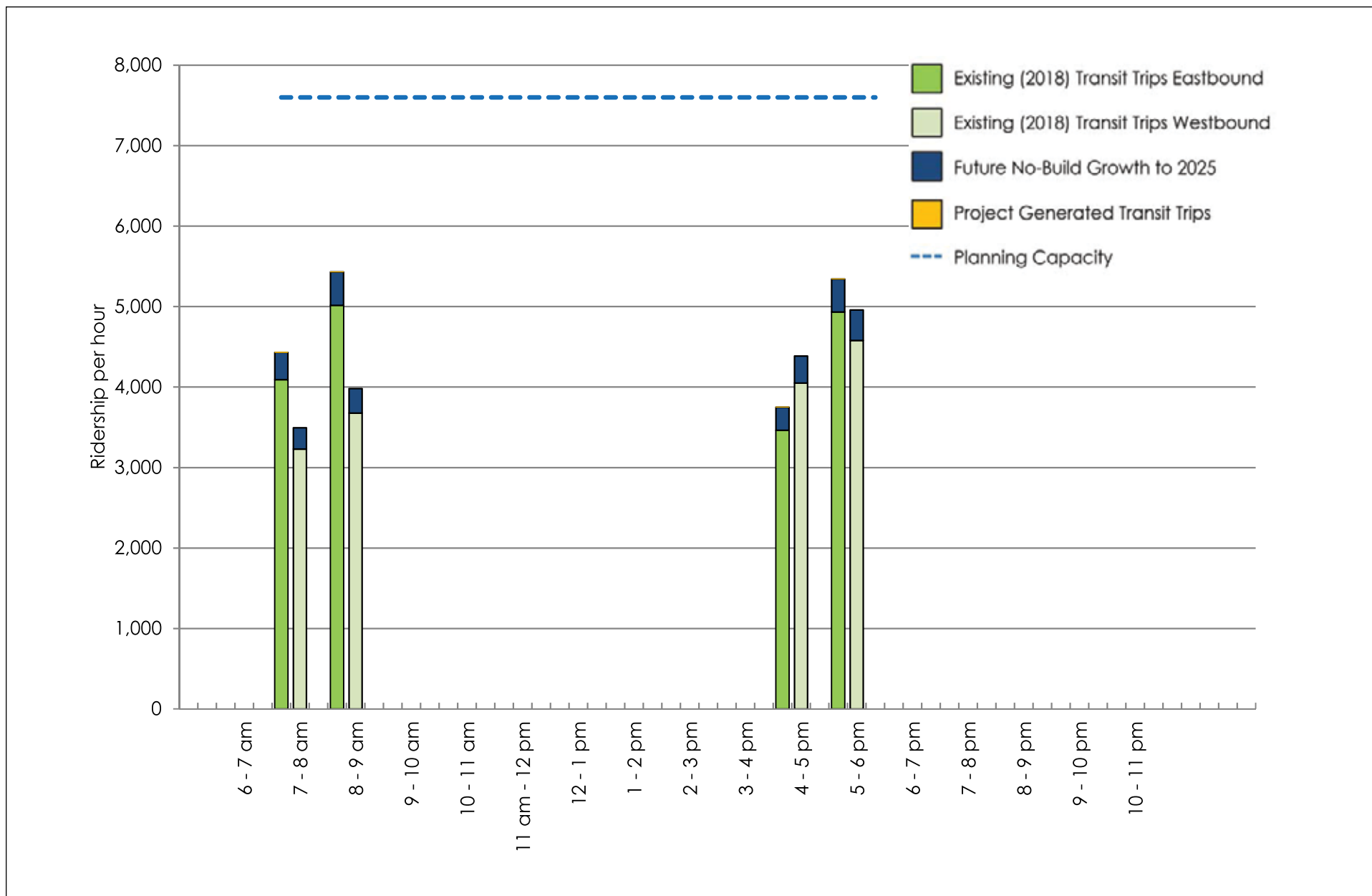
Orange Line to Site - Build (2025) Condition, Hourly Ridership, Weekday



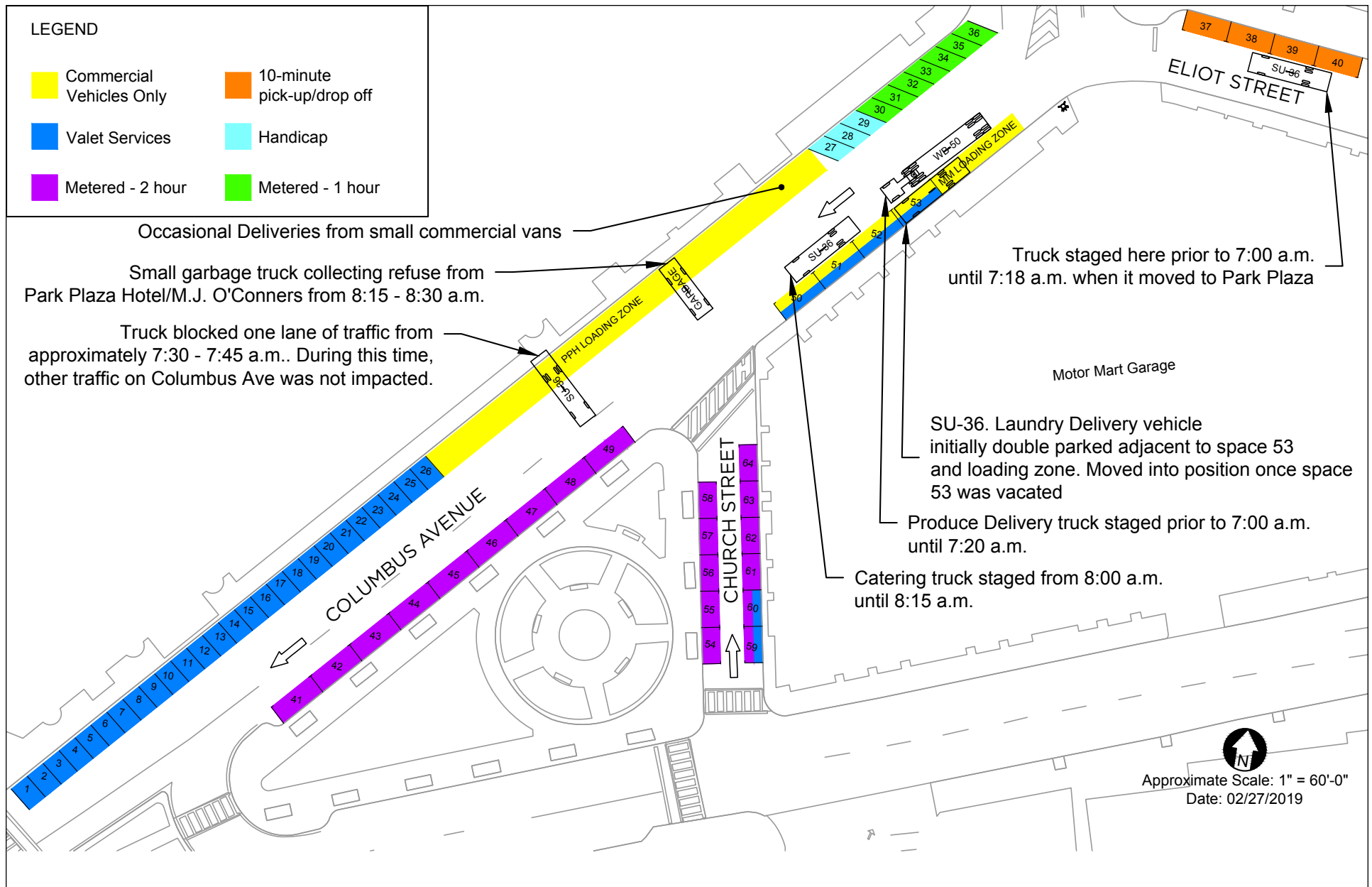
Motor Mart Garage Boston, Massachusetts

Figure 2-16

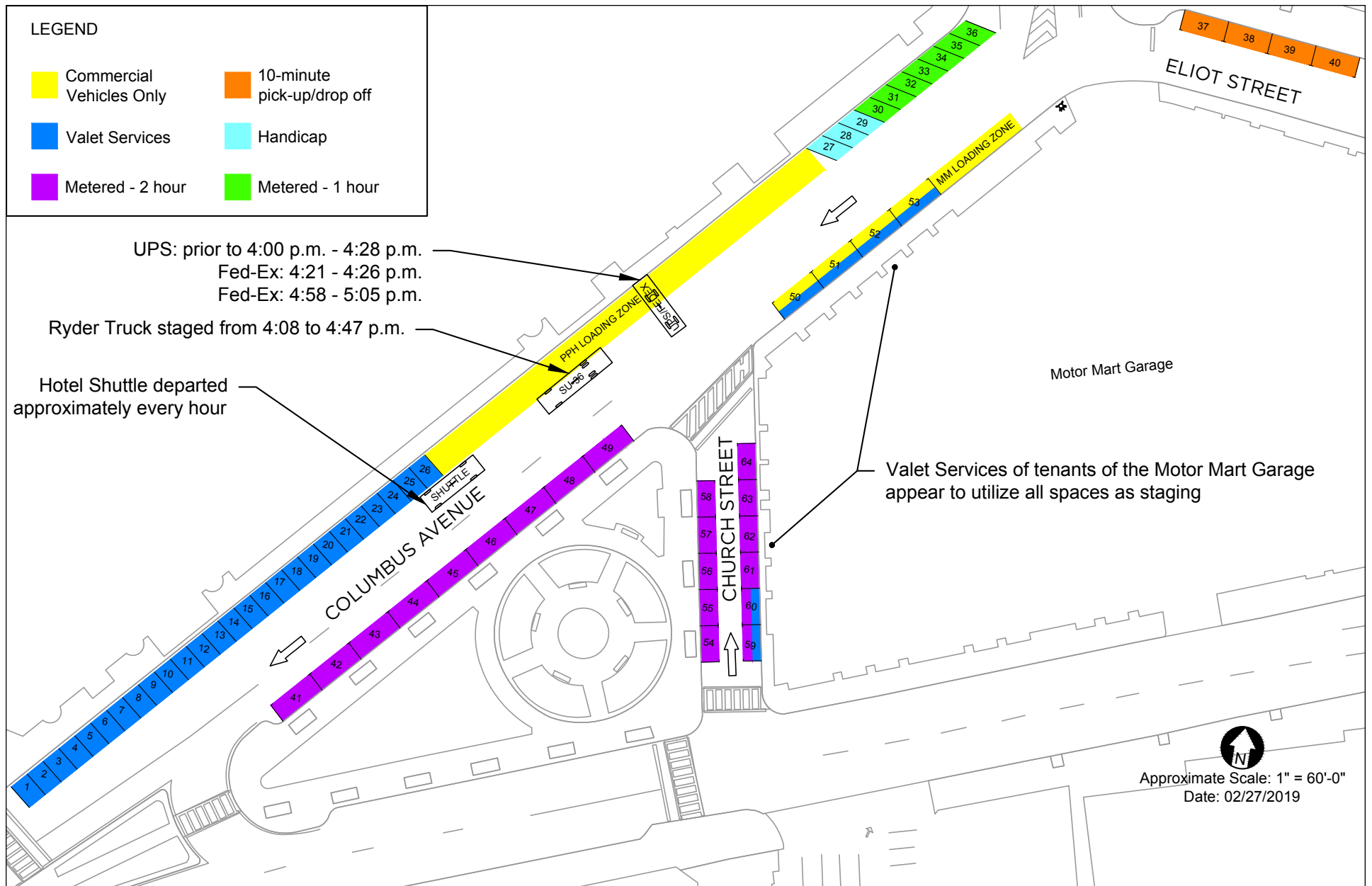
Green Line from Site - Build (2025) Condition, Hourly Ridership, Weekday



Motor Mart Garage Boston, Massachusetts



Motor Mart Garage Boston, Massachusetts



Motor Mart Garage Boston, Massachusetts

Table 2-8 Vehicle Circulation and Curbside Activity Observations

Spaces ¹	Curbside Regulation	Morning peak period 7:00 a.m. – 9:00 a.m.	Afternoon peak period 4:00 p.m.– 6:00 p.m.
1-26	Valet	<ul style="list-style-type: none"> ♦ ~40% occupied ♦ vehicles appear staged for guests to depart ♦ low turnover 	<ul style="list-style-type: none"> ♦ ~75% occupied ♦ high turnover ♦ Several occupied spaces blocked by hotel shuttle for approximately 30 minutes
27-30	Handicap/ Accessible	<ul style="list-style-type: none"> ♦ ~30% occupied ♦ all vehicles handicap certified ♦ low turnover 	<ul style="list-style-type: none"> ♦ ~60% occupied ♦ all vehicles handicap certified ♦ low turnover
30-36	Metered 1 hour	<ul style="list-style-type: none"> ♦ ~90% occupied ♦ most vehicles remained for more than 1 hour ♦ low turnover 	<ul style="list-style-type: none"> ♦ ~90% occupied ♦ most vehicles remain from morning peak period ♦ low turnover
37-40	10 min pick-up/drop-off	<ul style="list-style-type: none"> ♦ Initially blocked by SU-36 staged for loading on Park Plaza from prior to 7:00 a.m. to 7:18 a.m. ♦ Rarely occupied otherwise 	<ul style="list-style-type: none"> ♦ rarely occupied
41-49	Metered 2 hour	<ul style="list-style-type: none"> ♦ ~40% occupied from 7 – 8 a.m. ♦ ~80% occupied from 8 – 9 a.m. ♦ most vehicles remained for more than 2 hours ♦ low turnover 	<ul style="list-style-type: none"> ♦ ~70% occupied ♦ most vehicles remain for more than 2 hours ♦ low turnover
50-53	Commercial Only 7 a.m. – 5 p.m.	<ul style="list-style-type: none"> - ~60% occupied ♦ 1 contractor pick-up truck, mostly non-commercial vehicles ♦ low turnover 	<ul style="list-style-type: none"> ♦ ~30% occupied from 4 – 5 p.m.
	Valet 5 p.m. – 1 a.m.	<ul style="list-style-type: none"> ♦ valet service during p.m. peak period 	<ul style="list-style-type: none"> ♦ ~100% occupied from 5 – 6 p.m. ♦ high turnover
54-64	Metered – 2 hour	<ul style="list-style-type: none"> ♦ ~90% occupied ♦ most vehicles remained for more than 2 hours ♦ low turnover 	<ul style="list-style-type: none"> ♦ ~100% occupied ♦ most vehicles appear to be Valet ♦ high turnover
59-60	Valet 5 p.m. – 1 a.m.	<ul style="list-style-type: none"> ♦ valet service during p.m. peak period 	<ul style="list-style-type: none"> ♦ ~100% occupied ♦ high turnover
Park Plaza Hotel Loading Area	Commercial Vehicles only	<ul style="list-style-type: none"> ♦ high turnover ♦ occasionally used by non-commercial vehicles for approximately 30 minutes 	<ul style="list-style-type: none"> ♦ high turnover ♦ mostly package delivery vehicles (Fed-Ex, UPS, USPS) ♦ used by non-commercial vehicles that appear to belong to employees of Park Plaza Hotel
Motor Mart Garage Loading Area	Commercial Vehicles only	<ul style="list-style-type: none"> ♦ Heavily utilized ♦ low turnover 	<ul style="list-style-type: none"> ♦ not utilized for loading ♦ utilized by valet

¹ keyed to Figure 2-18 and Figure 2-19.

While the curbside regulations were generally followed by drivers, a few trucks were observed to be double-parked along the east side of Columbus Avenue during the morning peak period, adjacent to the commercial loading zone. At the Park Plaza Hotel curbside loading zone, on the west side of Columbus Avenue, a couple of trucks were observed parked perpendicular to the curb to more easily access the hotel loading bay doors. Although the travel way was narrowed with perpendicular loading, at no time was traffic flow along Columbus Avenue impeded.

Figure 2-20 shows the a.m. and p.m. peak period truck counts on Columbus Avenue as observed during the turning movement count data collection. Of the nine trucks arriving on Columbus Avenue during the a.m. period, about half arrive from Eliot Street and about half arrive from Park Plaza. During the p.m. peak period, five trucks arrived on Columbus Avenue, all from Park Plaza. No trucks were observed on Church Street during either peak period.

These observations and counts will help inform the on-going development of a conceptual bicycle facility along Columbus Avenue, as described in the next section, which will also aim to better delineate areas for all appropriate curbside uses.

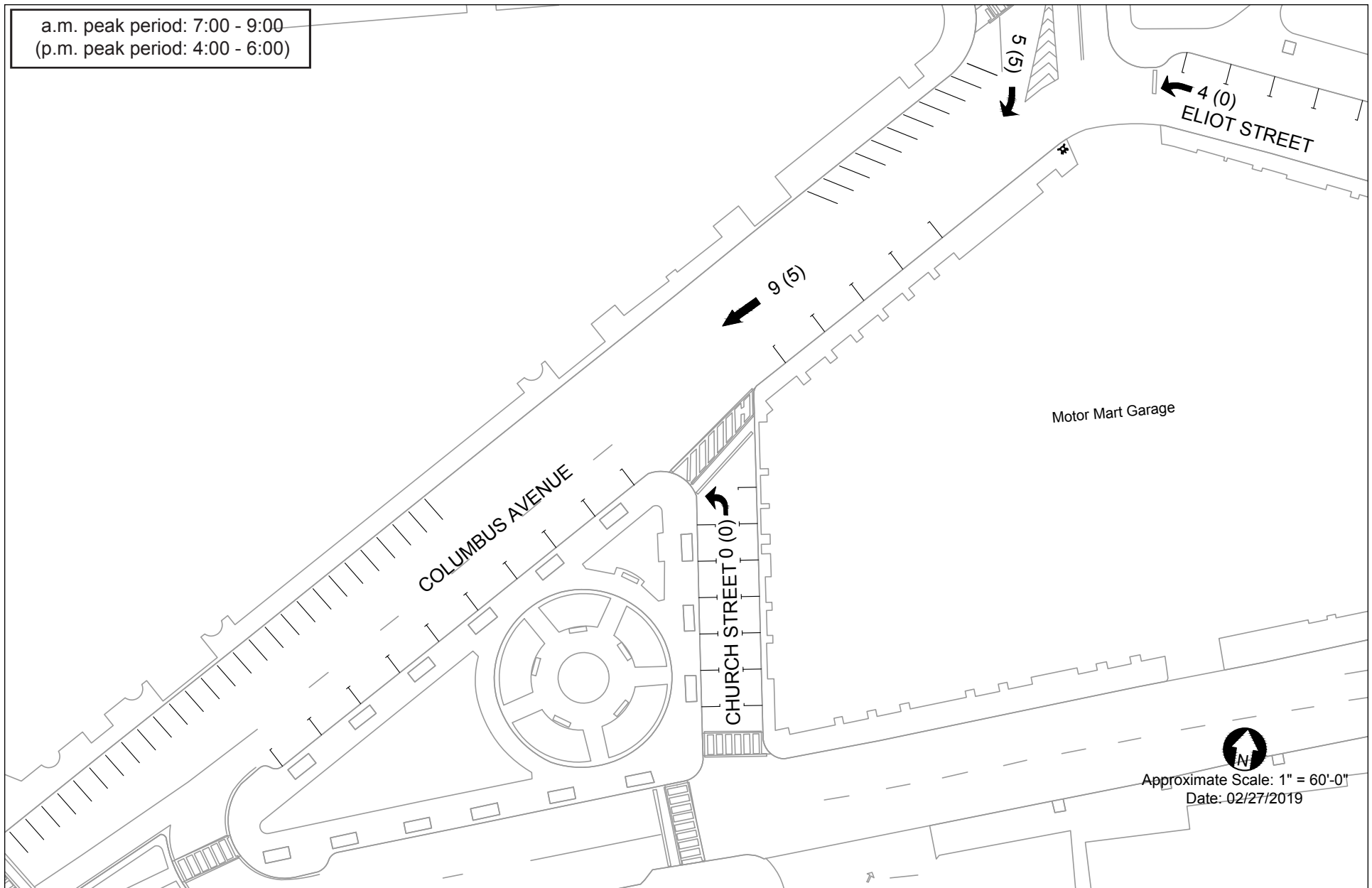
2.8 Columbus Avenue - Conceptual Bicycle Accommodation

In March 2017, the BTM published “GoBoston 2030”, the City’s long-term mobility plan. Among the many recommended projects to improve crosstown connections for all travel modes, the BTM presented a sketch plan for a fully-protected bike lane between the Southwest Corridor and Massachusetts General Hospital (MGH). While the Southwest Corridor currently connects sections of adjoining neighborhoods in Jamaica Plain, Mission Hill, and Roxbury to the Back Bay, it lacks a continuous connection further into the downtown core. In the City’s sketch plan, the proposed alignment of the bicycle connection is along Columbus Avenue to Charles Street.

At the request of the BTM, the Project team is coordinating with BTM staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site, generally between Arlington Street and Park Plaza. The team continues to work on developing a concept plan that will not only accommodate bicycle activity but will provide better delineation for all appropriate curbside uses and potentially improve safety for bicycles and pedestrians at the Stuart Street/Arlington Street/Columbus Avenue intersection.

2.9 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management measures to reduce dependence on autos. TDM will be facilitated by the Project’s proximity to available transit services, including the Green Line (at Arlington and Boylston stations) and Orange Line (Tufts Medical Center), and local MBTA bus routes.



Motor Mart Garage Boston, Massachusetts

Because the Project is primarily residential, its trip generation is already lower than that of an office or retail use project. TDM will be facilitated by the nature and location of the proposed Project. The Project Site's proximity to workplaces, shopping, and transit will help reduce auto use by residents and visitors alike. The Proponent is committed to implementing a TDM program that supports the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak time periods, through the following TDM commitments listed below:

- ◆ Limited Parking: The Project will have approximately 144 parking spaces for residents. With approximately 306 residential units, the resulting parking ratio is anticipated to be approximately 0.48 spaces per unit.
- ◆ Public Transportation:
 - Include language in new commercial tenant leases to encourage tenants to promote public transportation and consider subsidizing employee use of public transit.
 - Provide orientation packets to new residents containing material on available transportation choices, including routes and schedules for MBTA public transit services and nearby bicycle facilities. The Proponent will also consider installing electronic displays in the residential lobby to show real-time transit data, live traffic updates, and service alerts.
 - Provide information on The Ride and the City of Boston Senior Shuttle to ensure that residents of all abilities and ages are aware of transportation options.
- ◆ Bicycle Transportation:
 - Bicycle Spaces: Secure bicycle storage will be made available to tenants and visitors to encourage bicycling as an alternative mode of transportation. In accordance with BTG guidelines, the Proponent will provide one secure/covered bicycle parking spaces for each residential unit and one space for every 5,000 sf of retail, for retail employees. Bicycle racks, signs, and parking areas will conform to BTG standards and be sited in safe, secure locations.
 - Although the closest existing Blue Bikes bicycle-sharing station is only about 500 feet from the Project Site (on Stuart Street, east of Charles Street), the Proponent will explore the possibility of incorporating a new Blue Bikes station along Church Street, adjacent to Statler Park.
 - The Project team is coordinating with BTG staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site.

- ◆ Transportation Management Association (TMA): The Proponent will join the local TMA, A Better City (ABC).
- ◆ Transportation Coordinator: The Proponent will designate a transportation coordinator to manage loading and service activities and provide alternative transportation materials to residents and Project residents.
- ◆ Car Sharing: The existing Motor Mart garage has five Zipcar spaces and the nearby 200 Stuart Street Garage has eight spaces. As warranted by demand, the Proponent will consider adding more car share spaces.
- ◆ Electric Vehicle Charging: The existing Motor Mart garage does not have any charging stations and the Proponent is providing charging stations to accommodate five percent of the total parking and sufficient infrastructure capacity for future accommodation of at least 15% of the total parking spaces; and designate up to five percent of the parking spaces as preferred parking for low emission vehicles.
- ◆ A Transportation Access Plan Agreement will be entered into between the Proponent and BTM. The TAPA will codify the specific measures and agreements between the Proponent and the City of Boston.

Chapter 3.0

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW COMPONENT

3.1 Shadow

The Project PNF provided a shadow impact analysis to investigate shadow impacts from the Project during three time periods (9:00 a.m., 12:00 noon, and 3:00 p.m.) during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and winter solstice (December 21), as well as the 6:00 p.m. time period during the summer solstice and autumnal equinox. An additional shadow impact analysis was included to demonstrate compliance with both the Boston Common and Boston Public Garden Shadow Acts.

An additional shadow analysis providing fifteen-minute interval shadow studies beginning at 7:45 am and concluding at 10:15 am for March 21, June 21, September 21, October 21, and December 21 is provided in Appendix B.

3.2 Solar Glare

RWDI was retained to investigate the impact that solar reflections emanating from the proposed Project will have on the surrounding urban realm. As with any modern building, the Project naturally creates reflections within its surroundings, the majority of which are minor in nature and are considered typical of any new construction. A preliminary set of simulations was conducted to determine peak reflection intensities and the frequency of occurrence of reflections for a broad area around the Project. Based on the preliminary simulations, 25 receptor points were chosen to understand in detail how reflections from the building may impact drivers, pedestrians, and building facades.

The results of the solar glare analysis are summarized below, and the detailed results are included as Appendix C.

Thermal Impacts on Pedestrians, Drivers, and Facades

Thermal impact categories for people are described as low, moderate, high or very high. Low impact suggests either no significant reflections occur or the reflection intensity is below a specified short term exposure threshold, moderate impact suggests the reflection intensity is above the short term exposure threshold, but below the safety threshold, high impact suggests the reflection intensity is above the safety threshold and very high impact is further above the safety threshold.

No significant off-site thermal impacts are predicted. The vertical fins on the proposed Project are positive design features reducing the frequency and intensity of impacts on the adjacent streets, pedestrian and neighboring buildings.

Visual Glare Impacts for Drivers, Pedestrians, and Facades

Visual impact categories are described as low, moderate, high or damaging. Low impact suggests that either no significant reflections occur or the reflections will have a minimal effect on a viewer, even when looking directly at the source. Moderate impact suggests the reflections can cause some visual nuisance only to viewers looking directly at the source. High impact suggests the reflections can reduce visual acuity for viewers operating vehicles or performing other high-risk tasks who are unable to look away from the source, posing a significant risk of distraction.

Reflection impacts are generally predicted to be low to moderate for drivers in the area. Occasional high impact reflections are anticipated to occur along Stuart Street, however, these impacts are short in duration, and infrequent. Potential mitigation options are being explored.

Visual impacts on pedestrians and facades in the immediate vicinity of the Project site are anticipated to be moderate. These reflections would likely occur from any glazed building on the Motor Mart site, do not pose a safety risk, and represent a visual nuisance at worst, as viewers can easily look away.

The vertical fins on the façade assist in lowering the visual impact of the reflections from the Project.

The simulations did not predict any significant visual impact from the reflections on either Boston Common or the Public Garden.

3.3 Smart Utilities Technology

3.3.1 Green Infrastructure

The Proponent has reviewed the BPDA's document entitled "Smart Utilities Policy for Article 80 Development Review- 2018" and the document entitled "Smart Utility Standards" dated June 2017 to identify applicable opportunities to incorporate smart utilities into the Project.

The Project does not require or propose to reconstruct the existing public infrastructure abutting the Project area except for surface sidewalk improvements. Therefore, the existing rights-of-ways, utility main, and telecom/electrical distribution systems will remain as is.

The Project will comply with the Complete Streets design criteria to the fullest extent practical and will employ a combination of green infrastructure solutions, such as pervious sidewalk pavers, open planting beds, and street trees within the abutting public ways. Figure 3-1 presents the conceptual green infrastructure design.

The improvements under consideration include:

Columbus Avenue: The Project is considering the installation of pervious pavers, planting beds and new street trees. Currently, there are no pervious pavers, planting beds, or street trees in the 13- foot wide sidewalk on Columbus Avenue.

Elliot Street: The Project is considering the installation of pervious pavers and/or planting beds. Currently, there are no pervious pavers, planting beds, or street trees in the 9-foot wide sidewalk on Elliot Street.

Park Plaiice: The Project is considering the installation of pervious pavers and/or planting beds. Currently, there are no pervious pavers or planting beds in the 10-foot wide sidewalk on Elliot Street.

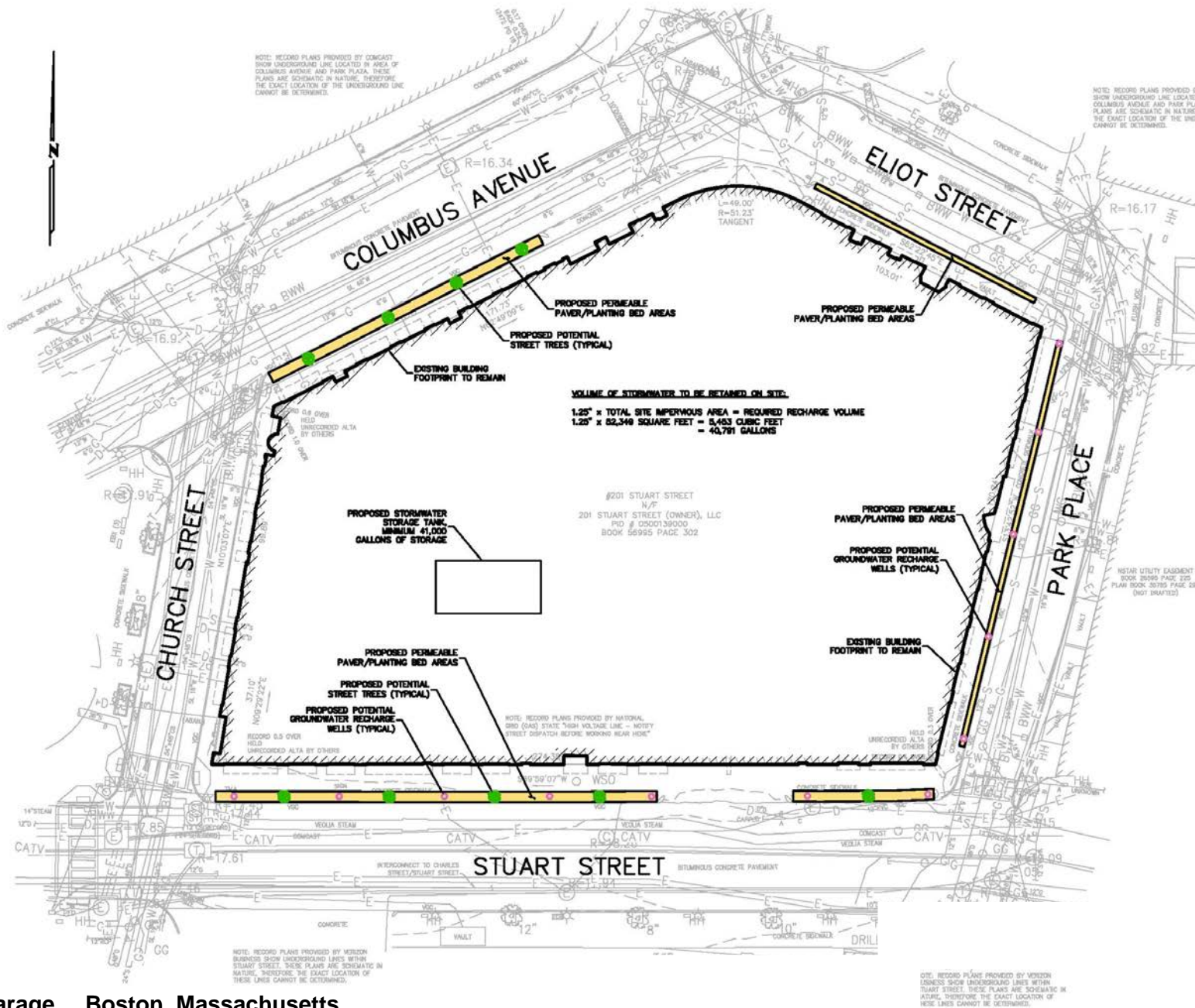
Stuart Street: The Project is considering the installation of pervious pavers, planting beds, and street trees. Currently, there are no pervious pavers or planting beds in the 14-foot wide sidewalk on Stuart Street.

Church Street: Currently, there are no pervious pavers, planting beds, or street trees in the 7-foot wide sidewalk. The existing sidewalk width prohibits the installation of pervious pavers, planting beds and street trees if the Project is to maintain an adequate pedestrian path of travel.

In addition to these street improvements, the Project is committed to collecting and recharging the 1.25 inch of stormwater runoff from the building. This allows up to 41,000 gallons (5,481 cubic feet) of stormwater runoff to be diverted from the City's stormwater system for each storm event.

3.4 Noise

Residents of neighboring buildings raised concerns regarding noise impacts from the mechanical equipment proposed on the roof of the ninth floor. Additional measurements were performed on the existing rooftop, and existing equipment was operated during these measurements. Results indicated that future sound levels resulting from the rooftop will be quieter than existing sound levels. This is achieved through use of new quieter equipment, and 20-foot mechanical enclosures. The mechanical well will be enclosed with the same architectural building envelope as the rest of the building. For the mechanical well, an acoustic treatment to minimize sound transfer and reverberation will also be added. In addition, the new equipment will be operated using variable frequency drives (VFDs). Any equipment using a VFD will only operate at maximum load during extreme temperatures, and will therefore be operated at a reduced speed for the majority of the time.



Motor Mart Garage Boston, Massachusetts

Chapter 4.0

Response to Comments

4.0 RESPONSE TO COMMENTS

This chapter provides responses to the comment letters that were received on the PNF filed with the BPDA on September 10, 2018. The comment letters have been annotated and individual comments coded in the right-hand margin. The responses to the comments are listed below with the corresponding code numbers. Comment letters were received from the following agencies and organizations.

- ◆ Boston Planning and Development Agency Staff (BPDA)
- ◆ Boston Transportation Department (BTD)
- ◆ Boston Parks and Recreation Department (BPRD)
- ◆ Boston Public Works Department (PWD)
- ◆ Boston Groundwater Trust (BGWT)
- ◆ Boston Elderly Commission (BEC)
- ◆ Prince Lobel representing the Four Seasons Place Condominium Association (PL)
- ◆ Park Plaza Civic Advisory Committee (CAC)
- ◆ Boston Preservation Alliance (BPA)
- ◆ Diana K. Mayer (DKM)
- ◆ Jamie Brewer (JB)
- ◆ Friends of the Public Garden (FPG)
- ◆ Midtown Park Plaza Neighborhood Association (MPPNA)
- ◆ Judith Komarow (JK)
- ◆ Tony Fusco (TF)
- ◆ Moriarty, Troyer & Malloy LLC on behalf of the One Charles Condominium (MTM)
- ◆ Pawel Latawiec (PL)
- ◆ Maggie Peatridge (MP)
- ◆ Kingsley Osias (KO)
- ◆ Bay Village Neighborhood Association (BVNA)

BOSTON PLANNING & DEVELOPMENT AGENCY
REQUEST FOR SUPPLEMENTAL INFORMATION
MOTOR MART GARAGE REDEVELOPMENT PROJECT
SUBMISSION REQUIREMENTS
FOR SUPPLEMENTAL INFORMATION REQUEST

PROPOSED PROJECT: MOTOR MART GARAGE

PROJECT SITE: 201 STUART STREET
BOSTON, MA 02116

PROPONENT: 201 STUART STREET OWNER, LLC, C/O CIM GROUP, LLC
BOSTON GLOBAL INVESTORS

DATE: DECEMBER 5, 2018

The Boston Redevelopment Authority ("BRA") d/b/a The Boston Planning & Development Agency ("BPDA") is issuing this Supplemental Information Request in response to the Project Notification Form ("PNF") which 201 Stuart Street Owner, LLC, c/o CIM Group LLC and Boston Global Investors (the "Proponents") filed for the Motor Mart Redevelopment project on September 10, 2018. Notice of the receipt by the BPDA of the PNF was published in the *Boston Herald* on September 10, 2018 which initiated a public comment period which ended on October 19, 2018.

This document is not a Scoping Determination as we are not requesting a Draft Project Impact Report. This document is only requesting that the Proponents provide more details around the information that was submitted in the PNF and respond to all comments and feedback received during the initial comment period. When the Proponents file a response to this request we will start a new comment period and continue the public review process. The Proponents may choose to file a response in conjunction with an anticipated Planned Development Area application.

On March 2, 2018, the Proponents filed a Letter of Intent in accordance with the Executive Order regarding Provision of Mitigation by Development Projects in Boston. On September 10, 2018, the Proponents filed a PNF pursuant of Article 80 Large Project Review. The Proponents propose to redevelop the existing eight-story, Motor Mart Garage into a vibrant, mixed-use building by adding basement level retail space, reducing parking, and constructing new residential apartments within the western portion of the existing

building, and constructing new residential apartments and condominiums within a 20-story residential tower rising out of the existing building (the Project). The Project will create a mix of approximately 306 new apartment and condominium units, retain approximately 46,000 sf of retail and restaurant space, and retain 672 parking spaces. (the "Proposed Project").

On October 2, 2018, the BPDA hosted an Impact Advisory Group ("IAG") meeting, at the Revere Hotel, Salada Room, 6th Floor. On October 9, 2018, the BPDA hosted a publicly advertised community meeting regarding the PNF, also at the Revere Hotel, in Grand Master Ballroom 1. The public comment period concluded on October 19, 2018.

Written comments in response to the PNF from BPDA staff and from other public agencies are included in **Appendix A** and must be answered in their entirety. Appendix A includes comments from:

BPDA 01

- BPDA Staff
 - Corey Zehngebot, Senior Architect/Urban Designer
 - Michael Cannizzo, Senior Architect/Urban Designer
 - Jill Zick, Landscape architect/Urban Designer
 - Kathleen Pedersen, Senior Land Use Planner, Sustainability Specialist & Environmental Review
 - Mary Knasas, Senior Planner III
 - Phillip Hu, Planner
 - Nick Schmidt, Senior Transportation Planner II
 - Manuel Esquivel, Senior Infrastructure & Energy Planning Fellow
- City of Boston Staff
 - Carrie Marsh, Executive Secretary, Boston Parks & Recreation Commission
 - Zach Wassmouth, Chief Design Engineer, Boston Public Works Dept.
 - Nicole Chandler, Boston Elderly Commission
 - Josh Weiland, Transportation Planner, Boston Transportation Dept.
 - Christian Simonelli, Executive Director, Boston Groundwater Trust

Written comments in response to the PNF received by the BPDA from the public are included in **Appendix B** and must be answered in their entirety.

BPDA 02

As part of the Request for Supplemental Information, the Proponent must also include a completed Article 80 Broadband Ready Buildings Questionnaire, attached as **Appendix C**. The information that is shared through the Broadband Ready Buildings Questionnaire will help the BPDA and the City understand how developers currently integrate telecommunications planning in their work and how this integration can be most responsive to a changing technological landscape.

BPDA 03

Supplemental Information is requested that the BPDA requires for its review of the Proposed Project in connection with Article 80 of the Code, Development Review and Approval and other applicable sections of the Code.

I. PROJECT DESCRIPTION

201 Stuart Street Owner, LLC (the Proponent), an affiliate of CIM Group LLC, together with its development partner Boston Global Investors, LLC, proposes to redevelop the existing eight-story, Motor Mart Garage into a vibrant, mixed-use building by adding basement level retail space, reducing parking, and constructing new residential apartments within the western portion of the existing building, and constructing new residential apartments and condominiums within a 20-story residential tower rising out of the existing building (the Project). The Project will create a mix of approximately 306 new apartment and condominium units, retain approximately 46,000 sf of retail and restaurant space, and retain 672 parking spaces.

The existing Motor Mart Garage (the Existing Building or Garage) is located in the Midtown Cultural District neighborhood of Downtown Boston and bounded by Stuart Street to the south, Park Place to the east, Columbus Avenue to the northwest, Eliot Street to the northeast and Church Street to the west (the Project Site). The Project will improve and activate the western façade along Statler Park by lightening the existing dark Garage windows to create more eyes on the park, and by locating the primary residential entrance directly across Church Street from the park. The Project will also enhance Church Street in order to create a more inviting connection between the Bay Village and Midtown Cultural District neighborhoods. Sidewalks surrounding the site will be improved in accordance with Boston Complete Streets guidelines, including new street lighting and new street trees where feasible. In addition to these public realm benefits, the Project will provide new housing, new affordable housing opportunities in accordance with the City Inclusionary Development Policy (IDP), new construction and permanent jobs, and improved tax revenues for the City.

II. PREAMBLE

The Proposed Project is being reviewed pursuant to Article 80, Development Review and Approval, which sets forth a comprehensive procedure for project review of the following components: transportation, environmental protection, urban design, historic resources,

infrastructure systems, site plan, tidelands, and Development Impact Project, if any. The Proponents are required to prepare and submit to the BPDA a filing with supplemental information that meets the requirements of this request by detailing the Proposed Project's impacts and proposed measures to mitigate, limit or minimize such impacts. After submitting the supplemental information filing, the Proponents shall publish notice of such submittal. Public comments, including the comments of public agencies, shall be transmitted in writing to the BPDA after the public notice has been published. If the BPDA determines that the filing of supplemental information adequately describes the Proposed Project's impacts and, if appropriate, proposed measures to mitigate, limit or minimize such impacts, the Scoping Determination will announce such a determination and that the requirements of further review are waived pursuant to Section 80B-5.4(c) (iv). Section 80B-6 requires the Director of the BPDA to issue a Certification of Compliance indicating the successful completion of the Article 80 development review requirements before the Commissioner of Inspectional Services can issue any building permit for the Proposed Project.

III. REVIEW/SUBMISSION REQUIREMENTS

In addition to full-size scale drawings, 10 copies of a bound booklet and an electronic copy (PDF format) containing all submission materials reduced to size 8-1/2" x 11", except where otherwise specified are required. The electronic copy should also be emailed to Michael Rooney at michael.rooney@boston.gov. The booklet should be printed on both sides of the page. In addition, an adequate number of copies must be available for community review. A copy of this request for supplemental information should be included in the booklet for reference.

A. General Information

1. Applicant/Proponent Information
 - a. Development Team

BPDA 04

- (1) Names

- (a) Proponents (including description of development entity and type of corporation, and the principals thereof)
 - (b) Attorney
 - (c) Project consultants and architects

- (2) Business address, telephone number, FAX number and e-mail, where available for each

- (3) Designated contact for each

- b. Legal Information
 - (1) Legal judgments or actions pending concerning the Proposed Project
 - (2) History of tax arrears on property owned in Boston by Applicant
 - (3) Evidence of site control over Project Site, including current ownership and purchase options, if any, for all parcels in the Proposed Project, all restrictive covenants and contractual restrictions affecting the Proponent's right or ability to accomplish the Proposed Project, and the nature of the agreements for securing parcels not owned by the Applicant.
 - (4) Nature and extent of any and all public easements into, through, or surrounding the site.
- 2. Project Site
 - a. An area map identifying the location of the Proposed Project
 - b. Description of metes and bounds of Project Site or certified survey of the Project Site.
 - c. Current zoning
- 3. Project Description and Alternatives
 - a. The filing of supplement information shall contain a full description of the Proposed Project and its components, including its size, physical characteristics, development schedule, costs, and proposed uses. This section shall also present analysis of the development context of the Proposed Project. Appropriate site and building plans to illustrate clearly the Proposed Project shall be required.
 - b. A description of alternatives to the Proposed Project that were considered shall be presented and primary differences among the alternatives, particularly as they may affect environmental and traffic/transportation conditions, shall be discussed.
- 4. Public Benefits

- a. Anticipated employment levels including the following:
 - (1) Estimated number of construction jobs
 - (2) Estimated number of permanent jobs
 - b. Current and/or future activities and program which benefit adjacent neighborhoods of Boston and the city at large, such as, child care programs, scholarships, internships, elderly services, education and job training programs, etc.
 - c. Other public benefits, if any, to be provided.
5. Community Process
- a. A list of meetings held and proposed with interested parties, including public agencies, abutters, and business and community groups.
 - b. Names and addresses of project area owners, abutters, and any community or business groups which, in the opinion of the applicant, may be substantially interested in or affected by the Proposed Project.

B. REGULATORY CONTROLS AND PERMITS

An updated listing of all anticipated permits or approvals required from other municipal, state or federal agencies, including a proposed application schedule shall be included in the filing.

A statement on the applicability of the Massachusetts Environmental Policy Act (MEPA) should be provided. If the Proposed Project is subject to MEPA, all required documentation should be provided to the BPDA, including, but not limited to, a copy of the Environmental Notification Form, decisions of the secretary of Environmental Affairs, and the proposed schedule for coordination with BPDA procedure.

PUBLIC NOTICE

The Proponent will be responsible for preparing and publishing in one or more newspapers of general circulation in the City of Boston a Public Notice of the submission of the filing of supplemental information to the BPDA. Following publication of the Public Notice, the Proponent shall submit to the BPDA a copy of the published Public Notice together with the date of publication.

MEMORANDUM

TO: Michael Rooney, BPDA Project Manager
FROM: Manuel Esquivel, Senior Infrastructure & Energy Planning Fellow, BPDA
Transportation & Infrastructure Planning Department
Phillip Hu, Planner II, BPDA Downtown & Neighborhood Planning
Department
Matthew Moran, Senior Transportation Planner, BPDA Transportation &
Infrastructure Planning Department
Nick Schmidt, Senior Transportation Planner, BPDA Transportation &
Infrastructure Planning Department
Kathleen Pedersen, Senior Land Use Planner, Sustainability Specialist &
Environmental Review, BPDA Climate Change & Environmental Planning
Department
Corey Zehngebot, Senior Architect/Urban Designer, BPDA Urban Design
Department
Jill Zick, Landscape Architect, BPDA Urban Design Department

DATE: December 5, 2018

SUBJECT: MOTOR MART GARAGE - BPDA Planning Division Comments

The BPDA Planning Division requests the proponent consider the following suggestions and to provide additional information in the Draft Project Impact Report (DPIR) and next iteration of the design.

Alternatives Analysis

Based on consultation with other departments and agencies, BPDA staff requests that the **BPDA 05** following alternative massings be analyzed, to facilitate comparison:

- A no-build scenario;
- A PNF scenario, showing the Proposed Project as described in the PNF; and
- An “as-of-right” scenario, under the existing General Area zoning within the Midtown Cultural District, which provides for an FAR of 10.0 and a maximum height of 155’ when a project has elected to undergo Large Project Review.

Urban Design

- The decision to foster a “strong and immediate connection between the existing facade and new tower” has the potential for an interesting interweaving of new with old. The existing Motor Mart Garage, the 1927 BSA Harleston Parker Medal winner, has a heft and clarity of architectural expression. However, the expression of a tower that takes its cues from a historic base is one that needs further study as currently proposed. In particular, the continuation of the concrete piers, which then taper off mid-tower, needs further refinement and iteration. In addition, material expression will also be important, as the patina of the existing Motor Mart structure cannot be precisely replicated on the tower above. **BPDA 06**
- The tower “tail” is unresolved. This element currently contains a variety of programs including residential units, amenity space, and mechanical equipment. While the strategy of locating the mechanical equipment at a mezzanine level minimizes shadows and also helps to service the retail and restaurant spaces below, some of the other programs might be reconfigured to allow for a simplification of the “tail.” As currently shown, this element is an architectural outlier and is also visible from the street below. **BPDA 07**
- More study of how the roof deck mechanicals impact abutters, such as 1 Charles Street, should be considered. We encourage the proponent to explore setting the mechanicals back further from the roof edge and ensuring that they are completely camouflaged at the street level. **BPDA 08**
- Though the distance between the 212 Stuart Street project and this proposed project has been ameliorated by re-orientating the massing to include an eased edge facing its neighbors, further study is warranted. More views showing the streetscape impacts should be included in the next phase of study to understand the effects on the ground level. **BPDA 09**
- Tabling Church Street between the project and Statler Park is an intriguing public realm improvement that could bring much-needed urban vitality to this part of the City and to Statler Park. As such, retail storefronts should be oriented facing the park and lobby entrances minimized. **BPDA 10**
- The retrofit of the existing garage structure with a residential liner that serves to animate the facade facing Statler Park is wholly embraced. How these units operate in relation to the parking on the same level will need to be clarified through more detailed plans and other drawings, as needed. **BPDA 11**
- Study a single parking entrance/egress located off of Stuart Street, thereby freeing up additional space for an active streetwall along Columbus Avenue. The location of the proposed loading dock next to a neighborhood market is not ideal. On a related **BPDA 12**

note, the relocation of all loading activity to Park Place should be studied. Though there is an existing retail tenant along the Park Place ground floor, there may be compelling reasons to shift that restaurant use to an alternate facade.

- Given its proximity to the Boston Common and Public Garden, the Proponent must prove that the project is in compliance with the provisions of the Midtown Cultural District. **BPDA 13**

Public Realm and Open Space

- We appreciate the spirit of the public realm concept for the project, but we request more details about specific public realm improvements to better connect Statler Park, Lincoln Square, and the Boston Common. **BPDA 14**
- More details around public realm conditions along Columbus Avenue, Eliot Street, Stuart Street, and Park Place in a site plan are requested. A site plan with dimensions of the sidewalk, furnishing, and frontage zones should illustrate how improvements are consistent with Boston Complete Streets. An additional streetview and/or more detailed plan of Columbus Avenue should provide more details about the ground floor condition to show how the loading area and parking garage entrance interacts with the retail, market, and lobby entrances. **BPDA 15**
- We encourage the Proponent to work with the Boston Parks and Recreation Department to identify ways the project can enhance existing open spaces and improved connections between them. **BPDA 16**

Transportation

- We support the Proponent's accommodation of all transportation modes and reduction in total on-site parking. In accordance with BTDA's comments, we encourage the Proponent to examine modifications to site access, curbside conditions, circulation, and transportation demand management, including:
 - Additional detail on the tabling of Church Street, in particular conversion of the block to a pedestrian-only space and how this can further enhance safety and accessibility for pedestrians, activate Statler Park, and connect with the Bay Village neighborhood and enhancements proposed as part of 212 Stuart Street. Analysis should consider impacts to site access, area circulation, truck movements, and relocation of proposed drop-off/pick-up. **BPDA 17**
 - Additional detail on advancing the Columbus Avenue "Better Bike Corridor" as outlined in Go Boston 2030, including impacts to bike network connectivity **BPDA 18**

and “level of traffic stress.” Work with BTM to evaluate and accommodate east-west bicycle connectivity needs in this area.

- Detail on car-sharing opportunities within the garage, including quantity of vehicles, anticipated location, and convenience of residential and public access. **BPDA 19**
- Additional detail on proposed bicycle parking quantity, location of spaces within the site, support amenities, and convenience of access to ensure bicycling is an attractive option. Please refer to BTM’s Off-Street Bicycle Parking Guidelines. **BPDA 20**
- Unbundling of parking associated with residential units and limiting public parking to a maximum rental timeframe of one day. **BPDA 21**
- Compliance with the city’s Electric Vehicle Charging standards. **BPDA 22**
- Exploration of a more robust transportation demand management program, including subsidized transit, bike share, and car share memberships for employees as well as bundling such memberships with residential leases or condo sales. Real-time transportation displays are encouraged for all lobbies. **BPDA 23**
- Further analysis of the Arlington Street/Columbus Avenue/Stuart Street intersection to improve safety and reduce delay for people walking, biking, and taking transit. **BPDA 24**
- Analysis of area transit services, including capacity during peak periods and relative impacts associated with new transit trips supplied by the project. **BPDA 25**
- Traffic analysis for proposed driveways, the Stuart Street/Tremont Street intersection, and the Kneeland Street/Stuart Street/Washington Street intersection. **BPDA 26**
- In addition, we ask the Proponent to explore:
 - Opportunities to reduce or eliminate conflicts between vehicles and bicyclists on Columbus Avenue, a critical link in the citywide bike network. In particular, this analysis should examine the feasibility of consolidating vehicle access to Stuart Street, which is where the vast majority of vehicle trips will likely enter and exit the site, and relocating loading activity to Park Place. **BPDA 27**
 - Provision of a new off-street Blue bikes station within the vicinity of Church Street to encourage non-motorized trips. **BPDA 28**
 - A long-term agreement to maintain Church Street and Statler Park. **BPDA 29**

Environment

- We request additional details about the wind analysis:

- Provide a list of the BPDA approved projects and those under construction that were included in the wind tunnel analysis. **BPDA 30**
- We request additional details about the shadow analysis: **BPDA 31**
 - Provide fifteen-minute interval shadow studies beginning at 7:45 am and concluding at 10:15 am for October 21st and all previously studied dates with the exception of December 21st.
 - Provide the longitude and latitude; altitude and azimuth used
- We request additional details about solar glare:
 - Solar Spot Glare: As the proponent has stated that “materials are still being studied and glazing of the windows will be determined as the design progresses” shall be required to demonstrate that extensive areas of glazing, highly reflective glass or metal cladding, or areas of sloping glass will not be included in the design or conduct a solar glare analysis to determine visual impact or discomfort due to reflective spot glare. **BPDA 32**
 - Solar Heat Buildup: Analysis of the potential for solar heat buildup in any nearby buildings receiving reflective sunlight **BPDA 33**
- Climate Resilience:
 - The potential for a new supermarket as a new amenity for the neighborhood is desired. More details are requested for the resiliency strategy around an underground market. **BPDA 34**

Smart Utilities

- The [Smart Utilities Policy for Article 80 Development Review](#)--adopted by the BPDA Board in 2018--calls for five (5) Smart Utility Technologies (SUTs) to be incorporated into new Article 80 developments. Each technology applies at a different size threshold and has different requirement specifications. Information about this policy and project is available through the website at: bostonplans.org/smart-utilities
- The project proponent should study the policy to verify which of the 5 SUTs apply. Some of the SUTs may become applicable at later stages of review, based on conversations with BTB, PIC, and other departments. **BPDA 35**
- A Smart Utilities Checklist will be made available soon to guide project proponents through the required submissions.
- Based on the information received from the proponent so far, the information required on Smart Utilities may include at least the following:
 - Green Infrastructure: **BPDA 36**

- Provide a map/diagram highlighting where on the development Green Infrastructure will be installed
- Provide the following information:
 1. Types of Green Infrastructure included in the project: (drop down)
 - a. Bioretention basins
 - b. Bioretention planters
 - c. Infiltration chambers
 - d. Tree pits/trenches
 - e. Dry wells
 - f. Permeable paving
 - g. Other (specify)
 2. Total impervious area of the development: (Number field)
 3. Volume of stormwater that will be retained: (Number field) -
Note: Should equal to at least "Total impervious area times 1.25 inches"
- Smart Street Lights:
 - Provide a map/diagram highlighting where new street lights will be installed or where improvements to street lights will be made **BPDA 37**
- Smart Utility Standards:
 - Provide typical below and above grade cross section diagrams of all utility infrastructure in your development area (including infrastructure related to the applicable SUTs) **BPDA 38**
 - Provide typical below and above grade lateral diagrams of all utility infrastructure (including infrastructure related to the applicable SUTs)

BOSTON PLANNING AND DEVELOPMENT AGENCY

- BPDA 01** Written comments in response to the PNF from BPDA staff and from other public agencies are included in Appendix A and must be answered in their entirety.
- Responses to comments received from the BPDA staff and other public agencies are included in this Chapter.
- BPDA 02** Written comments in response to the PNF received by the BPDA from the public are included in Appendix B and must be answered in their entirety.
- Responses to comments received from the BPDA staff and other public agencies are included in this Chapter.
- BPDA 03** The Proponent must also include a completed Article 80 Broadband Ready Buildings Questionnaire.
- The Broadband Ready Buildings Questionnaire is included in Appendix D.
- BPDA 04** General Information
- Chapter 1.0 includes the applicant information and legal information, Project site, zoning, a description of the Project and alternatives, public benefits, community process and updated permit list as requested.
- BPDA 05** Based on consultation with other departments and agencies, BPDA staff requests that the following alternative massings be analyzed, to facilitate comparison:
- ◆ A no-build scenario;
 - ◆ A PNF scenario, showing the Proposed Project as described in the PNF; and
 - ◆ An “as-of-right” scenario, under the existing General Area zoning within the Midtown Cultural District, which provides for an FAR of 10.0 and a maximum height of 155’ when a project has elected to undergo Large Project Review.
- A discussion of the as-of-right massing is provided in Section 1.10.
- BPDA 06** The decision to foster a “strong and immediate connection between the existing facade and new tower” has the potential for an interesting interweaving of new with old. The existing Motor Mart Garage, the 1 927 BSA Harleston Parker Medal winner, has a heft and clarity of architectural expression. However, the expression of a tower that takes its cues from a historic base is one that needs further study as currently proposed. In particular, the continuation of the concrete piers, which then taper off

mid-tower, needs further refinement and iteration. In addition, material expression will also be important, as the patina of the existing Motor Mart structure cannot be precisely replicated on the tower above.

The design team has met with and coordinated with BCDC and BPDA Urban Design staff to further refine the intention and reference of the new tower envelope to the existing building façade. Please see Section 1.3.4 for more information about the evolution of the design. The design team will continue to advance the articulation and detailing of the façade in concert with BPDA and BCDC.

BPDA 07 The tower “tail” is unresolved. This element currently contains a variety of programs including residential units, amenity space, and mechanical equipment. While the strategy of locating the mechanical equipment at a mezzanine level minimizes shadows and also helps to service the retail and restaurant spaces below, some of the other programs might be reconfigured to allow for a simplification of the “tail.” As currently shown, this element is an architectural outlier and is also visible from the street below.

In response to BPDA and BCDC comments, the design team has investigated the multi-tiered “tail” of the building and has recently presented a scheme which eliminates one of the tiers and adjusts the program to accommodate two setbacks as opposed to three. The design team will continue to study more detailed adjustments to resolve the overall façade language.

BPDA 08 More study of how the roof deck mechanicals impact abutters, such as 1 Charles Street, should be considered. We encourage the proponent to explore setting the mechanicals back further from the roof edge and ensuring that they are completely camouflaged at the street level.

The design team will continue to investigate methods to mitigate the acoustic as well as the visual impact of the mechanical well on the east portion of the site. The design team has relocated equipment inside the parking garage in order to maintain as minimal a cooling tower as possible. Another implementation strategy has been to shift the lower “tail” south so that it resides more or less in the middle portion of the roof deck thereby minimizing the visual impact both from the pedestrian experience as well as from the east abutter, in effect creating a more slender “tail”.

BPDA 09 Though the distance between the 212 Stuart Street project and this proposed project has been ameliorated by re-orientating the massing to include an eased edge facing its neighbors, further study is warranted. More views showing the streetscape impacts should be included in the next phase of study to understand the effects on the ground level.

The design team will continue to study the impact from street level and prepare new views for upcoming meetings with BPDA and BCDC.

- BPDA 10** **Tabling Church Street between the project and Statler Park is an intriguing public realm improvement that could bring much-needed urban vitality to this part of the City and to Statler Park. As such, retail storefronts should be oriented facing the park and lobby entrances minimized.**

The design team will look to maximize retail storefronts along Church Street (as well as along the other four bounding streets) while maintaining a concise and remarkable residential entry.

- BPDA 11** **The retrofit of the existing garage structure with a residential liner that serves to animate the facade facing Statler Park is wholly embraced. How these units operate in relation to the parking on the same level will need to be clarified through more detailed plans and other drawings, as needed.**

The design team will continue to investigate this unique urban condition as the parking and unit mix evolves and aim to create a buffer between the uses.

- BPDA 12** **Study a single parking entrance/egress located off of Stuart Street, thereby freeing up additional space for an active streetwall along Columbus Avenue. The location of the proposed loading dock next to a neighborhood market is not ideal. On a related note, the relocation of all loading activity to Park Place should be studied. Though there is an existing retail tenant along the Park Place ground floor, there may be compelling reasons to shift that restaurant use to an alternate facade.**

The garage has operated with two entrances and egresses since it was first built in the late 1920's. As discussed in numerous public meetings and presentations, the goal has always been to maintain the parking operation in the approximately 50% of the structure not affected by the re-development. This concept has been embraced by the neighborhood and adjacent retail/hotel operators who count on the availability of public parking for their patrons and customers. Modifications necessary to accommodate only one entrance/egress would require significant modifications to the garages existing ramping system and require the garage to be closed for several months. In addition, relocation the loading dock to the Park Place side of the building is not feasible because of height restrictions that would require significant modifications to not only the first but also the second floor parking area above. Finally, Park Place currently serves as a primary egress for the One Charles loading dock and parking garage. Moving additional delivery and traffic to that street could have a significant negative impact on operations of the neighboring building.

BPDA 13 **Given its proximity to the Boston Common and Public Garden, the Proponent must prove that the project is in compliance with the provisions of the Midtown Cultural District.**

Appendix E of the Project PNF provided shadow studies showing that the project is in compliance with the provisions of the Midtown Cultural District.

BPDA 14 **We appreciate the spirit of the public realm concept for the project, but we request more details about specific public realm improvements to better connect Statler Park, Lincoln Square, and the Boston Common.**

Boston Complete Streets guidelines will be applied to the fullest extent practical when developing all pedestrian routes throughout the site (furnishing zones, softscape, unobstructed pedestrian circulation, etc). Proposed street tree plantings will help reinforce a continuous visual green connection between Statler Park and Lincoln Square. The design team is considering the tabling of Church Street which would improve both physical and visual connectivity to Statler Park. Updated universally accessible pedestrian crossings throughout the site will improve connectivity and safety for all users.

BPDA 15 **More details around public realm conditions along Columbus Avenue, Eliot Street, Stuart Street, and Park Place in a site plan are requested. A site plan with dimensions of the sidewalk, furnishing, and frontage zones should illustrate how improvements are consistent with Boston Complete Streets. An additional street view and/or more detailed plan of Columbus Avenue should provide more details about the ground floor condition to show how the loading area and parking garage entrance interacts with the retail, market, and lobby entrances.**

The updated site plan shows streetscape dimensions and provide call outs for streetscape zones (furnishing, frontage, softscape, etc.). Pedestrian and vehicular entries and exits are indicated. These designs will follow Boston Complete Street guidelines to the fullest extent practical.

BPDA 16 **We encourage the Proponent to work with the Boston Parks and Recreation Department to identify ways the project can enhance existing open spaces and improved connections between them.**

The Proponent will work with the Boston Parks and Recreation Department to identify ways that the Project can enhance existing open spaces and improve pedestrian connections in the neighborhood.

BPDA 17 Additional detail on the tabling of Church Street, in particular conversion of the block to a pedestrian-only space and how this can further enhance safety and accessibility for pedestrians, activate Statler Park, and connect with the Bay Village neighborhood and enhancements proposed as part of 212 Stuart Street. Analysis should consider impacts to site access, area circulation, truck movements, and relocation of proposed drop-off/pick-up.

Church Street will continue to operate as a local road however the Project includes the removal of street parking on both sides of Church Street. In addition, passive barriers such as bollards to assist in pedestrian and vehicular zones will be further investigated. Tree plantings, lighting, and pavement colors/textures will also be explored to clearly delineate vehicular, pedestrian and shared spaces.

See Section 2.5.4, Church Street Modifications, for supplemental information on Church Street traffic operations.

BPDA 18 Additional detail on advancing the Columbus Avenue “Better Bike Corridor” as outlined in Go Boston 2030, including impacts to bike network connectivity and “level of traffic stress.” Work with BTM to evaluate and accommodate east-west bicycle connectivity needs in this area.

The Project team is coordinating with BTM staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site and continues to work on developing a concept plan to accommodate a bicycle connection. Also see Section 2.8, Columbus Avenue Circulation.

BPDA 19 Detail on car-sharing opportunities within the garage, including quantity of vehicles, anticipated location, and convenience of residential and public access.

The Proponent and garage operator are both committed to provide a wide range of conveniently located car-share opportunities located in the vicinity of the garage elevators. See Section 2.9, Transportation Demand Management, for supplemental information on the Project’s car-sharing plan.

BPDA 20 Additional detail on proposed bicycle parking quantity, location of spaces within the site, support amenities, and convenience of access to ensure bicycling is an attractive option. Please refer to BTM’s Off-Street Bicycle Parking Guidelines.

The Project proposes one bicycle parking space for each residential unit located in a secure space off of the residential elevator lobby. The bicycle parking will be distributed over floors two through four. For the proposed retail areas, the Project proposes 0.3 bicycle parking spaces per 1,000 sf of retail, roughly 14 spaces. In

addition, a shower will be accommodated within a back of house area for potential retail employees. Lastly, a minimum of six bike parking spaces will be accommodated on the exterior of the building, two for residential guests and the remainder for retail use.

BPDA 21 Unbundling of parking associated with residential units and limiting public parking to a maximum rental timeframe of one day.

The Proponent will unbundle parking from the residential units. See Section 2.4.3, Project Parking, for supplemental information on the Project's parking plan.

BPDA 22 Compliance with the city's Electric Vehicle Charging standards.

See Section 2.9, Transportation Demand Management, for supplemental information on the Project's electric vehicle charging plan.

BPDA 23 Exploration of a more robust transportation demand management program, including subsidized transit, bike share, and car share memberships for employees as well as bundling such memberships with residential leases or condo sales. Real-time transportation displays are encouraged for all lobbies.

See Section 2.9, Transportation Demand Management, for supplemental information on the Project's full TDM plan.

BPDA 24 Further analysis of the Arlington Street/Columbus Avenue/Stuart Street intersection to improve safety and reduce delay for people walking, biking, and taking transit.

As part of the Columbus Avenue Conceptual Bicycle Accommodations presented in Section 2.8, safety improvements at the Arlington Street/Columbus Avenue/Stuart Street are being proposed.

BPDA 25 Analysis of area transit services, including capacity during peak periods and relative impacts associated with new transit trips supplied by the project.

See Section 2.6, Transit Impact Analysis, for supplemental information on the Project's impact to area transit services.

BPDA 26 Traffic analysis for proposed driveways, the Stuart Street/Tremont Street intersection, and the Kneeland Street/Stuart Street/Washington Street intersection.

These locations have been integrated into Chapter 2.0, Transportation.

BPDA 27 Explore opportunities to reduce or eliminate conflicts between vehicles and bicyclists on Columbus Avenue, a critical link in the citywide bike network. In particular, this analysis should examine the feasibility of consolidating vehicle access to Stuart Street, which is where the vast majority of vehicle trips will likely enter and exit the site, and relocating loading activity to Park Place.

The Project team is coordinating with BTB staff to review potential bicycle connections along Columbus Avenue adjacent to the Project site and continues to work on developing a concept plan to accommodate a bicycle connection. Also see Section 2.8, Columbus Avenue Conceptual Bicycle Accommodation.

Moving the loading area to Park Place on the eastern side of the site would require that an internal service corridor be created between the loading area and the retail businesses on the western portion of the site. The existing garage infrastructure (ramps, garage cashier lobby) does not support such a connection.

BPDA 28 Explore provision of a new off-street Blue bikes station within the vicinity of Church Street to encourage non-motorized trips.

See Section 2.9, Transportation Demand Management, for information on the Project's full TDM plan.

BPDA 29 Explore a long-term agreement to maintain Church Street and Statler Park.

The Proponent has met with Courtney Sharpe, the Director of Cultural Planning Arts and Culture, and Karin Goodfellow, Director of the Boston Arts Commission, to discuss the Project's participation in the City's desire to create a monument to the Coconut Grove fire in Statler Park. The Proponent feels that both Statler Park and Church Street will benefit greatly from the Project's public realm improvements and looks forward to continuing to work closely with both the neighborhood and the various City agencies to upgrade and maintain both Church Street and Statler Park.

BPDA 30 Provide a list of the BPDA approved projects and those under construction that were included in the wind tunnel analysis.

The approved 212-222 Stuart Street was included in the wind tunnel analysis.

BPDA 31 We request additional details about the shadow analysis:

- ◆ Provide fifteen-minute interval shadow studies beginning at 7:45 am and concluding at 10:15 am for October 21st and all previously studied dates with the exception of December 21st.
- ◆ Provide the longitude and latitude; altitude and azimuth used.

These additional shadow studies are provided in Appendix B.

BPDA 32 **Solar Spot Glare:** As the proponent has stated that “materials are still being studied and glazing of the windows will be determined as the design progresses” shall be required to demonstrate that extensive areas of glazing, highly reflective glass or metal cladding, or areas of sloping glass will not be included in the design or conduct a solar glare analysis to determine visual impact or discomfort due to reflective spot glare.

A solar glare analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.

BPDA 33 **Solar Heat Buildup:** Analysis of the potential for solar heat buildup in any nearby buildings receiving reflective sunlight.

A solar heat gain analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.

BPDA 34 **The potential for a new supermarket as a new amenity for the neighborhood is desired. More details are requested for the resiliency strategy around an underground market.**

The resiliency strategy for the basement is focused on reducing the quantity of water infiltration during storm events. One strategy is to build curbs at the ground floor storefront to cut off water infiltration to the furthest extent possible as part of the ground floor slab. For the space below grade, a double wall cavity system will be explored using the cavity to potentially manage and pump any water that may infiltrate. The utilities serving the below grade retail spaces will be within water tight conduits. Exhaust and make-up air will be drawn from areas above the ground floor. Lastly, the design team will investigate the use of hydrostatic vents if possible.

BPDA 35 **The project proponent should study the Smart Utilities Policy to verify which of the 5 Smart Utility Technologies (SUTs) apply. Some of the SUTs may become applicable at later stages of review, based on conversations with BTM, PIC, and other departments.**

The Project team reviewed the BPDA’s document entitled “Smart Utilities Policy for Article 80 Development Review- 2018” and will incorporate applicable Smart Utility Technologies to the fullest extent possible. See Section 3.3 for more information.

BPDA 36 The information required on Smart Utilities may include Green Infrastructure:

- ◆ Provide a map/diagram highlighting where on the development Green Infrastructure will be installed
- ◆ Provide the following information:
 - ◆ 1. Types of Green Infrastructure included in the project: (drop down)
 - ◆ a. Bioretention basins
 - ◆ b. Bioretention planters
 - ◆ c. Infiltration chambers
 - ◆ d. Tree pits/trenches
 - ◆ e. Drywells
 - ◆ f. Permeable paving
 - ◆ g. Other(specify)
 - ◆ 2. Total impervious area of the development: (Number field)
 - ◆ 3. Volume of stormwater that will be retained: (Number field) - Note: Should equal to at least "Total impervious area times 1 .25 inches"

A discussion of Green Infrastructure is provided in Section 3.3

BPDA 37 Provide a map/diagram highlighting where new street lights will be installed or where improvements to street lights will be made.

Street light improvements will be reviewed and approved by Boston Public Works and the Boston Street Lighting Department as part of the design process.

BPDA 38 Provide typical below and above grade cross section diagrams of all utility infrastructure in your development area (including infrastructure related to the applicable SUTs), and typical below and above grade lateral diagrams of all utility infrastructure (including infrastructure related to the applicable SUTs).

This level of detail on existing infrastructure in the area can be provided at a later stage of the design process.



BOSTON
TRANSPORTATION
DEPARTMENT

ONE CITY HALL SQUARE • ROOM 721
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617-635-4680 • FAX 617-635-4295

October 24, 2018

Brian Golden, Director
Boston Planning & Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201

RE: Project Notification Form: Motor Mart Garage

Dear Mr. Golden,

Thank you for the opportunity to comment on the Motor Mart Project Notification Form (PNF). The project includes the redevelopment of a 1,037 space parking garage with ground-floor retail as a mixed-use tower rising out of the existing building. The proposed use includes 306 units, while retaining 46,000sf of retail/restaurant space, and 672 parking spaces (a reduction of 365 spaces).

Due to the complexity of the project, BTD supports the proposal for an additional filing, in which to provide new information and analysis as described below.

Site Access/Curbside

BTD looks forward to more information on proposed tabling of Church Street. The proponent should also explore pedestrianizing the block. The proponent should study the impact of this proposed change on access to Columbus, and particularly to trucks accessing Columbus. This should include a study of current trucks accessing Columbus Avenue, including truck type, time of day, and what route they use, including from Park Plaza, from Church Street, and from Park Plaisance/Eliot Street.

BTD 01

The PNF proposes pickup/dropoff on Church Street. BTD feels that this would diminish the value of the tabled/pedestrianized space. BTD notes that the building has a large internal automotive circulation area, and will be looking for a proposal for all loading and pickup/dropoff to be internal to the building.

BTD 02

If a non-standard material is proposed for Church Street, the proponent should work with Public Works Department, Disabilities Commission, Boston Water and Sewer, as well as BTD to understand the implications for persons with disabilities, and access to utilities. Would the proponent be proposing to maintain the non-standard material whenever a utility company has to dig it up?

BTD 03

Parking

BTD supports the reduction in the total number of spaces at this location, and would request that the next submission include a detailed breakdown of which spaces will be dedicated to which uses. BTD would like to see the parking spaces unbundled, that is sold/rented at market rate separately from residential/employee units. Because after the purchase, monthly parking becomes a “sunk cost” for the person who is weighing whether to drive or not, BTD would like to see all non-residential parking have a maximum rentable timeframe of one day, that is, no monthly parking. BTD will also require the project to work with a car share provider to see whether it is possible to dedicate some of the spaces to car share.

BTD 04

BTD 05

BTD 06

BTD 07

BTD supports the proposal for one secure, covered bicycle parking station per unit, and the proposal to provide bicycle parking for employees. In future submissions, the proponent should spell out the number of spaces and ratios for employees, relying on the City’s Off-Street Bicycle Parking Guidelines, as well as the location of bicycle parking spaces, which should be located in an area that is convenient for bicyclists so as to make this as attractive an option as possible. Please also see the aforementioned Off-Street Bicycle Parking Guidelines for BTD’s requirements for outdoor parking spaces and shower/changing facilities.

BTD 08

The proponent should spell out how it plans to address the City’s Electric Vehicle Charging standards, which include that at a minimum 5% of all spaces must be EV spaces, and that at least 15% of spaces must be constructed with EV-ready electrical capacity. As this is an existing garage, this may not be possible in full, but the proponent should address this, and how it will attempt to install as much EV parking as possible. BTD notes that the project location is in the Boston Parking Freeze area, and should coordinate with the Boston Environment Department regarding whether they have any comments.

BTD 09

Transportation Mitigation

BTD looks forward to working with the proponent on developing an appropriate transportation mitigation package, which should be informed by the trips generated as well as peak hour mode share. BTD encourages the proponent to analyze transit services in the area based not only upon what services are supplied, but also peak capacity, and how the project’s generated transit trips will impact that supply. If the proponent’s trips will impact a transit, pedestrian or bicycle facility, the proponent should assess options to facilitate safe, convenient and attractive access. This may include (but is not limited to) sidewalks, crossings, bus stops, bike facilities and/or subway stops.

BTD 10

While the project is just outside the Stuart Street Zoning area, this is a good document to examine when thinking about the neighborhood’s desire for transportation mitigation. In that document, projects create public realm improvements, including multi-modal access at locations other than in the abutting streets of the proposed project, of a value equal to or greater than one half of one percent of the cost of building construction.

BTD 11

Circulation

BTD looks forward to working with the proponent on improving circulation in the area. This includes bike facilities, key intersections, and reevaluating existing curbside use.

BTD 12

As you know, in the City’s comprehensive transportation plan Go Boston 2030, one of the highest two ranked projects was “Better Bike Corridors,” including the Southwest Corridor Extension to MGH, which runs along Columbus Avenue (p. 153). We are therefore looking forward to working with the development team in designing

BTD 13

and implementing that project, which could include installation of a contraflow bike lane on the Columbus block abutting the project. BTM will look to work with the proponent on implementing this project on more than just the abutting block.

The Arlington/Columbus/Stuart intersection is key to continuing this bike facility, as well as being a very busy intersection that could be much improved from a pedestrian, bicycle, transit and automotive perspective. BTM looks forward to working with the proponent on the associated study and implementation of signal retimings in the area, including, but not limited to the intersection of Arlington, Columbus and Stuart Streets

BTM 14

Transportation Demand Management

BTM encourages the project to require retail tenants to subsidize transit, bike share and car share membership for employees, as well as to bundle subsidized transit, bike share and car share membership for residents through residential leases, as well as for the first year of any condo sales. BTM also encourages the proponent to propose inclusion of real-time transportation (transit, bikeshare, carshare, transportation network services, wayfinding, walk/bike distance) display technology in all lobbies. In addition, the next submission should include a strategy of how urban packages delivery, which has seen a huge increase in small truck trips, will be accommodated. Will delivery companies be locating local pick up “warehouses” in the development?

BTM 15

BTM 16

Traffic

The PNF includes the study of the following intersections:

- Arlington/Boylston
- Arlington/Saint James
- Arlington/Stuart/Columbus
- Columbus/Eliot
- Columbus/Park Place
- Charles/Boylston
- Charles/Stuart

BTM requests the study area additionally include the following intersections:

BTM 17

- Any proposed driveways
- Kneeland/Stuart/Washington
- Stuart/Tremont

Site Plan

The proponent needs to submit an engineered site plan within the context of the surrounding roadways at 1:20 scale depicting:

BTM 18

- Vehicular access and circulation
- Parking layout and circulation
- Pedestrian access and circulation
- Bicycle access and circulation
- Area shuttle/van pool pickup and drop-off
- Parking spaces for car sharing services
- Service and loading*
- Roadways and sidewalks
- Building layout
- Bicycle parking locations and types (covered, indoor, bike share, etc)
- Transit stops and connections
- Electric vehicle charging stations and ev-ready spaces

*Trash compactors/dumpsters need to be depicted as well.

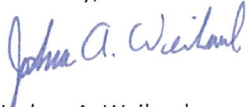
Construction Management Plan

As the project in the advances, the proponents will be required to develop and submit a detailed Construction Management Plan (CMP) to BTB for review and approval. The CMP will address TDM measures for construction workers, proposed street occupancies, equipment staging, sidewalk and bike-lane relocations and hours of construction work. BTB will work with the proponents to execute the CMP.

BTB 19

The issues raised above should be addressed in the additional filing. BTB looks forward to working collaboratively with the proponents and the community in the review of these projects and to address any outstanding concerns in the permitting process.

Sincerely,



Joshua A. Weiland

Transportation Planner

Boston Transportation Department

Cc: Vineet Gupta, Director of Policy and Planning
John DeBenedictis, Director of Engineering

BOSTON TRANSPORTATION DEPARTMENT

- BTD 01** **BTD looks forward to more information on proposed tabling of Church Street. The proponent should also explore pedestrianizing the block. The proponent should study the impact of this proposed change on access to Columbus, and particularly to trucks accessing Columbus. This should include a study of current trucks accessing Columbus Avenue, including truck type, time of day, and what route they use, including from Park Plaza, from Church Street, and from Park Plaiice/Eliot Street.**
- See Section 2.5.4, Church Street Modifications, for information on Church Street traffic operations and Section 2.7, Columbus Avenue Circulation, for information on Columbus Avenue truck volumes.
- BTD 02** **The PNF proposes pickup dropoff on Church Street. BTD feels that this would diminish the value of the tabled/pedestrianized space. BTD notes that the building has a large internal automotive circulation area, and will be looking for a proposal for all loading and pickup/dropoff to be internal to the building.**
- See Section 2.4.1, Site Access and Vehicle Circulation.
- BTD 03** **If a non-standard material is proposed for Church Street, the proponent should work with Public Works Department, Disabilities Commission, Boston Water and Sewer, as well as BTD to understand the implications for persons with disabilities, and access to utilities. Would the proponent be proposing to maintain the non-standard material whenever a utility company has to dig it up?**
- The design team will work with the various commissions and committees to present proposed materials within the public realm.
- BTD 04** **BTD supports the reduction in the total number of spaces at this location, and would request that the next submission include a detailed breakdown of which spaces will be dedicated to which uses.**
- See Section 2.4.3, Project Parking, for information on the Project's parking plan.
- BTD 05** **BTD would like to see the parking spaces unbundled, that is sold/rented at market rate separately from residential/employee units.**
- The parking spaces will be unbundled from the residential units.
- BTD 06** **Because after the purchase, monthly parking becomes a "sunk cost" for the person who is weighing whether to drive or not, BTD would like to see all non-residential parking have a maximum rentable timeframe of one day, that is, no monthly parking.**

The garage operators currently provide over 600 monthly parking agreements to area residents and tenants including Tufts Medical Center. In addition to removing cars from local neighborhood streets, this also helps to free up metered and shorter-term parking spaces that serve the areas retail tenants. Monthly parking provides an important revenue stream for the continued operation of the public garage. However, the Proponent expects the number of monthly parkers to be reduced in the reconfigured, smaller garage in the future.

BTD 07 **BTD will also require the project to work with a car share provider to see whether it is possible to dedicate some of the spaces to car share.**

See Section 2.9, Transportation Demand Management, for information on the Project's car-sharing plan.

BTD 08 **BTD supports the proposal for one secure, covered bicycle parking station per unit, and the proposal to provide bicycle parking for employees. In future submissions, the proponent should spell out the number of spaces and ratios for employees, relying on the City's Off-Street Bicycle Parking Guidelines, as well as the location of bicycle parking spaces, which should be located in an area that is convenient for bicyclists so as to make this as attractive an option as possible. Please also see the aforementioned Off-Street Bicycle Parking Guidelines for BTD's requirements for outdoor parking spaces and shower/changing facilities.**

The Project proposes one bicycle parking space for each residential unit located in a secure space off of the residential elevator lobby. The bicycle parking will be distributed over floors two through four. For the proposed retail areas, the Project proposes 0.3 bicycle parking spaces per 1,000 sf of retail, roughly 14 spaces. In addition, a shower will be accommodated within a back of house area for potential retail employees. Lastly, a minimum of six bike parking spaces will be accommodated on the exterior of the building, two for residential guests and the remainder for retail use.

See Section 2.4.10, Bicycle Accommodations, for information on the Project's on-site bicycle plan.

BTD 09 **The proponent should spell out how it plans to address the City's Electric Vehicle Charging standards, which include that at a minimum 5% of all spaces must be EV spaces, and that at least 15% of spaces must be constructed with EV-ready electrical capacity. As this is an existing garage, this may not be possible in full, but the proponent should address this, and how it will attempt to install as much EV parking as possible. BTD notes that the project location is in the Boston Parking Freeze area, and should coordinate with the Boston Environment Department regarding whether they have any comments.**

See Section 2.9, Transportation Demand Management, for information on the Project's electric vehicle charging plan.

BTD 10 **BTD encourages the proponent to analyze transit services in the area based not only upon what services are supplied, but also peak capacity, and how the project's generated transit trips will impact that supply. If the proponent's trips will impact a transit, pedestrian or bicycle facility, the proponent should assess options to facilitate safe, convenient and attractive access. This may include (but is not limited to) sidewalks, crossings, bus stops, bike facilities and/or subway stops.**

See Section 2.6, Transit Impact Analysis, for information on the Project's impact to area transit services.

BTD 11 **While the project is just outside the Stuart Street Zoning area, this is a good document to examine when thinking about the neighborhood's desire for transportation mitigation. In that document, projects create public realm improvements, including multi-modal access at locations other than in the abutting streets of the proposed project, of a value equal to or greater than one half of one percent of the cost of building construction.**

The Proponent will continue to work with the City to identify appropriate mitigation elements, including continued conceptual design development for bicycle accommodations along Columbus Avenue and conceptual design improvements to the Arlington Street/Columbus Avenue/Stuart Street intersection.

BTD 12 **BTD looks forward to working with the Proponent on improving circulation in the area. This includes bike facilities, key intersections, and reevaluating existing curbside use.**

The Project team is coordinating with BTD staff to review potential bicycle connections along Columbus Avenue adjacent to the Project site and continues to work on developing a concept plan to accommodate a bicycle connection. Also see Section 2.8, Columbus Avenue Bicycle Accommodation. New intersections have been integrated into Chapter 2, Transportation.

BTD 13 **As you know, in the City's comprehensive transportation plan Go Boston 2030, one of the highest two ranked projects was "Better Bike Corridors," including the Southwest Corridor Extension to MGH, which runs along Columbus Avenue (p. 153). We are therefore looking forward to working with the development team in designing and implementing that project, which could include installation of a contraflow bike lane on the Columbus block abutting the project. BTD will look to work with the proponent on implementing this project on more than just the abutting block.**

The Project team is coordinating with BTB staff to review potential bicycle connections along Columbus Avenue adjacent to the Project site and continues to work on developing a concept plan to accommodate a bicycle connection. Also see Section 2.8. Columbus Avenue Conceptual Bicycle Accommodation.

BTB 14 The Arlington/Columbus/Stuart intersection is key to continuing this bike facility, as well as being a very busy intersection that could be much improved from a pedestrian, bicycle, transit and automotive perspective. BTB looks forward to working with the proponent on the associated study and implementation of signal retimings in the area, including, but not limited to the intersection of Arlington, Columbus and Stuart Streets.

As part of the Columbus Avenue Bicycle Accommodations presented in Section 2.8, safety improvements at the Arlington Street/Columbus Avenue/Stuart Street are being proposed.

BTB 15 BTB encourages the project to require retail tenants to subsidize transit, bike share and car share membership for employees, as well as to bundle subsidized transit, bike share and car share membership for residents through residential leases, as well as for the first year of any condo sales. BTB also encourages the proponent to propose inclusion of real-time transportation (transit, bikeshare, carshare, transportation network services, wayfinding, walk/bike distance) display technology in all lobbies.

See Section 2.9, Transportation Demand Management, for information on the Project's full TDM plan.

BTB 16 The next submission should include a strategy of how urban packages delivery, which has seen a huge increase in small truck trips, will be accommodated. Will delivery companies be locating local pick up "warehouses" in the development?

The residential lobby will be equipped with an on-site storage room for Project residents only. See Section 2.4.2, Loading and Service Accommodations, for a further discussion on urban package delivery activity.

BTB 17 BTB requests the study area additionally include the following intersections:

- ◆ Any proposed driveways
- ◆ Stuart/Tremont
- ◆ Kneeland/Stuart/Washington

These locations have been integrated into Chapter 2.0, Transportation.

BTD 18 The proponent needs to submit an engineered site plan within the context of the surrounding roadways at 1:20 scale depicting the following information:

- ◆ Vehicular access and circulation
- ◆ Parking layout and circulation
- ◆ Pedestrian access and circulation
- ◆ Bicycle access and circulation
- ◆ Area shuttle/van pool pickup and drop-off
- ◆ Parking spaces for car sharing services
- ◆ Service and loading*
- ◆ Roadways and sidewalks
- ◆ Building layout
- ◆ Bicycle parking locations and types (covered, indoor, bike share, etc)
- ◆ Transit stops and connections
- ◆ Electric vehicle charging stations and ev-ready spaces

*Trash compactors/dumpsters need to be depicted as well.

Site plans presenting this information are provided in Figures 1-5 and 1-6.

BTD 19 As the project advances, the proponents will be required to develop and submit a detailed Construction Management Plan (CMP) to BTD for review and approval. The CMP will address TDM measures for construction workers, proposed street occupancies, equipment staging, sidewalk and bike-lane relocations and hours of construction work. BTD will work with the proponents to execute the CMP.

The Proponent will submit a CMP for BTD review and approval.



Michael Rooney <michael.rooney@boston.gov>

Project Notification Form Submission Notice - Motor Mart Garage Project, Midtown Cultural District

Carrie Marsh <carrie.marsh@boston.gov>

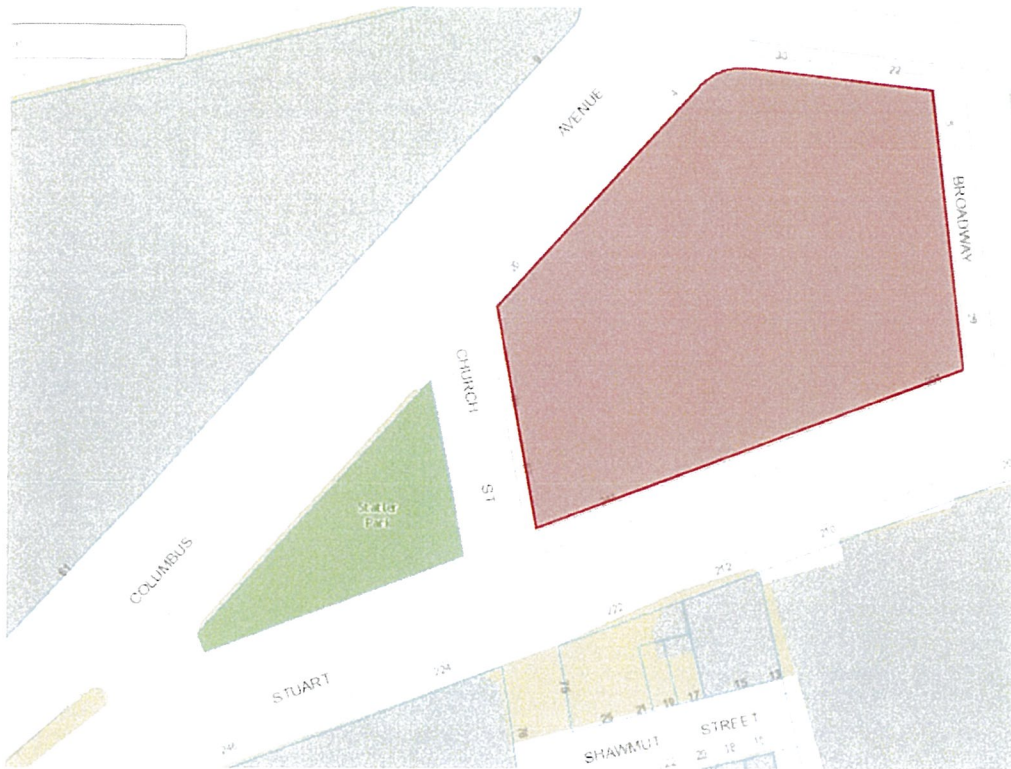
Wed, Oct 3, 2018 at 11:35 AM

To: Michael Rooney <michael.rooney@boston.gov>

Cc: Christopher Cook <christopher.cook@boston.gov>, "Liza Meyer, ASLA" <liza.meyer@boston.gov>

Hello Michael - below is an informal summary of BPRD's comments made at the Scoping Session for your reference:

- Park Plaza Urban Renewal Area: The proponent and BPDA said that the site was within the Park Plaza Urban Renewal Area. BPRD seeks confirmation of whether the project is subject to the stipulation that 1% of total development costs must be contributed to the Boston Common and Public Garden. **BPRD 01**
- Shadow Impacts: The PNF and presentation only showed net new shadows related to the Boston Common and Public Garden shadow restrictions (nominal impact). BPRD requested additional studies that show the shadow impacts year round, from sunrise to sunset, on the entire neighborhood - including all public open spaces such as Statler Park. **BPRD 02**
- Statler Park Amenity: The proponent would like to visually, physically and functionally connect Statler to its project as an amenity to the development. It would like to make Church Street flush to the sidewalk with no curbs so that it reads as a continual space from the project to the park. The pedestrian use of that raised roadway was emphasized, though cars were shown.
- Impacts of Use: The proponent said that Trader Joe's or a similar use is expected for the first floor facing the park. BPRD notes that 300 households and a grocery store immediately on the park would dramatically increase the usage impacts. BPRD would request consideration of a major contribution to the existing maintenance endowment for Statler Park to offset these impacts. **BPRD 03**
- Public Realm Design: The proponent is proposing to create a visual and physical connection to Statler as an amenity to its project. BPRD will need to see the public realm plans more closely. Public spaces may not be privatized so the proposed connection will need to be evaluated. Further, BPRD will need to assess the current design and features in the park to determine the impact that such use would have. BPRD would likely look to the proponent for a major contribution to improvements to the park to accommodate the increased usage. **BPRD 04**
- Construction Management: BPRD would like to work with BTM and the proponent on the development of a Construction Management Plan. **BPRD 05**



CARRIE MARSH
Executive Secretary
Boston Parks and Recreation Commission
1010 Massachusetts Avenue, 3rd floor
Boston, Massachusetts 02118
617-961-3074 (direct) 617-635-4505 (main)

----- Forwarded message -----

From: **Michael Rooney** <michael.rooney@boston.gov>

Date: Mon, Sep 17, 2018 at 2:39 PM

Subject: Project Notification Form Submission Notice - Motor Mart Garage Project, Midtown Cultural District

[Quoted text hidden]

[Quoted text hidden]

BOSTON PARKS AND RECREATION DEPARTMENT

BPRD 01 **The proponent and BPDA said that the site was within the Park Plaza Urban Renewal Area. BPRD seeks confirmation of whether the project is subject to the stipulation that 1% of total development costs must be contributed to the Boston Common and Public Garden.**

The regulation and control of the Park Plaza Urban Renewal Plan does not apply to the Project because the Project does not require any urban renewal action by the BPDA and is not located within any parcels subject to special regulation under the plan.

BPRD 02 **The PNF and presentation only showed net new shadows related to the Boston Common and Public Garden shadow restrictions (nominal impact). BPRD requested additional studies that show the shadow impacts year round, from sunrise to sunset, on the entire neighborhood - including all public open spaces such as Statler Park.**

In addition to the shadow impact analysis on the Boston Common and Boston Public Garden, Section 3.2 of the Project PNF included a shadow analysis during three time periods (9:00 a.m., 12:00 noon, and 3:00 p.m.) during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and winter solstice (December 21). In addition, shadow studies were conducted for the 6:00 p.m. time period during the summer solstice and autumnal equinox.

In order to provide additional detail on shadow impacts on all public open spaces including Statler Park, Appendix B of this filing includes fifteen-minute interval shadow studies beginning at 7:45 am and concluding at 10:15 am for October 21st and all previously studied dates.

BPRD 03 **The proponent said that Trader Joe's or a similar use is expected for the first floor facing the park. BPRD notes that 300 households and a grocery store immediately on the park would dramatically increase the usage impacts. BPRD would request consideration of a major contribution to the existing maintenance endowment for Statler Park to offset these impacts.**

The Proponent views Statler Park as a tremendous neighborhood amenity and looks forward to working closely with the City to upgrade, maintain and find new ways to activate the park. The Proponent is currently in discussions with the City about the proposed Coconut Grove Memorial that will be designed and located in the park. The development team is currently exploring the super market concept but as of yet, no specific tenant/operator has been identified.

BPRD 04 The proponent is proposing to create a visual and physical connection to Statler as an amenity to its project. BPRD will need to see the public realm plans more closely. Public spaces may not be privatized so the proposed connection will need to be evaluated. Further, BPRD will need to assess the current design and features in the park to determine the impact that such use would have, BPRD would likely look to the proponent for a major contribution to improvements to the park to accommodate the increased usage.

The Proponent looks forward to continued discussions with the City and Boston Parks and Recreation Department on the improvements and long term maintenance of Statler Park. The Project landscape architects at CRJA will work closely with BPRD and the City as plans for the area are developed and refined.

BPRD 05 BPRD would like to work with BTB and the proponent on the development of a Construction Management Plan.

Comment noted.



CITY of BOSTON

Martin J. Walsh, Mayor

To: Michael Rooney, BPDA
From: Zach Wassmouth, PWD
Date: October 12, 2018
Subject: Motor Mart Garage PNF - Boston Public Works Department Comments

Included here are Boston Public Works Department comments for the Motor Mart Garage PNF.

Site Plan:

Developer must provide an engineer's site plan at an appropriate engineering scale that shows curb functionality on **PWD 01** both sides of all streets that abut the property.

Construction Within The Public Way:

All work within the public way shall conform to Boston Public Works Department (PWD) standards. Any non-standard materials (i.e. pavers, landscaping, bike racks, etc.) proposed within the public way will require approval through the Public Improvement Commission (PIC) process and a fully executed License, Maintenance and Indemnification (LM&I) Agreement with the PIC.

PWD 02

Sidewalks:

Developer is responsible for the reconstruction of the sidewalks abutting the project and, wherever possible, to extend the limits to the nearest intersection to encourage and compliment pedestrian improvements and travel along all sidewalks within the Public Right of Way (ROW) within and beyond the project limits. The reconstruction effort also must meet current American's with Disabilities Act (ADA)/ Massachusetts Architectural Access Board (AAB) guidelines, including the installation of new or reconstruction of existing pedestrian ramps at all corners of all intersections. Plans showing the extents of the proposed sidewalk improvements associated with this project must be submitted to the Public Works Department (PWD) Engineering Division for review and approval.

PWD 03

The developer is encouraged to contact the City's Disabilities Commission to confirm compliant accessibility within the public right-of-way.

PWD 04

Driveway Curb Cuts:

Any proposed driveway curb cuts will need to be reviewed and approved by the PIC.

PWD 05

Discontinuances:

Any and all discontinuances (sub-surface, surface or above surface) within the Public ROW must be processed through the PIC.

PWD 06

Easements:

Any and all easements associated with this project must be processed through the PIC.

PWD 07

Landscaping:

Developer must seek approval from the Chief Landscape Architect with the Parks and Recreation Department for all landscape elements within the Public ROW. Program must accompany a LM&I with the PIC.

PWD 08



PUBLIC WORKS DEPARTMENT

Boston City Hall • 1 City Hall Sq Rm 714 • Boston MA 02201-2024

CHRIS OSGOOD • Chief of Streets, Transportation, and Sanitation

Phone (617) 635-2854 • Fax (617) 635-7499

Street Lighting:

Developer must seek approval from the PWD Street Lighting Division, where needed, for all proposed street lighting to be installed by the developer, and must be consistent with the area lighting to provide a consistent urban design. The developer should coordinate with the PWD Street Lighting Division for an assessment of any street lighting upgrades that can be considered in conjunction with this project. All existing metal street light pull box covers within the limits of sidewalk construction to remain shall be replaced with new composite covers per PWD Street Lighting standards. Metal covers should remain for pull box covers in the roadway.

PWD 09

Roadway:

Based on the extent of construction activity, including utility connections and taps, the developer will be responsible for the full restoration of the roadway sections that immediately abut the property and, in some cases, to extend the limits of roadway restoration to the nearest intersection. A plan showing the extents and methods for roadway restoration shall be submitted to the PWD Engineering Division for review and approval.

PWD 10

Project Coordination:

All projects must be entered into the City of Boston Utility Coordination Software (COBUCS) to review for any conflicts with other proposed projects within the public right-of-way. The Developer must coordinate with any existing projects within the same limits and receive clearance from PWD before commencing work.

PWD 11

Green Infrastructure:

The Developer shall work with PWD and the Boston Water and Sewer Commission (BWSC) to determine appropriate methods of green infrastructure and/or stormwater management systems within the public right-of-way. The ongoing maintenance of such systems shall require an LM&I Agreement with the PIC.

PWD 12

Please note that these are the general standard and somewhat specific PWD requirements applicable to every project, more detailed comments may follow and will be addressed during the PIC review process.

If you have any questions, please feel free to contact me at zachary.wassmouth@boston.gov or at 617-635-4953.

Sincerely,

Zach Wassmouth
Chief Design Engineer
Boston Public Works Department
Engineering Division

CC: Para Jayasinghe, PWD



PUBLIC WORKS DEPARTMENT

Boston City Hall • 1 City Hall Sq Rm 714 • Boston MA 02201-2024

CHRIS OSGOOD • Chief of Streets, Transportation, and Sanitation

Phone (617) 635-2854 • Fax (617) 635-7499

BOSTON PUBLIC WORKS DEPARTMENT

PWD 01 **Developer must provide an engineer's site plan at an appropriate engineering scale that shows curb functionality on both sides of all streets that abut the property.**

This information is presented in Figure 2-19.

PWD 02 **All work within the public way shall conform to Boston Public Works Department (PWD) standards. Any non standard materials (i.e. payers, landscaping, bike racks, etc.) proposed within the public way will require approval through the Public Improvement Commission (PIC) process and a fully executed License, Maintenance and Indemnification (LM&I) Agreement with the PIC.**

All work within the public way will either conform to PWD standards or obtain approval through the PIC process.

PWD 03 **Developer is responsible for the reconstruction of the sidewalks abutting the project and, wherever possible, to extend the limits to the nearest intersection to encourage and compliment pedestrian improvements and travel along all sidewalks within the Public Right of Way (ROW) within and beyond the project limits. The reconstruction effort also must meet current American's with Disabilities Act (ADA)/Massachusetts Architectural Access Board (AAB) guidelines, including the installation of new or reconstruction of existing pedestrian ramps at all corners of all intersections. Plans showing the extents of the proposed sidewalk improvements associated with this project must be submitted to the Public Works Department (PWD) Engineering Division for review and approval.**

Plans showing the extents of the proposed sidewalk improvements will be submitted to the PWD Engineering Division for review and approval.

PWD 04 **The developer is encouraged to contact the City's Disabilities Commission to confirm compliant accessibility within the public right-of-way.**

The Proponent along with the design and landscape architects will work closely with the City's Disabilities Commission to insure accessibility within the public ways.

PWD 05 **Any proposed driveway curb cuts will need to be reviewed and approved by the PIC.**

Proposed driveway curb cuts will be reviewed and approved by the PIC.

PWD 06 **Any and all discontinuances (sub-surface, surface or above surface) within the Public ROW must be processed through the PIC.**

Any discontinuances will be processed through the PIC.

- PWD 07** Any and all easements associated with this project must be processed through the PIC.
- Any easements will be processed through the PIC.
- PWD 08** Developer must seek approval from the Chief Landscape Architect with the Parks and Recreation Department for all landscape elements within the Public ROW. Program must accompany a LM&I with the PIC.
- The Proponent will seek the necessary approvals for all landscape elements within the Public ROW.
- PWD 09** Developer must seek approval from the PWD Street Lighting Division, where needed, for all proposed street lighting to be installed by the developer, and must be consistent with the area lighting to provide a consistent urban design. The developer should coordinate with the PWD Street Lighting Division for an assessment of any street lighting upgrades that can be considered in conjunction with this project. All existing metal street light pull box covers within the limits of sidewalk construction to remain shall be replaced with new composite covers per PWD Street Lighting standards. Metal covers should remain for pull box covers in the roadway.
- The Proponent will coordinate with the PWD Street Lighting Division.
- PWD 10** Based on the extent of construction activity, including utility connections and taps, the developer will be responsible for the full restoration of the roadway sections that immediately abut the property and, in some cases, to extend the limits of roadway restoration to the nearest intersection. A plan showing the extents and methods for roadway restoration shall be submitted to the PWD Engineering Division for review and approval.
- A plan showing the extents and methods for roadway restoration will be submitted to the PWD Engineering Division for review and approval.
- PWD 11** All projects must be entered into the City of Boston Utility Coordination Software (COBUCS) to review for any conflicts with other proposed projects within the public right-of-way. The Developer must coordinate with any existing projects within the same limits and receive clearance from PWD before commencing work.
- The Proponent will receive clearance from PWD before commencing work.

PWD 12 The Developer shall work with PWD and the Boston Water and Sewer Commission (BWSC) to determine appropriate methods of green infrastructure and/or stormwater management systems within the public right-of-way. The ongoing maintenance of such systems shall require an LM&I Agreement with the PIC.

The Proponent will work with PWD and the BWSC on the proposed stormwater management systems.

Boston Groundwater Trust

229 Berkeley St, Fourth Floor, Boston, MA 02116
617.859.8439
www.bostongroundwater.org

October 4th, 2018

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Executive Director

Christian Simonelli

Michael Rooney, Project Manager
Boston Planning & Development Agency
One City Hall Square
Boston, MA 02201-1007

Subject: Motor Mart Garage Project Notification Form (PNF) Comments

Dear Mr. Rooney:

Thank you for the opportunity to comment on the Motor Mart Garage Project Notification Form (PNF) located in the Midtown Cultural District. The Boston Groundwater Trust was established by the Boston City Council to monitor groundwater levels in sections of Boston where the integrity of building foundations is threatened by low groundwater levels and to make recommendations for solving the problem. Therefore my comments are limited to groundwater related issues.

The project is located in the Groundwater Conservation Overlay District (GCOD) established under Article 32 of the Zoning Code. As stated in the document and confirmed at the scoping session, the project will be designed and constructed to comply with the requirements of Article 32.

As stated in the document and confirmed at the scoping session, part of the proposed redevelopment of the building includes adding basement level retail space. The document also states that temporary dewatering in isolated excavations for foundation and substructure is anticipated. Given the relatively limited nature of dewatering, the Project is expected to have negligible long-term impacts on groundwater levels. New foundations required for the Project are anticipated to be drilled-in, high capacity, deep foundations bearing in the dense glacial soils or bedrock underlying the site. No pile driving is planned. The drilled-in foundations result in negligible impacts to adjacent structures. Specific design and construction performance criteria will be established to be protective of adjacent structures. Also, groundwater level monitoring will be undertaken during construction to document impact to area groundwater levels. The well will be installed prior to construction and monitored throughout foundation construction.

The Project team shall coordinate with the Trust and confirm where the observation well will be installed. The groundwater level data should be furnished to the Trust and the Agency on a weekly basis. In addition, the proponent confirmed at the scoping session that the only below-grade work will be for the installation of these foundation elements and no new occupiable space will be created.

BGWT 01

As stated in the document the project site is vulnerable to storm surge, and stormwater flooding. As part of it's the resiliency strategy the proponent will take measures to minimize the impact of potential flooding at the site, including the following:

BGWT 02

- Critical infrastructure will be located above the 500-year flood plain, including boilers, cooling towers, generators and building switchgear, as will major air intakes and discharge points.
- Knee wall barriers are proposed for the surrounding ground floor storefronts. Temporary flood barriers will be deployed in areas without knee walls.
- A modular approach will be taken for the mechanical infrastructure; this will allow the equipment to be more standard commercial "off the shelf" type. This will help reduce the lead times for replacement equipment, allowing more rapid recovery.
- The Project will incorporate water tight utility conduits, waste water back flow prevention, and storm water back flow prevention.

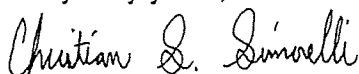
In addition, as part of its initial evaluation the proponent should identify and remedy existing critical infrastructure which may have a negative impact on groundwater levels.

BGWT 03

The document states that Sidewalks surrounding the site will be improved in accordance with Boston Complete Streets guidelines, including new street lighting and new street trees where feasible. At the scoping session the proponent committed to exploring pervious paving materials for Sidewalks surrounding the site.

I look forward to continuing to work with the proponent and the Agency to assure that this project can have only positive impacts on area groundwater levels.

Very truly yours,



Christian Simonelli
Executive Director

CC: Kathleen Pederson, BPDA
Maura Zlody, EOS

BOSTON GROUNDWATER TRUST

BGWT 01 The Project team shall coordinate with the Trust and confirm where the observation well will be installed. The groundwater level data should be furnished to the Trust and the Agency on a weekly basis. In addition, the proponent confirmed at the scoping session that the only below-grade work will be for the installation of these foundation elements and no new occupiable space will be created.

The Project Team will coordinate with the Trust regarding installation of observation wells and furnishing of information.

BGWT 02 As part of it's the resiliency strategy the proponent will take measures to minimize the impact of potential flooding at the site, including the following:

- ◆ Critical infrastructure will be located above the 500-year flood plain, including boilers, cooling towers, generators and building switchgear, as will major air intakes and discharge points.
- ◆ Knee wall barriers are proposed for the surrounding ground floor storefronts. Temporary flood barriers will be deployed in areas without knee walls.
- ◆ A modular approach will be taken for the mechanical infrastructure; this will allow the equipment to be more standard commercial "off the shelf" type. This will help reduce the lead times for replacement equipment, allowing more rapid recovery.
- ◆ The Project will incorporate water tight utility conduits, waste water back flow prevention, and storm water back flow prevention.

As demonstrated by the FEMA FIRMette map for the Project Site, the Project is located in "Zone X," also labeled as an Area of Minimal Hazard. Nevertheless, in anticipation of long-term climate resiliency, the Project will strive to take steps and methods feasible to minimize the impact of potential flooding at the site. Critical and life emergency infrastructure will be primarily located above the first floor of the building. Throughout permitting with Boston Water and Sewer Commission, the Project will meet the review requirements of the Commission and incorporate the necessary water tight utility conduits, waste water backflow prevention, and storm water back flow prevention.

BGWT 03 In addition, as part of its initial evaluation the proponent should identify and remedy existing critical infrastructure which may have a negative impact on groundwater levels.

Boston Groundwater Trust Well record information indicates groundwater elevation levels of 10 feet or more below the finished grade elevations surrounding the site. As such, it is unlikely the Project will have a negative impact on groundwater levels or the existing infrastructure, however, the Project will strive to observe and maintain minimal impact to existing groundwater water levels.

The Motor Mart Garage development will provide housing for older adults looking to downsize and live Downtown. We look forward to the Inclusionary Development Policy (IDP) numbers to offer additional older adults a new home at an affordable price. The project location offers residents a walkable community which will reduce social isolation keeping residents active. On-site amenities such as programming and roof deck offer community building between neighbors.

We encourage the developers to strongly consider the following:

- The use of universal design in all spaces. These design features allow residents to age in their home and community. It saves money upfront eliminating the need to make changes over time which are costly to residents and developers. **BEC 01**
- Provide information on The Ride, City of Boston Senior Shuttle and taxi coupons, Wheelchair Accessible Vehicles (WAVS), and offer free CharlieCards as part of the transportation management plan. Including this information ensures that residents of all abilities and ages will have access to transportation options. **BEC 02**
- Meet with the Disability Commission regarding all aspects of accessibility and placement of Group 2 units. **BEC 03**
- Any common areas with seating should have armrests. Armrests ensure balance support for people in need. If possible seating should have shade. **BEC 04**

Enclosed is a white paper developed by the Boston Society for Architects Design for Aging Committee on Age-Friendly Housing. In addition, Enterprise Green Communities created "[Aging In Place Guidelines for Independent Living in Multifamily Buildings](#)." That guide is another resource to consult for aging in place.

Please contact our office if you have any questions or need more information. We look forward to hearing from you.

Thanks,

Nicole Chandler
City of Boston Elderly Commission

BOSTON ELDERLY COMMISSION

BEC 01 Consider the use of universal design in all spaces. These design features allow residents to age in their home and community. It saves money upfront eliminating the need to make changes over time which are costly to residents and developers.

Universal design will be considered.

BEC 02 Provide information on The Ride, City of Boston Senior Shuttle and taxi coupons, Wheelchair Accessible Vehicles (WAVS), and offer free CharlieCards as part of the transportation management plan. Including this information ensures that residents of all abilities and ages will have access to transportation options.

The Proponent is committed to providing information on these services to building tenants. See Section 2.9, Transportation Demand Management, for information on the Project's full TDM plan.

BEC 03 Meet with the Disability Commission regarding all aspects of accessibility and placement of Group 2 units.

As plans and layouts for the residential units are developed, the Proponent agrees to meet with the Disability Commission to review the accessibility and location of the Group 2 units within the Project.

BEC 04 Any common areas with seating should have armrests. Armrests ensure balance support for people in need. If possible seating should have shade.

Comment noted. The Project team will work to incorporate this into the design.

October 19, 2018

Via Email and Hand Delivery

Michael Rooney
Boston Planning & Development Agency
One City Hall Square
Ninth Floor
Boston, MA 02201

Re: Comments Regarding the Proposed Motor Mart Garage project
201 Stuart Street (the "Proposed Project")

Dear Mr. Rooney:

We represent the Four Seasons Place Condominium Association (the "Four Seasons"), the association of unit owners for the condominiums at the Four Seasons, located at 220 Boylston Street in Boston, and an abutter to the Proposed Project. We have been retained to ensure that the Four Seasons has a voice in the Article 80 review process for the Proposed Project. As an abutter, the Four Seasons will most certainly be impacted by the Proposed Project. The Four Seasons was built in 1985 and was a pioneer in establishing Park Plaza as a residential neighborhood. The Four Seasons has made major contributions over the past three (3) decades to make this neighborhood a desirable place to invest in redevelopment projects like the Proposed Project.

To date, it does not appear that the Project Notification Form ("PNF") submitted by the Project Proponent has committed sufficient consideration to the impacts on the Four Seasons or the surrounding neighborhood. After diligent review of the PNF, as well as the IAG Presentation dated October 2, 2018 (the "IAG Presentation"), we have a number of serious concerns regarding the specific impacts on the Four Seasons. These include:

- Wholesale failure to assess impacts of the Proposed Project on the Four Seasons;
- Potential impact of cooling towers for noise disturbance;
- Potential impact of rooftop terraces on neighborhood quiet enjoyment;
- Insufficient study of transportation and vehicular and pedestrian congestion
- Insufficient study of Wind impacts;
- Insufficient study of Shadow impacts;
- Insufficient study of impact of Solar Glare;
- Excessive height, FAR and urban intensification;
- Undefined Public Benefits;
- Need for a construction period monitoring program; and

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- Insufficient construction impacts management plan.

We address each of these in turn and request that the BPDA require the Project Proponent to submit a Draft Project Impact Report ("DPIR") to further study and analyze these impacts.

Wholesale Failure to Assess Potential Impacts on the Four Seasons

The PNF and the IAG Presentation go into great detail explaining and assessing the impacts of the Proposed Project on many abutters and aspects of the surrounding area, but what is missing is any focused true analysis or frankly any significant references to the impacts of the Proposed Project on the Four Seasons. The PNF contains only one sketch showing a view (Figure 5-9) that is even remotely close to the Four Seasons and even that view is at an angle on the side closer to Charles Street. The residents of the Four Seasons should not have to guess what the Proposed Project will look like from their homes. Therefore, we respectfully request PL 01 that the Project Proponent develop renderings of what the Proposed Project will look like from the Four Seasons homes in order to determine what impacts the Proposed Project will have on them.

Potential Impact of Cooling Towers for Noise Disturbance

The cooling towers for the Proposed Project are proposed to be located on the Park Place side of the roof starting on the 9th floor and located in 20' high mechanical enclosures. This location appears to have been selected as a convenience to the Project Proponent and not to minimize impacts of the neighbors. Notably, the 9th floor of the Proposed Project is immediately at the roof level of and directly facing PL 02 the Four Seasons. This location is of significant concern to the residents of the Four Seasons as the equipment will likely produce significant noise pollution due to continuous exterior noise as well as cyclical noise. Their operation would greatly affect the ability of the residents on that side of the Four Seasons building to enjoy their homes. Notably during a community presentation in April, the developers suggested they could reduce the tiered portion to two floors, but it now shows as three floors. This third floor has not been justified and should be revised downward.

The risk of disturbing noise is heightened because there will be higher building facades on at least two (2) sides of the mechanical equipment, which has the potential to create a canyon effect and amplify the noise. We request the Project Proponent explore two (2) alternatives: the feasibility of placing these cooling towers on top of its building and including a mechanical penthouse instead. Should an alternative location prove infeasible, the DPIR must detail efforts to mitigate the PL 03 noise from these mechanicals and provide detailed evidence that the noise from the

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mechanical systems will be at a decibel lower than what is required by the City of Boston. The DPIR also must include a post-construction noise monitoring program.

In addition, the PNF has an absence of detail as to the design of the mechanical enclosures and equipment placement to protect the equipment visually. We ask for development of drawings so that the Four Seasons can better understand what will be visible to them at their rooftop level. Materials used by the Proposed Project to screen or enclose the mechanicals and visible to the Four Seasons should also be agreed upon by the Four Seasons in advance. PL 04

Potential Impact of Rooftop Terraces on Neighborhood Quiet Environment

In addition to the cooling towers starting on the 9th floor, the Proposed Project also includes a number of tiered rooftop levels containing landscaping and occupied rooftop terraces. The use and design of these tiered rooftop levels may interfere with the residents of the Four Seasons quiet enjoyment of their homes, particularly as to lighting. We ask that the Project Proponent include in the DPIR a plan that shows what type of lighting will be used, as well as more detail on the layout, and that the uses be limited to prevent noisy events. The neighbors need to know if these areas will be open to residents of certain floors only or will these areas be available to rent for events? The Proposed Project must have noise regulations governing the use of these rooftop areas and the noise emanated from the rooftop terraces shall be included in the post-construction noise monitoring program. PL 05

Insufficient Study of Transportation and Vehicular and Pedestrian Congestion

The PNF lacks an analysis of the congestion centering around the Park Plaza loading dock and its effect on Columbus Avenue, Eliot Street and the Motor Mart Garage Driveway. This congestion already leads to a pile up of cars and excessive double parking for Park Plaza guests. The DPIR should include an analysis of how the additional residential density and associated deliveries from the Proposed Project will impact this congestion, and what measures can be taken to mitigate and manage congestion. Of particular concern are early morning deliveries and reversing delivery trucks with beeping sounds. The Project Proponent should explain how these will be managed and mitigated to respect the residential character of the neighborhood. PL 06

The PNF also neglects to study the additional pedestrian traffic on the un-signalized intersections in the area. Adding 306 residences to this area will certainly exacerbate what can be a hectic and unsafe pedestrian environment. A further analysis in the DPIR is warranted to ensure that pedestrians are able to move safely through this transforming neighborhood. PL 07

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Insufficient Study of Wind Impacts

Section 3.1 of the PNF regarding wind impact, raises serious concern regarding degradation in wind conditions on the Four Seasons, at the corner of Hadassah Way. We call attention to Figure 3.1-6 (Pedestrian Wind Conditions – Mean Speed – No-Build) of the PNF which shows that the current wind speed category at the corner of Park Plaza and Hadassah Way is comfortable for “walking” whereas after construction there is degradation in the wind speed category to “uncomfortable”. See Figure 3.1.7 (Pedestrian Wind Conditions – Mean Speed – Build). There is substantial foot traffic at this location, so every effort should be made to ameliorate any additional wind impact. As a part of the DPIR, the Project Proponent should be directed to study and propose alternatives to mitigate this impact. In addition, the Four Seasons requests that the DPIR include a wind study at or above the current garage height to fully evaluate any wind impacts of the Proposed Projects. PL 08

Insufficient Study of Shadow Impact

The PNF also raises concern regarding the effect of shadows cast on the building. Figure 3.2-13 of the PNF indicates that a significant shadow will be cast upon the Four Seasons in the afternoon in the winter months. We ask that the Project Proponent be directed to include in the DPIR an expanded shadow study for the entire 12 months of the year, at various times of day during each month. In particular, a shadow study should look carefully at the entire winter period during all daylight hours and should consider options to minimize this effect. In the event the cooling towers are relocated to the roof, the DPIR should also provide a revised shadow study including the additional height from the rooftop mechanicals or the height of the mechanicals should be incorporated into the existing building envelope. PL 09

Insufficient Study of Solar Glare

Although the PNF states that no solar impact is anticipated, that is a difficult conclusion to reach without identifying the materials used in the window glass and building façade for the Proposed Project. Once these materials are selected for the Proposed Project, the BPDA should require a Solar Glare Study to evaluate impact of the reflection and resulting visual glare on nearby buildings, pedestrians and open spaces. The BPDA should also require a study of the associated thermal impact, including solar heat build-up. PL 10 PL 11

Excessive Height, FAR and Urban Intensification

The Project Proponent has proposed a tower of 28 stories, 310 feet and a floor area ratio (“FAR”) of 13.1, far in excess of the limits established by Article 38 and does so without justification for these exceedances. Article 38 of the Code requires a much

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lower height not to exceed 155 feet and limits FAR not to exceed 10. In the first instance, from an architectural historical perspective, excessive height at this location is out of character with the surrounding neighborhood of mid-level buildings. The existing buildings do not rise above 15-17 stories, nor can the Proposed Project reasonably be compared with buildings such as the W Hotel, Liberty Mutual or the Old John Hancock Building since these buildings are quite far away and are located in different neighborhoods. The building as proposed will be prominent, but does not it any way relate to the existing residential and historic buildings in the immediate area. PL 12

The real risk of this excessive height is the urban intensification manifest by the requested exceedance of FAR. While the Four Seasons welcomes new residents to the neighborhood, the proposed request for an FAR variance may well overburden the local pedestrian environment and traffic flows. Notably, no new parkland or open space is contemplated for the neighborhood. We ask that the Project Proponent consider a reduced massing with an FAR consistent with existing zoning. PL 13

Need for Upgraded Water and Sewer Infrastructure

The Four Seasons and neighboring properties are regularly disrupted by emergency sewer and water line projects. These incidents have occurred in the vicinity of Hadassah Way, Columbus Avenue and Park Plaza, among others, and have become almost routine. It is apparent that the water and sewer infrastructure in the neighborhood is aging and in poor condition. The Proposed Project will add many new users to this already overburdened infrastructure. We ask that the Project Proponent be required to determine if there is sufficient capacity for its new users within the existing, aging system and also be required to implement appropriate upgrades and replacement of the aging infrastructure. PL 14

Undefined Public Benefits

The PNF lacks description of any detailed investments in infrastructure, improvements or programs. The Proposed Project seeks to add significant density to an already dense area, so it is important for the Four Seasons and the neighborhood to better understand what the Project Proponent is intending to contribute to the neighborhood. The Four Seasons looks forward to participating in the public process surrounding the benefits the Proposed Project will provide for the community. PL 15

Need for Construction Period Monitoring Program

The Proposed Project is directly across the street from the Four Seasons. To prevent and mitigate any adverse impacts from the construction vibration to the Four

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Seasons property, the Proposed Project's Monitoring Program and Pre-Construction Survey ("PCS") should include the Four Seasons perimeter wall in addition to a topical exterior survey and a survey of the sidewalks and landscaped areas. The Four Seasons should be provided with a complete copy of the PCS in electronic format for review and comment. We also request a preconstruction survey of the interiors and exterior of the Four Seasons property to ensure we are able to identify any damage that will be caused by the adjacent construction. The Monitoring Program also must specify the hours construction will be taking place (with work hours calculated using the residential neighborhood standards and not those for business or mixed use neighborhoods) and should include noise monitoring, including reasonable sensors at the Four Seasons. The Four Seasons should have the right to review and comment on the proposed Monitoring Plan.

Insufficient Construction Management Plan

More information is required from the Project Proponent regarding their plan for construction management. The Four Seasons has concerns and questions regarding the impact of what will likely be a two (2) plus year construction project. The DPIR must include a comprehensive plan for construction management, including, but not limited to:

- No blocking or impeding in any way of the Four Season's loading dock, Hadassah Way and service or garage access points.
- The construction activities must allow for access of emergency vehicles at all times.
- A description of the vibration that will emanate from the construction, including its effect on nearby buildings.
- The Project Proponent should provide a full time traffic control manager stationed in this area during times of high vehicular impact on the Four Seasons. The Four Seasons will determine points and times of impact; and
- Coordination with the Boston Transportation Department and any concurrent construction in the immediate area to minimize traffic flow disruption and promote safety for neighbors, commuters and visitors.
- Designation of liaison during the construction period who will be reachable 24 hours/day in the event of noise disturbances and the like.

In Sum

The residents of the Four Seasons face a dramatic change in their immediate neighbor to the south, from an eight-story parking garage to a 28 story residential tower. While we do not necessarily seek to delay or prevent the Proposed Project, we do urge the BPDA to carefully consider the impacts of the Project on the Four



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Seasons, especially in terms of environmental and other construction impacts that require appropriate mitigation. We ask that the BPDA require the Project Proponent to submit a DPIR to further study and address these impacts.

Thank you for your time and please do not hesitate to contact me with any questions or comments.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Diane R. Rubin', with a large, stylized flourish extending to the right.

Diane R. Rubin

Direct Dial: 617-456-8042
Email Address: drubin@PrinceLobel.com

cc: Brian Golden, BPDA Director
Jonathan Greeley, BPDA Director of Development Review
The Four Seasons Place Condominium Association

PL 01 We respectfully request that the Project Proponent develop renderings of what the Proposed Project will look like from the Four Seasons homes in order to determine what impacts the Proposed Project will have on them.

See Figure 4-1 for a existing and proposed views of the Project from the Four Seasons.

PL 02 The cooling towers for the Proposed Project are proposed to be located on the Park Place side of the roof starting on the 9th floor and located in 20' high mechanical enclosures. This location appears to have been selected as a convenience to the Project Proponent and not to minimize impacts of the neighbors. Notably, the 9th floor of the Proposed Project is immediately at the roof level of and directly facing the Four Seasons. This location is of significant concern to the residents of the Four Seasons as the equipment will likely produce significant noise pollution due to continuous exterior noise as well as cyclical noise. Their operation would greatly affect the ability of the residents on that side of the Four Seasons building to enjoy their homes. Notably during a community presentation in April, the developers suggested they could reduce the tiered portion to two floors, but it now shows as three floors. This third floor has not been justified and should be revised downward.

Future sound levels resulting from the rooftop will be quieter than existing sound levels experienced by Four Seasons residents. This is achieved through use of new quieter equipment, and 20 foot mechanical enclosures. The mechanical well will be enclosed with the same architectural building envelope as the rest of the building. For the mechanical well, an acoustic treatment to minimize sound transfer and reverberation will also be added. In addition, the new equipment will be operated using variable frequency drives (VFDs). Any equipment using a VFD will only operate at maximum load during extreme temperatures, and will therefore be operated at a reduced speed for the majority of the time.

PL 03 We request the Project Proponent explore two (2) alternatives: the feasibility of placing these cooling towers on top of its building and including a mechanical penthouse instead. Should an alternative location prove infeasible, the DPIR must detail efforts to mitigate the noise from these mechanicals and provide detailed evidence that the noise from the mechanical systems will be at a decibel lower than what is required by the City of Boston. The DPIR also must include a post-construction noise monitoring program.

See response to PL 02.



Motor Mart Garage Boston, Massachusetts

PL 04 The PNF has an absence of detail as to the design of the mechanical enclosures and equipment placement to protect the equipment visually. We ask for development of drawings so that the Four Seasons can better understand what will be visible to them at their rooftop level. Materials used by the Proposed Project to screen or enclose the mechanicals and visible to the Four Seasons should also be agreed upon by the Four Seasons in advance.

As described in PL 02, the mechanical well will be enclosed with the same architectural building envelope as the rest of the building. This design is shown in Figure 4-1.

PL 05 In addition to the cooling towers starting on the 9th floor, the Proposed Project also includes a number of tiered rooftop levels containing landscaping and occupied rooftop terraces. The use and design of these tiered rooftop levels may interfere with the residents of the Four Seasons quiet enjoyment of their homes, particularly as to lighting. We ask that the Project Proponent include in the DPIR a plan that shows what type of lighting will be used, as well as more detail on the layout, and that the uses be limited to prevent noisy events. The neighbors need to know if these areas will be open to residents of certain floors only or will these areas be available to rent for events? The Proposed Project must have noise regulations governing the use of these rooftop areas and the noise emanated from the rooftop terraces shall be included in the post-construction noise monitoring program.

The ninth floor amenity deck will be available to all building residents and the lighting and details will be developed such that the adjacent buildings are not negatively impacted by light or noise. Roof areas on other floors will only be available to residents immediately adjacent to those areas.

PL 06 The PNF lacks an analysis of the congestion centering around the Park Plaza loading dock and its effect on Columbus Avenue, Eliot Street and the Motor Mart Garage Driveway. This congestion already leads to a pile up of cars and excessive double parking for Park Plaza guests. The DPIR should include an analysis of how the additional residential density and associated deliveries from the Proposed Project will impact this congestion, and what measures can be taken to mitigate and manage congestion. Of particular concern are early morning deliveries and reversing delivery trucks with beeping sounds. The Project Proponent should explain how these will be managed and mitigated to respect the residential character of the neighborhood.

The Project will create four interior loading bays to accommodate delivery activity at the site. See Section 2.7, Columbus Avenue Circulation, for supplemental information on Columbus Avenue truck volumes. The Project team is coordinating with BTB staff to review potential bicycle connections along Columbus Avenue

adjacent to the Project Site and continues to work on developing a concept plan to accommodate a bicycle connection. A goal of the plan is to better delineate areas for all appropriate curbside uses.

- PL 07** The PNF also neglects to study the additional pedestrian traffic on the un-signalized intersections in the area. Adding 306 residences to this area will certainly exacerbate what can be a hectic and unsafe pedestrian environment. A further analysis in the DPIR is warranted to ensure that pedestrians are able to move safely through this transforming neighborhood.

While approximately 306 residential units will be added, the Project also includes removal of approximately 365 public parking spaces and reduction in commercial (restaurant/retail) space. The removal of these program uses causes an incremental reduction in vehicle, transit, and pedestrian trips. The overall impact to pedestrian activity in the study is expected to be minimal. Also see Section 2.4.7, Project Trip Generation.

- PL 08** We call attention to Figure 3.1-6 (Pedestrian Wind Conditions — Mean Speed — No-Build) of the PNF which shows that the current wind speed category at the corner of Park Plaza and Hadassah Way is comfortable for “walking” whereas after construction there is degradation in the wind speed category to “uncomfortable”. See Figure 3.1.7 (Pedestrian Wind Conditions — Mean Speed — Build). There is substantial foot traffic at this location, so every effort should be made to ameliorate any additional wind impact. As a part of the DPIR, the Project Proponent should be directed to study and propose alternatives to mitigate this impact. In addition, the Four Seasons requests that the DPIR include a wind study at or above the current garage height to fully evaluate any wind impacts of the Proposed Projects.

In RWDI’s report Sensor 135 was reported as having a mean wind speed of 19 mph in the No-build condition. With the addition of the proposed tower, represented in the Build condition, the mean wind speed is 20 mph. The increase of 1 mph bridges the reporting category from “walking” to “uncomfortable”.

The addition of the proposed tower to the existing building provides significant sheltering when winds are from the south direction. When winds are from the north, there is a very slight increase in winds at Location 135, which is likely the result of localized redirection of winds from the tower and around the existing buildings to the north of the project site. This is resulting in the small 1 mph increase as reported.

RWDI considers this to be a small change in the wind speed at this location relative to existing site conditions. The wind speeds are at the very low end of the uncomfortable category speed range (20.0 mph). The wind tunnel simulations were

conducted without modeling the localized landscaping, trees, planters etc. that occur along side-streets around the Project Site. The results thereby represent a conservative estimation of the conditions.

- PL 09** We ask that the Project Proponent be directed to include in the DPIR an expanded shadow study for the entire 12 months of the year, at various times of day during each month. In particular, a shadow study should look carefully at the entire winter period during all daylight hours and should consider options to minimize this effect. In the event the cooling towers are relocated to the roof, the DPIR should also provide a revised shadow study including the additional height from the rooftop mechanicals or the height of the mechanicals should be incorporated into the existing building envelope.

In accordance with BPDA Article 80 requirements, Section 3.2 of the Project PNF included a shadow analysis during three time periods (9:00 a.m., 12:00 noon, and 3:00 p.m.) during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and winter solstice (December 21). In addition, shadow studies were conducted for the 6:00 p.m. time period during the summer solstice and autumnal equinox. Mechanical equipment was included in the shadow study.

In order to provide additional detail on shadow impacts, Appendix B of this filing includes fifteen-minute interval shadow studies beginning at 7:45 am and concluding at 10:15 am for October 21st and all previously studied dates.

- PL 10** The BPDA should require a Solar Glare Study to evaluate impact of the reflection and resulting visual glare on nearby buildings, pedestrians and open spaces.

A solar glare analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.

- PL 11** The BPDA should also require a study of the associated thermal impact, including solar heat build-up.

A solar heat gain analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.

- PL 12** The Project Proponent has proposed a tower of 28 stories, 310 feet and a floor area ratio ("FAR") of 13.1, far in excess of the limits established by Article 38 and does so without justification for these exceedances. Article 38 of the Code requires a much lower height not to exceed 155 feet and limits FAR not to exceed 10. In the first instance, from an architectural historical perspective, excessive height at this location is out of character with the surrounding neighborhood of mid-level buildings. The existing buildings do not rise above 15-17 stories, nor can the Proposed Project reasonably be compared with buildings such as the W Hotel, Liberty Mutual or the

Old John Hancock Building since these buildings are quite far away and are located in different neighborhoods. The building as proposed will be prominent, but does not in any way relate to the existing residential and historic buildings in the immediate area.

The Project tower will become a new member that forms part of the “High Spine” of Boston, which is a positive symbol for the city. Due to the wider streets, namely Columbus Avenue and Stuart Street and the fact that the existing building recedes significantly from the intersection, gives the city the opportunity to add a significant building to the high spine, thereby reinforcing the city’s skyline. To propose a building of lower height would weaken the significance of this particular prominent intersection. The detailed design of the new tower also makes use of the rich historical detail of the existing building and its context. The proposed new tower façade incorporates a stone like material vertically similar to the existing garage building and continues a similar cadence to that of the garage below. The proposed material will be similar in color and tone not only to the existing Motor Mart building but also to the Park Plaza building, 75 Arlington and 100 Arlington to name a few.

- PL 13** While the Four Seasons welcomes new residents to the neighborhood, the proposed request for an FAR variance may well overburden the local pedestrian environment and traffic flows. Notably, no new parkland or open space is contemplated for the neighborhood. We ask that the Project Proponent consider a reduced massing with an FAR consistent with existing zoning.

As presented in the traffic analysis in Chapter 2.0, the Project will have no significant impact to area traffic operations. Although the Project does not include new open space, the Proponent will work closely with the City to upgrade, maintain and find new ways to activate Statler Park. The Proponent is currently in discussions with the City about the proposed Coconut Grove Memorial that will be designed and located in the park.

- PL 14** The Four Seasons and neighboring properties are regularly disrupted by emergency sewer and water line projects. These incidents have occurred in the vicinity of Hadassah Way, Columbus Avenue and Park Plaza, among others, and have become almost routine. It is apparent that the water and sewer infrastructure in the neighborhood is aging and in poor condition. The Proposed Project will add many new users to this already overburdened infrastructure. We ask that the Project Proponent be required to determine if there is sufficient capacity for its new users within the existing, aging system and also be required to implement appropriate upgrades and replacement of the aging infrastructure.

The Proponent has provided the necessary information to the Boston Water and Sewer Commission (BWSC) to conduct an analysis and determine if the existing sewer and water infrastructure networks have sufficient capacity and are in working condition to support the addition of the Project. BWSC has not indicated to the proponent that there are capacity concerns.

- PL 15** The PNF lacks description of any detailed investments in infrastructure, improvements or programs. The Proposed Project seeks to add significant density to an already dense area, so it is important for the Four Seasons and the neighborhood to better understand what the Project Proponent is intending to contribute to the neighborhood. The Four Seasons looks forward to participating in the public process surrounding the benefits the Proposed Project will provide for the community.

The community benefits to be provided by the Proponent will be determined as part of the review process.

- PL 16** To prevent and mitigate any adverse impacts from the construction vibration to the Four Seasons property, the Proposed Project's Monitoring Program and Pre-Construction Survey ("PCS") should include the Four Seasons perimeter wall in addition to a topical exterior survey and a survey of the sidewalks and landscaped areas. The Four Seasons should be provided with a complete copy of the PCS in electronic format for review and comment.

The Proponent will conduct a pre-construction condition survey (PCS) of the exterior of the hotel wall facing the construction site (i.e., the south wall). The PCS will include documentation of sidewalk and landscaped area conditions. A copy of the PCS will be provided to the Four Seasons.

- PL 17** We also request a preconstruction survey of the interiors and exterior of the Four Seasons property to ensure we are able to identify any damage that will be caused by the adjacent construction.

Surveys will include exterior of the building and publicly accessible entryway and lobby. Given the distance between the garage and the Four Seasons, approximately 200 feet and greater, impacts to the Four Seasons from Project construction are not anticipated.

- PL 18** The Monitoring Program also must specify the hours construction will be taking place (with work hours calculated using the residential neighborhood standards and not those for business or mixed use neighborhoods) and should include noise monitoring, including reasonable sensors at the Four Seasons. The Four Seasons should have the right to review and comment on the proposed Monitoring Plan.

Work hours and noise levels will be specified in the Construction Management Plan. Noise monitoring will be included in the monitoring program.

PL 19

The Four Seasons has concerns and questions regarding the impact of what will likely be a two (2) plus year construction project. The DPIR must include a comprehensive plan for construction management including, but not limited to:

- ◆ No blocking or impeding in any way of the Four Season's loading dock, Hadassah Way and service or garage access points.
- ◆ The construction activities must allow for access of emergency vehicles at all times.
- ◆ A description of the vibration that will emanate from the construction, including its effect on nearby buildings.
- ◆ The Project Proponent should provide a full time traffic control manager stationed in this area during times of high vehicular impact on the Four Seasons. The Four Seasons will determine points and times of impact; and
- ◆ Coordination with the Boston Transportation Department and any concurrent construction in the immediate area to minimize traffic flow disruption and promote safety for neighbors, commuters and visitors.
- ◆ Designation of liaison during the construction period who will be reachable 24 hours/day in the event of noise disturbances and the like.

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

CAC

October 19, 2018

Michael Rooney, Project Manager
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201
Michael.Rooney@boston.gov

Re: Motor Mart Garage Project Notification Form

Dear Mr Rooney:

The Park Plaza Civic Advisory Committee (CAC) was mandated as a condition of the approval of the Park Plaza Urban Renewal Plan (PPURP) on November 23, 1976 by then Executive Office of Communities and Development Secretary William G. Flynn. As a result the CAC has been involved with this urban renewal project since its inception and have a thorough understanding of its history and development. The CAC consists of delegates from diverse organizations in the area that represent commercial, residential and general civic interests, including seniors and families with young children who are concerned about the impacts of high density development on the residential quality of the precious historic neighborhoods of Bay Village, Back Bay, and Beacon Hill, and Chinatown.

Your records will show the CAC recommended letting the Plan sunset. The Phase 1 portion has been completed and the BRA/BPDA has not undertaken preparation of a cohesive plan for Phase 2, the most basic threshold for continuing the plan. The approved Plan itself included a provision for termination 40 years from the date of the original approval in 1971 (2011).

Regarding the Motor Mart Garage Project, on October 9, 2018 I attended the public meeting for this project. Here I repeat the observation that the submission is incomplete. Also, I repeat my request that the submission be updated to reflect the project's Park Plaza Urban Renewal location. The site, 201 Stuart Street, is within Park Square Sub-Parcel 2, designated as the Church/Charles Sub-Parcel. I requested an analysis comparing the project with the Park Plaza Urban Renewal Plan (Plan), which includes specific criteria for development, including the requirement that a car rental business be included in the program, as well as height limits not met by the proposal. The project should address the CAC 01 Plan.

In addition, because of the great value of these public assets, I request additional studies of the timing, CAC 02 location, and duration of shadows on the Boston Common and the Public Garden.

At this time, The Plan should sunset immediately or the project should comply with the long established plan developed to prevent haphazard development, such as this design as presented.

Sincerely,

Jacquelin S. Yessian, President Park Plaza CAC

Cc: Director Golden, Counsilors Wu, Zakim, Essaibi-George

PARK PLAZA CIVIC ADVISORY COMMITTEE

CAC 01 The submission should be updated to reflect the project's Park Plaza Urban Renewal location. The site, 201 Stuart Street, is within Park Square Sub-Parcel 2, designated as the Church/Charles Sub-Parcel. I requested an analysis comparing the project with the Park Plaza Urban Renewal Plan (Plan), which includes specific criteria for development, including the requirement that a car rental business be included in the program, as well as height limits not met by the proposal. The project should address the Plan.

The regulation and control of the Park Plaza Urban Renewal Plan does not apply to the Project because the Project does not require any urban renewal action by the BPDA and is not located within any parcels subject to special regulation under the plan.

CAC 02 In addition, because of the great value of these public assets, I request additional studies of the timing, location, and duration of shadows on the Boston Common and the Public Garden.

Please see Appendix B for additional shadow analysis.

December 10, 2018

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Executive Director

Gregory J. Galer, Ph.D.

The Otis House
141 Cambridge Street
Boston, MA 02114
617.367.2458
bostonpreservation.org

David Wamester
Boston Global Investors
55 Seaport Boulevard
Boston, MA 02210
Re: Motor Mart Garage, 201 Stuart Street, Downtown

Dear Mr. Wamester,

The Boston Preservation Alliance values the opportunity to discuss your proposed redevelopment of the Motor Mart Garage and to provide our feedback. Without question, the Motor Mart Garage is a prominent historic resource that anchors Park Square and was recommended for individual listing on the National Register of Historic Places. We appreciate that your team recognizes and embraces the significance of this unique building.

When we met with you and your team, we expressed some of our initial concerns relating to the historic characteristics of the site. After further internal discussions, we would like to reiterate our thoughts as follows:

- The garage is a historically significant structure. We are not opposed to change and we appreciate your concern that the redevelopment should be done with sensitivity to the history and character of the garage. We encourage you to embrace this unique history in design details, interior décor, marketing materials, etc. As the design team continues to evolve the building's vertical transition from the garage's Art Deco expression to the tower's modern language, we again discourage a "glass hat" approach and would like to see a smoother transition in materials. We believe a tower with far less glass than many we are seeing today would be more appropriate in this setting.
- At the ground level, we feel it is important for pedestrians to feel welcomed by the new retail spaces. Therefore, we discourage the creation of two separate lobbies in favor of more retail space, and we strongly support the concept of a lower-level grocery store which we believe would add vibrancy to the neighborhood and encourage more local people to engage with the building. We also hope that the landscaping between the building and Statler Park will not create a sense of private circulation space for residents only, as we have seen at some recent developments. Historically the garage was designed for public use and while we do not oppose the transition to a partially private use, the pedestrian realm should remain welcoming to all.
- While we would prefer new development not add additional shadow on the city's open spaces like the Boston Common and Public Garden, we recognize that your design does meet existing laws regarding allowable shadow. We do appreciate the fact that the BPDA encouraged modification of the massing from the initial proposal to reduce shadow

BPA 01

BPA 02

impacts. Any opportunities for further refinement towards reducing shadow impact would be welcome.

- We request more information about the construction process itself, how the panels will be removed, stored, transported and reinstalled, and the protocol for repairing any damaged elements. We urge you to be transparent with the public about the need to remove elements of the façade to demolish a significant portion of the interior structure. It is important that the neighborhood knows what to expect. And it is critical that you continue to make all assurances that the visual qualities of the historic garage, so carefully replicated in the 1999 restoration, will be preserved and enhanced by your project, not overshadowed. From our meeting we believe your team seems to recognize the opportunities the historic structure creates.

BPA 03

The Alliance looks forward to further dialogue with you as the project moves forward.

Thank you,



Greg Galer
Executive Director

CC:

Phil Casey, CBT
Henry Celli, CBT
Michael Rooney, Boston Planning and Development Agency
Rosanne Foley, Boston Landmarks Commission

BOSTON PRESERVATION ALLIANCE

October 19, 2018

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David Nagahiro AIA

Regan Shields Ives AIA

Anthony Ursillo CFA

Peter Vanderwarker

Executive Director

Gregory J. Galer, Ph.D.

Michael Rooney
Boston Planning and Development Agency
One City Hall Square
Boston, MA 02201
Re: Motor Mart Garage, 201 Stuart Street, Downtown

Dear Mr. Rooney,

The Boston Preservation Alliance is Boston's primary, non-profit advocacy organization that protects and promotes the use of historic buildings and landscapes in all of the city's neighborhoods. With 41 Organizational Members, 121 Corporate Members, and a reach of 35,000 friends and supporters we represent a diverse constituency advocating for the thoughtful evolution of the city and celebration of its unique character. We appreciate the opportunity to offer comments on projects that impact the historic character of the city.

The Alliance has reviewed the proposal to redevelop the Motor Mart Garage and we appreciate the one week extension of the comment deadline. We do plan to meet with the proponent soon to discuss the project in more detail and offer additional feedback. The Alliance is unable to support this project at the current time.

The Motor Mart Garage is a prominent historic resource that anchors Park Square. When completed in 1929, it was the largest garage in the world, indicative of the city's transition to motor vehicles that continues to dominate our urban design and culture. Its Art Deco features give the garage a sophisticated presence, especially after a sensitive restoration in 1999 for which the Alliance gave the building our Preservation Achievement Award.

While not opposed to change, even the addition of towers within historic buildings in some instances, the Alliance is concerned about the scale and degree of change proposed at this site based on the information available. The tower addition should not overwhelm the scale of the historic structure or the neighborhood. Alterations to the facade should be done carefully to preserve original materials and design features. New openings at the street level must be more fully justified given their impact on the character of this Art Deco gem.

The Alliance looks forward to further dialogue with the proponent to better understand the proposal and alternatives that have been, and could be, explored.

Thank you,



Greg Galer
Executive Director

BPA 01 We are not opposed to change and we appreciate your concern that the redevelopment should be done with sensitivity to the history and character of the garage. We encourage you to embrace this unique history in design details, interior décor, marketing materials, etc. As the design team continues to evolve the building's vertical transition from the garage's Art Deco expression to the tower's modern language, we again discourage a "glass hat" approach and would like to see a smoother transition in materials. We believe a tower with far less glass than many we are seeing today would be more appropriate in this setting.

Comment noted. The transition of materials is evolving as described in Section 1.3.4. The design team will continue to refine the facades in concert with BCDC and BPDA Design staff as well as with input from the BPA.

BPA 02 At the ground level, we feel it is important for pedestrians to feel welcomed by the new retail spaces. Therefore, we discourage the creation of two separate lobbies in favor of more retail space, and we strongly support the concept of a lower-level grocery store which we believe would add vibrancy to the neighborhood and encourage more local people to engage with the building. We also hope that the landscaping between the building and Statler Park will not create a sense of private circulation space for residents only, as we have seen at some recent developments. Historically the garage was designed for public use and while we do not oppose the transition to a partially private use, the pedestrian realm should remain welcoming to all.

The design team is currently proposing a single use lobby, eliminating the Stuart Street lobby and replacing it with additional retail. A grocery store is being considered for the Project. The articulation of Church Street will continue to evolve in order to create a widely used public area that would benefit not only the neighborhood but also the proposed Project. See figure 1-7 for a landscape plan.

BPA 03 We request more information about the construction process itself, how the panels will be removed, stored, transported and reinstalled, and the protocol for repairing any damaged elements. We urge you to be transparent with the public about the need to remove elements of the façade to demolish a significant portion of the interior structure. It is important that the neighborhood knows what to expect. And it is critical that you continue to make all assurances that the visual qualities of the historic garage, so carefully replicated in the 1999 restoration, will be preserved and enhanced by your project, not overshadowed. From our meeting we believe your team seems to recognize the opportunities the historic structure creates.

The Proponent and its construction team have extensive experience working with older structures. Prior to the commencement of demolition, the team will produce a digital scan of the existing façade to produce an accurate record of the existing conditions. The team will then number and catalogue each piece of precast prior to dismantling. The architect and contractor will work with the original supplier to identify the exact weights and proper rigging procedures for each specific panel. The contractor will then secure the panels using a mobile crane and rigging and will cut loose the structural connections and safely lower the panels onto a flatbed truck equipped with the proper shipping frames. The panels will then be trucked to an off-site storage yard and returned to the Project when required.

Diana K. Mayer
One Charles Street South, PH2D
Boston, MA 02116
(m) 646-823-8840
dianakmayer@msn.com

October 19, 2018

Mr. Michael Rooney
Senior Project Manager
Boston Planning & Development Agency
One City Hall, Ninth Floor
Boston, MA 02201
By email: Michael.Rooney@boston.gov.

Re: Motor Mart Development Project
Comment Period Ending October 19

Dear Michael,

It was a pleasure to meet you on October 9 and to talk briefly with you after the Motor Mart Garage Public Meeting. Thank you for opportunities to offer comments about the proposed Motor Mart Project.

In light of questions, suggestions and issues identified at the October 9 Public Meeting, you said there will be a second comment period and a second public meeting on the Motor Mart Development Project. It is understood that a second comment period and second public meeting will enable the Development Team, the City of Boston, and Boston community representatives to discuss various issues in more detail.

As a resident owner at One Charles Condominium, an abutter to the Motor Mart Garage, and for neighbor owners and abutters, we respectfully submit comment for the comment period of October 19. There are a number of impact areas that seem to require more study and more technical detail and that may result in requests to modify the size, mass or design, or to take other measures to mitigate the impacts, of the proposed development project.

Decibel Noise Estimates: It is now proposed that Major Mechanical Equipment are to be housed in 20-foot high mechanical enclosures at the East End of the existing Garage structure (approx. 9 floors up). This placement is different from a prior proposal for the HVAC and related Equipment to rest at the top of the new residential tower, as shown by the Developers in an April 2018 One Charles Owners meeting.

At the October 9 Public Meeting, the Development Team deferred questions about the potential elevated noise level to be expected from the proposed positioning of HVAC and Major Mechanical Equipment at the East End of the existing Garage. It was understood that additional decibel data would be forthcoming. Incremental noise levels ought to be measured at the ninth floor and above, as well as at street levels as presented in the PNF. Also, incremental noise levels ought to be measured during peak periods, as well as in "quiet periods" as presented in the PNF. These measurements of estimated total noise impacts will indicate estimated total noise in the surrounding environment. Bordered by Stuart Street on the south, and on the East by a narrow short Park Place and a narrow short Eliot Street, the East End of the Garage rests in a "cul-de-sac" close to One Charles Condominium. This position affects noise and wind impacts. DKM 01

We request reconsideration be given to placing HVAC and Major Mechanical Equipment at the top of the proposed new Motor Mart residential tower, in order to minimize reverberations, vibrations and noise impacts in the surrounding environs. DKM 02

High Wind and Wind Shear Impacts: As noted, the East End of the existing Motor Mart Garage is in a "cul-de-sac", which borders the porte-cochere of One Charles Condominium and its nearby plazas. On

days with high winds, particularly in winter and spring, the areas around Park Place, Park Place (with seats around Lincoln Statue), Eliot Street, Park Plaza, and Charles Street South now have uncomfortable winds well above annual mean or average wind impacts. It is noted that there are prevailing southwesterly winds in the area, especially in winter and spring, that blow through the porte-cochere and plaza areas. The proposed tower at the West End of the Garage, a vertical plane that will block direct winds, may change wind directions and may have wind shear impacts. These impacts may be significant at the ninth floor roof amenity level of the proposed development, as well as porte-cochere and plaza areas, and along the entire west-facing facade of One Charles, as high as 15th or 16th floor levels where there are terraces.

We request expansion of the PNF's wind study to estimate potential wind impacts at ground level at high seasonal winds and also wind shear and wind impacts at high wind speeds around the structure, at the structure's ninth floor amenity roof area and at One Charles' elevations at the 15th or 16th floor terraces. DKM 03

Traffic Patterns and Congestion: Traffic volumes used in the PNF to develop Existing Traffic Conditions are measurements conducted in weekday peak periods in November 2017. There appear to be higher traffic volumes in summer months, and other months, compared to November. It is possible that hotels in the area (Park Plaza Hotel and Four Seasons Hotel), as well as the Motor Mart Garage itself, may have lodging and parking statistics, respectively, to show seasonal variations. DKM 04

In any season, there is existing congestion along Columbus Avenue adjacent to the Park Plaza Hotel and the Motor Mart Garage. The Park Plaza Hotel does not have an interior loading dock, and therefore, the Hotel's deliveries and waste pick-ups occur on Columbus Avenue, notably in morning rush hours and often starting before 7:00am. Trucks park at right angles to the curb, while loading and unloading. Hotel vendors and valets park cars along Columbus Avenue also at right angles to the curb, including along the north side of Columbus Avenue opposite Church Street. The proposed Motor Mart Project must have adequate interior docks for all loading and unloading to avoid more congestion along Columbus Avenue. DKM 05

The Motor Mart's proposed addition of 306 residential residences will impact Delay and LOS of existing traffic patterns. There will be more vehicular traffic from deliveries (Fedex, UPS, Amazon and others), from Uber, Lyft and Boston Taxis, and from residents, workers and visitors in their own cars. Existing congestion will also be impacted by other Stuart Street projects the BPDA has already approved. Special attention to pedestrian safety needs to be directed at the Stuart and Charles Street South intersection, the intersection at Columbus Avenue/Eliot Street/Motor Mart Garage Driveway (without signals and no crosswalks) and the Park Plaza/Columbus Avenue intersection (without signals and with three crosswalks). DKM 06

We request further study to prepare a more complete Area Traffic Plan for the Motor Mart Development with review by all appropriate City Agencies and with input from community residents and businesses. Traffic management and pedestrian safety conditions require a careful review, and possible changes made, to avoid impairment. DKM 07

Solar Glass: In the PNF Section 3.4, it states "Due to the potential glass and glazing used, solar glare impacts are not currently anticipated." However, the proposed Project's window glass and other building facade materials have not been identified in the PNF. As stated in Attorney Moriarty's October 9 letter to you, "the BPDA should require a Solar Glare Study to fully evaluate reflection and resultant visual glare impacts on adjacent buildings, pedestrians, drivers and open spaces and also require an analysis of any associated thermal impact, including solar heat build-up." DKM 08

Shadows: As noted in Attorney Moriarty's October 9 letter to you, the PNF's shadow analysis looks only at shadows on four days of the year and does not include analysis of shadow impacts on neighboring buildings. The PNF also does not detail the loss of natural light inside neighboring buildings.

As owners and abutters, *"One Charles respectfully requests that the BPDA require the Development Team to perform a total shadow path analysis on neighboring building, including One Charles, so that it can more fully evaluate the shadow impacts associated with the Proposed Project."* DKM 09

Water and Sewer: It is unclear from the PNF whether existing water and sewer lines are adequate for the proposed development project. Existing sewer lines, some of which are 12-inch in diameter, currently service multiple restaurants, as well as multiple hotels and residential buildings.

We request a further study of the incremental impacts on the sewer lines to ensure health and environmental safety. DKM 10

Parking: The proposed Project would eliminate 509 public open parking spaces and reduce total parking by 365 spaces. The Plan is to set aside 144 parking spaces for 306 residential units, a ratio of 0.47 spaces per unit, below parking goals developed by the BTID for the Park Plaza/Bay Village neighborhood of a maximum of 0.5-1.0 residential parking spaces per unit. The residual public parking spaces would be 528. At the October 9 Public Meeting it was said that the Motor Mart Garage currently averages 80% to 85% occupancy during weekdays, showing 850 to 880 public parking spaces are used, annually on average

In the PNF the Development Team shows a commitment to encourage use of public transportation by future Motor Mart residents, as well as a commitment to encourage use of public transportation by workers during construction.

Building Height and Architectural Character: The Proposed Project Dimensions exceed the height and maximum floor area ratio ("FAR") specified by Article 38. The proposed height of 310 feet compares to Code maximum height of 155 feet. The proposed FAR of 13.1 compares to Code FAR of 10.0.

The proposed 28 story tower at 310-feet exceeds by 100 feet (by 50%) the approved tower across the street at 212-222 Stuart (approved at 19 stories at about 200 feet). The proposed 28 story tower at 310-feet is well in excess of all the surrounding adjacent buildings: One Charles (17 stories at 179 feet); Four Seasons Residences (16 stories at 170 feet); the Park Plaza Hotel (15 stories at 154 feet); and 100 Arlington Street (15 stories at 155 feet). The so-called high spine referenced in the PNF is not immediately adjacent to the Motor Mart, and two of the referenced high spine buildings - Liberty Mutual and the old John Hancock Building - are office buildings.

We suggest that the proposed height does not relate well to the existing residential and historic buildings in the immediate area and should be reconsidered. We understand the proposed Project will require zoning relief from the Board of Zoning Appeals and is subject to a series of City Agency approvals as well as by State and Federal agencies. DKM 11

We respectfully submit these comments on October 19 and look ahead to the second comment period and second public meeting for the Motor Mart Development Project. We anticipate that further study, with more analysis and more detailed review would create a more positive outcome for the community as well as provide a sufficient investment return to investors in the proposed Project.

Thank you for your consideration of the comments offered to enhance Motor Mart Development Plans.

Sincerely yours, Cc: Brian Buhler, Gen. Mgr., One Charles Condominium Association
Diana K. Mayer Thomas Moriarty, Esq., Moriarty Troyer & Malloy LLC

- DKM 01** Incremental noise levels ought to be measured at the ninth floor and above, as well as at street levels as presented in the PNF. Also, incremental noise levels ought to be measured during peak periods, as well as in “quiet periods” as presented in the PNF.

Additional measurements have been performed on the existing rooftop, and existing equipment was operated during these measurements. Results indicate that future sound levels using new, quieter equipment with 20 foot mechanical enclosure walls will result in quieter sound levels at upper floors surrounding the Project Site than what is currently experienced.

- DKM 02** We request consideration be given to placing HVAC and Major Mechanical Equipment at the top of the proposed new Motor Mart residential tower, in order to minimize reverberations, vibrations and noise impacts in the surrounding environs.

Placing the mechanical units at the top of the tower building would require additional height to the tower, which would create additional shadows on the Public Garden and Boston Common as well as other public areas.

Compliance with the City of Boston sound limits has been demonstrated with the sound study performed for the PNF, and additional measurements of existing rooftop equipment has demonstrated that future sound levels from the Project’s rooftop will be lower than existing sound levels.

- DKM 03** We request expansion of the PNF’s wind study to estimate potential wind impacts at ground level at high seasonal winds and also wind shear and wind impacts at high wind speeds around the structure, at the structure’s ninth floor amenity roof area and at One Charles’ elevations at the 15th or 16th floor terraces.

The pedestrian wind assessment included in the Project PNF was conducted in accordance with Article 80 Large Project Review requirements.

- DKM 04** Traffic volumes used in the PNF to develop Existing Traffic Conditions are measurements conducted in weekday peak periods in November 2017. There appear to be higher traffic volumes in summer months, and other months, compared to November. It is possible that hotels in the area (Park Plaza Hotel and Four Seasons Hotel), as well as the Motor Mart Garage itself, may have lodging and parking statistics, respectively, to show seasonal variations,

Data collection and treatment of the data in the transportation analysis of the Project properly followed guidelines per the Boston Transportation Department. To account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT was reviewed. The most recent MassDOT Weekday Seasonal Factors were

used to determine the need for seasonal adjustments to the November 2017 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6) in the month of November is 0.97. This factor of 0.97 indicates that average month traffic volumes are approximately three percent less than the traffic volumes that were collected for this Project. The Project team, however, did not reduce the traffic volumes by 3%, resulting in a higher than average set of volumes. The MassDOT Weekday Seasonal Factors table was provided in Appendix C of the Project PNF.

- DKM 05** In any season, there is existing congestion along Columbus Avenue adjacent to the Park Plaza Hotel and the Motor Mart Garage. The Park Plaza Hotel does not have an interior loading dock, and therefore, the Hotel's deliveries and waste pick-ups occur on Columbus Avenue, notably in morning rush hours and often starting before 7:00am. Trucks park at right angles to the curb, while loading and unloading. Hotel vendors and valets park cars along Columbus Avenue also at right angles to the curb, including along the north side of Columbus Avenue opposite Church Street. The proposed Motor Mart Project must have adequate interior docks for all loading and unloading to avoid more congestion along Columbus Avenue.

The Project will create four interior loading bays to accommodate delivery activity at the site. See Section 2.7, Columbus Avenue Circulation, for supplemental information on Columbus Avenue truck volumes. The Project team is coordinating with BTM staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site and continues to work on developing a concept plan to accommodate a bicycle connection. A goal of the plan is to better delineate areas for all appropriate curbside uses.

- DKM 06** The Motor Mart's proposed addition of 306 residential residences will impact Delay and LOS of existing traffic patterns. There will be more vehicular traffic from deliveries (Fedex, UPS, Amazon and others), from Uber, Lyft and Boston Taxis, and from residents, workers and visitors in their own cars. Existing congestion will also be impacted by other Stuart Street projects the BPDA has already approved. Special attention to pedestrian safety needs to be directed at the Stuart and Charles Street South intersection, the intersection at Columbus Avenue/Eliot Street/Motor Mart Garage Driveway (without signals and no crosswalks) and the Park Plaza/Columbus Avenue intersection (without signals and with three crosswalks).

The Project's transportation impact evaluation properly followed guidelines per the Boston Transportation Department. Table 2-6 and Table 2-7 quantify the Project's impact to intersection level of service and delay, for the a.m. and p.m. peak hours respectively. The Project will not reduce the level of service at any area intersections. Projected traffic from other approved developments in the area have been included in the future year analysis.

- DKM 07** We request further study to prepare a more complete Area Traffic Plan for the Motor Mart Development with review by all appropriate City agencies and with input from community residents and businesses. Traffic management and pedestrian safety conditions require a careful review, and possible changes made, to avoid impairment.
- In addition to the intersections presented in the Project PNF, the Boston Transportation Department requested inclusion of the Stuart Street/Site Driveway intersection, the Stuart Street/Tremont Street intersection, and the Kneeland Street/Stuart Street/Washington Street intersection. These locations have been integrated into Chapter 2.0, Transportation.
- DKM 08** The BPDA should require a solar glare study to fully evaluate reflection and resultant visual glare impacts on adjacent buildings, pedestrians, drivers and open spaces and also require an analysis of any associated thermal impact, including solar heat build-up.
- A solar glare analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.
- DKM 09** One Charles respectfully requests that the BPDA require the Development Team to perform a total shadow path analysis on neighboring building, including One Charles, so that it can more fully evaluate the shadow impacts associated with the Proposed Project.
- Additional shadow diagrams, as requested by the BPDA, are provided in Appendix B.
- DKM 10** It is unclear from the PNF whether existing water and sewer lines are adequate for the proposed development project. Existing sewer lines, some of which are 12-inch in diameter, currently service multiple restaurants, as well as multiple hotels and residential buildings. We request further study of the incremental impacts on the sewer lines to ensure health and environmental safety.
- The Proponent has provided the necessary information to the Boston Water and Sewer Commission (BWSC) to conduct an analysis and determine if the existing sewer and water infrastructure networks have sufficient capacity and are in working condition to support the addition of the Project. BWSC has not indicated to the Proponent that there are capacity concerns.
- DKM 11** The proposed 28 story tower at 310—feet exceeds by 100 feet (by 50%) the approved tower across the street at 212—222 Stuart (approved at 19 stories at about 200 feet). The proposed 28 story tower at 310—feet is well in excess of all the surrounding adjacent buildings: One Charles (17 stories at 179 feet); Four Seasons Residences (16 stories at 170 feet); the Park Plaza Hotel (15 stories at 154 feet); and 100 Arlington

Street (15 stories at 155 feet). The so—called high spine referenced in the PNF is not immediately adjacent to the Motor Mart, and two of the referenced high spine buildings — Liberty Mutual and old John Hancock Building - are office buildings. We suggest that the proposed height does not relate well to the existing residential and historic buildings in the immediate area and should be reconsidered.

The Project tower will become a new member that forms part of the “High Spine” of Boston, which is a positive symbol for the city. Due to the wider streets, namely Columbus Avenue and Stuart Street and the fact that the existing building recedes significantly from the intersection, gives the city the opportunity to add a significant building to the high spine, thereby reinforcing the city’s skyline. To propose a building of lower height would weaken the significance of this particular prominent intersection. The detailed design of the new tower also makes use of the rich historical detail of the existing building and its context. The proposed new tower façade incorporates a stone like material vertically similar to the existing garage building and continues a similar cadence to that of the garage below. The proposed material will be similar in color and tone not only to the existing Motor Mart building but also to the Park Plaza building, 75 Arlington and 100 Arlington to name a few.

October 16, 2018

Mr. Michael Rooney
Senior Project Manager
Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201

Re: Motor Mart project comments

Dear Michael,

The three block stretch of Stuart St between Charles and Clarendon has three towers approved or proposed, all of which could conceivably be under construction at the same time; construction management plans for all three projects must take into account the traffic impact of all three projects on the surrounding area. JB 01

380 Stuart – approved

212 Stuart – approved

201 Stuart - proposed

The long-term impact of three new towers on traffic, particularly on Stuart St. and Columbus Ave. will be significant. I encourage the BTM to look at the current traffic, parking and delivery/pick-up usage on Columbus and Stuart Streets to address current problem areas that will get worse with increased traffic volume.

The Park Plaza delivery, tour bus, valet and frequent double parking situation on Columbus Ave needs some attention to keep travel lanes available. JB 02

Stuart Street, directly across from the Motor Mart, is currently the pick-up point for commuter buses during the afternoon rush hour (10 minute limit not enforced); the BTM should consider a new location for this bus stop, both during construction, and beyond, as the new 212 Stuart loading dock will be active in that block. JB 03

Additional traffic delays on Stuart St will increase cut through traffic on Isabella St. for cars heading to I-90 and I-93; measures to discourage this cut through on a narrow residential street should be considered. JB 04

The Motor Mart developers have proposed that all Uber, Lyft, taxi, and resident vehicle passenger drop-offs and pick-ups will be directed to the 2nd floor of the garage. This arrangement should be written in to the plan, and enforced by building employees, as those activities could cause significant traffic tie-ups on Church, Columbus and Stuart Streets. JB 05

The Motor Mart developers have proposed changes to Church Street in front of Statler Park that would reduce the number of metered parking spaces on that block. Both the 212 project, and the Motor Mart project will create additional retail/restaurant demand for short-term parking in that block. There are currently 6 hard metered spaces on the east side of the street, two of which are valet in the evening. There are 5-6 pay-station-metered spots on the west side of the street. There are no metered spaces east of Church St on Stuart which is good for traffic flow; losing these 11-12 metered spaces will make it more difficult for patrons to access the retail and restaurants in the area. The Motor Mart should consider options to make inexpensive short-term parking available in the garage to discourage cars from pulling up and blocking travel lanes on Stuart and Church when visiting tower residents or accessing the 201 Stuart shops and restaurants. JB 06

I applaud the developers' commitment to take over the upkeep of Statler Park, and to landscape the surrounding sidewalks with plants/trees.

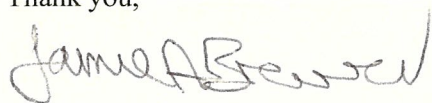
A grocery market at the Motor Mart site would be a welcome benefit to the surrounding neighborhoods. The developers' commitment to make a serious effort, including to offer competitive lease rates, to bring a grocery market in to their building has been an important factor in encouraging neighbor support; this commitment should be written in to the plan.

JB 07

As a resident of the Bay Village neighborhood, I am concerned about crime increasing, particularly while our neighborhood abuts two construction sites which are generally dark, unattended spots overnight. I encourage the developer of the Motor Mart to include in any mitigation package an investment in security cameras in coordination with, and connected to the Boston Police Department.

JB 08

Thank you,

A handwritten signature in dark ink, appearing to read "Jamie Brewer". The signature is fluid and cursive, with the first name "Jamie" written in a larger, more prominent script than the last name "Brewer".

Jamie Brewer
17 Piedmont Street

JB 01 **The three block stretch of Stuart St between Charles and Clarendon has three towers approved or proposed, all of which could conceivably be under construction at the same time; construction management plans for all three projects must take into account the traffic impact of all three projects on the surrounding area including 380 Stuart Street, 212 Stuart Street and 201 Stuart Street.**

Construction Management Plans (CMPs) are submitted by project proponents to the Boston Transportation Department and must receive approval before construction can commence. The City will ensure that appropriate coordination and management on each project occurs.

JB 02 **The Park Plaza delivery, tour bus, valet and frequent double parking situation on Columbus Ave needs some attention to keep travel lanes available.**

See Section 2.7, Columbus Avenue Circulation, for supplemental information on Columbus Avenue truck volumes. The Project team is coordinating with BTB staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site and continues to work on developing a concept plan to accommodate a bicycle connection. A goal of the plan is to better delineate areas for all appropriate curbside uses.

JB 03 **Stuart Street, directly across from the Motor Mart, is currently the pick-up point for commuter buses during the afternoon rush hour (10 minute limit not enforced); the BTB should consider a new location for this bus stop, both during construction, and beyond, as the new 212 Stuart loading dock will be active in that block.**

As noted, the curbside regulation for commuter buses is under the control of the City.

JB 04 **Additional traffic delays on Stuart St will increase cut through traffic on Isabella St. for cars heading to 1-90 and 1-93; measures to discourage this cut through on a narrow residential street should be considered.**

The Project will not cause additional delays on Stuart Street and, therefore, will not increase cut-through traffic on Isabella Street. See Section 2.5, Traffic Capacity Analysis.

JB 05 **The Motor Mart developers have proposed that all Uber, Lyft, taxi, and resident vehicle passenger drop offs and pick-ups will be directed to the 2nd floor of the garage. This arrangement should be written in to the plan, and enforced by building employees, as those activities could cause significant traffic tie-ups on Church, Columbus and Stuart Streets.**

This arrangement will be negotiated with the City as part of the TAPA.

JB 06 The Motor Mart developers have proposed changes to Church Street in front of Statler Park that would reduce the number of metered parking spaces on that block. Both the 212 project, and the Motor Mart project will create additional retail/restaurant demand for short-term parking in that block. There are currently 6 hard metered spaces on the east side of the street, two of which are valet in the evening. There are 5-6 pay-station-metered spots on the west side of the street. There are no metered spaces east of Church St on Stuart which is good for traffic flow; losing these 11-12 metered spaces will make it more difficult for patrons to access the retail and restaurants in the area. The Motor Mart should consider options to make inexpensive short-term parking available in the garage to discourage cars from pulling up and blocking travel lanes on Stuart and Church when visiting tower residents or accessing the 201 Stuart shops and restaurants.

Public parking will continue to be available in the Motor Mart Garage, as well as at the 212 Stuart Street garage, located across Stuart Street from the Motor Mart site.

JB 07 A grocery market at the Motor Mart site would be a welcome benefit to the surrounding neighborhoods. The developers' commitment to make a serious effort, including to offer competitive lease rates, to bring a grocery market in to their building has been an important factor in encouraging neighbor support; this commitment should be written in to the plan.

The Proponent agrees that a grocery/market would be both a tremendous building amenity as well as a welcome benefit to the surrounding neighborhood. As discussed in several public meetings, the Proponent has agreed to make every effort to attempt to incorporate a grocery/market into the future retail program. The Proponent is currently in the process of exploring the feasibility of the location with several operators.

JB 08 As a resident of the Bay Village neighborhood, I am concerned about crime increasing, particularly while our neighborhood abuts two construction sites which are generally dark, unattended spots overnight. I encourage the developer of the Motor Mart to include in any mitigation package an investment in security cameras in coordination with, and connected to the Boston Police Department.

Following meetings at the Midtown Park Plaza Neighborhood Association the development team had conversations with Captain Kenneth Fong of the Boston Police Department (BPD) about the BPD neighborhood camera project. The development team will follow up and looks forward to participating in the program along with other property owners.



Leslie Singleton Adam
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Colin Zick
First Vice Chair

Valerie Burns
Vice Chair

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Vice Chair

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Barbara Hostetter

EX OFFICIO
Jeanne Burlingame
Jim Hood
Sherley Smith

October 18, 2018

Mr. Michael Rooney
Project Manager
Boston Planning and Development Agency
One City Hall Plaza – 9th Floor
Boston, MA 02201

RE: Motor Mart Garage

Dear Mr. Rooney,

Since 1970, the Friends of the Public Garden has been committed to renew, care, and advocate for the Boston Common, Public Garden, and Commonwealth Avenue Mall. We are enthusiastic about Boston's growth and vibrancy but, consistent with our mission, we must ensure that the parks are protected from adverse impacts from development projects. Accordingly, we are writing to you to express our views regarding the proposed Motor Mart PNF currently under BPDA review through the Article 80 process.

As partners with the Boston Parks Department, the Friends contributes both time and resources to maintain and enhance the Boston Common and the Public Garden. One of our chief concerns is protecting the Common and Garden from additional shadows, which have negative impacts on the parks' horticulture as well as the enjoyment of the greenspaces by their many users, particularly during the cold winter months. We are pleased that the proposed project's design complies with the State shadow laws by not casting any new shadows between 8:00 am and 2:30 pm from March 21 to October 21.

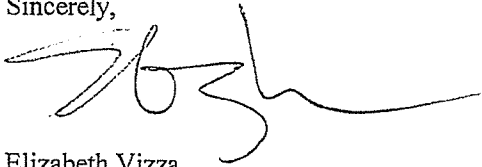
Nonetheless, we also wish to reiterate our concern about the importance of ensuring that these parks can be enjoyed year-round by users and that they do not become increasingly shadowed during the cold and windy winter months. The PNF shadow analysis does indicate that new shadows are cast on December 21 at 9:00 am in the Public Garden and at 3:00 pm in the Boston Common, but does not indicate the duration or the acreage covered. We request that the proponent provide time lapse analysis with area data for December 21 so that the public can evaluate the extent of shadow impact on that date. FPG 01

As we have stated in comment letters on previous development projects, we recommend that the BPDA change its scoping requirements for shadow analysis to be more consistent with the State shadow laws. We applaud the proponent for providing time lapse shadow analysis for equinox and solstice dates from 8:00 am to 2:30 pm in the PNF Appendix and would like encourage the BPDA to make this time lapse analysis a requirement of all environmental submittals along with areal extent data when new shadows are cast.

We would like to point out that in the PNF the proponents have referred to the Public Garden as the “oldest link in the co-called Emerald Necklace” (Ch. 6-4) The Boston Common is in fact the oldest park link.

Thank you for the opportunity to comment on this project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Elizabeth Vizza', with a long horizontal flourish extending to the right.

Elizabeth Vizza
Executive Director

cc: Brian Golden, Director, Boston Planning and Development Agency
Christopher Cook, Chief of Environment, Energy, and Open Space
Andrea Campbell, City Council President
Michael Flaherty, City Councilor At-Large
Ed Flynn, City Councilor
Annissa Essaibi George City Councilor At-Large
Ayanna Pressley, City Councilor At-Large
Michelle Wu, City Councilor At-Large
Josh Zakim, City Councilor
Jay Livingstone, State Representative
Aaron Michlewicz, State Representative
Byron Rushing, State Representative
Joe Boncore, State Senator
Will Brownsberger, State Senator
Greg Galer, Executive Director, Boston Preservation Alliance

FRIENDS OF THE PUBLIC GARDEN

FPG 01 The PNF does indicate that new shadows are cast on December 21 at 9:00 a.m. in the Public Garden and at 3:00 p.m. in the Boston Common, but does not indicate the duration or the acreage covered. We request that the proponent provide a time lapse analysis with the area data for December 21 so that the public can evaluate the extent of shadow impact on that date.

Additional shadow graphics showing the new shadow created by the Project on December 21 from 7:45 a.m. to 10:15 a.m. and from 1:00 p.m. to 4:00 p.m. in 15-minute increments is provided in Appendix B.

October 18, 2018

Michael Rooney, Senior Project Manager
Boston Planning and Development Agency
One City Hall Square
Boston, MA 02201

RE: Motor Mart Garage Project, 201 Stuart Street, Boston, MA 02116

Dear Mr. Rooney:

On October 10, 2018, Dave Wamester representing Boston Global Investors and the project team provided an update to the Midtown Park Plaza Neighborhood Association (MPPNA) of the Motor Mart Garage development project. This project entails redeveloping the eight-story Motor Mart garage into a mixed-use building to include basement-level retail space, new construction of 306 units within a 20-story residential tower above the existing garage with 672 parking spaces.

The members had concerns regarding the net new shadow cast on the Public Garden and Boston Common in addition to the reduction of approximately 365 parking spaces. The developer has committed to providing more in depth shadow studies.

MPPNA 01

In terms of mitigation for the Midtown Cultural District, any improvements to the public realm and pedestrian experience such as enhanced lighting, security, and reconstruction of sidewalk/streets would be welcome, as these overall improvements will help transform and beautify this part of the city.

MPPNA 02

The association, comprised of local business owners, residents, institutions and neighborhood organizations, meets monthly with Area A-1 Captain Kenneth Fong and Sergeant Stephen Moy to discuss issues affecting the quality of life for all those who work, visit or reside in the area surrounding the Theatre District located within the Midtown Cultural District.

Sincerely,

Members of the Midtown Park Plaza Neighborhood Association

MIDTOWN PARK PLAZA NEIGHBORHOOD ASSOCIATION

MMPNA 01 The members had concerns regarding the net new shadow cast on the Public Garden and Boston Common in addition to the reduction of approximately 365 parking spaces. The developer has committed to providing more in depth shadow studies.

Additional shadow studies are included in Appendix B.

The City has stated its support for the reduction in total on-site parking as part of its continuing focus to reduce parking demand and increase opportunity for shared services.

MMPNA 02 In terms of mitigation for the Midtown Cultural District, any improvements to the public realm and pedestrian experience such as enhanced lighting, security, and reconstruction of sidewalk/streets would be welcome, as these overall improvements will help transform and beautify this part of the city.

The streetscape design elements will explore a blend of Boston Complete Street guidelines with Green Building Principles to create an urban realm that is safe, resilient, functional and aesthetically pleasing.



Michael Rooney <michael.rooney@boston.gov>

Motor Mart proposal

1 message

judithkomarow [REDACTED]
To: Michael.Rooney@boston.gov

Sun, Oct 14, 2018 at 1:23 PM

Dear Mr. Rooney,

I am a 14 year resident of Bay Village. I have attended multiple meetings concerning the proposed development above the motor mart garage. As it currently stands, I am against the project.

Why am I against it? It is far, far too tall. It will over shadow Bay Village and the surrounding area. Furthermore, the design is lopsided, it covers just a portion of the current structure. The developer in my opinion is not being forth coming as to why. It is my belief that the current lease(s) prevents the developers from using the whole area at this time. And I believe that when the lease(s) expire, that the remaining area will be developed. This will result in a massive structure unsuitable for the vicinity. JK 01

In my experience, developers of large projects always ask for far more than is required to turn a profit. And honestly, I do not care about the developer's profit margin. I care about the city and my neighborhood. If the developer claims that a structure say 1/2 the size of the current plan is not feasible, then so be it. The area will be fine if the motor mart remains as it is.

As a representative of the city, residents and constituents, I sincerely hope that you will support our collective needs verses that of a profit seeking developer.

Yours truly,

Judith Komarow
Melrose Street

JK 01 It is far, far too tall. It will over shadow Bay Village and the surrounding area. Furthermore, the design is lopsided, it covers just a portion of the current structure. The developer in my opinion is not being forth coming as to why. It is my belief that the current lease(s) prevents the developers from using the whole area at this time. And I believe that when the lease(s) expire, that the remaining area will be developed. This will result in a massive structure unsuitable for the vicinity.

The Proponent only has plans to develop the Project program indicated in the Project PNF.



Michael Rooney <michael.rooney@boston.gov>

Motor Mart Garage - Comments from the Art Deco Society of Boston

1 message

Fusco & Four [REDACTED]

Thu, Oct 11, 2018 at 12:06 PM

To: michael.rooney@boston.gov

Dear Mr. Rooney --

We have not seen all of the plans for the redevelopment of this Art Deco award-winning building, but we were very concerned about a description reported in The Boston Globe that the development would "feature a new look for the concrete facade at street level."

This building, which was Boston's first large scale parking garage, and was designed in the Art Deco style, won the Boston Society of Architects' prestigious Harleston Parker Award as Boston Best Building of 1927. The redevelopment of the building in 1999 included the replacement of the original concrete facade with all details restored to their original. The building received the Art Deco Society of Boston Preservation Award in 2000.

It displays obvious Art Deco and stripped Classical elements, such as the ornaments designed as winged tires. In the lobby one can also still see Art Deco designs in the tilework. Egyptian temples had windows so that the spirit of the dead could appear to the living. Here, car headlights are allowed to appear at the Egyptian style windows—the spirit of the new "Machine Age."

This is one of Boston's most important and most intact Art Deco buildings, and we vigorously object to any changes on any of its facades that would detract from or modify the Art Deco characteristics of the building. We would also encourage the developers to utilize the Art Deco style in the lobby and common areas of their new building in order to provide a continuity of design from the past. TF 01

We also feel that the height of the building as proposed is detrimental to the Bay Village neighborhood and that it may cause additional shadow problems. The fact that the proposed structure would sacrifice 365 parking spots, with many of the remaining 1,037 parking spots undoubtedly being dedicated to residents in the 306 units, should be of huge concern to the planning board. TF 02 TF 03

Tony Fusco, President, Art Deco Society of Boston
617-363-0405

--

8 Allenwood Street
Boston, MA 02132

[REDACTED]
artdecoboston.org

TF 01 This is one of Boston's most important and most intact Art Deco buildings, and we vigorously object to any changes on any of its facades that would detract from or modify the Art Deco characteristics of the building. We would also encourage the developers to utilize the Art Deco style in the lobby and common areas of their new building in order to provide a continuity of design from the past.

The design team will investigate further as design progresses.

TF 02 We also feel that the height of the building as proposed is detrimental to the Bay Village neighborhood and that it may cause additional shadow problems.

Section 3.2 of the Project PNF provided shadow studies for the four seasons at 9:00 am, noon and 3:00 pm and at 6:00 pm for the summer solstice and fall equinox. As can be seen in these shadow studies, new shadows from the Project travel from the west to the east as the day progresses. The Bay Village neighborhood is located immediately to the south of the Project Site, and the Project will not cast new shadows on the neighborhood.

TF 03 The fact that the proposed structure would sacrifice 365 parking spots, with many of the remaining 1,037 parking spots undoubtedly being dedicated to residents in the 306 units, should be of huge concern to the planning board.

The City has stated its support for the reduction in total on-site parking as part of its continuing focus to reduce parking demand and increase opportunity for shared services.



MORIARTY TROYER & MALLOY LLC
ATTORNEYS AT LAW

Thomas O. Moriarty
Direct Dial: [REDACTED]
Admitted in MA

VIA ELECTRONIC SUBMISSION

October 9, 2018

Michael Rooney, Project Manager
Boston Planning & Development Agency
One City Hall, Ninth Floor
Boston, MA 02201

RE: MOTOR MART GARAGE PNF

Dear Director Golden and Project Manager Rooney:

I am writing on behalf of the Board of Directors of the One Charles Condominium ("One Charles"), an abutter to the Motor Mart Garage, with comments and concerns about the September 2018 Project Notification Form Filed (the "Proposed Project").

One Charles is a 17-story condominium with 235 residential units as well as commercial space that abuts the Proposed Project to the east. The unit owners are a vibrant mix of singles, couples and families many of whom work in Boston, send their children to Boston schools and invest in the neighborhood through social and civic participation. One Charles and its neighbors have the unique position of sitting at the intersection of the historic Back Bay, Bay Village and Theatre District neighborhoods and near the Public Gardens and Commons.

One Charles appreciates the opportunity to offer comments on the Proposed Project and participate in the planning process. One Charles, together with its experts, have identified the following concerns, which require further study and consideration, to fully evaluate the Proposed Project's compliance with applicable zoning and regulatory requirements as well as its impact on surrounding neighbors.

PROPOSED PROJECT ZONING CONCERNS

The Proposed Project will require zoning relief from the Board of Zoning Appeals. The Proposed Project will require a dimensional variance, along with other approvals. Furthermore, only some of the proposed uses, that of the upper floors, is permitted as of right, the first floor uses will require a conditional use permit.

Dimensional Requirements

The Proposed Project exceeds the dimensional requirements of the Boston Zoning Code. The Project Site is located within the Midtown Cultural District ("MCD") and, as such, is governed by Article 38 of the Boston Zoning Code (the "Code"). The Project Site is also located within the

Groundwater Conservation Overlay District (“GCOD”) governed by Article 32 of the Code and the Restricted Parking Overlay District (“RPOD”) governed by Article 3 of the Code.

For Projects subject to Large Project Review, Article 38 of the Code sets a maximum building height of 155 feet and a maximum floor area ratio (“FAR”) of 10.0. Section 38-19 of the Code also establishes specific design requirements relating to street wall continuity, street wall height, sky plan setbacks, display windows, and maximum floor plates above a building height of 125 feet. The following are the Proposed Projects dimensions, as submitted in the PNF:

Proposed Project Dimensions:		
Project Element	Existing Dimension	Proposed Dimension
Residential	None	306 units
Commercial	50,712 sf	46,000 sf
Total Square Footage	421,000 sf	685,000 sf
Zoning Height	93 feet	310 feet
Parcel Area	52,323 sf	52,323 sf
FAR	8.0	13.1

Since the Proposed Project FAR (13.1) will exceed the maximum allowed (10.0) and Proposed Project height (310’) exceeds the allowed (155’), whether under the District requirements or Large Project status, variances will be required.

Proposed Uses

Only certain proposed uses under the Proposed Project are permitted as a matter of right. The Proposed Project will include upper-floor multifamily dwelling use (with accessory parking), general retail use, and restaurant use. The Proposed Project also proposes ground floor retail uses, commercial parking and parking accessory to retail and restaurant uses. The upper floor uses would appear to be permitted as of right, but the first floor uses and any proposed parking usage would be conditional uses—either under the applicable Midtown Cultural District zoning or under the Restricted Parking Overlay District requirements. Therefore, the Proposed Project proponent will need to obtain conditional use permits.

Other Zoning/Relief

The Proposed Project is also subject to a series of city agency approvals (from Civic Design Commission, Transportation Department, Sewer & Water, Public Works, Parks Department, Public Safety, Fire Department, Inspectional Services, Parks and Recreation and Air Pollution Control Commission) as well as state and federal agencies (MWRA, FAA).

PROPOSED PROJECT IMPACT CONCERNS

Shadows

The PNF's shadow analysis is incomplete to evaluate the full scope of the Proposed Project's impact. The shadow impact analysis presents a very limited snapshot; it looks only at shadows created on 4 days in a given year and does not include an analysis of shadow impact on neighboring buildings. The shadow analysis focuses on nearby open spaces, sidewalks and bus stops; it does not, for example, look at the shadow impact on One Charles, the Park Plaza or The Four Seasons Residences, though all are likely to be impacted. The Public Garden Shadow Analysis shows, without much detail, that there will be significant new shadows on One Charles in the afternoon at multiple times during the year. This requires further investigation and study. One Charles respectfully requests that the BPDA require the proponent to perform a total shadow path analysis on neighboring buildings, including One Charles, so that it can more fully evaluate the shadow impact associated with the Proposed Project. MTM 01

Solar Glare

There is significant risk of solar and thermal impacts on One Charles and adjacent buildings that should be studied. The PNF concludes that no solar impact is anticipated. The proponent reaches this conclusion, however, without having identified the Proposed Project's window glass and other building façade materials, which will dictate the nature of the solar and thermal impacts. Once the Proposed Project selects these materials, the BPDA should require a Solar Glare Study MTM 02 to fully evaluate reflection and resulting visual glare impacts on adjacent residential buildings (including One Charles), pedestrians, drivers and open spaces (including Statler Park and the Public Garden). The BPDA should also require an analysis of any associated thermal impact, MTM 03 including solar heat build-up.

Wind

The proponent's PNF, using RWDI's model, concluded that the anticipated impact of the Proposed Project on wind at pedestrian level will be minimal. The wind modeling did not consider whether the new tower, rising out of a portion of the 8-story garage, and creating a new vertical plane, would change the wind direction or velocity experienced at 8-9 floors above ground level. A change in direction and/or velocity of wind at this level could greatly impact the ability of neighboring residents to comfortably open windows and use outdoor spaces above pedestrian level. One Charles requests that the BPDA require a wind study at or above the MTM 04 current garage height to fully evaluate any wind impacts of the Proposed Project.

Historic and Architectural Character

Article 80 requires new projects to observe the historical and architectural character of the neighborhood. The Proposed Project would include a 310-foot tower. To justify the proposed height, the proponent largely points to hotels and office towers in the high spine, which are not immediately adjacent, including the W Hotel, Liberty Mutual Building, and Old John Hancock Building. The proposed 28-story tower at 310 feet is disproportionate to the adjacent residential and historic buildings, including One Charles (17 stories at ~179'); Four Seasons Residences (16 stories at ~170'); the Park Plaza (15 stories ~154') and 100 Arlington (15 stories at ~155'). The Proposed Project even exceeds the approved tower across the street at 212-222 Stuart by 110 feet (approved at 19 stories at 200'). One Charles submits for the BPDA's consideration and additional review that the proposed height (which will require a dimensional variance) does not relate well to the existing residential and historic buildings in the immediate area and should similarly conform.

It is also important that, as the building façade materials are finalized, they include the color or type of materials in character with other adjacent buildings. Many of the neighboring buildings prominently feature brick (One Charles; Four Seasons; State Transportation Building) or stone (Park Plaza; 100 Arlington; Emerson Buildings) and the Proposed Project should similarly include elements that maintain the architectural style and character of the neighborhood.

MTM 05

Noise

The Proposed Project contemplates that major mechanical elements servicing the building will be located on the roof, in 20' high mechanical enclosures, (approx. 9 floors up) next to One Charles. These major mechanical systems will cause both continuous exterior noise as well as cyclical noise. The BPDA should require the proponent to consider an alternate location, away from residences, for these systems, including a mechanical system penthouse or placement on the rooftop of the tower. If there is no other viable location, the Proposed Project plan must detail appropriate efforts to mitigate mechanical system noise. The plan must provide that the cyclical noise from fans, heating/cooling and exhaust systems will be at a decibel below that which is required by the City of Boston Ordinance, as cyclical noise will have a greater disruptive impact on adjacent neighbors. The proponent should also take other steps to mitigate noise as may be appropriate so that the timing and use of systems is designed to have the least disruptive impact. Furthermore, if the mechanical system remains in the present, proposed location, the enclosure should use materials (such as screening) agreed upon by One Charles. Finally, the proponent should have a post-construction noise monitoring program in place.

MTM 06

MTM 07

MTM 08

MTM 09

MTM 10

Use Restrictions

The PNF calls for retail space on the first floor. As a conditional use, there should be reasonable restrictions placed on the type of retail business to ensure that those businesses fit the character of the neighborhood and do not pose a noise or safety risk to immediate neighbors.

MTM 11

Additionally, the PNF calls for amenity space for the residential units on the top of the garage, a portion of which will face nearby residences. There should be appropriate restrictions on the noise and light which these facilities can emanate.

Transportation – Existing Intersection Conditions

The PNF transportation analysis does not account for the existing congestion in and around the Columbus Avenue/Eliot Street/Motor Mart Garage Driveway caused by the Park Plaza loading dock located nearby. The use of the loading dock frequently results in congestion as do the queued and double-parked cars of Park Plaza hotel guests. This back-up can often make it difficult for One Charles residents to exit the garage and proceed onto Columbus Avenue. Further study is warranted how additional traffic will impact the congestion from the loading dock and queued cars around the Park Plaza.¹

MTM 12

The PNF transportation analysis also does not consider the additional pedestrian traffic at the un-signalized intersections. An additional 306 residences in this location will create additional foot traffic, but the Columbus Ave/Eliot Street/Motor Mart Garage Driveway is un-signalized and has no crosswalk and the Park Plaza/Columbus Avenue intersection (located in close proximity) is also un-signalized and features two cross-walks and a diagonal cross-walk. Further study is warranted to ensure pedestrian safety of neighboring residents and new residents. It would also assist vehicle traffic to contemplate better signage and/or signals where pedestrian traffic may lawfully cross.

MTM 13

We note, too, that it is likely that existing congestion in this and surrounding areas will only increase as the BPDA has approved other projects along Stuart Street, including at 212-222 Stuart, 380 Stuart and 40 Trinity Place (426 Stuart), which will likely contribute to traffic flow in and around the area. For this additional reason, further study of the impact on traffic and intersection conditions around the Proposed Project is warranted.

MTM 14

¹ At an earlier IAG meeting, the City of Boston discussed bike racks and the activation and/or creation of bike lanes in the project vicinity. The PNF's discussion of transportation impacts does not contemplate the addition of a bike lane in the vicinity. One Charles requests further transportation study as the result of a bike line or other bike facilities.

Transportation – Vehicle Staging/Temporary Vehicles

According to the PNF, the project contemplates that there will be one entrance on Stuart Street (for apartment tenants) and another on Church Street (for condominium owners). The PNF does not adequately account for temporary parking on these two streets. In a building with over 300 units, there will be a high demand for ride-sharing services and delivery services that will park directly outside these entrances. Ride sharing services continue to expand rapidly in Boston and the use of delivery services has expanded from traditional USPS, UPS and Fed-Ex deliveries which were once or twice daily, to also include countless deliveries of groceries, meals, flowers and laundry. On top of this, the Proposed Project can reasonably expect to have a sizable number of building and unit vendors, including utility services, cable services, house cleaning, pet care, etc. There will also be resident vehicles loading and unloading prior to garage entry based upon the current configuration. One Charles requests that the BDPA require the proponent to study whether this type of staging and temporary parking can be mitigated by a design that allows for all temporary parking and passenger loading and unloading to be accommodated entirely within the garage. MTM 15

Monitoring Program

The Proposed Project site is in very close proximity to One Charles. To prevent and mitigate any adverse construction impacts upon One Charles the Proposed Project's Monitoring Program and Pre-Construction Survey (PCS) should include the One Charles perimeter wall in addition to a topical exterior survey. A complete copy of the PCS should be provided to One Charles in electronic format for review and further comment. The Monitoring Program should also include noise and vibration monitoring, including reasonable sensors at One Charles, and One Charles should retain rights to review the Monitoring Plan. MTM 16 MTM 17

Construction Management Plan

Development projects have significant construction impacts on their neighbors. There needs to be additional mitigation steps to strike a balance between construction-related inconveniences with the daily activities that will occur adjacent to the Proposed Project site. Furthermore, it is imperative that the Construction Management Plan take into account the construction schedule for the 212-222 Stuart Street tower, located directly across Stuart Street, which is likely to break ground in the near future.

A detailed approach to construction management must be included in the DPIR. One Charles requests that the Construction Management Plan include, at a minimum: MTM 18

- Construction vehicles must not in any way block access to, or materially impair use of, the One Charles garage, porte cochere, or loading dock.

- No construction staging may be allowed in the area outside of the One Charles garage, porte cochere or loading dock that would impede or impair entry or exit or use of these areas by One Charles residents and guests.
- Construction must not impede emergency vehicle access to One Charles.
- Construction must not impede service access to and around One Charles, including sanitation pick-up, grease trap access, etc.
- Proponent must provide a full-time traffic control manager stationed in the area during any time that activity will, or foreseeably may impact One Charles. One Charles will determine if it is being impacted.
- A TAPA agreement that considers current construction and approved projects. Stuart Street is a major thoroughfare (classified as an urban principal arterial under BTDA jurisdiction), carrying traffic to and from downtown. Over the past few years, the BPDA has approved several projects along Stuart Street, all within 4 blocks, including: 40 Trinity Place (426 Stuart), 380 Stuart and 212-222 Stuart (directly across from the Proposed Project). If there is concurrent construction, it is imperative that the proponent with BTDA form a comprehensive traffic plan to minimize traffic flow disruption for neighbors, commuters and visitors.

Neighborhood Safety

One Charles would like to see the entirety of the Proposed Project, during and post-construction, take into account neighborhood safety. One Charles has raised some of this in other areas of concern (construction management, for example), but it is sufficiently important to stand alone and should be built into the plans for the project with greater intention. The project proposal should include additional details on site and adjacent lighting, security systems, signage, safety personnel and guards to be employed at all stages, and a point of contact for all safety concerns. MTM 19

Run-Off

One Charles is concerned that the PNF calls for tabling on Church Street and flush walkways to Statler Park that may cause run-off or water to pool in the area. One Charles requests that there be further study on the proposed plans to address and mitigate this concern. MTM 20

Water-Sewer

The PNF does not contain enough detail for One Charles to comment on the proposed water-sewer connections for the project including, critically, location and capacity. One Charles requests that the BPDA require the proponent to provide further information. MTM 21

Michael Rooney, Project Manager
Boston Planning and Development Agency
October 9, 2018
Page 8

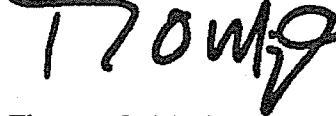
Public Benefits

The PNF does not describe in detail any neighborhood specific investments in infrastructure, improvements or programs. One Charles looks forward to hearing more about any public benefits or cooperation agreements reached with the proponent to invest in the immediate area. MTM 22

One Charles welcomes the opportunity to discuss these concerns with the BPDA and the Proposed Project proponent. One Charles respectfully requests that the BPDA require further study of certain impact areas as set forth above and require a detailed technical analysis of the projects impacts through the submission of a DPIR. One Charles does not waive any rights in connection with the Proposed Project, including, without limitation, to oppose the Proposed Project based on impacts and analysis not set forth herein or to request that the proponent modify the size, mass or design or take other measures to mitigate its impact.

Sincerely,

MORIARTY TROYER & MALLOY LLC

A handwritten signature in black ink, appearing to read 'TOM', with a stylized flourish at the end.

Thomas O. Moriarty

cc: Board of Directors of One Charles

MTM 01The shadow impact analysis presents a very limited snapshot; it looks only at shadows created on 4 days in a given year and does not include an analysis of shadow impact on neighboring buildings. The shadow analysis focuses on nearby open spaces, sidewalks and bus stops; it does not, for example, look at the shadow impact on One Charles, the Park Plaza or The Four Seasons Residences, though all are likely to be impacted.... One Charles respectfully requests that the BPDA require the proponent to perform a total shadow path analysis on neighboring buildings, including One Charles, so that it can more fully evaluate the shadow impact associated with the Proposed Project.

As outlined in the BPDA's Development Review Guidelines, studies were conducted for the four seasons at 9:00 am, noon and 3:00 pm and at 6:00 pm for the summer solstice and fall equinox. Also as described in the Development Review Guidelines and as noted above, the shadows focused on nearby open spaces, sidewalks, and bus stops.

MTM 02 Once the Proposed Project selects these materials [window glass and other building façade materials], the BPDA should require a Solar Glare Study to fully evaluate reflection and resulting visual glare impacts on adjacent residential buildings (including One Charles), pedestrians, drivers and open spaces (including Statler Park and the Public Garden).

A solar glare analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.

MTM 03 The BPDA should also require an analysis of any associated thermal impact, including solar heat build-up.

A solar heat gain analysis was conducted by RWDI. A summary of the results is provided in Section 3.2, and the detailed analysis is provided in Appendix C.

MTM 04 The proponent's PNF, using RWDI's model, concluded that the anticipated impact of the Proposed Project on wind at pedestrian level will be minimal. The wind modeling did not consider whether the new tower, rising out of a portion of the 8-story garage, and creating a new vertical plane, would change the wind direction or velocity experienced at 8-9 floors above ground level. A change in direction and/or velocity of wind at this level could greatly impact the ability of neighboring residents to comfortably open windows and use outdoor spaces above pedestrian level. One Charles requests that the BPDA require a wind study at or above the current garage height to fully evaluate any wind impacts of the Proposed Project.

The pedestrian wind assessment included in the PNF was conducted in accordance with Article 80 Large Project Review requirements.

MTM 05 It is also important that, as the building façade materials are finalized, they include the color or type of materials in character with other adjacent buildings. Many of the neighboring buildings prominently feature brick (One Charles; Four Seasons; State Transportation Building) or stone (Park Plaza; 100 Arlington; Emerson Buildings) and the Proposed Project should similarly include elements that maintain the architectural style and character of the neighborhood.

This will be investigated as the design progresses.

MTM 06 The Proposed Project contemplates that major mechanical elements servicing the building will be located on the roof, in 20' high mechanical enclosures, (approx. 9 floors up) next to One Charles. These major mechanical systems will cause both continuous exterior noise as well as cyclical noise. The BPDA should require the proponent to consider an alternate location, away from residences, for these systems, including a mechanical system penthouse or placement on the rooftop of the tower.

Placing the mechanical units at the top of the tower building would require additional height to the tower, which would create additional shadows on the Public Garden and Boston Common as well as other public areas.

MTM 07 If there is no other viable location, the Proposed Project plan must detail appropriate efforts to mitigate mechanical system noise. The plan must provide that the cyclical noise from fans, heating/cooling and exhaust systems will be at a decibel below that which is required by the City of Boston Ordinance, as cyclical noise will have a greater disruptive impact on adjacent neighbors.

See response to DKM 02.

MTM 08 The proponent should also take other steps to mitigate noise as may be appropriate so that the timing and use of systems is designed to have the least disruptive impact.

See response to PL 02.

MTM 09 Furthermore, if the mechanical system remains in the present, proposed location, the enclosure should use materials (such as screening) agreed upon by One Charles.

The mechanical well will be enclosed with the same architectural building envelope as the rest of the building.

MTM 10 Finally, the proponent should have a post-construction noise monitoring program in place.

A sound level assessment was conducted as part of the Project Notification Form. The Project will be required to comply with the City of Boston noise ordinance and noise regulations. See Section 3.10.1 of the Project PNF.

MTM 11 The PNF calls for retail space on the first floor. As a conditional use, there should be reasonable restrictions placed on the type of retail business to ensure that those businesses fit the character of the neighborhood and do not pose a noise or safety risk to immediate neighbors. The PNF calls for amenity space for the residential units on the top of the garage, a portion of which will face nearby residences. There should be appropriate restrictions on the noise and light which these facilities can emanate.

The Proponent agrees that all future retail spaces should fit in with the character of the neighborhood and comply with all local and state regulations. As part of the building's management program the amenity deck will be managed in accordance with a first-class residential building with appropriate restrictions on noise and light.

MTM 12 The PNF transportation analysis does not account for the existing congestion in and around the Columbus Avenue/Eliot Street/Motor Mart Garage Driveway caused by the Park Plaza loading dock located nearby. The use of the loading dock frequently results in congestion as do the queued and double-parked cars of Park Plaza hotel guests. This back-up can often make it difficult for One Charles residents to exit the garage and proceed onto Columbus Avenue. Further study is warranted how additional traffic will impact the congestion from the loading dock and queued cars around the Park Plaza.

See Section 2.7, Columbus Avenue Circulation, for supplemental information on Columbus Avenue truck volumes. The Project team is coordinating with BTD staff to review potential bicycle connections along Columbus Avenue adjacent to the Project Site and continues to work on developing a concept plan to accommodate a bicycle connection. A goal of the plan is to better delineate areas for all appropriate curbside uses.

MTM 13 An additional 306 residences in this location will create additional foot traffic, but the Columbus Ave/Eliot Street/Motor Mart Garage Driveway is un-signalized and has no crosswalk and the Park Plaza/Columbus Avenue intersection (located in close proximity) is also un-signalized and features two cross-walks and a diagonal cross-walk. Further study is warranted to ensure pedestrian safety of neighboring residents and new residents. It would also assist vehicle traffic to contemplate better signage and/or signals where pedestrian traffic may lawfully cross.

While approximately 306 residential units will be added, the Project also includes removal of approximately 365 public parking spaces and reduction in commercial (restaurant/retail) space. The removal of these program uses causes an incremental reduction in vehicle, transit, and pedestrian trips. The overall impact to pedestrian activity in the study is expected to be minimal. Also see Section 2.4.7, Project Trip Generation.

- MTM 14** We note, too, that it is likely that existing congestion in this and surrounding areas will only increase as the BPDA has approved other projects along Stuart Street, including at 212-222 Stuart, 380 Stuart and 40 Trinity Place (426 Stuart), which will likely contribute to traffic flow in and around the area. For this additional reason, further study of the impact on traffic and intersection conditions around the Proposed Project is warranted.

The Project's transportation impact evaluation properly followed guidelines per the Boston Transportation Department. Projected traffic volumes from other approved developments in the area have been included in the future year analysis.

- MTM 15** According to the PNF, the project contemplates that there will be one entrance on Stuart Street (for apartment tenants) and another on Church Street (for condominium owners). The PNF does not adequately account for temporary parking on these two streets. In a building with over 300 units, there will be a high demand for ride-sharing services and delivery services that will park directly outside these entrances. Ride sharing services continue to expand rapidly in Boston and the use of delivery services has expanded from traditional USPS, UPS and Fed-Ex deliveries which were once or twice daily, to also include countless deliveries of groceries, meals, flowers and laundry. On top of this, the Proposed Project can reasonably expect to have a sizable number of building and unit vendors, including utility services, cable services, house cleaning, pet care, etc. There will also be resident vehicles loading and unloading prior to garage entry based upon the current configuration. One Charles requests that the BDPA require the proponent to study whether this type of staging and temporary parking can be mitigated by a design that allows for all temporary parking and passenger loading and unloading to be accommodated entirely within the garage.

The current plan is to have one on-street lobby entrance for all residential tenants of the building on Church Street. Activity related to taxi, uber, and Lyft services will be accommodated both curbside on Church Street and in the garage. Also see Section 2.4.2, Loading and Service Accommodation, for more information on deliveries.

- MTM 16** The Proposed Project site is in very close proximity to One Charles. To prevent and mitigate any adverse construction impacts upon One Charles the Proposed Project's Monitoring Program and Pre-Construction Survey (PCS) should include the One

Charles perimeter wall in addition to a topical exterior survey. A complete copy of the PCS should be provided to One Charles in electronic format for review and further comment.

The Proponent will conduct a pre-construction condition survey (PCS) of the exterior perimeter wall. The PCS will include documentation of sidewalk area conditions. A copy of the PCS will be provided to One Charles. Monitoring points will be installed on the south wall. Baseline measurements will be obtained prior to start of construction.

- MTM 17** **The Monitoring Program should also include noise and vibration monitoring, including reasonable sensors at One Charles, and One Charles should retain rights to review the Monitoring Plan.**

The monitoring plan will be developed during subsequent design phases and provided for review. The program will include noise and vibration monitoring.

- MTM 18** **A detailed approach to construction management must be included in the DPIR.**

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

- MTM 19** **The project proposal should include additional details on site and adjacent lighting, security systems, signage, safety personnel and guards to be employed at all stages, and a point of contact for all safety concerns.**

A complete Construction Management Plan will be developed and must be approved by the City prior to the commencement of construction. A point of contact and cell number will be provide to all neighboring buildings during construction.

- MTM 20** **One Charles is concerned that the PNF calls for tabling on Church Street and flush walkways to Statler Park that may cause run-off or water to pool in the area. One Charles requests that there be further study on the proposed plans to address and mitigate this concern.**

The Project will work to improve existing drainage conditions and provide solutions at all proposed work areas, including locations that call for tabling and/or flush walkways.

MTM 21 The PNF does not contain enough detail for One Charles to comment on the proposed water-sewer connections for the project including, critically, location and capacity. One Charles requests that the BPDA require the proponent to provide further information.

The Proponent has provided the necessary information to the Boston Water and Sewer Commission (BWSC) to conduct an analysis and determine if the existing sewer and water infrastructure networks have sufficient capacity and are in working condition to support the addition of the Project. BWSC has not indicated to the Proponent that there are capacity concerns.

MTM 22 The PNF does not describe in detail any neighborhood specific investments in infrastructure, improvements or programs. One Charles looks forward to hearing more about any public benefits or cooperation agreements reached with the proponent to invest in the immediate area.

The community benefits to be provided by the Proponent will be determined as part of the review process.

Motor Mart Garage Public Comments submitted via website 2018-10-19

Date	First Name	Last Name	Organization	Opinion	Comments	
10/7/2018	Pawel	Latawiec		Support	I am writing in strong support of the Motor Mart garage project. The proponents have crafted an engaging proposal which both preserves and elevates the historic architecture, adapts its use toward modern needs, and meaningfully contributes to the Mayor's (and greater Boston area's) revised 2030 housing goals. I appreciate the conversion of places for cars to homes for people. Furthermore, the project site is a prime location for denser development, as it can reduce gentrification pressures in other neighborhoods. Any reduction in massing or number of units should not be considered.	PL 01
10/11/2018	Maggie	Peatridge	None	Neutral	Are there plans to temporarily close or relocate the existing restaurant tenants? I notice the new plan has a sketch of a market in the space that maggianos little Italy is relocated.	MP 01
10/11/2018	Tony	Fusco	Art Deco Society of Boston	Oppose	We have not seen all of the plans for the redevelopment of this Art Deco award-winning building, but we were very concerned about a description reported in The Boston Globe that the development would "feature a new look for the concrete facade at street level." This building, which was Boston's first large scale parking garage, and was designed in the Art Deco style, won the Boston Society of Architects' prestigious Harleston Parker Award as Boston Best Building of 1927. The redevelopment of the building in 1999 included the replacement of the original concrete facade with all details restored to their original. The building received the Art Deco Society of Boston Preservation Award in 2000. It displays obvious Art Deco and stripped Classical elements, such as the ornaments designed as winged tires. In the lobby one can also still see Art Deco designs in the tilework. Egyptian temples had windows so that the spirit of the dead could appear to the living. Here, car headlights are allowed to appear at the Egyptian style windows?the spirit of the new "Machine Age." This is one of Boston's most important and most intact Art Deco buildings, and we vigorously object to any changes on any of its facades that would detract from or modify the Art Deco characteristics of the building. We would also encourage the developers to utilize the Art Deco style in the lobby and common areas of their new building in order to provide a continuity of design from the past. We also feel that the height of the building as proposed is detrimental to the Bay Village neighborhood and that it may cause additional shadow problems. The fact that the proposed structure would sacrifice 365 parking spots, with many of the remaining 1,037 parking spots undoubtedly being dedicated to residents in the 306 units, should be of huge concern to the planning board. Tony Fusco, President, Art Deco Society of Boston 617-363-0405	
10/17/2018	Kingsley	Osias	Employed	Support	What are the plans for the current businesses there now? Are there any plans to keep any of the current businesses? Will they need to be closed during construction? Timeline? - So we can plan accordingly, please and thank you.	KO 01
10/18/2018	Bethany	Patten	Bay Village Neighborhood Association	Neutral	Because the developers have not come to the neighborhood association since filing their more detailed project plan, the BVNA have not voted. However, our concerns are: (1) Traffic impacts on Stuart Church and Columbus; (2) Security Cameras hooked into the BPD system; (3) Height/shadow impact; (4) Mechanicals on the roof effecting 1 Charles. We will write a letter outlining these concerns, and reserving our right to comment as more info is available.	BVNA 01 BVNA 02 BVNA 03 BVNA 04

PL 01 Strong support of the Motor Mart garage project.

Thank you for your support.

MP 01 Are there plans to temporarily close or relocate the existing restaurant tenants? I notice the new plan has a sketch of a market in the space that maggianos little Italy is relocated.

It is anticipated that construction of the new tower will require that the majority of existing retail tenants will need to close during construction. The Proponent is currently in discussions with each of the retail/restaurant tenants and will keep the neighborhood apprised of the anticipated construction/development schedule.

KO 01 What are the plans for the current businesses there now? Are there any plans to keep any of the current businesses? Will they need to be closed during construction? Timeline? - So we can plan accordingly, please and thank you.

It is anticipated that construction of the new tower will require that the majority of existing retail tenants will need to close during construction. The Proponent is currently in discussions with each of the retail tenants and will keep the neighborhood apprised of the anticipated construction/development schedule.

BETHANY PATTEN, BAY VILLAGE NEIGHBORHOOD ASSOCIATION

BVNA 01 Traffic impacts on Stuart Church and Columbus.

A full traffic impact study was provided in the Project PNF including intersections along Stuart Street, Church Street, and Columbus Avenue. Additional analysis is provided in Section 2.5, Traffic Capacity Analysis.

BVNA 02 Security Cameras hooked into the BPD system.

Following meetings at the Midtown Park Plaza Neighborhood Association the development team had conversations with Captain Kenneth Fong of the Boston Police Department about the BPD neighborhood camera project. The development team will follow up and looks forward to participating in the program along with other property owners.

BVNA 03 Height/shadow impact.

Additional shadow studies as requested by the BPDA are provided in Appendix B.

BVNA 04 Mechanicals on the roof effecting 1 Charles.

See previous response to DKM 02.

Appendix A

Transportation

APPENDIX A – TRANSPORTATION APPENDIX

A1 – Detailed Traffic Counts

A2 – MassDOT Weekday Seasonal Adjustment Factors

A3 – Detailed Trip Generation Calculations

A4 – Synchro Analysis

APPENDIX A1 – Detailed Traffic Counts

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 1

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

Groups Printed- Cars - Trucks

	Arlington St From North			Boylston St From East			Arlington St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	87	201	0	0	0	0	0	0	0	0	65	35	388
07:15 AM	96	204	0	0	0	0	0	0	0	0	69	19	388
07:30 AM	112	247	0	0	0	0	0	0	0	0	92	23	474
07:45 AM	130	252	0	0	0	0	0	0	0	0	100	27	509
Total	425	904	0	0	0	0	0	0	0	0	326	104	1759
08:00 AM	158	256	0	0	0	0	0	0	0	0	97	31	542
08:15 AM	128	300	0	0	0	0	0	0	0	0	96	25	549
08:30 AM	131	249	0	0	0	0	0	0	0	0	100	38	518
08:45 AM	134	235	0	0	0	0	0	0	0	0	100	39	508
Total	551	1040	0	0	0	0	0	0	0	0	393	133	2117
Grand Total	976	1944	0	0	0	0	0	0	0	0	719	237	3876
Apprch %	33.4	66.6	0	0	0	0	0	0	0	0	75.2	24.8	
Total %	25.2	50.2	0	0	0	0	0	0	0	0	18.6	6.1	
Cars	967	1921	0	0	0	0	0	0	0	0	669	209	3766
% Cars	99.1	98.8	0	0	0	0	0	0	0	0	93	88.2	97.2
Trucks	9	23	0	0	0	0	0	0	0	0	50	28	110
% Trucks	0.9	1.2	0	0	0	0	0	0	0	0	7	11.8	2.8

Accurate Counts

978-664-2565

File Name : 17034001

Site Code : 17034001

Start Date : 11/30/2017

Page No : 2

N/S Street : Arlington Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

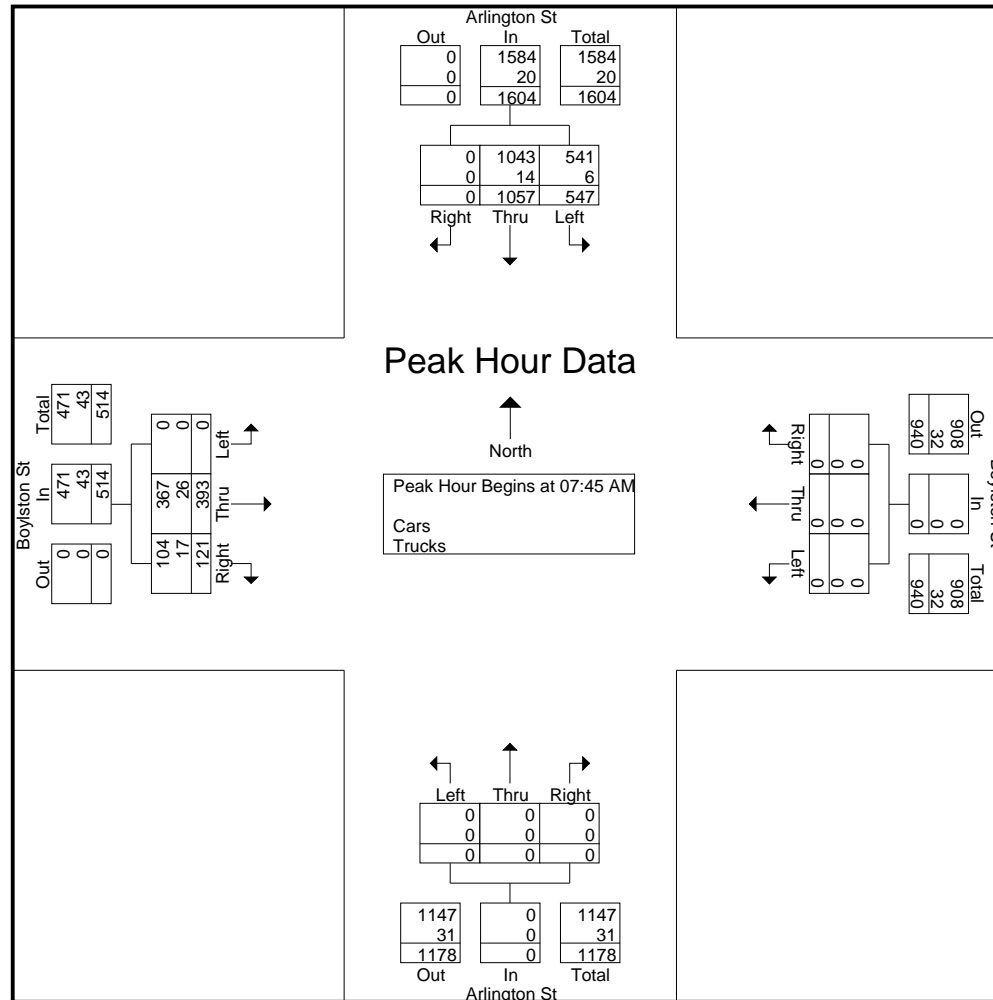
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	130	252	0	382	0	0	0	0	0	0	0	0	0	100	27	127	509
08:00 AM	158	256	0	414	0	0	0	0	0	0	0	0	0	97	31	128	542
08:15 AM	128	300	0	428	0	0	0	0	0	0	0	0	0	96	25	121	549
08:30 AM	131	249	0	380	0	0	0	0	0	0	0	0	0	100	38	138	518
Total Volume	547	1057	0	1604	0	0	0	0	0	0	0	0	0	393	121	514	2118
% App. Total	34.1	65.9	0		0	0	0		0	0	0		0	76.5	23.5		
PHF	.866	.881	.000	.937	.000	.000	.000	.000	.000	.000	.000	.000	.000	.983	.796	.931	.964
Cars	541	1043	0	1584	0	0	0	0	0	0	0	0	0	367	104	471	2055
% Cars	98.9	98.7	0	98.8	0	0	0	0	0	0	0	0	0	93.4	86.0	91.6	97.0
Trucks	6	14	0	20	0	0	0	0	0	0	0	0	0	26	17	43	63
% Trucks	1.1	1.3	0	1.2	0	0	0	0	0	0	0	0	0	6.6	14.0	8.4	3.0

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 3

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



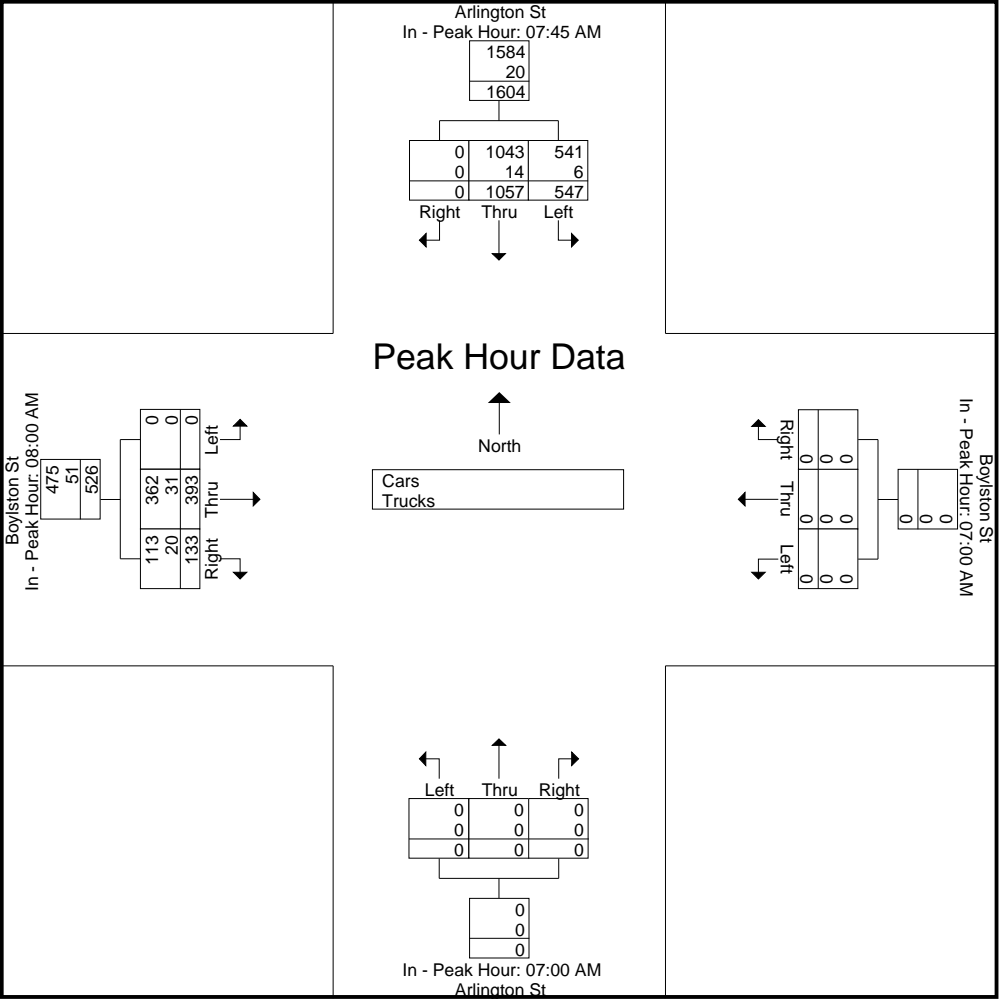
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				08:00 AM			
+0 mins.	130	252	0	382	0	0	0	0	0	0	0	0	0	97	31	128
+15 mins.	158	256	0	414	0	0	0	0	0	0	0	0	0	96	25	121
+30 mins.	128	300	0	428	0	0	0	0	0	0	0	0	0	100	38	138
+45 mins.	131	249	0	380	0	0	0	0	0	0	0	0	0	100	39	139
Total Volume	547	1057	0	1604	0	0	0	0	0	0	0	0	0	393	133	526
% App. Total	34.1	65.9	0		0	0	0		0	0	0		0	74.7	25.3	

Accurate Counts
978-664-2565

PHF	.866	.881	.000	.937	.000	.000	.000	.000	.000	.000	.000	.000	.000	.983	.853	.946
Cars	541	1043	0	1584	0	0	0	0	0	0	0	0	0	362	113	475
% Cars	98.9	98.7	0	98.8	0	0	0	0	0	0	0	0	0	92.1	85	90.3
Trucks	6	14	0	20	0	0	0	0	0	0	0	0	0	31	20	51
% Trucks	1.1	1.3	0	1.2	0	0	0	0	0	0	0	0	0	7.9	15	9.7



Accurate Counts

978-664-2565

File Name : 17034001

Site Code : 17034001

Start Date : 11/30/2017

Page No : 5

N/S Street : Arlington Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Cars

	Arlington St From North			Boylston St From East			Arlington St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	86	196	0	0	0	0	0	0	0	0	60	33	375
07:15 AM	96	202	0	0	0	0	0	0	0	0	65	17	380
07:30 AM	110	246	0	0	0	0	0	0	0	0	89	23	468
07:45 AM	127	245	0	0	0	0	0	0	0	0	93	23	488
Total	419	889	0	0	0	0	0	0	0	0	307	96	1711
08:00 AM	157	253	0	0	0	0	0	0	0	0	89	26	525
08:15 AM	126	297	0	0	0	0	0	0	0	0	88	23	534
08:30 AM	131	248	0	0	0	0	0	0	0	0	97	32	508
08:45 AM	134	234	0	0	0	0	0	0	0	0	88	32	488
Total	548	1032	0	0	0	0	0	0	0	0	362	113	2055
Grand Total	967	1921	0	0	0	0	0	0	0	0	669	209	3766
Apprch %	33.5	66.5	0	0	0	0	0	0	0	0	76.2	23.8	
Total %	25.7	51	0	0	0	0	0	0	0	0	17.8	5.5	

Accurate Counts
978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 6

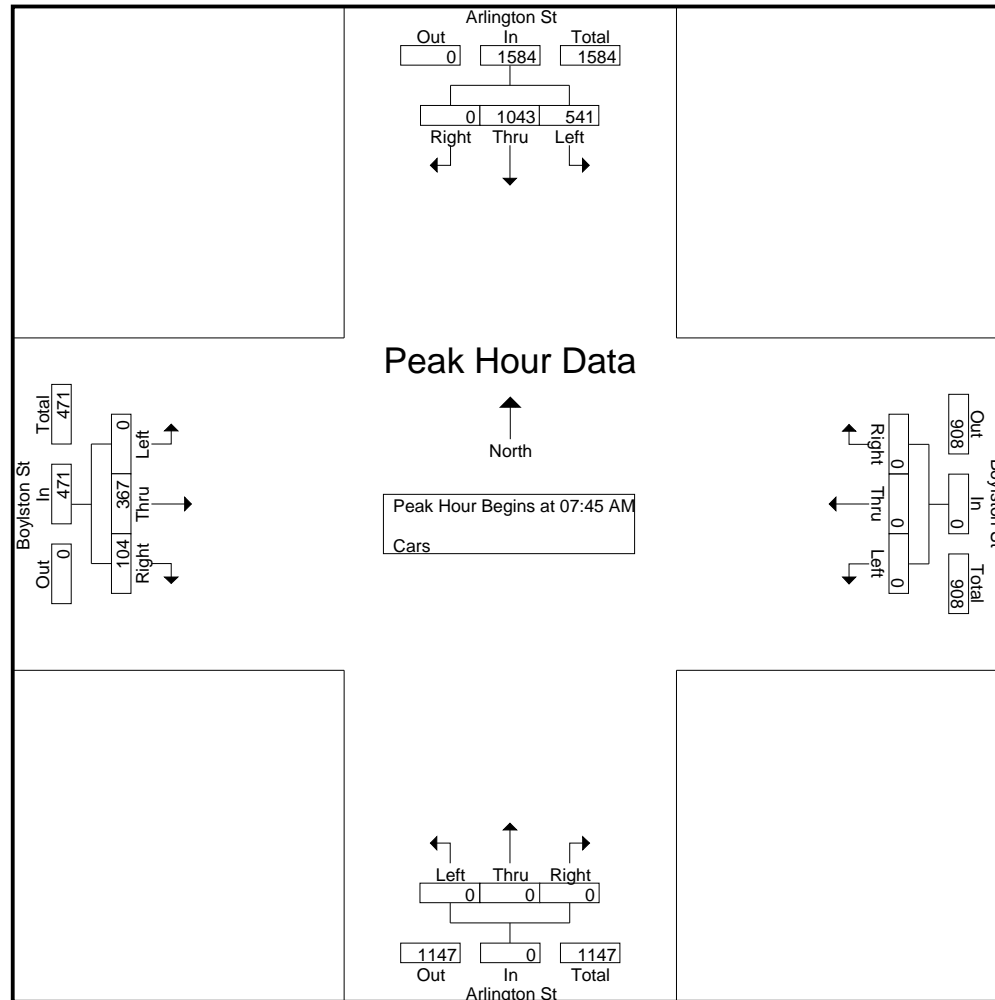
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	127	245	0	372	0	0	0	0	0	0	0	0	0	93	23	116	488
08:00 AM	157	253	0	410	0	0	0	0	0	0	0	0	0	89	26	115	525
08:15 AM	126	297	0	423	0	0	0	0	0	0	0	0	0	88	23	111	534
08:30 AM	131	248	0	379	0	0	0	0	0	0	0	0	0	97	32	129	508
Total Volume	541	1043	0	1584	0	0	0	0	0	0	0	0	0	367	104	471	2055
% App. Total	34.2	65.8	0		0	0	0		0	0	0		0	77.9	22.1		
PHF	.861	.878	.000	.936	.000	.000	.000	.000	.000	.000	.000	.000	.000	.946	.813	.913	.962

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 7

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

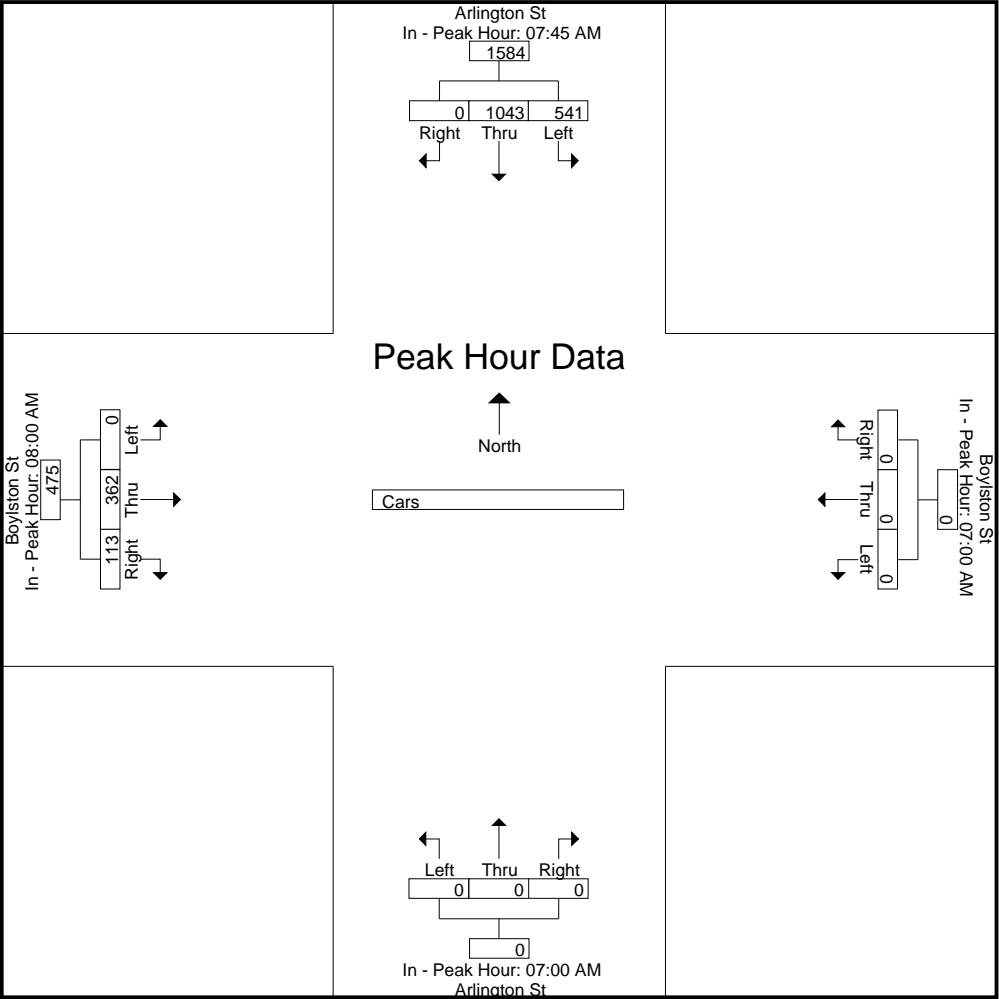


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				08:00 AM			
+0 mins.	127	245	0	372	0	0	0	0	0	0	0	0	0	89	26	115
+15 mins.	157	253	0	410	0	0	0	0	0	0	0	0	0	88	23	111
+30 mins.	126	297	0	423	0	0	0	0	0	0	0	0	0	97	32	129
+45 mins.	131	248	0	379	0	0	0	0	0	0	0	0	0	88	32	120
Total Volume	541	1043	0	1584	0	0	0	0	0	0	0	0	0	362	113	475
% App. Total	34.2	65.8	0		0	0	0		0	0	0		0	76.2	23.8	

PHF	.861	.878	.000	.936	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.933	.883	.921
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 9

Groups Printed- Trucks

	Arlington St From North			Boylston St From East			Arlington St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	1	5	0	0	0	0	0	0	0	0	5	2	13
07:15 AM	0	2	0	0	0	0	0	0	0	0	4	2	8
07:30 AM	2	1	0	0	0	0	0	0	0	0	3	0	6
07:45 AM	3	7	0	0	0	0	0	0	0	0	7	4	21
Total	6	15	0	0	0	0	0	0	0	0	19	8	48
08:00 AM	1	3	0	0	0	0	0	0	0	0	8	5	17
08:15 AM	2	3	0	0	0	0	0	0	0	0	8	2	15
08:30 AM	0	1	0	0	0	0	0	0	0	0	3	6	10
08:45 AM	0	1	0	0	0	0	0	0	0	0	12	7	20
Total	3	8	0	0	0	0	0	0	0	0	31	20	62
Grand Total	9	23	0	0	0	0	0	0	0	0	50	28	110
Apprch %	28.1	71.9	0	0	0	0	0	0	0	0	64.1	35.9	
Total %	8.2	20.9	0	0	0	0	0	0	0	0	45.5	25.5	

Accurate Counts
978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 10

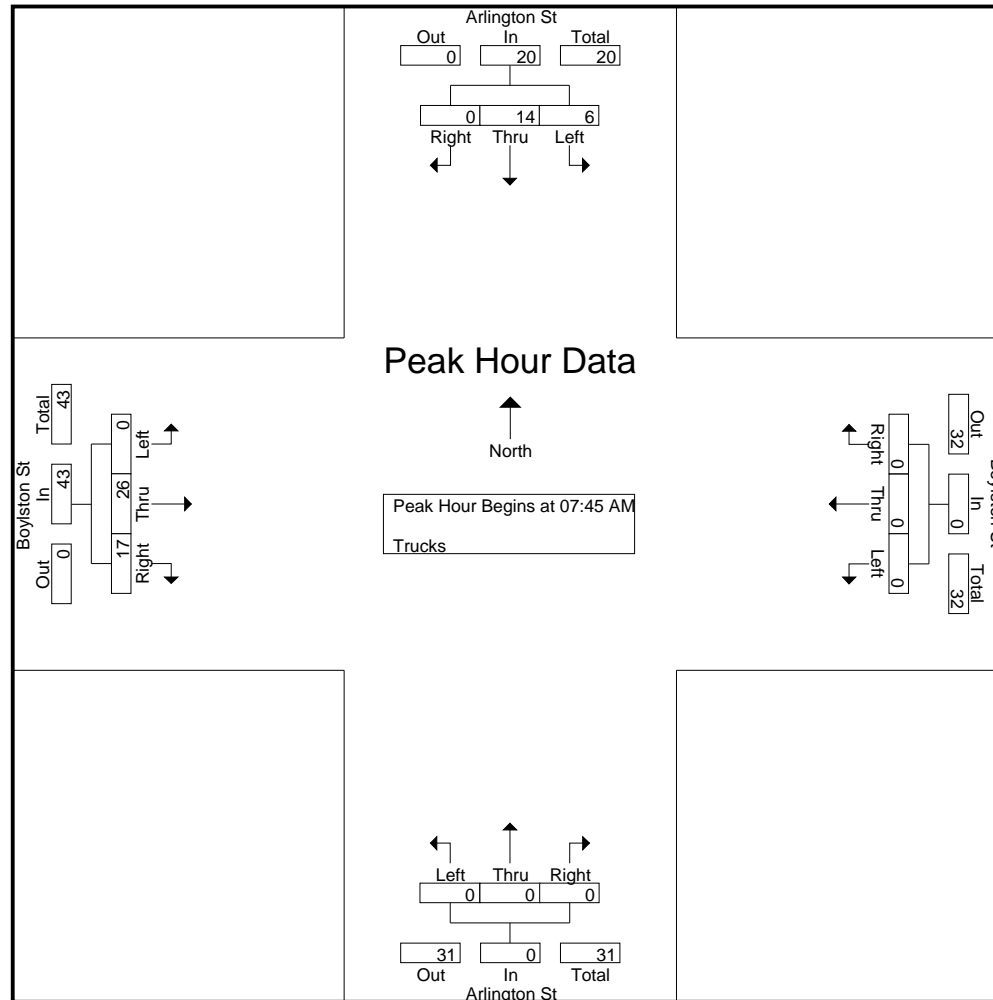
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	3	7	0	10	0	0	0	0	0	0	0	0	0	7	4	11	21
08:00 AM	1	3	0	4	0	0	0	0	0	0	0	0	0	8	5	13	17
08:15 AM	2	3	0	5	0	0	0	0	0	0	0	0	0	8	2	10	15
08:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	3	6	9	10
Total Volume	6	14	0	20	0	0	0	0	0	0	0	0	0	26	17	43	63
% App. Total	30	70	0		0	0	0		0	0	0		0	60.5	39.5		
PHF	.500	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.813	.708	.827	.750

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 11

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



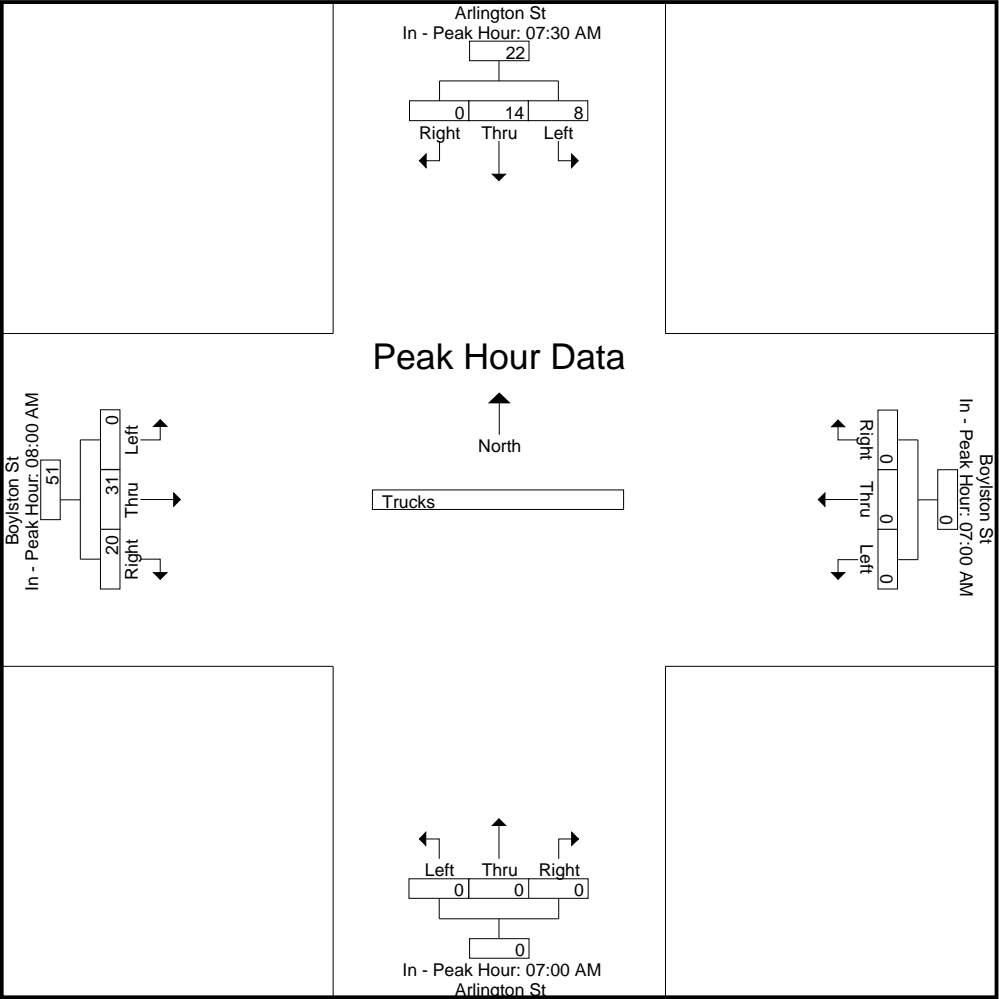
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:00 AM				08:00 AM			
+0 mins.	2	1	0	3	0	0	0	0	0	0	0	0	0	8	5	13
+15 mins.	3	7	0	10	0	0	0	0	0	0	0	0	0	8	2	10
+30 mins.	1	3	0	4	0	0	0	0	0	0	0	0	0	3	6	9
+45 mins.	2	3	0	5	0	0	0	0	0	0	0	0	0	12	7	19
Total Volume	8	14	0	22	0	0	0	0	0	0	0	0	0	31	20	51
% App. Total	36.4	63.6	0		0	0	0		0	0	0		0	60.8	39.2	

Accurate Counts
978-664-2565

PHF	.667	.500	.000	.550	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.646	.714	.671
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Accurate Counts

978-664-2565

File Name : 17034001

Site Code : 17034001

Start Date : 11/30/2017

Page No : 13

N/S Street : Arlington Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Bikes Peds

	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	7	3	0	36	0	2	1	32	0	0	0	18	1	2	1	19	105	17	122
07:15 AM	5	4	0	65	0	0	0	25	0	0	0	34	0	2	1	30	154	12	166
07:30 AM	1	0	0	56	0	0	0	33	0	0	0	43	0	2	1	30	162	4	166
07:45 AM	9	2	0	117	0	1	0	35	0	1	0	59	0	5	0	43	254	18	272
Total	22	9	0	274	0	3	1	125	0	1	0	154	1	11	3	122	675	51	726
08:00 AM	12	10	0	96	0	0	0	39	0	0	0	70	0	5	0	52	257	27	284
08:15 AM	13	8	0	138	0	0	0	61	0	1	0	83	0	9	0	63	345	31	376
08:30 AM	32	13	0	161	1	1	0	64	0	0	0	63	0	11	0	52	340	58	398
08:45 AM	21	5	0	156	0	0	0	65	0	0	0	86	0	5	0	55	362	31	393
Total	78	36	0	551	1	1	0	229	0	1	0	302	0	30	0	222	1304	147	1451
Grand Total	100	45	0	825	1	4	1	354	0	2	0	456	1	41	3	344	1979	198	2177
Apprch %	69	31	0		16.7	66.7	16.7		0	100	0		2.2	91.1	6.7				
Total %	50.5	22.7	0		0.5	2	0.5		0	1	0		0.5	20.7	1.5		90.9	9.1	

Accurate Counts

978-664-2565

File Name : 17034001

Site Code : 17034001

Start Date : 11/30/2017

Page No : 14

N/S Street : Arlington Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

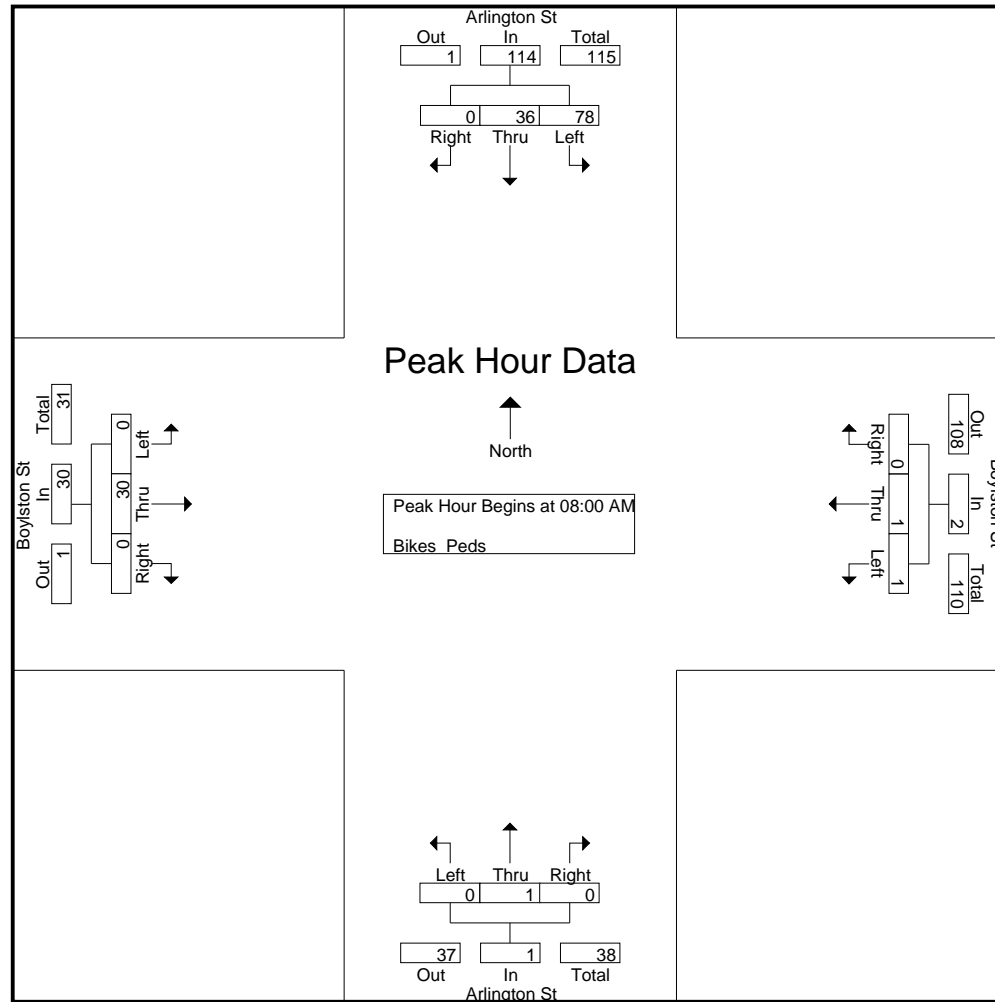
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	12	10	0	22	0	0	0	0	0	0	0	0	0	5	0	5	27
08:15 AM	13	8	0	21	0	0	0	0	0	1	0	1	0	9	0	9	31
08:30 AM	32	13	0	45	1	1	0	2	0	0	0	0	0	11	0	11	58
08:45 AM	21	5	0	26	0	0	0	0	0	0	0	0	0	5	0	5	31
Total Volume	78	36	0	114	1	1	0	2	0	1	0	1	0	30	0	30	147
% App. Total	68.4	31.6	0		50	50	0		0	100	0		0	100	0		
PHF	.609	.692	.000	.633	.250	.250	.000	.250	.000	.250	.000	.250	.000	.682	.000	.682	.634

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 15

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



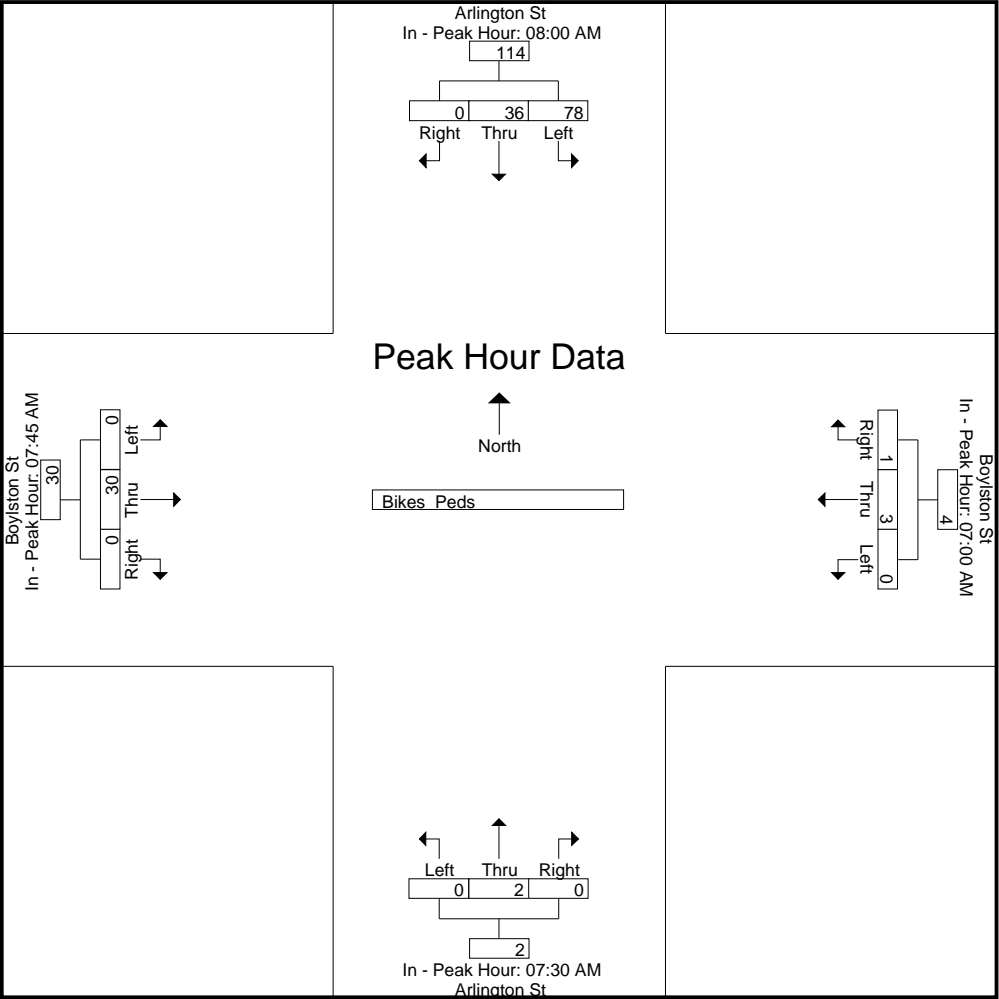
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:30 AM				07:45 AM			
+0 mins.	12	10	0	22	0	2	1	3	0	0	0	0	0	5	0	5
+15 mins.	13	8	0	21	0	0	0	0	0	1	0	1	0	5	0	5
+30 mins.	32	13	0	45	0	0	0	0	0	0	0	0	0	9	0	9
+45 mins.	21	5	0	26	0	1	0	1	0	1	0	1	0	11	0	11
Total Volume	78	36	0	114	0	3	1	4	0	2	0	2	0	30	0	30
% App. Total	68.4	31.6	0		0	75	25		0	100	0		0	100	0	

Accurate Counts
978-664-2565

PHF	.609	.692	.000	.633	.000	.375	.250	.333	.000	.500	.000	.500	.000	.682	.000	.682
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 1

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

Groups Printed- Cars - Trucks

	Arlington St From North			Boylston St From East			Arlington St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	156	285	0	0	0	0	0	0	0	0	133	39	613
04:15 PM	141	301	0	0	0	0	0	0	0	0	135	54	631
04:30 PM	153	275	0	0	0	0	0	0	0	0	156	43	627
04:45 PM	156	287	0	0	0	0	0	0	0	0	151	51	645
Total	606	1148	0	0	0	0	0	0	0	0	575	187	2516
05:00 PM	189	260	0	0	0	0	0	0	0	0	160	49	658
05:15 PM	142	271	0	0	0	0	0	0	0	0	184	60	657
05:30 PM	166	277	0	0	0	0	0	0	0	0	180	49	672
05:45 PM	169	255	0	0	0	0	0	0	0	0	182	49	655
Total	666	1063	0	0	0	0	0	0	0	0	706	207	2642
Grand Total	1272	2211	0	0	0	0	0	0	0	0	1281	394	5158
Apprch %	36.5	63.5	0	0	0	0	0	0	0	0	76.5	23.5	
Total %	24.7	42.9	0	0	0	0	0	0	0	0	24.8	7.6	
Cars	1267	2203	0	0	0	0	0	0	0	0	1252	374	5096
% Cars	99.6	99.6	0	0	0	0	0	0	0	0	97.7	94.9	98.8
Trucks	5	8	0	0	0	0	0	0	0	0	29	20	62
% Trucks	0.4	0.4	0	0	0	0	0	0	0	0	2.3	5.1	1.2

Accurate Counts

978-664-2565

File Name : 17034001

Site Code : 17034001

Start Date : 11/30/2017

Page No : 2

N/S Street : Arlington Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

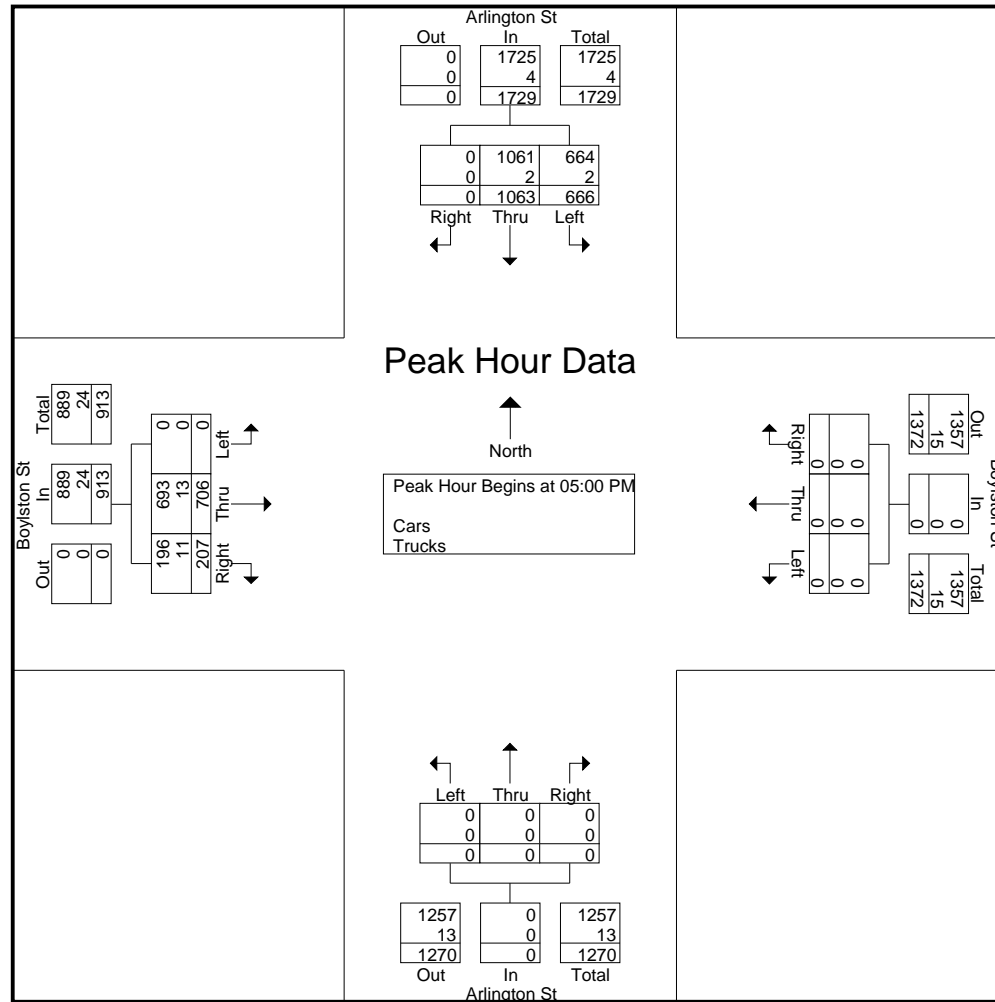
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	189	260	0	449	0	0	0	0	0	0	0	0	0	160	49	209	658
05:15 PM	142	271	0	413	0	0	0	0	0	0	0	0	0	184	60	244	657
05:30 PM	166	277	0	443	0	0	0	0	0	0	0	0	0	180	49	229	672
05:45 PM	169	255	0	424	0	0	0	0	0	0	0	0	0	182	49	231	655
Total Volume	666	1063	0	1729	0	0	0	0	0	0	0	0	0	706	207	913	2642
% App. Total	38.5	61.5	0		0	0	0		0	0	0		0	77.3	22.7		
PHF	.881	.959	.000	.963	.000	.000	.000	.000	.000	.000	.000	.000	.000	.959	.863	.935	.983
Cars	664	1061	0	1725	0	0	0	0	0	0	0	0	0	693	196	889	2614
% Cars	99.7	99.8	0	99.8	0	0	0	0	0	0	0	0	0	98.2	94.7	97.4	98.9
Trucks	2	2	0	4	0	0	0	0	0	0	0	0	0	13	11	24	28
% Trucks	0.3	0.2	0	0.2	0	0	0	0	0	0	0	0	0	1.8	5.3	2.6	1.1

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 3

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



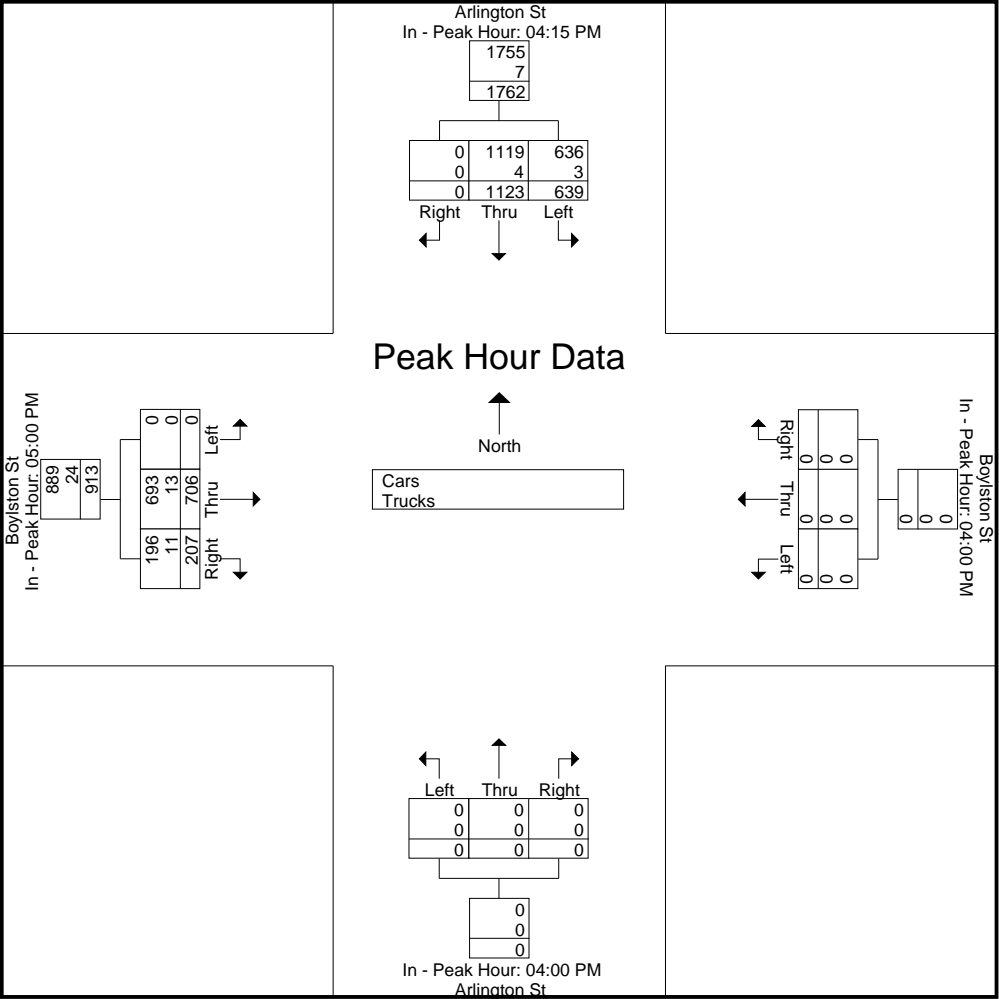
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	141	301	0	442	0	0	0	0	0	0	0	0	0	160	49	209
+15 mins.	153	275	0	428	0	0	0	0	0	0	0	0	0	184	60	244
+30 mins.	156	287	0	443	0	0	0	0	0	0	0	0	0	180	49	229
+45 mins.	189	260	0	449	0	0	0	0	0	0	0	0	0	182	49	231
Total Volume	639	1123	0	1762	0	0	0	0	0	0	0	0	0	706	207	913
% App. Total	36.3	63.7	0		0	0	0	0	0	0	0	0	0	77.3	22.7	

Accurate Counts
978-664-2565

PHF	.845	.933	.000	.981	.000	.000	.000	.000	.000	.000	.000	.000	.000	.959	.863	.935
Cars	636	1119	0	1755	0	0	0	0	0	0	0	0	0	693	196	889
% Cars	99.5	99.6	0	99.6	0	0	0	0	0	0	0	0	0	98.2	94.7	97.4
Trucks	3	4	0	7	0	0	0	0	0	0	0	0	0	13	11	24
% Trucks	0.5	0.4	0	0.4	0	0	0	0	0	0	0	0	0	1.8	5.3	2.6



Accurate Counts

978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 5

Groups Printed- Cars

	Arlington St From North			Boylston St From East			Arlington St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	156	283	0	0	0	0	0	0	0	0	129	37	605
04:15 PM	140	300	0	0	0	0	0	0	0	0	131	52	623
04:30 PM	152	274	0	0	0	0	0	0	0	0	151	40	617
04:45 PM	155	285	0	0	0	0	0	0	0	0	148	49	637
Total	603	1142	0	0	0	0	0	0	0	0	559	178	2482
05:00 PM	189	260	0	0	0	0	0	0	0	0	157	47	653
05:15 PM	141	271	0	0	0	0	0	0	0	0	179	55	646
05:30 PM	166	276	0	0	0	0	0	0	0	0	175	47	664
05:45 PM	168	254	0	0	0	0	0	0	0	0	182	47	651
Total	664	1061	0	0	0	0	0	0	0	0	693	196	2614
Grand Total	1267	2203	0	0	0	0	0	0	0	0	1252	374	5096
Apprch %	36.5	63.5	0	0	0	0	0	0	0	0	77	23	
Total %	24.9	43.2	0	0	0	0	0	0	0	0	24.6	7.3	

Accurate Counts
978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 6

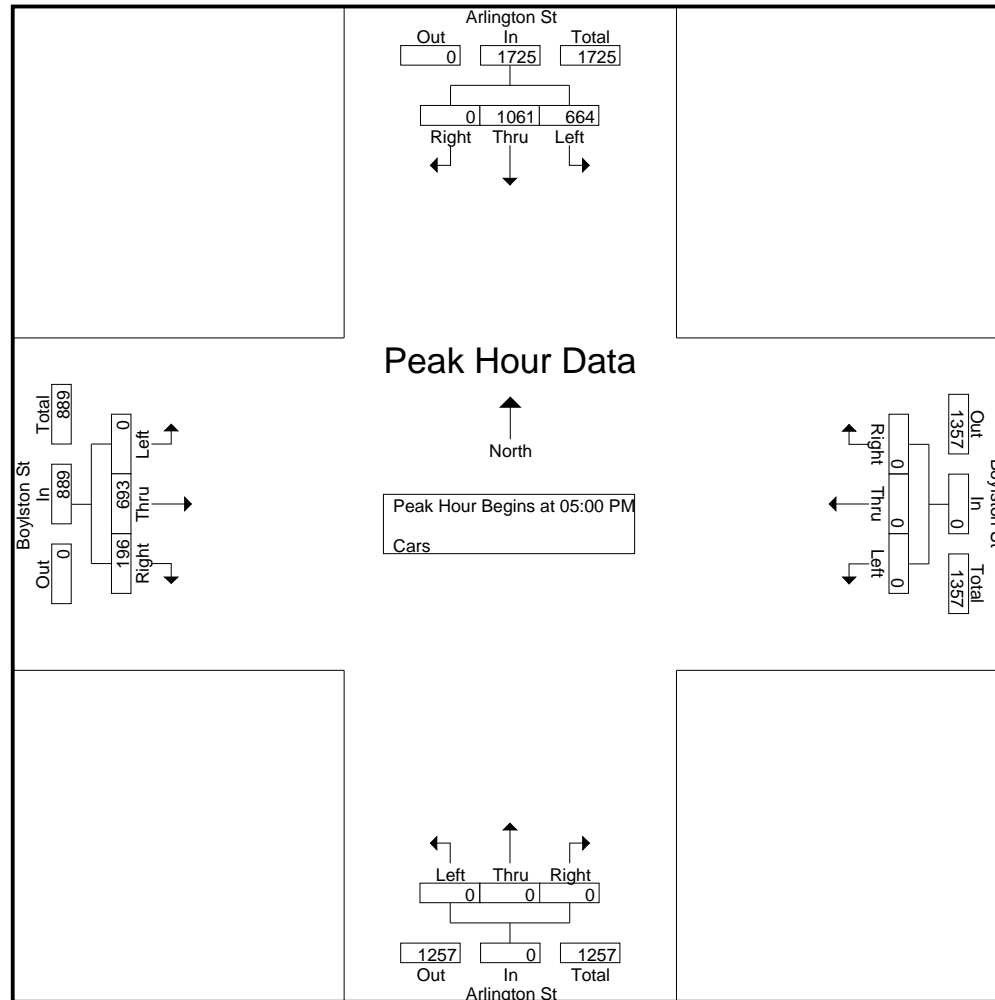
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	189	260	0	449	0	0	0	0	0	0	0	0	0	157	47	204	653
05:15 PM	141	271	0	412	0	0	0	0	0	0	0	0	0	179	55	234	646
05:30 PM	166	276	0	442	0	0	0	0	0	0	0	0	0	175	47	222	664
05:45 PM	168	254	0	422	0	0	0	0	0	0	0	0	0	182	47	229	651
Total Volume	664	1061	0	1725	0	0	0	0	0	0	0	0	0	693	196	889	2614
% App. Total	38.5	61.5	0		0	0	0		0	0	0		0	78	22		
PHF	.878	.961	.000	.960	.000	.000	.000	.000	.000	.000	.000	.000	.000	.952	.891	.950	.984

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 7

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



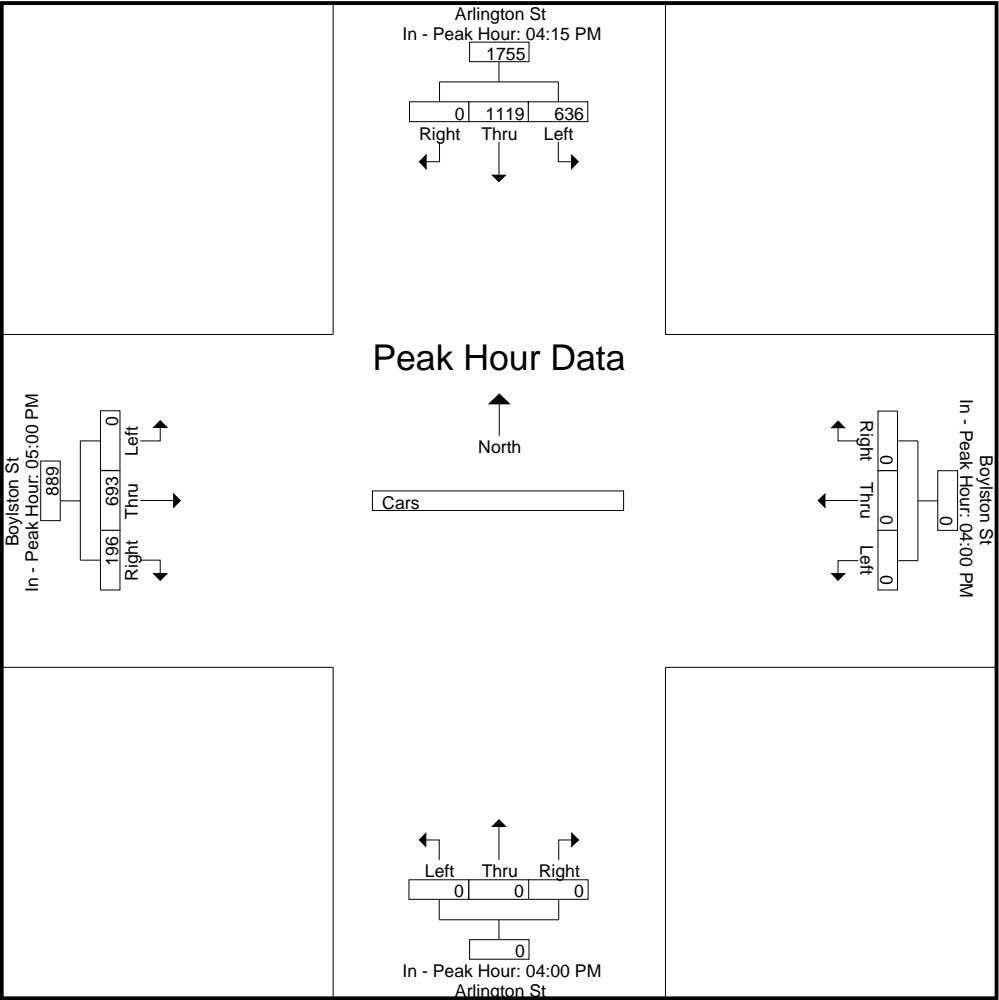
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	140	300	0	440	0	0	0	0	0	0	0	0	0	157	47	204
+15 mins.	152	274	0	426	0	0	0	0	0	0	0	0	0	179	55	234
+30 mins.	155	285	0	440	0	0	0	0	0	0	0	0	0	175	47	222
+45 mins.	189	260	0	449	0	0	0	0	0	0	0	0	0	182	47	229
Total Volume	636	1119	0	1755	0	0	0	0	0	0	0	0	0	693	196	889
% App. Total	36.2	63.8	0		0	0	0		0	0	0		0	78	22	

Accurate Counts
978-664-2565

PHF	.841	.933	.000	.977	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.952	.891	.950
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 9

Groups Printed- Trucks

	Arlington St From North			Boylston St From East			Arlington St From South			Boylston St 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	0	0	0	4	2	8
04:15 PM	1	1	0	0	0	0	0	0	0	0	4	2	8
04:30 PM	1	1	0	0	0	0	0	0	0	0	5	3	10
04:45 PM	1	2	0	0	0	0	0	0	0	0	3	2	8
Total	3	6	0	0	0	0	0	0	0	0	16	9	34
05:00 PM	0	0	0	0	0	0	0	0	0	0	3	2	5
05:15 PM	1	0	0	0	0	0	0	0	0	0	5	5	11
05:30 PM	0	1	0	0	0	0	0	0	0	0	5	2	8
05:45 PM	1	1	0	0	0	0	0	0	0	0	0	2	4
Total	2	2	0	0	0	0	0	0	0	0	13	11	28
Grand Total	5	8	0	0	0	0	0	0	0	0	29	20	62
Apprch %	38.5	61.5	0	0	0	0	0	0	0	0	59.2	40.8	
Total %	8.1	12.9	0	0	0	0	0	0	0	0	46.8	32.3	

Accurate Counts
978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 10

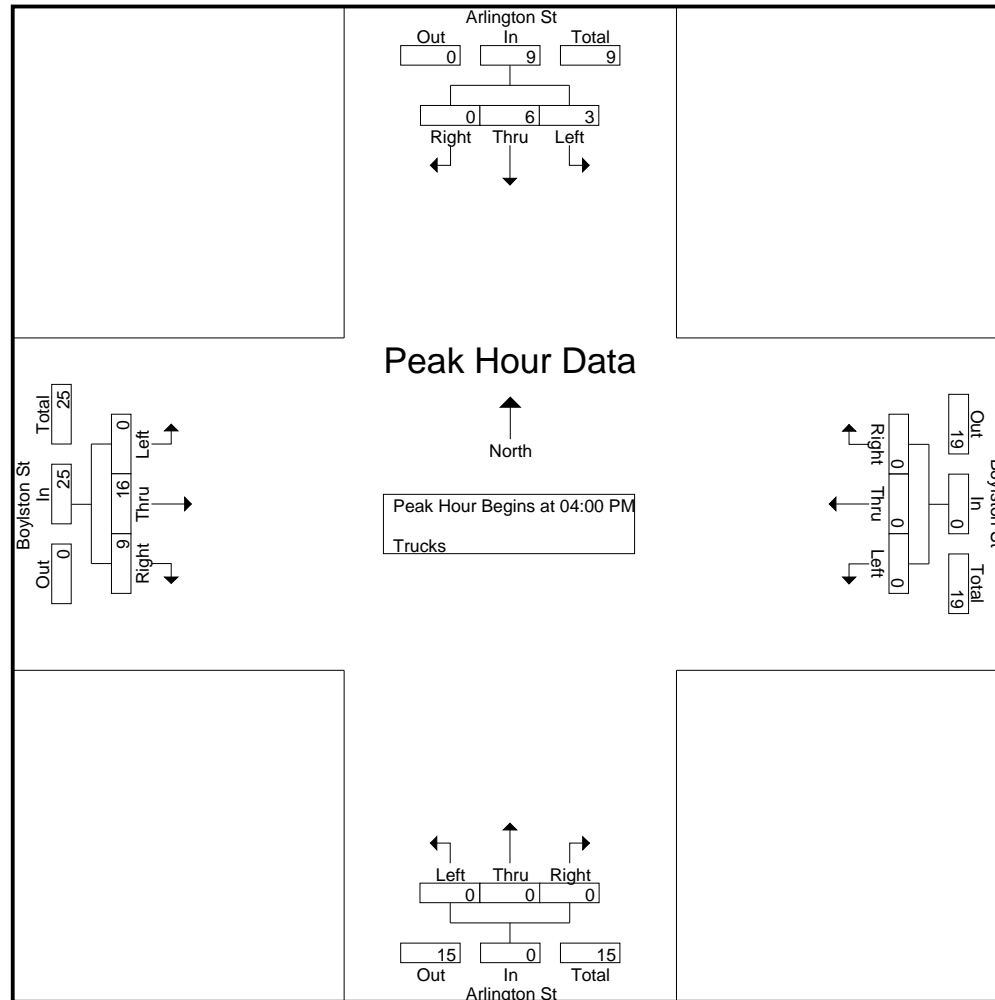
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	4	2	6	8
04:15 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	4	2	6	8
04:30 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	5	3	8	10
04:45 PM	1	2	0	3	0	0	0	0	0	0	0	0	0	3	2	5	8
Total Volume	3	6	0	9	0	0	0	0	0	0	0	0	0	16	9	25	34
% App. Total	33.3	66.7	0		0	0	0		0	0	0		0	64	36		
PHF	.750	.750	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.800	.750	.781	.850

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 11

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

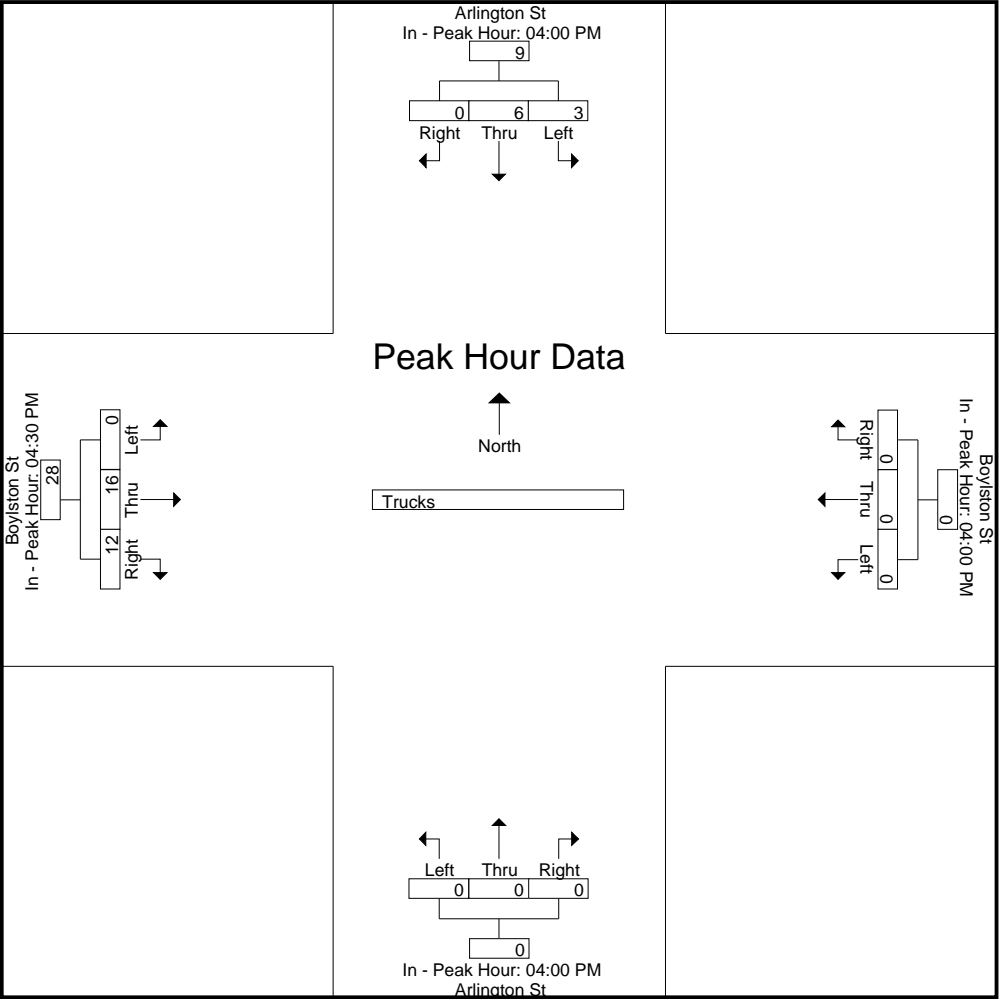


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	0	2	0	2	0	0	0	0	0	0	0	0	0	5	3	8
+15 mins.	1	1	0	2	0	0	0	0	0	0	0	0	0	3	2	5
+30 mins.	1	1	0	2	0	0	0	0	0	0	0	0	0	3	2	5
+45 mins.	1	2	0	3	0	0	0	0	0	0	0	0	0	5	5	10
Total Volume	3	6	0	9	0	0	0	0	0	0	0	0	0	16	12	28
% App. Total	33.3	66.7	0		0	0	0		0	0	0		0	57.1	42.9	

PHF	.750	.750	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.800	.600	.700
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

File Name : 17034001

Site Code : 17034001

Start Date : 11/30/2017

Page No : 13

N/S Street : Arlington Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Bikes Peds

	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	1	3	0	102	0	1	0	75	0	0	0	105	0	3	1	55	337	9	346
04:15 PM	0	2	0	120	0	0	0	87	0	0	0	123	0	4	1	64	394	7	401
04:30 PM	0	1	0	160	0	1	0	95	0	0	0	141	0	9	1	69	465	12	477
04:45 PM	1	1	0	161	0	1	0	81	0	0	0	140	0	4	0	68	450	7	457
Total	2	7	0	543	0	3	0	338	0	0	0	509	0	20	3	256	1646	35	1681
05:00 PM	2	4	0	204	0	1	0	91	0	0	0	171	0	4	0	68	534	11	545
05:15 PM	1	4	0	173	0	0	1	78	0	0	0	147	0	5	0	58	456	11	467
05:30 PM	1	4	0	188	0	1	0	66	0	0	0	128	0	3	0	64	446	9	455
05:45 PM	1	3	0	206	0	0	0	81	0	0	0	169	0	4	0	51	507	8	515
Total	5	15	0	771	0	2	1	316	0	0	0	615	0	16	0	241	1943	39	1982
Grand Total	7	22	0	1314	0	5	1	654	0	0	0	1124	0	36	3	497	3589	74	3663
Apprch %	24.1	75.9	0		0	83.3	16.7		0	0	0		0	92.3	7.7				
Total %	9.5	29.7	0		0	6.8	1.4		0	0	0		0	48.6	4.1		98	2	

Accurate Counts
978-664-2565

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 14

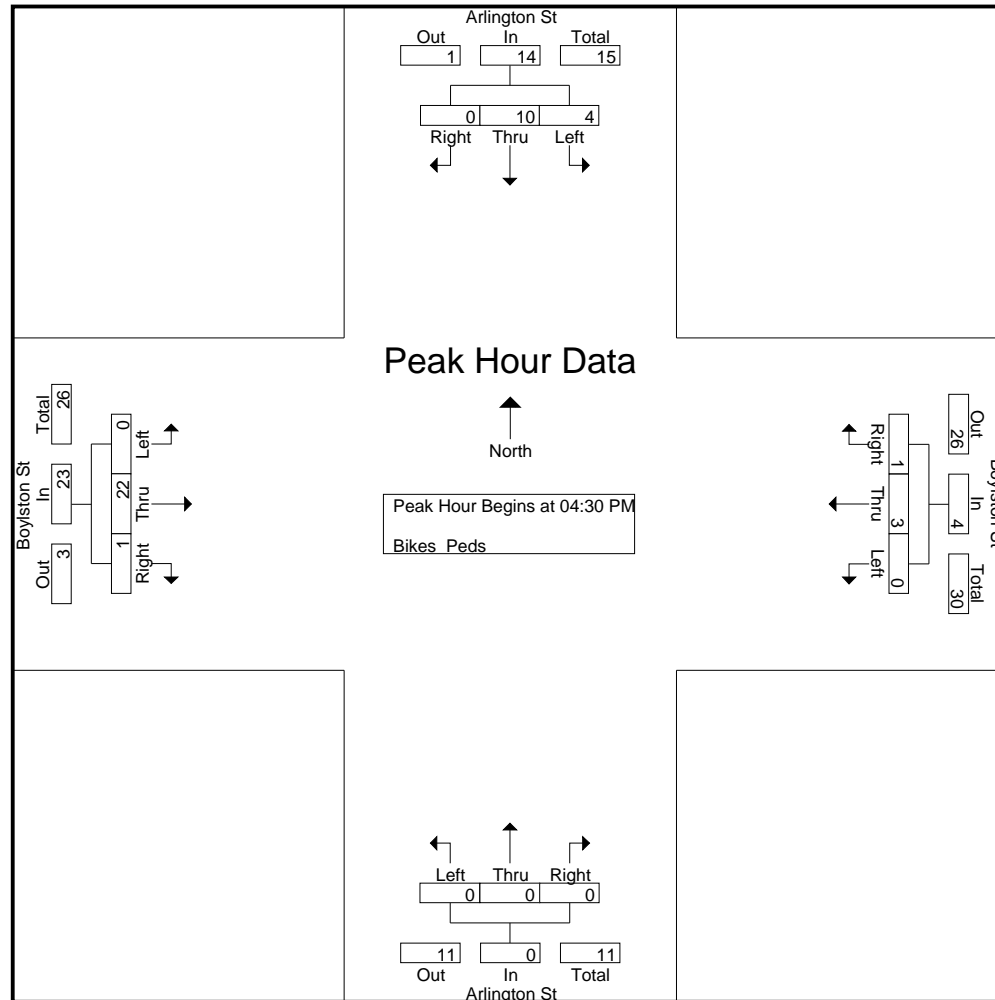
	Arlington St From North				Boylston St From East				Arlington St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	9	1	10	12
04:45 PM	1	1	0	2	0	1	0	1	0	0	0	0	0	4	0	4	7
05:00 PM	2	4	0	6	0	1	0	1	0	0	0	0	0	4	0	4	11
05:15 PM	1	4	0	5	0	0	1	1	0	0	0	0	0	5	0	5	11
Total Volume	4	10	0	14	0	3	1	4	0	0	0	0	0	22	1	23	41
% App. Total	28.6	71.4	0		0	75	25		0	0	0		0	95.7	4.3		
PHF	.500	.625	.000	.583	.000	.750	.250	1.00	.000	.000	.000	.000	.000	.611	.250	.575	.854

Accurate Counts

978-664-2565

File Name : 17034001
Site Code : 17034001
Start Date : 11/30/2017
Page No : 15

N/S Street : Arlington Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

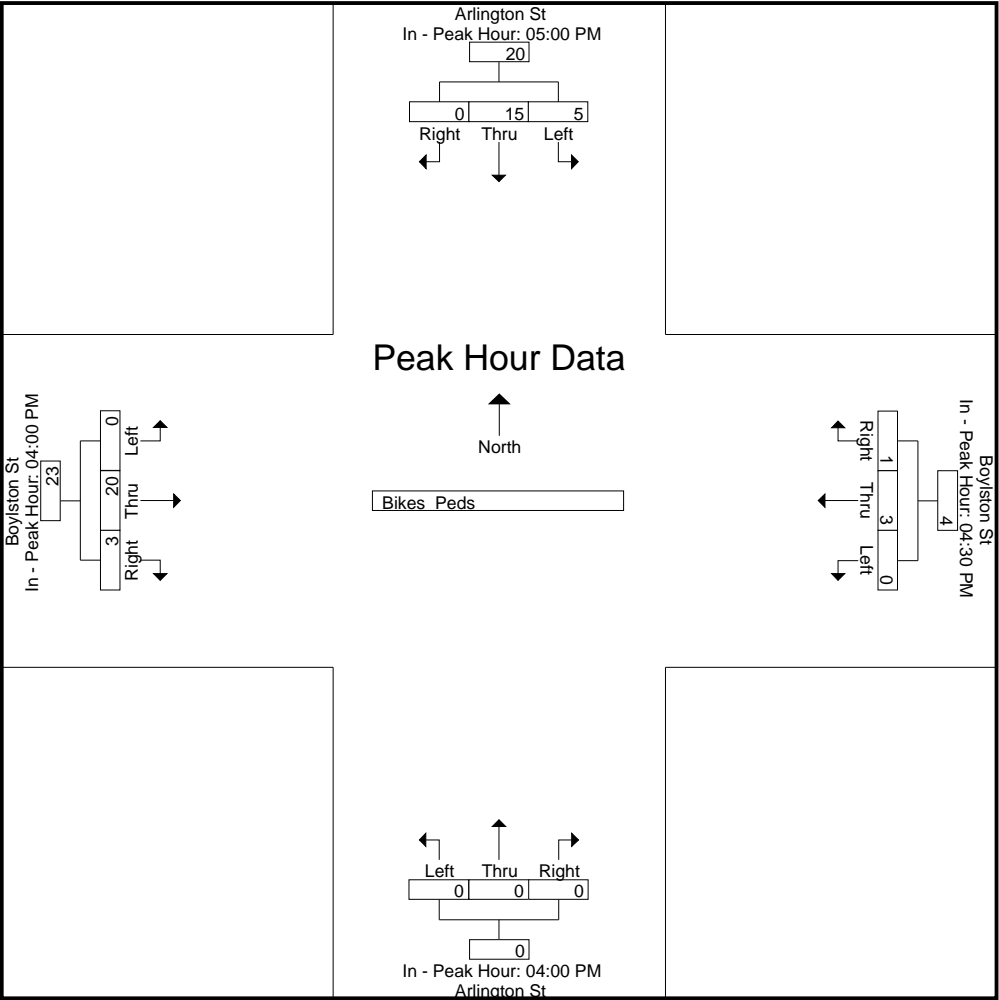


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	2	4	0	6	0	1	0	1	0	0	0	0	0	3	1	4
+15 mins.	1	4	0	5	0	1	0	1	0	0	0	0	0	4	1	5
+30 mins.	1	4	0	5	0	1	0	1	0	0	0	0	0	9	1	10
+45 mins.	1	3	0	4	0	0	1	1	0	0	0	0	0	4	0	4
Total Volume	5	15	0	20	0	3	1	4	0	0	0	0	0	20	3	23
% App. Total	25	75	0		0	75	25		0	0	0		0	87	13	

PHF	.625	.938	.000	.833	.000	.750	.250	1.000	.000	.000	.000	.000	.000	.556	.750	.575
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Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

	Charles St From North			Boylston St From East			Charles St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	32	0	109	25	53	79	0	298
07:15 AM	0	0	0	0	0	39	0	131	25	74	103	0	372
07:30 AM	0	0	0	0	0	35	0	114	25	95	101	0	370
07:45 AM	0	0	0	0	0	32	0	164	23	83	99	0	401
Total	0	0	0	0	0	138	0	518	98	305	382	0	1441
08:00 AM	0	0	0	0	0	48	0	167	18	110	114	0	457
08:15 AM	0	0	0	0	0	43	0	159	35	99	103	0	439
08:30 AM	0	0	0	0	0	34	0	123	23	108	106	0	394
08:45 AM	0	0	0	0	0	33	0	151	25	113	107	0	429
Total	0	0	0	0	0	158	0	600	101	430	430	0	1719
Grand Total	0	0	0	0	0	296	0	1118	199	735	812	0	3160
Apprch %	0	0	0	0	0	100	0	84.9	15.1	47.5	52.5	0	
Total %	0	0	0	0	0	9.4	0	35.4	6.3	23.3	25.7	0	
Cars	0	0	0	0	0	295	0	1090	195	717	797	0	3094
% Cars	0	0	0	0	0	99.7	0	97.5	98	97.6	98.2	0	97.9
Trucks	0	0	0	0	0	1	0	28	4	18	15	0	66
% Trucks	0	0	0	0	0	0.3	0	2.5	2	2.4	1.8	0	2.1

Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

Page No : 2

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

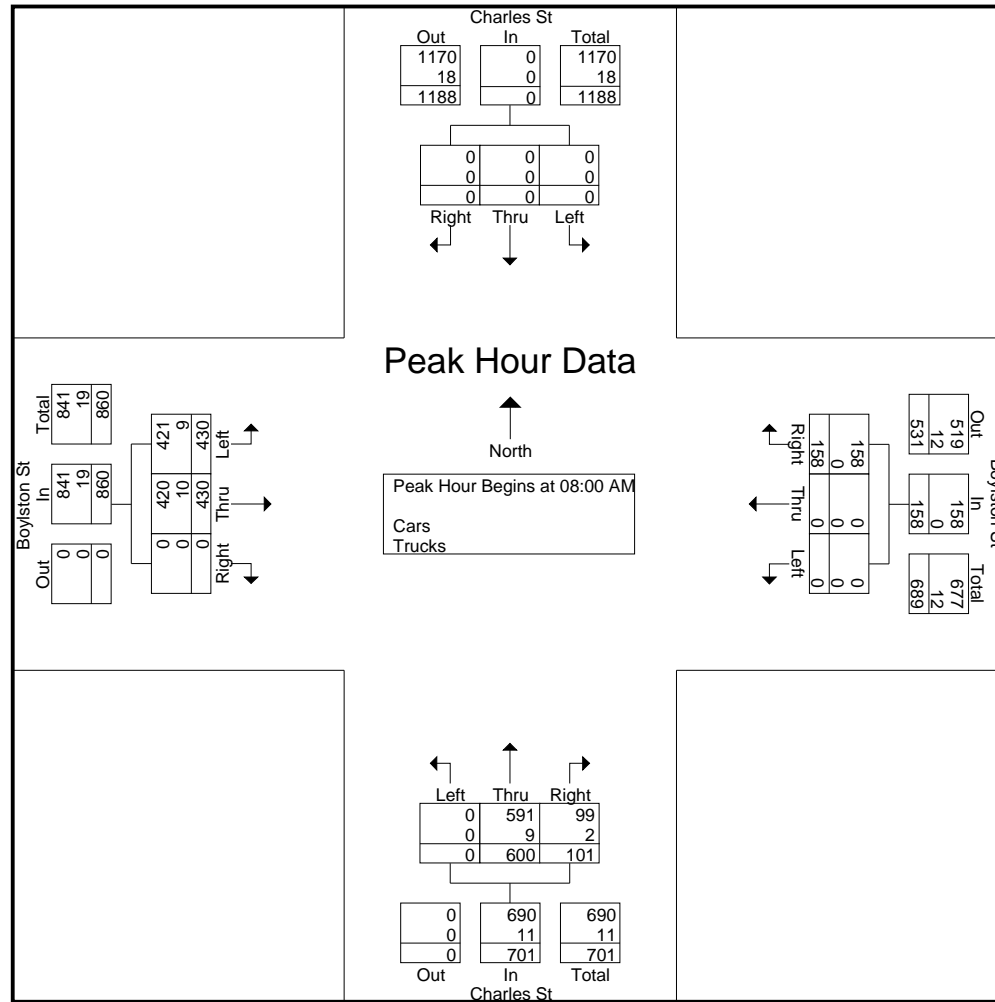
	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	48	48	0	167	18	185	110	114	0	224	457
08:15 AM	0	0	0	0	0	0	43	43	0	159	35	194	99	103	0	202	439
08:30 AM	0	0	0	0	0	0	34	34	0	123	23	146	108	106	0	214	394
08:45 AM	0	0	0	0	0	0	33	33	0	151	25	176	113	107	0	220	429
Total Volume	0	0	0	0	0	0	158	158	0	600	101	701	430	430	0	860	1719
% App. Total	0	0	0		0	0	100		0	85.6	14.4		50	50	0		
PHF	.000	.000	.000	.000	.000	.000	.823	.823	.000	.898	.721	.903	.951	.943	.000	.960	.940
Cars	0	0	0	0	0	0	158	158	0	591	99	690	421	420	0	841	1689
% Cars	0	0	0	0	0	0	100	100	0	98.5	98.0	98.4	97.9	97.7	0	97.8	98.3
Trucks	0	0	0	0	0	0	0	0	0	9	2	11	9	10	0	19	30
% Trucks	0	0	0	0	0	0	0	0	0	1.5	2.0	1.6	2.1	2.3	0	2.2	1.7

Accurate Counts

978-664-2565

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 3

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



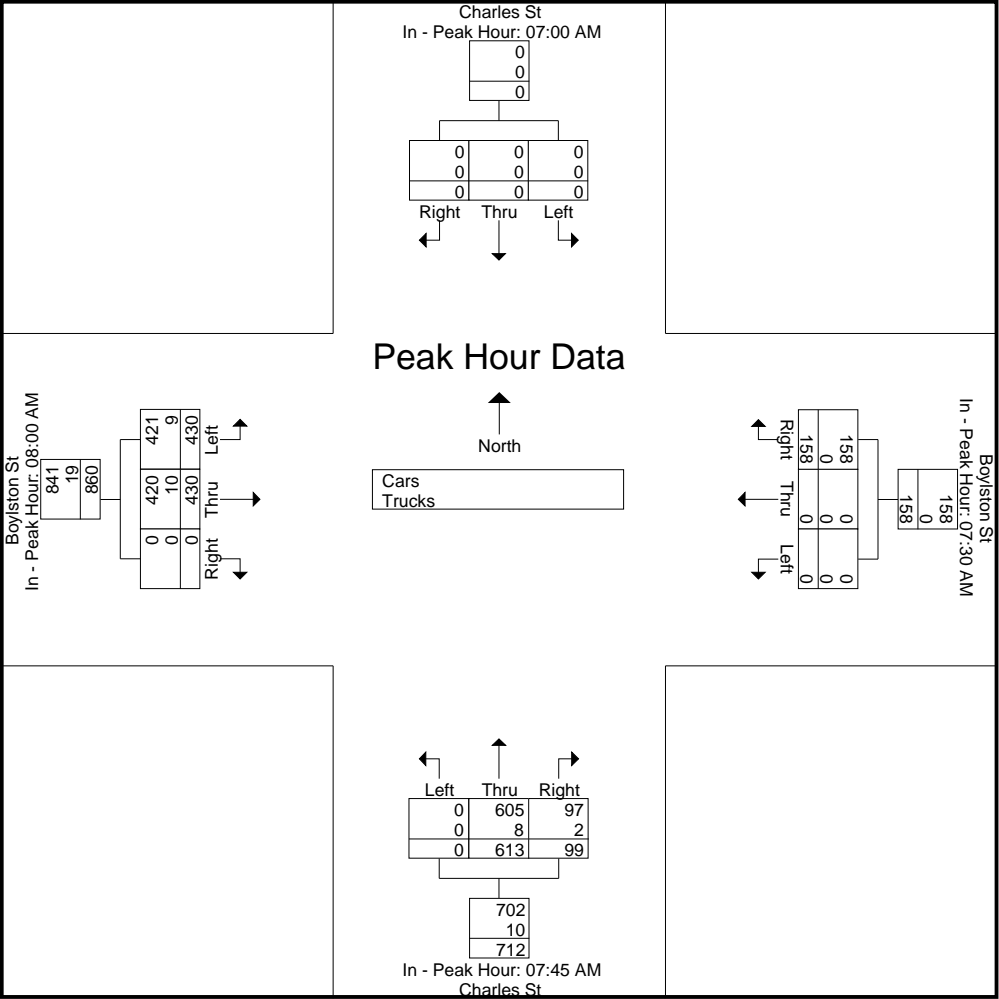
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:45 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	35	35	0	164	23	187	110	114	0	224
+15 mins.	0	0	0	0	0	0	32	32	0	167	18	185	99	103	0	202
+30 mins.	0	0	0	0	0	0	48	48	0	159	35	194	108	106	0	214
+45 mins.	0	0	0	0	0	0	43	43	0	123	23	146	113	107	0	220
Total Volume	0	0	0	0	0	0	158	158	0	613	99	712	430	430	0	860
% App. Total	0	0	0		0	0	100		0	86.1	13.9		50	50	0	

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.823	.823	.000	.918	.707	.918	.951	.943	.000	.960
Cars	0	0	0	0	0	0	158	158	0	605	97	702	421	420	0	841
% Cars	0	0	0	0	0	0	100	100	0	98.7	98	98.6	97.9	97.7	0	97.8
Trucks	0	0	0	0	0	0	0	0	0	8	2	10	9	10	0	19
% Trucks	0	0	0	0	0	0	0	0	0	1.3	2	1.4	2.1	2.3	0	2.2



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 5

Groups Printed- Cars

	Charles St From North			Boylston St From East			Charles St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	31	0	102	24	50	79	0	286
07:15 AM	0	0	0	0	0	39	0	124	24	73	102	0	362
07:30 AM	0	0	0	0	0	35	0	112	25	93	99	0	364
07:45 AM	0	0	0	0	0	32	0	161	23	80	97	0	393
Total	0	0	0	0	0	137	0	499	96	296	377	0	1405
08:00 AM	0	0	0	0	0	48	0	166	18	107	113	0	452
08:15 AM	0	0	0	0	0	43	0	156	35	98	99	0	431
08:30 AM	0	0	0	0	0	34	0	122	21	105	104	0	386
08:45 AM	0	0	0	0	0	33	0	147	25	111	104	0	420
Total	0	0	0	0	0	158	0	591	99	421	420	0	1689
Grand Total	0	0	0	0	0	295	0	1090	195	717	797	0	3094
Apprch %	0	0	0	0	0	100	0	84.8	15.2	47.4	52.6	0	
Total %	0	0	0	0	0	9.5	0	35.2	6.3	23.2	25.8	0	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 6

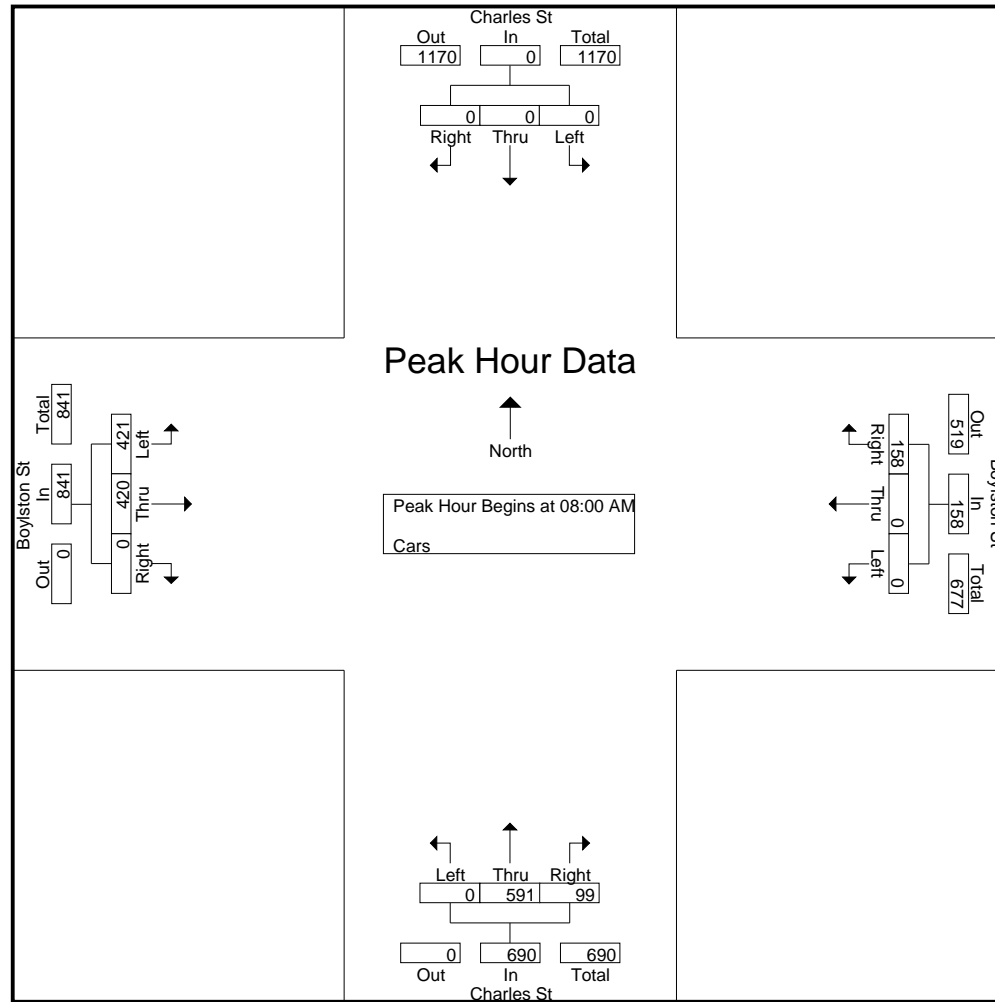
	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	48	48	0	166	18	184	107	113	0	220	452
08:15 AM	0	0	0	0	0	0	43	43	0	156	35	191	98	99	0	197	431
08:30 AM	0	0	0	0	0	0	34	34	0	122	21	143	105	104	0	209	386
08:45 AM	0	0	0	0	0	0	33	33	0	147	25	172	111	104	0	215	420
Total Volume	0	0	0	0	0	0	158	158	0	591	99	690	421	420	0	841	1689
% App. Total	0	0	0		0	0	100		0	85.7	14.3		50.1	49.9	0		
PHF	.000	.000	.000	.000	.000	.000	.823	.823	.000	.890	.707	.903	.948	.929	.000	.956	.934

Accurate Counts

978-664-2565

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 7

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

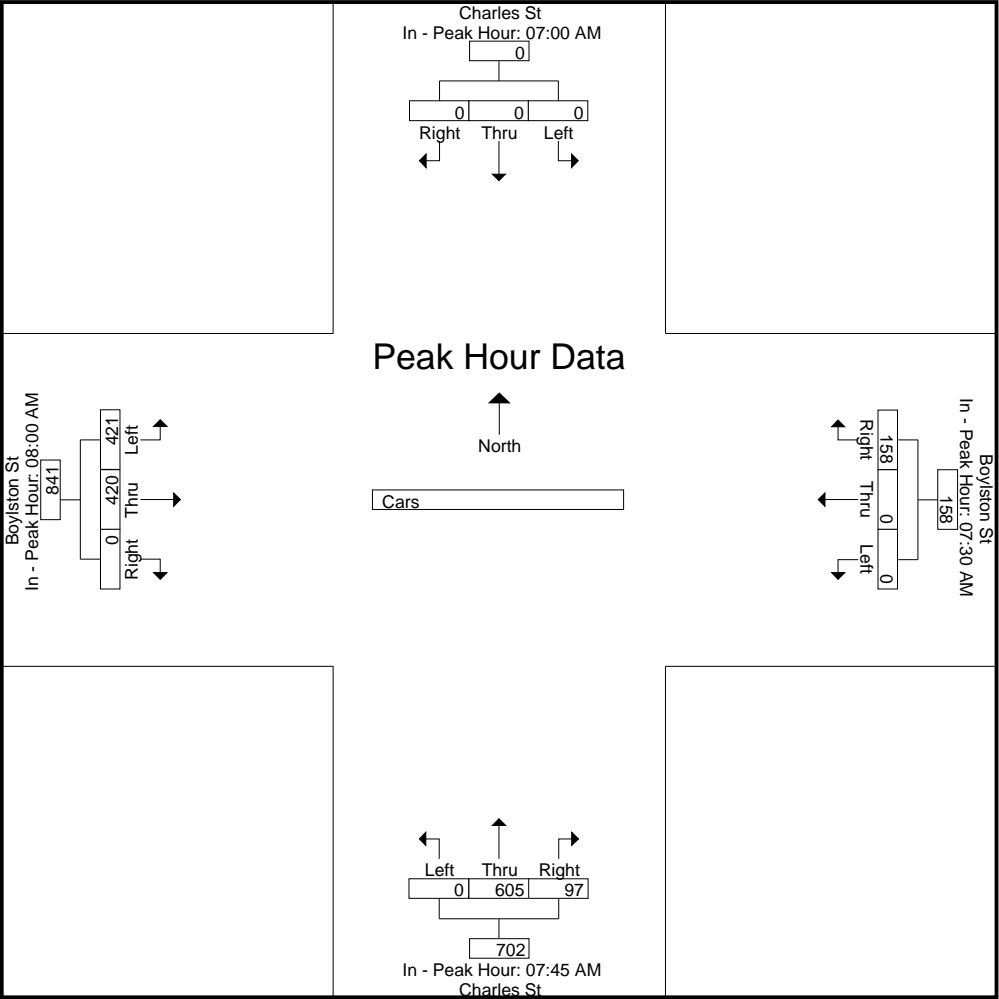


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:45 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	35	35	0	161	23	184	107	113	0	220
+15 mins.	0	0	0	0	0	0	32	32	0	166	18	184	98	99	0	197
+30 mins.	0	0	0	0	0	0	48	48	0	156	35	191	105	104	0	209
+45 mins.	0	0	0	0	0	0	43	43	0	122	21	143	111	104	0	215
Total Volume	0	0	0	0	0	0	158	158	0	605	97	702	421	420	0	841
% App. Total	0	0	0		0	0	100		0	86.2	13.8		50.1	49.9	0	

PHF	.000	.000	.000	.000	.000	.000	.823	.823	.000	.911	.693	.919	.948	.929	.000	.956
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Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Charles St From North			Boylston St From East			Charles St From South			Boylston St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	1	0	7	1	3	0	0	12
07:15 AM	0	0	0	0	0	0	0	7	1	1	1	0	10
07:30 AM	0	0	0	0	0	0	0	2	0	2	2	0	6
07:45 AM	0	0	0	0	0	0	0	3	0	3	2	0	8
Total	0	0	0	0	0	1	0	19	2	9	5	0	36
08:00 AM	0	0	0	0	0	0	0	1	0	3	1	0	5
08:15 AM	0	0	0	0	0	0	0	3	0	1	4	0	8
08:30 AM	0	0	0	0	0	0	0	1	2	3	2	0	8
08:45 AM	0	0	0	0	0	0	0	4	0	2	3	0	9
Total	0	0	0	0	0	0	0	9	2	9	10	0	30
Grand Total	0	0	0	0	0	1	0	28	4	18	15	0	66
Apprch %	0	0	0	0	0	100	0	87.5	12.5	54.5	45.5	0	
Total %	0	0	0	0	0	1.5	0	42.4	6.1	27.3	22.7	0	

Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

Page No : 10

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

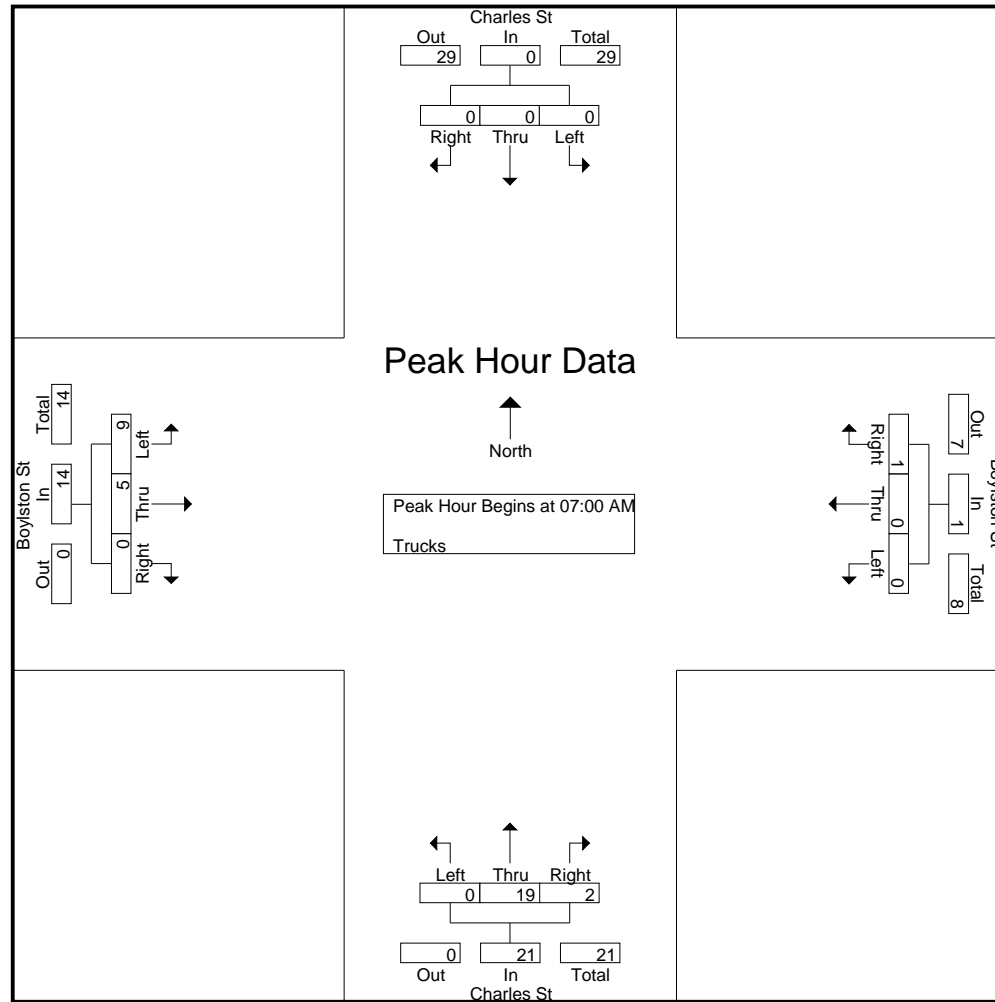
	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	1	1	0	7	1	8	3	0	0	3	12
07:15 AM	0	0	0	0	0	0	0	0	0	7	1	8	1	1	0	2	10
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	2	2	0	4	6
07:45 AM	0	0	0	0	0	0	0	0	0	3	0	3	3	2	0	5	8
Total Volume	0	0	0	0	0	0	1	1	0	19	2	21	9	5	0	14	36
% App. Total	0	0	0		0	0	100		0	90.5	9.5		64.3	35.7	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.679	.500	.656	.750	.625	.000	.700	.750

Accurate Counts

978-664-2565

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 11

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

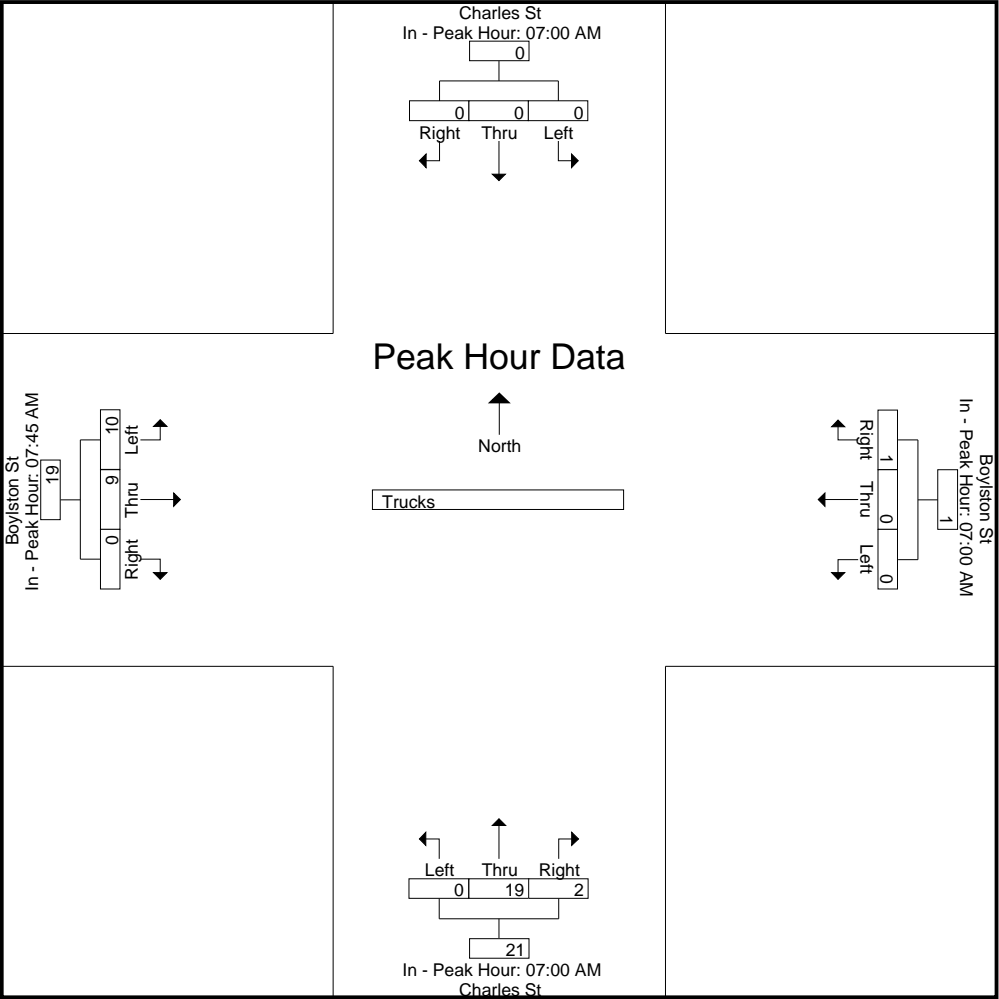


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	1	1	0	7	1	8	3	2	0	5
+15 mins.	0	0	0	0	0	0	0	0	0	7	1	8	3	1	0	4
+30 mins.	0	0	0	0	0	0	0	0	0	2	0	2	1	4	0	5
+45 mins.	0	0	0	0	0	0	0	0	0	3	0	3	3	2	0	5
Total Volume	0	0	0	0	0	0	1	1	0	19	2	21	10	9	0	19
% App. Total	0	0	0		0	0	100		0	90.5	9.5		52.6	47.4	0	

PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.679	.500	.656	.833	.563	.000	.950
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Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

Page No : 13

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Bikes Peds

	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	1	0	6	0	0	1	22	0	3	0	19	0	5	0	20	67	10	77
07:15 AM	0	0	0	16	0	0	0	31	0	1	0	29	1	3	0	41	117	5	122
07:30 AM	0	1	0	11	0	0	0	46	0	0	0	33	1	4	0	31	121	6	127
07:45 AM	0	0	0	24	0	0	0	54	0	0	0	45	2	9	0	43	166	11	177
Total	0	2	0	57	0	0	1	153	0	4	0	126	4	21	0	135	471	32	503
08:00 AM	0	0	0	28	0	0	0	46	0	3	0	31	2	14	0	50	155	19	174
08:15 AM	0	0	0	35	0	0	0	62	0	3	0	29	4	7	0	43	169	14	183
08:30 AM	0	0	0	37	0	0	0	70	0	3	1	42	1	14	0	58	207	19	226
08:45 AM	0	1	0	24	0	0	0	58	0	9	0	30	3	11	0	32	144	24	168
Total	0	1	0	124	0	0	0	236	0	18	1	132	10	46	0	183	675	76	751
Grand Total	0	3	0	181	0	0	1	389	0	22	1	258	14	67	0	318	1146	108	1254
Apprch %	0	100	0		0	0	100		0	95.7	4.3		17.3	82.7	0				
Total %	0	2.8	0		0	0	0.9		0	20.4	0.9		13	62	0		91.4	8.6	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 14

	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 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	3	0	3	2	14	0	16	19
08:15 AM	0	0	0	0	0	0	0	0	0	3	0	3	4	7	0	11	14
08:30 AM	0	0	0	0	0	0	0	0	0	3	1	4	1	14	0	15	19
08:45 AM	0	1	0	1	0	0	0	0	0	9	0	9	3	11	0	14	24
Total Volume	0	1	0	1	0	0	0	0	0	18	1	19	10	46	0	56	76
% App. Total	0	100	0		0	0	0		0	94.7	5.3		17.9	82.1	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.250	.528	.625	.821	.000	.875	.792

Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

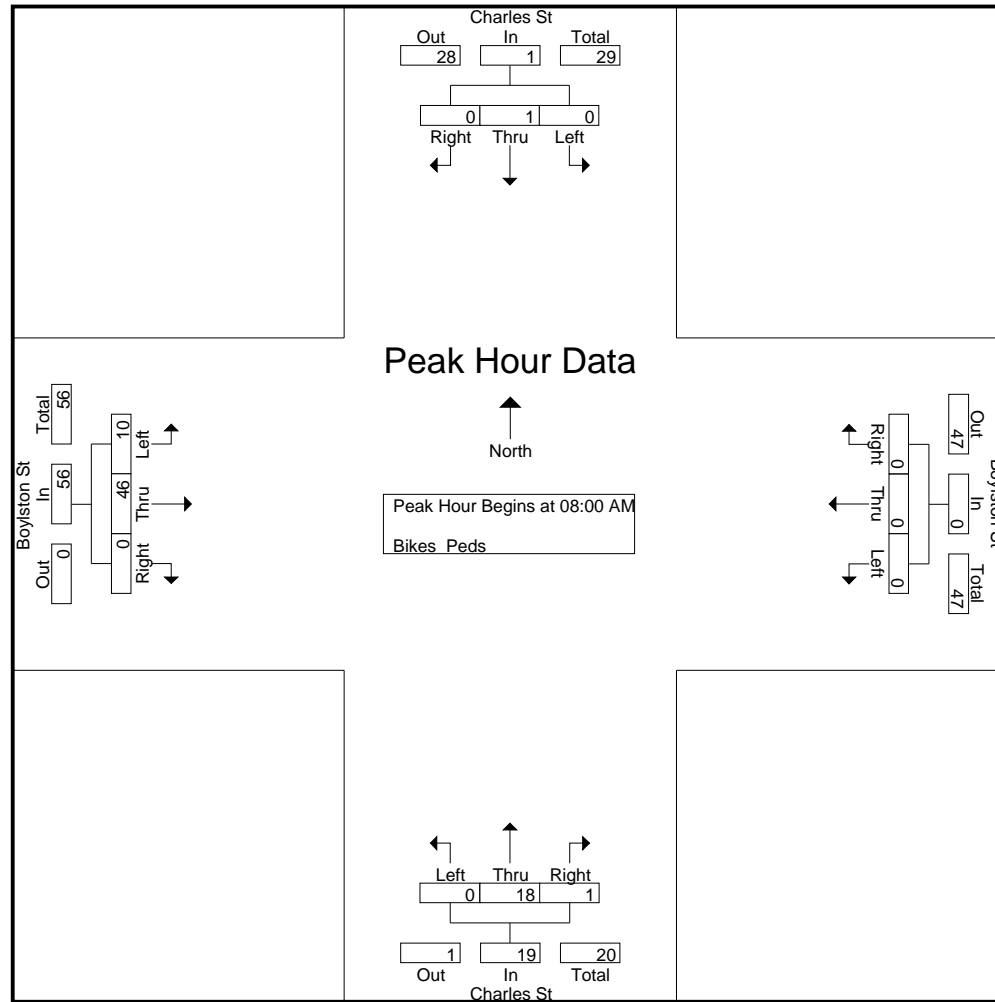
Page No : 15

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

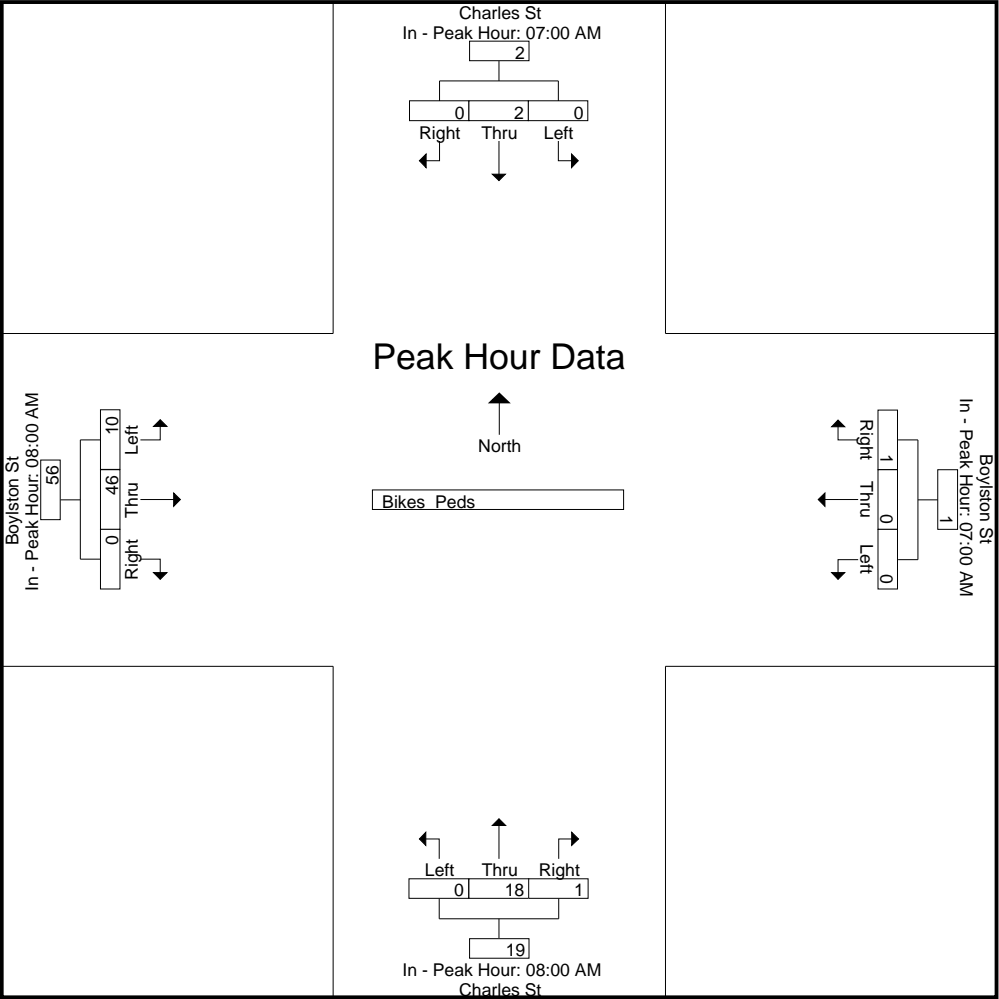


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	1	0	1	0	0	1	1	0	3	0	3	2	14	0	16
+15 mins.	0	0	0	0	0	0	0	0	0	3	0	3	4	7	0	11
+30 mins.	0	1	0	1	0	0	0	0	0	3	1	4	1	14	0	15
+45 mins.	0	0	0	0	0	0	0	0	0	9	0	9	3	11	0	14
Total Volume	0	2	0	2	0	0	1	1	0	18	1	19	10	46	0	56
% App. Total	0	100	0		0	0	100		0	94.7	5.3		17.9	82.1	0	

PHF	.000	.500	.000	.500	.000	.000	.250	.250	.000	.500	.250	.528	.625	.821	.000	.875
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Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

	Charles St From North			Boylston St From East			Charles St From South			Boylston 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	50	0	148	27	108	80	0	413
04:15 PM	0	0	0	0	0	41	0	154	55	82	122	0	454
04:30 PM	0	0	0	0	0	29	0	150	43	76	98	0	396
04:45 PM	0	0	0	0	0	44	0	166	41	97	115	0	463
Total	0	0	0	0	0	164	0	618	166	363	415	0	1726
05:00 PM	0	0	0	0	0	56	0	179	29	102	100	0	466
05:15 PM	0	0	0	0	0	57	0	183	52	111	148	0	551
05:30 PM	0	0	0	0	0	53	0	169	38	143	138	0	541
05:45 PM	0	0	0	0	0	42	0	218	48	163	124	0	595
Total	0	0	0	0	0	208	0	749	167	519	510	0	2153
Grand Total	0	0	0	0	0	372	0	1367	333	882	925	0	3879
Apprch %	0	0	0	0	0	100	0	80.4	19.6	48.8	51.2	0	
Total %	0	0	0	0	0	9.6	0	35.2	8.6	22.7	23.8	0	
Cars	0	0	0	0	0	372	0	1345	323	863	917	0	3820
% Cars	0	0	0	0	0	100	0	98.4	97	97.8	99.1	0	98.5
Trucks	0	0	0	0	0	0	0	22	10	19	8	0	59
% Trucks	0	0	0	0	0	0	0	1.6	3	2.2	0.9	0	1.5

Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

Page No : 2

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

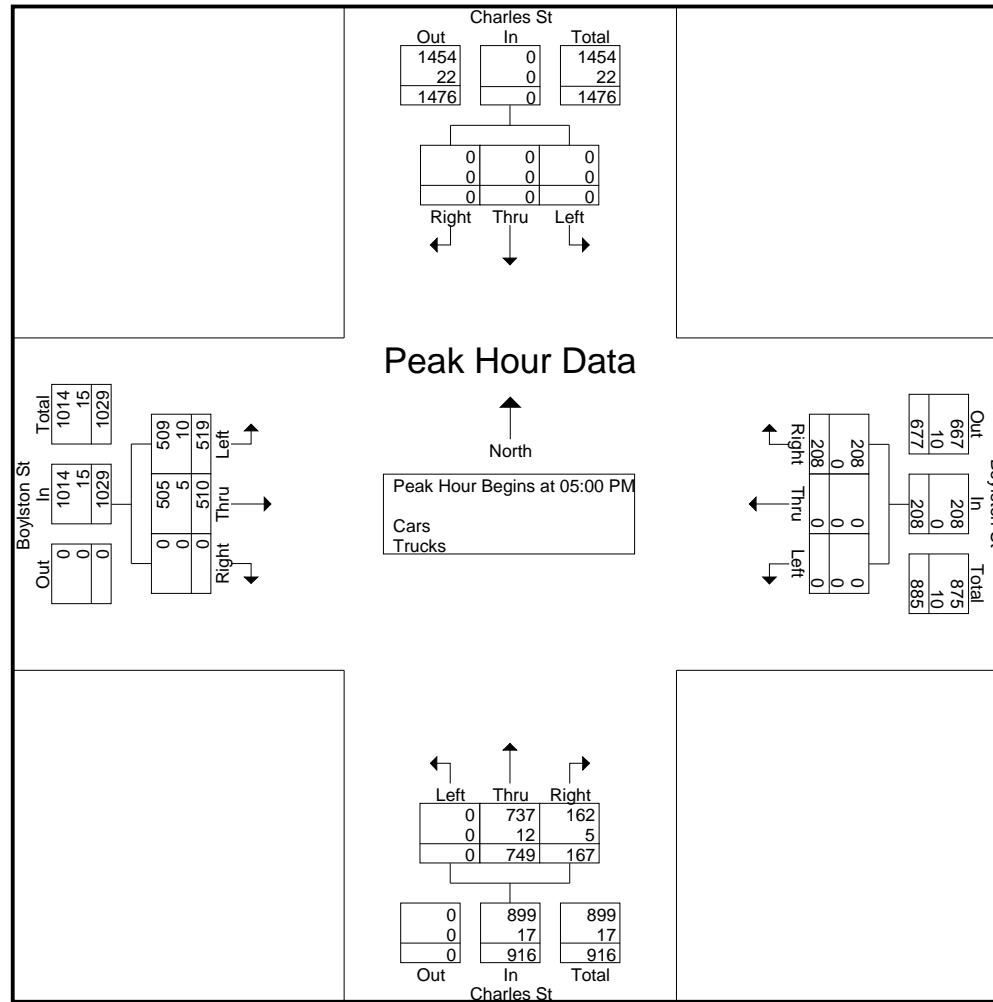
	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	56	56	0	179	29	208	102	100	0	202	466
05:15 PM	0	0	0	0	0	0	57	57	0	183	52	235	111	148	0	259	551
05:30 PM	0	0	0	0	0	0	53	53	0	169	38	207	143	138	0	281	541
05:45 PM	0	0	0	0	0	0	42	42	0	218	48	266	163	124	0	287	595
Total Volume	0	0	0	0	0	0	208	208	0	749	167	916	519	510	0	1029	2153
% App. Total	0	0	0		0	0	100		0	81.8	18.2		50.4	49.6	0		
PHF	.000	.000	.000	.000	.000	.000	.912	.912	.000	.859	.803	.861	.796	.861	.000	.896	.905
Cars	0	0	0	0	0	0	208	208	0	737	162	899	509	505	0	1014	2121
% Cars	0	0	0	0	0	0	100	100	0	98.4	97.0	98.1	98.1	99.0	0	98.5	98.5
Trucks	0	0	0	0	0	0	0	0	0	12	5	17	10	5	0	15	32
% Trucks	0	0	0	0	0	0	0	0	0	1.6	3.0	1.9	1.9	1.0	0	1.5	1.5

Accurate Counts

978-664-2565

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 3

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear



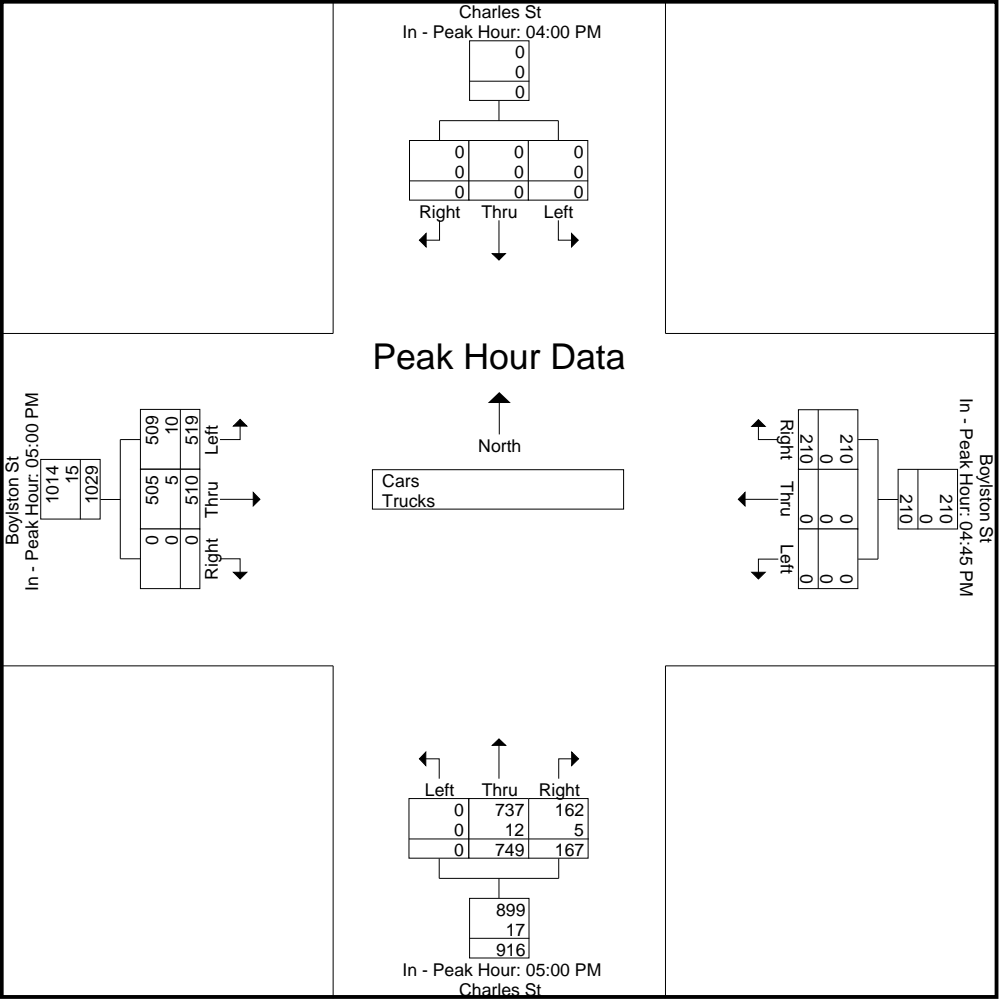
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	44	44	0	179	29	208	102	100	0	202
+15 mins.	0	0	0	0	0	0	56	56	0	183	52	235	111	148	0	259
+30 mins.	0	0	0	0	0	0	57	57	0	169	38	207	143	138	0	281
+45 mins.	0	0	0	0	0	0	53	53	0	218	48	266	163	124	0	287
Total Volume	0	0	0	0	0	0	210	210	0	749	167	916	519	510	0	1029
% App. Total	0	0	0		0	0	100		0	81.8	18.2		50.4	49.6	0	

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.921	.921	.000	.859	.803	.861	.796	.861	.000	.896
Cars	0	0	0	0	0	0	210	210	0	737	162	899	509	505	0	1014
% Cars	0	0	0	0	0	0	100	100	0	98.4	97	98.1	98.1	99	0	98.5
Trucks	0	0	0	0	0	0	0	0	0	12	5	17	10	5	0	15
% Trucks	0	0	0	0	0	0	0	0	0	1.6	3	1.9	1.9	1	0	1.5



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 5

Groups Printed- Cars

	Charles St From North			Boylston St From East			Charles St From South			Boylston 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	50	0	146	27	104	80	0	407
04:15 PM	0	0	0	0	0	41	0	151	54	78	120	0	444
04:30 PM	0	0	0	0	0	29	0	147	41	76	98	0	391
04:45 PM	0	0	0	0	0	44	0	164	39	96	114	0	457
Total	0	0	0	0	0	164	0	608	161	354	412	0	1699
05:00 PM	0	0	0	0	0	56	0	172	28	99	100	0	455
05:15 PM	0	0	0	0	0	57	0	181	49	108	148	0	543
05:30 PM	0	0	0	0	0	53	0	167	38	143	136	0	537
05:45 PM	0	0	0	0	0	42	0	217	47	159	121	0	586
Total	0	0	0	0	0	208	0	737	162	509	505	0	2121
Grand Total	0	0	0	0	0	372	0	1345	323	863	917	0	3820
Apprch %	0	0	0	0	0	100	0	80.6	19.4	48.5	51.5	0	
Total %	0	0	0	0	0	9.7	0	35.2	8.5	22.6	24	0	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 6

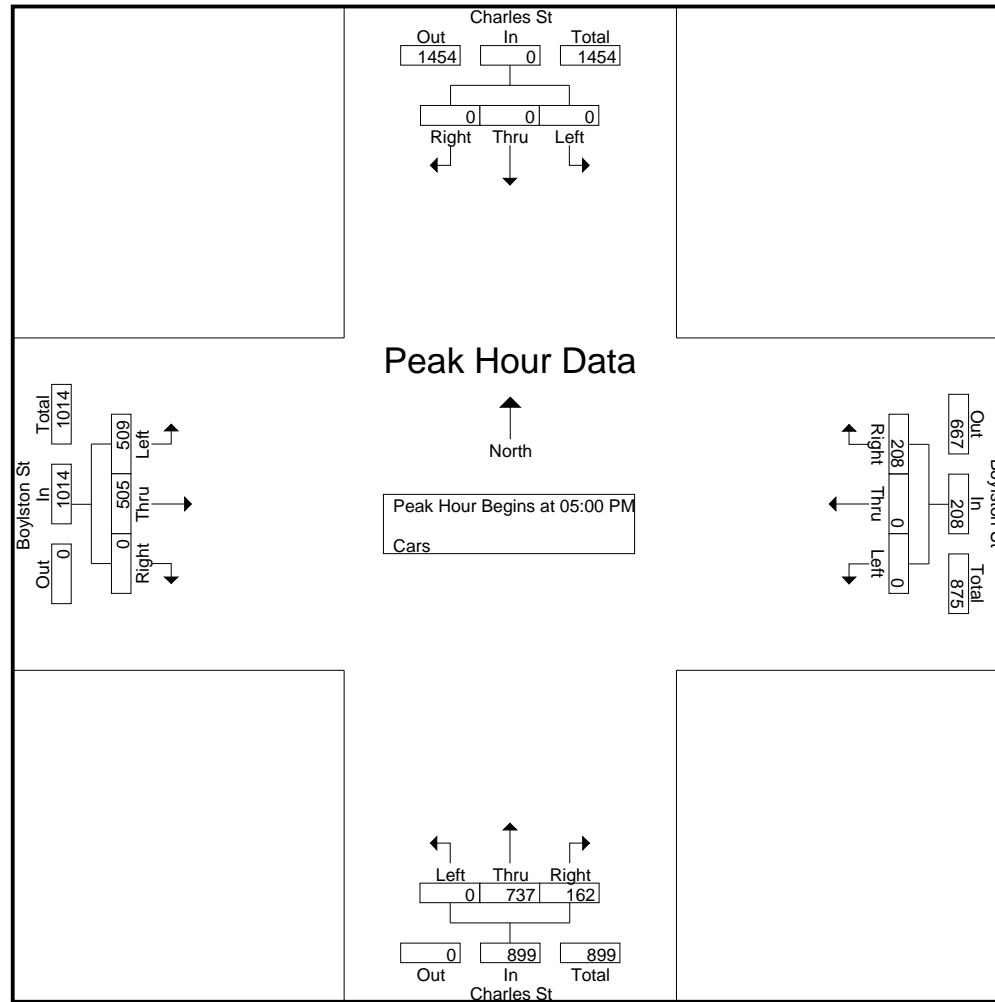
	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	56	56	0	172	28	200	99	100	0	199	455
05:15 PM	0	0	0	0	0	0	57	57	0	181	49	230	108	148	0	256	543
05:30 PM	0	0	0	0	0	0	53	53	0	167	38	205	143	136	0	279	537
05:45 PM	0	0	0	0	0	0	42	42	0	217	47	264	159	121	0	280	586
Total Volume	0	0	0	0	0	0	208	208	0	737	162	899	509	505	0	1014	2121
% App. Total	0	0	0		0	0	100		0	82	18		50.2	49.8	0		
PHF	.000	.000	.000	.000	.000	.000	.912	.912	.000	.849	.827	.851	.800	.853	.000	.905	.905

Accurate Counts

978-664-2565

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 7

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

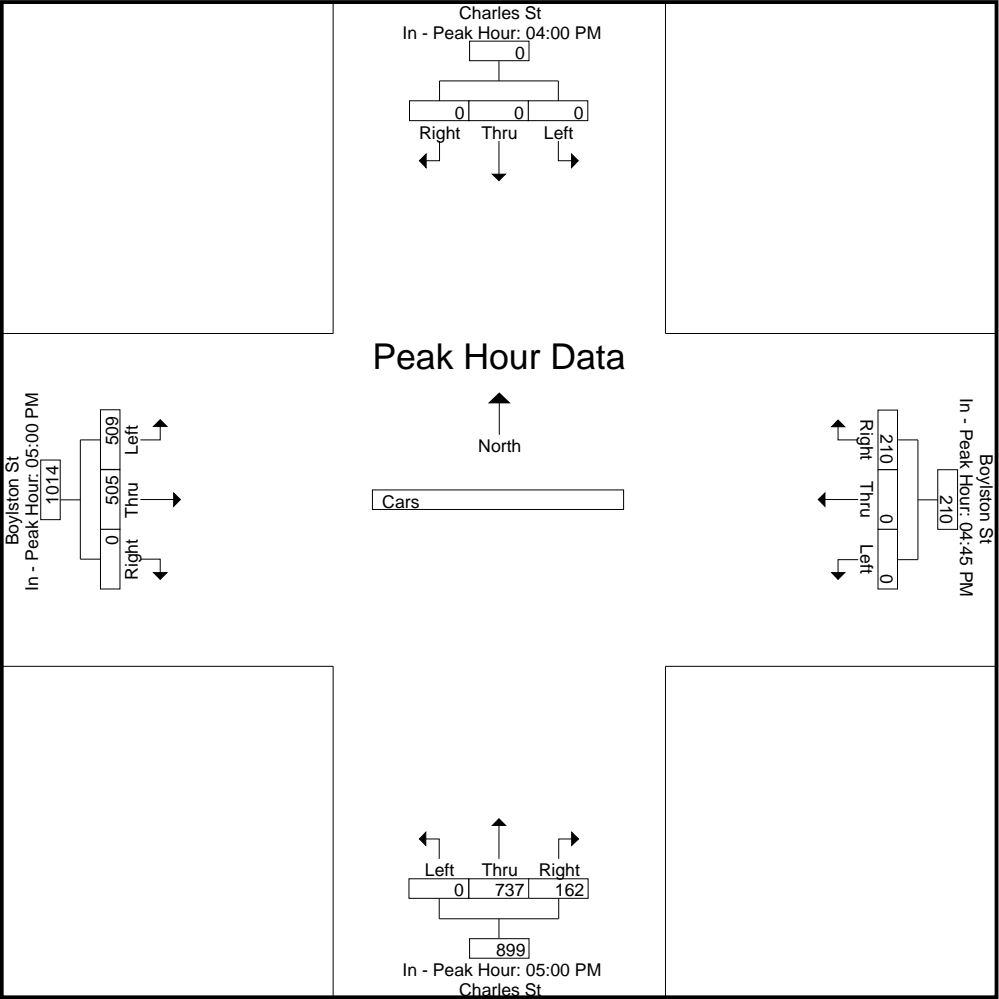


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	44	44	0	172	28	200	99	100	0	199
+15 mins.	0	0	0	0	0	0	56	56	0	181	49	230	108	148	0	256
+30 mins.	0	0	0	0	0	0	57	57	0	167	38	205	143	136	0	279
+45 mins.	0	0	0	0	0	0	53	53	0	217	47	264	159	121	0	280
Total Volume	0	0	0	0	0	0	210	210	0	737	162	899	509	505	0	1014
% App. Total	0	0	0		0	0	100		0	82	18		50.2	49.8	0	

PHF	.000	.000	.000	.000	.000	.000	.921	.921	.000	.849	.827	.851	.800	.853	.000	.905
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Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Charles St From North			Boylston St From East			Charles St From South			Boylston 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	2	0	4	0	0	6
04:15 PM	0	0	0	0	0	0	0	3	1	4	2	0	10
04:30 PM	0	0	0	0	0	0	0	3	2	0	0	0	5
04:45 PM	0	0	0	0	0	0	0	2	2	1	1	0	6
Total	0	0	0	0	0	0	0	10	5	9	3	0	27
05:00 PM	0	0	0	0	0	0	0	7	1	3	0	0	11
05:15 PM	0	0	0	0	0	0	0	2	3	3	0	0	8
05:30 PM	0	0	0	0	0	0	0	2	0	0	2	0	4
05:45 PM	0	0	0	0	0	0	0	1	1	4	3	0	9
Total	0	0	0	0	0	0	0	12	5	10	5	0	32
Grand Total	0	0	0	0	0	0	0	22	10	19	8	0	59
Apprch %	0	0	0	0	0	0	0	68.8	31.2	70.4	29.6	0	
Total %	0	0	0	0	0	0	0	37.3	16.9	32.2	13.6	0	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 10

	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 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	3	1	4	4	2	0	6	10
04:30 PM	0	0	0	0	0	0	0	0	0	3	2	5	0	0	0	0	5
04:45 PM	0	0	0	0	0	0	0	0	0	2	2	4	1	1	0	2	6
05:00 PM	0	0	0	0	0	0	0	0	0	7	1	8	3	0	0	3	11
Total Volume	0	0	0	0	0	0	0	0	0	15	6	21	8	3	0	11	32
% App. Total	0	0	0		0	0	0		0	71.4	28.6		72.7	27.3	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.536	.750	.656	.500	.375	.000	.458	.727

Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

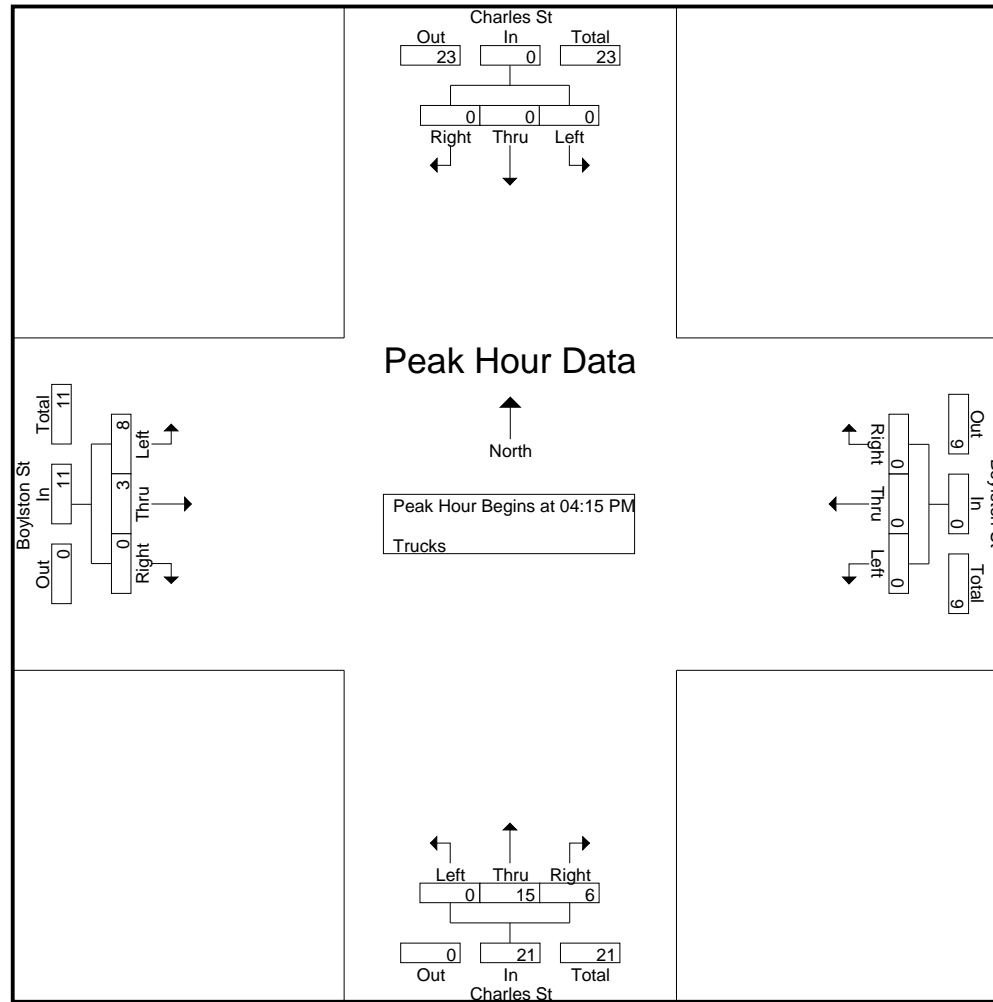
Page No : 11

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

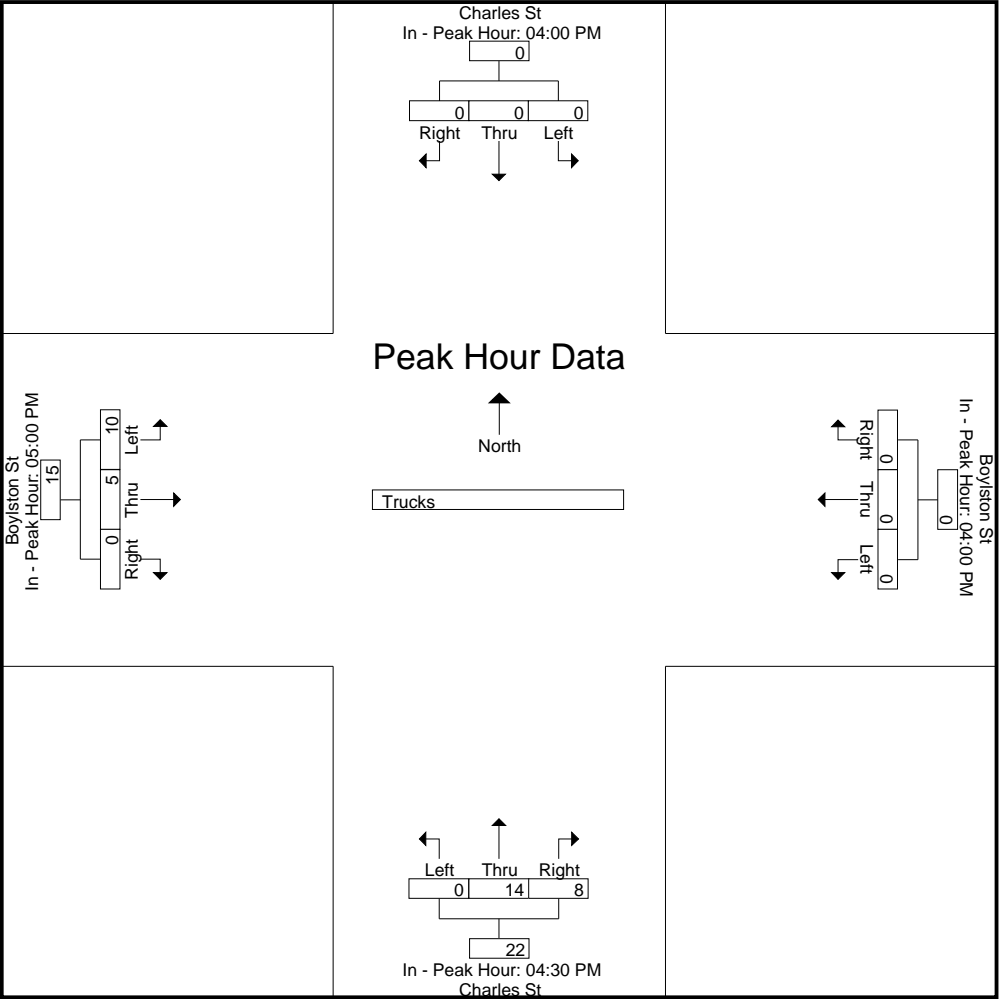


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:30 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	3	2	5	3	0	0	3
+15 mins.	0	0	0	0	0	0	0	0	0	2	2	4	3	0	0	3
+30 mins.	0	0	0	0	0	0	0	0	0	7	1	8	0	2	0	2
+45 mins.	0	0	0	0	0	0	0	0	0	2	3	5	4	3	0	7
Total Volume	0	0	0	0	0	0	0	0	0	14	8	22	10	5	0	15
% App. Total	0	0	0		0	0	0		0	63.6	36.4		66.7	33.3	0	

PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.667	.688	.625	.417	.000	.536
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

Page No : 13

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Bikes Peds

	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	12	0	0	0	30	0	3	0	56	0	4	0	52	150	7	157
04:15 PM	0	0	0	14	0	0	0	50	0	0	0	39	3	0	0	28	131	3	134
04:30 PM	0	0	0	6	0	0	0	35	0	2	0	28	0	1	1	35	104	4	108
04:45 PM	0	0	0	3	0	0	0	22	0	3	0	24	1	1	0	20	69	5	74
Total	0	0	0	35	0	0	0	137	0	8	0	147	4	6	1	135	454	19	473
05:00 PM	0	0	0	10	0	0	0	23	0	0	0	24	1	0	0	40	97	1	98
05:15 PM	0	0	0	9	0	0	0	24	0	0	0	23	0	0	0	31	87	0	87
05:30 PM	0	0	0	9	0	0	0	19	0	1	0	24	1	0	0	35	87	2	89
05:45 PM	0	0	0	5	0	0	0	14	0	0	0	13	0	0	0	19	51	0	51
Total	0	0	0	33	0	0	0	80	0	1	0	84	2	0	0	125	322	3	325
Grand Total	0	0	0	68	0	0	0	217	0	9	0	231	6	6	1	260	776	22	798
Apprch %	0	0	0		0	0	0		0	100	0		46.2	46.2	7.7				
Total %	0	0	0		0	0	0		0	40.9	0		27.3	27.3	4.5		97.2	2.8	

Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 14

	Charles St From North				Boylston St From East				Charles St From South				Boylston St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 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	3	0	3	0	4	0	4	7
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	1	2	4
04:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	1	1	0	2	5
Total Volume	0	0	0	0	0	0	0	0	0	8	0	8	4	6	1	11	19
% App. Total	0	0	0		0	0	0		0	100	0		36.4	54.5	9.1		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.667	.000	.667	.333	.375	.250	.688	.679

Accurate Counts

978-664-2565

File Name : 17034002

Site Code : 17034002

Start Date : 11/28/2017

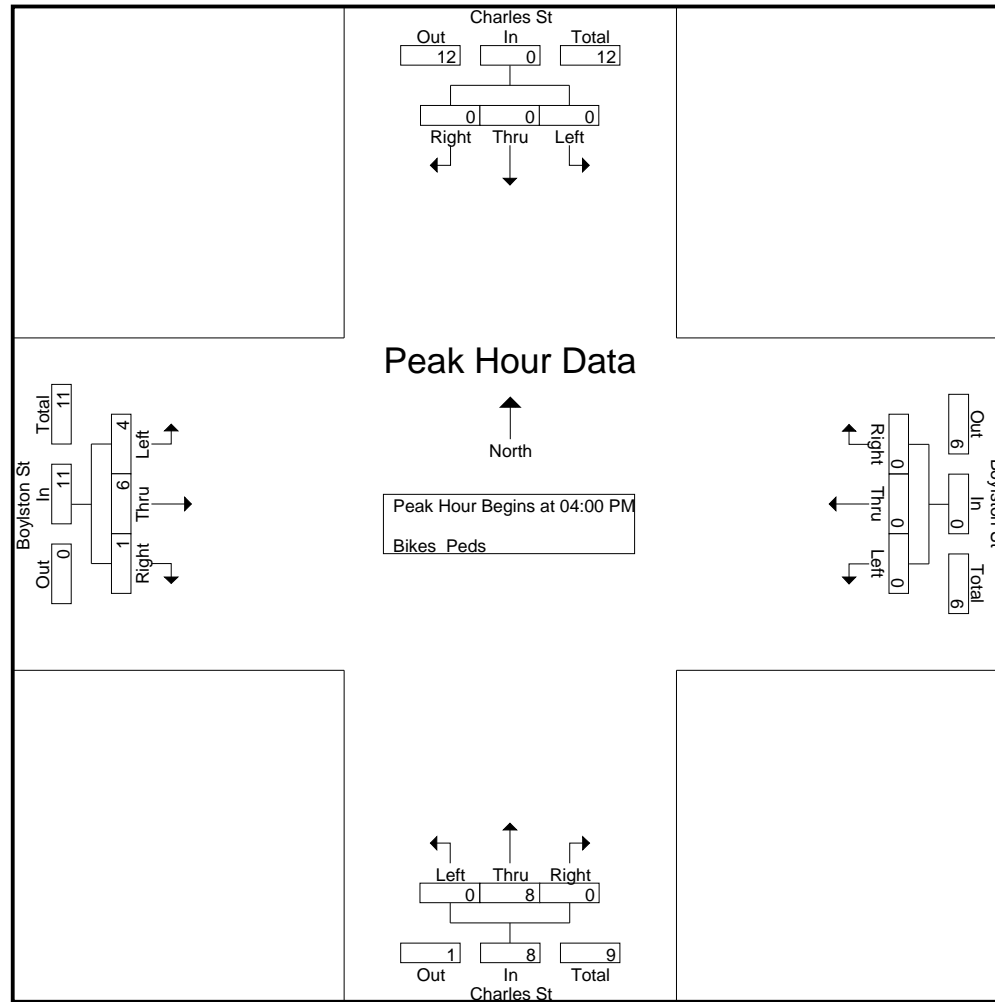
Page No : 15

N/S Street : Charles Street

E/W Street: Boylston Street

City/State : Boston, MA

Weather : Clear



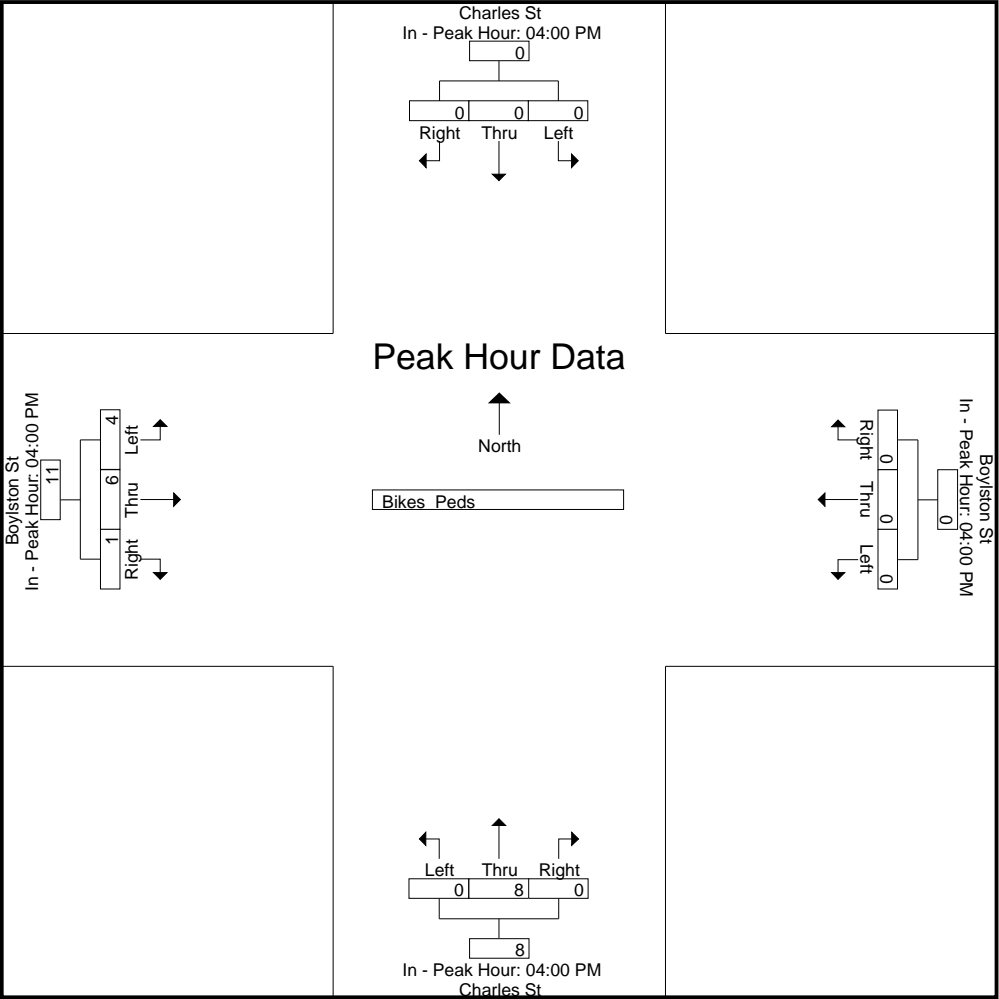
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

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	3	0	3	0	4	0	4
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
+30 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	1	1	2
+45 mins.	0	0	0	0	0	0	0	0	0	3	0	3	1	1	0	2
Total Volume	0	0	0	0	0	0	0	0	0	8	0	8	4	6	1	11
% App. Total	0	0	0		0	0	0		0	100	0		36.4	54.5	9.1	

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.667	.000	.667	.333	.375	.250	.688
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 1

Groups Printed- Peds 2 NW			
	Boylston St From West		
	Start Time	NW Leg	Int. Total
	07:00 AM	12	12
	07:15 AM	20	20
	07:30 AM	19	19
	07:45 AM	20	20
	Total	71	71
	08:00 AM	26	26
	08:15 AM	29	29
	08:30 AM	31	31
	08:45 AM	16	16
	Total	102	102
	Grand Total	173	173
	Apprch %	100	
	Total %	100	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

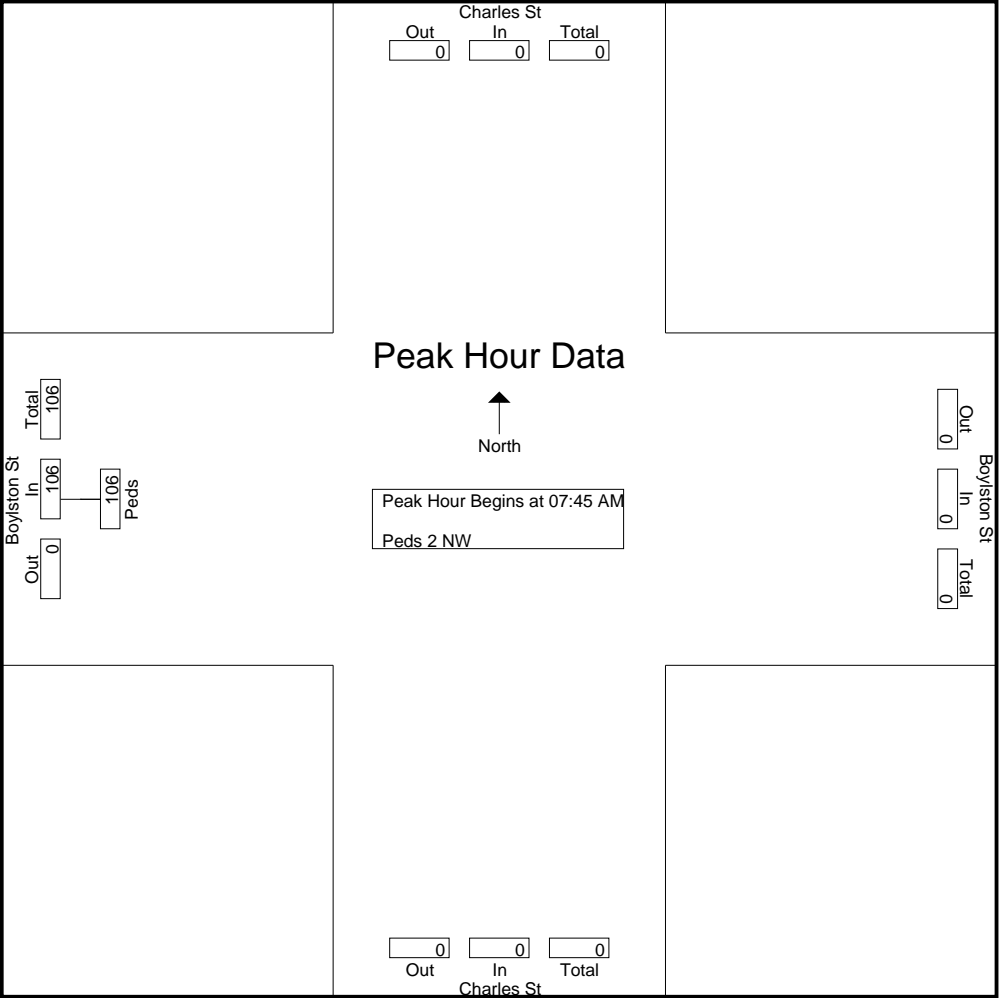
File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 2

	From North	From East	From South	Boylston St From West		
Start Time	App. Total	App. Total	App. Total	NW Leg	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1						
Peak Hour for Entire Intersection Begins at 07:45 AM						
07:45 AM	0	0	0	20	20	20
08:00 AM	0	0	0	26	26	26
08:15 AM	0	0	0	29	29	29
08:30 AM	0	0	0	31	31	31
Total Volume	0	0	0	106	106	106
% App. Total				100		
PHF	.000	.000	.000	.855	.855	.855

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

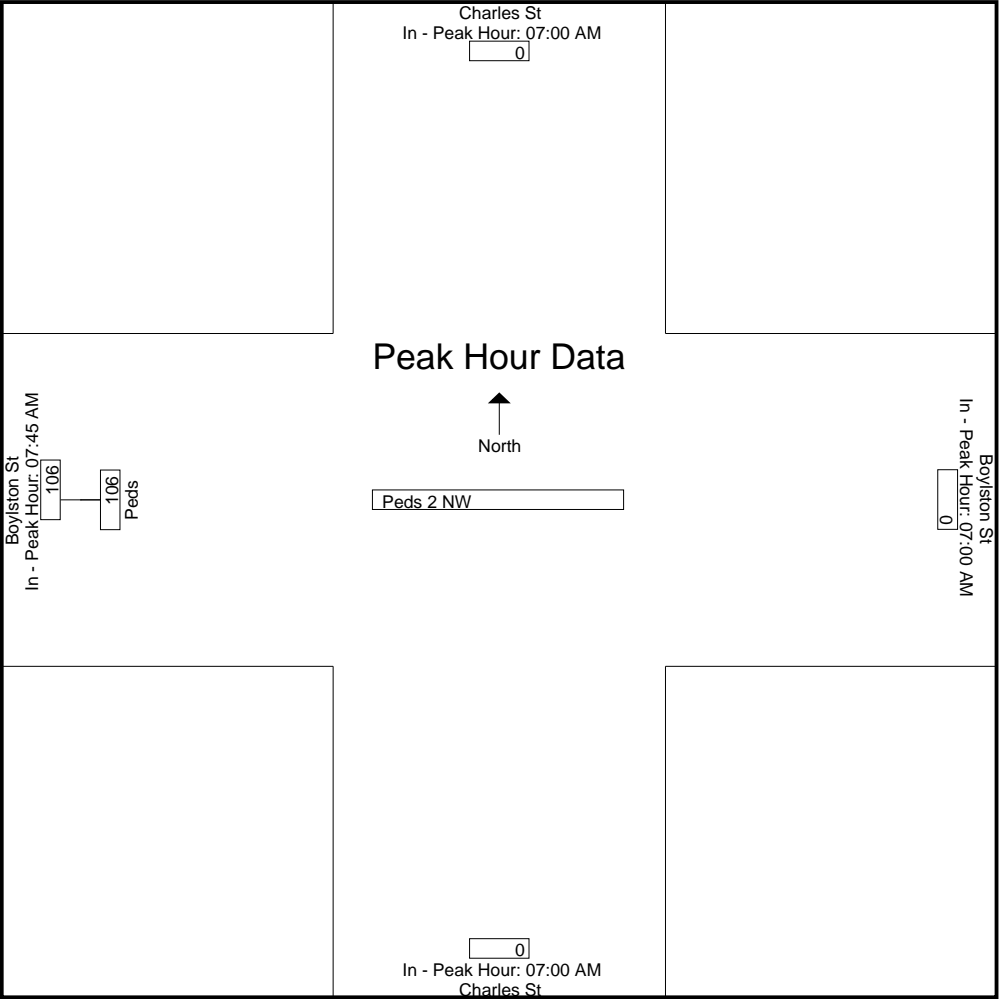
File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 3



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

	07:00 AM	07:00 AM	07:00 AM	07:45 AM	
+0 mins.	0	0	0	20	20
+15 mins.	0	0	0	26	26
+30 mins.	0	0	0	29	29
+45 mins.	0	0	0	31	31
Total Volume	0	0	0	106	106
% App. Total				100	

PHF	.000	.000	.000	.855	.855
-----	------	------	------	------	------



Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 1

Groups Printed- Peds 2 NW			
	Boylston St From West		
	Start Time	NW Leg	Int. Total
	04:00 PM	46	46
	04:15 PM	32	32
	04:30 PM	24	24
	04:45 PM	30	30
	Total	132	132
	05:00 PM	25	25
	05:15 PM	32	32
	05:30 PM	27	27
	05:45 PM	16	16
	Total	100	100
	Grand Total	232	232
	Apprch %	100	
	Total %	100	

Accurate Counts
978-664-2565

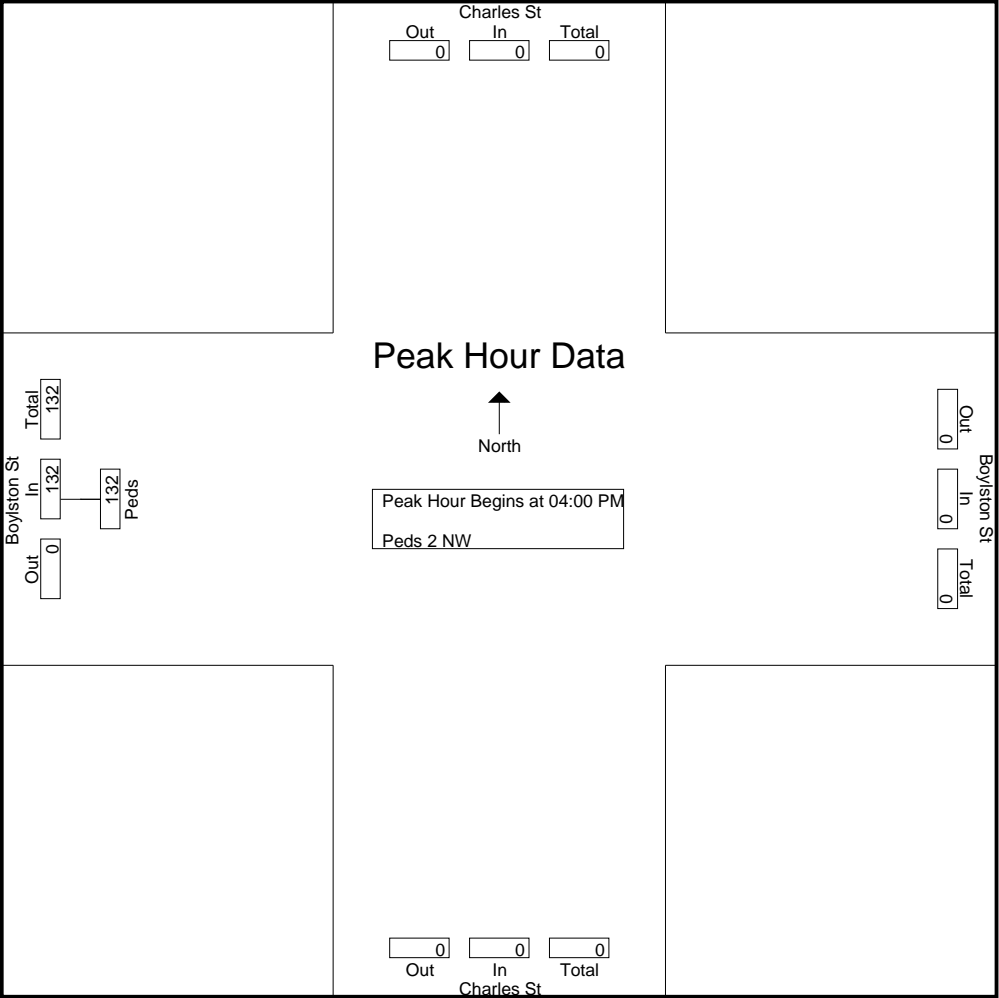
N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 2

	From North	From East	From South	Boylston St From West		
Start Time	App. Total	App. Total	App. Total	NW Leg	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	46	46	46
04:15 PM	0	0	0	32	32	32
04:30 PM	0	0	0	24	24	24
04:45 PM	0	0	0	30	30	30
Total Volume	0	0	0	132	132	132
% App. Total				100		
PHF	.000	.000	.000	.717	.717	.717

N/S Street : Charles Street
E/W Street: Boylston Street
City/State : Boston, MA
Weather : Clear

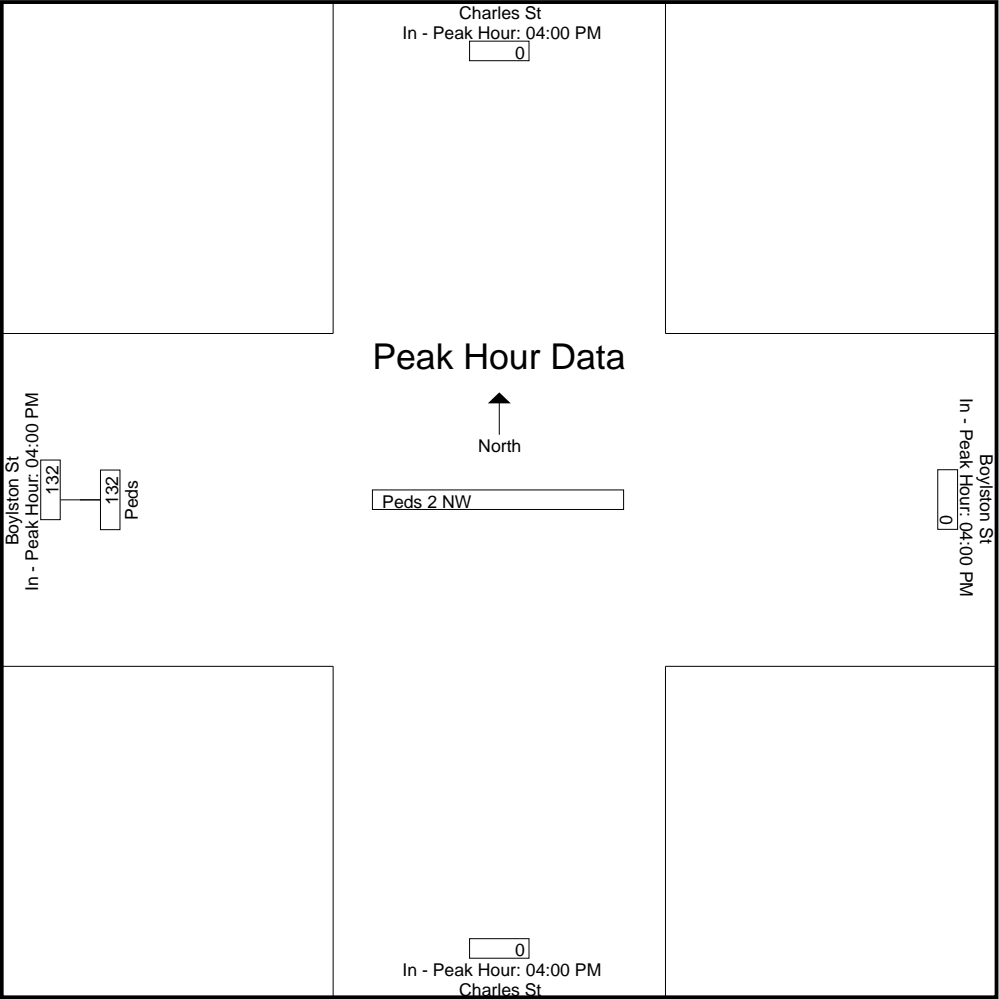
File Name : 17034002
Site Code : 17034002
Start Date : 11/28/2017
Page No : 3



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	04:00 PM	04:00 PM	04:00 PM
+0 mins.	0	0	0	4646
+15 mins.	0	0	0	3232
+30 mins.	0	0	0	2424
+45 mins.	0	0	0	3030
Total Volume	0	0	0	132132
% App. Total				100

PHF	.000	.000	.000	.717	.717
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Accurate Counts

978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

	Arlington St From North			Park Plaza From East			Arlington St From South			St. James Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	188	24	21	64	0	0	0	0	0	0	7	304
07:15 AM	0	196	38	18	71	0	0	0	0	0	0	3	326
07:30 AM	0	213	32	12	54	0	0	0	0	0	0	5	316
07:45 AM	0	237	37	21	85	0	0	0	0	0	0	3	383
Total	0	834	131	72	274	0	0	0	0	0	0	18	1329
08:00 AM	0	211	51	22	76	0	0	0	0	0	0	7	367
08:15 AM	0	223	50	23	74	0	0	0	0	0	0	18	388
08:30 AM	0	241	42	37	84	0	0	0	0	0	0	15	419
08:45 AM	0	196	49	25	65	0	0	0	0	0	0	13	348
Total	0	871	192	107	299	0	0	0	0	0	0	53	1522
Grand Total	0	1705	323	179	573	0	0	0	0	0	0	71	2851
Apprch %	0	84.1	15.9	23.8	76.2	0	0	0	0	0	0	100	
Total %	0	59.8	11.3	6.3	20.1	0	0	0	0	0	0	2.5	
Cars	0	1653	316	160	537	0	0	0	0	0	0	70	2736
% Cars	0	97	97.8	89.4	93.7	0	0	0	0	0	0	98.6	96
Trucks	0	52	7	19	36	0	0	0	0	0	0	1	115
% Trucks	0	3	2.2	10.6	6.3	0	0	0	0	0	0	1.4	4

978-664-2565

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 2

[illegible]

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

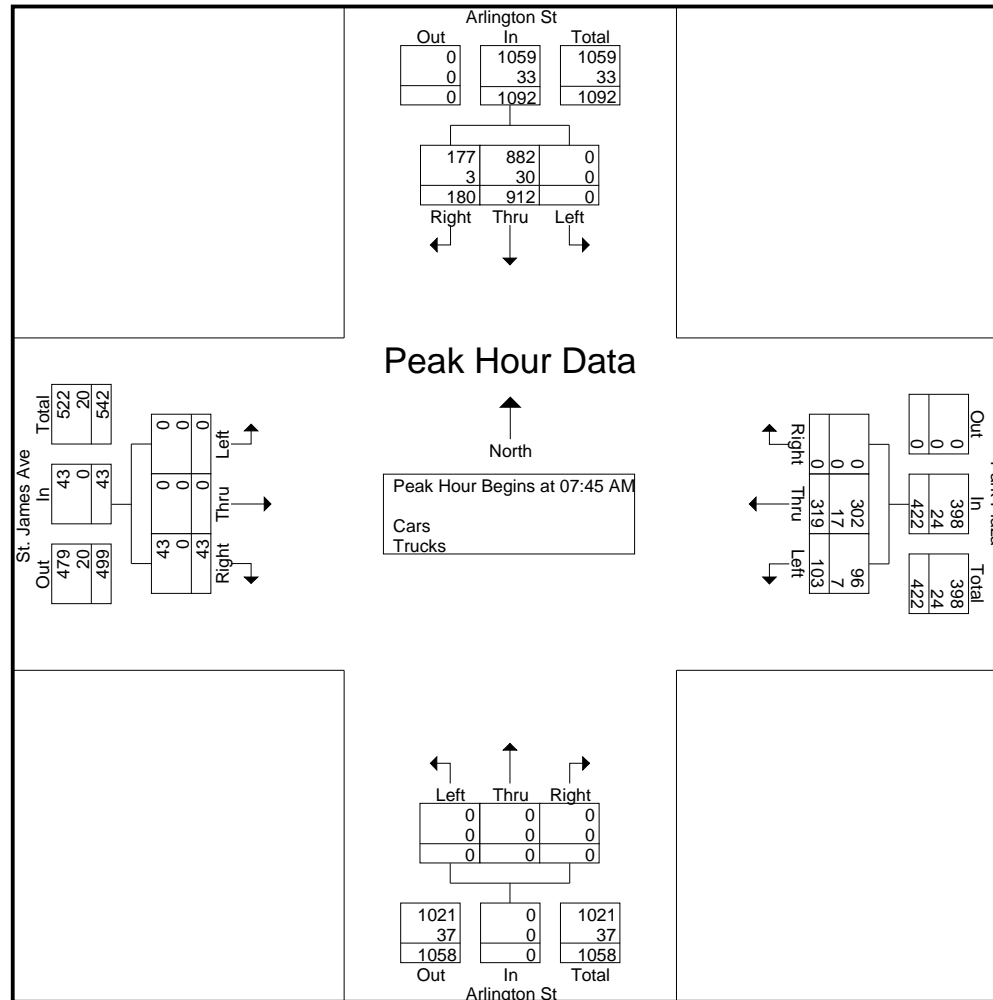
Page No : 3

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear



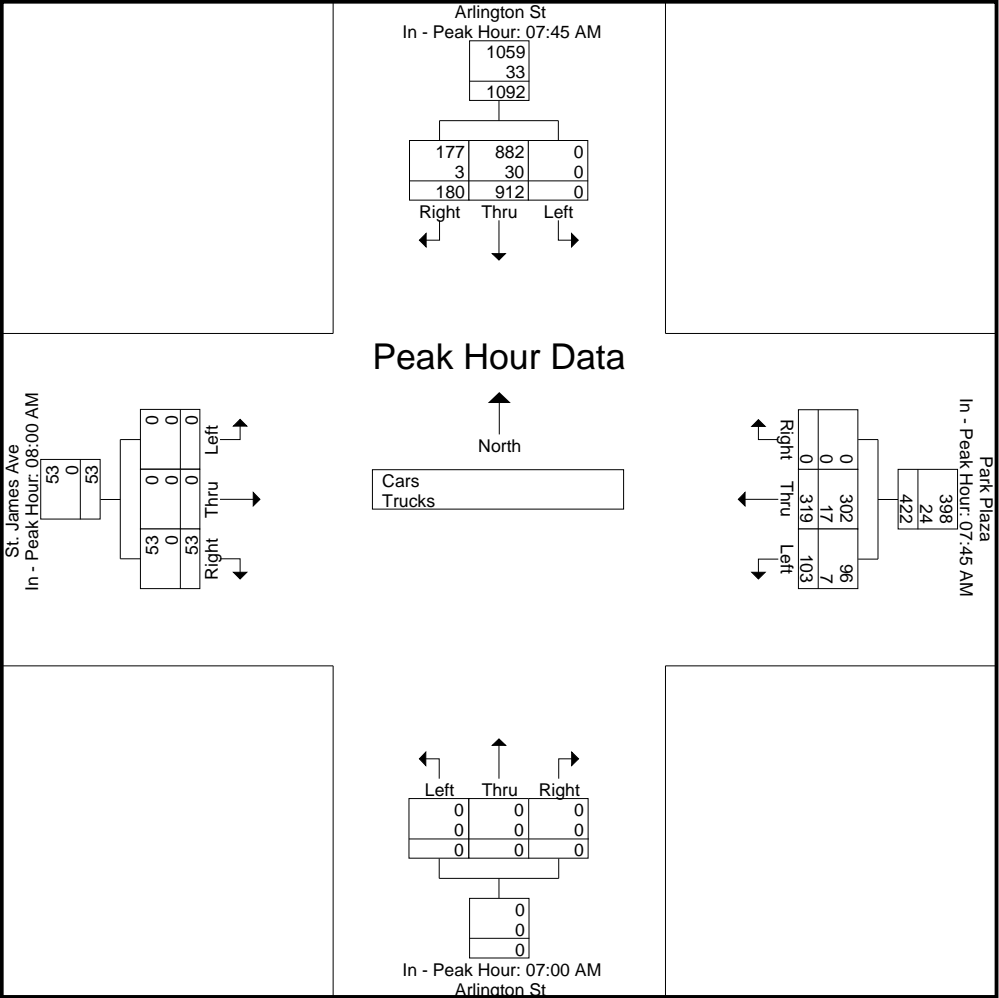
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:00 AM				08:00 AM			
+0 mins.	0	237	37	274	21	85	0	106	0	0	0	0	0	0	7	7
+15 mins.	0	211	51	262	22	76	0	98	0	0	0	0	0	0	18	18
+30 mins.	0	223	50	273	23	74	0	97	0	0	0	0	0	0	15	15
+45 mins.	0	241	42	283	37	84	0	121	0	0	0	0	0	0	13	13
Total Volume	0	912	180	1092	103	319	0	422	0	0	0	0	0	0	53	53
% App. Total	0	83.5	16.5		24.4	75.6	0		0	0	0		0	0	100	

Accurate Counts
978-664-2565

PHF	.000	.946	.882	.965	.696	.938	.000	.872	.000	.000	.000	.000	.000	.000	.736	.736
Cars	0	882	177	1059	96	302	0	398	0	0	0	0	0	0	53	53
% Cars	0	96.7	98.3	97	93.2	94.7	0	94.3	0	0	0	0	0	0	100	100
Trucks	0	30	3	33	7	17	0	24	0	0	0	0	0	0	0	0
% Trucks	0	3.3	1.7	3	6.8	5.3	0	5.7	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 5

Groups Printed- Cars

	Arlington St From North			Park Plaza From East			Arlington St From South			St. James Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	181	22	19	58	0	0	0	0	0	0	6	286
07:15 AM	0	190	38	16	67	0	0	0	0	0	0	3	314
07:30 AM	0	208	30	8	49	0	0	0	0	0	0	5	300
07:45 AM	0	229	37	18	80	0	0	0	0	0	0	3	367
Total	0	808	127	61	254	0	0	0	0	0	0	17	1267
08:00 AM	0	203	50	22	72	0	0	0	0	0	0	7	354
08:15 AM	0	216	48	22	71	0	0	0	0	0	0	18	375
08:30 AM	0	234	42	34	79	0	0	0	0	0	0	15	404
08:45 AM	0	192	49	21	61	0	0	0	0	0	0	13	336
Total	0	845	189	99	283	0	0	0	0	0	0	53	1469
Grand Total	0	1653	316	160	537	0	0	0	0	0	0	70	2736
Apprch %	0	84	16	23	77	0	0	0	0	0	0	100	
Total %	0	60.4	11.5	5.8	19.6	0	0	0	0	0	0	2.6	

Accurate Counts
978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 6

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave 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	229	37	266	18	80	0	98	0	0	0	0	0	0	3	3	367
08:00 AM	0	203	50	253	22	72	0	94	0	0	0	0	0	0	7	7	354
08:15 AM	0	216	48	264	22	71	0	93	0	0	0	0	0	0	18	18	375
08:30 AM	0	234	42	276	34	79	0	113	0	0	0	0	0	0	15	15	404
Total Volume	0	882	177	1059	96	302	0	398	0	0	0	0	0	0	43	43	1500
% App. Total	0	83.3	16.7		24.1	75.9	0		0	0	0		0	0	100		
PHF	.000	.942	.885	.959	.706	.944	.000	.881	.000	.000	.000	.000	.000	.000	.597	.597	.928

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

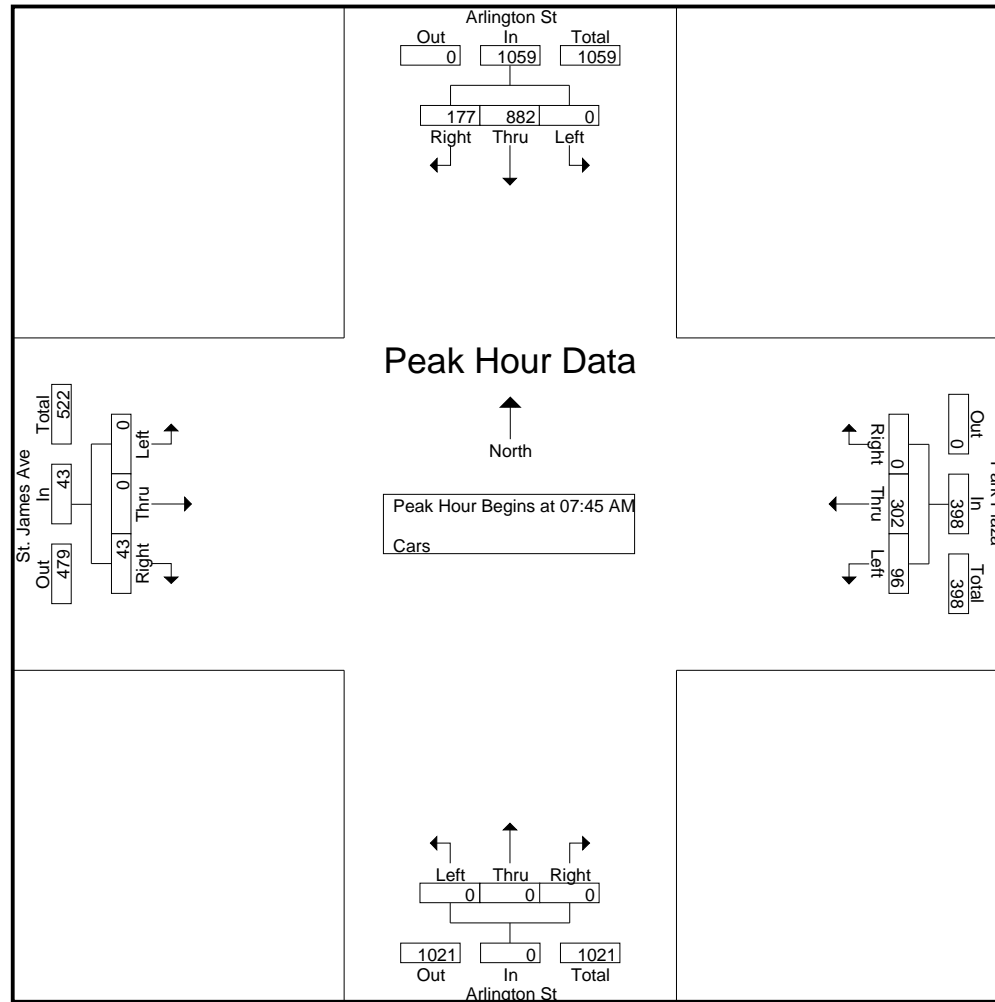
Page No : 7

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear

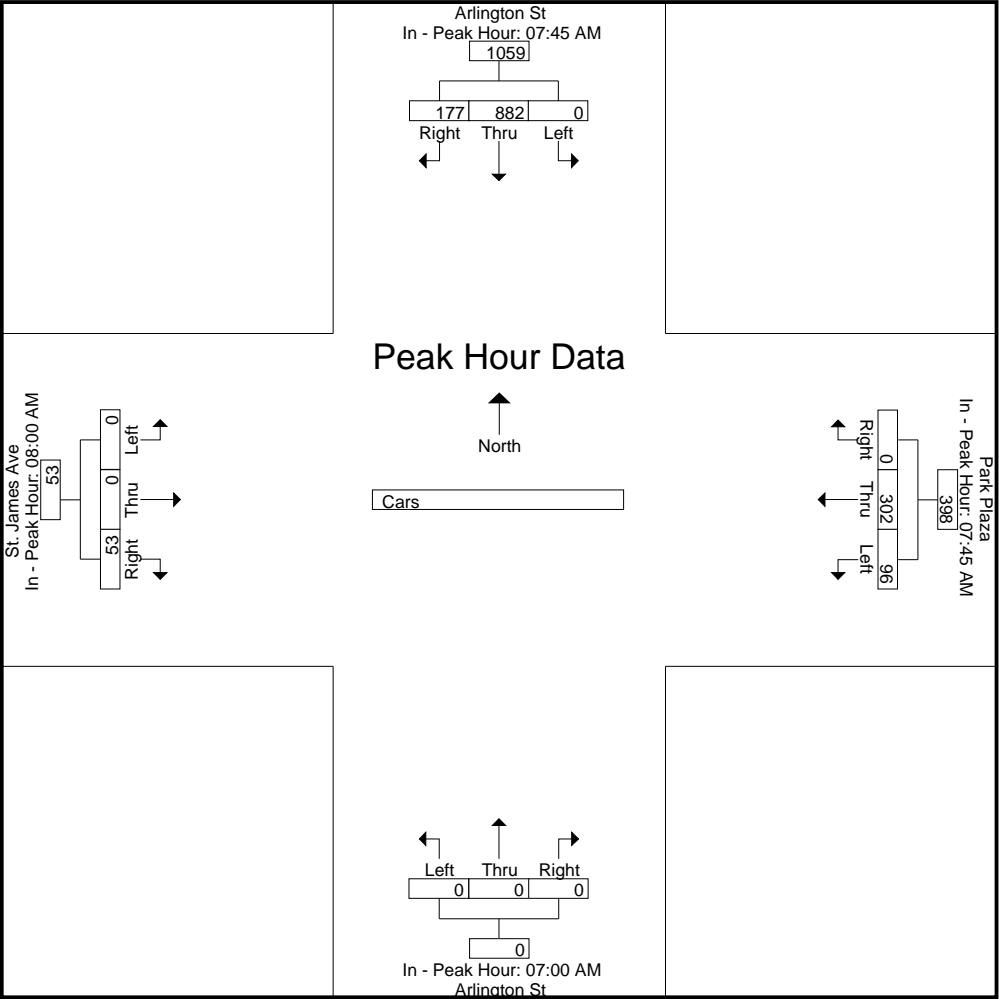


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:00 AM				08:00 AM			
+0 mins.	0	229	37	266	18	80	0	98	0	0	0	0	0	0	7	7
+15 mins.	0	203	50	253	22	72	0	94	0	0	0	0	0	0	18	18
+30 mins.	0	216	48	264	22	71	0	93	0	0	0	0	0	0	15	15
+45 mins.	0	234	42	276	34	79	0	113	0	0	0	0	0	0	13	13
Total Volume	0	882	177	1059	96	302	0	398	0	0	0	0	0	0	53	53
% App. Total	0	83.3	16.7		24.1	75.9	0		0	0	0		0	0	100	

PHF	.000	.942	.885	.959	.706	.944	.000	.881	.000	.000	.000	.000	.000	.000	.736	.736
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Accurate Counts

978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Arlington St From North			Park Plaza From East			Arlington St From South			St. James Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	7	2	2	6	0	0	0	0	0	0	1	18
07:15 AM	0	6	0	2	4	0	0	0	0	0	0	0	12
07:30 AM	0	5	2	4	5	0	0	0	0	0	0	0	16
07:45 AM	0	8	0	3	5	0	0	0	0	0	0	0	16
Total	0	26	4	11	20	0	0	0	0	0	0	1	62
08:00 AM	0	8	1	0	4	0	0	0	0	0	0	0	13
08:15 AM	0	7	2	1	3	0	0	0	0	0	0	0	13
08:30 AM	0	7	0	3	5	0	0	0	0	0	0	0	15
08:45 AM	0	4	0	4	4	0	0	0	0	0	0	0	12
Total	0	26	3	8	16	0	0	0	0	0	0	0	53
Grand Total	0	52	7	19	36	0	0	0	0	0	0	1	115
Apprch %	0	88.1	11.9	34.5	65.5	0	0	0	0	0	0	100	
Total %	0	45.2	6.1	16.5	31.3	0	0	0	0	0	0	0.9	

Accurate Counts
978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 10

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave 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	7	2	9	2	6	0	8	0	0	0	0	0	0	1	1	18
07:15 AM	0	6	0	6	2	4	0	6	0	0	0	0	0	0	0	0	12
07:30 AM	0	5	2	7	4	5	0	9	0	0	0	0	0	0	0	0	16
07:45 AM	0	8	0	8	3	5	0	8	0	0	0	0	0	0	0	0	16
Total Volume	0	26	4	30	11	20	0	31	0	0	0	0	0	0	1	1	62
% App. Total	0	86.7	13.3		35.5	64.5	0		0	0	0		0	0	100		
PHF	.000	.813	.500	.833	.688	.833	.000	.861	.000	.000	.000	.000	.000	.000	.250	.250	.861

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

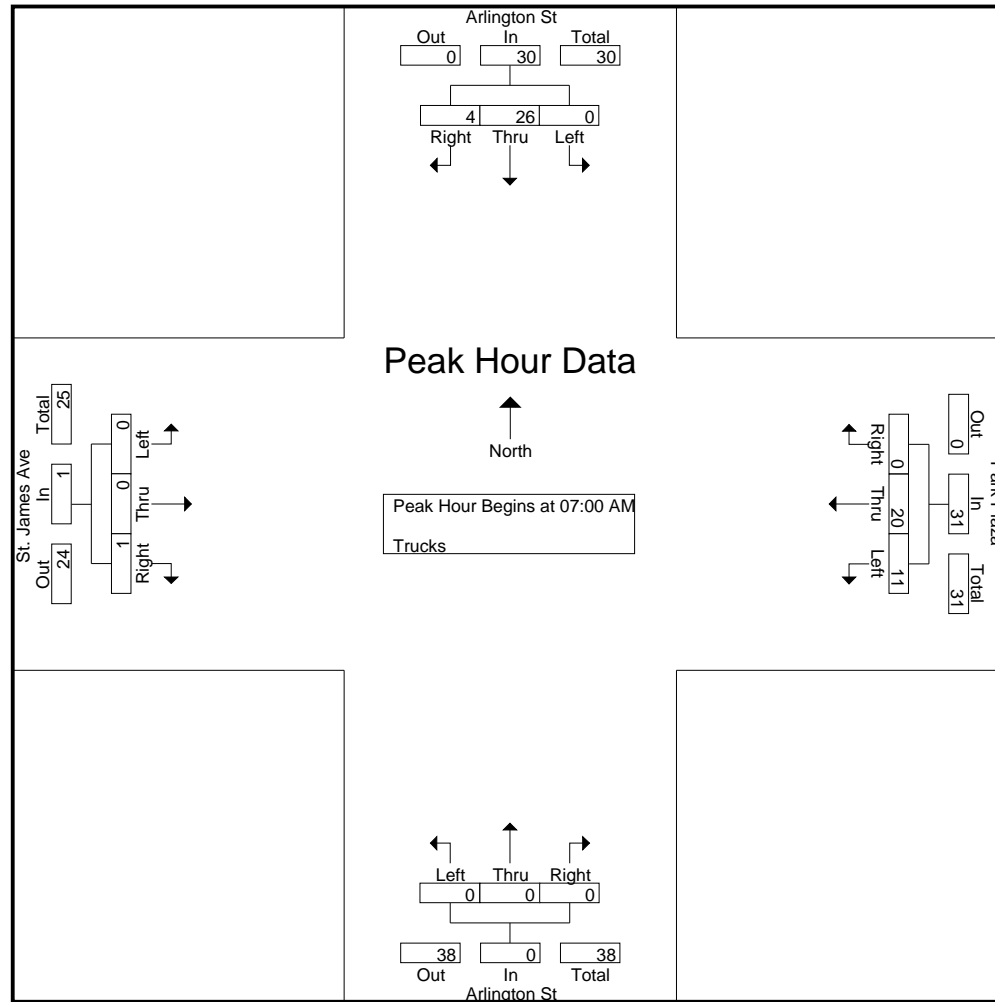
Page No : 11

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear



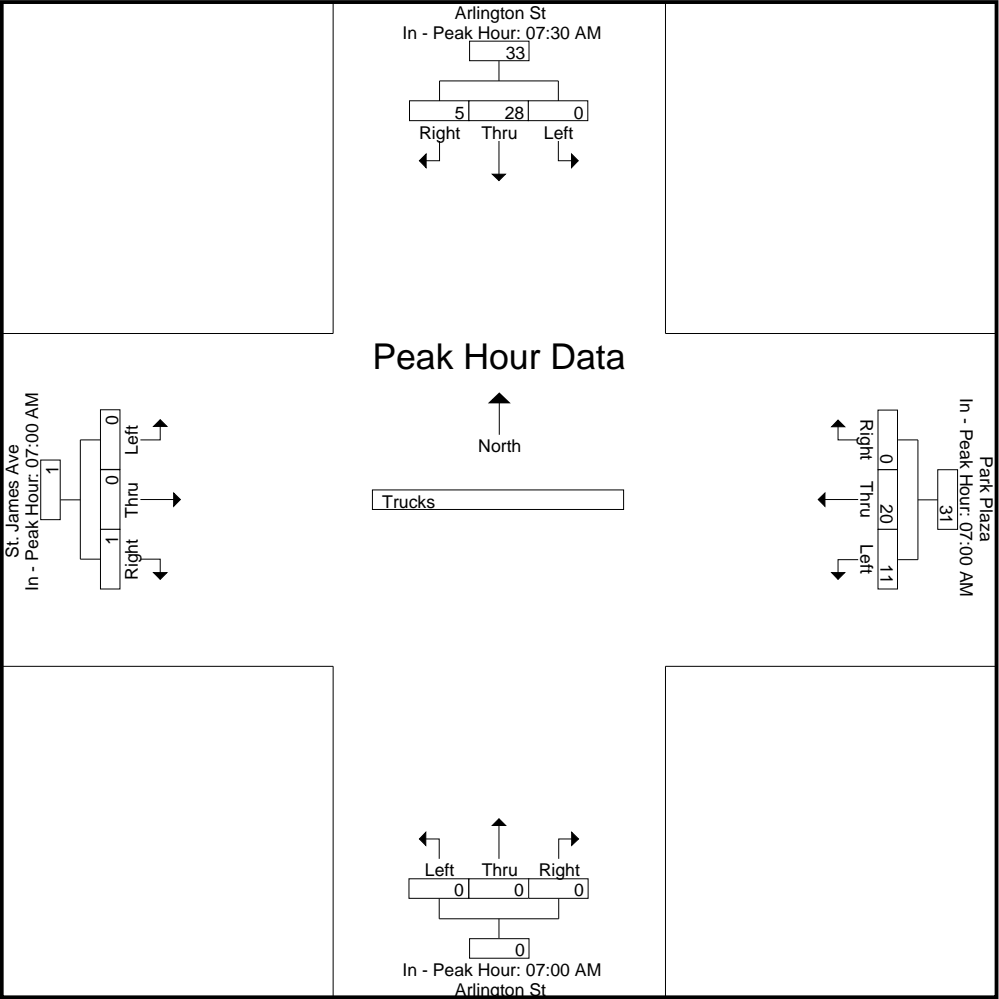
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	5	2	7	2	6	0	8	0	0	0	0	0	0	1	1
+15 mins.	0	8	0	8	2	4	0	6	0	0	0	0	0	0	0	0
+30 mins.	0	8	1	9	4	5	0	9	0	0	0	0	0	0	0	0
+45 mins.	0	7	2	9	3	5	0	8	0	0	0	0	0	0	0	0
Total Volume	0	28	5	33	11	20	0	31	0	0	0	0	0	0	1	1
% App. Total	0	84.8	15.2		35.5	64.5	0		0	0	0		0	0	100	

Accurate Counts
978-664-2565

PHF	.000	.875	.625	.917	.688	.833	.000	.861	.000	.000	.000	.000	.000	.000	.250	.250
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Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

Page No : 13

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

Groups Printed- Bikes Peds

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	2	0	14	0	0	0	31	0	0	0	27	0	0	0	46	118	2	120
07:15 AM	0	2	0	40	0	1	0	74	0	0	0	27	0	0	0	73	214	3	217
07:30 AM	0	2	0	25	0	1	0	95	0	0	0	49	0	0	0	92	261	3	264
07:45 AM	0	1	2	44	0	0	0	83	0	1	0	42	0	0	0	133	302	4	306
Total	0	7	2	123	0	2	0	283	0	1	0	145	0	0	0	344	895	12	907
08:00 AM	0	1	3	56	0	1	0	85	0	0	0	48	0	0	0	194	383	5	388
08:15 AM	0	5	5	76	0	2	0	88	0	0	0	60	0	0	0	201	425	12	437
08:30 AM	0	8	4	60	0	2	0	91	1	0	0	49	0	0	0	240	440	15	455
08:45 AM	0	2	1	72	1	1	0	105	0	0	0	58	0	0	0	208	443	5	448
Total	0	16	13	264	1	6	0	369	1	0	0	215	0	0	0	843	1691	37	1728
Grand Total	0	23	15	387	1	8	0	652	1	1	0	360	0	0	0	1187	2586	49	2635
Apprch %	0	60.5	39.5		11.1	88.9	0		50	50	0		0	0	0				
Total %	0	46.9	30.6		2	16.3	0		2	2	0		0	0	0		98.1	1.9	

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

Page No : 14

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	1	3	4	0	1	0	1	0	0	0	0	0	0	0	0	5
08:15 AM	0	5	5	10	0	2	0	2	0	0	0	0	0	0	0	0	12
08:30 AM	0	8	4	12	0	2	0	2	1	0	0	1	0	0	0	0	15
08:45 AM	0	2	1	3	1	1	0	2	0	0	0	0	0	0	0	0	5
Total Volume	0	16	13	29	1	6	0	7	1	0	0	1	0	0	0	0	37
% App. Total	0	55.2	44.8		14.3	85.7	0		100	0	0		0	0	0		
PHF	.000	.500	.650	.604	.250	.750	.000	.875	.250	.000	.000	.250	.000	.000	.000	.000	.617

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

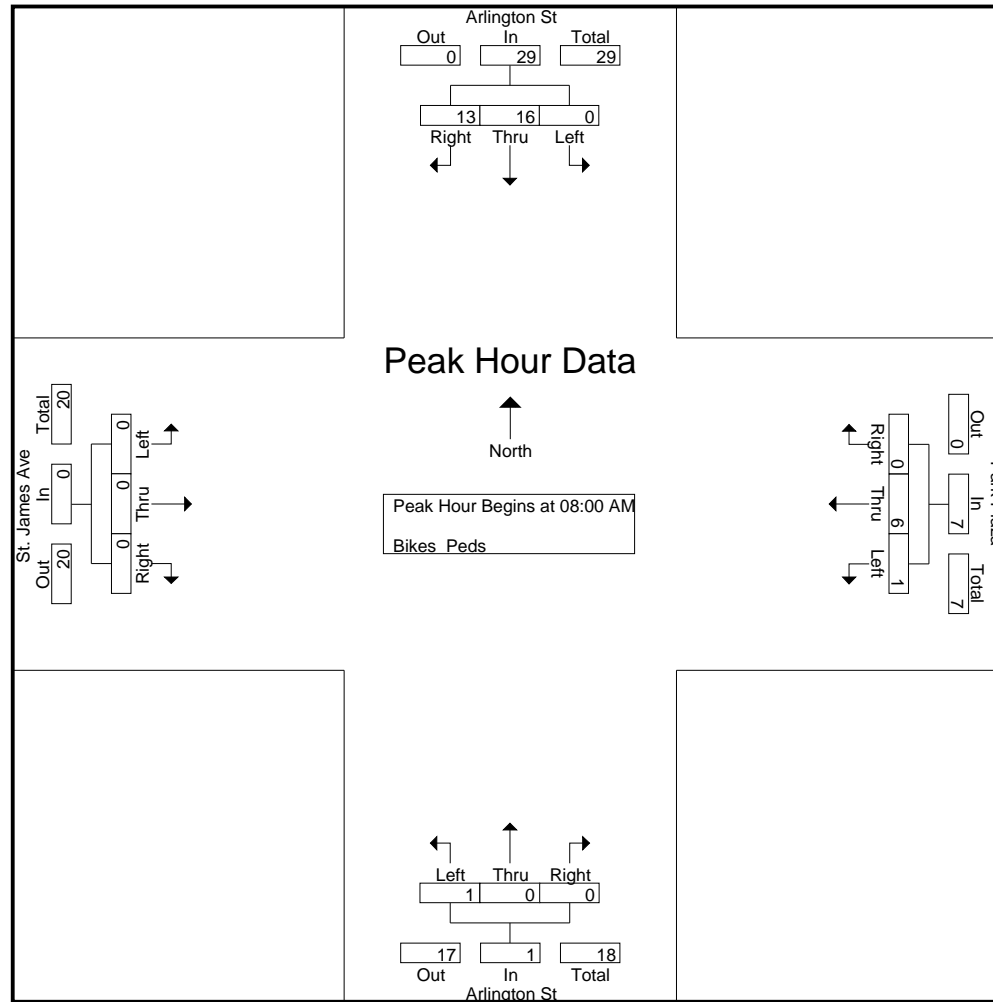
Page No : 15

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear

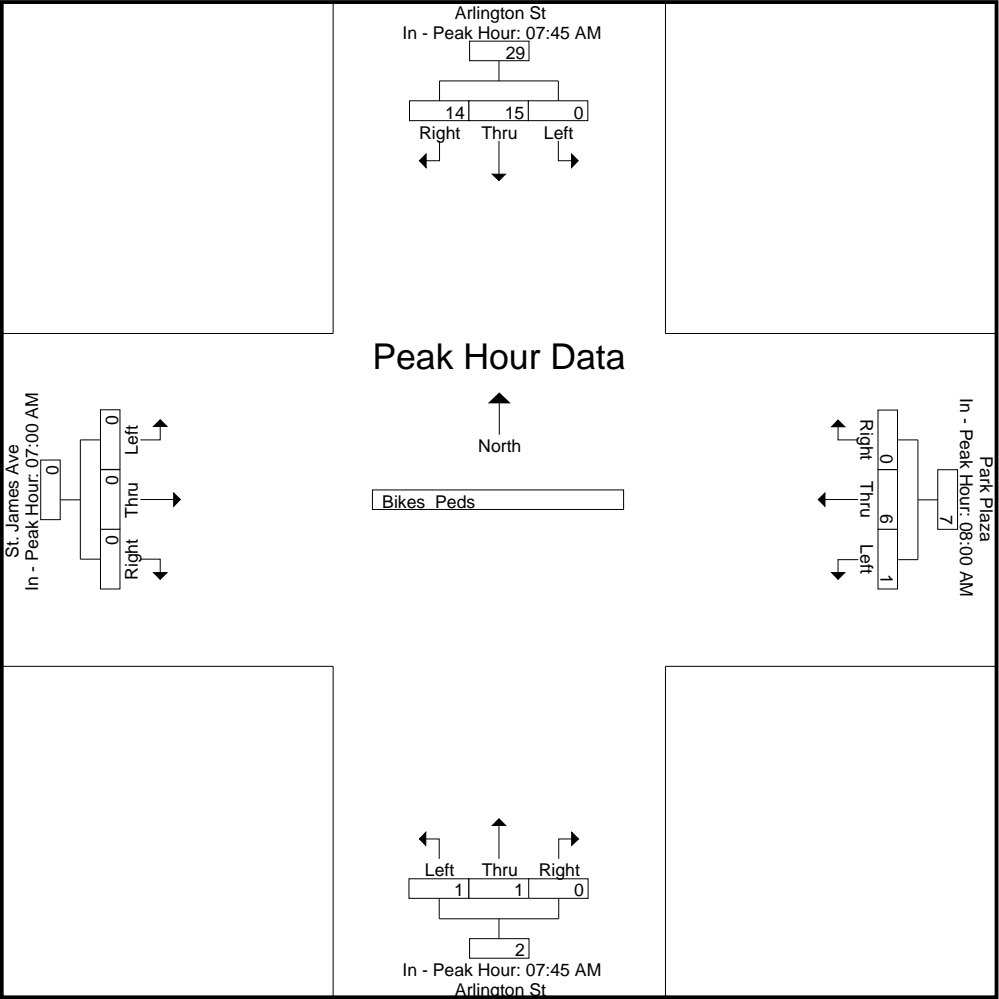


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	1	2	3	0	1	0	1	0	1	0	1	0	0	0	0
+15 mins.	0	1	3	4	0	2	0	2	0	0	0	0	0	0	0	0
+30 mins.	0	5	5	10	0	2	0	2	0	0	0	0	0	0	0	0
+45 mins.	0	8	4	12	1	1	0	2	1	0	0	1	0	0	0	0
Total Volume	0	15	14	29	1	6	0	7	1	1	0	2	0	0	0	0
% App. Total	0	51.7	48.3		14.3	85.7	0		50	50	0		0	0	0	

PHF	.000	.469	.700	.604	.250	.750	.000	.875	.250	.250	.000	.500	.000	.000	.000	.000
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Accurate Counts

978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

	Arlington St From North			Park Plaza From East			Arlington St From South			St. James Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	219	27	22	88	0	0	0	0	0	0	14	370
04:15 PM	0	294	27	25	91	0	0	0	0	0	0	10	447
04:30 PM	0	255	34	19	86	0	0	0	0	0	0	14	408
04:45 PM	0	252	30	39	84	0	0	0	0	0	0	10	415
Total	0	1020	118	105	349	0	0	0	0	0	0	48	1640
05:00 PM	0	271	30	38	79	0	0	0	0	0	0	13	431
05:15 PM	0	238	21	30	117	1	0	0	0	0	0	19	426
05:30 PM	0	272	31	34	79	0	0	0	0	0	0	15	431
05:45 PM	0	286	32	41	90	0	0	0	0	0	0	14	463
Total	0	1067	114	143	365	1	0	0	0	0	0	61	1751
Grand Total	0	2087	232	248	714	1	0	0	0	0	0	109	3391
Apprch %	0	90	10	25.8	74.1	0.1	0	0	0	0	0	100	
Total %	0	61.5	6.8	7.3	21.1	0	0	0	0	0	0	3.2	
Cars	0	2068	230	240	697	1	0	0	0	0	0	109	3345
% Cars	0	99.1	99.1	96.8	97.6	100	0	0	0	0	0	100	98.6
Trucks	0	19	2	8	17	0	0	0	0	0	0	0	46
% Trucks	0	0.9	0.9	3.2	2.4	0	0	0	0	0	0	0	1.4

978-664-2565

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 2

[illegible]

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

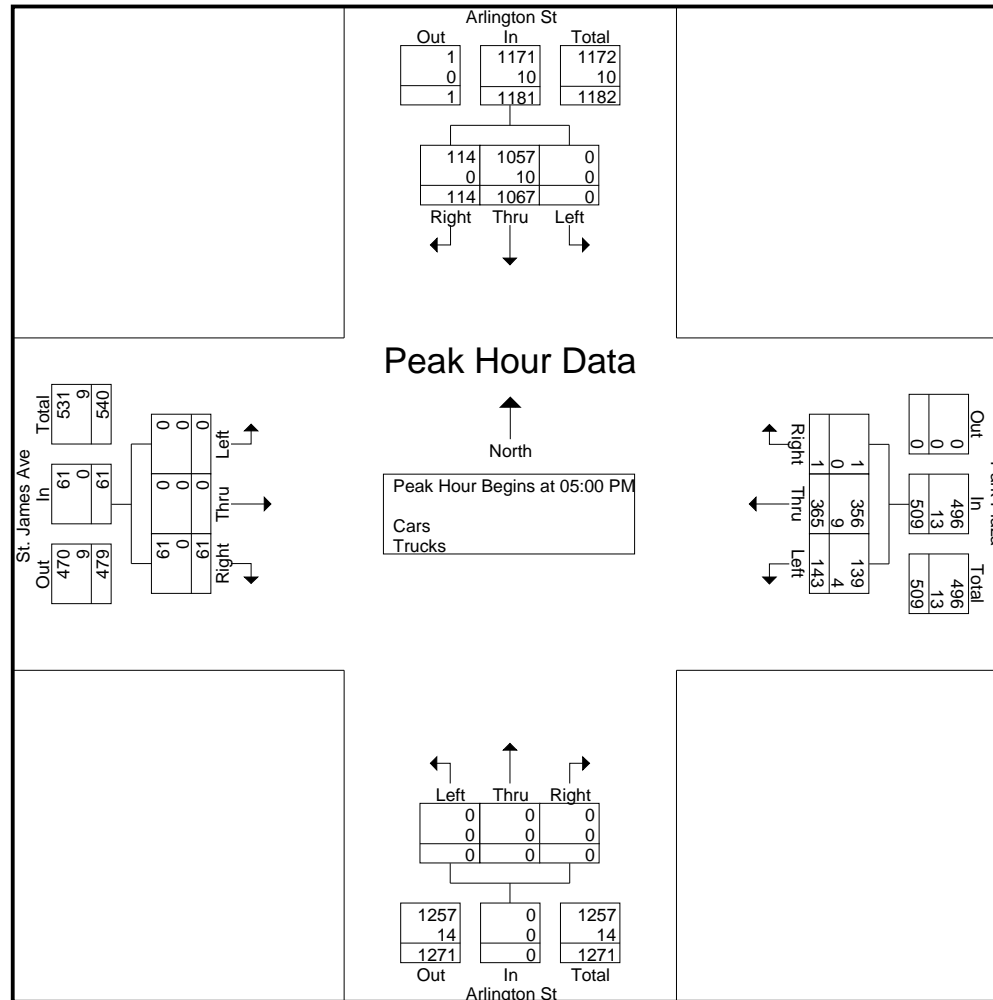
Page No : 3

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear



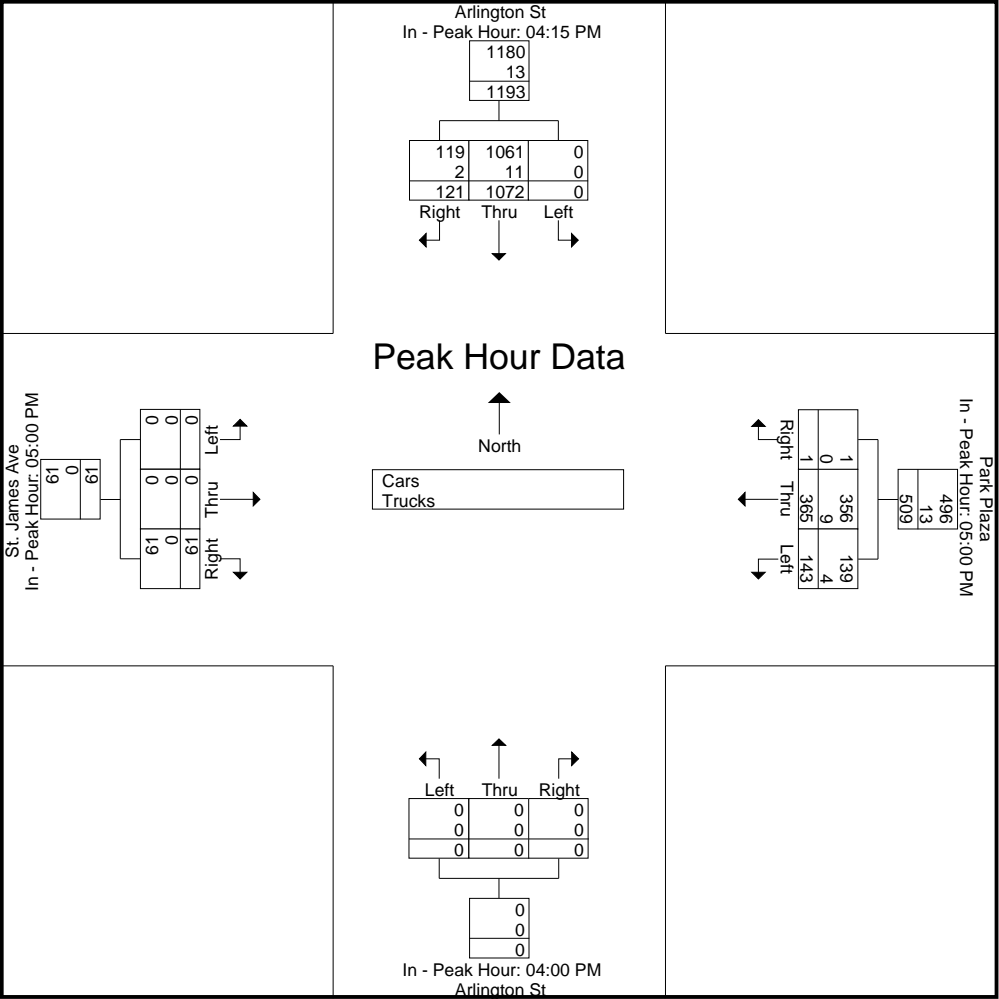
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				05:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	294	27	321	38	79	0	117	0	0	0	0	0	0	13	13
+15 mins.	0	255	34	289	30	117	1	148	0	0	0	0	0	0	19	19
+30 mins.	0	252	30	282	34	79	0	113	0	0	0	0	0	0	15	15
+45 mins.	0	271	30	301	41	90	0	131	0	0	0	0	0	0	14	14
Total Volume	0	1072	121	1193	143	365	1	509	0	0	0	0	0	0	61	61
% App. Total	0	89.9	10.1		28.1	71.7	0.2		0	0	0		0	0	100	

Accurate Counts
978-664-2565

PHF	.000	.912	.890	.929	.872	.780	.250	.860	.000	.000	.000	.000	.000	.000	.803	.803
Cars	0	1061	119	1180	139	356	1	496	0	0	0	0	0	0	61	61
% Cars	0	99	98.3	98.9	97.2	97.5	100	97.4	0	0	0	0	0	0	100	100
Trucks	0	11	2	13	4	9	0	13	0	0	0	0	0	0	0	0
% Trucks	0	1	1.7	1.1	2.8	2.5	0	2.6	0	0	0	0	0	0	0	0



Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

Page No : 5

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear

Groups Printed- Cars

	Arlington St From North			Park Plaza From East			Arlington St From South			St. James Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	217	27	20	86	0	0	0	0	0	0	14	364
04:15 PM	0	292	26	24	88	0	0	0	0	0	0	10	440
04:30 PM	0	252	34	19	86	0	0	0	0	0	0	14	405
04:45 PM	0	250	29	38	81	0	0	0	0	0	0	10	408
Total	0	1011	116	101	341	0	0	0	0	0	0	48	1617
05:00 PM	0	267	30	37	76	0	0	0	0	0	0	13	423
05:15 PM	0	238	21	28	116	1	0	0	0	0	0	19	423
05:30 PM	0	269	31	34	75	0	0	0	0	0	0	15	424
05:45 PM	0	283	32	40	89	0	0	0	0	0	0	14	458
Total	0	1057	114	139	356	1	0	0	0	0	0	61	1728
Grand Total	0	2068	230	240	697	1	0	0	0	0	0	109	3345
Apprch %	0	90	10	25.6	74.3	0.1	0	0	0	0	0	100	
Total %	0	61.8	6.9	7.2	20.8	0	0	0	0	0	0	3.3	

Accurate Counts
978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 6

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave 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	267	30	297	37	76	0	113	0	0	0	0	0	0	13	13	423
05:15 PM	0	238	21	259	28	116	1	145	0	0	0	0	0	0	19	19	423
05:30 PM	0	269	31	300	34	75	0	109	0	0	0	0	0	0	15	15	424
05:45 PM	0	283	32	315	40	89	0	129	0	0	0	0	0	0	14	14	458
Total Volume	0	1057	114	1171	139	356	1	496	0	0	0	0	0	0	61	61	1728
% App. Total	0	90.3	9.7		28	71.8	0.2		0	0	0		0	0	100		
PHF	.000	.934	.891	.929	.869	.767	.250	.855	.000	.000	.000	.000	.000	.000	.803	.803	.943

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

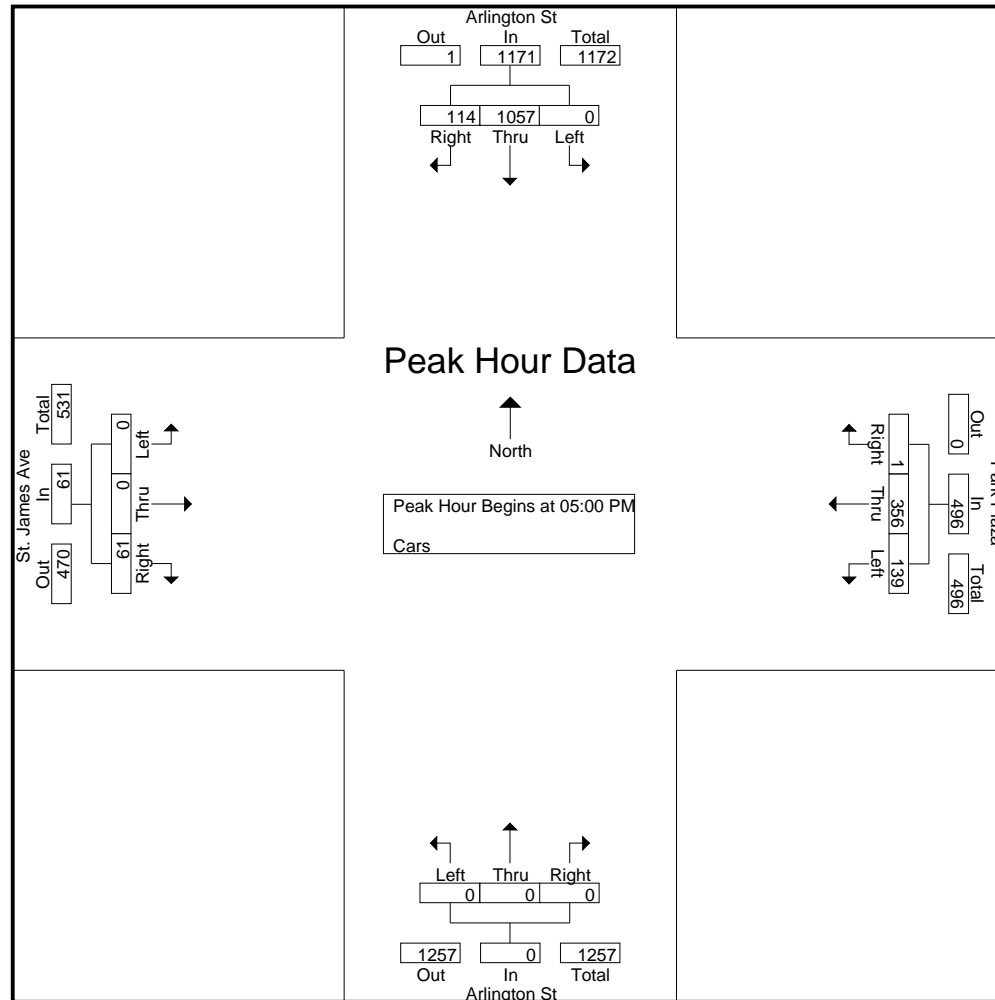
Page No : 7

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear



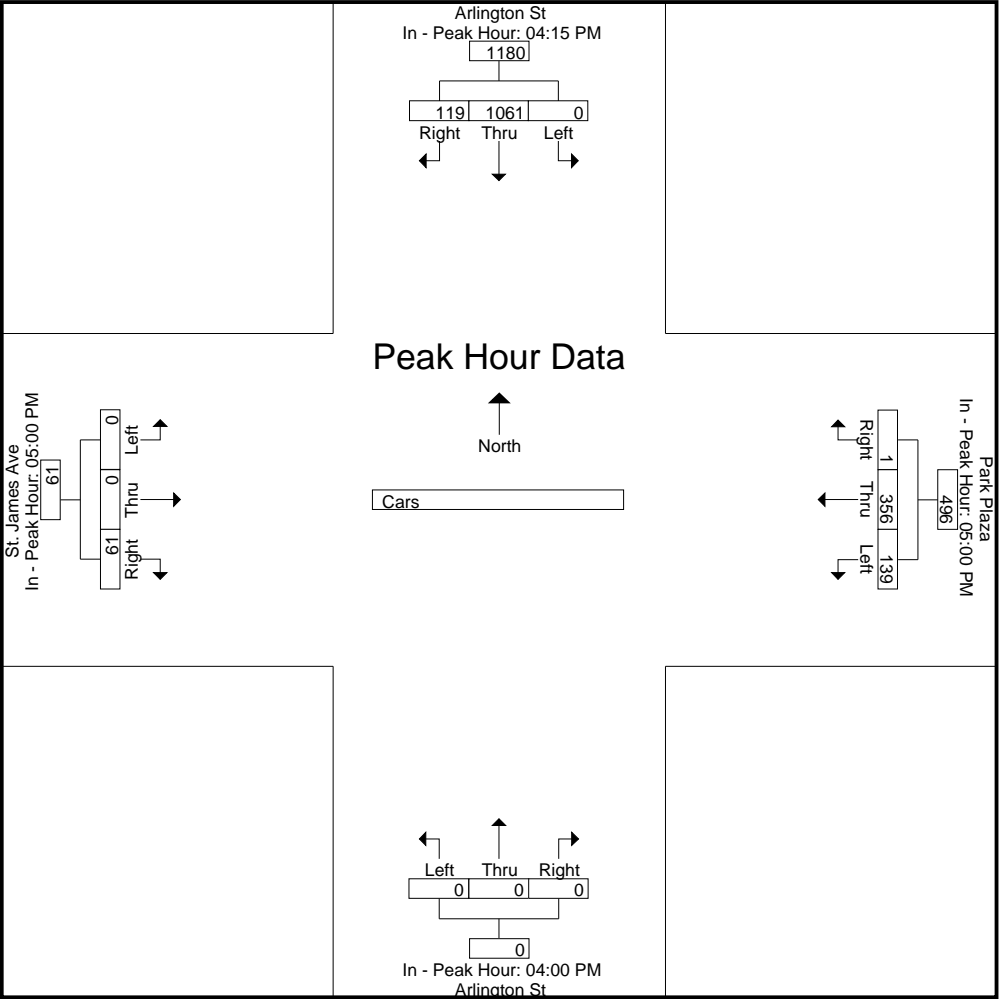
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				05:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	292	26	318	37	76	0	113	0	0	0	0	0	0	13	13
+15 mins.	0	252	34	286	28	116	1	145	0	0	0	0	0	0	19	19
+30 mins.	0	250	29	279	34	75	0	109	0	0	0	0	0	0	15	15
+45 mins.	0	267	30	297	40	89	0	129	0	0	0	0	0	0	14	14
Total Volume	0	1061	119	1180	139	356	1	496	0	0	0	0	0	0	61	61
% App. Total	0	89.9	10.1		28	71.8	0.2		0	0	0		0	0	100	

Accurate Counts
978-664-2565

PHF	.000	.908	.875	.928	.869	.767	.250	.855	.000	.000	.000	.000	.000	.000	.803	.803
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Accurate Counts

978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Arlington St From North			Park Plaza From East			Arlington St From South			St. James Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	2	0	2	2	0	0	0	0	0	0	0	6
04:15 PM	0	2	1	1	3	0	0	0	0	0	0	0	7
04:30 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
04:45 PM	0	2	1	1	3	0	0	0	0	0	0	0	7
Total	0	9	2	4	8	0	0	0	0	0	0	0	23
05:00 PM	0	4	0	1	3	0	0	0	0	0	0	0	8
05:15 PM	0	0	0	2	1	0	0	0	0	0	0	0	3
05:30 PM	0	3	0	0	4	0	0	0	0	0	0	0	7
05:45 PM	0	3	0	1	1	0	0	0	0	0	0	0	5
Total	0	10	0	4	9	0	0	0	0	0	0	0	23
Grand Total	0	19	2	8	17	0	0	0	0	0	0	0	46
Apprch %	0	90.5	9.5	32	68	0	0	0	0	0	0	0	
Total %	0	41.3	4.3	17.4	37	0	0	0	0	0	0	0	

978-664-2565

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 10

[illegible]

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

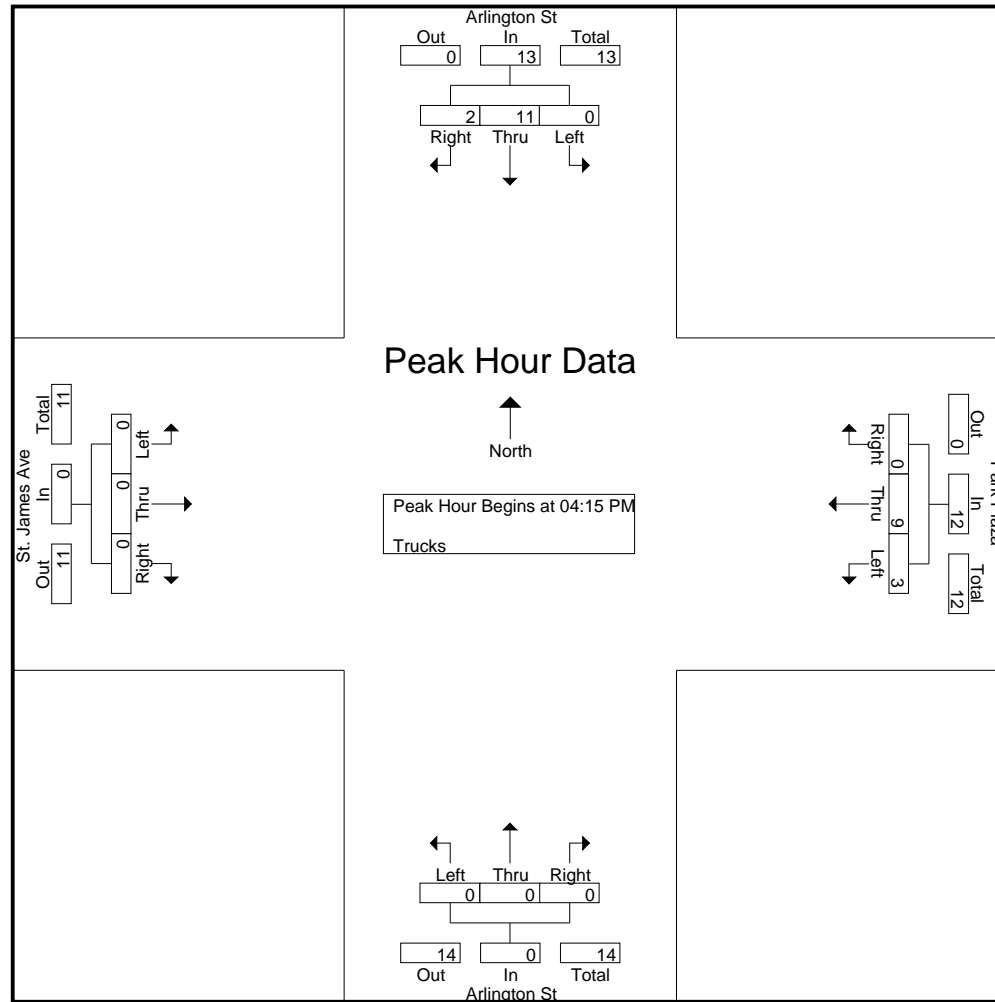
Page No : 11

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear



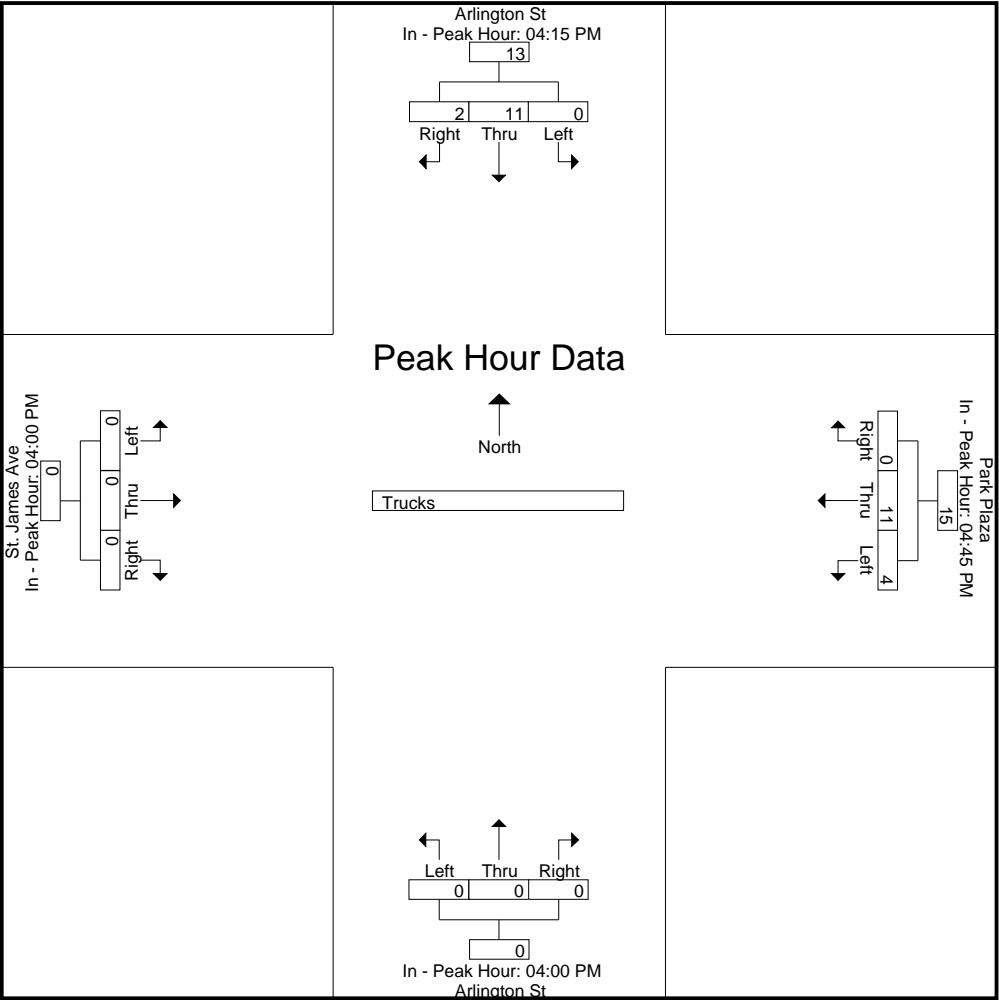
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				04:00 PM				04:00 PM			
+0 mins.	0	2	1	3	1	3	0	4	0	0	0	0	0	0	0	0
+15 mins.	0	3	0	3	1	3	0	4	0	0	0	0	0	0	0	0
+30 mins.	0	2	1	3	2	1	0	3	0	0	0	0	0	0	0	0
+45 mins.	0	4	0	4	0	4	0	4	0	0	0	0	0	0	0	0
Total Volume	0	11	2	13	4	11	0	15	0	0	0	0	0	0	0	0
% App. Total	0	84.6	15.4		26.7	73.3	0		0	0	0		0	0	0	

Accurate Counts
978-664-2565

PHF	.000	.688	.500	.813	.500	.688	.000	.938	.000	.000	.000	.000	.000	.000	.000	.000
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Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

Page No : 13

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

Groups Printed- Bikes Peds

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	2	1	46	0	1	0	63	0	0	0	18	0	0	0	72	199	4	203
04:15 PM	0	0	0	38	0	3	0	70	1	0	0	17	0	0	0	78	203	4	207
04:30 PM	0	1	0	62	0	3	0	66	0	0	0	25	0	0	0	77	230	4	234
04:45 PM	0	2	0	56	1	4	0	72	0	0	0	23	0	0	0	96	247	7	254
Total	0	5	1	202	1	11	0	271	1	0	0	83	0	0	0	323	879	19	898
05:00 PM	0	8	0	77	1	6	0	97	0	0	0	31	0	0	2	136	341	17	358
05:15 PM	0	4	0	103	0	7	0	97	0	0	0	17	0	0	0	137	354	11	365
05:30 PM	0	0	1	88	1	4	0	97	0	0	0	49	0	0	1	101	335	7	342
05:45 PM	0	7	0	63	0	6	0	92	0	0	0	24	0	0	1	83	262	14	276
Total	0	19	1	331	2	23	0	383	0	0	0	121	0	0	4	457	1292	49	1341
Grand Total	0	24	2	533	3	34	0	654	1	0	0	204	0	0	4	780	2171	68	2239
Apprch %	0	92.3	7.7		8.1	91.9	0		100	0	0		0	0	100				
Total %	0	35.3	2.9		4.4	50	0		1.5	0	0		0	0	5.9		97	3	

Accurate Counts
978-664-2565

N/S Street : Arlingotn Street
E/W Street: St. James Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034003
Site Code : 17034003
Start Date : 11/28/2017
Page No : 14

	Arlington St From North				Park Plaza From East				Arlington St From South				St. James Ave 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	8	0	8	1	6	0	7	0	0	0	0	0	0	2	2	17
05:15 PM	0	4	0	4	0	7	0	7	0	0	0	0	0	0	0	0	11
05:30 PM	0	0	1	1	1	4	0	5	0	0	0	0	0	0	1	1	7
05:45 PM	0	7	0	7	0	6	0	6	0	0	0	0	0	0	1	1	14
Total Volume	0	19	1	20	2	23	0	25	0	0	0	0	0	0	4	4	49
% App. Total	0	95	5		8	92	0		0	0	0		0	0	100		
PHF	.000	.594	.250	.625	.500	.821	.000	.893	.000	.000	.000	.000	.000	.000	.500	.500	.721

Accurate Counts

978-664-2565

File Name : 17034003

Site Code : 17034003

Start Date : 11/28/2017

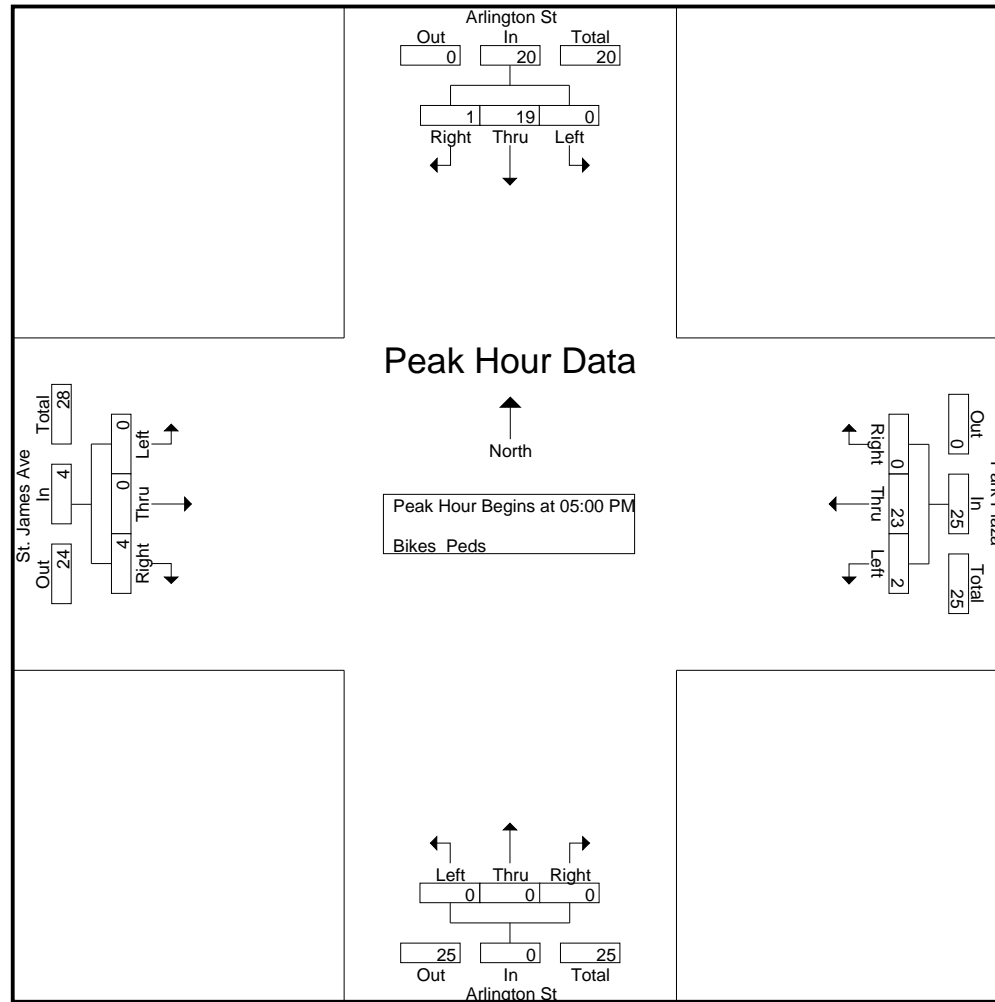
Page No : 15

N/S Street : Arlingotn Street

E/W Street: St. James Ave / Park Plaza

City/State : Boston, MA

Weather : Clear



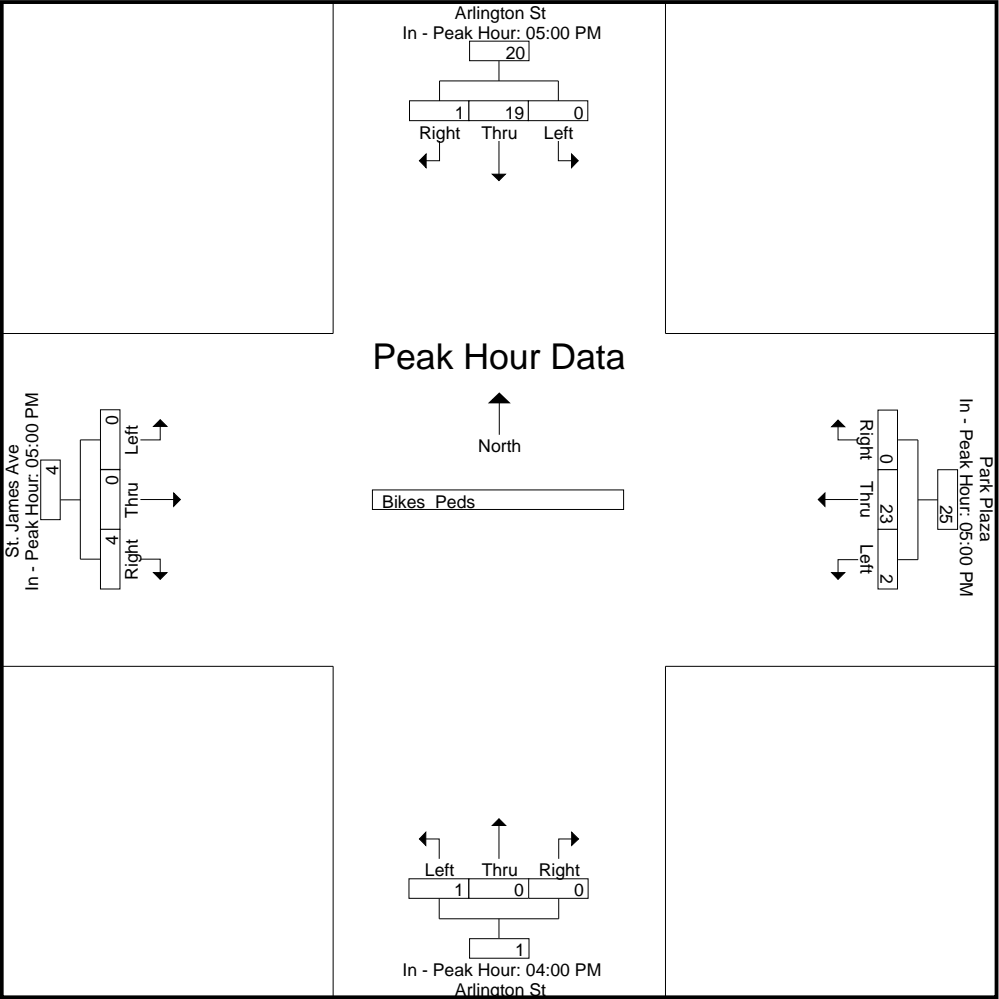
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	8	0	8	1	6	0	7	0	0	0	0	0	0	2	2
+15 mins.	0	4	0	4	0	7	0	7	1	0	0	1	0	0	0	0
+30 mins.	0	0	1	1	1	4	0	5	0	0	0	0	0	0	1	1
+45 mins.	0	7	0	7	0	6	0	6	0	0	0	0	0	0	1	1
Total Volume	0	19	1	20	2	23	0	25	1	0	0	1	0	0	4	4
% App. Total	0	95	5		8	92	0		100	0	0		0	0	100	

Accurate Counts
978-664-2565

PHF	.000	.594	.250	.625	.500	.821	.000	.893	.250	.000	.000	.250	.000	.000	.500	.500
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



978-664-2565

File Name : 17034004

Site Code : 17034004

Start Date : 11/28/2017

Page No : 1

N/S Street : Garage / Eliot St

E/W Street : Columbus Ave / Park Plaza

City/State : Boston, MA

Weather : Clear

Groups Printed- Cars - Trucks

[illegible]

978-664-2565

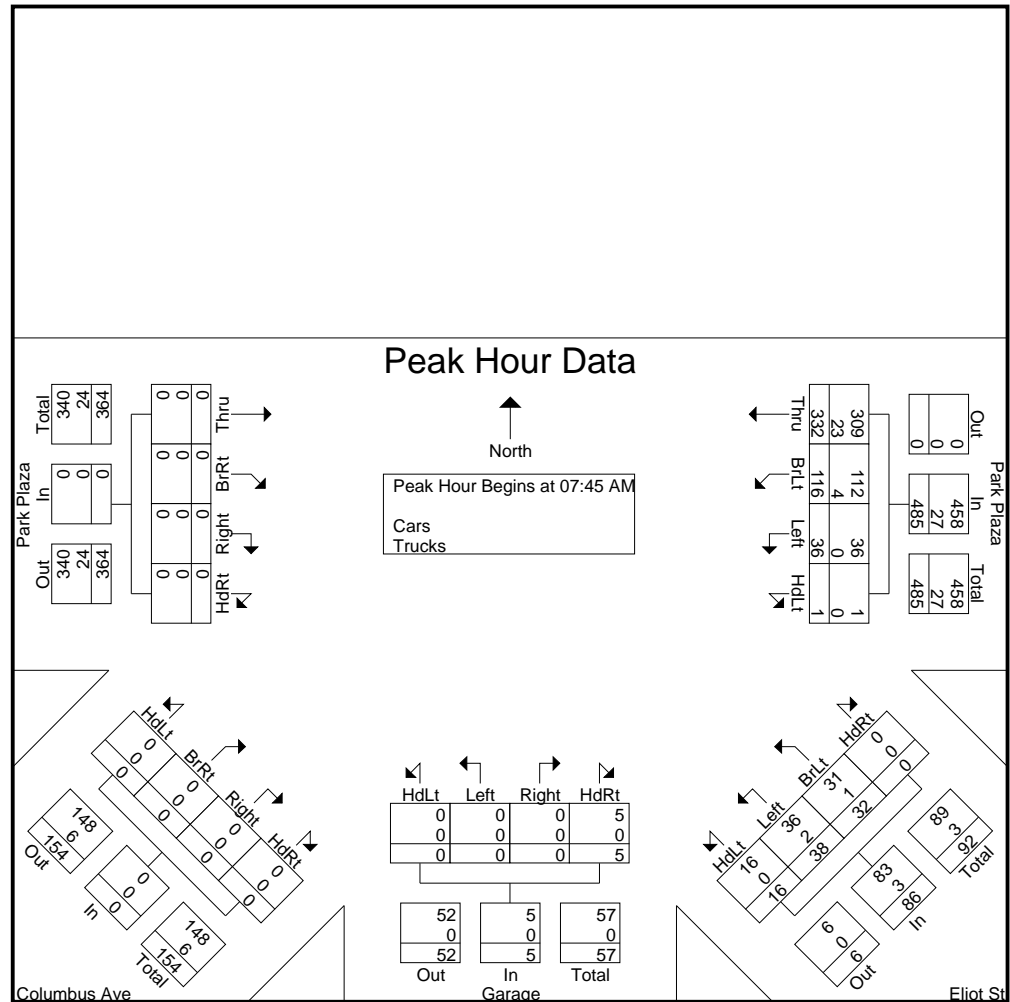
File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 2

[illegible]

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 3

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear



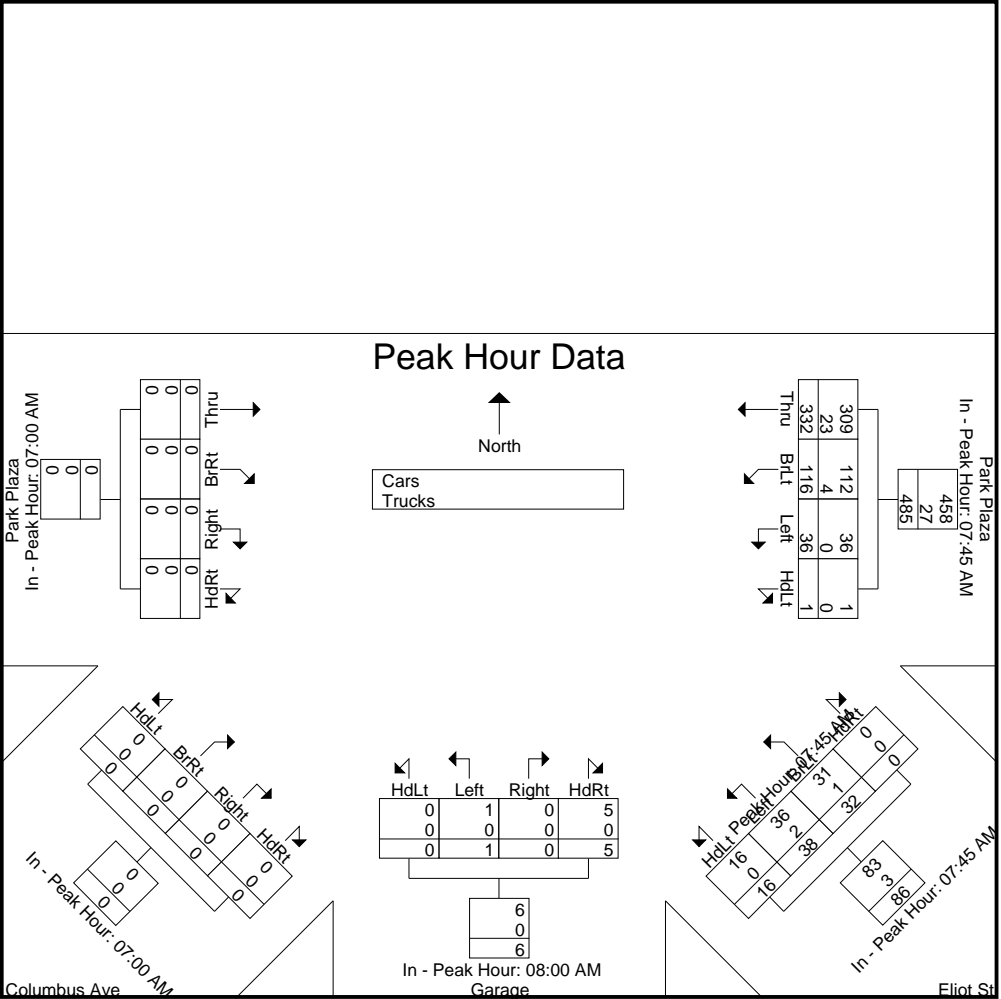
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM					07:45 AM					08:00 AM					07:00 AM					07:00 AM				
+0 mins.	0	10	33	85	128	2	7	6	0	15	0	0	0	1	1	0	0	0	0	0	0	0			
+15 mins.	0	6	20	89	115	3	10	5	0	18	0	0	0	3	3	0	0	0	0	0	0	0			
+30 mins.	1	10	30	82	123	7	7	7	0	21	0	0	0	1	1	0	0	0	0	0	0	0			
+45 mins.	0	10	33	76	119	4	14	14	0	32	0	1	0	0	1	0	0	0	0	0	0	0			
Total Volume	1	36	116	332	485	16	38	32	0	86	0	1	0	5	6	0	0	0	0	0	0	0			
% App. Total	0.2	7.4	23.9	68.5		18.6	44.2	37.2	0		0	16.7	0	83.3		0	0	0	0	0	0				

Accurate Counts
978-664-2565

PHF	.250	.900	.879	.933	.947	.571	.679	.571	.000	.672	.000	.250	.000	.417	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Cars	1	36	112	309	458	16	36	31	0	83	0	1	0	5	6	0	0	0	0	0	0	0	0	0	0
% Cars	100	100	96.6	93.1	94.4	100	94.7	96.9	0	96.5	0	100	0	100	100	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	4	23	27	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	3.4	6.9	5.6	0	5.3	3.1	0	3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 6

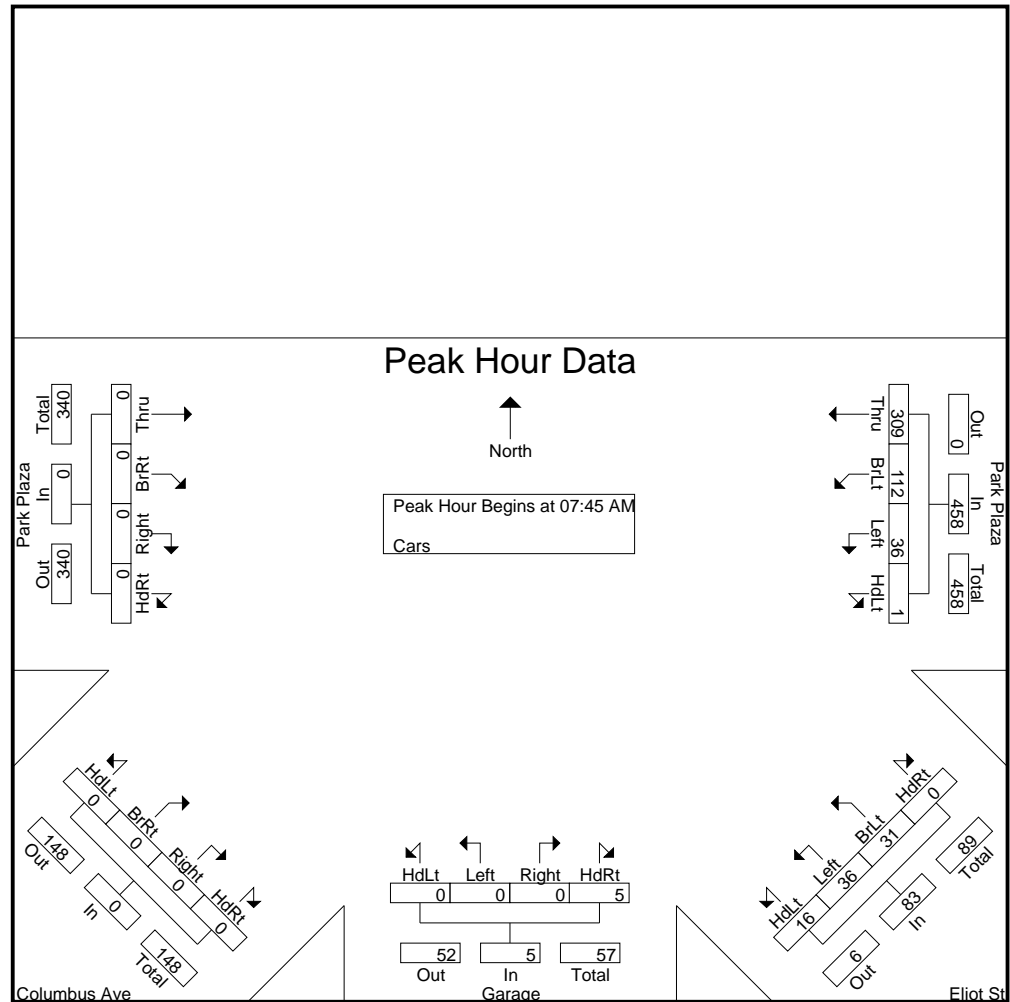
[illegible]

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 7

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

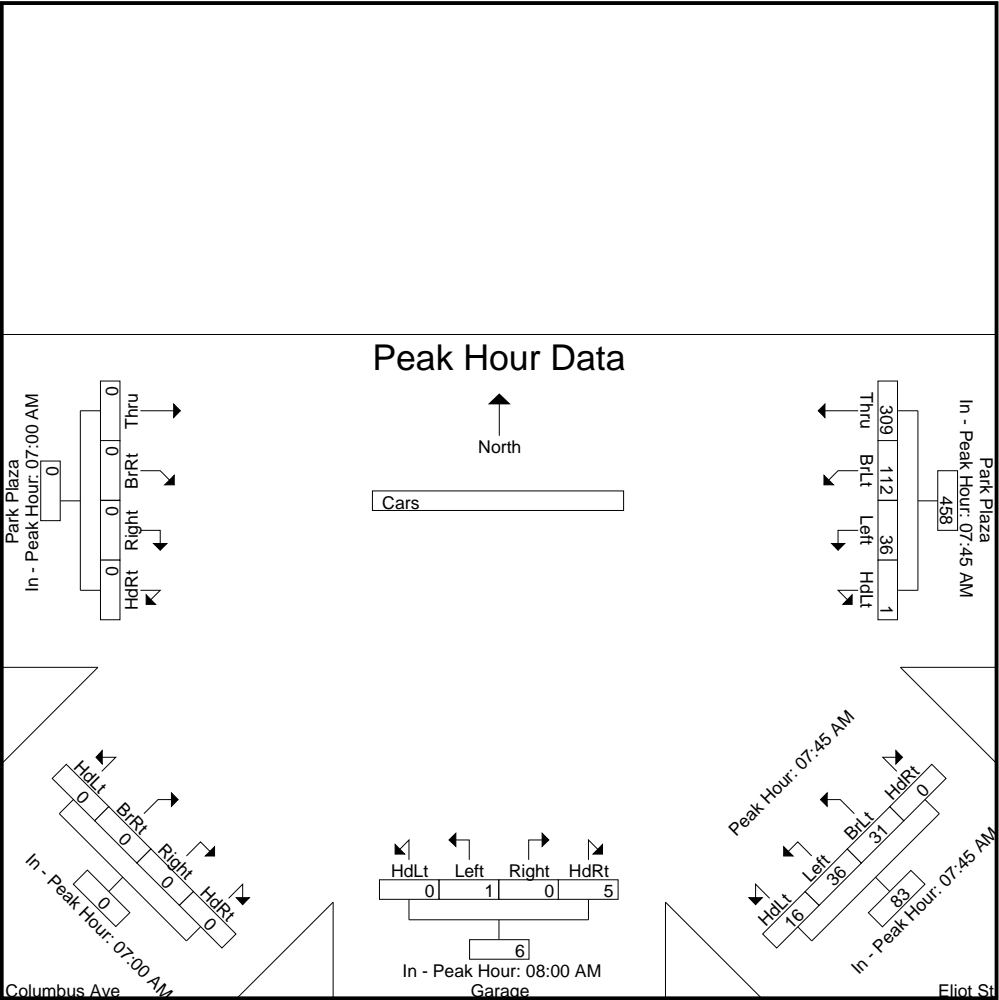


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM					07:45 AM					08:00 AM					07:00 AM					07:00 AM				
+0 mins.	0	10	33	78	121	2	7	6	0	15	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	6	20	87	113	3	9	5	0	17	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	10	28	76	115	7	7	6	0	20	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	10	31	68	109	4	13	14	0	31	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Total Volume	1	36	112	309	458	16	36	31	0	83	0	1	0	5	6	0	0	0	0	0	0	0	0	0	0
% App. Total	0.2	7.9	24.5	67.5		19.3	43.4	37.3	0		0	16.7	0	83.3		0	0	0	0		0	0	0	0	

PHF	.250	.900	.848	.888	.946	.571	.692	.554	.000	.669	.000	.250	.000	.417	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



978-664-2565

File Name : 17034004

Site Code : 17034004

Start Date : 11/28/2017

Page No : 9

N/S Street : Garage / Eliot St

E/W Street : Columbus Ave / Park Plaza

City/State : Boston, MA

Weather : Clear

Groups Printed- Trucks

[illegible]

978-664-2565

Page No : 10

Weather : Clear

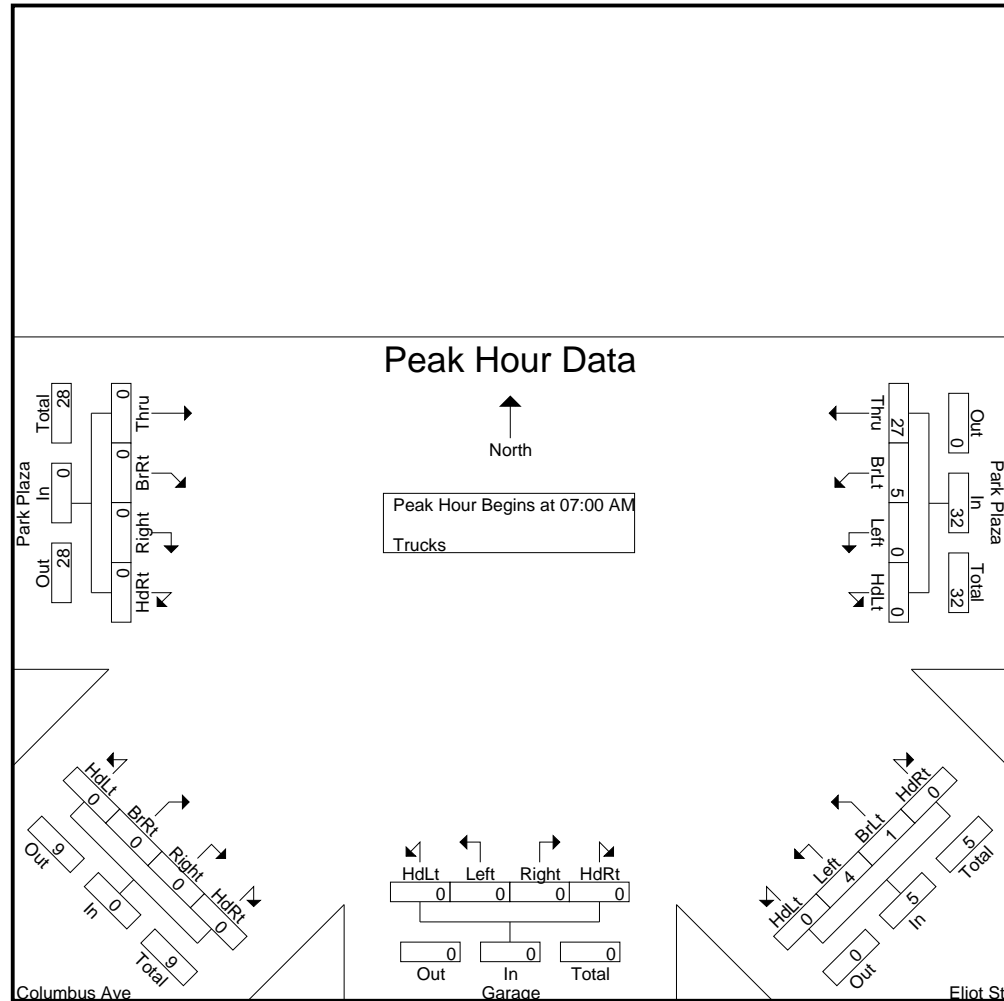
[illegible]

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 11

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

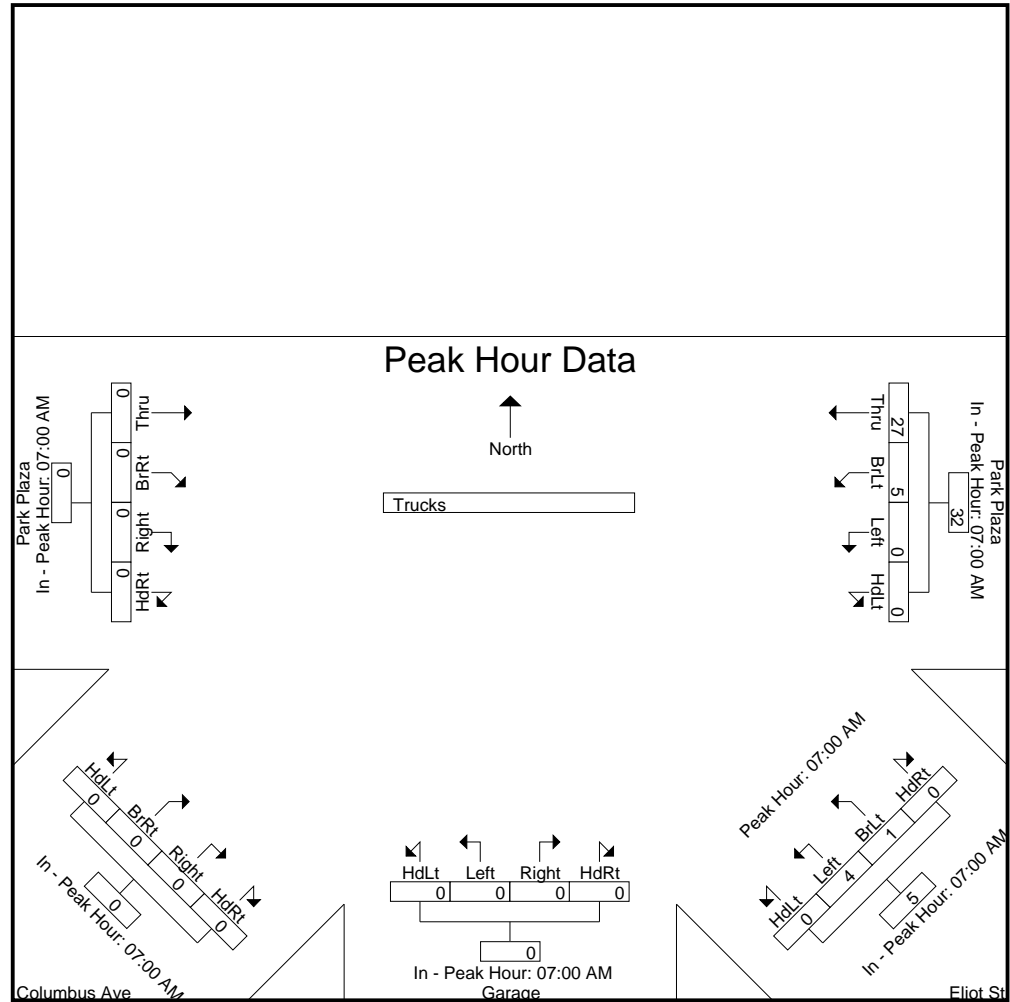


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM					07:00 AM					07:00 AM					07:00 AM					07:00 AM				
+0 mins.	0	0	4	7	11	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	1	7	8	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	5	27	32	0	4	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	15.6	84.4		0	80	20	0		0	0	0	0		0	0	0	0		0	0	0	0	

978-664-2565

[illegible]

Accurate Counts
978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 13

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

Groups Printed- Bikes Peds																													
	Park Plaza From East					Eliot St From Southeast					Garage From South					Columbus Ave From Southwest					Park Plaza From West								
Start Time	HdLt	Left	BrLt	Thru	Peds	HdLt	Left	BrLt	HdRt	Peds	HdLt	Left	Right	HdRt	Peds	HdLt	BrRt	Right	HdRt	Peds	Thru	BrRt	Right	HdRt	Peds	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	0	0	0	16	0	0	0	0	3	0	0	0	1	18	0	0	0	0	0	0	0	0	0	0	1	38	1	39
07:15 AM	0	0	2	1	33	0	0	0	0	3	0	0	0	0	9	0	0	0	0	0	2	0	0	0	0	1	48	3	51
07:30 AM	0	0	0	0	46	0	0	0	0	12	0	0	0	0	12	0	0	0	0	0	2	0	0	0	0	2	74	0	74
07:45 AM	0	0	1	1	40	0	0	0	0	9	0	0	0	0	16	0	0	0	0	0	8	0	0	0	0	0	73	2	75
Total	0	0	3	2	135	0	0	0	0	27	0	0	0	1	55	0	0	0	0	0	12	0	0	0	0	4	233	6	239
08:00 AM	0	0	0	1	65	0	0	0	0	13	0	0	0	0	29	0	0	0	0	0	1	0	0	0	0	0	108	1	109
08:15 AM	0	0	1	4	69	0	0	0	0	6	0	0	0	1	40	0	0	0	0	0	8	0	0	0	0	0	123	6	129
08:30 AM	0	0	1	2	78	0	0	0	0	8	0	0	0	0	12	0	0	0	0	0	5	0	0	0	0	0	103	3	106
08:45 AM	0	0	1	2	112	0	0	0	0	18	0	0	0	0	31	0	0	0	0	0	7	0	0	0	0	0	168	3	171
Total	0	0	3	9	324	0	0	0	0	45	0	0	0	1	112	0	0	0	0	0	21	0	0	0	0	0	502	13	515
Grand Total	0	0	6	11	459	0	0	0	0	72	0	0	0	2	167	0	0	0	0	0	33	0	0	0	0	4	735	19	754
Apprch %	0	0	35.3	64.7		0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	0					
Total %	0	0	31.6	57.9		0	0	0	0		0	0	0	10.5		0	0	0	0		0	0	0	0		97.5	2.5		

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 14

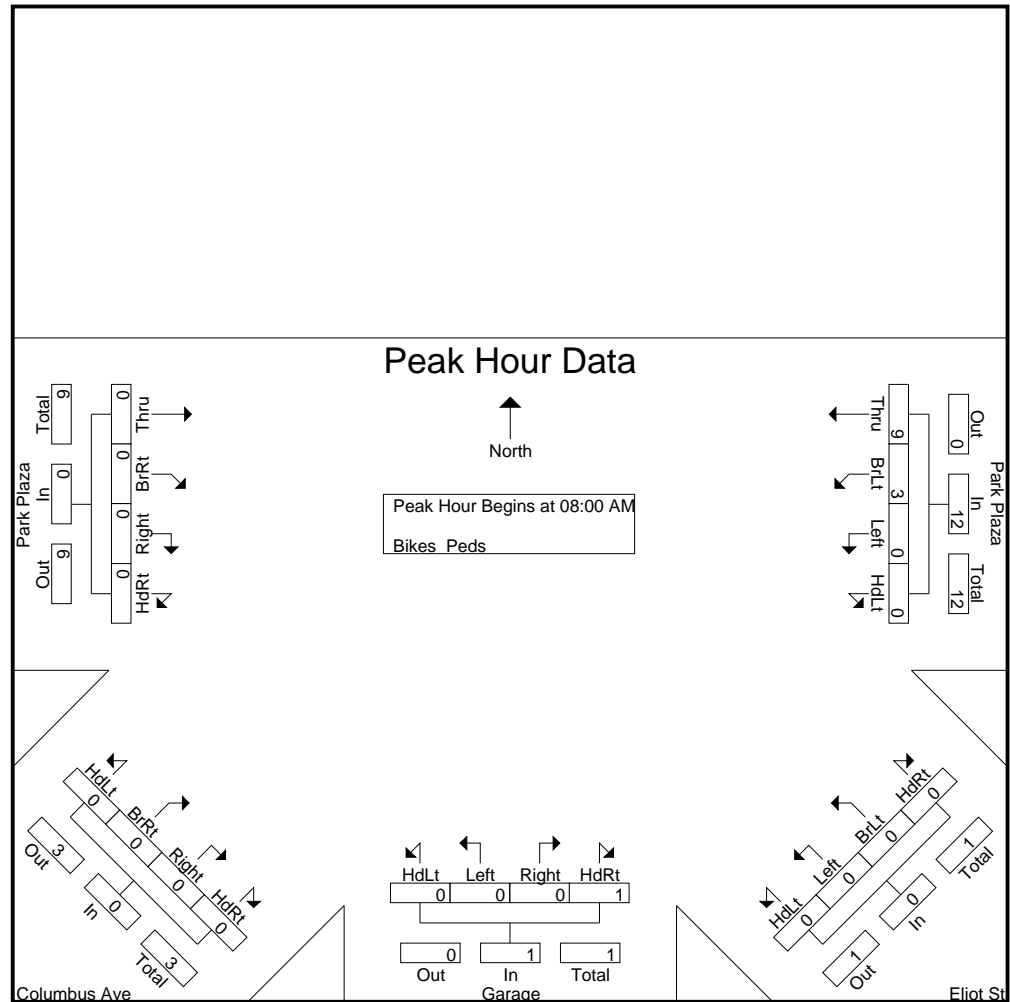
[illegible]

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 15

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

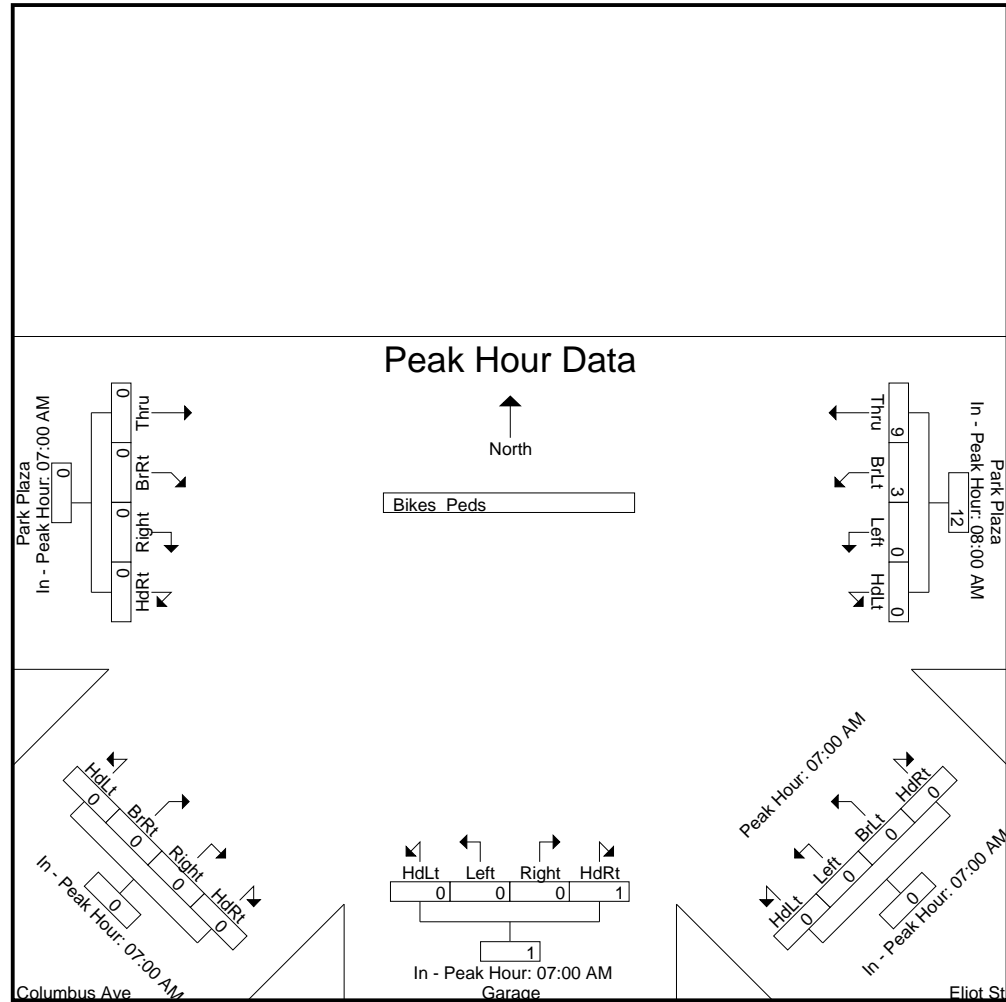


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM					07:00 AM					07:00 AM					07:00 AM					07:00 AM				
+0 mins.	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	3	9	12	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	25	75		0	0	0	0		0	0	0	100		0	0	0	0		0	0	0		

978-664-2565

[illegible]

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

[illegible]

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 2

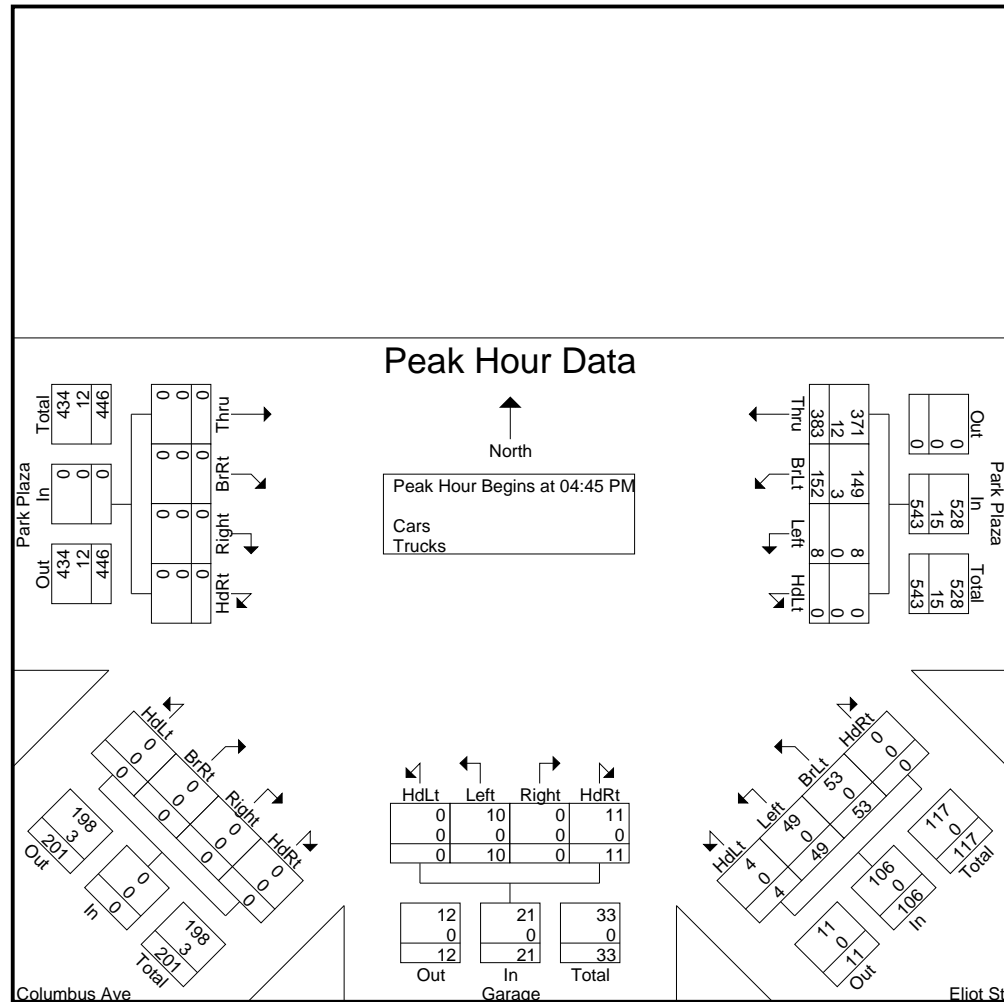
[illegible]

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 3

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear



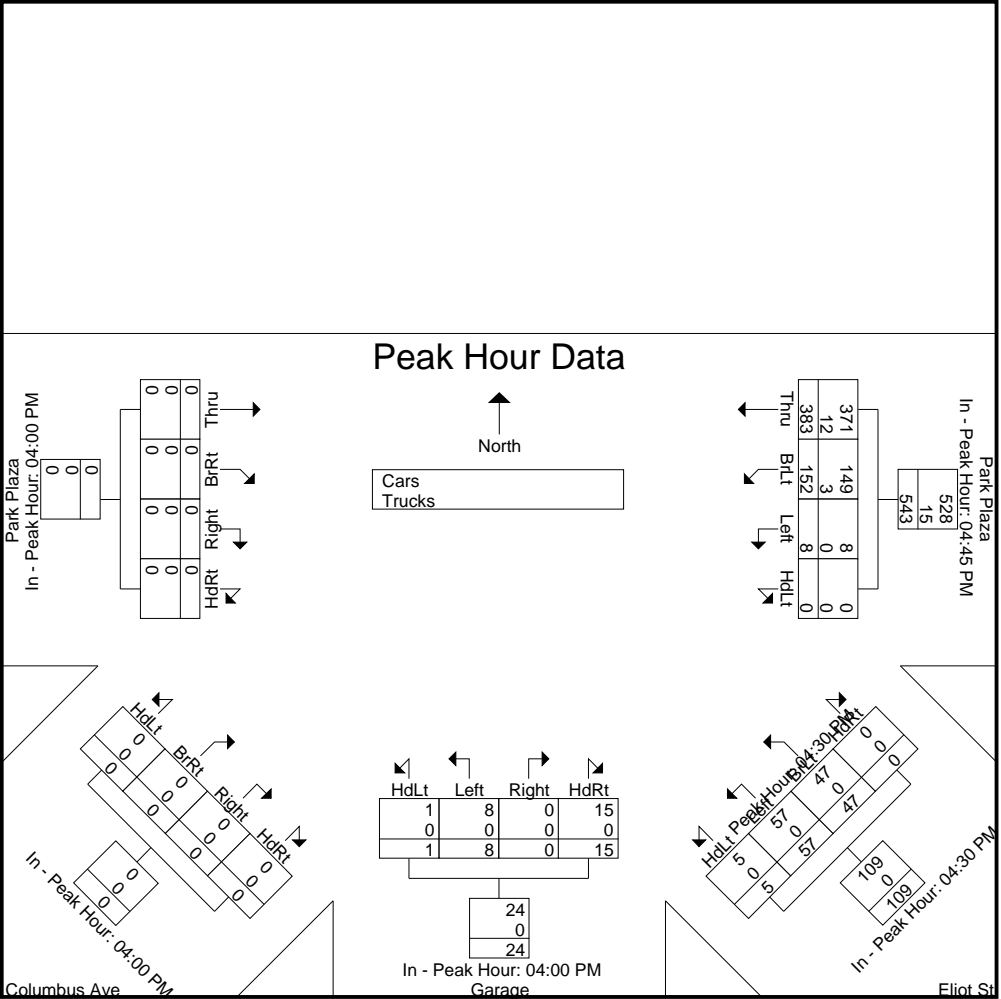
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM					04:30 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	2	40	94	136	2	14	7	0	23	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	1	29	82	112	0	23	10	0	33	1	0	0	3	4	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	3	44	115	162	1	9	16	0	26	0	2	0	2	4	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	2	39	92	133	2	11	14	0	27	0	6	0	1	7	0	0	0	0	0	0	0	0	0	0
Total Volume	0	8	152	383	543	5	57	47	0	109	1	8	0	15	24	0	0	0	0	0	0	0	0	0	0
% App. Total	0	1.5	28	70.5		4.6	52.3	43.1	0		4.2	33.3	0	62.5		0	0	0	0		0	0	0	0	

Accurate Counts
978-664-2565

PHF	.000	.667	.864	.833	.838	.625	.620	.734	.000	.826	.250	.333	.000	.417	.667	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Cars	0	8	149	371	528	5	57	47	0	109	1	8	0	15	24	0	0	0	0	0	0	0	0	0	0
% Cars	0	100	98	96.9	97.2	100	100	100	0	100	100	100	0	100	100	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	3	12	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	2	3.1	2.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 6

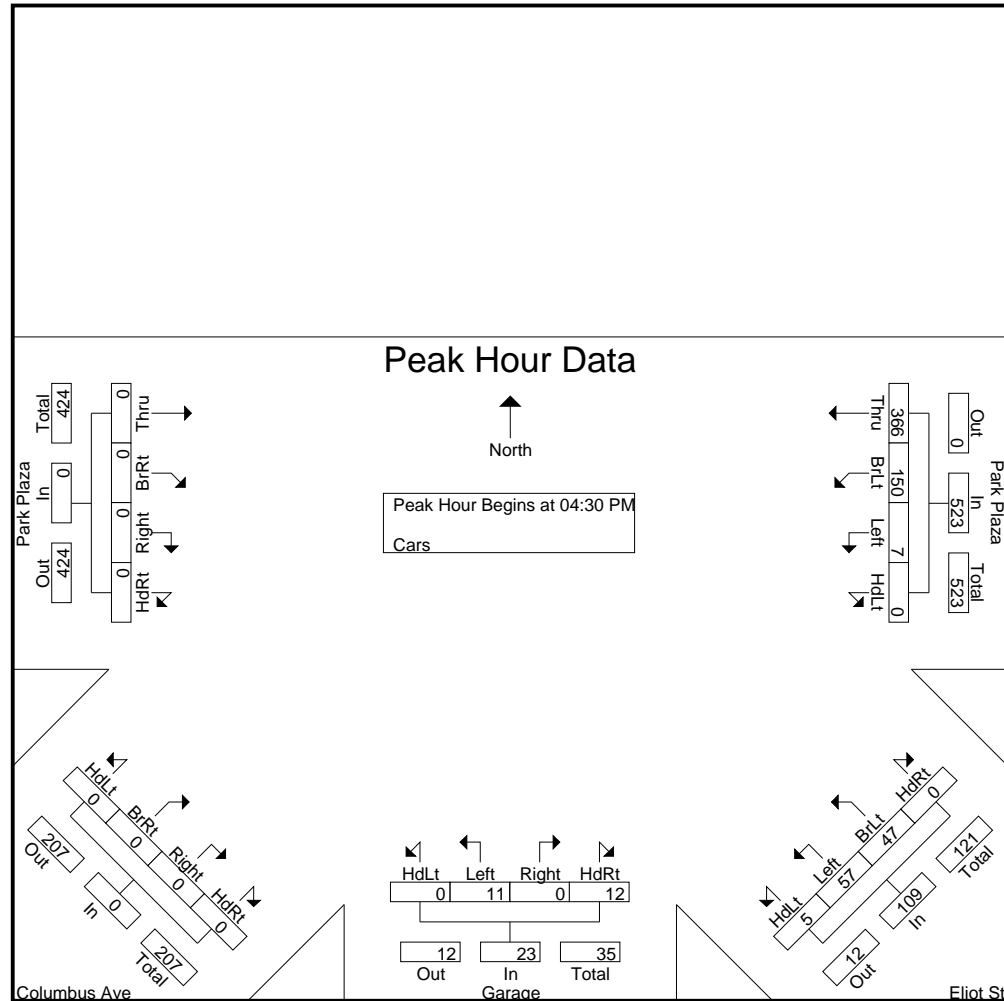
Peak Hour for Entire Intersection Begins at 04:30 PM

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 7

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

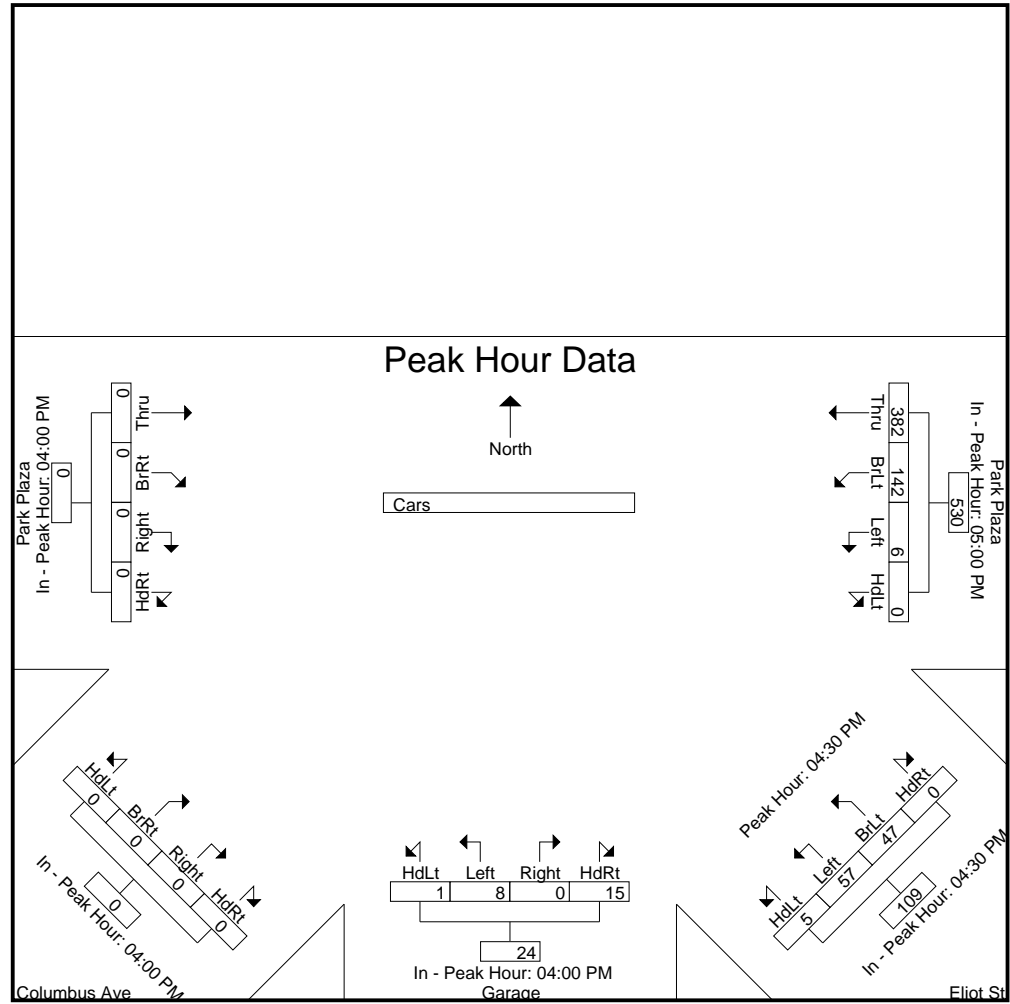


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					04:30 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	1	29	76	106	2	14	7	0	23	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	3	44	113	160	0	23	10	0	33	1	0	0	3	4	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	2	38	90	130	1	9	16	0	26	0	2	0	2	4	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	31	103	134	2	11	14	0	27	0	6	0	1	7	0	0	0	0	0	0	0	0	0	0
Total Volume	0	6	142	382	530	5	57	47	0	109	1	8	0	15	24	0	0	0	0	0	0	0	0	0	0
% App. Total	0	1.1	26.8	72.1		4.6	52.3	43.1	0		4.2	33.3	0	62.5		0	0	0	0		0	0	0	0	

978-664-2565

[illegible]

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 9

[illegible]

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 10

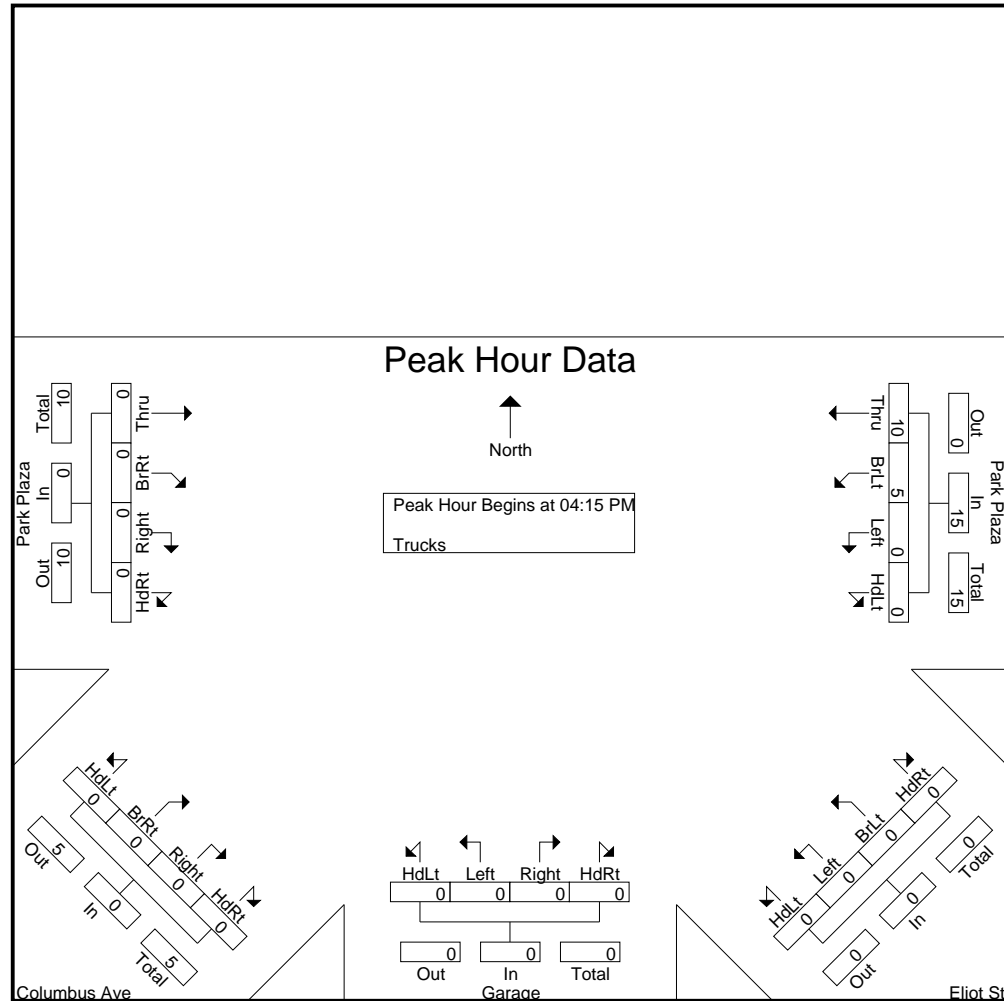
Peak Hour for Entire Intersection Begins at 04:15 PM

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 11

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

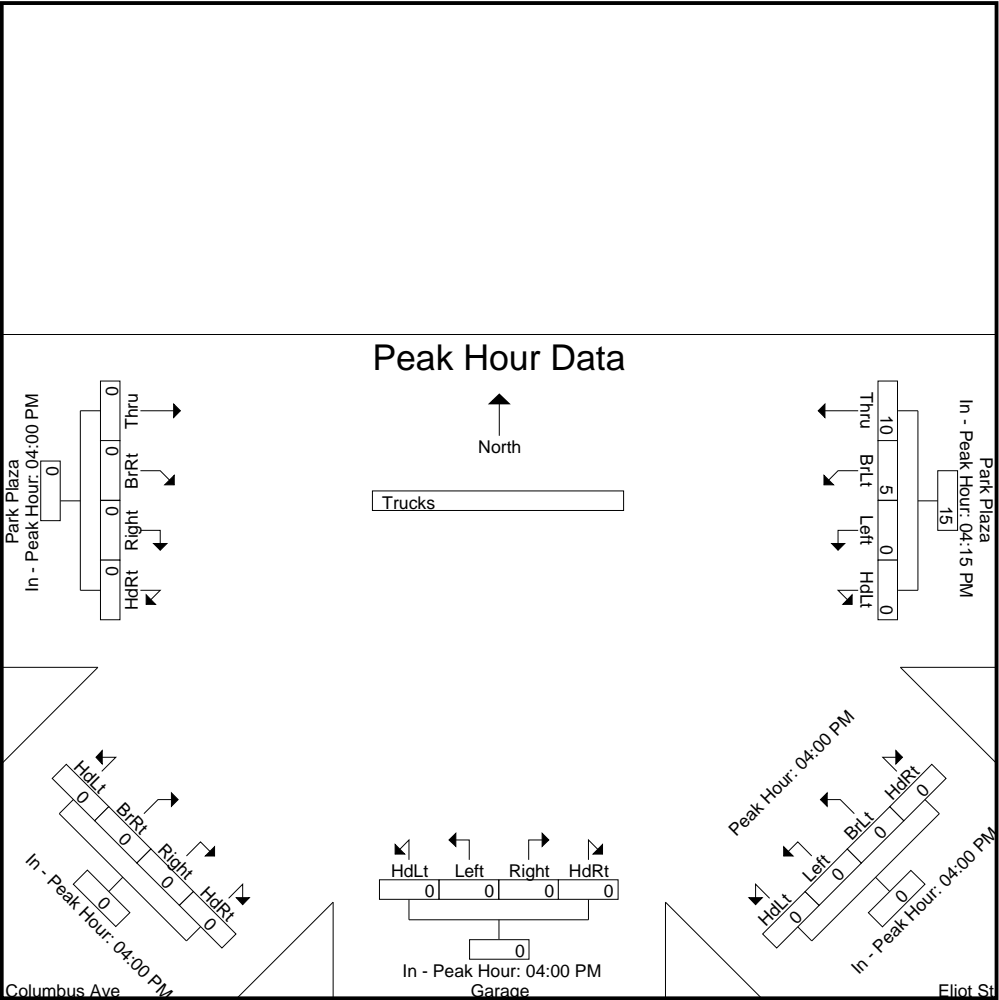


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM					04:00 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	5	10	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	33.3	66.7		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	

PHF	.000	.000	.625	.417	.625	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts
978-664-2565

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 13

Groups Printed- Bikes Peds																												
	Park Plaza From East					Eliot St From Southeast					Garage From South					Columbus Ave From Southwest					Park Plaza From West							
Start Time	HdLt	Left	BrLt	Thru	Peds	HdLt	Left	BrLt	HdRt	Peds	HdLt	Left	Right	HdRt	Peds	HdLt	BrRt	Right	HdRt	Peds	Thru	BrRt	Right	HdRt	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	1	18	0	0	0	0	15	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	46	1	47
04:15 PM	0	0	3	3	22	0	0	0	0	10	0	1	0	0	28	0	0	0	0	0	0	0	0	0	0	60	7	67
04:30 PM	0	0	4	4	26	0	0	0	0	7	0	1	0	1	33	0	0	0	0	2	0	0	0	0	0	68	10	78
04:45 PM	0	1	1	4	23	0	0	0	0	7	0	3	0	0	25	0	0	0	0	0	0	0	0	0	3	58	9	67
Total	0	1	8	12	89	0	0	0	0	39	0	5	0	1	99	0	0	0	0	2	0	0	0	0	3	232	27	259
05:00 PM	0	0	9	7	34	0	0	0	0	15	0	3	0	1	37	0	0	0	0	1	0	0	0	0	1	88	20	108
05:15 PM	0	0	5	4	22	0	0	0	0	12	1	1	0	0	16	0	0	0	0	0	0	0	0	0	0	50	11	61
05:30 PM	0	0	8	9	44	0	0	0	0	21	0	1	0	0	15	0	0	0	0	2	0	0	0	0	0	82	18	100
05:45 PM	0	0	9	5	28	0	0	0	0	6	0	2	0	0	25	0	0	0	0	3	0	0	0	0	0	62	16	78
Total	0	0	31	25	128	0	0	0	0	54	1	7	0	1	93	0	0	0	0	6	0	0	0	0	1	282	65	347
Grand Total	0	1	39	37	217	0	0	0	0	93	1	12	0	2	192	0	0	0	0	8	0	0	0	0	4	514	92	606
Apprch %	0	1.3	50.6	48.1		0	0	0	0		6.7	80	0	13.3		0	0	0	0		0	0	0	0				
Total %	0	1.1	42.4	40.2		0	0	0	0		1.1	13	0	2.2		0	0	0	0		0	0	0	0		84.8	15.2	

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 14

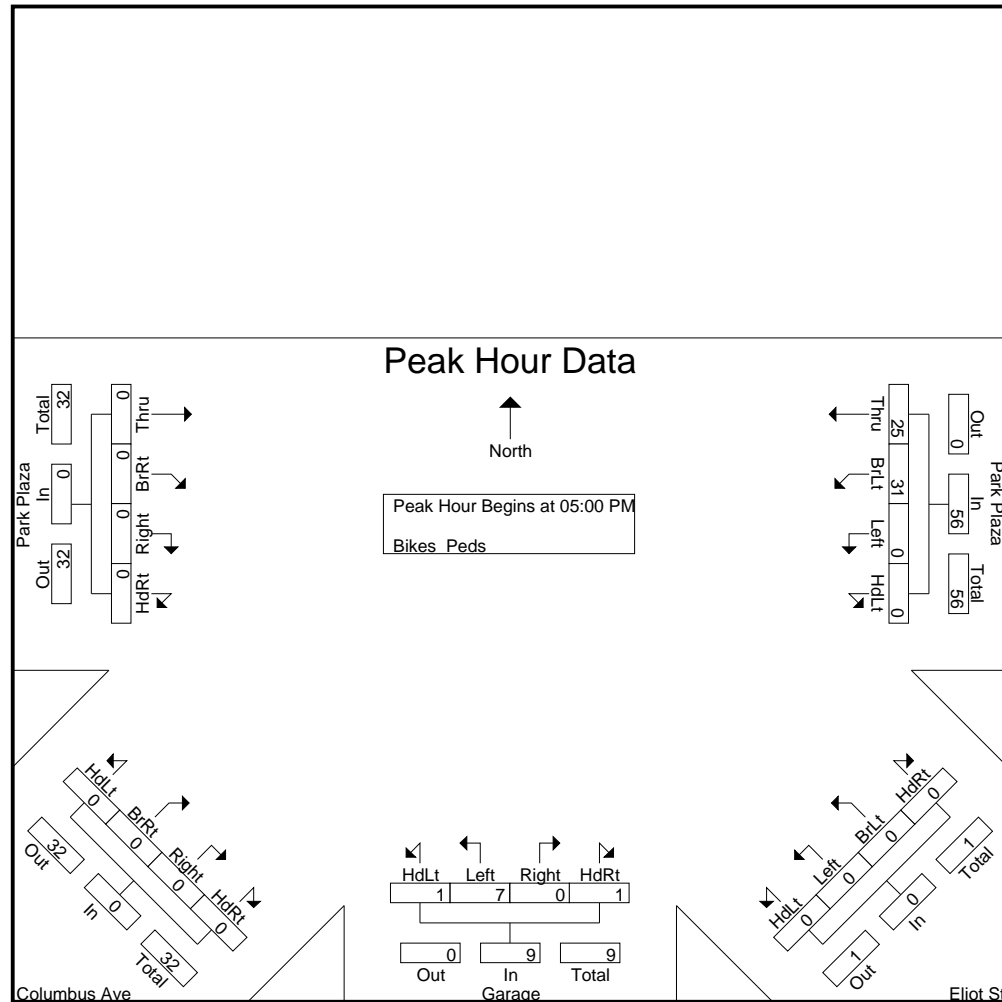
[illegible]

Accurate Counts

978-664-2565

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 15

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

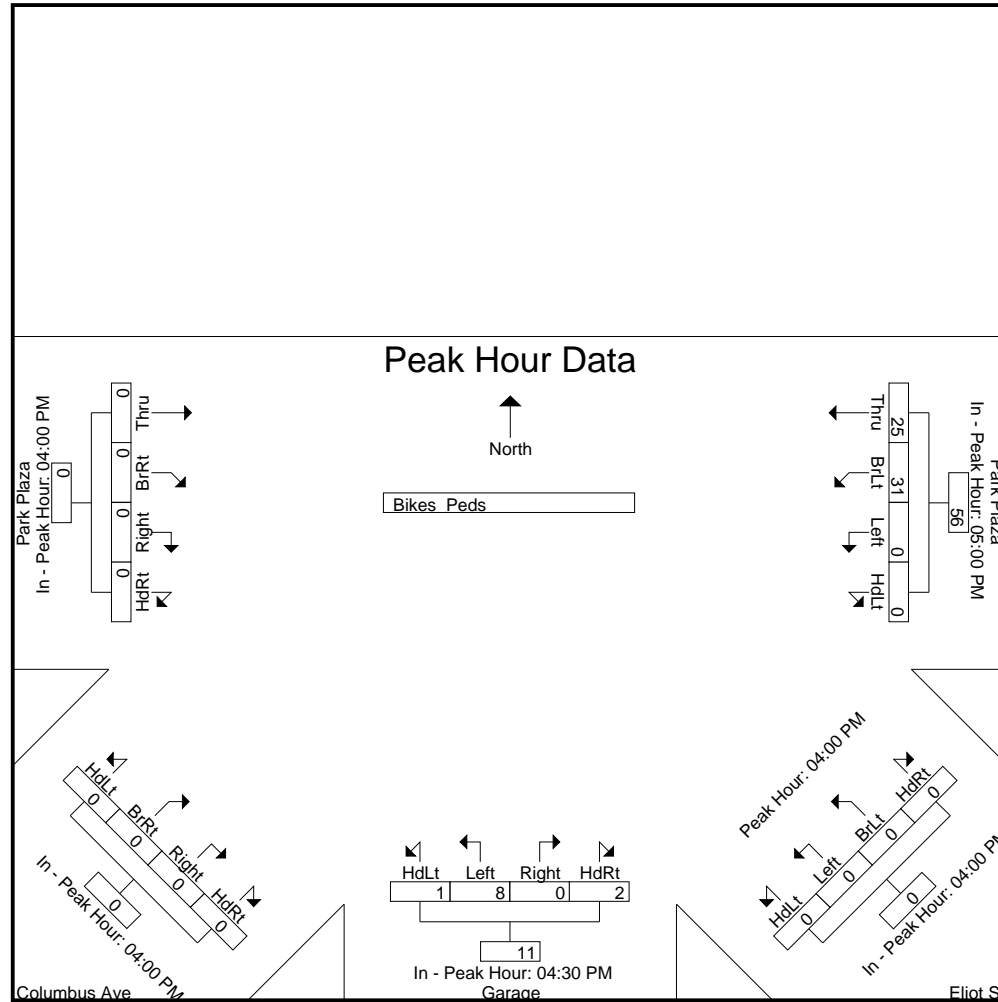


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					04:00 PM					04:30 PM					04:00 PM					04:00 PM				
+0 mins.	0	0	9	7	16	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	5	4	9	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	8	9	17	0	0	0	0	0	0	3	0	1	4	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	9	5	14	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	31	25	56	0	0	0	0	0	1	8	0	2	11	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	55.4	44.6		0	0	0	0		9.1	72.7	0	18.2		0	0	0	0		0	0	0	0	

978-664-2565

[illegible]

Accurate Counts
978-664-2565

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 1

Groups Printed- Peds				
	Park Plaza From East	Eliot St From Southeast		
Start Time	E-W Peds	NE - SW Peds	Int. Total	
07:00 AM	6	24	30	
07:15 AM	22	30	52	
07:30 AM	24	37	61	
07:45 AM	20	34	54	
Total	72	125	197	
08:00 AM	26	47	73	
08:15 AM	28	66	94	
08:30 AM	49	54	103	
08:45 AM	57	63	120	
Total	160	230	390	
Grand Total	232	355	587	
Apprch %	100	100		
Total %	39.5	60.5		

Accurate Counts
978-664-2565

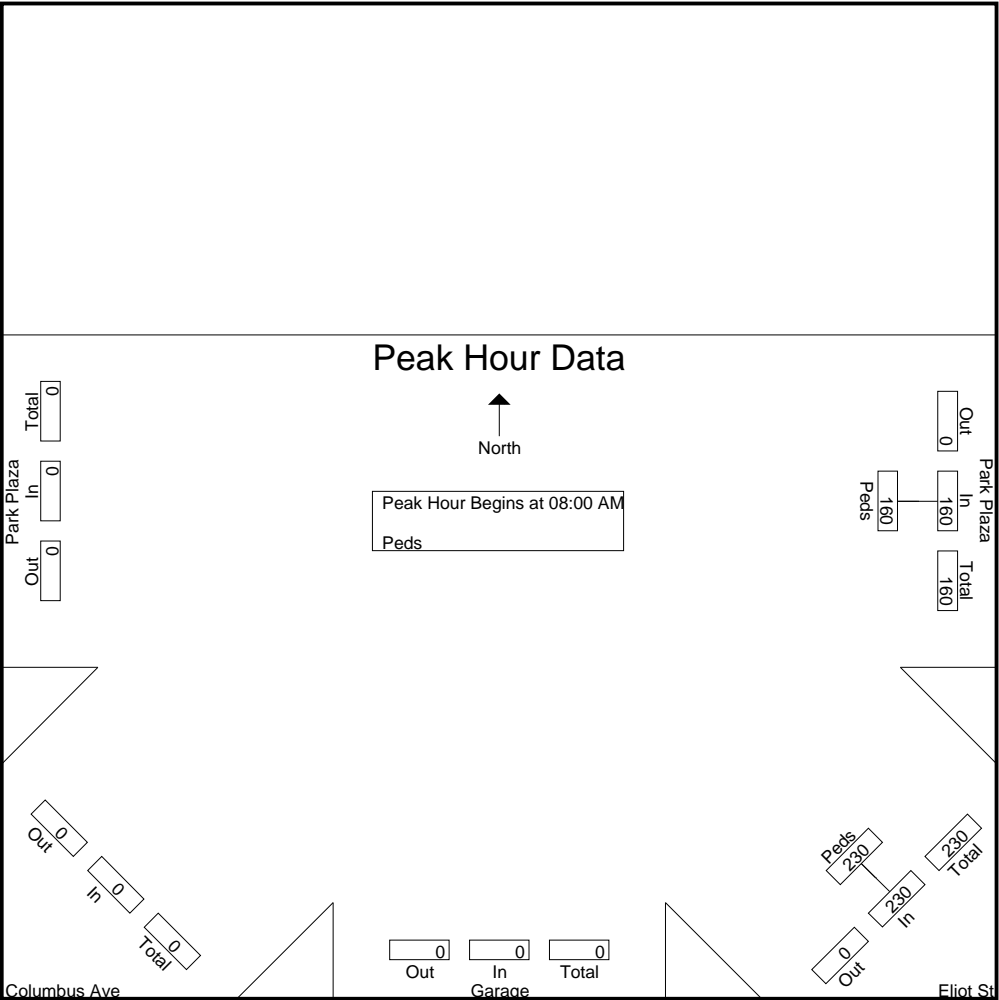
N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 2

	Park Plaza From East		Eliot St From Southeast		From South	From Southwest	From West	
Start Time	E-W Peds	App. Total	NE - SW Peds	App. Total	App. Total	App. Total	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	26	26	47	47	0	0	0	73
08:15 AM	28	28	66	66	0	0	0	94
08:30 AM	49	49	54	54	0	0	0	103
08:45 AM	57	57	63	63	0	0	0	120
Total Volume	160	160	230	230	0	0	0	390
% App. Total	100		100					
PHF	.702	.702	.871	.871	.000	.000	.000	.813

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

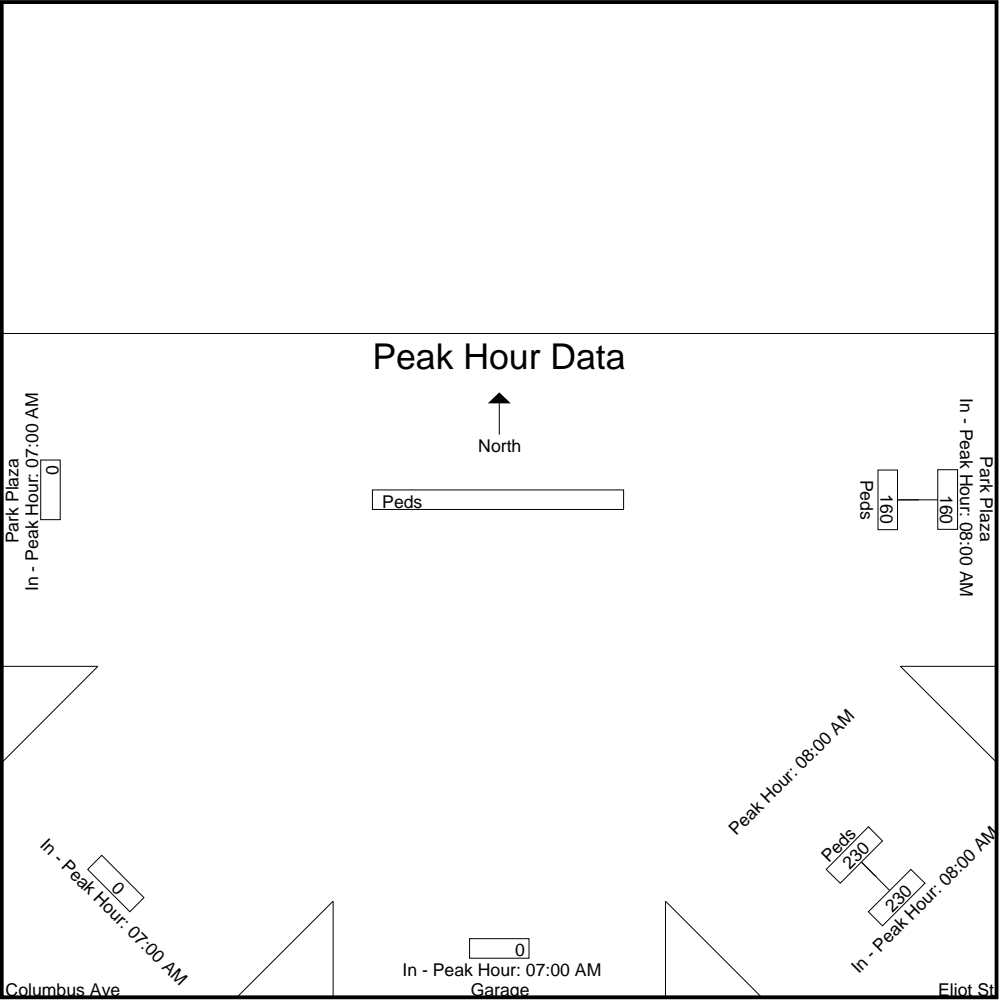
File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 3



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		07:00 AM	07:00 AM	07:00 AM
+0 mins.	26	26	47	47	0	0	0
+15 mins.	28	28	66	66	0	0	0
+30 mins.	49	49	54	54	0	0	0
+45 mins.	57	57	63	63	0	0	0
Total Volume	160	160	230	230	0	0	0
% App. Total	100		100				

PHF	.702	.702	.871	.871	.000	.000	.000
-----	------	------	------	------	------	------	------



Accurate Counts
978-664-2565

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 1

Groups Printed- Peds				
	Park Plaza From East	Eliot St From Southeast		
Start Time	E-W Peds	NE - SW Peds	Int. Total	
04:00 PM	10	14	24	
04:15 PM	25	26	51	
04:30 PM	26	39	65	
04:45 PM	27	47	74	
Total	88	126	214	
05:00 PM	52	56	108	
05:15 PM	40	56	96	
05:30 PM	44	45	89	
05:45 PM	24	46	70	
Total	160	203	363	
Grand Total	248	329	577	
Apprch %	100	100		
Total %	43	57		

Accurate Counts
978-664-2565

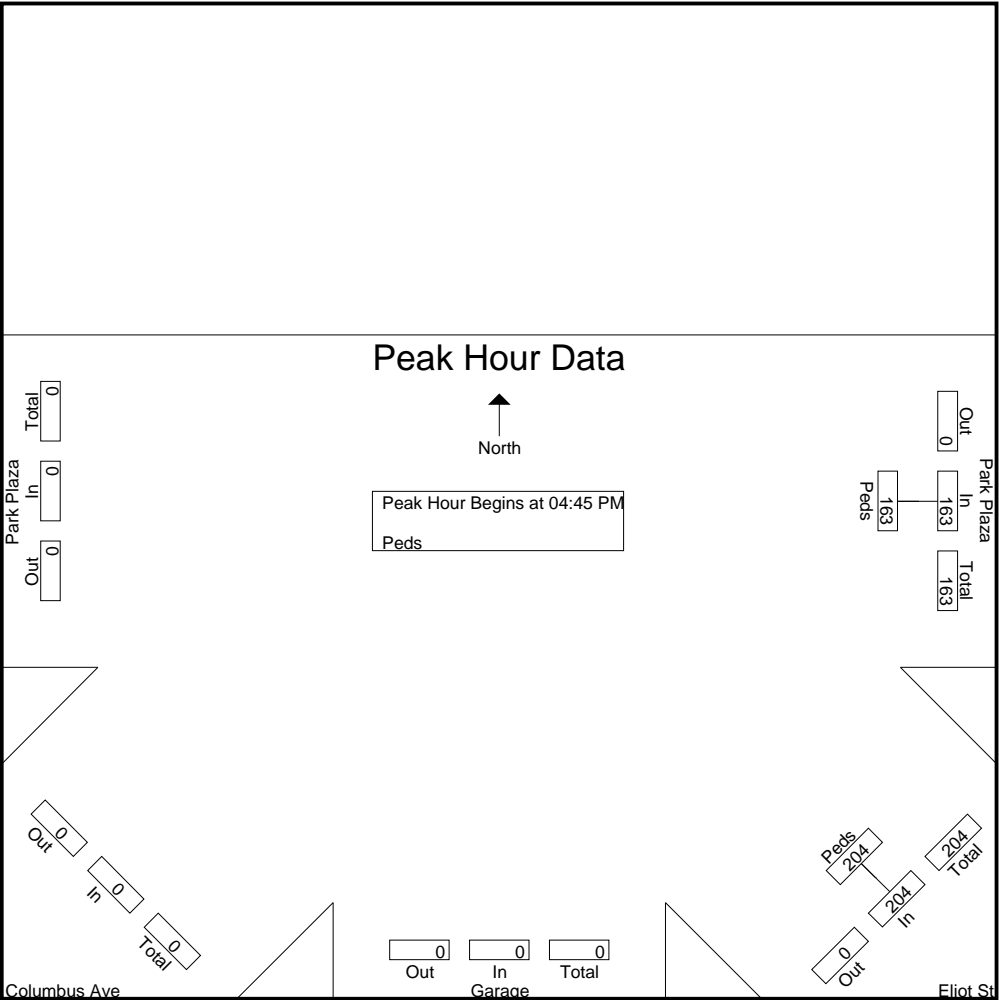
N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 2

	Park Plaza From East		Eliot St From Southeast		From South	From Southwest	From West	
Start Time	E-W Peds	App. Total	NE - SW Peds	App. Total	App. Total	App. Total	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	27	27	47	47	0	0	0	74
05:00 PM	52	52	56	56	0	0	0	108
05:15 PM	40	40	56	56	0	0	0	96
05:30 PM	44	44	45	45	0	0	0	89
Total Volume	163	163	204	204	0	0	0	367
% App. Total	100		100					
PHF	.784	.784	.911	.911	.000	.000	.000	.850

N/S Street : Garage / Eliot St
E/W Street : Columbus Ave / Park Plaza
City/State : Boston, MA
Weather : Clear

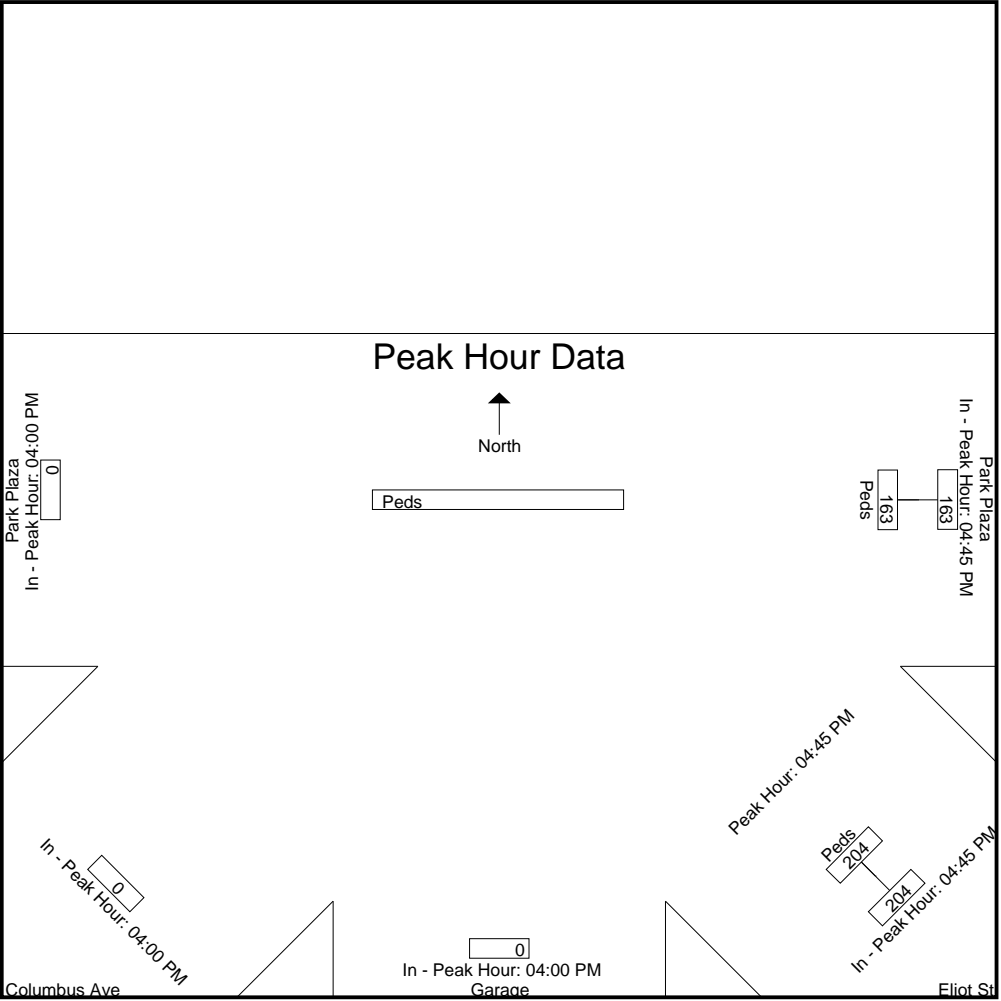
File Name : 17034004
Site Code : 17034004
Start Date : 11/28/2017
Page No : 3



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

	04:45 PM		04:45 PM		04:00 PM	04:00 PM	04:00 PM
+0 mins.	27	27	47	47	0	0	0
+15 mins.	52	52	56	56	0	0	0
+30 mins.	40	40	56	56	0	0	0
+45 mins.	44	44	45	45	0	0	0
Total Volume	163	163	204	204	0	0	0
% App. Total	100		100				

PHF	.784	.784	.911	.911	.000	.000	.000
-----	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 1

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

Groups Printed- Cars - Trucks

	Arlington St From North					Columbus Ave From Northeast					Stuart St From East					Arlington St From South					Columbus Ave From Southwest					Stuart St From West						
Start Time	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	Int. Total	
07:00 AM	0	43	136	25	0	16	10	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	3	0	0	75	34	4	383	
07:15 AM	0	63	128	29	0	12	12	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0	82	29	1	398	
07:30 AM	0	74	116	32	0	12	13	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	13	0	0	95	38	4	431	
07:45 AM	0	84	130	29	0	18	11	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	8	0	0	93	48	12	478	
Total	0	264	510	115	0	58	46	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96	28	0	0	345	149	21	1690	
08:00 AM	0	62	140	31	0	8	12	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	7	0	0	104	27	1	439	
08:15 AM	0	84	160	36	0	16	10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	6	0	0	123	43	5	530	
08:30 AM	0	85	148	53	0	21	15	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	9	0	0	96	26	1	512	
08:45 AM	0	70	125	52	0	11	6	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	6	0	0	89	39	4	442	
Total	0	301	573	172	0	56	43	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	28	0	0	412	135	11	1923	
Grand Total Apprch %	0	565	1083	287	0	114	89	114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	232	56	0	0	757	284	32	3613	
	0	29.2	56	14.8	0	36	28.1	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80.6	19.4	0	0	70.5	26.5	3		
Total %	0	15.6	30	7.9	0	3.2	2.5	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.4	1.5	0	0	21	7.9	0.9		
Cars	0	552	1033	280	0	107	88	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226	54	0	0	738	276	29	3485	
% Cars	0	97.7	95.4	97.6	0	93.9	98.9	89.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97.4	96.4	0	0	97.5	97.2	90.6	96.5	
Trucks	0	13	50	7	0	7	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0	19	8	3	128		
% Trucks	0	2.3	4.6	2.4	0	6.1	1.1	10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.6	3.6	0	0	2.5	2.8	9.4	3.5		

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 2

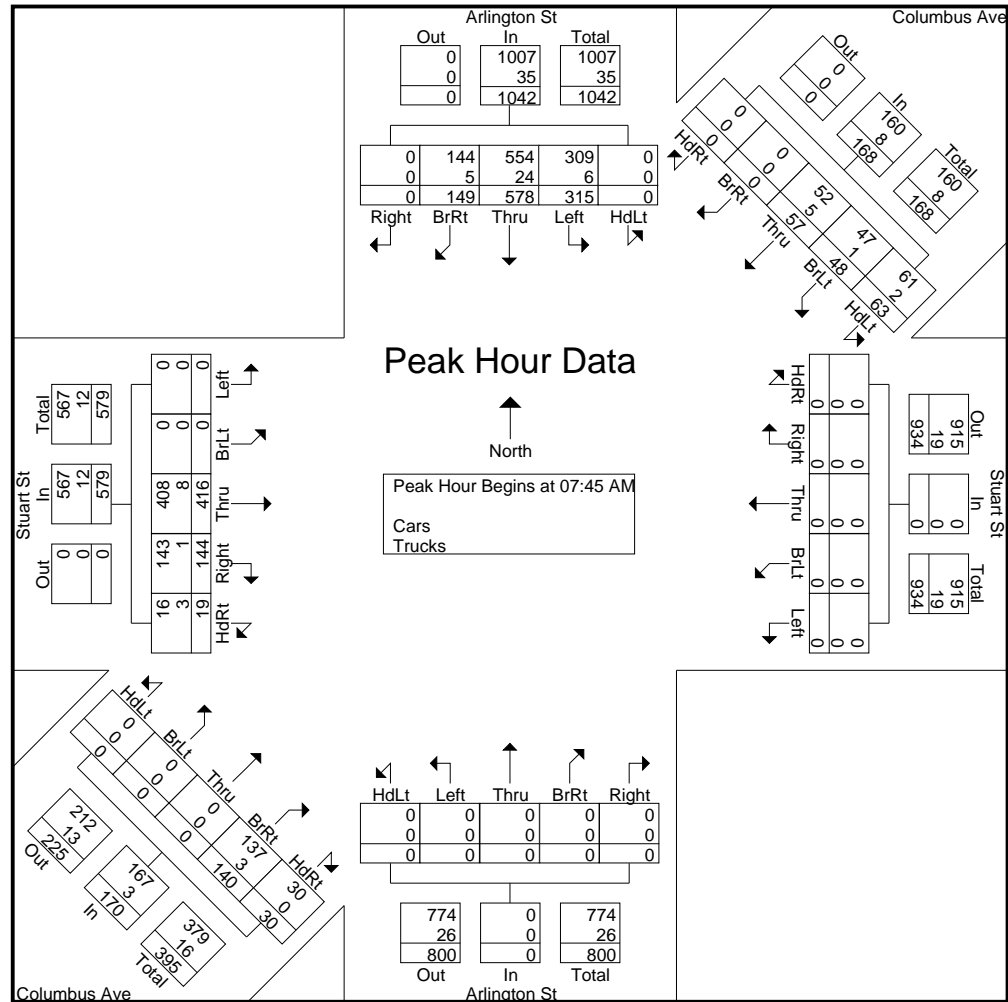
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	84	130	29	0	243	18	11	19	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	8	34	0	0	93	48	12	153	478	
08:00 AM	0	62	140	31	0	233	8	12	10	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	7	44	0	0	104	27	1	132	439	
08:15 AM	0	84	160	36	0	280	16	10	9	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	6	44	0	0	123	43	5	171	530	
08:30 AM	0	85	148	53	0	286	21	15	19	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	9	48	0	0	96	26	1	123	512	
Total Volume	0	315	578	149	0	1042	63	48	57	0	0	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	30	170	0	0	416	144	19	579	1959	
% App. Total	0	30.2	55.5	14.3	0		37.5	28.6	33.9	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	82.4	17.6		0	0	71.8	24.9	3.3		1959	
PHF	.000	.926	.903	.703	.000	.911	.750	.800	.750	.000	.000	.764	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.897	.833	.885	.000	.000	.846	.750	.396	.846	.924	
Cars	0	309	554	144	0	1007	61	47	52	0	0	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137	30	167	0	0	408	143	16	567	1901	
% Cars	0	98.1	95.8	96.6	0	96.6	96.8	97.9	91.2	0	0	95.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97.9	100	98.2	0	0	98.1	99.3	84.2	97.9	97.0	
Trucks	0	6	24	5	0	35	2	1	5	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	8	1	3	12	58	
% Trucks	0	1.9	4.2	3.4	0	3.4	3.2	2.1	8.8	0	0	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1	0	1.8	0	0	1.9	0.7	15.8	2.1	3.0	

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 3

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



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						07:00 AM						07:00 AM						07:45 AM						07:30 AM					
+0 mins.	0	62	140	31	0	233	18	11	19	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	8	34	0	0	95	38	4	137
+15 mins.	0	84	160	36	0	280	8	12	10	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	7	44	0	0	93	48	12	153
+30 mins.	0	85	148	53	0	286	16	10	9	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	6	44	0	0	104	27	1	132

978-664-2565

Peak Hour Data

North

Cars Trucks

Arlington St
In - Peak Hour: 08:00 AM

1013
33
1046

0	168	550	295	0
0	4	23	6	0
0	172	573	301	0

Right BrRt Thru Left HdLt

Stuart St
In - Peak Hour: 07:30 AM

578	15	593
-----	----	-----

19	154	405	0	0
3	2	10	0	0
22	156	415	0	0

HdRt Right BrLt Left

Columbus Ave
In - Peak Hour: 07:45 AM

167	3	170
-----	---	-----

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

HdLt BrLt Thru BrRt HdRt

Stuart St
In - Peak Hour: 07:00 AM

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

HdRt Right BrLt Left

Arlington St
In - Peak Hour: 07:00 AM

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

HdLt Left Thru BrRt Right

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 5

Groups Printed- Cars

	Arlington St From North					Columbus Ave From Northeast					Stuart St From East					Arlington St From South					Columbus Ave From Southwest					Stuart St From West						
Start Time	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	Int. Total	
07:00 AM	0	42	129	24	0	12	10	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	3	0	0	72	32	4	357	
07:15 AM	0	62	121	28	0	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	4	0	0	80	27	1	384	
07:30 AM	0	72	109	32	0	12	13	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	11	0	0	91	36	4	412	
07:45 AM	0	81	124	28	0	18	11	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	8	0	0	90	48	10	463	
Total	0	257	483	112	0	53	46	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	26	0	0	333	143	19	1616	
08:00 AM	0	62	134	29	0	8	11	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	7	0	0	103	27	1	427	
08:15 AM	0	82	154	36	0	15	10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	6	0	0	121	43	4	517	
08:30 AM	0	84	142	51	0	20	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	9	0	0	94	25	1	494	
08:45 AM	0	67	120	52	0	11	6	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	6	0	0	87	38	4	431	
Total	0	295	550	168	0	54	42	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	133	28	0	0	405	133	10	1869	
Grand Total	0	552	1033	280	0	107	88	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226	54	0	0	738	276	29	3485	
Apprch %	0	29.6	55.4	15	0	36	29.6	34.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80.7	19.3	0	0	70.8	26.5	2.8		
Total %	0	15.8	29.6	8	0	3.1	2.5	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.5	1.5	0	0	21.2	7.9	0.8		

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 6

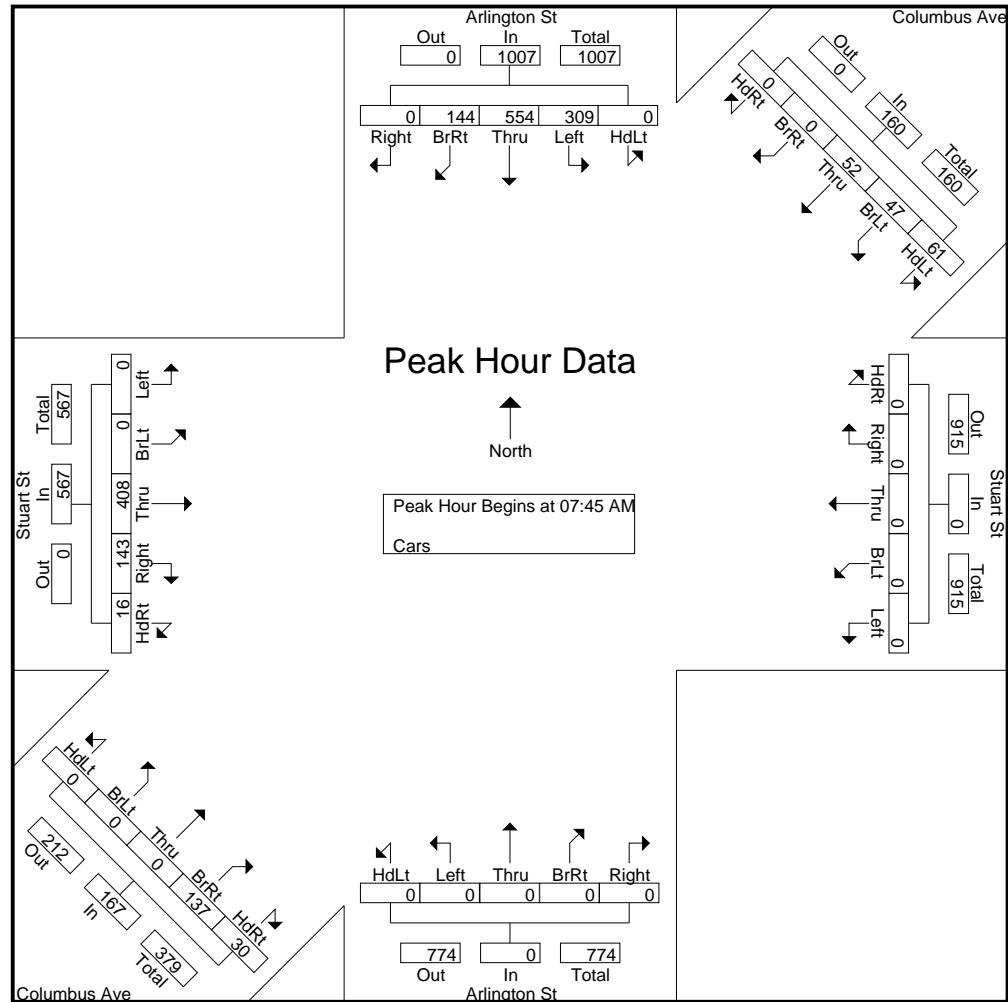
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	81	124	28	0	233	18	11	19	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	8	34	0	0	90	48	10	148	463	
08:00 AM	0	62	134	29	0	225	8	11	9	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	7	43	0	0	103	27	1	131	427	
08:15 AM	0	82	154	36	0	272	15	10	9	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	6	43	0	0	121	43	4	168	517	
08:30 AM	0	84	142	51	0	277	20	15	15	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	9	47	0	0	94	25	1	120	494	
Total Volume	0	309	554	144	0	1007	61	47	52	0	0	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137	30	167	0	0	408	143	16	567	1901	
% App. Total	0	30.7	55	14.3	0		38.1	29.4	32.5	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	82	18		0	0	72	25.2	2.8			
PHF	.000	.920	.899	.706	.000	.909	.763	.783	.684	.000	.000	.800	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.901	.833	.888	.000	.000	.843	.745	.400	.844	.919	

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 7

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



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						07:00 AM						07:00 AM						07:45 AM						07:30 AM					
+0 mins.	0	62	134	29	0	225	18	11	19	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	8	34	0	0	91	36	4	131
+15 mins.	0	82	154	36	0	272	8	11	9	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	7	43	0	0	90	48	10	148
+30 mins.	0	84	142	51	0	277	15	10	9	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	6	43	0	0	103	27	1	131

978-664-2565

The diagram illustrates the peak hour data for two intersections: Arlington St and Stuart St. A central box labeled "Peak Hour Data" is oriented with "North" pointing upwards. A horizontal bar labeled "Cars" is positioned below the "North" arrow.

Arlington St Data:

- In - Peak Hour: 08:00 AM:** A horizontal bar shows the following values from left to right: 0 (Right), 168 (BrRt), 550 (Thru), 295 (Left), and 0 (HdLt). Arrows indicate the flow for each movement.
- In - Peak Hour: 07:45 AM:** A diagonal bar shows the following values from top to bottom: 0 (HdRt), 0 (BrRt), 52 (Thru), 47 (BrLt), and 61 (HdLt). Arrows indicate the flow for each movement.

Stuart St Data:

- In - Peak Hour: 07:30 AM:** A vertical bar shows the following values from top to bottom: 0 (Left), 0 (BrLt), 405 (Thru), 154 (Right), and 19 (HdRt). Arrows indicate the flow for each movement.
- In - Peak Hour: 07:00 AM:** A vertical bar shows the following values from top to bottom: 0 (Left), 0 (BrLt), 0 (Thru), 0 (Right), and 0 (HdRt). Arrows indicate the flow for each movement.

Other Data:

- Bottom Left:** A diagonal bar for "In - Peak Hour: 07:45 AM" shows values: 167 (HdLt), 0 (BrLt), 0 (Thru), 137 (BrRt), and 30 (HdRt). Arrows indicate the flow for each movement.
- Bottom Center:** A horizontal bar for "In - Peak Hour: 07:00 AM" shows values: 0 (HdLt), 0 (Left), 0 (Thru), 0 (BrRt), and 0 (Right). Arrows indicate the flow for each movement.

Accurate Counts

978-664-2565

File Name : 17034005

Site Code : 17034005

Start Date : 11/28/2017

Page No : 9

N/S Street : Arlington St / Stuart St

E/W Street : Columbus Avenue

City/State : Boston, MA

Weather : Clear

Groups Printed- Trucks

	Arlington St From North					Columbus Ave From Northeast					Stuart St From East					Arlington St From South					Columbus Ave From Southwest					Stuart St From West					
Start Time	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	Int. Total
07:00 AM	0	1	7	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	2	0	26
07:15 AM	0	1	7	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	14	
07:30 AM	0	2	7	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4	2	0	19	
07:45 AM	0	3	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	15	
Total	0	7	27	3	0	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	12	6	2	74
08:00 AM	0	0	6	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	12
08:15 AM	0	2	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	13	
08:30 AM	0	1	6	2	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	18	
08:45 AM	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	11	
Total	0	6	23	4	0	2	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	7	2	1	54
Grand Total	0	13	50	7	0	7	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0	19	8	3	128
Apprch %	0	18.6	71.4	10	0	35	5	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	25	0	0	63.3	26.7	10		
Total %	0	10.2	39.1	5.5	0	5.5	0.8	9.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.7	1.6	0	0	14.8	6.2	2.3		

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 10

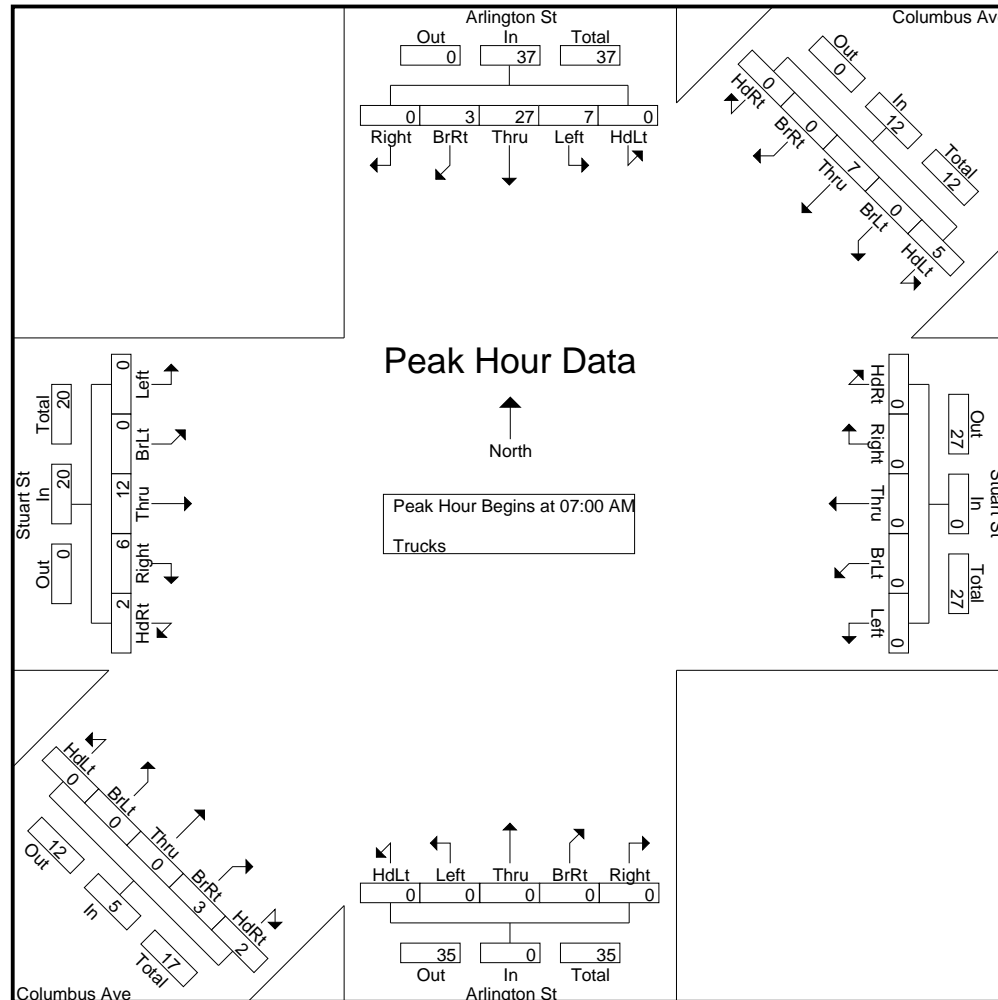
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	7	1	0	9	4	0	5	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	3	2	0	5	26	
07:15 AM	0	1	7	1	0	9	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4	14		
07:30 AM	0	2	7	0	0	9	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	2	0	6	19	
07:45 AM	0	3	6	1	0	10	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	2	5	15		
Total Volume	0	7	27	3	0	37	5	0	7	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0	0	12	6	2	20	74		
% App. Total		18.9	73	8.1	0		41.7		58.3	0	0			0	0	0	0	0		0	0	0	0	0		0	0	0	60	40		0	0	60	30	10		
PHF	.000	.583	.964	.750	.000	.925	.313	.000	.350	.000	.000	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.417	.000	.000	.750	.750	.250	.833	.712	

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 11

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



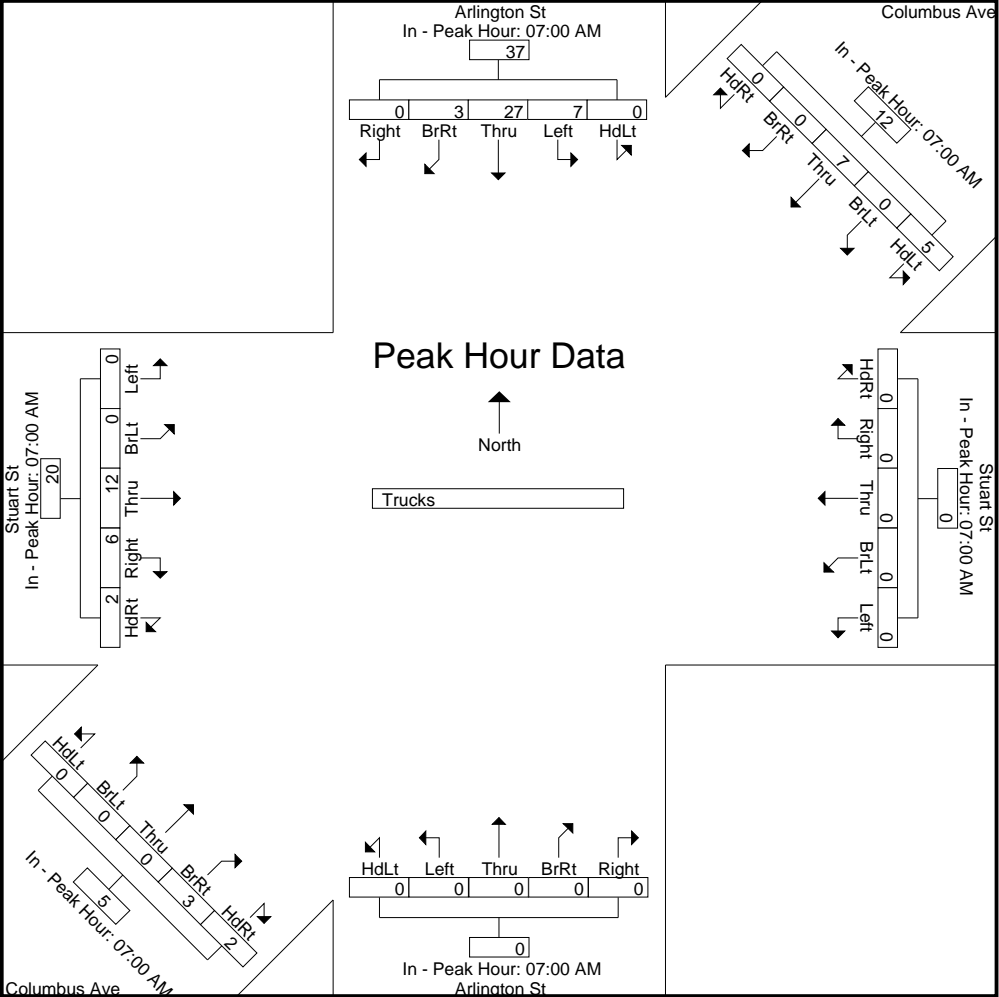
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM	07:00 AM	07:00 AM	07:00 AM	07:00 AM	07:00 AM
+0 mins.	0 1 7 1 0 9	4 0 5 0 0 9	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 3 0 3	0 0 3 2 0 5
+15 mins.	0 1 7 1 0 9	1 0 0 0 0 1	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 2 2 0 4
+30 mins.	0 2 7 0 0 9	0 0 2 0 0 2	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 2 2	0 0 4 2 0 6

Accurate Counts
978-664-2565

+45 mins.	0	3	6	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	5
Total Volume	0	7	27	3	0	37	5	0	7	0	0	12	0	0	0	0	0	0	0	0	0	3	2	5	0	0	12	6	2	20	
	0		73	8.1	0		41.7	0	58.3	0	0		0	0	0	0	0		0	0	0	60	40		0	0	60	30	10		
% App. Total		18.9																													
PHF	.000	.583	.964	.750	.000	.925	.313	.000	.350	.000	.000	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.417	.000	.000	.750	.750	.250	.833	



Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 13

Groups Printed- Bikes Peds

	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West									
Start Time	HdLt	Left	Thru	BrRt	Right	Peds	HdLt	BrLt	Thru	BrRt	HdRt	Peds	Left	BrLt	Thru	Right	HdRt	Peds	HdLt	Left	Thru	BrRt	Right	Peds	HdLt	BrLt	Thru	BrRt	HdRt	Peds	Left	BrLt	Thru	Right	HdRt	Peds	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	1	0	1	0	31	0	0	0	0	0	20	0	0	0	0	0	22	0	0	0	0	0	23	0	0	0	2	0	15	0	0	2	0	0	22	133	6	139	
07:15 AM	0	2	0	0	0	50	0	0	1	0	0	32	0	0	0	0	0	35	0	0	0	0	0	45	0	0	0	4	0	20	0	0	1	0	0	40	222	8	230	
07:30 AM	0	0	1	0	0	47	0	0	2	0	0	35	0	0	0	0	0	41	0	0	0	0	0	34	0	0	0	3	0	26	0	0	0	0	0	30	213	6	219	
07:45 AM	0	0	1	0	0	87	0	0	1	0	0	38	0	0	0	0	0	43	0	0	0	0	0	32	0	0	0	7	0	51	0	0	1	1	0	36	287	11	298	
Total	0	3	2	1	0	215	0	0	4	0	0	125	0	0	0	0	0	141	0	0	0	0	0	134	0	0	0	16	0	112	0	0	4	1	0	128	855	31	886	
08:00 AM	0	0	1	1	0	103	0	0	1	0	0	39	0	0	0	0	0	43	0	0	0	0	0	55	0	0	0	11	0	38	0	0	0	0	0	72	350	14	364	
08:15 AM	0	2	3	0	0	118	0	0	1	0	0	49	0	0	0	0	0	41	0	0	0	0	0	39	0	0	0	13	0	49	0	0	0	0	0	70	366	19	385	
08:30 AM	0	2	1	0	0	95	0	1	1	0	0	46	0	0	0	0	0	48	0	0	0	0	0	49	0	0	0	10	0	46	0	0	1	1	0	54	338	17	355	
08:45 AM	0	2	1	0	0	116	0	0	0	0	0	49	0	0	0	0	0	35	0	0	0	0	0	46	0	0	0	18	0	40	0	0	0	1	0	67	353	22	375	
Total	0	6	6	1	0	432	0	1	3	0	0	183	0	0	0	0	0	167	0	0	0	0	0	189	0	0	0	52	0	173	0	0	1	2	0	263	1407	72	1479	
Grand Total	0	9	8	2	0	647	0	1	7	0	0	308	0	0	0	0	0	308	0	0	0	0	0	323	0	0	0	68	0	285	0	0	5	3	0	391	2262	103	2365	
Apprch %	0	47.4	42.1	10.5	0		0	12.5	87.5	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	100	0		0	0	62.5	37.5	0					
Total %	0	8.7	7.8	1.9	0		0	1	6.8	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	66	0		0	0	4.9	2.9	0					

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 14

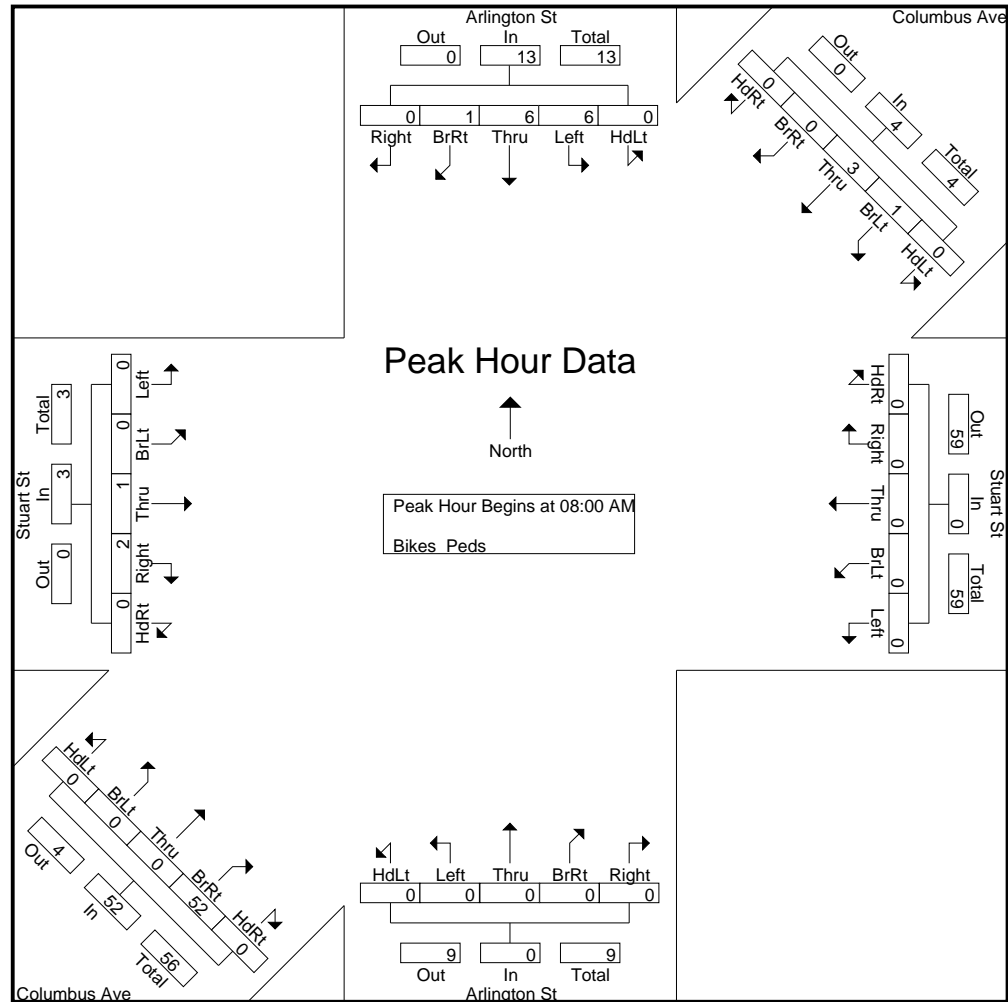
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	1	1	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11	0	0	0	0	0	0	14	
08:15 AM	0	2	3	0	0	5	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	13	0	0	0	0	0	0	19	
08:30 AM	0	2	1	0	0	3	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	1	1	0	2	17	
08:45 AM	0	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	18	0	0	0	1	0	1	22	
Total Volume	0	6	6	1	0	13	0	1	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	52	0	0	1	2	0	3	72	
% App. Total	0	46.2	46.2	7.7	0		0	25	75	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	100	0		33.3	66.7	0					
PHF	.000	.750	.500	.250	.000	.650	.000	.250	.750	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.722	.000	.722	.000	.250	.500	.000	.375	.818		

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 15

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



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	07:15 AM	07:00 AM	07:00 AM	08:00 AM	07:00 AM
+0 mins.	0 0 1 1 0 2	0 0 1 0 0 1	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 11 0 11	0 0 2 0 0 2
+15 mins.	0 2 3 0 0 5	0 0 2 0 0 2	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 13 0 13	0 0 1 0 0 1
+30 mins.	0 2 1 0 0 3	0 0 1 0 0 1	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 10 0 10	0 0 0 0 0 0

978-664-2565

Diagram illustrating Peak Hour Data for the intersection of Arlington St and Columbus Ave.

Northbound (Arlington St):

- In - Peak Hour: 08:00 AM
- Total Volume: 13
- Lane Volumes: Right (0), BrRt (1), Thru (6), Left (6), HdLt (0)

Southbound (Arlington St):

- In - Peak Hour: 07:00 AM
- Total Volume: 0
- Lane Volumes: HdLt (0), Left (0), Thru (0), BrRt (0), Right (0)

Eastbound (Columbus Ave):

- In - Peak Hour: 07:15 AM
- Total Volume: 5
- Lane Volumes: HdRt (0), BrRt (0), Thru (5), BrLt (0), HdLt (0)

Westbound (Columbus Ave):

- In - Peak Hour: 07:00 AM
- Total Volume: 0
- Lane Volumes: HdRt (0), Right (0), Thru (0), BrLt (0), Left (0)

Central Data:

- Bikes Peds: 0

Accurate Counts

978-664-2565

File Name : 17034005

Site Code : 17034005

Start Date : 11/28/2017

Page No : 1

N/S Street : Arlington St / Stuart St

E/W Street : Columbus Avenue

City/State : Boston, MA

Weather : Clear

Groups Printed- Cars - Trucks

	Arlington St From North					Columbus Ave From Northeast					Stuart St From East					Arlington St From South					Columbus Ave From Southwest					Stuart St From West						
Start Time	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	Int. Total	
04:00 PM	0	55	158	49	0	8	15	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	5	0	0	107	51	3	495	
04:15 PM	0	76	186	57	0	14	16	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	4	0	0	102	43	13	544	
04:30 PM	0	91	140	53	0	9	14	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	19	0	0	103	36	6	534	
04:45 PM	0	98	144	57	0	26	19	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	13	0	0	95	30	4	545	
Total	0	320	628	216	0	57	64	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	101	41	0	0	407	160	26	2118	
05:00 PM	0	74	173	57	0	25	23	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	6	0	0	103	50	8	576	
05:15 PM	0	63	162	69	0	30	19	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	7	0	0	116	41	11	570	
05:30 PM	0	86	156	62	0	30	17	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	10	0	0	124	37	4	598	
05:45 PM	0	90	165	64	0	22	14	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	13	0	0	127	43	8	617	
Total	0	313	656	252	0	107	73	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169	36	0	0	470	171	31	2361	
Grand Total	0	633	1284	468	0	164	137	181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	270	77	0	0	877	331	57	4479	
Apprch %	0	26.5	53.8	19.6	0	34	28.4	37.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77.8	22.2	0	0	69.3	26.2	4.5		
Total %	0	14.1	28.7	10.4	0	3.7	3.1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1.7	0	0	19.6	7.4	1.3		
Cars	0	625	1267	467	0	161	136	181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	262	74	0	0	873	328	57	4431	
% Cars	0	98.7	98.7	99.8	0	98.2	99.3	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	97	96.1	0	0	99.5	99.1	100	98.9	
Trucks	0	8	17	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	0	0	4	3	0	48		
% Trucks	0	1.3	1.3	0.2	0	1.8	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3.9	0	0	0.5	0.9	0	1.1		

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 2

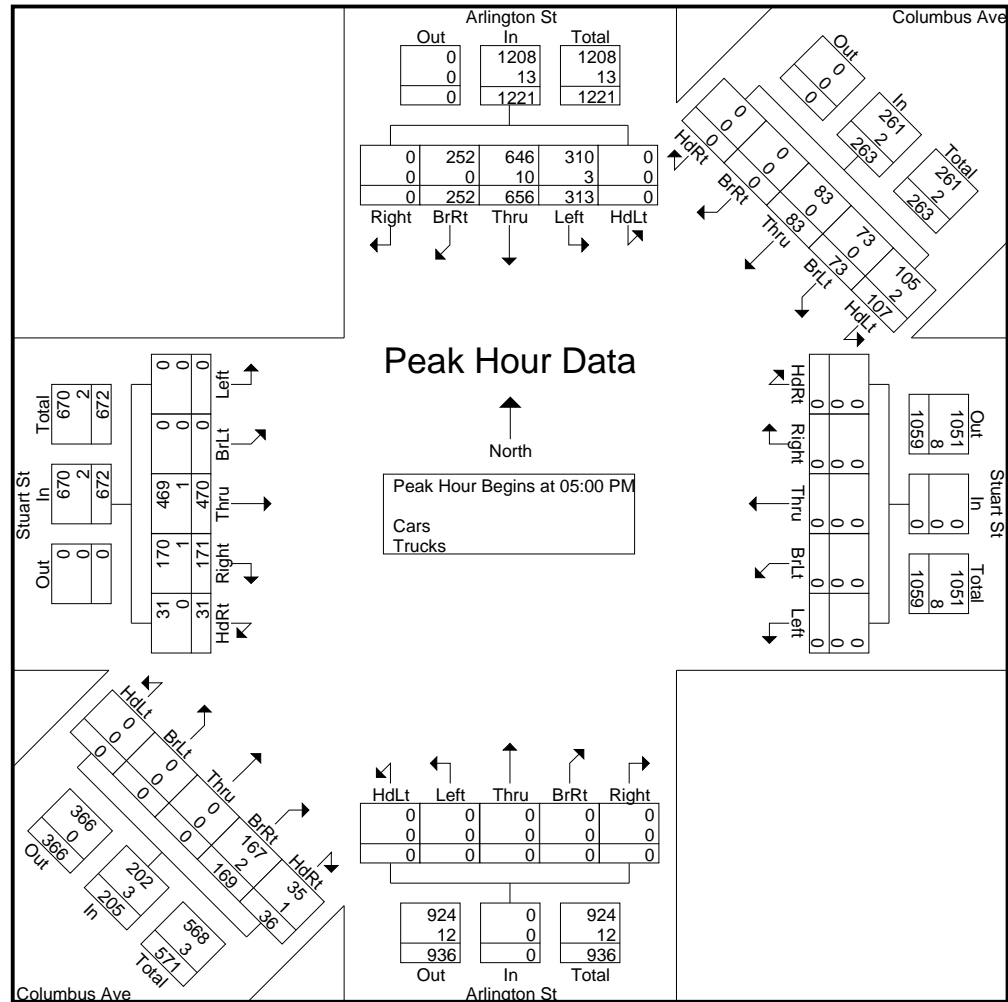
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West						
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	74	173	57	0	304	25	23	15	0	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	6	48	0	0	103	50	8	161	576
05:15 PM	0	63	162	69	0	294	30	19	20	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	7	39	0	0	116	41	11	168	570
05:30 PM	0	86	156	62	0	304	30	17	24	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	10	58	0	0	124	37	4	165	598
05:45 PM	0	90	165	64	0	319	22	14	24	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	13	60	0	0	127	43	8	178	617
Total Volume	0	313	656	252	0	1221	107	73	83	0	0	263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	169	36	205	0	0	470	171	31	672	2361
% App. Total	0	25.6	53.7	20.6	0		40.7	27.8	31.6	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	82.4	17.6		0	0	69.9	25.4	4.6		2361
PHF	.000	.869	.948	.913	.000	.957	.892	.793	.865	.000	.000	.926	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.880	.692	.854	.000	.000	.925	.855	.705	.944	.957
Cars	0	310	646	252	0	1208	105	73	83	0	0	261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	35	202	0	0	469	170	31	670	2341
% Cars	0	99.0	98.5	100	0	98.9	98.1	100	100	0	0	99.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98.8	97.2	98.5	0	0	99.8	99.4	100	99.7	99.2
Trucks	0	3	10	0	0	13	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	1	1	0	2	20
% Trucks	0	1.0	1.5	0	0	1.1	1.9	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	2.8	1.5	0	0	0.2	0.6	0	0.3	0.8

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 3

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



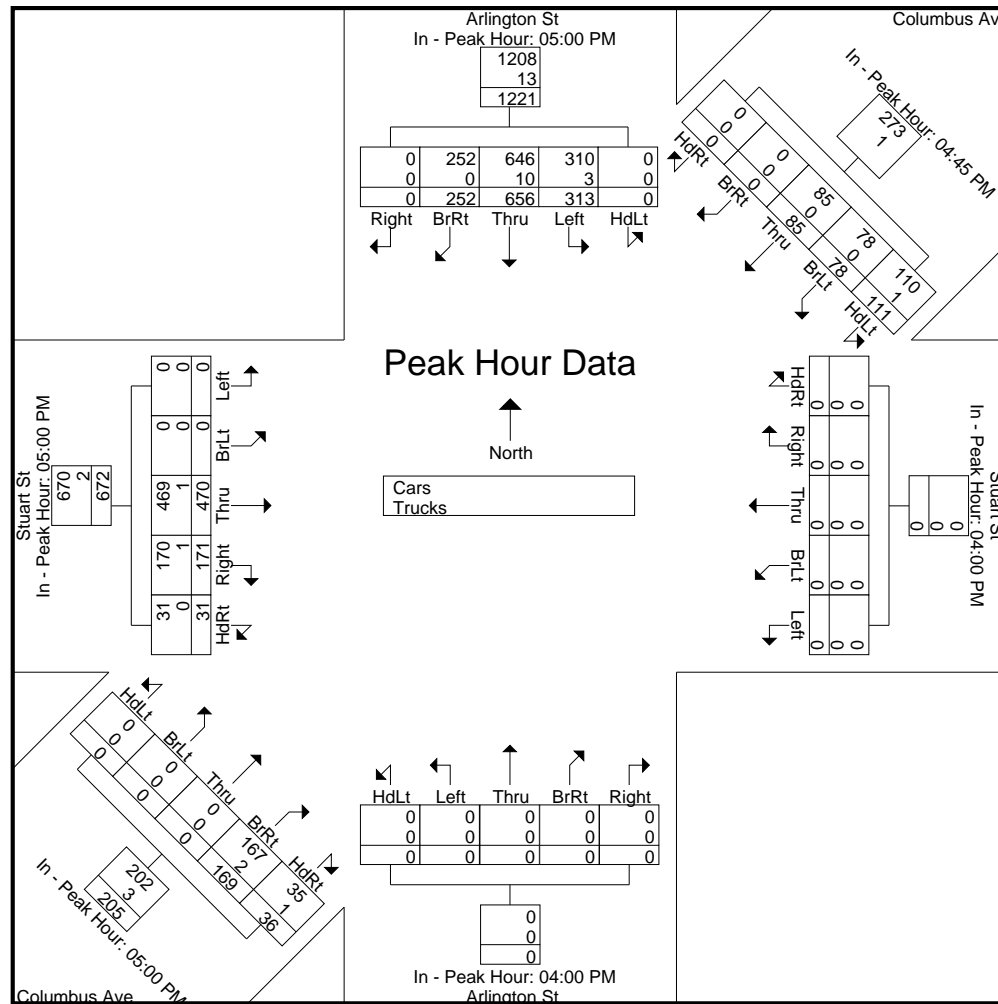
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM	04:45 PM	04:00 PM	04:00 PM	05:00 PM	05:00 PM
+0 mins.	0 74 173 57 0 304	26 19 26 0 0 71	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 42 6 48	0 0 103 50 8 161
+15 mins.	0 63 162 69 0 294	25 23 15 0 0 63	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 32 7 39	0 0 116 41 11 168
+30 mins.	0 86 156 62 0 304	30 19 20 0 0 69	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 48 10 58	0 0 124 37 4 165

978-664-2565

+45 mins.	0	90	165	64	0	319	30	17	24	0	0	71	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0</
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Accurate Counts
978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 5

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

Groups Printed- Cars

	Arlington St From North					Columbus Ave From Northeast					Stuart St From East					Arlington St From South					Columbus Ave From Southwest					Stuart St From West					
Start Time	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	Int. Total
04:00 PM	0	52	157	49	0	8	15	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	5	0	0	106	50	3	488	
04:15 PM	0	75	185	56	0	14	16	17	0	0	0	0	0	0	0	0	0	0	0	0	0	13	4	0	0	102	43	13	538		
04:30 PM	0	91	137	53	0	9	13	27	0	0	0	0	0	0	0	0	0	0	0	0	0	34	19	0	0	103	36	6	528		
04:45 PM	0	97	142	57	0	25	19	26	0	0	0	0	0	0	0	0	0	0	0	0	0	33	11	0	0	93	29	4	536		
Total	0	315	621	215	0	56	63	98	0	0	0	0	0	0	0	0	0	0	0	0	0	95	39	0	0	404	158	26	2090		
05:00 PM	0	73	169	57	0	25	23	15	0	0	0	0	0	0	0	0	0	0	0	0	0	40	5	0	0	102	49	8	566		
05:15 PM	0	62	162	69	0	30	19	20	0	0	0	0	0	0	0	0	0	0	0	0	0	32	7	0	0	116	41	11	569		
05:30 PM	0	85	153	62	0	30	17	24	0	0	0	0	0	0	0	0	0	0	0	0	0	48	10	0	0	124	37	4	594		
05:45 PM	0	90	162	64	0	20	14	24	0	0	0	0	0	0	0	0	0	0	0	0	0	47	13	0	0	127	43	8	612		
Total	0	310	646	252	0	105	73	83	0	0	0	0	0	0	0	0	0	0	0	0	0	167	35	0	0	469	170	31	2341		
Grand Total	0	625	1267	467	0	161	136	181	0	0	0	0	0	0	0	0	0	0	0	0	0	262	74	0	0	873	328	57	4431		
Apprch %	0	26.5	53.7	19.8	0	33.7	28.5	37.9	0	0	0	0	0	0	0	0	0	0	0	0	0	78	22	0	0	69.4	26.1	4.5			
Total %	0	14.1	28.6	10.5	0	3.6	3.1	4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9	1.7	0	0	19.7	7.4	1.3			

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 6

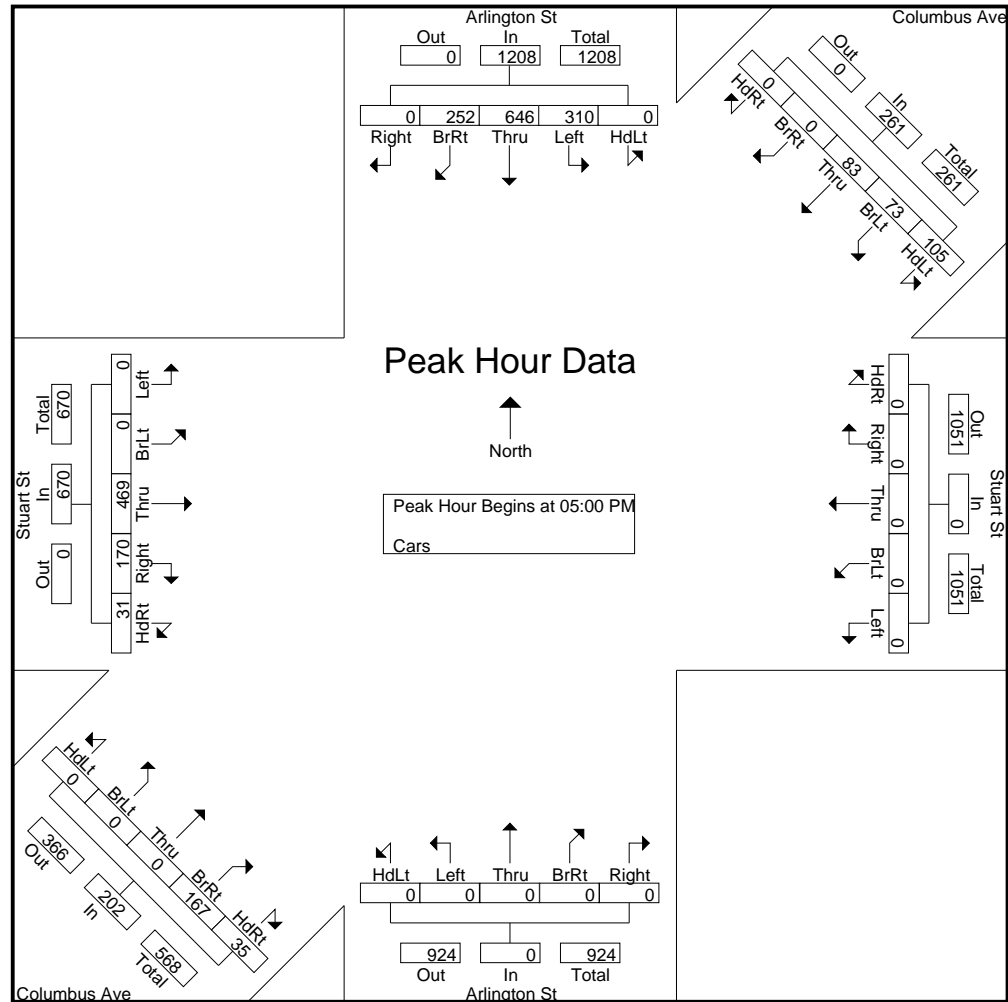
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	73	169	57	0	299	25	23	15	0	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	5	45	0	0	102	49	8	159	566	
05:15 PM	0	62	162	69	0	293	30	19	20	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	7	39	0	0	116	41	11	168	569	
05:30 PM	0	85	153	62	0	300	30	17	24	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	10	58	0	0	124	37	4	165	594	
05:45 PM	0	90	162	64	0	316	20	14	24	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	13	60	0	0	127	43	8	178	612	
Total Volume	0	310	646	252	0	1208	105	73	83	0	0	261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	35	202	0	0	469	170	31	670	2341	
% App. Total	0	25.7	53.5	20.9	0		40.2	28	31.8	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	82.7	17.3		0	0	70	25.4	4.6			
PHF	.000	.861	.956	.913	.000	.956	.875	.793	.865	.000	.000	.919	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.870	.673	.842	.000	.000	.923	.867	.705	.941	.956	

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 7

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



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

Peak Hour for Each Approach Begins at:

	05:00 PM						04:45 PM						04:00 PM						04:00 PM						05:00 PM						05:00 PM					
+0 mins.	0	73	169	57	0	299	25	19	26	0	0	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	5	45	0	0	102	49	8	159
+15 mins.	0	62	162	69	0	293	25	23	15	0	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	7	39	0	0	116	41	11	168
+30 mins.	0	85	153	62	0	300	30	19	20	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	10	58	0	0	124	37	4	165

978-664-2565

Peak Hour Data

North

Cars

Arlington St In - Peak Hour: 05:00 PM

0	252	646	310	0
Right	BrRt	Thru	Left	HdLt

Columbus Ave In - Peak Hour: 04:45 PM

0	0	85	78	110
HdRt	BrRt	Thru	BrLt	HdLt

Columbus Ave Out - Peak Hour: 05:00 PM

0	0	0	0	0
HdLt	BrLt	Thru	BrRt	HdRt

Arlington St Out - Peak Hour: 04:00 PM

0	0	0	0	0
HdLt	Left	Thru	BrRt	Right

Stuart St In - Peak Hour: 05:00 PM

31	170	469	0
HdRt	Right	Thru	Left

Stuart St Out - Peak Hour: 04:00 PM

0	0	0	0
HdRt	Right	Thru	Left

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Arlington St From North					Columbus Ave From Northeast					Stuart St From East					Arlington St From South					Columbus Ave From Southwest					Stuart St From West					
Start Time	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	HdLt	Left	Thru	BrRt	Right	HdLt	BrLt	Thru	BrRt	HdRt	Left	BrLt	Thru	Right	HdRt	Int. Total
04:00 PM	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	7
04:15 PM	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6
04:30 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	6
04:45 PM	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	9
Total	0	5	7	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	0	0	3	2	0	28
05:00 PM	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	10
05:15 PM	0	1	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	1
05:30 PM	0	1	3	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	4
05:45 PM	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	3	10	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	20
Grand Total	0	8	17	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	0	0	4	3	0	48
Apprch %	0	30.8	65.4	3.8	0	75	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72.7	27.3	0	0	57.1	42.9	0	
Total %	0	16.7	35.4	2.1	0	6.2	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.7	6.2	0	0	8.3	6.2	0	

Accurate Counts
978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 10

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

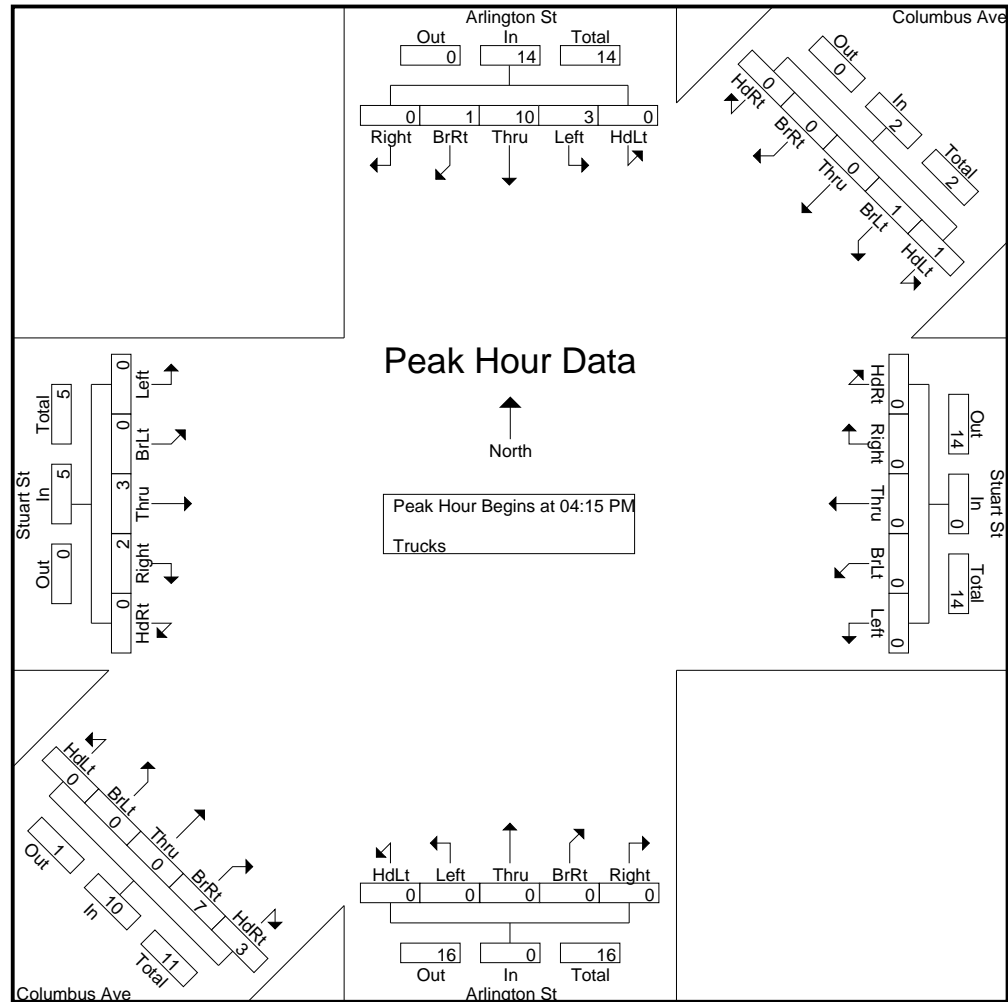
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	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	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	6		
04:30 PM	0	0	3	0	0	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	6			
04:45 PM	0	1	2	0	0	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	2	1	0	3	9	
05:00 PM	0	1	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	1	1	0	2	10		
Total Volume	0	3	10	1	0	14	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3	10	0	0	3	2	0	5	31		
% App. Total	0	21.4	71.4	7.1	0		50	50	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	70	30		0	0	60	40	0			
PHF	.000	.750	.625	.250	.000	.700	.250	.250	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.583	.375	.833	.000	.000	.375	.500	.000	.417	.775		

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 11

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



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	04:00 PM	04:00 PM	04:00 PM	04:00 PM
+0 mins.	0 1 1 1 0 3	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 3 0 3	0 0 1 1 0 2
+15 mins.	0 0 3 0 0 3	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 2 0 2	0 0 0 0 0 0
+30 mins.	0 1 2 0 0 3	0 1 0 0 0 1	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 2 2	0 0 0 0 0 0

978-664-2565

Peak Hour Data

North

Trucks

Approach 1: Northbound (Arlington St)
 In - Peak Hour: 04:15 PM
 14
 0 Right, 1 BrRt, 10 Thru, 3 Left, 0 HdLt

Approach 2: Southbound (Arlington St)
 In - Peak Hour: 04:00 PM
 2
 0 HdLt, 1 BrLt, 0 Thru, 0 BrRt, 0 HdRt

Approach 3: Eastbound (Columbus Ave)
 In - Peak Hour: 04:15 PM
 10
 0 HdLt, 0 BrLt, 0 Thru, 7 BrRt, 3 HdRt

Approach 4: Westbound (Stuart St)
 In - Peak Hour: 04:00 PM
 5
 0 HdRt, 0 Right, 2 Thru, 3 BrLt, 0 Left

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 13

Groups Printed- Bikes Peds

	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West						Exclu. Total	Inclu. Total	Int. Total
Start Time	HdLt	Left	Thru	BrRt	Right	Peds	HdLt	BrLt	Thru	BrRt	HdRt	Peds	Left	BrLt	Thru	Right	HdRt	Peds	HdLt	Left	Thru	BrRt	Right	Peds	HdLt	BrLt	Thru	BrRt	HdRt	Peds	Left	BrLt	Thru	Right	HdRt	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	1	0	0	64	0	0	0	0	0	37	0	0	0	0	0	32	0	0	0	0	0	20	0	0	0	2	0	34	0	0	0	0	0	36	223	3	226
04:15 PM	0	0	1	0	0	60	0	0	4	0	0	43	0	0	0	0	0	42	0	0	0	0	0	40	0	0	0	0	2	47	0	0	0	0	0	43	275	7	282
04:30 PM	0	0	3	0	0	56	0	0	3	0	0	47	0	0	0	0	0	34	0	0	0	0	0	58	0	0	0	1	0	42	0	0	2	1	0	16	253	10	263
04:45 PM	0	0	2	0	0	80	0	0	6	0	0	59	0	0	0	0	0	48	0	0	0	0	0	47	0	0	0	2	1	35	0	0	2	0	0	19	288	13	301
Total	0	0	7	0	0	260	0	0	13	0	0	186	0	0	0	0	0	156	0	0	0	0	0	165	0	0	0	5	3	158	0	0	4	1	0	114	1039	33	1072
05:00 PM	0	0	2	1	0	88	0	0	8	0	0	77	0	0	0	0	0	61	0	0	0	0	0	43	0	0	0	5	0	33	0	0	0	0	0	16	318	16	334
05:15 PM	0	0	1	0	0	98	0	0	7	0	0	61	0	0	0	0	0	52	0	0	0	0	0	50	0	0	0	2	0	36	0	0	0	1	0	19	316	11	327
05:30 PM	0	0	1	0	0	97	0	1	3	0	0	70	0	0	0	0	0	55	0	0	0	0	0	54	0	0	0	0	0	40	0	0	1	0	0	20	336	6	342
05:45 PM	0	1	1	0	0	72	0	0	9	0	0	68	0	0	0	0	0	58	0	0	0	0	0	61	0	0	0	1	0	29	0	0	0	0	0	17	305	12	317
Total	0	1	5	1	0	355	0	1	27	0	0	276	0	0	0	0	0	226	0	0	0	0	0	208	0	0	0	8	0	138	0	0	1	1	0	72	1275	45	1320
Grand Total	0	1	12	1	0	615	0	1	40	0	0	462	0	0	0	0	0	382	0	0	0	0	0	373	0	0	0	13	3	296	0	0	5	2	0	186	2314	78	2392
Apprch %	0	7.1	85.7	7.1	0		0	2.4	97.6	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	81.2	18.8		0	0	71.4	28.6	0				
Total %	0	1.3	15.4	1.3	0		0	1.3	51.3	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	16.7	3.8		0	0	6.4	2.6	0				

Accurate Counts
978-664-2565

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 14

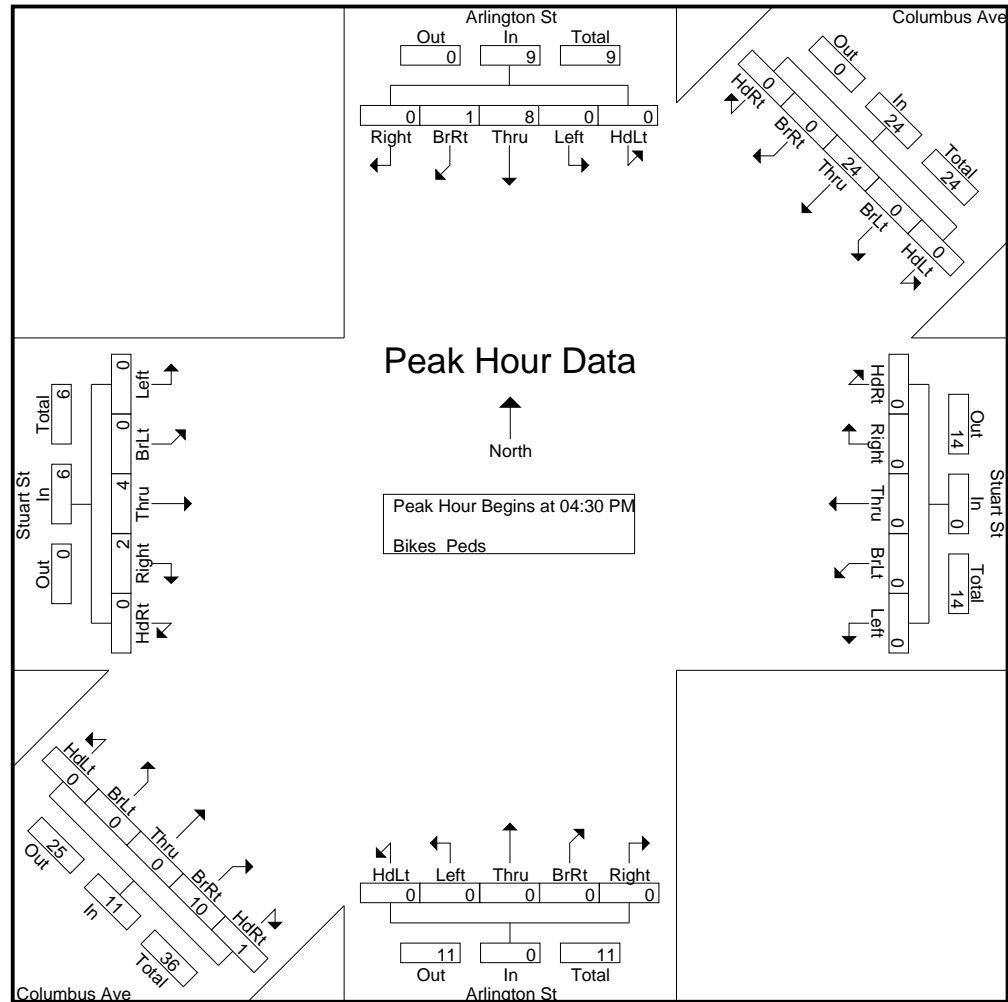
	Arlington St From North						Columbus Ave From Northeast						Stuart St From East						Arlington St From South						Columbus Ave From Southwest						Stuart St From West							
Start Time	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	HdLt	Left	Thru	BrRt	Right	App. Total	HdLt	BrLt	Thru	BrRt	HdRt	App. Total	Left	BrLt	Thru	Right	HdRt	App. Total	Int. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																																						
Peak Hour for Entire Intersection Begins at 04:30 PM																																						
04:30 PM	0	0	3	0	0	3	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	1	0	3	10	
04:45 PM	0	0	2	0	0	2	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	2	0	0	2	13	
05:00 PM	0	0	2	1	0	3	0	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	16	
05:15 PM	0	0	1	0	0	1	0	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	1	0	1	11		
Total Volume	0	0	8	1	0	9	0	0	24	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	11	0	0	4	2	0	6	50	
% App. Total	0	0	88.9	11.1	0		0	0	100	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	90.9	9.1		0	0	66.7	33.3	0			
PHF	.000	.000	.667	.250	.000	.750	.000	.000	.750	.000	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.250	.550	.000	.000	.500	.500	.000	.500	.781		

Accurate Counts

978-664-2565

File Name : 17034005
Site Code : 17034005
Start Date : 11/28/2017
Page No : 15

N/S Street : Arlington St / Stuart St
E/W Street : Columbus Avenue
City/State : Boston, MA
Weather : Clear



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	05:00 PM	04:00 PM	04:00 PM	04:15 PM	04:30 PM
+0 mins.	0 0 1 0 0 1	0 0 8 0 0 8	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 2 2	0 0 2 1 0 3
+15 mins.	0 0 3 0 0 3	0 0 7 0 0 7	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 1 0 1	0 0 2 0 0 2
+30 mins.	0 0 2 0 0 2	0 1 3 0 0 4	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 2 1 3	0 0 0 0 0 0

978-664-2565

Peak Hour Data

North

Bikes Peds

Arlington St
In - Peak Hour: 04:15 PM

0	1	8	0	0
Right	BrRt	Thru	Left	HdLt

Columbus Ave
In - Peak Hour: 05:00 PM

0	0	28	1	0
HdRt	BrRt	Thru	BrLt	HdLt

Stuart St
In - Peak Hour: 04:00 PM

0	0	0	0	0
HdRt	Right	Thru	BrLt	Left

Columbus Ave
In - Peak Hour: 04:15 PM

0	0	0	8	3
HdLt	BrLt	Thru	BrRt	HdRt

Arlington St
In - Peak Hour: 04:00 PM

0	0	0	0	0
HdLt	Left	Thru	BrRt	Right

Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

	Charles St From North			Stuart St From East			Charles St From South			Stuart St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	157	0	55	14	44	72	0	342
07:15 AM	0	0	0	0	0	166	0	62	13	62	75	0	378
07:30 AM	0	0	0	0	0	149	0	80	10	52	83	0	374
07:45 AM	0	0	0	0	0	160	0	94	13	64	89	0	420
Total	0	0	0	0	0	632	0	291	50	222	319	0	1514
08:00 AM	0	0	0	0	0	138	0	115	15	73	77	0	418
08:15 AM	0	0	0	0	0	133	0	120	15	65	106	0	439
08:30 AM	0	0	0	0	0	149	0	94	24	45	96	0	408
08:45 AM	0	0	0	0	0	145	0	107	21	44	78	0	395
Total	0	0	0	0	0	565	0	436	75	227	357	0	1660
Grand Total	0	0	0	0	0	1197	0	727	125	449	676	0	3174
Apprch %	0	0	0	0	0	100	0	85.3	14.7	39.9	60.1	0	
Total %	0	0	0	0	0	37.7	0	22.9	3.9	14.1	21.3	0	
Cars	0	0	0	0	0	1156	0	710	123	443	665	0	3097
% Cars	0	0	0	0	0	96.6	0	97.7	98.4	98.7	98.4	0	97.6
Trucks	0	0	0	0	0	41	0	17	2	6	11	0	77
% Trucks	0	0	0	0	0	3.4	0	2.3	1.6	1.3	1.6	0	2.4

Accurate Counts

978-664-2565

N/S Street : Charles Street
 E/W Street: Stuart Street
 City/State : Boston, MA
 Weather : Clear

File Name : 17034006
 Site Code : 17034006
 Start Date : 11/28/2017
 Page No : 2

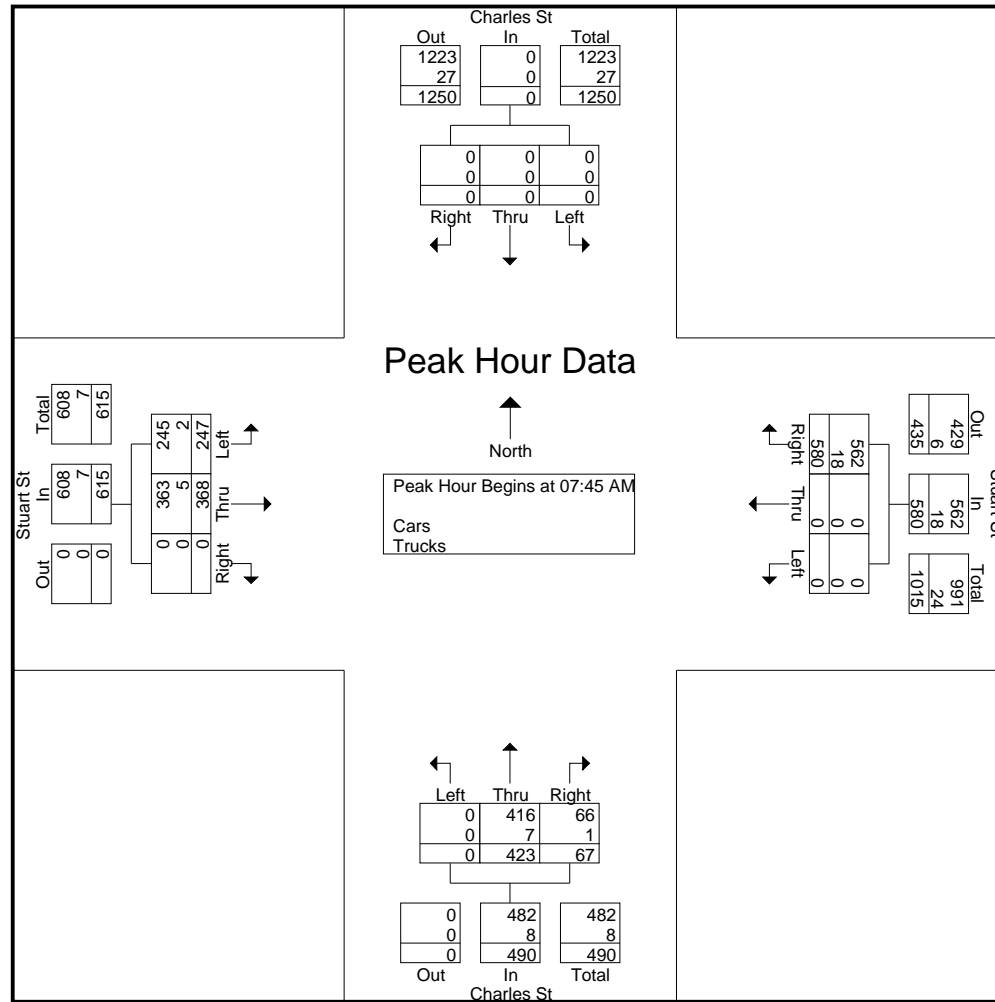
	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	160	160	0	94	13	107	64	89	0	153	420
08:00 AM	0	0	0	0	0	0	138	138	0	115	15	130	73	77	0	150	418
08:15 AM	0	0	0	0	0	0	133	133	0	120	15	135	65	106	0	171	439
08:30 AM	0	0	0	0	0	0	149	149	0	94	24	118	45	96	0	141	408
Total Volume	0	0	0	0	0	0	580	580	0	423	67	490	247	368	0	615	1685
% App. Total	0	0	0		0	0	100		0	86.3	13.7		40.2	59.8	0		
PHF	.000	.000	.000	.000	.000	.000	.906	.906	.000	.881	.698	.907	.846	.868	.000	.899	.960
Cars	0	0	0	0	0	0	562	562	0	416	66	482	245	363	0	608	1652
% Cars	0	0	0	0	0	0	96.9	96.9	0	98.3	98.5	98.4	99.2	98.6	0	98.9	98.0
Trucks	0	0	0	0	0	0	18	18	0	7	1	8	2	5	0	7	33
% Trucks	0	0	0	0	0	0	3.1	3.1	0	1.7	1.5	1.6	0.8	1.4	0	1.1	2.0

Accurate Counts

978-664-2565

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 3

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear



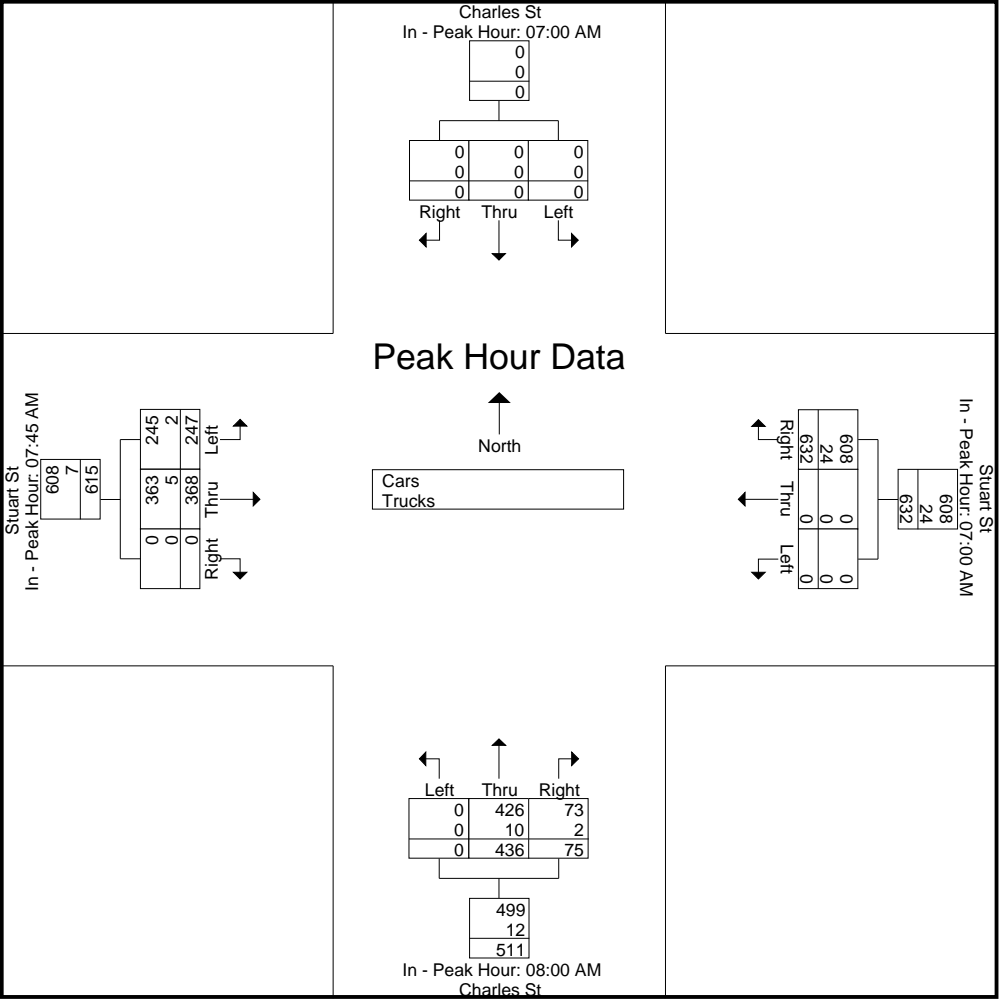
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	157	157	0	115	15	130	64	89	0	153
+15 mins.	0	0	0	0	0	0	166	166	0	120	15	135	73	77	0	150
+30 mins.	0	0	0	0	0	0	149	149	0	94	24	118	65	106	0	171
+45 mins.	0	0	0	0	0	0	160	160	0	107	21	128	45	96	0	141
Total Volume	0	0	0	0	0	0	632	632	0	436	75	511	247	368	0	615
% App. Total	0	0	0	0	0	0	100		0	85.3	14.7		40.2	59.8	0	

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.952	.952	.000	.908	.781	.946	.846	.868	.000	.899
Cars	0	0	0	0	0	0	608	608	0	426	73	499	245	363	0	608
% Cars	0	0	0	0	0	0	96.2	96.2	0	97.7	97.3	97.7	99.2	98.6	0	98.9
Trucks	0	0	0	0	0	0	24	24	0	10	2	12	2	5	0	7
% Trucks	0	0	0	0	0	0	3.8	3.8	0	2.3	2.7	2.3	0.8	1.4	0	1.1



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 5

Groups Printed- Cars

	Charles St From North			Stuart St From East			Charles St From South			Stuart St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	152	0	54	14	41	72	0	333
07:15 AM	0	0	0	0	0	160	0	59	13	62	73	0	367
07:30 AM	0	0	0	0	0	142	0	79	10	51	82	0	364
07:45 AM	0	0	0	0	0	154	0	92	13	64	87	0	410
Total	0	0	0	0	0	608	0	284	50	218	314	0	1474
08:00 AM	0	0	0	0	0	135	0	113	15	72	77	0	412
08:15 AM	0	0	0	0	0	129	0	119	15	65	105	0	433
08:30 AM	0	0	0	0	0	144	0	92	23	44	94	0	397
08:45 AM	0	0	0	0	0	140	0	102	20	44	75	0	381
Total	0	0	0	0	0	548	0	426	73	225	351	0	1623
Grand Total	0	0	0	0	0	1156	0	710	123	443	665	0	3097
Apprch %	0	0	0	0	0	100	0	85.2	14.8	40	60	0	
Total %	0	0	0	0	0	37.3	0	22.9	4	14.3	21.5	0	

Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 6

	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	154	154	0	92	13	105	64	87	0	151	410
08:00 AM	0	0	0	0	0	0	135	135	0	113	15	128	72	77	0	149	412
08:15 AM	0	0	0	0	0	0	129	129	0	119	15	134	65	105	0	170	433
08:30 AM	0	0	0	0	0	0	144	144	0	92	23	115	44	94	0	138	397
Total Volume	0	0	0	0	0	0	562	562	0	416	66	482	245	363	0	608	1652
% App. Total	0	0	0		0	0	100		0	86.3	13.7		40.3	59.7	0		
PHF	.000	.000	.000	.000	.000	.000	.912	.912	.000	.874	.717	.899	.851	.864	.000	.894	.954

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

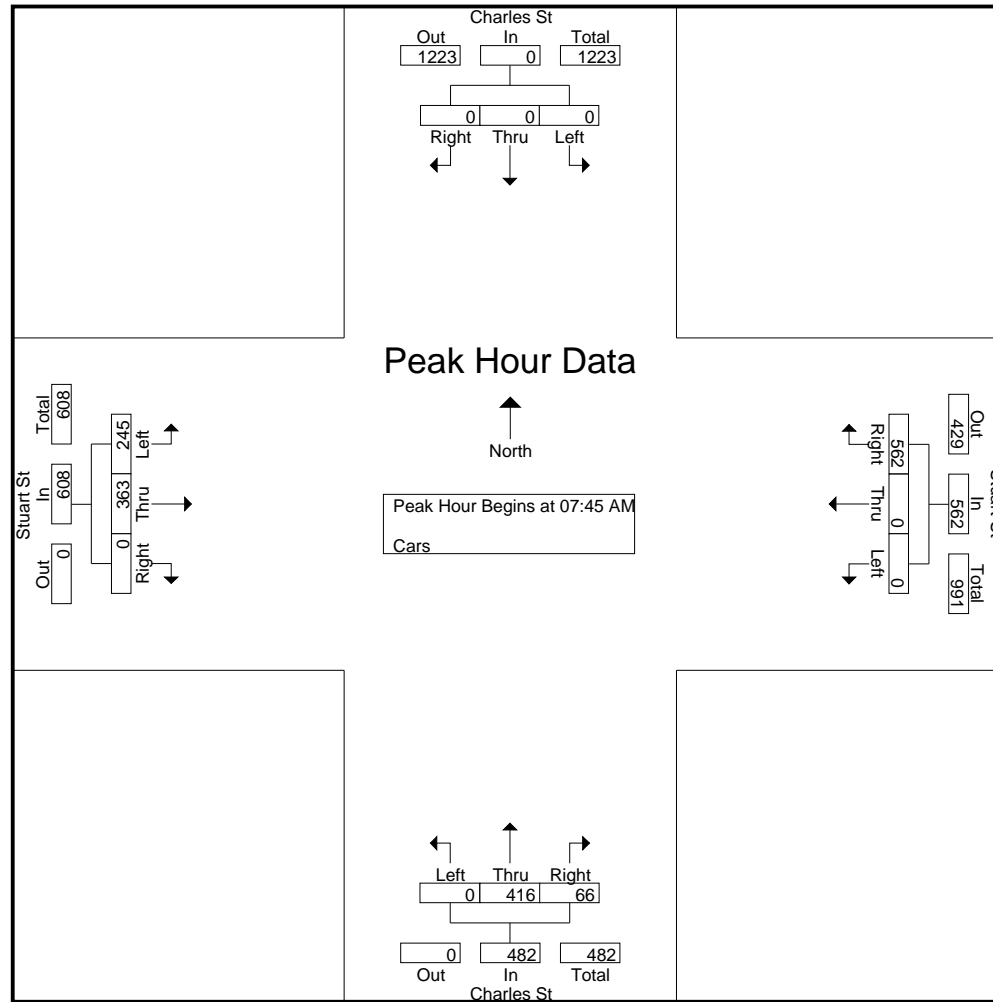
Page No : 7

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

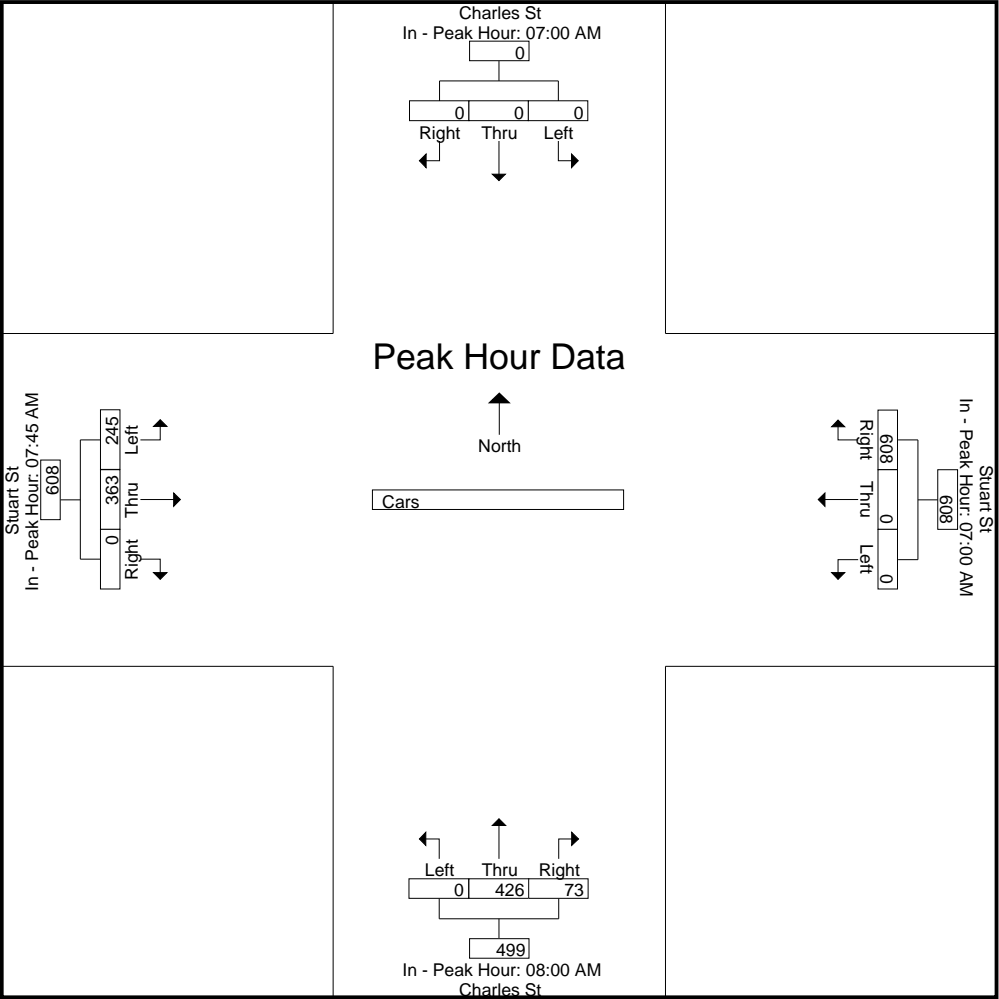


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	152	152	0	113	15	128	64	87	0	151
+15 mins.	0	0	0	0	0	0	160	160	0	119	15	134	72	77	0	149
+30 mins.	0	0	0	0	0	0	142	142	0	92	23	115	65	105	0	170
+45 mins.	0	0	0	0	0	0	154	154	0	102	20	122	44	94	0	138
Total Volume	0	0	0	0	0	0	608	608	0	426	73	499	245	363	0	608
% App. Total	0	0	0		0	0	100		0	85.4	14.6		40.3	59.7	0	

PHF	.000	.000	.000	.000	.000	.000	.950	.950	.000	.895	.793	.931	.851	.864	.000	.894
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Charles St From North			Stuart St From East			Charles St From South			Stuart St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	5	0	1	0	3	0	0	9
07:15 AM	0	0	0	0	0	6	0	3	0	0	2	0	11
07:30 AM	0	0	0	0	0	7	0	1	0	1	1	0	10
07:45 AM	0	0	0	0	0	6	0	2	0	0	2	0	10
Total	0	0	0	0	0	24	0	7	0	4	5	0	40
08:00 AM	0	0	0	0	0	3	0	2	0	1	0	0	6
08:15 AM	0	0	0	0	0	4	0	1	0	0	1	0	6
08:30 AM	0	0	0	0	0	5	0	2	1	1	2	0	11
08:45 AM	0	0	0	0	0	5	0	5	1	0	3	0	14
Total	0	0	0	0	0	17	0	10	2	2	6	0	37
Grand Total	0	0	0	0	0	41	0	17	2	6	11	0	77
Apprch %	0	0	0	0	0	100	0	89.5	10.5	35.3	64.7	0	
Total %	0	0	0	0	0	53.2	0	22.1	2.6	7.8	14.3	0	

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

Page No : 10

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	5	5	0	1	0	1	3	0	0	3	9
07:15 AM	0	0	0	0	0	0	6	6	0	3	0	3	0	2	0	2	11
07:30 AM	0	0	0	0	0	0	7	7	0	1	0	1	1	1	0	2	10
07:45 AM	0	0	0	0	0	0	6	6	0	2	0	2	0	2	0	2	10
Total Volume	0	0	0	0	0	0	24	24	0	7	0	7	4	5	0	9	40
% App. Total	0	0	0		0	0	100		0	100	0		44.4	55.6	0		
PHF	.000	.000	.000	.000	.000	.000	.857	.857	.000	.583	.000	.583	.333	.625	.000	.750	.909

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

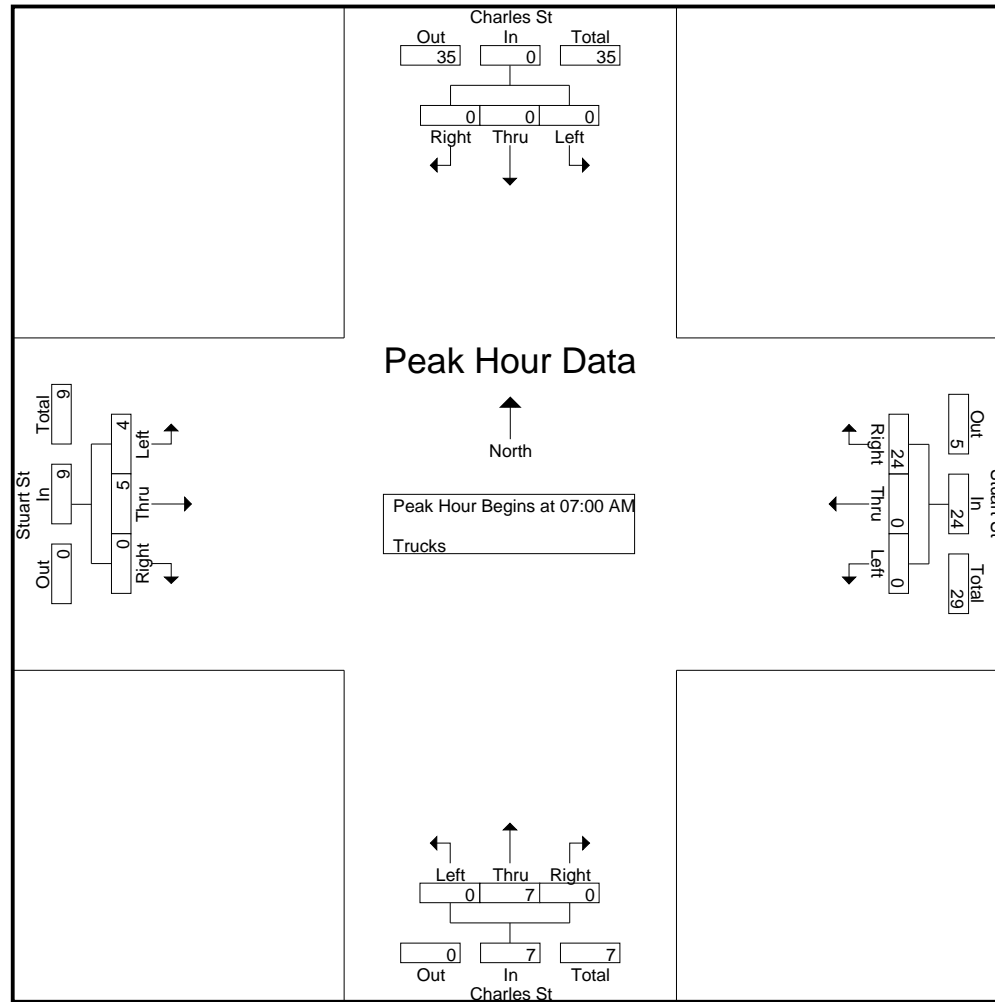
Page No : 11

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear



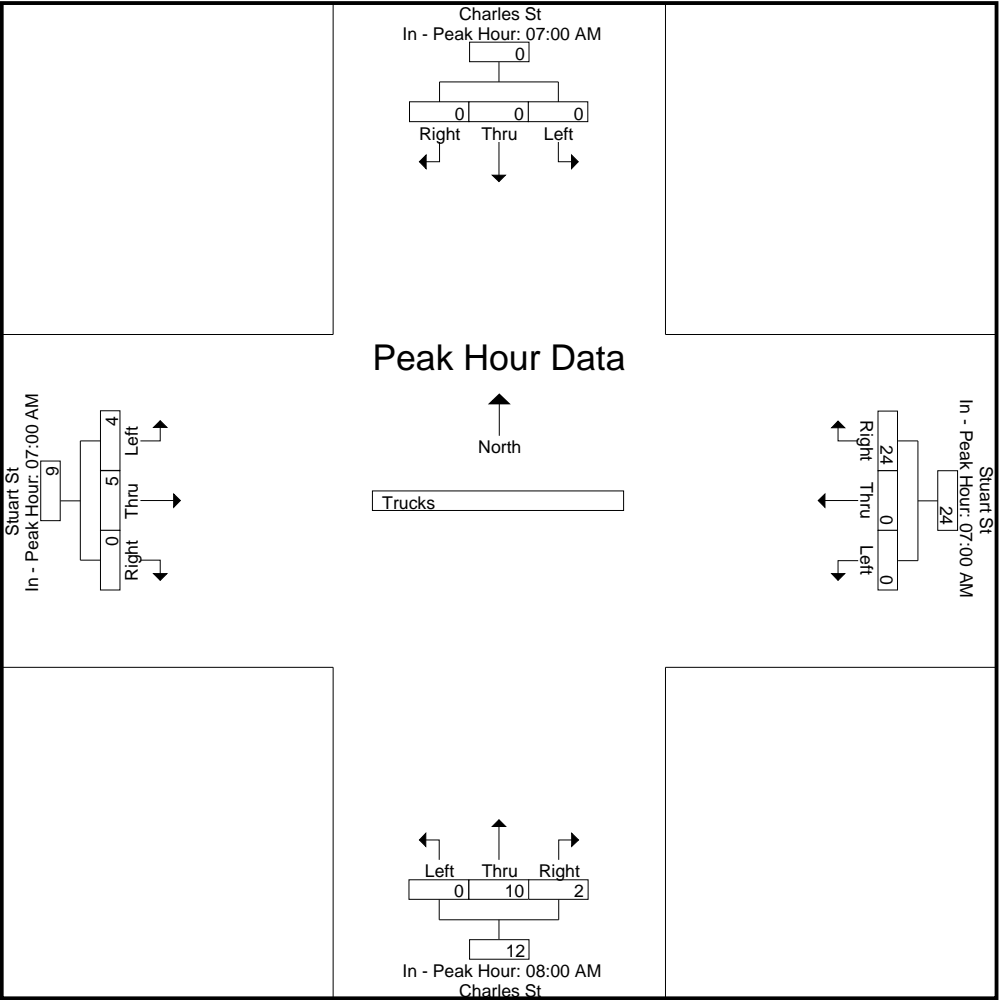
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	5	5	0	2	0	2	3	0	0	3
+15 mins.	0	0	0	0	0	0	6	6	0	1	0	1	0	2	0	2
+30 mins.	0	0	0	0	0	0	7	7	0	2	1	3	1	1	0	2
+45 mins.	0	0	0	0	0	0	6	6	0	5	1	6	0	2	0	2
Total Volume	0	0	0	0	0	0	24	24	0	10	2	12	4	5	0	9
% App. Total	0	0	0		0	0	100		0	83.3	16.7		44.4	55.6	0	

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.857	.857	.000	.500	.500	.500	.333	.625	.000	.750
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

Page No : 13

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Bikes Peds

	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	10	0	0	0	32	0	1	0	50	1	3	0	10	102	5	107
07:15 AM	0	0	0	29	0	0	1	32	0	1	0	53	2	3	0	27	141	7	148
07:30 AM	0	0	0	51	0	1	0	13	0	0	0	49	2	3	0	13	126	6	132
07:45 AM	0	0	0	41	0	0	1	31	0	3	1	60	1	6	0	34	166	12	178
Total	0	0	0	131	0	1	2	108	0	5	1	212	6	15	0	84	535	30	565
08:00 AM	0	0	0	37	0	0	0	26	0	0	0	51	2	7	0	28	142	9	151
08:15 AM	0	0	0	27	0	0	1	26	0	6	0	62	1	9	0	20	135	17	152
08:30 AM	0	0	0	37	0	1	2	37	0	3	0	59	1	8	0	15	148	15	163
08:45 AM	0	0	0	45	0	1	1	48	0	4	0	63	1	12	0	15	171	19	190
Total	0	0	0	146	0	2	4	137	0	13	0	235	5	36	0	78	596	60	656
Grand Total	0	0	0	277	0	3	6	245	0	18	1	447	11	51	0	162	1131	90	1221
Apprch %	0	0	0		0	33.3	66.7		0	94.7	5.3		17.7	82.3	0				
Total %	0	0	0		0	3.3	6.7		0	20	1.1		12.2	56.7	0		92.6	7.4	

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

Page No : 14

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

	Charles St From North				Stuart St From East				Charles St From South				Stuart 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	2	7	0	9	9
08:15 AM	0	0	0	0	0	0	1	1	0	6	0	6	1	9	0	10	17
08:30 AM	0	0	0	0	0	1	2	3	0	3	0	3	1	8	0	9	15
08:45 AM	0	0	0	0	0	1	1	2	0	4	0	4	1	12	0	13	19
Total Volume	0	0	0	0	0	2	4	6	0	13	0	13	5	36	0	41	60
% App. Total	0	0	0		0	33.3	66.7		0	100	0		12.2	87.8	0		
PHF	.000	.000	.000	.000	.000	.500	.500	.500	.000	.542	.000	.542	.625	.750	.000	.788	.789

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

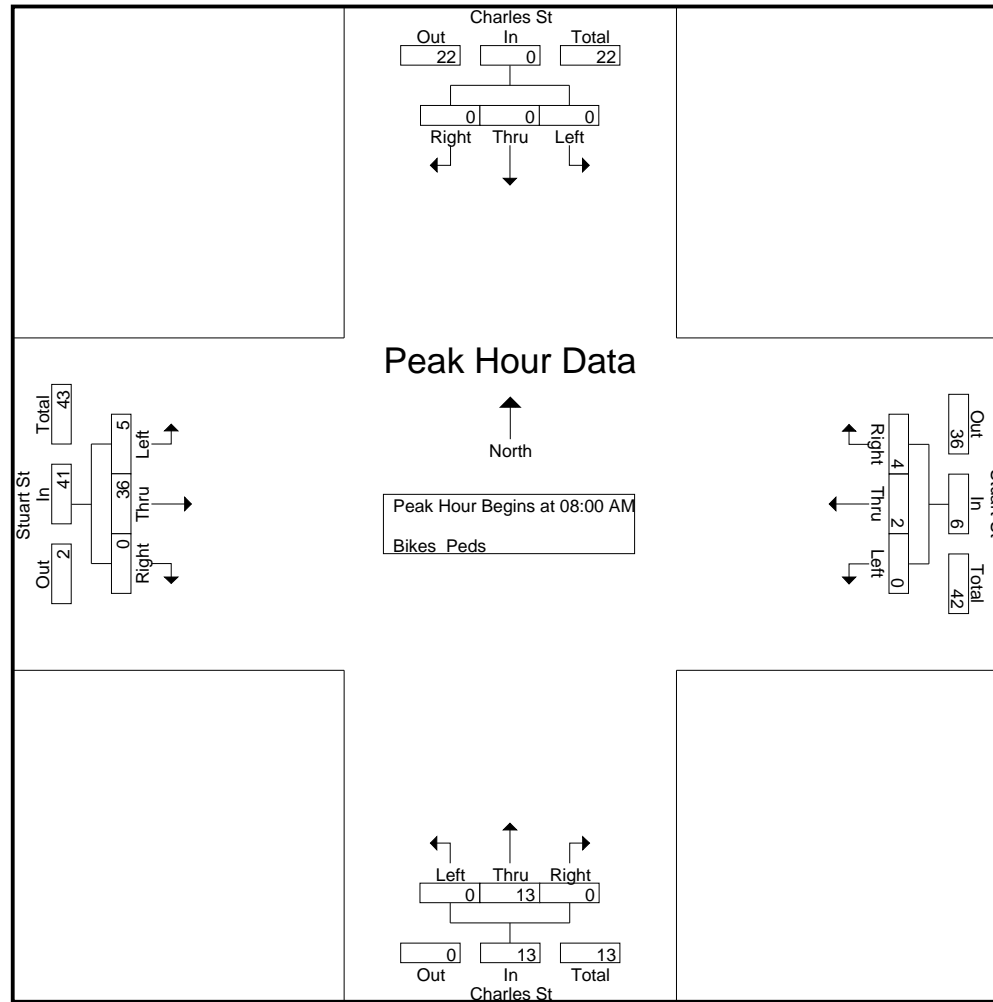
Page No : 15

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

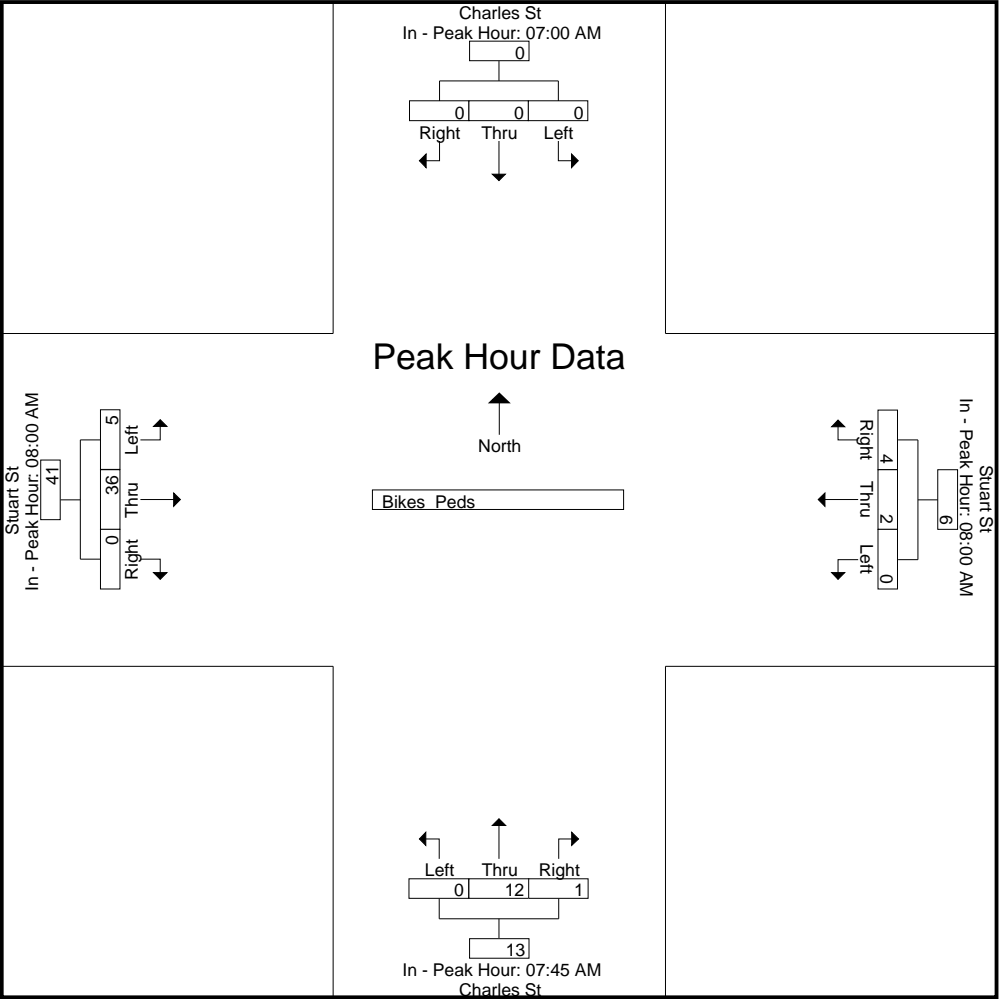


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:45 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	3	1	4	2	7	0	9
+15 mins.	0	0	0	0	0	0	1	1	0	0	0	0	1	9	0	10
+30 mins.	0	0	0	0	0	1	2	3	0	6	0	6	1	8	0	9
+45 mins.	0	0	0	0	0	1	1	2	0	3	0	3	1	12	0	13
Total Volume	0	0	0	0	0	2	4	6	0	12	1	13	5	36	0	41
% App. Total	0	0	0		0	33.3	66.7		0	92.3	7.7		12.2	87.8	0	

PHF	.000	.000	.000	.000	.000	.500	.500	.500	.000	.500	.250	.542	.625	.750	.000	.788
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 1

Groups Printed- Cars - Trucks

	Charles St From North			Stuart St From East			Charles St From South			Stuart 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	135	0	89	25	56	111	0	416
04:15 PM	0	0	0	0	0	137	0	131	23	74	118	0	483
04:30 PM	0	0	0	0	0	136	0	105	24	68	126	0	459
04:45 PM	0	0	0	0	0	136	0	103	34	70	147	0	490
Total	0	0	0	0	0	544	0	428	106	268	502	0	1848
05:00 PM	0	0	0	0	0	135	0	121	25	71	137	0	489
05:15 PM	0	0	0	0	0	166	0	114	25	79	144	0	528
05:30 PM	0	0	0	0	0	118	0	105	19	69	154	0	465
05:45 PM	0	0	0	0	0	144	0	118	21	76	156	0	515
Total	0	0	0	0	0	563	0	458	90	295	591	0	1997
Grand Total	0	0	0	0	0	1107	0	886	196	563	1093	0	3845
Apprch %	0	0	0	0	0	100	0	81.9	18.1	34	66	0	
Total %	0	0	0	0	0	28.8	0	23	5.1	14.6	28.4	0	
Cars	0	0	0	0	0	1078	0	869	195	557	1077	0	3776
% Cars	0	0	0	0	0	97.4	0	98.1	99.5	98.9	98.5	0	98.2
Trucks	0	0	0	0	0	29	0	17	1	6	16	0	69
% Trucks	0	0	0	0	0	2.6	0	1.9	0.5	1.1	1.5	0	1.8

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

Page No : 2

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

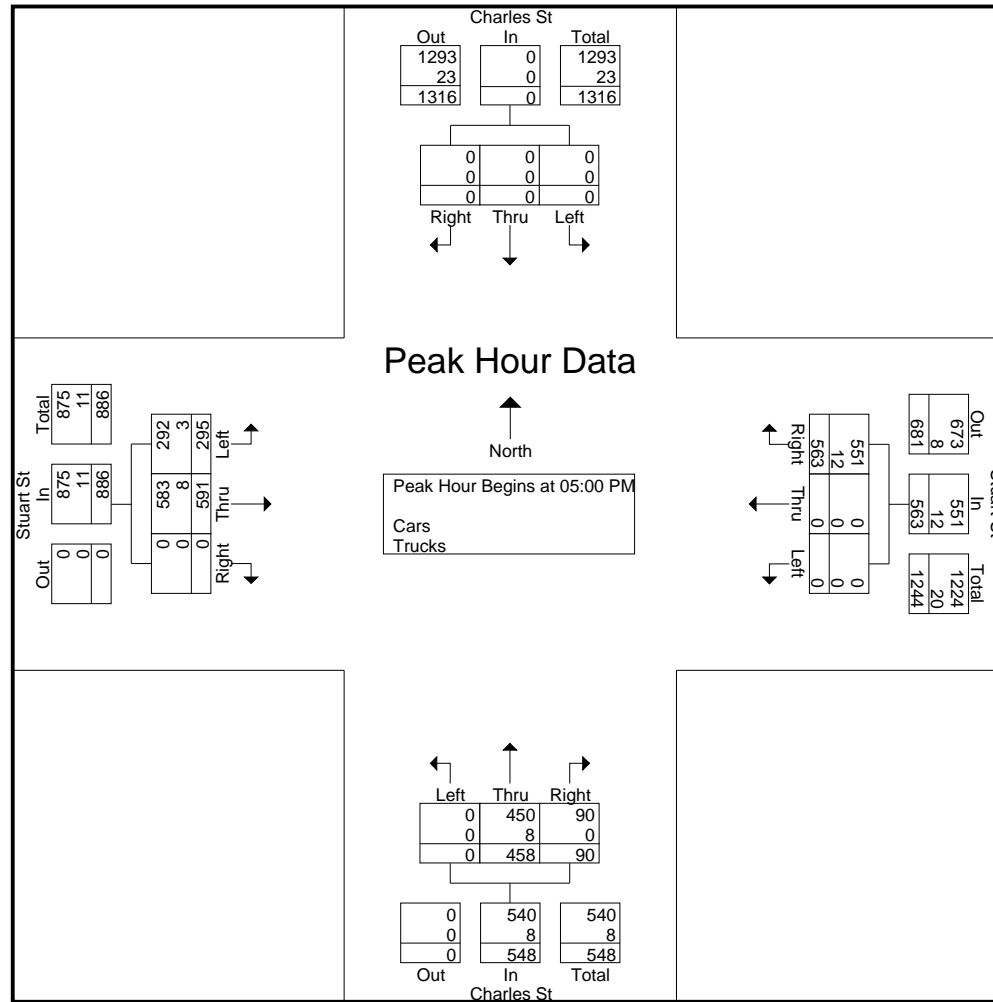
	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	135	135	0	121	25	146	71	137	0	208	489
05:15 PM	0	0	0	0	0	0	166	166	0	114	25	139	79	144	0	223	528
05:30 PM	0	0	0	0	0	0	118	118	0	105	19	124	69	154	0	223	465
05:45 PM	0	0	0	0	0	0	144	144	0	118	21	139	76	156	0	232	515
Total Volume	0	0	0	0	0	0	563	563	0	458	90	548	295	591	0	886	1997
% App. Total	0	0	0		0	0	100		0	83.6	16.4		33.3	66.7	0		
PHF	.000	.000	.000	.000	.000	.000	.848	.848	.000	.946	.900	.938	.934	.947	.000	.955	.946
Cars	0	0	0	0	0	0	551	551	0	450	90	540	292	583	0	875	1966
% Cars	0	0	0	0	0	0	97.9	97.9	0	98.3	100	98.5	99.0	98.6	0	98.8	98.4
Trucks	0	0	0	0	0	0	12	12	0	8	0	8	3	8	0	11	31
% Trucks	0	0	0	0	0	0	2.1	2.1	0	1.7	0	1.5	1.0	1.4	0	1.2	1.6

Accurate Counts

978-664-2565

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 3

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear



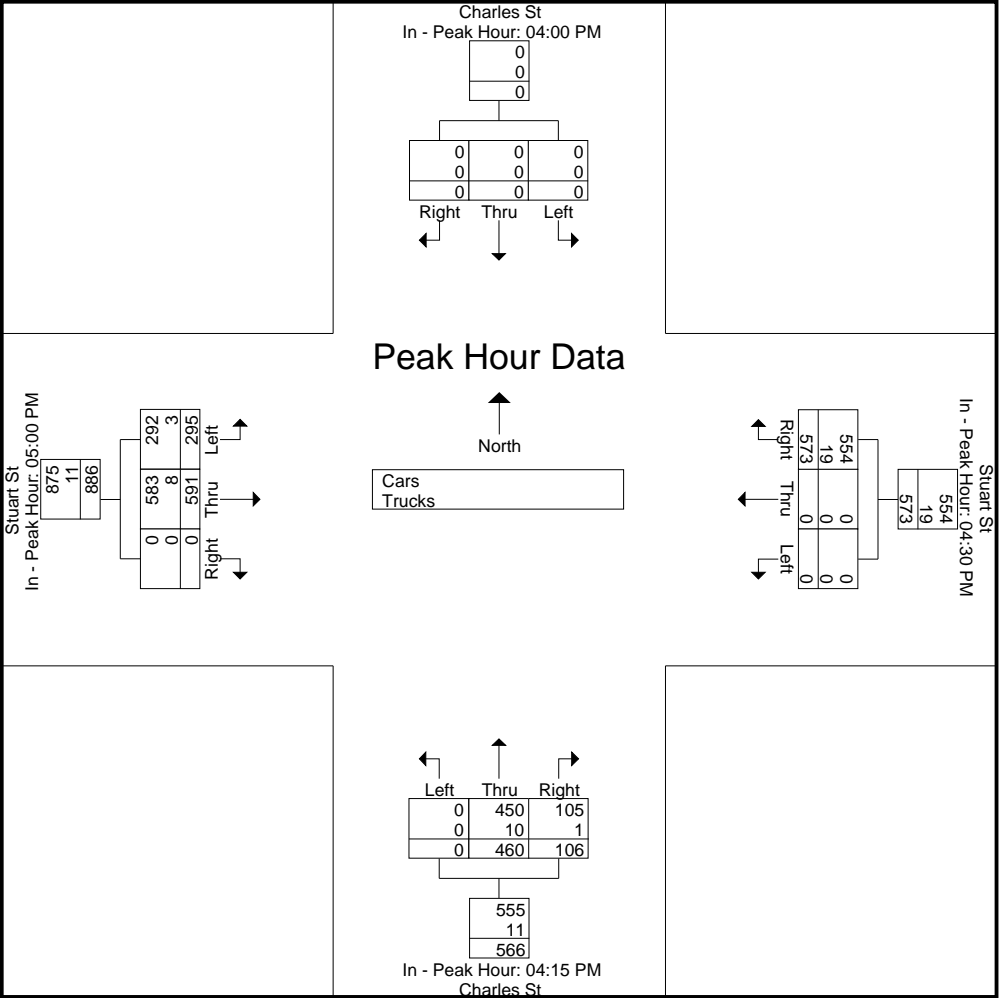
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:15 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	136	136	0	131	23	154	71	137	0	208
+15 mins.	0	0	0	0	0	0	136	136	0	105	24	129	79	144	0	223
+30 mins.	0	0	0	0	0	0	135	135	0	103	34	137	69	154	0	223
+45 mins.	0	0	0	0	0	0	166	166	0	121	25	146	76	156	0	232
Total Volume	0	0	0	0	0	0	573	573	0	460	106	566	295	591	0	886
% App. Total	0	0	0	0	0	0	100	100	0	81.3	18.7	100	33.3	66.7	0	100

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.863	.863	.000	.878	.779	.919	.934	.947	.000	.955
Cars	0	0	0	0	0	0	554	554	0	450	105	555	292	583	0	875
% Cars	0	0	0	0	0	0	96.7	96.7	0	97.8	99.1	98.1	99	98.6	0	98.8
Trucks	0	0	0	0	0	0	19	19	0	10	1	11	3	8	0	11
% Trucks	0	0	0	0	0	0	3.3	3.3	0	2.2	0.9	1.9	1	1.4	0	1.2



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 5

Groups Printed- Cars

	Charles St From North			Stuart St From East			Charles St From South			Stuart 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	134	0	87	25	55	109	0	410
04:15 PM	0	0	0	0	0	132	0	128	23	73	117	0	473
04:30 PM	0	0	0	0	0	131	0	103	23	67	124	0	448
04:45 PM	0	0	0	0	0	130	0	101	34	70	144	0	479
Total	0	0	0	0	0	527	0	419	105	265	494	0	1810
05:00 PM	0	0	0	0	0	131	0	118	25	69	134	0	477
05:15 PM	0	0	0	0	0	162	0	113	25	79	143	0	522
05:30 PM	0	0	0	0	0	117	0	103	19	68	153	0	460
05:45 PM	0	0	0	0	0	141	0	116	21	76	153	0	507
Total	0	0	0	0	0	551	0	450	90	292	583	0	1966
Grand Total	0	0	0	0	0	1078	0	869	195	557	1077	0	3776
Apprch %	0	0	0	0	0	100	0	81.7	18.3	34.1	65.9	0	
Total %	0	0	0	0	0	28.5	0	23	5.2	14.8	28.5	0	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 6

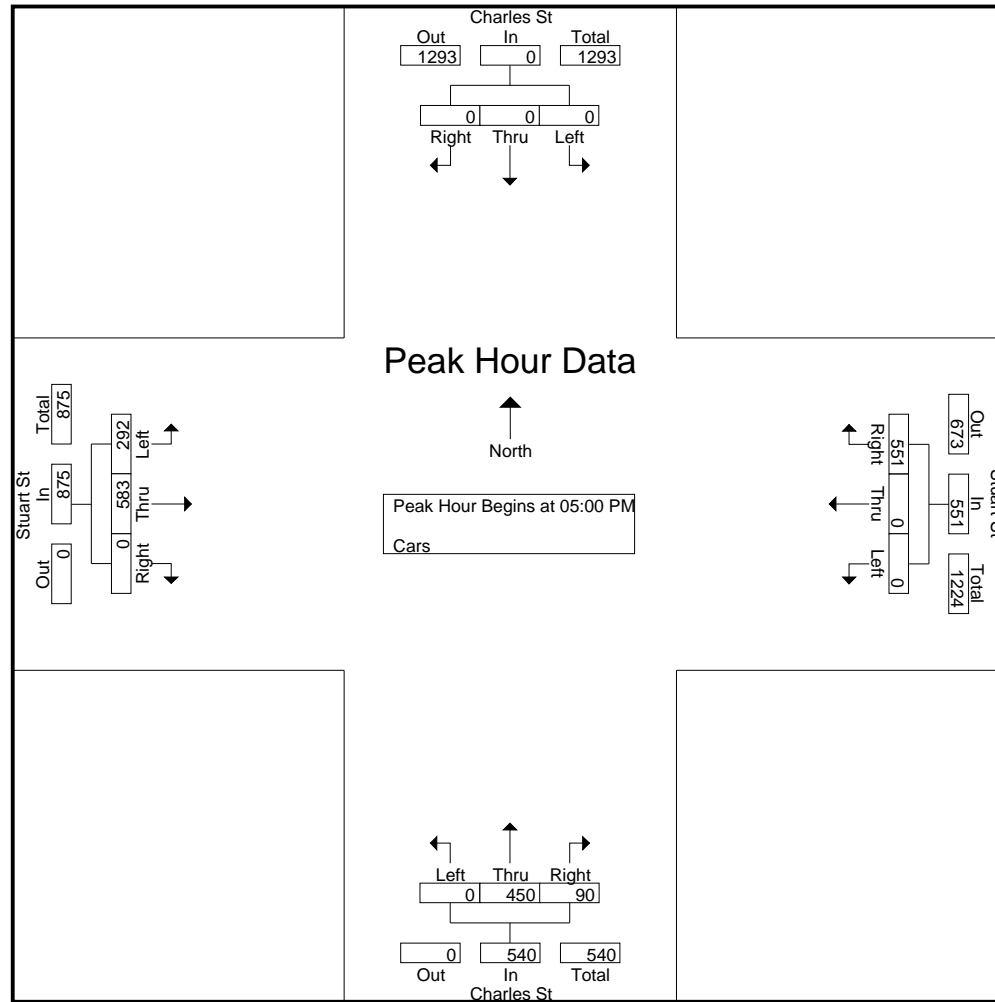
	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	131	131	0	118	25	143	69	134	0	203	477
05:15 PM	0	0	0	0	0	0	162	162	0	113	25	138	79	143	0	222	522
05:30 PM	0	0	0	0	0	0	117	117	0	103	19	122	68	153	0	221	460
05:45 PM	0	0	0	0	0	0	141	141	0	116	21	137	76	153	0	229	507
Total Volume	0	0	0	0	0	0	551	551	0	450	90	540	292	583	0	875	1966
% App. Total	0	0	0		0	0	100		0	83.3	16.7		33.4	66.6	0		
PHF	.000	.000	.000	.000	.000	.000	.850	.850	.000	.953	.900	.944	.924	.953	.000	.955	.942

Accurate Counts

978-664-2565

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 7

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear



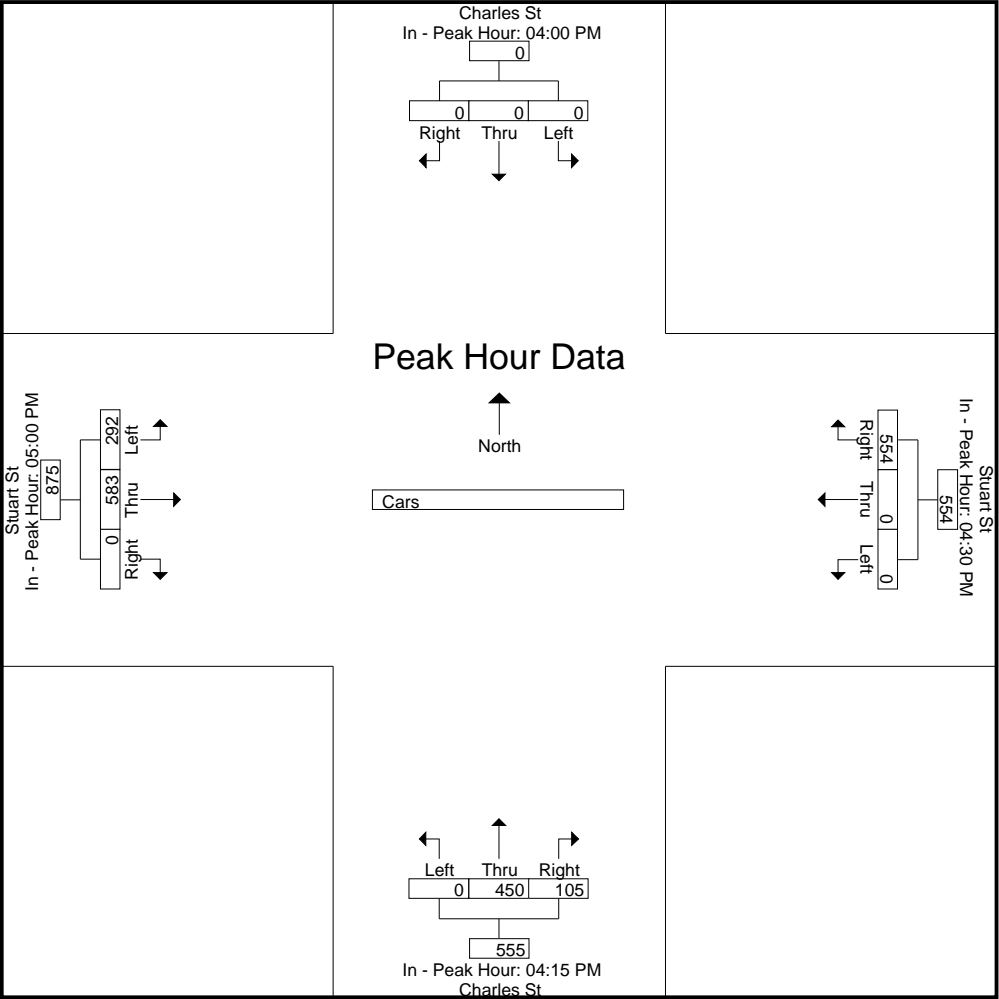
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:15 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	131	131	0	128	23	151	69	134	0	203
+15 mins.	0	0	0	0	0	0	130	130	0	103	23	126	79	143	0	222
+30 mins.	0	0	0	0	0	0	131	131	0	101	34	135	68	153	0	221
+45 mins.	0	0	0	0	0	0	162	162	0	118	25	143	76	153	0	229
Total Volume	0	0	0	0	0	0	554	554	0	450	105	555	292	583	0	875
% App. Total	0	0	0		0	0	100		0	81.1	18.9		33.4	66.6	0	

Accurate Counts
978-664-2565

PHF	.000	.000	.000	.000	.000	.000	.855	.855	.000	.879	.772	.919	.924	.953	.000	.955
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 9

Groups Printed- Trucks

	Charles St From North			Stuart St From East			Charles St From South			Stuart St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	1	0	2	0	1	2	0	6
04:15 PM	0	0	0	0	0	5	0	3	0	1	1	0	10
04:30 PM	0	0	0	0	0	5	0	2	1	1	2	0	11
04:45 PM	0	0	0	0	0	6	0	2	0	0	3	0	11
Total	0	0	0	0	0	17	0	9	1	3	8	0	38
05:00 PM	0	0	0	0	0	4	0	3	0	2	3	0	12
05:15 PM	0	0	0	0	0	4	0	1	0	0	1	0	6
05:30 PM	0	0	0	0	0	1	0	2	0	1	1	0	5
05:45 PM	0	0	0	0	0	3	0	2	0	0	3	0	8
Total	0	0	0	0	0	12	0	8	0	3	8	0	31
Grand Total	0	0	0	0	0	29	0	17	1	6	16	0	69
Apprch %	0	0	0	0	0	100	0	94.4	5.6	27.3	72.7	0	
Total %	0	0	0	0	0	42	0	24.6	1.4	8.7	23.2	0	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 10

	Charles St From North				Stuart St From East				Charles St From South				Stuart 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 04:15 PM																	
04:15 PM	0	0	0	0	0	0	5	5	0	3	0	3	1	1	0	2	10
04:30 PM	0	0	0	0	0	0	5	5	0	2	1	3	1	2	0	3	11
04:45 PM	0	0	0	0	0	0	6	6	0	2	0	2	0	3	0	3	11
05:00 PM	0	0	0	0	0	0	4	4	0	3	0	3	2	3	0	5	12
Total Volume	0	0	0	0	0	0	20	20	0	10	1	11	4	9	0	13	44
% App. Total	0	0	0		0	0	100		0	90.9	9.1		30.8	69.2	0		
PHF	.000	.000	.000	.000	.000	.000	.833	.833	.000	.833	.250	.917	.500	.750	.000	.650	.917

Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

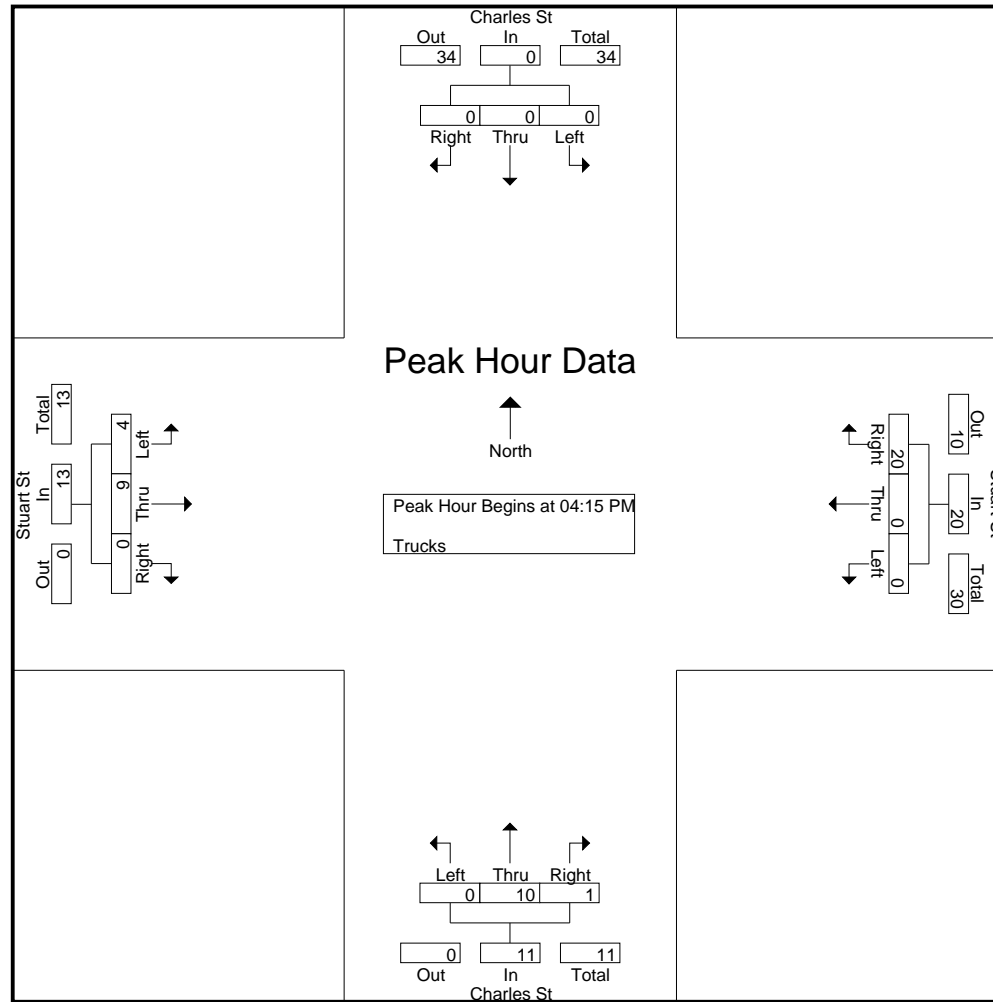
Page No : 11

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

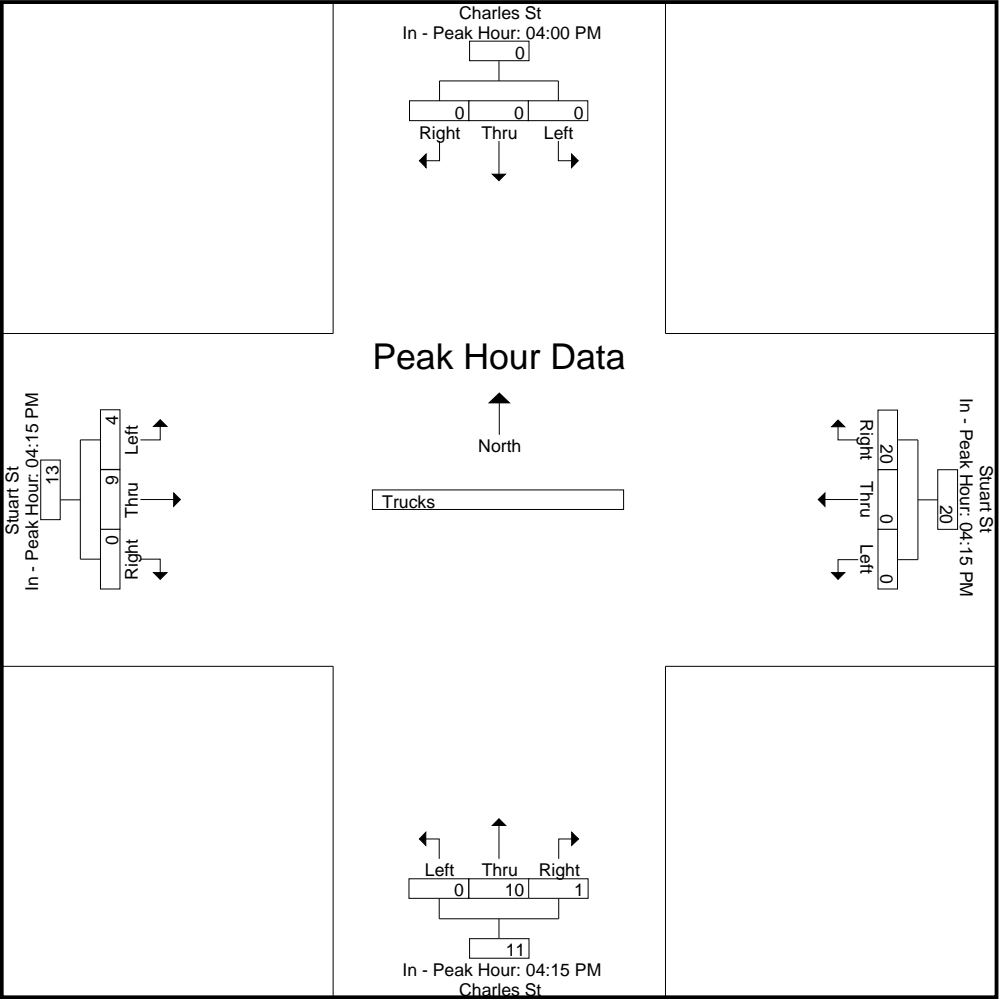


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	0	0	0	0	0	5	5	0	3	0	3	1	1	0	2
+15 mins.	0	0	0	0	0	0	5	5	0	2	1	3	1	2	0	3
+30 mins.	0	0	0	0	0	0	6	6	0	2	0	2	0	3	0	3
+45 mins.	0	0	0	0	0	0	4	4	0	3	0	3	2	3	0	5
Total Volume	0	0	0	0	0	0	20	20	0	10	1	11	4	9	0	13
% App. Total	0	0	0		0	0	100		0	90.9	9.1		30.8	69.2	0	

PHF	.000	.000	.000	.000	.000	.000	.833	.833	.000	.833	.250	.917	.500	.750	.000	.650
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Accurate Counts

978-664-2565

File Name : 17034006

Site Code : 17034006

Start Date : 11/28/2017

Page No : 13

N/S Street : Charles Street

E/W Street: Stuart Street

City/State : Boston, MA

Weather : Clear

Groups Printed- Bikes Peds

	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	44	0	0	3	24	0	0	0	44	0	1	0	17	129	4	133
04:15 PM	0	0	0	47	0	0	2	26	0	0	0	55	0	0	0	17	145	2	147
04:30 PM	0	0	0	39	0	1	0	27	0	0	0	65	0	3	0	22	153	4	157
04:45 PM	0	0	0	30	0	0	0	25	0	1	0	63	0	2	0	17	135	3	138
Total	0	0	0	160	0	1	5	102	0	1	0	227	0	6	0	73	562	13	575
05:00 PM	0	0	0	19	0	0	0	18	0	1	0	79	0	2	0	19	135	3	138
05:15 PM	0	0	0	33	0	0	2	26	0	0	0	77	0	4	0	31	167	6	173
05:30 PM	0	0	0	43	0	0	2	29	0	0	0	67	0	0	0	30	169	2	171
05:45 PM	0	0	0	38	0	0	0	28	0	1	0	100	0	0	0	25	191	1	192
Total	0	0	0	133	0	0	4	101	0	2	0	323	0	6	0	105	662	12	674
Grand Total	0	0	0	293	0	1	9	203	0	3	0	550	0	12	0	178	1224	25	1249
Apprch %	0	0	0		0	10	90		0	100	0		0	100	0				
Total %	0	0	0		0	4	36		0	12	0		0	48	0		98	2	

Accurate Counts
978-664-2565

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 14

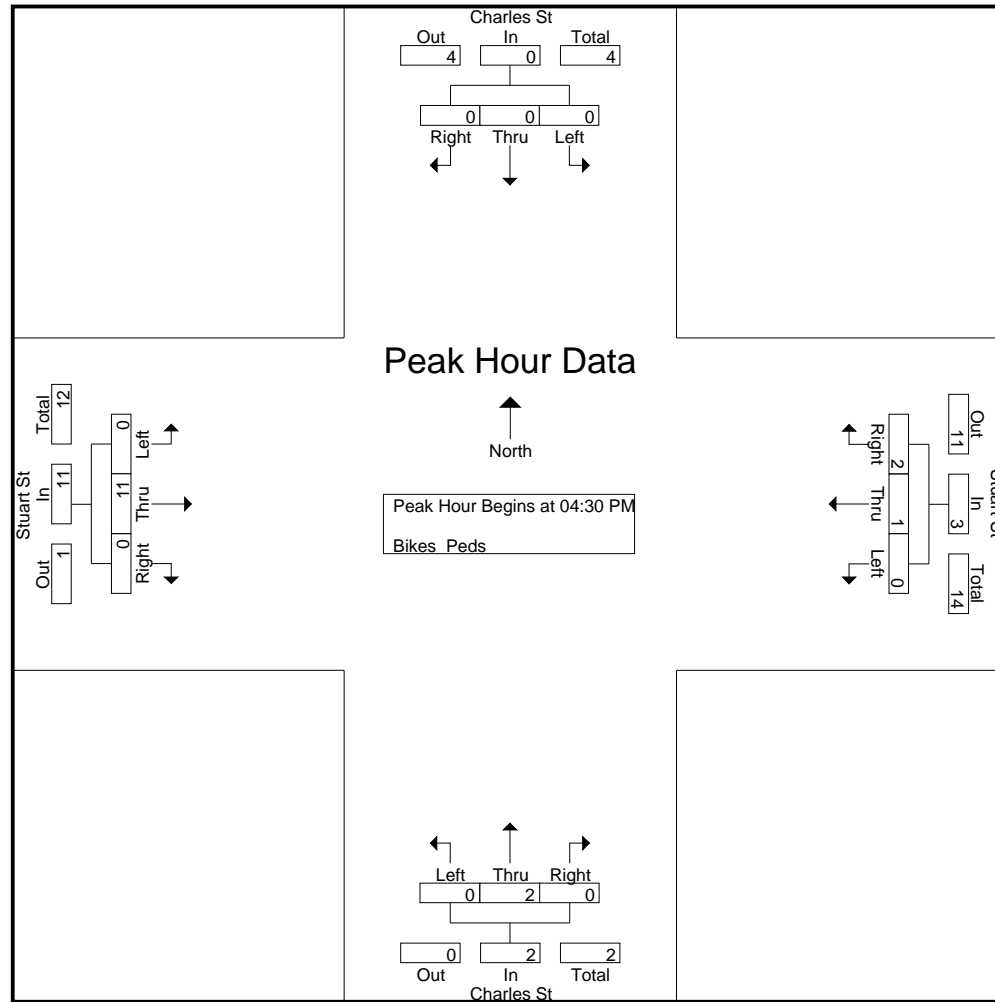
	Charles St From North				Stuart St From East				Charles St From South				Stuart St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
05:15 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	4	0	4	6
Total Volume	0	0	0	0	0	1	2	3	0	2	0	2	0	11	0	11	16
% App. Total	0	0	0		0	33.3	66.7		0	100	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.375	.000	.500	.000	.500	.000	.688	.000	.688	.667

Accurate Counts

978-664-2565

File Name : 17034006
Site Code : 17034006
Start Date : 11/28/2017
Page No : 15

N/S Street : Charles Street
E/W Street: Stuart Street
City/State : Boston, MA
Weather : Clear

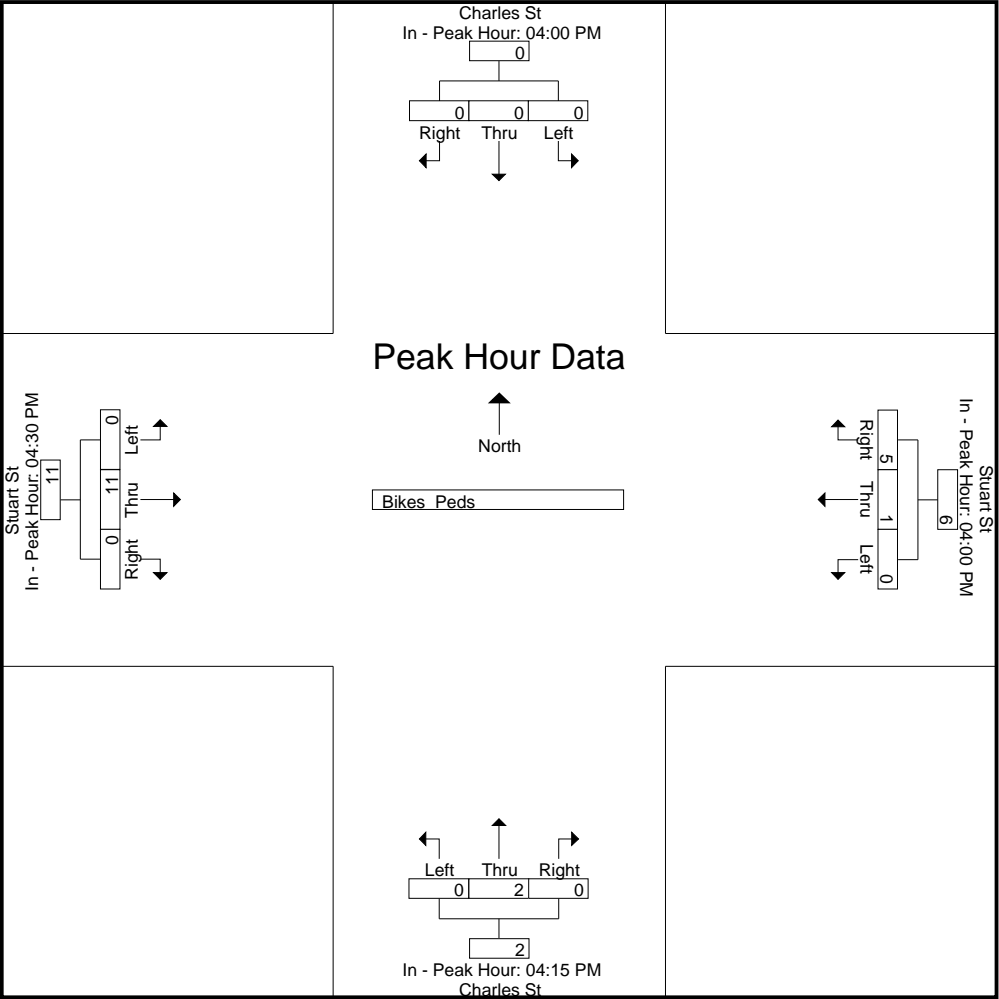


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	3	3	0	0	0	0	0	3	0	3
+15 mins.	0	0	0	0	0	0	2	2	0	0	0	0	0	2	0	2
+30 mins.	0	0	0	0	0	1	0	1	0	1	0	1	0	2	0	2
+45 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4
Total Volume	0	0	0	0	0	1	5	6	0	2	0	2	0	11	0	11
% App. Total	0	0	0		0	16.7	83.3		0	100	0		0	100	0	

PHF	.000	.000	.000	.000	.000	.250	.417	.500	.000	.500	.000	.500	.000	.688	.000	.688
-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------



Client: Michael White
 Project #: 329_C005_HSH
 BTB #: Location 1
 Location: Boston, MA
 Street 1: Columbus Avenue
 Street 2: Church Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

BOSTON

TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701
 Office: 978-746-1259
 DataRequest@BostonTrafficData.com
 www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

Church Street Northbound					Church Street Southbound				Columbus Avenue Eastbound				Columbus Avenue 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	3	0	0	0	0	0	0	0	0	0	0	0	0	25	0
7:15 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	29	0
7:30 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	32	0
7:45 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	37	0
8:00 AM	0	7	0	0	0	0	0	0	0	0	0	0	0	0	43	0
8:15 AM	0	6	0	0	0	0	0	0	0	0	0	0	0	0	42	0
8:30 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	41	0
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	38	0

Church Street Northbound					Southbound				Columbus Avenue Eastbound				Columbus Avenue 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	10	0	0	0	0	0	0	0	0	0	0	0	0	46	0
4:15 PM	0	9	0	0	0	0	0	0	0	0	0	0	0	0	44	0
4:30 PM	0	10	0	0	0	0	0	0	0	0	0	0	0	0	41	0
4:45 PM	0	11	0	0	0	0	0	0	0	0	0	0	0	0	48	0
5:00 PM	0	11	0	0	0	0	0	0	0	0	0	0	0	0	56	0
5:15 PM	0	10	0	0	0	0	0	0	0	0	0	0	0	0	54	0
5:30 PM	0	9	0	0	0	0	0	0	0	0	0	0	0	0	52	0
5:45 PM	0	8	0	0	0	0	0	0	0	0	0	0	0	0	50	0

AM PEAK HOUR 7:45 AM to 8:45 AM PHF HV %	Church Street Northbound				Church Street Southbound				Columbus Avenue Eastbound				Columbus Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	21	0	0	0	0	0	0	0	0	0	0	0	0	163	0
	0.75				0.00				0.00				0.95			
	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%	4.3%	0.0%

PM PEAK HOUR 4:45 PM to 5:45 PM PHF HV %	Church Street Northbound				Church Street Southbound				Columbus Avenue Eastbound				Columbus Avenue Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	41	0	0	0	0	0	0	0	0	0	0	0	0	210	0
	0.93				0.00				0.00				0.94			
	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%	3.3%	0.0%

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 1
 Location: Boston, MA
 Street 1: Columbus Avenue
 Street 2: Church Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

BOSTON

TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701
 Office: 978-746-1259
 DataRequest@BostonTrafficData.com
 www.BostonTrafficData.com

HEAVY VEHICLES

Church Street									Columbus Avenue				Columbus Avenue			
Northbound					Southbound				Eastbound				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	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

Church Street									Columbus Avenue				Columbus Avenue							
Northbound									Southbound				Eastbound				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	1	0				
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0				
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	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	2	0				
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0				
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0				
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0				

AM PEAK HOUR 8:00 AM to 9:00 AM <i>PHF</i>	Church Street Northbound				Church Street Southbound				Columbus Avenue Eastbound				Columbus Avenue 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	0	0	0	0	0	0	0	0	0	8	0
<i>PHF</i>	0.00				0.00				0.00				0.67			

PM PEAK HOUR 4:15 PM to 5:15 PM <i>PHF</i>	Church Street Northbound				Church Street Southbound				Columbus Avenue Eastbound				Columbus Avenue 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	0	0	0	0	0	0	0	0	0	7	0
<i>PHF</i>	0.00				0.00				0.00				0.88			

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 1
 Location: Boston, MA
 Street 1: Columbus Avenue
 Street 2: Church Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

PEDESTRIANS & BICYCLES

Church Street Northbound					Church Street Southbound					Columbus Avenue Eastbound					Columbus Avenue 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	7		0	0	0	0		0	0	0	7		0	0	0	5
7:15 AM	0	0	0	8		0	0	0	0		0	0	0	8		0	0	0	6
7:30 AM	0	0	0	9		0	0	0	0		0	0	0	9		0	1	0	7
7:45 AM	0	0	0	13		0	0	0	0		0	1	0	10		0	2	0	5
8:00 AM	0	0	0	17		0	0	0	0		0	2	0	11		0	1	0	3
8:15 AM	0	0	0	20		0	0	0	0		0	1	0	8		0	1	0	4
8:30 AM	0	0	0	25		0	0	0	0		0	3	0	6		0	2	0	5
8:45 AM	0	0	0	23		0	0	0	0		0	0	0	7		0	1	0	4

Church Street Northbound					Church Street Southbound					Columbus Avenue Eastbound					Columbus Avenue 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	14		0	0	0	0		0	0	0	6		0	2	0	7
4:15 PM	0	0	0	15		0	0	0	0		0	1	0	3		0	3	0	9
4:30 PM	0	0	0	13		0	0	0	0		0	2	0	2		0	1	0	12
4:45 PM	0	0	0	12		0	0	0	0		0	1	0	4		0	2	0	8
5:00 PM	0	0	0	11		0	0	0	0		0	5	0	6		0	7	0	4
5:15 PM	0	0	0	12		0	0	0	0		0	1	0	5		0	5	0	9
5:30 PM	0	0	0	11		0	0	0	0		0	2	0	4		0	6	0	14
5:45 PM	0	0	0	10		0	0	0	0		0	0	0	5		0	2	0	10

Church Street Northbound					Church Street Southbound					Columbus Avenue Eastbound					Columbus Avenue Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
7:45 AM to 8:45 AM	0	0	0	75		0	0	0	0		0	7	0	35		0	6	0	17

Church Street Northbound					Church Street Southbound					Columbus Avenue Eastbound					Columbus Avenue Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
4:45 PM to 5:45 PM	0	0	0	46		0	0	0	0		0	9	0	19		0	20	0	35

¹ Peak hours corresponds to vehicular peak hours.

Client: Michael White
 Project #: 329_C005_HSH
 BTD #: Location 2
 Location: Boston, MA
 Street 1: Stuart Street
 Street 2: Motor Mart Parking Garage Driveway
 Count Date: 2/6/2019 (AM) & 2/14/2019 (PM)
 Day of Week: Wednesday (AM) & Thursday (PM)
 Weather: Mostly Cloudy, 40°F

BOSTON TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701
 Office: 978-746-1259
 DataRequest@BostonTrafficData.com
 www.BostonTrafficData.com

PASSENGER CARS & HEAVY VEHICLES COMBINED

Motor Mart Parking Garage Driveway									Stuart Street Eastbound				Stuart Street Westbound			
Northbound					Southbound											
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	6	0	0	0	25	118	0	0	0	0	0
7:15 AM	0	0	0	0	0	9	0	0	0	29	124	0	0	0	0	0
7:30 AM	0	0	0	0	0	7	0	0	0	27	147	0	0	0	0	0
7:45 AM	0	0	0	0	0	6	0	0	0	26	168	0	0	0	0	0
8:00 AM	0	0	0	0	0	7	0	0	0	29	170	0	0	0	0	0
8:15 AM	0	0	0	0	0	6	0	0	0	31	173	0	0	0	0	0
8:30 AM	0	0	0	0	0	7	0	0	0	36	176	0	0	0	0	0
8:45 AM	0	0	0	0	0	5	0	0	0	33	172	0	0	0	0	0

Motor Mart Parking Garage Driveway									Stuart Street Eastbound				Stuart Street Westbound			
Northbound					Southbound											
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	24	0	0	0	9	173	0	0	0	0	0
4:15 PM	0	0	0	0	0	25	0	0	0	10	185	0	0	0	0	0
4:30 PM	0	0	0	0	0	26	0	0	0	11	194	0	0	0	0	0
4:45 PM	0	0	0	0	0	31	0	0	0	8	216	0	0	0	0	0
5:00 PM	0	0	0	0	0	38	0	0	0	7	243	0	0	0	0	0
5:15 PM	0	0	0	0	0	34	0	0	0	8	221	0	0	0	0	0
5:30 PM	0	0	0	0	0	32	0	0	0	7	202	0	0	0	0	0
5:45 PM	0	0	0	0	0	31	0	0	0	6	196	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM PHF HV %	Motor Mart Parking Garage Driveway								Stuart Street Eastbound				Stuart Street Westbound			
	Northbound				Southbound											
	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	25	0	0	0	129	691	0	0	0	0	0
	0.00				0.89				0.97				0.00			
0.0%0.0%0.0%0.0%0.0%0.0%0.0%0.0%0.0%0.0%2.6%0.0%0.0%0.0%0.0%																

PM PEAK HOUR 4:45 PM to 5:45 PM PHF HV %	Motor Mart Parking Garage Driveway								Stuart Street Eastbound				Stuart Street Westbound			
	Northbound				Southbound											
	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	135	0	0	0	30	882	0	0	0	0	0
	0.00				0.89				0.91				0.00			
0.0%0.0%0.0%0.0%0.0%0.0%0.0%0.0%0.0%0.0%1.1%0.0%0.0%0.0%0.0%																

*Note:

1. 4:00 PM to 6:00 PM count was on 2/14/2019.

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 2
 Location: Boston, MA
 Street 1: Stuart Street
 Street 2: Motor Mart Parking Garage Driveway
 Count Date: 2/6/2019 (AM) & 2/14/2019 (PM)
 Day of Week: Wednesday (AM) & Thursday (PM)
 Weather: Mostly Cloudy, 40°F

BOSTON

TRAFFIC DATA

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HEAVY VEHICLES

Motor Mart Parking Garage Driveway									Stuart Street Eastbound				Stuart Street Westbound			
Northbound					Southbound											
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	2	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0

Motor Mart Parking Garage Driveway									Stuart Street				Stuart Street			
Northbound					Southbound				Eastbound				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	3	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0

Northbound				Southbound				Eastbound				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	0	0	0	0	0	20	0	0	0	0	0
PHF				0.00				0.83				0.00			

Northbound				Southbound				Eastbound				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	0	0	0	0	0	15	0	0	0	0	0
PHF				0.00				0.75				0.00			

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 2
 Location: Boston, MA
 Street 1: Stuart Street
 Street 2: Motor Mart Parking Garage Driveway
 Count Date: 2/6/2019 (AM) & 2/14/2019 (PM)
 Day of Week: Wednesday (AM) & Thursday (PM)
 Weather: Mostly Cloudy, 40°F

PEDESTRIANS & BICYCLES

Northbound					Motor Mart Parking Garage Driveway Southbound					Stuart Street Eastbound					Stuart 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		0	0	0	7		0	2	0	3		0	0	0	8
7:15 AM	0	0	0	0		0	0	0	9		0	1	0	2		0	0	0	12
7:30 AM	0	0	0	0		0	0	0	18		0	3	0	4		0	0	0	9
7:45 AM	0	0	0	0		0	0	0	24		0	9	0	3		0	0	0	5
8:00 AM	0	0	0	0		0	0	0	32		0	7	0	4		0	0	0	6
8:15 AM	0	0	0	0		0	0	0	39		0	10	0	6		0	0	0	5
8:30 AM	0	0	0	0		0	0	0	45		0	8	0	5		0	0	0	4
8:45 AM	0	0	0	0		0	0	0	40		0	7	0	5		0	0	0	3

Northbound					Motor Mart Parking Garage Driveway Southbound					Stuart Street Eastbound					Stuart 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	43		0	2	0	1		0	0	0	1
4:15 PM	0	0	0	0		0	0	0	57		0	2	0	1		0	0	0	1
4:30 PM	0	0	0	0		0	0	0	65		0	1	0	1		0	0	0	2
4:45 PM	0	0	0	0		0	0	0	69		0	3	0	2		0	0	0	1
5:00 PM	0	0	0	0		0	0	0	74		0	2	0	1		0	0	0	1
5:15 PM	0	0	0	0		0	0	0	55		0	2	0	3		0	0	0	2
5:30 PM	0	0	0	0		0	0	0	48		0	1	0	1		0	0	0	1
5:45 PM	0	0	0	0		0	0	0	42		0	1	0	1		0	0	0	1

Northbound					Motor Mart Parking Garage Driveway Southbound					Stuart Street Eastbound					Stuart Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
8:00 AM to 9:00 AM	0	0	0	0		0	0	0	156		0	32	0	20		0	0	0	18

Northbound					Motor Mart Parking Garage Driveway Southbound					Stuart Street Eastbound					Stuart Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
4:45 PM to 5:45 PM	0	0	0	0		0	0	0	246		0	8	0	7		0	0	0	5

¹ Peak hours corresponds to vehicular peak hours.

Client: Michael White
 Project #: 329_C005_HSH
 BTD #: Location 3
 Location: Boston, MA
 Street 1: Stuart Street
 Street 2: Tremont Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

PASSENGER CARS & HEAVY VEHICLES COMBINED

Tremont Street Northbound					Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	19	49	29	0	0	55	22	1	29	111	0
7:15 AM	0	0	0	0	0	21	47	30	0	0	65	21	0	34	113	0
7:30 AM	0	0	0	0	0	21	44	27	0	0	74	20	3	43	112	0
7:45 AM	0	0	0	0	0	22	65	32	1	0	70	27	0	40	126	0
8:00 AM	0	0	0	0	0	19	71	37	0	0	68	35	1	38	123	0
8:15 AM	0	0	0	0	0	17	67	36	0	0	80	37	0	35	127	0
8:30 AM	0	0	0	0	0	14	64	35	1	0	92	41	1	31	123	0
8:45 AM	0	0	0	0	0	15	62	33	0	0	85	39	0	28	125	0

Tremont Street Northbound					Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	38	85	32	1	0	103	26	2	22	94	0
4:15 PM	0	0	0	0	0	37	81	34	0	0	114	24	0	25	98	0
4:30 PM	0	0	0	0	0	40	78	33	1	0	123	23	1	28	95	0
4:45 PM	0	0	0	0	0	45	86	35	0	0	109	29	0	24	88	0
5:00 PM	0	0	0	0	0	52	95	36	0	0	86	37	0	21	92	0
5:15 PM	0	0	0	0	0	50	93	33	1	0	91	35	0	23	89	0
5:30 PM	0	0	0	0	0	48	91	34	0	0	96	34	0	20	90	0
5:45 PM	0	0	0	0	0	46	86	31	0	0	90	32	1	19	87	0

AM PEAK HOUR 8:00 AM to 9:00 AM PHF HV %	Tremont Street Northbound				Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	65	264	141	1	0	325	152	2	132	498	0
	0.00				0.93				0.89				0.98			
	0.0%	0.0%	0.0%	0.0%	0.0%	29.2%	4.2%	16.3%	0.0%	0.0%	4.9%	1.3%	0.0%	1.5%	6.0%	0.0%

PM PEAK HOUR 4:30 PM to 5:30 PM PHF HV %	Tremont Street Northbound				Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	187	352	137	2	0	409	124	1	96	364	0
	0.00				0.92				0.91				0.93			
	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	3.4%	10.2%	0.0%	0.0%	2.2%	1.6%	0.0%	2.1%	3.0%	0.0%

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 3
 Location: Boston, MA
 Street 1: Stuart Street
 Street 2: Tremont Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

BOSTON

TRAFFIC DATA

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HEAVY VEHICLES

Tremont Street Northbound					Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	4	2	4	0	0	4	0	0	0	5	0
7:15 AM	0	0	0	0	0	5	2	5	0	0	2	1	0	2	6	0
7:30 AM	0	0	0	0	0	5	3	6	0	0	5	0	0	0	7	0
7:45 AM	0	0	0	0	0	4	2	8	0	0	2	0	0	1	8	0
8:00 AM	0	0	0	0	0	5	3	7	0	0	2	1	0	1	6	0
8:15 AM	0	0	0	0	0	4	3	5	0	0	8	0	0	0	10	0
8:30 AM	0	0	0	0	0	5	2	6	0	0	4	0	0	1	7	0
8:45 AM	0	0	0	0	0	5	3	5	0	0	2	1	0	0	7	0

Tremont Street Northbound					Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	3	4	3	0	0	3	1	0	0	4	0
4:15 PM	0	0	0	0	0	2	5	2	0	0	2	0	0	1	4	0
4:30 PM	0	0	0	0	0	3	4	4	0	0	2	0	0	1	3	0
4:45 PM	0	0	0	0	0	2	3	3	0	0	1	1	0	0	2	0
5:00 PM	0	0	0	0	0	4	3	3	0	0	2	0	0	0	3	0
5:15 PM	0	0	0	0	0	3	2	4	0	0	4	1	0	1	3	0
5:30 PM	0	0	0	0	0	3	3	3	0	0	1	0	0	0	2	0
5:45 PM	0	0	0	0	0	3	2	3	0	0	0	0	0	0	2	0

AM PEAK HOUR 7:30 AM to 8:30 AM <i>PHF</i>	Tremont Street Northbound				Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	18	11	26	0	0	17	1	0	2	31	0
<i>PHF</i>	0.00				0.92				0.56				0.83			

PM PEAK HOUR 4:00 PM to 5:00 PM <i>PHF</i>	Tremont Street Northbound				Tremont Street Southbound				Stuart Street Eastbound				Stuart 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	10	16	12	0	0	8	2	0	2	13	0
<i>PHF</i>	0.00				0.86				0.63				0.75			

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 3
 Location: Boston, MA
 Street 1: Stuart Street
 Street 2: Tremont Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

PEDESTRIANS & BICYCLES

Tremont Street Northbound					Tremont Street Southbound					Stuart Street Eastbound					Stuart 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	3		0	0	0	40		0	2	0	42		0	2	0	4	
7:15 AM	0	1	0	5		0	0	0	44		1	2	0	45		0	1	0	5	
7:30 AM	0	0	0	8		0	1	0	48		0	3	0	48		1	2	0	10	
7:45 AM	0	0	0	6		0	1	0	46		0	5	0	52		0	1	0	12	
8:00 AM	0	1	0	5		0	0	0	50		0	3	0	58		0	1	1	11	
8:15 AM	0	0	0	7		0	1	0	54		0	6	1	64		1	2	0	14	
8:30 AM	0	0	0	6		0	1	0	52		0	2	0	60		0	3	0	12	
8:45 AM	0	0	0	8		0	0	0	55		0	1	0	62		0	2	0	10	

Tremont Street Northbound					Tremont Street Southbound					Stuart Street Eastbound					Stuart 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	4		0	0	0	60		0	1	0	80		0	2	0	6	
4:15 PM	0	0	0	8		0	1	0	62		0	1	1	84		0	4	0	8	
4:30 PM	0	1	0	11		0	1	0	85		0	2	0	106		1	1	0	12	
4:45 PM	0	0	0	10		0	0	0	116		0	3	0	132		0	2	1	15	
5:00 PM	0	0	0	9		0	1	0	102		0	1	1	125		0	3	0	14	
5:15 PM	0	0	0	7		0	0	0	88		0	3	0	118		0	6	0	12	
5:30 PM	0	0	0	10		0	0	0	72		0	2	0	106		0	4	0	16	
5:45 PM	0	0	0	8		0	0	0	68		0	1	0	102		0	3	0	15	

AM PEAK HOUR ¹ 8:00 AM to 9:00 AM	Tremont Street Northbound					Tremont Street Southbound					Stuart Street Eastbound					Stuart Street Westbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	1	0	26		0	2	0	211		0	12	1	244		1	8	1	47	

PM PEAK HOUR ¹ 4:30 PM to 5:30 PM	Tremont Street Northbound					Tremont Street Southbound					Stuart Street Eastbound					Stuart Street Westbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	1	0	37		0	2	0	391		0	9	1	481		1	12	1	53	

¹ Peak hours corresponds to vehicular peak hours.

Client: Michael White
 Project #: 329_C005_HSH
 BTD #: Location 4
 Location: Boston, MA
 Street 1: Stuart Street/ Kneeland Street
 Street 2: Washington Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

PASSENGER CARS & HEAVY VEHICLES COMBINED

Washington Street Northbound					Washington Street Southbound				Stuart Street Eastbound				Kneeland 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	2	8	24	10	0	0	0	0	1	8	59	7	1	27	132	17
7:15 AM	2	10	26	13	0	0	0	0	2	10	64	10	2	33	135	19
7:30 AM	2	12	29	18	0	0	0	0	3	11	71	13	1	26	143	25
7:45 AM	3	13	32	24	0	0	0	0	2	12	67	11	1	20	151	36
8:00 AM	2	14	35	27	0	0	0	0	2	14	63	9	2	21	146	34
8:15 AM	3	11	41	25	0	0	0	0	3	12	70	12	1	19	148	32
8:30 AM	2	8	47	19	0	0	0	0	2	13	78	14	1	17	145	30
8:45 AM	2	9	44	17	0	0	0	0	3	11	75	11	2	15	141	27

Washington Street Northbound					Washington Street Southbound				Stuart Street Eastbound				Kneeland 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	2	14	29	24	0	0	0	0	3	9	116	15	1	19	101	16
4:15 PM	2	16	31	23	0	0	0	0	2	12	124	13	0	21	105	18
4:30 PM	3	18	30	19	0	0	0	0	3	19	131	11	1	23	103	24
4:45 PM	2	11	33	18	0	0	0	0	3	17	122	12	2	20	98	33
5:00 PM	1	7	38	17	0	0	0	0	2	14	112	10	1	24	104	26
5:15 PM	2	8	37	22	0	0	0	0	3	18	107	13	1	27	101	28
5:30 PM	1	9	36	25	0	0	0	0	2	21	103	18	1	25	99	25
5:45 PM	1	8	34	23	0	0	0	0	2	19	101	15	0	24	97	26

AM PEAK HOUR 7:45 AM to 8:45 AM PHF HV %	Washington Street Northbound				Washington Street Southbound				Stuart Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	10	46	155	95	0	0	0	0	9	51	278	46	5	77	590	132
	0.96				0.00				0.90				0.97			
	0.0%	4.3%	12.9%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	11.2%	2.2%	0.0%	2.6%	5.4%	4.5%

PM PEAK HOUR 4:15 PM to 5:15 PM PHF HV %	Washington Street Northbound				Washington Street Southbound				Stuart Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	8	52	132	77	0	0	0	0	10	62	489	46	4	88	410	101
	0.93				0.00				0.93				0.97			
	0.0%	1.9%	10.6%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	3.1%	2.2%	0.0%	4.5%	3.2%	1.0%

Client: Michael White
 Project #: 329_C005_HSH
 BTD #: Location 4
 Location: Boston, MA
 Street 1: Stuart Street/ Kneeland Street
 Street 2: Washington Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

BOSTON

TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701
 Office: 978-746-1259
 DataRequest@BostonTrafficData.com
 www.BostonTrafficData.com

HEAVY VEHICLES

Washington Street Northbound					Washington Street Southbound					Stuart Street Eastbound					Kneeland 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	6	0	0	0	0	0	0	0	7	1	0	0	5	0			
7:15 AM	0	1	4	0	0	0	0	0	0	0	7	0	0	1	7	1			
7:30 AM	0	0	6	1	0	0	0	0	0	1	8	1	0	0	7	0			
7:45 AM	0	0	6	1	0	0	0	0	0	0	6	0	0	1	9	3			
8:00 AM	0	0	5	0	0	0	0	0	0	0	7	0	0	0	7	1			
8:15 AM	0	2	5	1	0	0	0	0	0	2	10	0	0	1	8	0			
8:30 AM	0	0	4	0	0	0	0	0	0	0	8	1	0	0	8	2			
8:45 AM	0	0	5	1	0	0	0	0	0	0	7	0	0	0	7	0			

Washington Street Northbound					Washington Street Southbound				Stuart Street Eastbound				Kneeland 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	4	0	0	0	0	0	0	0	5	1	0	0	4	0
4:15 PM	0	0	4	1	0	0	0	0	0	1	3	0	0	2	5	0
4:30 PM	0	1	5	0	0	0	0	0	0	0	4	1	0	0	3	1
4:45 PM	0	0	2	0	0	0	0	0	0	0	3	0	0	2	2	0
5:00 PM	0	0	3	1	0	0	0	0	0	1	5	0	0	0	3	0
5:15 PM	0	1	3	0	0	0	0	0	0	1	5	1	0	1	3	1
5:30 PM	0	0	2	0	0	0	0	0	0	0	4	0	0	0	2	0
5:45 PM	0	0	2	0	0	0	0	0	0	0	3	0	0	0	2	0

AM PEAK HOUR 7:30 AM to 8:30 AM <i>PHF</i>	Washington Street Northbound				Washington Street Southbound				Stuart Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	2	22	3	0	0	0	0	0	3	31	1	0	2	31	4
<i>PHF</i>	0.84				0.00				0.73				0.71			

PM PEAK HOUR 4:00 PM to 5:00 PM <i>PHF</i>	Washington Street Northbound				Washington Street Southbound				Stuart Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	15	1	0	0	0	0	0	1	15	2	0	4	14	1
<i>PHF</i>	0.71				0.00				0.75				0.68			

Client: Michael White
 Project #: 329_C005_HSH
 BTM #: Location 4
 Location: Boston, MA
 Street 1: Stuart Street/ Kneeland Street
 Street 2: Washington Street
 Count Date: 2/6/2019
 Day of Week: Wednesday
 Weather: Mostly Cloudy, 40°F

PEDESTRIANS & BICYCLES

Washington Street Northbound					Washington Street Southbound					Stuart Street Eastbound					Kneeland Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
7:00 AM	0	2	0	17		0	0	0	9		1	1	0	27		0	2	0	70
7:15 AM	0	4	0	19		0	0	0	10		0	2	0	29		0	1	0	75
7:30 AM	0	2	0	26		0	1	0	13		0	3	0	40		0	3	0	82
7:45 AM	0	2	0	30		0	0	0	16		1	4	0	58		0	1	0	86
8:00 AM	0	2	0	32		0	0	0	23		0	2	0	56		0	1	0	114
8:15 AM	0	2	0	35		0	0	0	28		1	5	1	55		0	2	0	138
8:30 AM	0	5	0	37		0	1	0	30		0	2	0	52		0	3	0	130
8:45 AM	0	3	0	30		0	0	0	25		0	1	0	48		0	2	0	125

Washington Street Northbound					Washington Street Southbound					Stuart Street Eastbound					Kneeland Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
4:00 PM	0	1	0	28		0	0	0	28		0	1	0	80		0	2	0	128
4:15 PM	0	1	0	32		0	1	0	30		0	1	0	83		0	4	0	135
4:30 PM	0	2	0	35		0	0	0	38		0	2	0	87		0	2	0	132
4:45 PM	0	1	0	30		0	0	0	45		1	2	0	90		0	2	0	130
5:00 PM	0	1	0	27		0	0	0	50		0	1	0	86		0	3	0	118
5:15 PM	0	0	0	24		0	0	0	48		1	2	0	85		0	7	0	102
5:30 PM	0	1	0	26		0	0	0	44		0	2	0	92		0	4	0	108
5:45 PM	0	0	0	22		0	0	0	46		0	1	0	80		0	3	0	112

Washington Street Northbound					Washington Street Southbound					Stuart Street Eastbound					Kneeland Street Westbound				
AM PEAK HOUR ¹	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
7:45 AM to 8:45 AM	0	11	0	134		0	1	0	97		2	13	1	221		0	7	0	468

Washington Street Northbound					Washington Street Southbound					Stuart Street Eastbound					Kneeland Street Westbound				
PM PEAK HOUR ¹	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED
4:15 PM to 5:15 PM	0	5	0	124		0	1	0	163		1	6	0	346		0	11	0	515

¹ Peak hours corresponds to vehicular peak hours.

APPENDIX A2 – MassDOT Weekday Seasonal Adjustment Factors

MASSACHUSETTS HIGHWAY DEPARTMENT - STATEWIDE TRAFFIC DATA COLLECTION

2011 WEEKDAY SEASONAL FACTORS *

* Note: These are weekday factors. The average of the factors for the year will not equal 1, as weekend data are not considered

FACTOR GROUP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GROUP 1 - WEST INTERSTATE	0.98	0.93	0.90	0.89	0.90	0.88	0.91	0.90	0.89	0.89	0.93	0.95
Use group 2 for R5, R6, & R0												
GROUP 2 - RURAL MAJOR COLLECTOR (R-5)	1.12	1.12	1.07	0.99	0.91	0.90	0.86	0.86	0.92	0.93	1.01	1.05
GROUP 3A - RECREATIONAL **(1-4) See below	1.26	1.25	1.20	1.06	0.96	0.89	0.76	0.76	0.92	0.99	1.08	1.14
GROUP 3B - RECREATIONAL *** (5) See below	1.22	1.26	1.22	1.06	0.96	0.90	0.72	0.74	0.97	1.02	1.14	1.15
GROUP 4 - I-495 INTERSTATE	1.02	1.00	1.00	0.96	0.92	0.89	0.85	0.83	0.93	0.96	1.01	1.03
GROUP 5 - EAST INTERSTATE	1.04	1.00	0.96	0.93	0.92	0.91	0.91	0.89	0.93	0.93	0.96	1.01
GROUP 6: Use group 6 for U2, U3, U5, U6, U0, R2, & R3												
URBAN ARTERIALS, COLLECTORS & RURAL ARTERIALS (R-2, R-3)	1.03	1.01	0.96	0.92	0.91	0.90	0.92	0.92	0.93	0.92	0.97	0.97
GROUP 7 - I-84 PROXIMITY (STA. 17, 3921)	1.24	1.24	1.15	1.04	0.99	1.00	0.93	0.89	1.05	1.05	1.05	1.12
GROUP 8 - I-295 PROXIMITY (STA. 6590)	1.00	0.99	0.95	0.92	0.94	0.91	0.93	0.92	0.95	0.94	0.97	0.95
GROUP 9 - I-195 PROXIMITY (STA. 7)	1.13	1.05	1.03	0.95	0.89	0.87	0.86	0.79	0.88	0.91	0.99	1.03

RECREATIONAL: (ALL YEARS)

**GROUP 3A:

1. CAPE COD (ALL TOWNS)

2. PLYMOUTH (SOUTH OF RTE. 3A)

7014, 7079, 7080, 7090, 7091, 7092, 7093, 7094, 7095, 7096, 7097, 7108, 7178

3. MARTHA'S VINEYARD

4. NANTUCKET

***GROUP 3B:

5. PERMANENTS 2 & 189

1066, 1067, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092,

1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104,

1105, 1106, 1107, 1108, 1113, 1114, 1116, 2196, 2197, 2198

2011 AXLE CORRECTION FACTORS

ROAD INVENTORY

AXLE CORRECTION

FUNCTIONAL CLASSIFICATION

FACTOR

RURAL

1

0.95

2

0.97

3

0.98

0,5,6

0.98

URBAN

1

0.96

2,3

0.98

5

0.98

0,6

0.99

I-84

0.90

ROUND OFF

0 - 999.....10

> 1,000.....100

Apply I-84 factor to stations:

3290, 3921, 3929

APPENDIX A3 – Detailed Trip Generation Calculations

Motor Mart Garage Redevelopment

Trip Generation Assessment

HOWARD STEIN HUDSON

1-Mar-2019

						Assumed National Vehicle Occupancy Rate ¹	Unadjusted Person-Trips															
Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips			Transit Share ²	Transit Person- Trips	Walk/Bike/ Other Share ²	Walk/ Bike/ Other Trips	Auto Share ²	Auto Person- Trips	% Taxi ³	Private Auto Person-Trips	Taxi Person- Trips	Assumed Local Auto Occupancy Rate ¹	Assumed Local Auto Occupancy Rate for Taxis ⁴	Total Adjusted Private Auto Trips	Total Adjusted Taxi Trips	Total Adjusted Auto (Private + Taxi) Trips	
Daily Peak Hour																						
Multifamily Housing (High Rise) ⁵	306 units	Total		4.450	1,362	1.13	1,540	17%	262	49%	754	34%	524	10%	472	52	1.13	1.20	418	44	462	
		In	50%	2.225	681	1.13	770	17%	131	49%	377	34%	262	10%	236	26	1.13	1.20	209	22	231	
		Out	50%	2.225	681	1.13	770	17%	131	49%	377	34%	262	10%	236	26	1.13	1.20	209	22	231	
Shopping Center ⁶	14.479 KSF	Total		37.750	546	1.78	972	17%	166	43%	418	40%	388	2%	380	8	1.78	1.20	214	6	220	
		In	50%	18.875	273	1.78	486	17%	83	43%	209	40%	194	2%	190	4	1.78	1.20	107	3	110	
		Out	50%	18.875	273	1.78	486	17%	83	43%	209	40%	194	2%	190	4	1.78	1.20	107	3	110	
Supermarket ⁷	15 KSF	Total		106.780	1,602	1.78	2,852	17%	484	43%	1,228	40%	1,140	2%	1,118	22	1.78	1.20	628	18	646	
		In	50%	53.390	801	1.78	1,426	17%	242	43%	614	40%	570	2%	559	11	1.78	1.20	314	9	323	
		Out	50%	53.390	801	1.78	1,426	17%	242	43%	614	40%	570	2%	559	11	1.78	1.20	314	9	323	
Quality Restaurant ⁸ (existing)	-34.191 KSF	Total		83.840	-2,866	2.20	-6,306	17%	-1,072	43%	-2,712	40%	-2,522	2%	-2,472	-50	2.20	1.20	-1,124	-42	-1,166	
		In	50%	41.920	-1,433	2.20	-3,153	17%	-536	43%	-1,356	40%	-1,261	2%	-1,236	-25	2.20	1.20	-562	-21	-583	
		Out	50%	41.920	-1,433	2.20	-3,153	17%	-536	43%	-1,356	40%	-1,261	2%	-1,236	-25	2.20	1.20	-562	-21	-583	
Total		Total			644		-942		-160		-312		-470		-502	32			136	26	162	
		In			322		-471		-80		-156		-235		-251	16			68	13	81	
		Out			322		-471		-80		-156		-235		-251	16			68	13	81	
AM Peak Hour																						
Multifamily Housing (High Rise) ⁵	306 units	Total		0.310	95	1.13	107		15		62		30	10%	27	3	1.13	1.20	24	3	27	
		In	24%	0.074	23	1.13	26	17%	4	38%	10	45%	12	10%	11	1	1.13	1.20	10	1	11	
		Out	76%	0.236	72	1.13	81	13%	11	65%	52	22%	18	10%	16	2	1.13	1.20	14	2	16	
Shopping Center ⁶	14.479 KSF	Total		0.94	13	1.78	23		3		12		8	2%	8	0	1.78	1.20	5	0	5	
		In	62%	0.583	8	1.78	14	16%	2	33%	5	51%	7	2%	7	0	1.78	1.20	4	0	4	
		Out	38%	0.357	5	1.78	9	8%	1	79%	7	13%	1	2%	1	0	1.78	1.20	1	0	1	
Supermarket ⁷	15 KSF	Total		3.82	57	1.78	102		13		53		36	2%	35	1	1.78	1.20	20	1	21	
		In	60%	2.292	34	1.78	61	16%	10	33%	20	51%	31	2%	30	1	1.78	1.20	17	1	18	
		Out	40%	1.528	23	1.78	41	8%	3	79%	33	13%	5	2%	5	0	1.78	1.20	3	0	3	
Quality Restaurant ⁸ (existing)	-34.191 KSF	Total		0.73	-25	2.20	-55		-7		-29		-19	2%	-19	0	2.20	1.20	-8	0	-8	
		In	55%	0.402	-14	2.20	-31	16%	-5	33%	-10	51%	-16	2%	-16	0	2.20	1.20	-7	0	-7	
		Out	45%	0.329	-11	2.20	-24	8%	-2	79%	-19	13%	-3	2%	-3	0	2.20	1.20	-1	0	-1	
Total		Total			140		177		24		98		55		51	4			41	4	45	
		In			51		70		11		25		34		32	2			24	2	26	
		Out			89		107		13		73		21		19	2			17	2	19	
PM Peak Hour																						
Multifamily Housing (High Rise) ⁵	306 units	Total		0.360	110	1.13	125		18		68		39	10%	35	4	1.13	1.20	31	4	35	
		In	61%	0.220	67	1.13	76	13%	10	65%	49	22%	17	10%	15	2	1.13	1.20	13	2	15	
		Out	39%	0.140	43	1.13	49	17%	8	38%	19	45%	22	10%	20	2	1.13	1.20	18	2	20	
Shopping Center ⁶	14.479 KSF	Total		3.81	55	1.78	98		12		53		33	2%	32	1	1.78	1.20	18	1	19	
		In	48%	1.829	26	1.78	46	8%	4	79%	36	13%	6	2%	6	0	1.78	1.20	3	0	3	
		Out	52%	1.981	29	1.78	52	16%	8	33%	17	51%	27	2%	26	1	1.78	1.20	15	1	16	
Supermarket ⁷	15 KSF	Total		9.24	139	1.78	247		29		140		78	2%	77	1	1.78	1.20	43	1	44	
		In	51%	4.712	71	1.78	126	8%	10	79%	100	13%	16	2%	16	0	1.78	1.20	9	0	9	
		Out	49%	4.528	68	1.78	121	16%	19	33%	40	51%	62	2%	61	1	1.78	1.20	34	1	35	
Quality Restaurant ⁸ (existing)	-34.191 KSF	Total		7.80	-267	2.20	-588		-63		-375		-150	2%	-147	-3	2.20	1.20	-67	-3	-70	
		In	67%	5.226	-179	2.20	-394	8%	-32	79%	-311	13%	-51	2%	-50	-1	2.20	1.20	-23	-1	-24	
		Out	33%	2.574	-88	2.20	-194	16%	-31	33%	-64	51%	-99	2%	-97	-2	2.20	1.20	-44	-2	-46	
Total		Total			37		-118		-4		-114		0		-3	3			25	3	28	
		In			-15		-146		-8		-126		-12		-13	1			2	1	3	
		Out			52		28		4		12		12		10	2			23	2	25	

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 BTM Data for Area 3

3. Estimated trip rate for Transportation Network Companies (TNC's) at Project site

4. For taxi cabs, 1.2 passengers per cab. (2.2 minus 1 driver equals 1.2)

5. ITE Trip Generation Manual, 10th Edition, LUC 222 (Multifamily Housing High-Rise (11+ Floors)), average rate

6. ITE Trip Generation Manual, 10th Edition, LUC 820 (Shopping Center), average rate

7. ITE Trip Generation Manual, 10th Edition, LUC 850 (Supermarket), average rate

8. ITE Trip Generation Manual, 10th Edition, LUC 931 (Quality Restaurant), average rate

APPENDIX A4 – Detailed Synchro Analysis

	→	↘	↗	↙	↓	↘	↗	↙	↘	↗	↙	↘
Lane Group	EBT	EBR	EBR2	SBL	SBT	SBR	NER	NER2	SWL	SWT	Ø2	
Lane Configurations	↕↕	↕		↕	↕↕	↕	↕↕			↕↕		
Traffic Volume (vph)	420	145	19	343	630	164	141	30	48	58		
Future Volume (vph)	420	145	19	343	630	164	141	30	48	58		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		50			0		0			0		
Storage Lanes		1			1		2			0		
Taper Length (ft)					25					25		
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.88	1.00	0.95	0.95		
Ped Bike Factor		0.68				0.98						
Frt		0.850				0.850	0.850					
Flt Protected				0.950						0.978		
Satd. Flow (prot)	2443	1439	0	1593	3124	1411	2517	0	0	3003		
Flt Permitted				0.950						0.978		
Satd. Flow (perm)	2443	975	0	1593	3124	1388	2517	0	0	3003		
Right Turn on Red			Yes					No				
Satd. Flow (RTOR)		109										
Link Speed (mph)	25				25					25		
Link Distance (ft)	317				380					156		
Travel Time (s)	8.6				10.4					4.3		
Confl. Peds. (#/hr)			173									
Confl. Bikes (#/hr)			2			6		52				
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.89	0.89	0.76	0.76		
Heavy Vehicles (%)	33%	1%	1%	2%	4%	3%	2%	0%	2%	9%		
Adj. Flow (vph)	494	171	22	377	692	180	158	34	63	76		
Shared Lane Traffic (%)												
Lane Group Flow (vph)	494	193	0	377	692	180	192	0	0	139		
Turn Type	NA	Perm		Perm	NA	Perm	Prot		Perm	NA		
Protected Phases	4				1		7			7	2	
Permitted Phases		4		1		1			7			
Detector Phase	4	4		1	1	1	7		7	7		
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	1.0	
Minimum Split (s)	21.0	21.0		19.0	19.0	19.0	12.0		12.0	12.0	21.0	
Total Split (s)	31.0	31.0		37.0	37.0	37.0	21.0		21.0	21.0	21.0	
Total Split (%)	28.2%	28.2%		33.6%	33.6%	33.6%	19.1%		19.1%	19.1%	19%	
Maximum Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	
All-Red Time (s)	3.0	3.0		2.0	2.0	2.0	3.0		3.0	3.0	0.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0			0.0		
Total Lost Time (s)	6.0	6.0		5.0	5.0	5.0	6.0			6.0		
Lead/Lag				Lead	Lead	Lead					Lag	
Lead-Lag Optimize?				Yes	Yes	Yes					Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0	
Recall Mode	None	None		C-Max	C-Max	C-Max	None		None	None	Ped	
Walk Time (s)	7.0	7.0		6.0	6.0	6.0					7.0	
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0					11.0	
Pedestrian Calls (#/hr)	0	0		0	0	0					0	
Act Effct Green (s)	24.2	24.2		35.6	35.6	35.6	12.3			12.3		
Actuated g/C Ratio	0.22	0.22		0.32	0.32	0.32	0.11			0.11		
v/c Ratio	0.92	0.65		0.73	0.69	0.40	0.69			0.41		
Control Delay	66.0	28.1		71.5	66.4	61.8	59.4			48.7		
Queue Delay	0.0	0.0		5.7	1.5	0.0	0.0			0.0		
Total Delay	66.0	28.1		77.2	67.9	61.8	59.4			48.7		
LOS	E	C		E	E	E	E			D		
Approach Delay	55.4			69.9						48.7		
Approach LOS	E			E						D		
90th %ile Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0	
90th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped	
70th %ile Green (s)	25.0	25.0		32.5	32.5	32.5	14.5		14.5	14.5	18.0	
70th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped	
50th %ile Green (s)	25.0	25.0		34.3	34.3	34.3	12.7		12.7	12.7	18.0	
50th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped	
30th %ile Green (s)	25.0	25.0		36.1	36.1	36.1	10.9		10.9	10.9	18.0	
30th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped	
10th %ile Green (s)	20.8	20.8		42.9	42.9	42.9	8.3		8.3	8.3	18.0	
10th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Gap		Gap	Gap	Ped	
Queue Length 50th (ft)	178	52		280	269	130	75			48		
Queue Length 95th (ft)	#248	121		#416	335	206	113			65		
Internal Link Dist (ft)		237			300					76		
Turn Bay Length (ft)		50										
Base Capacity (vph)	555	305		514	1010	448	343			409		
Starvation Cap Reductn	0	0		89	160	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	0.89	0.63		0.89	0.81	0.40	0.56			0.34		

Intersection Summary

Area Type: CBD

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 102 (93%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 63.3

Intersection LOS: E

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbus Avenue & Arlington Street & Stuart Street

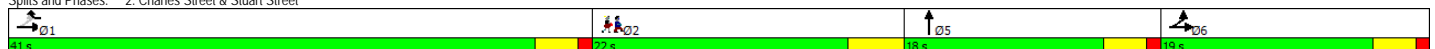


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	249	372	0	0	0	586	0	427	68	0	0	0	
Future Volume (vph)	249	372	0	0	0	586	0	427	68	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	150		0	0		0	0		0	0		0	
Storage Lanes	1		0	0		2	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor						0.850		1.00					
Frt								0.979					
Flt Protected	0.950												
Satd. Flow (prot)	1608	3217	0	0	0	2508	0	4460	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	1608	3217	0	0	0	2508	0	4460	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes		Yes				Yes	
Satd. Flow (RTOR)	277					1066		25					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		301			255			371			608		
Travel Time (s)		8.2			7.0			10.1			16.6		
Confl. Bikes (#/hr)						2		13					
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.25	
Heavy Vehicles (%)	1%	1%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	277	413	0	0	0	644	0	469	75	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	277	413	0	0	0	644	0	544	0	0	0	0	
Turn Type	custom	NA				Prot		NA					
Protected Phases	6	1 6				1		5					2
Permitted Phases	1												
Detector Phase	6	1 6				1		5					
Switch Phase													
Minimum Initial (s)	5.0					12.0		8.0					5.0
Minimum Split (s)	10.0					41.0		18.0					22.0
Total Split (s)	19.0					41.0		18.0					22.0
Total Split (%)	19.0%					41.0%		18.0%					22%
Maximum Green (s)	15.0					37.0		14.0					18.0
Yellow Time (s)	3.0					3.0		3.0					4.0
All-Red Time (s)	1.0					1.0		1.0					0.0
Lost Time Adjust (s)	0.0					0.0		0.0					
Total Lost Time (s)	4.0					4.0		4.0					
Lead/Lag	Lag					Lead		Lead					Lag
Lead-Lag Optimize?	Yes					Yes		Yes					Yes
Vehicle Extension (s)	2.0					2.0		2.0					2.0
Recall Mode	None					Max		None					None
Walk Time (s)	6.0					28.0		5.0					8.0
Flash Dont Walk (s)	0.0					9.0		9.0					10.0
Pedestrian Calls (#/hr)	0					0		0					500
Act Effect Green (s)	52.9	52.9				37.0		13.5					
Actuated g/C Ratio	0.55	0.55				0.38		0.14					
v/c Ratio	0.28	0.23				0.40		0.84					
Control Delay	2.1	11.7				0.7		52.0					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	2.1	11.7				0.7		52.0					
LOS	A	B				A		D					
Approach Delay		7.8			0.7			52.0					
Approach LOS		A			A			D					
90th %ile Green (s)	15.0					37.0		14.0					18.0
90th %ile Term Code	Max					MaxR		Max					Ped
70th %ile Green (s)	14.1					37.0		14.0					18.0
70th %ile Term Code	Gap					MaxR		Max					Ped
50th %ile Green (s)	11.9					37.0		14.0					18.0
50th %ile Term Code	Gap					MaxR		Max					Ped
30th %ile Green (s)	10.8					37.0		14.0					18.0
30th %ile Term Code	Gap					MaxR		Max					Ped
10th %ile Green (s)	8.1					37.0		11.7					18.0
10th %ile Term Code	Gap					MaxR		Gap					Ped
Queue Length 50th (ft)	0	65				0		115					
Queue Length 95th (ft)	34	92				0		#177					
Internal Link Dist (ft)		221			175			291			528		
Turn Bay Length (ft)	150												
Base Capacity (vph)	996	1739				1619		668					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.28	0.24				0.40		0.81					

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 96.5
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 18.2
Intersection Capacity Utilization 59.0%
Analysis Period (min) 15
90th %ile Actuated Cycle: 100
70th %ile Actuated Cycle: 99.1
50th %ile Actuated Cycle: 96.9
30th %ile Actuated Cycle: 95.8
10th %ile Actuated Cycle: 90.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Charles Street & Stuart Street



















Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	434	434	0	0	0	160	0	606	102	0	0	0	
Future Volume (vph)	434	434	0	0	0	160	0	606	102	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt						0.865		0.978					
Flt Protected	0.950												
Satd. Flow (prot)	3433	3539	0	0	0	1644	0	4956	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	3433	3539	0	0	0	1644	0	4956	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)	452					485		38					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		892			331			608			262		
Travel Time (s)		24.3			9.0			16.6			7.1		
Confl. Bikes (#/hr)								18					
Peak Hour Factor	0.96	0.96	0.96	0.82	0.82	0.82	0.90	0.90	0.90	0.25	0.25	0.25	
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	452	452	0	0	0	195	0	673	113	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	452	452	0	0	0	195	0	786	0	0	0	0	
Turn Type	Split	NA				Prot		NA					
Protected Phases	5!	5				5!		1					2
Permitted Phases													
Detector Phase	5	5				5		1					
Switch Phase													
Minimum Initial (s)	8.0	8.0				8.0		8.0					1.0
Minimum Split (s)	31.0	31.0				31.0		35.0					24.0
Total Split (s)	31.0	31.0				31.0		35.0					24.0
Total Split (%)	34.4%	34.4%				34.4%		38.9%					27%
Maximum Green (s)	26.5	26.5				26.5		29.0					20.0
Yellow Time (s)	3.0	3.0				3.0		3.5					4.0
All-Red Time (s)	1.5	1.5				1.5		2.5					0.0
Lost Time Adjust (s)	0.0	0.0				0.0		0.0					
Total Lost Time (s)	4.5	4.5				4.5		6.0					
Lead/Lag								Lead					Lag
Lead-Lag Optimize?								Yes					Yes
Vehicle Extension (s)	2.0	2.0				2.0		2.0					0.2
Recall Mode	Max	Max				Max		C-Max					None
Walk Time (s)	14.5	14.5				14.5		24.0					7.0
Flash Dont Walk (s)	12.0	12.0				12.0		5.0					13.0
Pedestrian Calls (#/hr)	0	0				0		0					500
Act Effct Green (s)	26.5	26.5				26.5		29.0					
Actuated g/C Ratio	0.29	0.29				0.29		0.32					
v/c Ratio	0.34	0.43				0.24		0.48					
Control Delay	3.2	27.3				0.7		24.4					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	3.2	27.3				0.7		24.4					
LOS	A	C				A		C					
Approach Delay		15.2			0.7			24.4					
Approach LOS		B			A			C					
90th %ile Green (s)	26.5	26.5				26.5		29.0					20.0
90th %ile Term Code	MaxR	MaxR				MaxR		Coord					Ped
70th %ile Green (s)	26.5	26.5				26.5		29.0					20.0
70th %ile Term Code	MaxR	MaxR				MaxR		Coord					Ped
50th %ile Green (s)	26.5	26.5				26.5		29.0					20.0
50th %ile Term Code	MaxR	MaxR				MaxR		Coord					Ped
30th %ile Green (s)	26.5	26.5				26.5		29.0					20.0
30th %ile Term Code	MaxR	MaxR				MaxR		Coord					Ped
10th %ile Green (s)	26.5	26.5				26.5		29.0					20.0
10th %ile Term Code	MaxR	MaxR				MaxR		Coord					Ped
Queue Length 50th (ft)	0	108				0		123					
Queue Length 95th (ft)	32	153				0		161					
Internal Link Dist (ft)		812			251			528			182		
Turn Bay Length (ft)													
Base Capacity (vph)						826		1622					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.34	0.43				0.24		0.48					

Intersection Summary

Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 26 (29%), Referenced to phase 1:NBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 48.8%	ICU Level of Service A
Analysis Period (min) 15	
! Phase conflict between lane groups.	

Splits and Phases: 3: Charles Street & Boylston Street



													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	397	122	0	0	0	0	0	0	553	1068	0	
Future Volume (vph)	0	397	122	0	0	0	0	0	0	553	1068	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	1.00	
Ped Bike Factor		0.99											
Frt		0.965											
Flt Protected										0.950	0.994		
Satd. Flow (prot)	0	5757	0	0	0	0	0	0	0	1537	4824	0	
Flt Permitted										0.950	0.994		
Satd. Flow (perm)	0	5757	0	0	0	0	0	0	0	1537	4824	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		70								417	50		
Link Speed (mph)		25			25				25		25		
Link Distance (ft)		336			892				297		292		
Travel Time (s)		9.2			24.3				8.1		8.0		
Confl. Bikes (#/hr)			30										
Peak Hour Factor	0.93	0.93	0.93	0.25	0.25	0.25	0.25	0.25	0.25	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	7%	14%	0%	0%	0%	0%	0%	0%	1%	1%	0%	
Adj. Flow (vph)	0	427	131	0	0	0	0	0	0	588	1136	0	
Shared Lane Traffic (%)										29%			
Lane Group Flow (vph)	0	558	0	0	0	0	0	0	0	417	1307	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								8.0	8.0		5.0
Minimum Split (s)		22.0								22.5	22.5		24.0
Total Split (s)		35.0								51.0	51.0		24.0
Total Split (%)		31.8%								46.4%	46.4%		22%
Maximum Green (s)		31.0								47.0	47.0		20.0
Yellow Time (s)		3.0								3.0	3.0		4.0
All-Red Time (s)		1.0								1.0	1.0		0.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		4.0								4.0	4.0		
Lead/Lag		Lead											Lag
Lead-Lag Optimize?		Yes											Yes
Vehicle Extension (s)		2.0								2.0	2.0		2.0
Recall Mode		Max								C-Max	C-Max		None
Walk Time (s)		7.0								7.0	7.0		7.0
Flash Dont Walk (s)		8.0								8.0	8.0		13.0
Pedestrian Calls (#/hr)		0								0	0		500
Act Effct Green (s)		31.0								47.0	47.0		
Actuated g/C Ratio		0.28								0.43	0.43		
v/c Ratio		0.33								0.47	0.63		
Control Delay		27.8								3.8	25.2		
Queue Delay		0.0								0.0	0.0		
Total Delay		27.8								3.8	25.2		
LOS		C								A	C		
Approach Delay		27.8									20.0		
Approach LOS		C									C		
90th %ile Green (s)		31.0								47.0	47.0		20.0
90th %ile Term Code		MaxR								Coord	Coord		Ped
70th %ile Green (s)		31.0								47.0	47.0		20.0
70th %ile Term Code		MaxR								Coord	Coord		Ped
50th %ile Green (s)		31.0								47.0	47.0		20.0
50th %ile Term Code		MaxR								Coord	Coord		Ped
30th %ile Green (s)		31.0								47.0	47.0		20.0
30th %ile Term Code		MaxR								Coord	Coord		Ped
10th %ile Green (s)		31.0								47.0	47.0		20.0
10th %ile Term Code		MaxR								Coord	Coord		Ped
Queue Length 50th (ft)		78								0	263		
Queue Length 95th (ft)		105								66	315		
Internal Link Dist (ft)		256			812			217			212		
Turn Bay Length (ft)													
Base Capacity (vph)		1672								895	2089		
Starvation Cap Reductn		0								0	0		
Spillback Cap Reductn		0								0	10		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.33								0.47	0.63		

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 8 (7%), Referenced to phase 5:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 21.9

Intersection LOS: C






Intersection Capacity Utilization 48.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Boylston Street & Arlington Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	43	104	322	0	0	0	0	0	989	190	
Future Volume (vph)	0	0	43	104	322	0	0	0	0	0	989	190	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor											1.00		
Frt			0.865								0.976		
Flt Protected				0.950	0.998								
Satd. Flow (prot)	0	0	1644	1535	3285	0	0	0	0	0	4906	0	
Flt Permitted				0.950	0.998								
Satd. Flow (perm)	0	0	1644	1535	3285	0	0	0	0	0	4906	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)			378	108	55						43		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		227			222			380			297		
Travel Time (s)		6.2			6.1			10.4			8.1		
Confl. Bikes (#/hr)						6						16	
Peak Hour Factor	0.60	0.60	0.60	0.87	0.87	0.87	0.25	0.25	0.25	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	0%	0%	7%	5%	0%	2%	2%	2%	0%	3%	2%	
Adj. Flow (vph)	0	0	72	120	370	0	0	0	0	0	1020	196	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	0	72	108	382	0	0	0	0	0	1216	0	
Turn Type			Prot	Split	NA						NA		
Protected Phases			1!	1!	1						5		2
Permitted Phases													
Detector Phase			1	1	1						5		
Switch Phase													
Minimum Initial (s)			8.0	8.0	8.0						8.0		5.0
Minimum Split (s)			37.0	37.0	37.0						48.0		25.0
Total Split (s)			37.0	37.0	37.0						48.0		25.0
Total Split (%)			33.6%	33.6%	33.6%						43.6%		23%
Maximum Green (s)			32.0	32.0	32.0						43.5		21.0
Yellow Time (s)			3.5	3.5	3.5						3.5		4.0
All-Red Time (s)			1.5	1.5	1.5						1.0		0.0
Lost Time Adjust (s)			0.0	0.0	0.0						0.0		
Total Lost Time (s)			5.0	5.0	5.0						4.5		
Lead/Lag			Lead	Lead	Lead								Lag
Lead-Lag Optimize?			Yes	Yes	Yes								Yes
Vehicle Extension (s)			2.0	2.0	2.0						2.0		2.0
Recall Mode			Max	Max	Max						C-Max		None
Walk Time (s)			23.0	23.0	23.0						29.5		7.0
Flash Dont Walk (s)			9.0	9.0	9.0						14.0		14.0
Pedestrian Calls (#/hr)			0	0	0						0		500
Act Effct Green (s)			32.0	32.0	32.0						43.5		
Actuated g/C Ratio			0.29	0.29	0.29						0.40		
v/c Ratio			0.10	0.21	0.38						0.62		
Control Delay			0.3	6.6	27.7						9.2		
Queue Delay			0.0	0.1	0.0						0.2		
Total Delay			0.3	6.7	27.7						9.4		
LOS			A	A	C						A		
Approach Delay		0.3			23.1						9.4		
Approach LOS		A			C						A		
90th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
90th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
70th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
70th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
50th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
50th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
30th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
30th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
10th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
10th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
Queue Length 50th (ft)			0	0	100						45		
Queue Length 95th (ft)			0	40	140						52		
Internal Link Dist (ft)		147			142			300			217		
Turn Bay Length (ft)													
Base Capacity (vph)			746	523	994						1966		
Starvation Cap Reductn			0	0	0						203		
Spillback Cap Reductn			88	73	0						50		
Storage Cap Reductn			0	0	0						0		
Reduced v/c Ratio			0.11	0.24	0.38						0.69		

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 15 (14%), Referenced to phase 5: SBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 12.8

Intersection LOS: B

Intersection Capacity Utilization 51.0%

ICU Level of Service A
















Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 5: St James Avenue/Park Plaza & Arlington Street



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↖	↗	
Traffic Volume (veh/h)	0	0	155	335	32	0
Future Volume (Veh/h)	0	0	155	335	32	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.95	0.95	0.42	0.42
Hourly flow rate (vph)	0	0	163	353	76	0
Pedestrians					21	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	565					
pX, platoon unblocked						
vC, conflicting volume			21		700	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			21		700	21
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		78	100
cM capacity (veh/h)			1557		352	1041
Direction, Lane #	WB 1	NB 1				
Volume Total	516	76				
Volume Left	163	76				
Volume Right	0	0				
cSH	1557	352				
Volume to Capacity	0.10	0.22				
Queue Length 95th (ft)	9	20				
Control Delay (s)	3.1	18.0				
Lane LOS	A	C				
Approach Delay (s)	3.1	18.0				
Approach LOS		C				
Intersection Summary						
Average Delay		5.0				
Intersection Capacity Utilization		36.2%		ICU Level of Service		A
Analysis Period (min)		15				

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Traffic Volume (veh/h)	16	38	32	0	0	5	1	36	117	0	0
Future Volume (Veh/h)	16	38	32	0	0	5	1	36	117	0	0
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.42	0.42	0.42	0.95	0.95	0.95	0.25	0.25
Hourly flow rate (vph)	24	57	48	0	0	12	1	38	123	0	0
Pedestrians	45			112			21				
Lane Width (ft)	12.0			12.0			12.0				
Walking Speed (ft/s)	3.5			3.5			3.5				
Percent Blockage	4			11			2				
Right turn flare (veh)											
Median type	None					None					
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	203	91	72	38				57	144 97		
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	203	91	72	38				57	144 97		
tC, single (s)	7.1	6.5	6.2	4.1				4.1	7.1 6.5		
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2				2.2	3.5 4.0		
p0 queue free %	96	92	95	100				100	100 100		
cM capacity (veh/h)	628	759	926	1585				1481	699 759		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	129	12	39	123							
Volume Left	24	0	1	0							
Volume Right	48	12	0	123							
cSH	781	1585	1481	1700							
Volume to Capacity	0.17	0.00	0.00	0.07							
Queue Length 95th (ft)	15	0	0	0							
Control Delay (s)	10.5	0.0	0.2	0.0							
Lane LOS	B		A								
Approach Delay (s)	10.5	0.0	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay	4.5										
Intersection Capacity Utilization	25.5%			ICU Level of Service				A			
Analysis Period (min)	15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Volume (veh/h)	0	0	0	165	21	0
Future Volume (Veh/h)	0	0	0	165	21	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.75	0.75
Hourly flow rate (vph)	0	0	0	174	28	0
Pedestrians	35					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0	122	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	122	0	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	97	100	
cM capacity (veh/h)			1636	866	1091	
Direction, Lane #	WB 1	WB 2	NB 1			
Volume Total	87	87	28			
Volume Left	0	0	28			
Volume Right	0	0	0			
cSH	1700	1700	866			
Volume to Capacity	0.05	0.05	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	9.3			
Lane LOS			A			
Approach Delay (s)	0.0		9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			14.6%	ICU Level of Service	A	
Analysis Period (min)			15			

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↓	
Traffic Volume (veh/h)	130	698	0	0	25	0
Future Volume (Veh/h)	130	698	0	0	25	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	134	720	0	0	28	0
Pedestrians			18		156	
Lane Width (ft)			0.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		15	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		556	301			
pX, platoon unblocked						
vC, conflicting volume	156				802	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156				802	156
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				89	100
cM capacity (veh/h)	1210				247	739
Direction, Lane #	EB 1	EB 2	SB 1			
Volume Total	374	480	28			
Volume Left	134	0	28			
Volume Right	0	0	0			
cSH	1210	1700	247			
Volume to Capacity	0.11	0.28	0.11			
Queue Length 95th (ft)	9	0	9			
Control Delay (s)	3.7	0.0	21.5			
Lane LOS	A		C			
Approach Delay (s)	1.6		21.5			
Approach LOS			C			
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		33.1%		ICU Level of Service		A
Analysis Period (min)		15				

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations			↔	↔		↔	↔					↔	↔	↔	
Traffic Volume (vph)	1	0	328	154	2	133	503	0	0	0	0	66	267	142	
Future Volume (vph)	1	0	328	154	2	133	503	0	0	0	0	66	267	142	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			0			100						0			170
Storage Lanes			0			1						0			1
Taper Length (ft)			25			25						25			
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	
Ped Bike Factor															
Frt				0.850										0.850	
Flt Protected						0.950						0.950			
Satd. Flow (prot)	0	0	3439	1599	0	1770	3539	0	0	0	0	1399	3471	1392	
Flt Permitted			0.842			0.478						0.950			
Satd. Flow (perm)	0	0	2895	1599	0	890	3539	0	0	0	0	1399	3471	1392	
Right Turn on Red				Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)				173									153		
Link Speed (mph)			25				25			25			25		
Link Distance (ft)			298				527			152			434		
Travel Time (s)			8.1				14.4			4.1			11.8		
Confl. Bikes (#/hr)				12				8						2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.25	1.00	1.00	0.25	0.92	0.92	0.92	0.93	0.93	0.93	
Heavy Vehicles (%)	0%	0%	5%	1%	2%	2%	2%	2%	2%	2%	2%	29%	4%	16%	
Adj. Flow (vph)	1	0	369	173	8	133	503	0	0	0	0	71	287	153	
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	370	173	0	141	503	0	0	0	0	71	287	153	
Turn Type	Perm		NA	Prot	custom	D.P+P	NA					Split	NA	Prot	
Protected Phases			1	1		6	1 6					5	5	5	2
Permitted Phases	1				6	1									
Detector Phase	1		1	1	6	6	1 6					5	5	5	
Switch Phase															
Minimum Initial (s)	8.0		8.0	8.0	6.0	6.0						8.0	8.0	8.0	1.0
Minimum Split (s)	13.5		13.5	13.5	11.5	11.5						13.0	13.0	13.0	28.0
Total Split (s)	34.0		34.0	34.0	14.0	14.0						33.0	33.0	33.0	29.0
Total Split (%)	30.9%		30.9%	30.9%	12.7%	12.7%						30.0%	30.0%	30.0%	26%
Maximum Green (s)	28.5		28.5	28.5	8.5	8.5						28.0	28.0	28.0	26.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0						3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.5	2.5	2.5	2.5						1.5	1.5	1.5	1.0
Lost Time Adjust (s)			0.0	0.0		0.0						0.0	0.0	0.0	
Total Lost Time (s)			5.5	5.5		5.5						5.0	5.0	5.0	
Lead/Lag	Lead		Lead	Lead	Lag	Lag						Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes		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	3.0
Recall Mode	C-Max		C-Max	C-Max	None	None						None	None	None	Ped
Walk Time (s)	7.0		7.0	7.0	6.0	6.0									7.0
Flash Dont Walk (s)	0.0		0.0	0.0	0.0	0.0									18.0
Pedestrian Calls (#/hr)	0		0	0	0	0									0
Act Effct Green (s)			35.2	35.2		50.5	56.0					15.5	15.5	15.5	
Actuated g/C Ratio			0.32	0.32		0.46	0.51					0.14	0.14	0.14	
v/c Ratio			0.40	0.28		0.27	0.28					0.36	0.59	0.47	
Control Delay			32.3	6.1		12.6	13.3					46.7	48.8	11.3	
Queue Delay			0.0	0.0		0.0	0.0					0.0	0.0	0.0	
Total Delay			32.3	6.1		12.6	13.3					46.7	48.8	11.3	
LOS			C	A		B	B					D	D	B	
Approach Delay			24.0			13.2						37.3			
Approach LOS			C			B						D			
90th %ile Green (s)	28.5		28.5	28.5	16.6	16.6						20.9	20.9	20.9	25.0
90th %ile Term Code	Coord		Coord	Coord	Max	Max						Gap	Gap	Gap	Ped
70th %ile Green (s)	28.9		28.9	28.9	19.3	19.3						17.8	17.8	17.8	25.0
70th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
50th %ile Green (s)	34.3		34.3	34.3	16.4	16.4						15.3	15.3	15.3	25.0
50th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
30th %ile Green (s)	39.5		39.5	39.5	13.7	13.7						12.8	12.8	12.8	25.0
30th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
10th %ile Green (s)	44.9		44.9	44.9	10.6	10.6						10.5	10.5	10.5	25.0
10th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
Queue Length 50th (ft)			107	0		73	146					46	101	0	
Queue Length 95th (ft)			163	51		135	213					86	137	55	
Internal Link Dist (ft)			218				447			72			354		
Turn Bay Length (ft)						100								170	
Base Capacity (vph)			926	629		531	1802					356	883	468	
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			0.40	0.28		0.27	0.28					0.20	0.33	0.33	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 23.9

Intersection LOS: C

Intersection Capacity Utilization 44.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 10: Tremont Street & Stuart Street



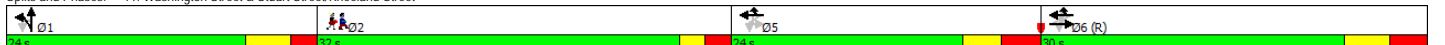
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR	Ø2	Ø5
Lane Configurations																	
Traffic Volume (vph)	9	52	281	46	5	78	596	133	10	46	157	96	0	0	0		
Future Volume (vph)	9	52	281	46	5	78	596	133	10	46	157	96	0	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		195		0		0		0		0		0	0	0	0		
Storage Lanes		1		0		0		1		0		0	0	0	0		
Taper Length (ft)		25				25				25			25				
Lane Util. Factor	0.95	1.00	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00		
Ped Bike Factor			1.00								0.99						
Frt			0.979					0.850			0.953						
Flt Protected		0.950					0.994				0.991						
Satd. Flow (prot)	0	1745	3209	0	0	0	3426	1538	0	0	3135	0	0	0	0		
Flt Permitted		0.386					0.617				0.991						
Satd. Flow (perm)	0	709	3209	0	0	0	2127	1538	0	0	3135	0	0	0	0		
Right Turn on Red				Yes				Yes				Yes			Yes		
Satd. Flow (RTOR)			15					137				57					
Link Speed (mph)			25				25				25			25			
Link Distance (ft)			527				256				211			185			
Travel Time (s)			14.4				7.0				5.8			5.0			
Confl. Bikes (#/hr)				13				7				11					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.92	0.92	0.92		
Heavy Vehicles (%)	0%	4%	11%	2%	0%	3%	5%	5%	0%	4%	13%	2%	2%	2%	2%		
Adj. Flow (vph)	10	58	312	51	5	80	614	137	10	48	164	100	0	0	0		
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	0	68	363	0	0	0	699	137	0	0	322	0	0	0	0		
Turn Type	Perm	Perm	NA		Perm	Perm	NA	Prot	Perm	Split	NA						
Protected Phases			6				5 6	5 6			1		1			2	5
Permitted Phases	6	6			5 6	5 6			1								
Detector Phase	6	6	6		5 6	5 6	5 6	5 6	1	1	1						
Switch Phase																	
Minimum Initial (s)	9.0	9.0	9.0						14.0	14.0	14.0					1.0	5.0
Minimum Split (s)	24.5	24.5	24.5						19.5	19.5	19.5					32.0	11.0
Total Split (s)	30.0	30.0	30.0						24.0	24.0	24.0					32.0	24.0
Total Split (%)	27.3%	27.3%	27.3%						21.8%	21.8%	21.8%					29%	22%
Maximum Green (s)	23.5	23.5	23.5						18.5	18.5	18.5					28.0	18.0
Yellow Time (s)	3.5	3.5	3.5						3.5	3.5	3.5					2.0	3.0
All-Red Time (s)	3.0	3.0	3.0						2.0	2.0	2.0					2.0	3.0
Lost Time Adjust (s)			0.0	0.0							0.0						
Total Lost Time (s)			6.5	6.5							5.5						
Lead/Lag	Lag	Lag	Lag						Lead	Lead	Lead					Lag	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	C-Max	C-Max	C-Max						Max	Max	Max					Ped	Max
Walk Time (s)																7.0	
Flash Dont Walk (s)																21.0	
Pedestrian Calls (#/hr)																0	
Act Effect Green (s)		23.5	23.5				48.0	48.0			18.5						
Actuated g/C Ratio		0.21	0.21				0.44	0.44			0.17						
v/c Ratio		0.45	0.52				0.75	0.18			0.56						
Control Delay		58.8	51.7				32.3	3.8			38.6						
Queue Delay		0.0	0.0				0.0	0.0			0.0						
Total Delay		58.8	51.7				32.3	3.8			38.6						
LOS		E	D				C	A			D						
Approach Delay			52.8				27.7				38.6						
Approach LOS			D				C				D						
90th %ile Green (s)	23.5	23.5	23.5						18.5	18.5	18.5					28.0	18.0
90th %ile Term Code	Coord	Coord	Coord						MaxR	MaxR	MaxR					Ped	MaxR
70th %ile Green (s)	23.5	23.5	23.5						18.5	18.5	18.5					28.0	18.0
70th %ile Term Code	Coord	Coord	Coord						MaxR	MaxR	MaxR					Ped	MaxR
50th %ile Green (s)	23.5	23.5	23.5						18.5	18.5	18.5					28.0	18.0
50th %ile Term Code	Coord	Coord	Coord						MaxR	MaxR	MaxR					Ped	MaxR
30th %ile Green (s)	23.5	23.5	23.5						18.5	18.5	18.5					28.0	18.0
30th %ile Term Code	Coord	Coord	Coord						MaxR	MaxR	MaxR					Ped	MaxR
10th %ile Green (s)	23.5	23.5	23.5						18.5	18.5	18.5					28.0	18.0
10th %ile Term Code	Coord	Coord	Coord						MaxR	MaxR	MaxR					Ped	MaxR
Queue Length 50th (ft)		44	120				213	0			91						
Queue Length 95th (ft)		99	162				291	35			138						
Internal Link Dist (ft)			447				176				131			105			
Turn Bay Length (ft)		195															
Base Capacity (vph)		151	697				928	748			574						
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		0.45	0.52				0.75	0.18			0.56						

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 81.5 (74%), Referenced to phase 6:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 36.7
Intersection Capacity Utilization 54.8%
Analysis Period (min) 15

Intersection LOS: D
ICU Level of Service A

Splits and Phases: 11: Washington Street & Stuart Street/Kneeland Street



Lane Group	EBT	EBR	EBR2	SBL	SBT	SBR	NER	NER2	SWL	SWT	Ø2
Lane Configurations	↔	↔		↔	↔	↔	↔			↔	
Traffic Volume (vph)	475	173	31	345	733	272	171	36	74	84	
Future Volume (vph)	475	173	31	345	733	272	171	36	74	84	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		50		0		0	0		0		
Storage Lanes		1		1		1	2		0		
Taper Length (ft)				25					25		
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.88	1.00	0.95	0.95	
Ped Bike Factor		0.69				0.98					
Frt		0.850				0.850	0.850				
Flt Protected				0.950						0.977	
Satd. Flow (prot)	3154	1441	0	1608	3185	1454	2524	0	0	3174	
Flt Permitted				0.950						0.977	
Satd. Flow (perm)	3154	998	0	1608	3185	1428	2524	0	0	3174	
Right Turn on Red			Yes					No			
Satd. Flow (RTOR)		109									
Link Speed (mph)	25				25					25	
Link Distance (ft)	317				380					156	
Travel Time (s)	8.6				10.4					4.3	
Confl. Peds. (#/hr)			138								
Confl. Bikes (#/hr)			2			8		10			
Peak Hour Factor	0.94	0.94	0.94	0.96	0.96	0.96	0.85	0.85	0.93	0.93	
Heavy Vehicles (%)	3%	1%	0%	1%	2%	0%	1%	3%	0%	0%	
Adj. Flow (vph)	505	184	33	359	764	283	201	42	80	90	
Shared Lane Traffic (%)											
Lane Group Flow (vph)	505	217	0	359	764	283	243	0	0	170	
Turn Type	NA	Perm		Perm	NA	Perm	Prot		Perm	NA	
Protected Phases	4				1		7			7	2
Permitted Phases		4		1		1			7		
Detector Phase	4	4		1	1	1	7		7	7	
Switch Phase											
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	7.0
Minimum Split (s)	21.0	21.0		19.0	19.0	19.0	12.0		12.0	12.0	21.0
Total Split (s)	30.0	30.0		41.0	41.0	41.0	18.0		18.0	18.0	21.0
Total Split (%)	27.3%	27.3%		37.3%	37.3%	37.3%	16.4%		16.4%	16.4%	19%
Maximum Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		2.0	2.0	2.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.0	5.0	5.0	6.0		6.0	6.0	
Lead/Lag				Lead	Lead	Lead					Lag
Lead-Lag Optimize?				Yes	Yes	Yes					Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		C-Max	C-Max	C-Max	None		None	None	Ped
Walk Time (s)	7.0	7.0		6.0	6.0	6.0					7.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0					11.0
Pedestrian Calls (#/hr)	0	0		0	0	0					0
Act Effct Green (s)	21.6	21.6		38.0	38.0	38.0	12.4			12.4	
Actuated g/C Ratio	0.20	0.20		0.35	0.35	0.35	0.11			0.11	
v/c Ratio	0.82	0.77		0.65	0.70	0.58	0.86			0.47	
Control Delay	53.4	38.7		53.9	52.4	51.9	75.2			50.6	
Queue Delay	0.0	0.0		4.6	4.0	1.1	0.0			0.0	
Total Delay	53.4	38.7		58.5	56.5	53.0	75.2			50.6	
LOS	D	D		E	E	D	E			D	
Approach Delay	49.0				56.3					50.6	
Approach LOS	D				E					D	
90th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
90th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
70th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
70th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
50th %ile Green (s)	23.5	23.5		36.0	36.0	36.0	12.5		12.5	12.5	18.0
50th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Max		Max	Max	Ped
30th %ile Green (s)	20.4	20.4		37.4	37.4	37.4	14.2		14.2	14.2	18.0
30th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Gap		Gap	Gap	Ped
10th %ile Green (s)	16.2	16.2		44.4	44.4	44.4	11.4		11.4	11.4	18.0
10th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Gap		Gap	Gap	Ped
Queue Length 50th (ft)	176	71		266	299	209	97			60	
Queue Length 95th (ft)	236	#184		365	366	299	#162			96	
Internal Link Dist (ft)	237				300					76	
Turn Bay Length (ft)		50									
Base Capacity (vph)	688	302		555	1099	492	287			361	
Starvation Cap Reductn	0	0		130	250	72	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	0.73	0.72		0.84	0.90	0.67	0.85			0.47	

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 86 (78%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 55.6
Intersection LOS: E
Intersection Capacity Utilization 69.3%
ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbus Avenue & Arlington Street & Stuart Street

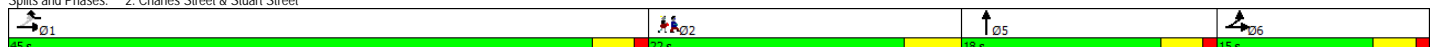














Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	298	597	0	0	0	569	0	463	91	0	0	0	
Future Volume (vph)	298	597	0	0	0	569	0	463	91	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	150		0	0		0	0		0	0		0	
Storage Lanes	1		0	0		2	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt						0.850		0.975					
Flt Protected	0.950												
Satd. Flow (prot)	1608	3217	0	0	0	2558	0	4466	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	1608	3217	0	0	0	2558	0	4466	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes		Yes				Yes	
Satd. Flow (RTOR)	314					1048		34					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		305			255			371			608		
Travel Time (s)		8.3			7.0			10.1			16.6		
Confl. Bikes (#/hr)						1		2					
Peak Hour Factor	0.95	0.95	0.95	0.85	0.85	0.85	0.94	0.94	0.94	0.25	0.25	0.25	
Heavy Vehicles (%)	1%	1%	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	
Adj. Flow (vph)	314	628	0	0	0	669	0	493	97	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	314	628	0	0	0	669	0	590	0	0	0	0	
Turn Type	custom	NA				Prot		NA					
Protected Phases	6	1 6				1		5					2
Permitted Phases	1												
Detector Phase	6	1 6				1		5					
Switch Phase													
Minimum Initial (s)	5.0					12.0		8.0					5.0
Minimum Split (s)	15.0					45.0		18.0					22.0
Total Split (s)	15.0					45.0		18.0					22.0
Total Split (%)	15.0%					45.0%		18.0%					22%
Maximum Green (s)	11.0					41.0		14.0					18.0
Yellow Time (s)	3.0					3.0		3.0					4.0
All-Red Time (s)	1.0					1.0		1.0					0.0
Lost Time Adjust (s)	0.0					0.0		0.0					
Total Lost Time (s)	4.0					4.0		4.0					
Lead/Lag	Lag					Lead		Lead					Lag
Lead-Lag Optimize?	Yes					Yes		Yes					Yes
Vehicle Extension (s)	2.0					2.0		2.0					2.0
Recall Mode	None					Max		None					None
Walk Time (s)	11.0					32.0		5.0					8.0
Flash Dont Walk (s)	0.0					9.0		9.0					10.0
Pedestrian Calls (#/hr)	0					0		0					500
Act Effect Green (s)	56.0	56.0				41.0		13.9					
Actuated g/C Ratio	0.56	0.56				0.41		0.14					
v/c Ratio	0.30	0.35				0.40		0.91					
Control Delay	2.0	12.7				0.7		59.2					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	2.0	12.7				0.7		59.2					
LOS	A	B				A		E					
Approach Delay		9.1			0.7			59.2					
Approach LOS		A			A			E					
90th %ile Green (s)	11.0					41.0		14.0					18.0
90th %ile Term Code	Max					MaxR		Max					Ped
70th %ile Green (s)	11.0					41.0		14.0					18.0
70th %ile Term Code	Max					MaxR		Max					Ped
50th %ile Green (s)	11.0					41.0		14.0					18.0
50th %ile Term Code	Max					MaxR		Max					Ped
30th %ile Green (s)	11.0					41.0		14.0					18.0
30th %ile Term Code	Max					MaxR		Max					Ped
10th %ile Green (s)	11.0					41.0		13.6					18.0
10th %ile Term Code	Max					MaxR		Gap					Ped
Queue Length 50th (ft)	0	108				0		129					
Queue Length 95th (ft)	36	145				0		#198					
Internal Link Dist (ft)		225			175			291			528		
Turn Bay Length (ft)	150												
Base Capacity (vph)	1039	1802				1667		654					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.30	0.35				0.40		0.90					

Intersection Summary

Area Type: CBD
 Cycle Length: 100
 Actuated Cycle Length: 99.9
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 20.0
 Intersection LOS: B
 Intersection Capacity Utilization 62.7%
 ICU Level of Service B
 Analysis Period (min) 15
 90th %ile Actuated Cycle: 100
 70th %ile Actuated Cycle: 100
 50th %ile Actuated Cycle: 100
 30th %ile Actuated Cycle: 100
 10th %ile Actuated Cycle: 99.6
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Charles Street & Stuart Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	524	515	0	0	0	210	0	757	169	0	0	0	
Future Volume (vph)	524	515	0	0	0	210	0	757	169	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt						0.865		0.973					
Flt Protected	0.950												
Satd. Flow (prot)	3433	3574	0	0	0	1644	0	4924	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	3433	3574	0	0	0	1644	0	4924	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)	582					380		54					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		892			331			608			262		
Travel Time (s)		24.3			9.0			16.6			7.1		
Confl. Bikes (#/hr)								8					
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.86	0.86	0.86	0.25	0.25	0.25	
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	0%	2%	3%	0%	0%	0%	
Adj. Flow (vph)	582	572	0	0	0	231	0	880	197	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	582	572	0	0	0	231	0	1077	0	0	0	0	
Turn Type	Split	NA				Prot		NA					
Protected Phases	5!	5				5!		1					2
Permitted Phases													
Detector Phase	5	5				5		1					
Switch Phase													
Minimum Initial (s)	8.0	8.0				8.0		8.0					5.0
Minimum Split (s)	36.0	36.0				36.0		50.0					24.0
Total Split (s)	36.0	36.0				36.0		50.0					24.0
Total Split (%)	32.7%	32.7%				32.7%		45.5%					22%
Maximum Green (s)	31.5	31.5				31.5		44.0					20.0
Yellow Time (s)	3.0	3.0				3.0		3.5					4.0
All-Red Time (s)	1.5	1.5				1.5		2.5					0.0
Lost Time Adjust (s)	0.0	0.0				0.0		0.0					
Total Lost Time (s)	4.5	4.5				4.5		6.0					
Lead/Lag								Lead					Lag
Lead-Lag Optimize?								Yes					Yes
Vehicle Extension (s)	2.0	2.0				2.0		2.0					2.0
Recall Mode	None	None				None		C-Max					None
Walk Time (s)	19.5	19.5				19.5		39.0					7.0
Flash Dont Walk (s)	12.0	12.0				12.0		5.0					13.0
Pedestrian Calls (#/hr)	0	0				0		0					454
Act Effct Green (s)	26.8	26.8				26.8		48.7					
Actuated g/C Ratio	0.24	0.24				0.24		0.44					
v/c Ratio	0.46	0.66				0.34		0.49					
Control Delay	6.9	35.2				1.3		22.2					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	6.9	35.2				1.3		22.2					
LOS	A	D				A		C					
Approach Delay		20.9			1.3			22.2					
Approach LOS		C			A			C					
90th %ile Green (s)	31.5	31.5				31.5		44.0					20.0
90th %ile Term Code	Max	Max				Max		Coord					Ped
70th %ile Green (s)	31.5	31.5				31.5		44.0					20.0
70th %ile Term Code	Max	Max				Max		Coord					Ped
50th %ile Green (s)	27.8	27.8				27.8		47.7					20.0
50th %ile Term Code	Gap	Gap				Gap		Coord					Ped
30th %ile Green (s)	24.1	24.1				24.1		51.4					20.0
30th %ile Term Code	Gap	Gap				Gap		Coord					Ped
10th %ile Green (s)	19.3	19.3				19.3		56.2					20.0
10th %ile Term Code	Gap	Gap				Gap		Coord					Ped
Queue Length 50th (ft)	64	209				0		186					
Queue Length 95th (ft)	105	273				0		228					
Internal Link Dist (ft)		812			251			528			182		
Turn Bay Length (ft)													
Base Capacity (vph)	1398	1023				741		2208					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.42	0.56				0.31		0.49					

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 25 (23%), Referenced to phase 1:NBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 19.7

Intersection LOS: B

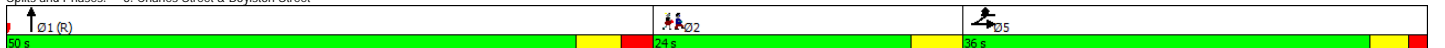
Intersection Capacity Utilization 58.8%





ICU Level of Service B

Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 3: Charles Street & Boylston Street








Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	713	209	0	0	0	0	0	0	673	1074	0	
Future Volume (vph)	0	713	209	0	0	0	0	0	0	673	1074	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	1.00	
Ped Bike Factor		0.99											
Frt		0.966											
Flt Protected										0.950	0.991		
Satd. Flow (prot)	0	6112	0	0	0	0	0	0	0	1552	4858	0	
Flt Permitted										0.950	0.991		
Satd. Flow (perm)	0	6112	0	0	0	0	0	0	0	1552	4858	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		73								417	50		
Link Speed (mph)		25			25				25		25		
Link Distance (ft)		336			892				297		292		
Travel Time (s)		9.2			24.3				8.1		8.0		
Confl. Bikes (#/hr)			22										
Peak Hour Factor	0.94	0.94	0.94	0.25	0.25	0.25	0.25	0.25	0.25	0.96	0.96	0.96	
Heavy Vehicles (%)	0%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	759	222	0	0	0	0	0	0	701	1119	0	
Shared Lane Traffic (%)										37%			
Lane Group Flow (vph)	0	981	0	0	0	0	0	0	0	442	1378	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5	2	
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								8.0	8.0	5.0	
Minimum Split (s)		24.0								22.0	22.0	24.0	
Total Split (s)		41.0								45.0	45.0	24.0	
Total Split (%)		37.3%								40.9%	40.9%	22%	
Maximum Green (s)		37.0								41.0	41.0	20.0	
Yellow Time (s)		3.0								3.0	3.0	4.0	
All-Red Time (s)		1.0								1.0	1.0	0.0	
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		4.0								4.0	4.0		
Lead/Lag		Lead										Lag	
Lead-Lag Optimize?		Yes										Yes	
Vehicle Extension (s)		2.0								2.0	2.0	2.0	
Recall Mode		Max								C-Max	C-Max	None	
Walk Time (s)		7.0								7.0	7.0	7.0	
Flash Dont Walk (s)		8.0								8.0	8.0	13.0	
Pedestrian Calls (#/hr)		0								0	0	500	
Act Effct Green (s)		37.0								41.0	41.0		
Actuated g/C Ratio		0.34								0.37	0.37		
v/c Ratio		0.47								0.53	0.75		
Control Delay		27.3								5.6	31.9		
Queue Delay		0.0								0.0	0.2		
Total Delay		27.3								5.6	32.1		
LOS		C								A	C		
Approach Delay		27.3									25.7		
Approach LOS		C									C		
90th %ile Green (s)		37.0								41.0	41.0	20.0	
90th %ile Term Code		MaxR								Coord	Coord	Ped	
70th %ile Green (s)		37.0								41.0	41.0	20.0	
70th %ile Term Code		MaxR								Coord	Coord	Ped	
50th %ile Green (s)		37.0								41.0	41.0	20.0	
50th %ile Term Code		MaxR								Coord	Coord	Ped	
30th %ile Green (s)		37.0								41.0	41.0	20.0	
30th %ile Term Code		MaxR								Coord	Coord	Ped	
10th %ile Green (s)		37.0								41.0	41.0	20.0	
10th %ile Term Code		MaxR								Coord	Coord	Ped	
Queue Length 50th (ft)		145								12	313		
Queue Length 95th (ft)		177								96	374		
Internal Link Dist (ft)		256			812			217			212		
Turn Bay Length (ft)													
Base Capacity (vph)		2104								840	1842		
Starvation Cap Reductn		0								0	0		
Spillback Cap Reductn		0								0	67		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.47								0.53	0.78		

Intersection Summary

Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 11 (10%), Referenced to phase 5:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Boylston Street & Arlington Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	62	144	369	0	0	0	0	0	1149	123	
Future Volume (vph)	0	0	62	144	369	0	0	0	0	0	1149	123	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor													
Frt			0.865								0.986		
Flt Protected				0.950	0.998								
Satd. Flow (prot)	0	0	1644	1595	3382	0	0	0	0	0	5058	0	
Flt Permitted				0.950	0.998								
Satd. Flow (perm)	0	0	1644	1595	3382	0	0	0	0	0	5058	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)			357	150	55						20		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		227			222			380			297		
Travel Time (s)		6.2			6.1			10.4			8.1		
Confl. Bikes (#/hr)													19
Peak Hour Factor	0.80	0.80	0.80	0.86	0.86	0.86	0.25	0.25	0.25	0.93	0.93	0.93	
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	0	0	78	167	429	0	0	0	0	0	1235	132	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	0	78	150	446	0	0	0	0	0	1367	0	
Turn Type			Prot	Split	NA						NA		
Protected Phases			1!	1!	1						5		2
Permitted Phases													
Detector Phase			1	1	1						5		
Switch Phase													
Minimum Initial (s)			8.0	8.0	8.0						8.0		5.0
Minimum Split (s)			35.0	35.0	35.0						50.0		25.0
Total Split (s)			35.0	35.0	35.0						50.0		25.0
Total Split (%)			31.8%	31.8%	31.8%						45.5%		23%
Maximum Green (s)			30.0	30.0	30.0						45.5		21.0
Yellow Time (s)			3.5	3.5	3.5						3.5		4.0
All-Red Time (s)			1.5	1.5	1.5						1.0		0.0
Lost Time Adjust (s)			0.0	0.0	0.0						0.0		
Total Lost Time (s)			5.0	5.0	5.0						4.5		
Lead/Lag			Lead	Lead	Lead								Lag
Lead-Lag Optimize?			Yes	Yes	Yes								Yes
Vehicle Extension (s)			2.0	2.0	2.0						2.0		2.0
Recall Mode			Max	Max	Max						C-Max		None
Walk Time (s)			21.0	21.0	21.0						31.5		7.0
Flash Dont Walk (s)			9.0	9.0	9.0						14.0		14.0
Pedestrian Calls (#/hr)			0	0	0						0		500
Act Effct Green (s)			30.0	30.0	30.0						45.5		
Actuated g/C Ratio			0.27	0.27	0.27						0.41		
v/c Ratio			0.11	0.28	0.46						0.65		
Control Delay			0.3	6.4	30.8						11.6		
Queue Delay			0.0	0.2	0.3						0.8		
Total Delay			0.4	6.6	31.2						12.4		
LOS			A	A	C						B		
Approach Delay		0.4			25.0						12.4		
Approach LOS		A			C						B		
90th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
90th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
70th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
70th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
50th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
50th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
30th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
30th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
10th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
10th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
Queue Length 50th (ft)			0	0	125						67		
Queue Length 95th (ft)			0	46	167						76		
Internal Link Dist (ft)		147			142			300			217		
Turn Bay Length (ft)													
Base Capacity (vph)			708	544	962						2103		
Starvation Cap Reductn			0	0	0						396		
Spillback Cap Reductn			85	77	155						89		
Storage Cap Reductn			0	0	0						0		
Reduced v/c Ratio			0.13	0.32	0.55						0.80		
















Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 18 (16%), Referenced to phase 5:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 15.6
Intersection Capacity Utilization 53.9%
Analysis Period (min) 15
! Phase conflict between lane groups.










Splits and Phases: 5: St James Avenue/Park Plaza & Arlington Street



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↖	↗	
Traffic Volume (veh/h)	0	0	162	387	64	0
Future Volume (Veh/h)	0	0	162	387	64	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.84	0.84	0.75	0.75
Hourly flow rate (vph)	0	0	193	461	85	0
Pedestrians	1				6	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	565					
pX, platoon unblocked						
vC, conflicting volume			6		854	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		854	6
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		71	100
cM capacity (veh/h)			1606		290	1076
Direction, Lane #	WB 1	NB 1				
Volume Total	654	85				
Volume Left	193	85				
Volume Right	0	0				
cSH	1606	290				
Volume to Capacity	0.12	0.29				
Queue Length 95th (ft)	10	30				
Control Delay (s)	3.1	22.5				
Lane LOS	A	C				
Approach Delay (s)	3.1	22.5				
Approach LOS		C				
Intersection Summary						
Average Delay		5.3				
Intersection Capacity Utilization		46.2%		ICU Level of Service		A
Analysis Period (min)		15				

													
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER		
Lane Configurations													
Traffic Volume (veh/h)	4	49	54	0	10	11	0	8	154	0	0		
Future Volume (Veh/h)	4	49	54	0	10	11	0	8	154	0	0		
Sign Control	Stop			Free			Free			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.80	0.80	0.80	0.75	0.75	0.75	0.84	0.84	0.84	0.25	0.25		
Hourly flow rate (vph)	5	61	68	0	13	15	0	10	183	0	0		
Pedestrians	54			93			6						
Lane Width (ft)	12.0			12.0			12.0						
Walking Speed (ft/s)	3.5			3.5			3.5						
Percent Blockage	5			9			1						
Right turn flare (veh)													
Median type	None					None							
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	178	84	80	10				82				135	92
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	178	84	80	10				82				135	92
tC, single (s)	7.1	6.5	6.2	4.1				4.1				7.1	6.5
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	2.2				2.2				3.5	4.0
p0 queue free %	99	92	93	100				100				100	100
cM capacity (veh/h)	655	768	929	1623				1450				700	761
Direction, Lane #	WB 1	NB 1	SB 1	SB 2									
Volume Total	134	28	10	183									
Volume Left	5	0	0	0									
Volume Right	68	15	0	183									
eSH	836	1623	1450	1700									
Volume to Capacity	0.16	0.00	0.00	0.11									
Queue Length 95th (ft)	14	0	0	0									
Control Delay (s)	10.1	0.0	0.0	0.0									
Lane LOS	B												
Approach Delay (s)	10.1	0.0	0.0										
Approach LOS	B												
Intersection Summary													
Average Delay	3.8												
Intersection Capacity Utilization	27.9%			ICU Level of Service				A					
Analysis Period (min)	15												

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Volume (veh/h)	0	0	0	212	41	0
Future Volume (Veh/h)	0	0	0	212	41	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	0	0	0	226	44	0
Pedestrians	19					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0	132	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	132	0	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
pD queue free %			100	95	100	
cM capacity (veh/h)			1636	854	1091	
Direction, Lane #	WB 1	WB 2	NB 1			
Volume Total	113	113	44			
Volume Left	0	0	44			
Volume Right	0	0	0			
cSH	1700	1700	854			
Volume to Capacity	0.07	0.07	0.05			
Queue Length 95th (ft)	0	0	4			
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			1.5			
Intersection Capacity Utilization			15.9%	ICU Level of Service	A	
Analysis Period (min)			15			

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 				
Traffic Volume (veh/h)	30	891	0	0	136	0
Future Volume (Veh/h)	30	891	0	0	136	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	33	979	0	0	153	0
Pedestrians			5		246	
Lane Width (ft)			0.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		23	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		555	305			
pX, platoon unblocked					0.91	
vC, conflicting volume	246				806	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				592	246
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				49	100
cM capacity (veh/h)	1020				298	582
Direction, Lane #	EB 1	EB 2	SB 1			
Volume Total	359	653	153			
Volume Left	33	0	153			
Volume Right	0	0	0			
cSH	1020	1700	298			
Volume to Capacity	0.03	0.38	0.51			
Queue Length 95th (ft)	3	0	69			
Control Delay (s)	1.1	0.0	29.1			
Lane LOS	A		D			
Approach Delay (s)	0.4		29.1			
Approach LOS			D			
Intersection Summary						
Average Delay		4.2				
Intersection Capacity Utilization		39.7%		ICU Level of Service		A
Analysis Period (min)		15				

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations			↑↑	↑		↓	↑↑					↓	↑↑	↑	
Traffic Volume (vph)	2	0	413	125	1	97	368	0	0	0	0	189	356	138	
Future Volume (vph)	2	0	413	125	1	97	368	0	0	0	0	189	356	138	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			0			100						0			
Storage Lanes			0			1						0			
Taper Length (ft)			25			25						25			
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	
Frt				0.850										0.850	
Flt Protected						0.950						0.950			
Satd. Flow (prot)	0	0	3540	1583	0	1770	3505	0	0	0	0	1703	3505	1468	
Flt Permitted			0.818			0.401						0.950			
Satd. Flow (perm)	0	0	2895	1583	0	747	3505	0	0	0	0	1703	3505	1468	
Right Turn on Red				Yes				Yes			Yes			Yes	
Satd. Flow (RTOR)				137										150	
Link Speed (mph)			25				25			25			25		
Link Distance (ft)			299				499			356			413		
Travel Time (s)			8.2				13.6			9.7			11.3		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	2%	2%	0%	2%	3%	0%	2%	2%	2%	6%	3%	10%	
Adj. Flow (vph)	2	0	454	137	1	104	396	0	0	0	0	205	387	150	
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	456	137	0	105	396	0	0	0	0	205	387	150	
Turn Type	Perm		NA	Prot	custom	D.P+P	NA					Split	NA	Prot	
Protected Phases			1	1		6	1 6					5	5	5	2
Permitted Phases	1				6	1									
Detector Phase	1		1	1	6	6	1 6					5	5	5	
Switch Phase															
Minimum Initial (s)	8.0		8.0	8.0	6.0	6.0						8.0	8.0	8.0	1.0
Minimum Split (s)	13.5		13.5	13.5	11.5	11.5						13.0	13.0	13.0	28.0
Total Split (s)	35.0		35.0	35.0	14.0	14.0						32.0	32.0	32.0	29.0
Total Split (%)	31.8%		31.8%	31.8%	12.7%	12.7%						29.1%	29.1%	29.1%	26%
Maximum Green (s)	29.5		29.5	29.5	8.5	8.5						27.0	27.0	27.0	26.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0						3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.5	2.5	2.5	2.5						1.5	1.5	1.5	1.0
Lost Time Adjust (s)			0.0	0.0		0.0						0.0	0.0	0.0	
Total Lost Time (s)			5.5	5.5		5.5						5.0	5.0	5.0	
Lead/Lag	Lead		Lead	Lead	Lag	Lag						Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes		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	3.0
Recall Mode	C-Max		C-Max	C-Max	None	None						None	None	None	Ped
Walk Time (s)	7.0		7.0	7.0	6.0	6.0									7.0
Flash Dont Walk (s)	0.0		0.0	0.0	0.0	0.0									18.0
Pedestrian Calls (#/hr)	0		0	0	0	0									0
Act Effect Green (s)			34.1	34.1		45.2	50.7					20.8	20.8	20.8	
Actuated g/C Ratio			0.31	0.31		0.41	0.46					0.19	0.19	0.19	
v/c Ratio			0.51	0.23		0.26	0.25					0.64	0.58	0.38	
Control Delay			34.8	6.4		20.6	19.6					49.3	43.5	8.3	
Queue Delay			0.0	0.0		0.0	0.0					0.0	0.0	0.0	
Total Delay			34.8	6.4		20.6	19.6					49.3	43.5	8.3	
LOS			C	A		C	B					D	D	A	
Approach Delay			28.2			19.8						38.0			
Approach LOS			C			B						D			
90th %ile Green (s)	29.5		29.5	29.5	8.5	8.5						28.0	28.0	28.0	25.0
90th %ile Term Code	Coord		Coord	Coord	Max	Max						Max	Max	Max	Ped
70th %ile Green (s)	29.5		29.5	29.5	12.0	12.0						24.5	24.5	24.5	25.0
70th %ile Term Code	Coord		Coord	Coord	Max	Max						Gap	Gap	Gap	Ped
50th %ile Green (s)	30.9		30.9	30.9	14.0	14.0						21.1	21.1	21.1	25.0
50th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
30th %ile Green (s)	37.0		37.0	37.0	11.4	11.4						17.6	17.6	17.6	25.0
30th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
10th %ile Green (s)	43.6		43.6	43.6	9.4	9.4						13.0	13.0	13.0	25.0
10th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
Queue Length 50th (ft)			144	0		42	87					134	132	0	
Queue Length 95th (ft)			202	47		85	136					197	167	50	
Internal Link Dist (ft)			219			419			276			333			
Turn Bay Length (ft)						100								170	
Base Capacity (vph)			897	585		409	1614					421	866	475	
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			0.51	0.23		0.26	0.25					0.49	0.45	0.32	

Intersection Summary															
Area Type:	Other														
Cycle Length: 110															
Actuated Cycle Length: 110															
Offset: 10 (9%), Referenced to phase 1:EBWB, Start of Green															
Natural Cycle: 75															
Control Type: Actuated-Coordinated															
Maximum v/c Ratio: 0.64															
Intersection Signal Delay: 29.9	Intersection LOS: C														
Intersection Capacity Utilization 45.5%	ICU Level of Service A														
Analysis Period (min) 15															

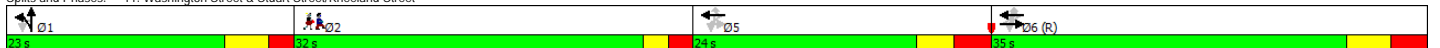
Splits and Phases: 10: Tremont Street & Stuart Street



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR	Ø2	Ø5
Lane Configurations																	
Traffic Volume (vph)	10	63	494	46	4	89	414	102	8	53	133	78	0	0	0		
Future Volume (vph)	10	63	494	46	4	89	414	102	8	53	133	78	0	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		195		0		0		0		0		0	0	0	0		
Storage Lanes		1		0		0		1		0		0	0	0	0		
Taper Length (ft)		25				25				25			25				
Lane Util. Factor	0.95	1.00	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00		
Frt			0.987					0.850			0.957						
Flt Protected		0.950					0.991				0.989						
Satd. Flow (prot)	0	1760	3462	0	0	0	3468	1599	0	0	3205	0	0	0	0		
Flt Permitted		0.458					0.535				0.989						
Satd. Flow (perm)	0	848	3462	0	0	0	1872	1599	0	0	3205	0	0	0	0		
Right Turn on Red				Yes				Yes				Yes			Yes		
Satd. Flow (RTOR)			8					105			45						
Link Speed (mph)		25					25				25			25			
Link Distance (ft)		499					269				343			341			
Travel Time (s)		13.6					7.3				9.4			9.3			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.97	0.97	0.97	0.97	0.93	0.93	0.93	0.93	0.92	0.92	0.92		
Heavy Vehicles (%)	0%	3%	3%	2%	0%	4%	3%	1%	0%	2%	11%	3%	2%	2%	2%		
Adj. Flow (vph)	11	68	531	49	4	92	427	105	9	57	143	84	0	0	0		
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	0	79	580	0	0	0	523	105	0	0	293	0	0	0	0		
Turn Type	Perm	Perm	NA		Perm	Perm	NA	Perm	Perm	Split	NA						
Protected Phases			6				5 6			1	1					2	5
Permitted Phases	6	6			5 6	5 6		5 6	1								
Detector Phase	6	6	6		5 6	5 6		5 6	1	1	1						
Switch Phase																	
Minimum Initial (s)	9.0	9.0	9.0					14.0	14.0	14.0						1.0	5.0
Minimum Split (s)	24.5	24.5	24.5					19.5	19.5	19.5						32.0	24.0
Total Split (s)	35.0	35.0	35.0					23.0	23.0	23.0						32.0	24.0
Total Split (%)	30.7%	30.7%	30.7%					20.2%	20.2%	20.2%						28%	21%
Maximum Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
Yellow Time (s)	3.5	3.5	3.5					3.5	3.5	3.5						2.0	3.0
All-Red Time (s)	3.0	3.0	3.0					2.0	2.0	2.0						2.0	3.0
Lost Time Adjust (s)		0.0	0.0								0.0						
Total Lost Time (s)		6.5	6.5								5.5						
Lead/Lag	Lag	Lag	Lag					Lead	Lead	Lead						Lag	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	C-Max	C-Max	C-Max					Max	Max	Max						Ped	Max
Walk Time (s)																7.0	
Flash Dont Walk (s)																21.0	
Pedestrian Calls (#/hr)																0	
Act Effect Green (s)		28.5	28.5				53.0	53.0			17.5						
Actuated g/C Ratio		0.25	0.25				0.46	0.46			0.15						
v/c Ratio		0.37	0.67				0.60	0.13			0.55						
Control Delay		41.5	42.3				26.3	3.7			42.0						
Queue Delay		0.0	0.0				0.0	0.0			0.0						
Total Delay		41.5	42.3				26.3	3.7			42.0						
LOS		D	D				C	A			D						
Approach Delay			42.2				22.5				42.0						
Approach LOS			D				C				D						
90th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
90th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
70th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
70th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
50th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
50th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
30th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
30th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
10th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
10th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
Queue Length 50th (ft)		48	199				145	0			89						
Queue Length 95th (ft)		97	262				205	30			135						
Internal Link Dist (ft)			419				189				263			261			
Turn Bay Length (ft)		195															
Base Capacity (vph)		212	871				870	799			530						
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		0.37	0.67				0.60	0.13			0.55						

Intersection Summary																	
Area Type:	Other																
Cycle Length:	114																
Actuated Cycle Length:	114																
Offset:	45 (39%), Referenced to phase 6:EBWB, Start of Green																
Natural Cycle:	100																
Control Type:	Actuated-Coordinated																
Maximum v/c Ratio:	0.67																
Intersection Signal Delay:	34.3																
Intersection Capacity Utilization	55.9%																
ICU Level of Service	B																
Analysis Period (min)	15																

Splits and Phases: 11: Washington Street & Stuart Street/Kneeland Street



	→	↘	↗	↙	↓	↘	↗	↙	↘	↗	↙
Lane Group	EBT	EBR	EBR2	SBL	SBT	SBR	NER	NER2	SWL	SWT	Ø2
Lane Configurations	↕↕	↕		↕	↕↕	↕	↕↕			↕↕	
Traffic Volume (vph)	442	166	20	355	658	200	148	31	51	65	
Future Volume (vph)	442	166	20	355	658	200	148	31	51	65	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		50		0		0	0		0		
Storage Lanes		1		1		1	2		0		
Taper Length (ft)				25					25		
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.88	1.00	0.95	0.95	
Ped Bike Factor		0.68				0.98					
Frt		0.850				0.850	0.850				
Flt Protected				0.950						0.979	
Satd. Flow (prot)	2443	1439	0	1593	3124	1411	2517	0	0	3003	
Flt Permitted				0.950						0.979	
Satd. Flow (perm)	2443	975	0	1593	3124	1388	2517	0	0	3003	
Right Turn on Red			Yes					No			
Satd. Flow (RTOR)		109									
Link Speed (mph)	25				25					25	
Link Distance (ft)	317				380					156	
Travel Time (s)	8.6				10.4					4.3	
Confl. Peds. (#/hr)			173								
Confl. Bikes (#/hr)			2			6		52			
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.89	0.89	0.76	0.76	
Heavy Vehicles (%)	33%	1%	1%	2%	4%	3%	2%	0%	2%	9%	
Adj. Flow (vph)	520	195	24	390	723	220	166	35	67	86	
Shared Lane Traffic (%)											
Lane Group Flow (vph)	520	219	0	390	723	220	201	0	0	153	
Turn Type	NA	Perm		Perm	NA	Perm	Prot		Perm	NA	
Protected Phases	4				1		7			7	2
Permitted Phases		4		1		1			7		
Detector Phase	4	4		1	1	1	7		7	7	
Switch Phase											
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	1.0
Minimum Split (s)	21.0	21.0		19.0	19.0	19.0	12.0		12.0	12.0	21.0
Total Split (s)	31.0	31.0		37.0	37.0	37.0	21.0		21.0	21.0	21.0
Total Split (%)	28.2%	28.2%		33.6%	33.6%	33.6%	19.1%		19.1%	19.1%	19%
Maximum Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		2.0	2.0	2.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.0	5.0	5.0	6.0			6.0	
Lead/Lag				Lead	Lead	Lead					Lag
Lead-Lag Optimize?				Yes	Yes	Yes					Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		C-Max	C-Max	C-Max	None		None	None	Ped
Walk Time (s)	7.0	7.0		6.0	6.0	6.0					7.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0					11.0
Pedestrian Calls (#/hr)	0	0		0	0	0					0
Act Effct Green (s)	24.6	24.6		34.8	34.8	34.8	12.6			12.6	
Actuated g/C Ratio	0.22	0.22		0.32	0.32	0.32	0.11			0.11	
v/c Ratio	0.95	0.73		0.77	0.73	0.50	0.70			0.45	
Control Delay	70.9	34.5		73.6	67.8	64.3	60.0			49.2	
Queue Delay	0.0	0.0		9.1	2.4	0.0	0.0			0.0	
Total Delay	70.9	34.5		82.7	70.2	64.3	60.0			49.2	
LOS	E	C		F	E	E	E			D	
Approach Delay	60.1				72.9					49.2	
Approach LOS	E				E					D	
90th %ile Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0
90th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
70th %ile Green (s)	25.0	25.0		32.1	32.1	32.1	14.9		14.9	14.9	18.0
70th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped
50th %ile Green (s)	25.0	25.0		33.9	33.9	33.9	13.1		13.1	13.1	18.0
50th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped
30th %ile Green (s)	25.0	25.0		35.8	35.8	35.8	11.2		11.2	11.2	18.0
30th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped
10th %ile Green (s)	23.1	23.1		40.3	40.3	40.3	8.6		8.6	8.6	18.0
10th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Gap		Gap	Gap	Ped
Queue Length 50th (ft)	190	72		290	282	160	78			53	
Queue Length 95th (ft)	#269	149		#437	348	243	118			71	
Internal Link Dist (ft)		237			300					76	
Turn Bay Length (ft)		50									
Base Capacity (vph)	555	305		504	988	439	343			409	
Starvation Cap Reductn	0	0		86	152	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	0.72		0.93	0.86	0.50	0.59			0.37	

Intersection Summary

Area Type: CBD

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 102 (93%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 66.4

Intersection LOS: E

Intersection Capacity Utilization 66.6%

ICU Level of Service C













Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbus Avenue & Arlington Street & Stuart Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	268	397	0	0	0	617	0	442	70	0	0	0	
Future Volume (vph)	268	397	0	0	0	617	0	442	70	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	150		0	0	0	0	0	0	0	0	0	0	
Storage Lanes	1		0	0	0	2	0	0	0	0	0	0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor						0.850		0.979					
Frt													
Flt Protected	0.950												
Satd. Flow (prot)	1608	3217	0	0	0	2508	0	4461	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	1608	3217	0	0	0	2508	0	4461	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes		Yes				Yes	
Satd. Flow (RTOR)	298					1050		25					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		301			255			371			608		
Travel Time (s)		8.2			7.0			10.1			16.6		
Confl. Bikes (#/hr)						2		13					
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.25	
Heavy Vehicles (%)	1%	1%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	298	441	0	0	0	678	0	486	77	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	298	441	0	0	0	678	0	563	0	0	0	0	
Turn Type	custom	NA				Prot		NA					
Protected Phases	6	1 6				1		5					2
Permitted Phases	1												
Detector Phase	6	1 6				1		5					
Switch Phase													
Minimum Initial (s)	5.0					12.0		8.0					5.0
Minimum Split (s)	10.0					41.0		18.0					22.0
Total Split (s)	19.0					41.0		18.0					22.0
Total Split (%)	19.0%					41.0%		18.0%					22%
Maximum Green (s)	15.0					37.0		14.0					18.0
Yellow Time (s)	3.0					3.0		3.0					4.0
All-Red Time (s)	1.0					1.0		1.0					0.0
Lost Time Adjust (s)	0.0					0.0		0.0					
Total Lost Time (s)	4.0					4.0		4.0					
Lead/Lag	Lag					Lead		Lead					Lag
Lead-Lag Optimize?	Yes					Yes		Yes					Yes
Vehicle Extension (s)	2.0					2.0		2.0					2.0
Recall Mode	None					Max		None					None
Walk Time (s)	6.0					28.0		5.0					8.0
Flash Dont Walk (s)	0.0					9.0		9.0					10.0
Pedestrian Calls (#/hr)	0					0		0					500
Act Effect Green (s)	53.5	53.5				37.0		13.6					
Actuated g/C Ratio	0.55	0.55				0.38		0.14					
v/c Ratio	0.29	0.25				0.42		0.87					
Control Delay	2.1	11.8				0.8		54.8					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	2.1	11.8				0.8		54.8					
LOS	A	B				A		D					
Approach Delay		7.9			0.8			54.8					
Approach LOS		A			A			D					
90th %ile Green (s)	15.0					37.0		14.0					18.0
90th %ile Term Code	Max					MaxR		Max					Ped
70th %ile Green (s)	14.7					37.0		14.0					18.0
70th %ile Term Code	Gap					MaxR		Max					Ped
50th %ile Green (s)	13.4					37.0		14.0					18.0
50th %ile Term Code	Gap					MaxR		Max					Ped
30th %ile Green (s)	11.3					37.0		14.0					18.0
30th %ile Term Code	Gap					MaxR		Max					Ped
10th %ile Green (s)	8.5					37.0		12.3					18.0
10th %ile Term Code	Gap					MaxR		Gap					Ped
Queue Length 50th (ft)	0	71				0		122					
Queue Length 95th (ft)	35	98				0		#187					
Internal Link Dist (ft)		221			175			291			528		
Turn Bay Length (ft)	150												
Base Capacity (vph)	1002	1730				1605		664					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.30	0.25				0.42		0.85					

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 97.2
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 18.8
Intersection Capacity Utilization 61.7%
Analysis Period (min) 15
90th %ile Actuated Cycle: 100
70th %ile Actuated Cycle: 99.7
50th %ile Actuated Cycle: 98.4
30th %ile Actuated Cycle: 96.3
10th %ile Actuated Cycle: 91.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Charles Street & Stuart Street




















Intersection Summary		
Area Type:	Other	
Cycle Length:	90	
Actuated Cycle Length:	90	
Offset:	26 (29%), Referenced to phase 1:NBT, Start of Green	
Natural Cycle:	90	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	0.50	
Intersection Signal Delay:	17.7	Intersection LOS: B
Intersection Capacity Utilization	50.2%	ICU Level of Service A
Analysis Period (min)	15	
! Phase conflict between lane groups.		

 01 (R)	 02	 05
35 s	24 s	31 s

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	8 (7%), Referenced to phase 5:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	22.5
Intersection Capacity Utilization	50.2%
Analysis Period (min)	15
	Intersection LOS: C
	ICU Level of Service A

→ Ø1	→ Ø2	→ Ø5 (R)
35 s	24 s	51 s

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	45	108	335	0	0	0	0	0	1057	198	
Future Volume (vph)	0	0	45	108	335	0	0	0	0	0	1057	198	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor											1.00		
Frt			0.865								0.976		
Flt Protected				0.950	0.998								
Satd. Flow (prot)	0	0	1644	1535	3285	0	0	0	0	0	4906	0	
Flt Permitted				0.950	0.998								
Satd. Flow (perm)	0	0	1644	1535	3285	0	0	0	0	0	4906	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)			373	112	55						41		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		227			222			380			297		
Travel Time (s)		6.2			6.1			10.4			8.1		
Confl. Bikes (#/hr)						6						16	
Peak Hour Factor	0.60	0.60	0.60	0.87	0.87	0.87	0.25	0.25	0.25	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	0%	0%	7%	5%	0%	2%	2%	2%	0%	3%	2%	
Adj. Flow (vph)	0	0	75	124	385	0	0	0	0	0	1090	204	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	0	75	112	397	0	0	0	0	0	1294	0	
Turn Type			Prot	Split	NA						NA		
Protected Phases			1!	1!	1						5		2
Permitted Phases													
Detector Phase			1	1	1						5		
Switch Phase													
Minimum Initial (s)			8.0	8.0	8.0						8.0		5.0
Minimum Split (s)			37.0	37.0	37.0						48.0		25.0
Total Split (s)			37.0	37.0	37.0						48.0		25.0
Total Split (%)			33.6%	33.6%	33.6%						43.6%		23%
Maximum Green (s)			32.0	32.0	32.0						43.5		21.0
Yellow Time (s)			3.5	3.5	3.5						3.5		4.0
All-Red Time (s)			1.5	1.5	1.5						1.0		0.0
Lost Time Adjust (s)			0.0	0.0	0.0						0.0		
Total Lost Time (s)			5.0	5.0	5.0						4.5		
Lead/Lag			Lead	Lead	Lead								Lag
Lead-Lag Optimize?			Yes	Yes	Yes								Yes
Vehicle Extension (s)			2.0	2.0	2.0						2.0		2.0
Recall Mode			Max	Max	Max						C-Max		None
Walk Time (s)			23.0	23.0	23.0						29.5		7.0
Flash Dont Walk (s)			9.0	9.0	9.0						14.0		14.0
Pedestrian Calls (#/hr)			0	0	0						0		500
Act Effct Green (s)			32.0	32.0	32.0						43.5		
Actuated g/C Ratio			0.29	0.29	0.29						0.40		
v/c Ratio			0.10	0.21	0.40						0.66		
Control Delay			0.3	6.6	28.1						9.5		
Queue Delay			0.0	0.1	0.0						0.3		
Total Delay			0.3	6.7	28.1						9.8		
LOS			A	A	C						A		
Approach Delay		0.3			23.4						9.8		
Approach LOS		A			C						A		
90th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
90th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
70th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
70th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
50th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
50th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
30th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
30th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
10th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
10th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
Queue Length 50th (ft)			0	0	105						48		
Queue Length 95th (ft)			0	41	146						55		
Internal Link Dist (ft)		147			142			300			217		
Turn Bay Length (ft)													
Base Capacity (vph)			742	525	994						1964		
Starvation Cap Reductn			0	0	0						199		
Spillback Cap Reductn			96	79	0						49		
Storage Cap Reductn			0	0	0						0		
Reduced v/c Ratio			0.12	0.25	0.40						0.73		

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 15 (14%), Referenced to phase 5:SBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 13.1

Intersection LOS: B

Intersection Capacity Utilization 52.8%

ICU Level of Service A
















Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 5: St James Avenue/Park Plaza & Arlington Street



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↖	↗	
Traffic Volume (veh/h)	0	0	167	349	33	0
Future Volume (Veh/h)	0	0	167	349	33	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.95	0.95	0.42	0.42
Hourly flow rate (vph)	0	0	176	367	79	0
Pedestrians					21	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	565					
pX, platoon unblocked						
vC, conflicting volume			21		740	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			21		740	21
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		76	100
cM capacity (veh/h)			1557		330	1041
Direction, Lane #	WB 1	NB 1				
Volume Total	543	79				
Volume Left	176	79				
Volume Right	0	0				
cSH	1557	330				
Volume to Capacity	0.11	0.24				
Queue Length 95th (ft)	10	23				
Control Delay (s)	3.2	19.3				
Lane LOS	A	C				
Approach Delay (s)	3.2	19.3				
Approach LOS		C				
Intersection Summary						
Average Delay		5.3				
Intersection Capacity Utilization		37.6%		ICU Level of Service		A
Analysis Period (min)		15				

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Traffic Volume (veh/h)	17	39	33	0	0	5	1	37	127	0	0
Future Volume (Veh/h)	17	39	33	0	0	5	1	37	127	0	0
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.42	0.42	0.42	0.95	0.95	0.95	0.25	0.25
Hourly flow rate (vph)	25	58	49	0	0	12	1	39	134	0	0
Pedestrians	45			112			21				
Lane Width (ft)	12.0			12.0			12.0				
Walking Speed (ft/s)	3.5			3.5			3.5				
Percent Blockage	4			11			2				
Right turn flare (veh)											
Median type	None					None					
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	204	92	72	39				57	146 98		
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	204	92	72	39				57	146 98		
tC, single (s)	7.1	6.5	6.2	4.1				4.1	7.1 6.5		
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2				2.2	3.5 4.0		
p0 queue free %	96	92	95	100				100	100 100		
cM capacity (veh/h)	627	758	926	1584				1481	695 758		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	132	12	40	134							
Volume Left	25	0	1	0							
Volume Right	49	12	0	134							
cSH	780	1584	1481	1700							
Volume to Capacity	0.17	0.00	0.00	0.08							
Queue Length 95th (ft)	15	0	0	0							
Control Delay (s)	10.6	0.0	0.2	0.0							
Lane LOS	B		A								
Approach Delay (s)	10.6	0.0	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay	4.4										
Intersection Capacity Utilization	25.6%			ICU Level of Service				A			
Analysis Period (min)	15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↖	
Traffic Volume (veh/h)	0	0	0	177	22	0
Future Volume (Veh/h)	0	0	0	177	22	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.75	0.75
Hourly flow rate (vph)	0	0	0	186	29	0
Pedestrians	35					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0	128	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	128	0	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	97	100	
cM capacity (veh/h)			1636	859	1091	
Direction, Lane #	WB 1	WB 2	NB 1			
Volume Total	93	93	29			
Volume Left	0	0	29			
Volume Right	0	0	0			
cSH	1700	1700	859			
Volume to Capacity	0.05	0.05	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	9.3			
Lane LOS			A			
Approach Delay (s)	0.0		9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			14.9%	ICU Level of Service	A	
Analysis Period (min)			15			

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↓	
Traffic Volume (veh/h)	145	723	0	0	26	0
Future Volume (Veh/h)	145	723	0	0	26	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	149	745	0	0	29	0
Pedestrians			18		156	
Lane Width (ft)			0.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		15	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		556	301			
pX, platoon unblocked						
vC, conflicting volume	156				844	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156				844	156
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				87	100
cM capacity (veh/h)	1210				228	739
Direction, Lane #	EB 1	EB 2	SB 1			
Volume Total	397	497	29			
Volume Left	149	0	29			
Volume Right	0	0	0			
cSH	1210	1700	228			
Volume to Capacity	0.12	0.29	0.13			
Queue Length 95th (ft)	10	0	11			
Control Delay (s)	3.9	0.0	23.0			
Lane LOS	A		C			
Approach Delay (s)	1.7		23.0			
Approach LOS			C			
Intersection Summary						
Average Delay		2.4				
Intersection Capacity Utilization		34.2%		ICU Level of Service	A	
Analysis Period (min)		15				

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations			↕	↕		↕	↕					↕	↕	↕	
Traffic Volume (vph)	13	0	352	159	2	138	531	0	0	0	0	68	276	147	
Future Volume (vph)	13	0	352	159	2	138	531	0	0	0	0	68	276	147	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			0	0		100		0	0		0	0	0	1	
Storage Lanes			0	1		1		0	0		0	1		1	
Taper Length (ft)			25			25		25			25				
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	
Ped Bike Factor															
Frt				0.850										0.850	
Flt Protected			0.998			0.950						0.950			
Satd. Flow (prot)	0	0	3437	1599	0	1770	3539	0	0	0	0	1399	3471	1392	
Flt Permitted			0.678			0.440						0.950			
Satd. Flow (perm)	0	0	2335	1599	0	820	3539	0	0	0	0	1399	3471	1392	
Right Turn on Red			Yes			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)			179									158		158	
Link Speed (mph)			25			25		25		25		25		25	
Link Distance (ft)			298			527		152		434		434		434	
Travel Time (s)			8.1			14.4		4.1		11.8		11.8		11.8	
Confl. Bikes (#/hr)			12			8		2		2		2		2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.25	1.00	1.00	0.25	0.92	0.92	0.92	0.93	0.93	0.93	
Heavy Vehicles (%)	0%	0%	5%	1%	2%	2%	2%	2%	2%	2%	2%	29%	4%	16%	
Adj. Flow (vph)	15	0	396	179	8	138	531	0	0	0	0	73	297	158	
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	411	179	0	146	531	0	0	0	0	73	297	158	
Turn Type	Perm		NA	Prot	custom	D.P+P	NA					Split	NA	Prot	
Protected Phases			1	1		6	1					5	5	5	2
Permitted Phases	1				6	1									
Detector Phase	1		1	1	6	6	1					5	5	5	
Switch Phase															
Minimum Initial (s)	8.0		8.0	8.0	6.0	6.0						8.0	8.0	8.0	1.0
Minimum Split (s)	13.5		13.5	13.5	11.5	11.5						13.0	13.0	13.0	28.0
Total Split (s)	34.0		34.0	34.0	14.0	14.0						33.0	33.0	33.0	29.0
Total Split (%)	30.9%		30.9%	30.9%	12.7%	12.7%						30.0%	30.0%	30.0%	26%
Maximum Green (s)	28.5		28.5	28.5	8.5	8.5						28.0	28.0	28.0	26.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0						3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.5	2.5	2.5	2.5						1.5	1.5	1.5	1.0
Lost Time Adjust (s)			0.0	0.0		0.0						0.0	0.0	0.0	
Total Lost Time (s)			5.5	5.5		5.5						5.0	5.0	5.0	
Lead/Lag	Lead		Lead	Lead	Lag	Lag						Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes		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	3.0
Recall Mode	C-Max		C-Max	C-Max	None	None						None	None	None	Ped
Walk Time (s)	7.0		7.0	7.0	6.0	6.0									7.0
Flash Dont Walk (s)	0.0		0.0	0.0	0.0	0.0									18.0
Pedestrian Calls (#/hr)	0		0	0	0	0									0
Act Effct Green (s)			34.6	34.6		50.2	55.7					15.8	15.8	15.8	
Actuated g/C Ratio			0.31	0.31		0.46	0.51					0.14	0.14	0.14	
v/c Ratio			0.56	0.29		0.29	0.30					0.36	0.60	0.47	
Control Delay			36.5	6.1		12.9	13.6					46.5	48.7	11.1	
Queue Delay			0.0	0.0		0.0	0.0					0.0	0.0	0.0	
Total Delay			36.5	6.1		12.9	13.6					46.5	48.7	11.1	
LOS			D	A		B	B					D	D	B	
Approach Delay			27.3			13.5						37.1			
Approach LOS			C			B						D			
90th %ile Green (s)	28.5		28.5	28.5	16.2	16.2						21.3	21.3	21.3	25.0
90th %ile Term Code	Coord		Coord	Coord	Max	Max						Gap	Gap	Gap	Ped
70th %ile Green (s)	28.5		28.5	28.5	19.4	19.4						18.1	18.1	18.1	25.0
70th %ile Term Code	Coord		Coord	Coord	Max	Max						Gap	Gap	Gap	Ped
50th %ile Green (s)	33.4		33.4	33.4	17.0	17.0						15.6	15.6	15.6	25.0
50th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
30th %ile Green (s)	38.7		38.7	38.7	14.2	14.2						13.1	13.1	13.1	25.0
30th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
10th %ile Green (s)	44.1		44.1	44.1	11.1	11.1						10.8	10.8	10.8	25.0
10th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
Queue Length 50th (ft)			128	0		76	157					47	104	0	
Queue Length 95th (ft)			192	51		140	226					88	141	55	
Internal Link Dist (ft)			218			447			72			354			
Turn Bay Length (ft)						100								170	
Base Capacity (vph)			735	626		508	1792					356	883	472	
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	0.29		0.29	0.30					0.21	0.34	0.33	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 9 (8%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 25.0
Intersection Capacity Utilization 45.7%
Analysis Period (min) 15

Intersection LOS: C
ICU Level of Service A

Splits and Phases: 10: Tremont Street & Stuart Street



Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	81.5 (74%), Referenced to phase 6:EBWB, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	38.3
Intersection Capacity Utilization	56.4%
Analysis Period (min)	15
m Volume for 95th percentile queue is metered by upstream signal.	
Intersection LOS:	D
ICU Level of Service	B

LPHS and Phases						H. Washington Street at Stuart Street / Colorado Street												
	Ø1						Ø2						Ø5					Ø6 (R)
24 s						32 s						24 s					30 s	

	→	↘	↙	↘	↓	↙	↘	↙	↘	↙	↘
Lane Group	EBT	EBR	EBR2	SBL	SBT	SBR	NER	NER2	SWL	SWT	Ø2
Lane Configurations	↕↕	↕		↕	↕↕	↕	↕↕			↕↕	
Traffic Volume (vph)	509	244	32	363	792	299	180	37	79	90	
Future Volume (vph)	509	244	32	363	792	299	180	37	79	90	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		50		0		0	0		0		
Storage Lanes		1		1		1	2		0		
Taper Length (ft)				25					25		
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.88	1.00	0.95	0.95	
Ped Bike Factor		0.69				0.98					
Frt		0.850				0.850	0.850				
Flt Protected				0.950						0.977	
Satd. Flow (prot)	3154	1441	0	1608	3185	1454	2524	0	0	3174	
Flt Permitted				0.950						0.977	
Satd. Flow (perm)	3154	997	0	1608	3185	1428	2524	0	0	3174	
Right Turn on Red			Yes					No			
Satd. Flow (RTOR)		109									
Link Speed (mph)	25				25					25	
Link Distance (ft)	317				380					156	
Travel Time (s)	8.6				10.4					4.3	
Confl. Peds. (#/hr)			138								
Confl. Bikes (#/hr)			2			8		10			
Peak Hour Factor	0.94	0.94	0.94	0.96	0.96	0.96	0.85	0.85	0.93	0.93	
Heavy Vehicles (%)	3%	1%	0%	1%	2%	0%	1%	3%	0%	0%	
Adj. Flow (vph)	541	260	34	378	825	311	212	44	85	97	
Shared Lane Traffic (%)											
Lane Group Flow (vph)	541	294	0	378	825	311	256	0	0	182	
Turn Type	NA	Perm		Perm	NA	Perm	Prot		Perm	NA	
Protected Phases	4				1		7			7	2
Permitted Phases		4		1		1			7		
Detector Phase	4	4		1	1	1	7		7	7	
Switch Phase											
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	7.0
Minimum Split (s)	21.0	21.0		19.0	19.0	19.0	12.0		12.0	12.0	21.0
Total Split (s)	30.0	30.0		41.0	41.0	41.0	18.0		18.0	18.0	21.0
Total Split (%)	27.3%	27.3%		37.3%	37.3%	37.3%	16.4%		16.4%	16.4%	19%
Maximum Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		2.0	2.0	2.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.0	5.0	5.0	6.0		6.0	6.0	
Lead/Lag				Lead	Lead	Lead					Lag
Lead-Lag Optimize?				Yes	Yes	Yes					Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		C-Max	C-Max	C-Max	None		None	None	Ped
Walk Time (s)	7.0	7.0		6.0	6.0	6.0					7.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0					11.0
Pedestrian Calls (#/hr)	0	0		0	0	0					0
Act Effct Green (s)	24.0	24.0		36.0	36.0	36.0	12.0			12.0	
Actuated g/C Ratio	0.22	0.22		0.33	0.33	0.33	0.11			0.11	
v/c Ratio	0.79	0.97		0.72	0.79	0.67	0.93			0.53	
Control Delay	49.9	73.7		56.7	56.0	55.1	88.5			52.3	
Queue Delay	0.0	0.0		13.5	27.2	2.5	0.0			0.0	
Total Delay	49.9	73.7		70.2	83.2	57.7	88.5			52.3	
LOS	D	E		E	F	E	F			D	
Approach Delay	58.3				74.7					52.3	
Approach LOS	E				E					D	
90th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
90th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
70th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
70th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
50th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
50th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
30th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
30th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
10th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
10th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
Queue Length 50th (ft)	191	139		281	325	231	103			64	
Queue Length 95th (ft)	255	#319		381	393	325	#174			102	
Internal Link Dist (ft)	237				300					76	
Turn Bay Length (ft)		50									
Base Capacity (vph)	688	302		526	1042	467	275			346	
Starvation Cap Reductn	0	0		130	249	72	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	0.79	0.97		0.95	1.04	0.79	0.93			0.53	

Intersection Summary

Area Type: CBD
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 86 (78%), Referenced to phase 1:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 69.6
 Intersection LOS: E
 Intersection Capacity Utilization 76.2%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbus Avenue & Arlington Street & Stuart Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	324	633	0	0	0	600	0	479	94	0	0	0	
Future Volume (vph)	324	633	0	0	0	600	0	479	94	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	150		0	0		0	0		0	0		0	
Storage Lanes	1		0	0		2	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor						0.850		0.975					
Frt													
Flt Protected	0.950												
Satd. Flow (prot)	1608	3217	0	0	0	2558	0	4466	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	1608	3217	0	0	0	2558	0	4466	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes		Yes				Yes	
Satd. Flow (RTOR)	341					1032		34					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		305			255			371			608		
Travel Time (s)		8.3			7.0			10.1			16.6		
Confl. Bikes (#/hr)						1		2					
Peak Hour Factor	0.95	0.95	0.95	0.85	0.85	0.85	0.94	0.94	0.94	0.25	0.25	0.25	
Heavy Vehicles (%)	1%	1%	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	
Adj. Flow (vph)	341	666	0	0	0	706	0	510	100	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	341	666	0	0	0	706	0	610	0	0	0	0	
Turn Type	custom	NA				Prot		NA					
Protected Phases	6	1 6				1		5					2
Permitted Phases	1												
Detector Phase	6	1 6				1		5					
Switch Phase													
Minimum Initial (s)	5.0					12.0		8.0				5.0	
Minimum Split (s)	15.0					45.0		18.0				22.0	
Total Split (s)	15.0					45.0		18.0				22.0	
Total Split (%)	15.0%					45.0%		18.0%				22%	
Maximum Green (s)	11.0					41.0		14.0				18.0	
Yellow Time (s)	3.0					3.0		3.0				4.0	
All-Red Time (s)	1.0					1.0		1.0				0.0	
Lost Time Adjust (s)	0.0					0.0		0.0					
Total Lost Time (s)	4.0					4.0		4.0					
Lead/Lag	Lag					Lead		Lead				Lag	
Lead-Lag Optimize?	Yes					Yes		Yes				Yes	
Vehicle Extension (s)	2.0					2.0		2.0				2.0	
Recall Mode	None					Max		None				None	
Walk Time (s)	11.0					32.0		5.0				8.0	
Flash Dont Walk (s)	0.0					9.0		9.0				10.0	
Pedestrian Calls (#/hr)	0					0		0				500	
Act Effect Green (s)	56.0	56.0				41.0		14.0					
Actuated g/C Ratio	0.56	0.56				0.41		0.14					
v/c Ratio	0.32	0.37				0.43		0.93					
Control Delay	2.1	12.9				0.8		63.0					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	2.1	12.9				0.8		63.0					
LOS	A	B				A		E					
Approach Delay		9.3			0.8			63.0					
Approach LOS		A			A			E					
90th %ile Green (s)	11.0					41.0		14.0				18.0	
90th %ile Term Code	Max					MaxR		Max				Ped	
70th %ile Green (s)	11.0					41.0		14.0				18.0	
70th %ile Term Code	Max					MaxR		Max				Ped	
50th %ile Green (s)	11.0					41.0		14.0				18.0	
50th %ile Term Code	Max					MaxR		Max				Ped	
30th %ile Green (s)	11.0					41.0		14.0				18.0	
30th %ile Term Code	Max					MaxR		Max				Ped	
10th %ile Green (s)	11.0					41.0		14.0				18.0	
10th %ile Term Code	Max					MaxR		Max				Ped	
Queue Length 50th (ft)	0	116				0		135					
Queue Length 95th (ft)	37	155				0		#209					
Internal Link Dist (ft)		225			175			291			528		
Turn Bay Length (ft)	150												
Base Capacity (vph)	1050	1801				1657		654					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.32	0.37				0.43		0.93					

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 100

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 20.8

Intersection LOS: C

Intersection Capacity Utilization 65.9%

ICU Level of Service C

Analysis Period (min) 15

90th %ile Actuated Cycle: 100

70th %ile Actuated Cycle: 100

50th %ile Actuated Cycle: 100

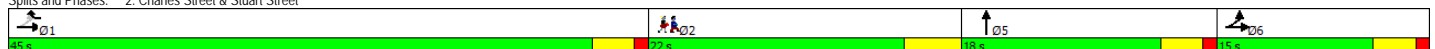
30th %ile Actuated Cycle: 100













10th %ile Actuated Cycle: 100

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Charles Street & Stuart Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	561	542	0	0	0	217	0	787	178	0	0	0	
Future Volume (vph)	561	542	0	0	0	217	0	787	178	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt						0.865		0.972					
Flt Protected	0.950												
Satd. Flow (prot)	3433	3574	0	0	0	1644	0	4919	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	3433	3574	0	0	0	1644	0	4919	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)	623					376		55					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		892			331			608			262		
Travel Time (s)		24.3			9.0			16.6			7.1		
Confl. Bikes (#/hr)								8					
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.86	0.86	0.86	0.25	0.25	0.25	
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	0%	2%	3%	0%	0%	0%	
Adj. Flow (vph)	623	602	0	0	0	238	0	915	207	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	623	602	0	0	0	238	0	1122	0	0	0	0	
Turn Type	Split	NA				Prot		NA					
Protected Phases	5!	5				5!		1					2
Permitted Phases													
Detector Phase	5	5				5		1					
Switch Phase													
Minimum Initial (s)	8.0	8.0				8.0		8.0					5.0
Minimum Split (s)	36.0	36.0				36.0		50.0					24.0
Total Split (s)	36.0	36.0				36.0		50.0					24.0
Total Split (%)	32.7%	32.7%				32.7%		45.5%					22%
Maximum Green (s)	31.5	31.5				31.5		44.0					20.0
Yellow Time (s)	3.0	3.0				3.0		3.5					4.0
All-Red Time (s)	1.5	1.5				1.5		2.5					0.0
Lost Time Adjust (s)	0.0	0.0				0.0		0.0					
Total Lost Time (s)	4.5	4.5				4.5		6.0					
Lead/Lag								Lead					Lag
Lead-Lag Optimize?								Yes					Yes
Vehicle Extension (s)	2.0	2.0				2.0		2.0					2.0
Recall Mode	None	None				None		C-Max					None
Walk Time (s)	19.5	19.5				19.5		39.0					7.0
Flash Dont Walk (s)	12.0	12.0				12.0		5.0					13.0
Pedestrian Calls (#/hr)	0	0				0		0					454
Act Effct Green (s)	27.6	27.6				27.6		47.9					
Actuated g/C Ratio	0.25	0.25				0.25		0.44					
v/c Ratio	0.47	0.67				0.34		0.52					
Control Delay	6.6	35.0				1.3		23.1					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	6.6	35.0				1.3		23.1					
LOS	A	D				A		C					
Approach Delay		20.6			1.3			23.1					
Approach LOS		C			A			C					
90th %ile Green (s)	31.5	31.5				31.5		44.0					20.0
90th %ile Term Code	Max	Max				Max		Coord					Ped
70th %ile Green (s)	31.5	31.5				31.5		44.0					20.0
70th %ile Term Code	Max	Max				Max		Coord					Ped
50th %ile Green (s)	29.4	29.4				29.4		46.1					20.0
50th %ile Term Code	Gap	Gap				Gap		Coord					Ped
30th %ile Green (s)	25.7	25.7				25.7		49.8					20.0
30th %ile Term Code	Gap	Gap				Gap		Coord					Ped
10th %ile Green (s)	20.1	20.1				20.1		55.4					20.0
10th %ile Term Code	Gap	Gap				Gap		Coord					Ped
Queue Length 50th (ft)	72	221				0		202					
Queue Length 95th (ft)	112	288				0		239					
Internal Link Dist (ft)		812			251			528			182		
Turn Bay Length (ft)													
Base Capacity (vph)						739		2171					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.44	0.59				0.32		0.52					

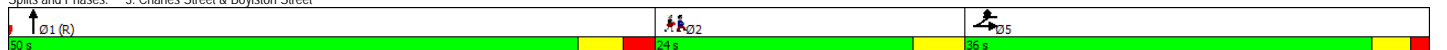
Intersection Summary


















Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 25 (23%), Referenced to phase 1:NBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 19.9
 Intersection Capacity Utilization 61.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

! Phase conflict between lane groups.

Splits and Phases: 3: Charles Street & Boylston Street



													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	763	271	0	0	0	0	0	0	697	1136	0	
Future Volume (vph)	0	763	271	0	0	0	0	0	0	697	1136	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	1.00	
Ped Bike Factor		0.99											
Frt		0.961											
Flt Protected										0.950	0.991		
Satd. Flow (prot)	0	6068	0	0	0	0	0	0	0	1552	4858	0	
Flt Permitted										0.950	0.991		
Satd. Flow (perm)	0	6068	0	0	0	0	0	0	0	1552	4858	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		88								410	50		
Link Speed (mph)		25			25				25		25		
Link Distance (ft)		336			892				297		292		
Travel Time (s)		9.2			24.3				8.1		8.0		
Confl. Bikes (#/hr)			22										
Peak Hour Factor	0.94	0.94	0.94	0.25	0.25	0.25	0.25	0.25	0.25	0.96	0.96	0.96	
Heavy Vehicles (%)	0%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	0	812	288	0	0	0	0	0	0	726	1183	0	
Shared Lane Traffic (%)										36%			
Lane Group Flow (vph)	0	1100	0	0	0	0	0	0	0	465	1444	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								8.0	8.0		5.0
Minimum Split (s)		24.0								22.0	22.0		24.0
Total Split (s)		41.0								45.0	45.0		24.0
Total Split (%)		37.3%								40.9%	40.9%		22%
Maximum Green (s)		37.0								41.0	41.0		20.0
Yellow Time (s)		3.0								3.0	3.0		4.0
All-Red Time (s)		1.0								1.0	1.0		0.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		4.0								4.0	4.0		
Lead/Lag		Lead											Lag
Lead-Lag Optimize?		Yes											Yes
Vehicle Extension (s)		2.0								2.0	2.0		2.0
Recall Mode		Max								C-Max	C-Max		None
Walk Time (s)		7.0								7.0	7.0		7.0
Flash Dont Walk (s)		8.0								8.0	8.0		13.0
Pedestrian Calls (#/hr)		0								0	0		500
Act Effct Green (s)		37.0								41.0	41.0		
Actuated g/C Ratio		0.34								0.37	0.37		
v/c Ratio		0.52								0.56	0.78		
Control Delay		27.9								6.9	33.2		
Queue Delay		0.0								0.0	0.7		
Total Delay		27.9								6.9	33.9		
LOS		C								A	C		
Approach Delay		27.9									27.3		
Approach LOS		C									C		
90th %ile Green (s)		37.0								41.0	41.0		20.0
90th %ile Term Code		MaxR								Coord	Coord		Ped
70th %ile Green (s)		37.0								41.0	41.0		20.0
70th %ile Term Code		MaxR								Coord	Coord		Ped
50th %ile Green (s)		37.0								41.0	41.0		20.0
50th %ile Term Code		MaxR								Coord	Coord		Ped
30th %ile Green (s)		37.0								41.0	41.0		20.0
30th %ile Term Code		MaxR								Coord	Coord		Ped
10th %ile Green (s)		37.0								41.0	41.0		20.0
10th %ile Term Code		MaxR								Coord	Coord		Ped
Queue Length 50th (ft)		165								29	335		
Queue Length 95th (ft)		201								126	399		
Internal Link Dist (ft)		256			812			217			212		
Turn Bay Length (ft)													
Base Capacity (vph)		2099								835	1842		
Starvation Cap Reductn		0								0	0		
Spillback Cap Reductn		0								0	146		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.52								0.56	0.85		

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 11 (10%), Referenced to phase 5:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 27.5

Intersection LOS: C

































Intersection Capacity Utilization 61.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Boylston Street & Arlington Street



																											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2														
Lane Configurations																											
Traffic Volume (vph)	0	0	64	149	382	0	0	0	0	0	1240	149															
Future Volume (vph)	0	0	64	149	382	0	0	0	0	0	1240	149															
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900															
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.91															
Ped Bike Factor																											
Frt			0.865								0.984																
Flt Protected				0.950	0.998																						
Satd. Flow (prot)	0	0	1644	1595	3382	0	0	0	0	0	5047	0															
Flt Permitted				0.950	0.998																						
Satd. Flow (perm)	0	0	1644	1595	3382	0	0	0	0	0	5047	0															
Right Turn on Red			Yes	Yes		Yes			Yes			Yes															
Satd. Flow (RTOR)			354	156	55						23																
Link Speed (mph)		25			25			25			25																
Link Distance (ft)		227			222			380			297																
Travel Time (s)		6.2			6.1			10.4			8.1																
Confl. Bikes (#/hr)													19														
Peak Hour Factor	0.80	0.80	0.80	0.86	0.86	0.86	0.25	0.25	0.25	0.93	0.93	0.93															
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	1%	0%															
Adj. Flow (vph)	0	0	80	173	444	0	0	0	0	0	1333	160															
Shared Lane Traffic (%)				10%																							
Lane Group Flow (vph)	0	0	80	156	461	0	0	0	0	0	1493	0															
Turn Type			Prot	Split	NA						NA																
Protected Phases			1!	1!	1						5		2														
Permitted Phases																											
Detector Phase			1	1	1						5																
Switch Phase																											
Minimum Initial (s)			8.0	8.0	8.0						8.0		5.0														
Minimum Split (s)			35.0	35.0	35.0						50.0		25.0														
Total Split (s)			35.0	35.0	35.0						50.0		25.0														
Total Split (%)			31.8%	31.8%	31.8%						45.5%		23%														
Maximum Green (s)			30.0	30.0	30.0						45.5		21.0														
Yellow Time (s)			3.5	3.5	3.5						3.5		4.0														
All-Red Time (s)			1.5	1.5	1.5						1.0		0.0														
Lost Time Adjust (s)			0.0	0.0	0.0						0.0																
Total Lost Time (s)			5.0	5.0	5.0						4.5																
Lead/Lag			Lead	Lead	Lead								Lag														
Lead-Lag Optimize?			Yes	Yes	Yes								Yes														
Vehicle Extension (s)			2.0	2.0	2.0						2.0		2.0														
Recall Mode			Max	Max	Max						C-Max		None														
Walk Time (s)			21.0	21.0	21.0						31.5		7.0														
Flash Dont Walk (s)			9.0	9.0	9.0						14.0		14.0														
Pedestrian Calls (#/hr)			0	0	0						0		500														
Act Effct Green (s)			30.0	30.0	30.0						45.5																
Actuated g/C Ratio			0.27	0.27	0.27						0.41																
v/c Ratio			0.11	0.28	0.48						0.71																
Control Delay			0.3	6.4	31.2						14.1																
Queue Delay			0.1	0.6	2.0						1.4																
Total Delay			0.4	7.0	33.2						15.5																
LOS			A	A	C						B																
Approach Delay		0.4			26.6						15.5																
Approach LOS		A			C						B																
90th %ile Green (s)			30.0	30.0	30.0						45.5		21.0														
90th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped														
70th %ile Green (s)			30.0	30.0	30.0						45.5		21.0														
70th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped														
50th %ile Green (s)			30.0	30.0	30.0						45.5		21.0														
50th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped														
30th %ile Green (s)			30.0	30.0	30.0						45.5		21.0														
30th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped														
10th %ile Green (s)			30.0	30.0	30.0						45.5		21.0														
10th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped														
Queue Length 50th (ft)			0	0	131						84																
Queue Length 95th (ft)			0	47	173						106																
Internal Link Dist (ft)		147			142			300			217																
Turn Bay Length (ft)																											
Base Capacity (vph)			705	548	962						2101																
Starvation Cap Reductn			0	0	0						386																
Spillback Cap Reductn			182	168	343						102																
Storage Cap Reductn			0	0	0						0																
Reduced v/c Ratio			0.15	0.41	0.74						0.87																

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 18 (16%), Referenced to phase 5:SBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 18.1

Intersection LOS: B

Intersection Capacity Utilization 56.6%

ICU Level of Service B
















Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 5: St James Avenue/Park Plaza & Arlington Street



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↖	↗	
Traffic Volume (veh/h)	0	0	173	402	66	0
Future Volume (Veh/h)	0	0	173	402	66	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.84	0.84	0.75	0.75
Hourly flow rate (vph)	0	0	206	479	88	0
Pedestrians	1				6	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	565					
pX, platoon unblocked						
vC, conflicting volume			6		898	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		898	6
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
pD queue free %			87		68	100
cM capacity (veh/h)			1606		271	1076
Direction, Lane #	WB 1	NB 1				
Volume Total	685	88				
Volume Left	206	88				
Volume Right	0	0				
cSH	1606	271				
Volume to Capacity	0.13	0.32				
Queue Length 95th (ft)	11	34				
Control Delay (s)	3.2	24.6				
Lane LOS	A	C				
Approach Delay (s)	3.2	24.6				
Approach LOS		C				
Intersection Summary						
Average Delay		5.7				
Intersection Capacity Utilization		47.7%		ICU Level of Service		A
Analysis Period (min)		15				

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Traffic Volume (veh/h)	4	51	56	0	10	11	0	11	161	0	0
Future Volume (Veh/h)	4	51	56	0	10	11	0	11	161	0	0
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.75	0.75	0.75	0.84	0.84	0.84	0.25	0.25
Hourly flow rate (vph)	5	64	70	0	13	15	0	13	192	0	0
Pedestrians	54			93			6				
Lane Width (ft)	12.0			12.0			12.0				
Walking Speed (ft/s)	3.5			3.5			3.5				
Percent Blockage	5			9			1				
Right turn flare (veh)											
Median type	None					None					
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	180	88	80	13			82			142	95
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	180	88	80	13			82			142	95
tC, single (s)	7.1	6.5	6.2	4.1			4.1			7.1	6.5
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2			2.2			3.5	4.0
p0 queue free %	99	92	92	100			100			100	100
cM capacity (veh/h)	652	765	929	1619			1450			689	758
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	139	28	13	192							
Volume Left	5	0	0	0							
Volume Right	70	15	0	192							
cSH	834	1619	1450	1700							
Volume to Capacity	0.17	0.00	0.00	0.11							
Queue Length 95th (ft)	15	0	0	0							
Control Delay (s)	10.2	0.0	0.0	0.0							
Lane LOS	B										
Approach Delay (s)	10.2	0.0	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay	3.8										
Intersection Capacity Utilization	28.3%			ICU Level of Service				A			
Analysis Period (min)	15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Volume (veh/h)	0	0	0	225	42	0
Future Volume (Veh/h)	0	0	0	225	42	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	0	0	0	239	45	0
Pedestrians	19					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0	138	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	138	0	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	95	100	
cM capacity (veh/h)			1636	846	1091	
Direction, Lane #	WB 1	WB 2	NB 1			
Volume Total	120	120	45			
Volume Left	0	0	45			
Volume Right	0	0	0			
cSH	1700	1700	846			
Volume to Capacity	0.07	0.07	0.05			
Queue Length 95th (ft)	0	0	4			
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			1.5			
Intersection Capacity Utilization			16.2%	ICU Level of Service	A	
Analysis Period (min)			15			

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕			↕	
Traffic Volume (veh/h)	51	923	0	0	141	0
Future Volume (Veh/h)	51	923	0	0	141	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	56	1014	0	0	158	0
Pedestrians			5		246	
Lane Width (ft)			0.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		23	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		553	305			
pX, platoon unblocked					0.90	
vC, conflicting volume	246				870	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				639	246
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				41	100
cM capacity (veh/h)	1020				270	582
Direction, Lane #	EB 1	EB 2	SB 1			
Volume Total	394	676	158			
Volume Left	56	0	158			
Volume Right	0	0	0			
cSH	1020	1700	270			
Volume to Capacity	0.05	0.40	0.59			
Queue Length 95th (ft)	4	0	85			
Control Delay (s)	1.8	0.0	35.6			
Lane LOS	A		E			
Approach Delay (s)	0.6		35.6			
Approach LOS			E			
Intersection Summary						
Average Delay		5.1				
Intersection Capacity Utilization		41.5%		ICU Level of Service		A
Analysis Period (min)		15				

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations			↔	↔		↔	↔					↔	↔	↔	
Traffic Volume (vph)	25	0	451	129	1	100	392	0	0	0	0	196	369	143	
Future Volume (vph)	25	0	451	129	1	100	392	0	0	0	0	196	369	143	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			0	0		100		0	0		0	0	0	1	
Storage Lanes			0	1		1		0	0		0	1		1	
Taper Length (ft)			25			25		25			25				
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	
Frt				0.850										0.850	
Flt Protected			0.997			0.950						0.950			
Satd. Flow (prot)	0	0	3532	1583	0	1770	3505	0	0	0	0	1703	3505	1468	
Flt Permitted			0.604			0.343						0.950			
Satd. Flow (perm)	0	0	2140	1583	0	639	3505	0	0	0	0	1703	3505	1468	
Right Turn on Red				Yes				Yes			Yes			Yes	
Satd. Flow (RTOR)				142										155	
Link Speed (mph)			25				25			25			25		
Link Distance (ft)			299				499			356			413		
Travel Time (s)			8.2				13.6			9.7			11.3		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	0%	2%	2%	0%	2%	3%	0%	2%	2%	2%	6%	3%	10%	
Adj. Flow (vph)	27	0	496	142	1	108	422	0	0	0	0	213	401	155	
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	523	142	0	109	422	0	0	0	0	213	401	155	
Turn Type	Perm		NA	Prot	custom	D.P+P	NA					Split	NA	Prot	
Protected Phases			1	1		6	1 6					5	5	5	2
Permitted Phases	1				6	1									
Detector Phase	1		1	1	6	6	1 6					5	5	5	
Switch Phase															
Minimum Initial (s)	8.0		8.0	8.0	6.0	6.0						8.0	8.0	8.0	1.0
Minimum Split (s)	13.5		13.5	13.5	11.5	11.5						13.0	13.0	13.0	28.0
Total Split (s)	35.0		35.0	35.0	14.0	14.0						32.0	32.0	32.0	29.0
Total Split (%)	31.8%		31.8%	31.8%	12.7%	12.7%						29.1%	29.1%	29.1%	26%
Maximum Green (s)	29.5		29.5	29.5	8.5	8.5						27.0	27.0	27.0	26.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0						3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.5	2.5	2.5	2.5						1.5	1.5	1.5	1.0
Lost Time Adjust (s)			0.0	0.0		0.0						0.0	0.0	0.0	
Total Lost Time (s)			5.5	5.5		5.5						5.0	5.0	5.0	
Lead/Lag	Lead		Lead		Lag	Lag						Lead	Lead	Lead	Lag
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	3.0
Recall Mode	C-Max		C-Max	C-Max	None	None						None	None	None	Ped
Walk Time (s)	7.0		7.0	7.0	6.0	6.0									7.0
Flash Dont Walk (s)	0.0		0.0	0.0	0.0	0.0									18.0
Pedestrian Calls (#/hr)	0		0	0	0	0									0
Act Effect Green (s)			33.3	33.3		44.8	50.3					21.2	21.2	21.2	
Actuated g/C Ratio			0.30	0.30		0.41	0.46					0.19	0.19	0.19	
v/c Ratio			0.81	0.25		0.29	0.26					0.65	0.59	0.38	
Control Delay			47.9	6.4		21.3	20.0					49.6	43.5	8.2	
Queue Delay			0.0	0.0		0.0	0.0					0.0	0.0	0.0	
Total Delay			47.9	6.4		21.3	20.0					49.6	43.5	8.2	
LOS			D	A		C	B					D	D	A	
Approach Delay			39.0			20.3						38.0			
Approach LOS			D			C						D			
90th %ile Green (s)	29.5		29.5	29.5	8.5	8.5						28.0	28.0	28.0	25.0
90th %ile Term Code	Coord		Coord	Coord	Max	Max						Max	Max	Max	Ped
70th %ile Green (s)	29.5		29.5	29.5	11.4	11.4						25.1	25.1	25.1	25.0
70th %ile Term Code	Coord		Coord	Coord	Max	Max						Gap	Gap	Gap	Ped
50th %ile Green (s)	29.7		29.7	29.7	14.7	14.7						21.6	21.6	21.6	25.0
50th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
30th %ile Green (s)	35.1		35.1	35.1	12.9	12.9						18.0	18.0	18.0	25.0
30th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
10th %ile Green (s)	42.9		42.9	42.9	9.8	9.8						13.3	13.3	13.3	25.0
10th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped
Queue Length 50th (ft)			187	0		44	94					139	136	0	
Queue Length 95th (ft)			#292	48		87	145					204	173	51	
Internal Link Dist (ft)			219				419			276			333		
Turn Bay Length (ft)						100								170	
Base Capacity (vph)			648	578		378	1602					421	866	479	
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			0.81	0.25		0.29	0.26					0.51	0.46	0.32	

Intersection Summary		
Area Type:	Other	
Cycle Length:	110	
Actuated Cycle Length:	110	
Offset:	10 (9%), Referenced to phase 1:EBWB, Start of Green	
Natural Cycle:	90	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	0.81	
Intersection Signal Delay:	33.6	Intersection LOS: C
Intersection Capacity Utilization	48.2%	ICU Level of Service A
Analysis Period (min)	15	
#	95th percentile volume exceeds capacity, queue may be longer.	
	Queue shown is maximum after two cycles.	

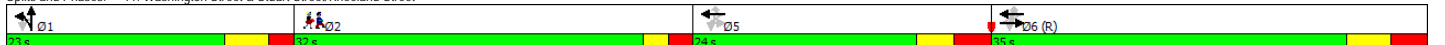
Splits and Phases: 10: Tremont Street & Stuart Street



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR	Ø2	Ø5
Lane Configurations																	
Traffic Volume (vph)	10	65	535	48	4	92	440	106	8	55	138	81	0	0	0		
Future Volume (vph)	10	65	535	48	4	92	440	106	8	55	138	81	0	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		195		0		0		0		0		0	0	0	0		
Storage Lanes		1		0		0		1		0		0	0	0	0		
Taper Length (ft)		25				25				25			25				
Lane Util. Factor	0.95	1.00	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00		
Frt			0.988					0.850			0.957						
Flt Protected		0.950					0.991				0.989						
Satd. Flow (prot)	0	1759	3466	0	0	0	3468	1599	0	0	3205	0	0	0	0		
Flt Permitted		0.445					0.521				0.989						
Satd. Flow (perm)	0	824	3466	0	0	0	1823	1599	0	0	3205	0	0	0	0		
Right Turn on Red				Yes				Yes				Yes			Yes		
Satd. Flow (RTOR)			8					109			45						
Link Speed (mph)			25				25				25			25			
Link Distance (ft)			499				269				343			341			
Travel Time (s)			13.6				7.3				9.4			9.3			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.97	0.97	0.97	0.97	0.93	0.93	0.93	0.93	0.92	0.92	0.92		
Heavy Vehicles (%)	0%	3%	3%	2%	0%	4%	3%	1%	0%	2%	11%	3%	2%	2%	2%		
Adj. Flow (vph)	11	70	575	52	4	95	454	109	9	59	148	87	0	0	0		
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	0	81	627	0	0	0	553	109	0	0	303	0	0	0	0		
Turn Type	Perm	Perm	NA		Perm	Perm	NA	Perm	Perm	Split	NA						
Protected Phases			6				5 6			1	1					2	5
Permitted Phases	6	6			5 6	5 6		5 6	1								
Detector Phase	6	6	6		5 6	5 6	5 6	5 6	1	1	1						
Switch Phase																	
Minimum Initial (s)	9.0	9.0	9.0					14.0	14.0	14.0						1.0	5.0
Minimum Split (s)	24.5	24.5	24.5					19.5	19.5	19.5						32.0	24.0
Total Split (s)	35.0	35.0	35.0					23.0	23.0	23.0						32.0	24.0
Total Split (%)	30.7%	30.7%	30.7%					20.2%	20.2%	20.2%						28%	21%
Maximum Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
Yellow Time (s)	3.5	3.5	3.5					3.5	3.5	3.5						2.0	3.0
All-Red Time (s)	3.0	3.0	3.0					2.0	2.0	2.0						2.0	3.0
Lost Time Adjust (s)		0.0	0.0								0.0						
Total Lost Time (s)		6.5	6.5								5.5						
Lead/Lag	Lag	Lag	Lag					Lead	Lead	Lead						Lag	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
Recall Mode	C-Max	C-Max	C-Max					Max	Max	Max						Ped	Max
Walk Time (s)																7.0	
Flash Dont Walk (s)																21.0	
Pedestrian Calls (#/hr)																0	
Act Effect Green (s)		28.5	28.5				53.0	53.0			17.5						
Actuated g/C Ratio		0.25	0.25				0.46	0.46			0.15						
v/c Ratio		0.39	0.72				0.93	0.14			0.57						
Control Delay		42.4	44.0				28.0	3.7			42.7						
Queue Delay		0.0	0.0				0.0	0.0			0.0						
Total Delay		42.4	44.0				28.0	3.7			42.7						
LOS		D	D				C	A			D						
Approach Delay			43.8				24.0				42.7						
Approach LOS			D				C				D						
90th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
90th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
70th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
70th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
50th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
50th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
30th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
30th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
10th %ile Green (s)	28.5	28.5	28.5					17.5	17.5	17.5						28.0	18.0
10th %ile Term Code	Coord	Coord	Coord					MaxR	MaxR	MaxR						Ped	MaxR
Queue Length 50th (ft)		50	219				159	0			93						
Queue Length 95th (ft)		100	285				225	31			141						
Internal Link Dist (ft)			419				189				263			261			
Turn Bay Length (ft)		195															
Base Capacity (vph)		206	872				847	801			530						
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		0.39	0.72				0.65	0.14			0.57						

Intersection Summary		
Area Type:	Other	
Cycle Length:	114	
Actuated Cycle Length:	114	
Offset:	45 (39%), Referenced to phase 6:EBWB, Start of Green	
Natural Cycle:	100	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	0.72	
Intersection Signal Delay:	35.8	Intersection LOS: D
Intersection Capacity Utilization	57.9%	ICU Level of Service B
Analysis Period (min)	15	
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.	

Splits and Phases: 11: Washington Street & Stuart Street/Kneeland Street



	→	↘	↗	↙	↓	↘	↗	↙	↘	↗	↙
Lane Group	EBT	EBR	EBR2	SBL	SBT	SBR	NER	NER2	SWL	SWT	Ø2
Lane Configurations	↕↕	↕		↕	↕↕	↕	↕↕			↕↕	
Traffic Volume (vph)	446	166	20	367	658	200	155	31	52	66	
Future Volume (vph)	446	166	20	367	658	200	155	31	52	66	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		50		0		0	0		0		
Storage Lanes		1		1		1	2		0		
Taper Length (ft)				25					25		
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.88	1.00	0.95	0.95	
Ped Bike Factor		0.68				0.98					
Frt		0.850				0.850	0.850				
Flt Protected				0.950						0.979	
Satd. Flow (prot)	2443	1439	0	1593	3124	1411	2516	0	0	3003	
Flt Permitted				0.950						0.979	
Satd. Flow (perm)	2443	975	0	1593	3124	1388	2516	0	0	3003	
Right Turn on Red			Yes					No			
Satd. Flow (RTOR)		109									
Link Speed (mph)	25				25					25	
Link Distance (ft)	317				380					156	
Travel Time (s)	8.6				10.4					4.3	
Confl. Peds. (#/hr)			173								
Confl. Bikes (#/hr)			2			6		52			
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.89	0.89	0.76	0.76	
Heavy Vehicles (%)	33%	1%	1%	2%	4%	3%	2%	0%	2%	9%	
Adj. Flow (vph)	525	195	24	403	723	220	174	35	68	87	
Shared Lane Traffic (%)											
Lane Group Flow (vph)	525	219	0	403	723	220	209	0	0	155	
Turn Type	NA	Perm		Perm	NA	Perm	Prot		Perm	NA	
Protected Phases	4				1		7			7	2
Permitted Phases		4		1		1			7		
Detector Phase	4	4		1	1	1	7		7	7	
Switch Phase											
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	1.0
Minimum Split (s)	21.0	21.0		19.0	19.0	19.0	12.0		12.0	12.0	21.0
Total Split (s)	31.0	31.0		37.0	37.0	37.0	21.0		21.0	21.0	21.0
Total Split (%)	28.2%	28.2%		33.6%	33.6%	33.6%	19.1%		19.1%	19.1%	19%
Maximum Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		2.0	2.0	2.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.0	5.0	5.0	6.0			6.0	
Lead/Lag				Lead	Lead	Lead					Lag
Lead-Lag Optimize?				Yes	Yes	Yes					Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		C-Max	C-Max	C-Max	None		None	None	Ped
Walk Time (s)	7.0	7.0		6.0	6.0	6.0					7.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0					11.0
Pedestrian Calls (#/hr)	0	0		0	0	0					0
Act Effct Green (s)	24.7	24.7		34.5	34.5	34.5	12.8			12.8	
Actuated g/C Ratio	0.22	0.22		0.31	0.31	0.31	0.12			0.12	
v/c Ratio	0.96	0.72		0.81	0.74	0.51	0.72			0.45	
Control Delay	71.8	34.4		75.9	68.2	64.7	60.6			48.9	
Queue Delay	0.0	0.0		13.4	2.5	0.0	0.0			0.0	
Total Delay	71.8	34.4		89.3	70.7	64.7	60.6			48.9	
LOS	E	C		F	E	E	E			D	
Approach Delay	60.8				75.3					48.9	
Approach LOS	E				E					D	
90th %ile Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0
90th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
70th %ile Green (s)	25.0	25.0		32.0	32.0	32.0	15.0		15.0	15.0	18.0
70th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
50th %ile Green (s)	25.0	25.0		33.6	33.6	33.6	13.4		13.4	13.4	18.0
50th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped
30th %ile Green (s)	25.0	25.0		35.4	35.4	35.4	11.6		11.6	11.6	18.0
30th %ile Term Code	Max	Max		Coord	Coord	Coord	Gap		Gap	Gap	Ped
10th %ile Green (s)	23.6	23.6		39.5	39.5	39.5	8.9		8.9	8.9	18.0
10th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Gap		Gap	Gap	Ped
Queue Length 50th (ft)	193	72		301	282	160	81			54	
Queue Length 95th (ft)	#273	149		#459	348	243	122			72	
Internal Link Dist (ft)		237			300					76	
Turn Bay Length (ft)		50									
Base Capacity (vph)	555	305		499	979	435	343			409	
Starvation Cap Reductn	0	0		83	146	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	0.72		0.97	0.87	0.51	0.61			0.38	

Intersection Summary

Area Type: CBD

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 102 (93%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 68.0

Intersection LOS: E

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Columbus Avenue & Arlington Street & Stuart Street

↓ Ø1 (R)	↘ Ø2	→ Ø4	↗ Ø7
27 s	21 s	31 s	21 s

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	276	404	0	0	0	620	0	442	70	0	0	0	
Future Volume (vph)	276	404	0	0	0	620	0	442	70	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	150		0	0	0	0	0	0	0	0	0	0	
Storage Lanes	1		0	0	0	2	0	0	0	0	0	0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor						0.850		0.979					
Frt													
Flt Protected	0.950												
Satd. Flow (prot)	1608	3217	0	0	0	2508	0	4461	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	1608	3217	0	0	0	2508	0	4461	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes		Yes				Yes	
Satd. Flow (RTOR)	307					1043		25					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		301			255			371			608		
Travel Time (s)		8.2			7.0			10.1			16.6		
Confl. Bikes (#/hr)						2		13					
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.91	0.91	0.91	0.25	0.25	0.25	
Heavy Vehicles (%)	1%	1%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	307	449	0	0	0	681	0	486	77	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	307	449	0	0	0	681	0	563	0	0	0	0	
Turn Type	custom	NA				Prot		NA					
Protected Phases	6	1 6				1		5					2
Permitted Phases	1												
Detector Phase	6	1 6				1		5					
Switch Phase													
Minimum Initial (s)	5.0					12.0		8.0					5.0
Minimum Split (s)	10.0					41.0		18.0					22.0
Total Split (s)	19.0					41.0		18.0					22.0
Total Split (%)	19.0%					41.0%		18.0%					22%
Maximum Green (s)	15.0					37.0		14.0					18.0
Yellow Time (s)	3.0					3.0		3.0					4.0
All-Red Time (s)	1.0					1.0		1.0					0.0
Lost Time Adjust (s)	0.0					0.0		0.0					
Total Lost Time (s)	4.0					4.0		4.0					
Lead/Lag	Lag					Lead		Lead					Lag
Lead-Lag Optimize?	Yes					Yes		Yes					Yes
Vehicle Extension (s)	2.0					2.0		2.0					2.0
Recall Mode	None					Max		None					None
Walk Time (s)	6.0					28.0		5.0					8.0
Flash Dont Walk (s)	0.0					9.0		9.0					10.0
Pedestrian Calls (#/hr)	0					0		0					500
Act Effect Green (s)	53.7	53.7				37.1		13.7					
Actuated g/C Ratio	0.55	0.55				0.38		0.14					
v/c Ratio	0.30	0.25				0.43		0.87					
Control Delay	2.1	11.8				0.8		54.9					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	2.1	11.8				0.8		54.9					
LOS	A	B				A		D					
Approach Delay		7.9			0.8			54.9					
Approach LOS		A			A			D					
90th %ile Green (s)	15.0					37.0		14.0					18.0
90th %ile Term Code	Max					MaxR		Max					Ped
70th %ile Green (s)	14.9					37.0		14.0					18.0
70th %ile Term Code	Gap					MaxR		Max					Ped
50th %ile Green (s)	13.6					37.0		14.0					18.0
50th %ile Term Code	Gap					MaxR		Max					Ped
30th %ile Green (s)	11.4					37.0		14.0					18.0
30th %ile Term Code	Gap					MaxR		Max					Ped
10th %ile Green (s)	8.6					37.0		12.3					18.0
10th %ile Term Code	Gap					MaxR		Gap					Ped
Queue Length 50th (ft)	0	72				0		122					
Queue Length 95th (ft)	36	101				0		#187					
Internal Link Dist (ft)		221			175			291			528		
Turn Bay Length (ft)	150												
Base Capacity (vph)	1006	1728				1600		663					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.31	0.26				0.43		0.85					

Intersection Summary

Area Type: CBD

Cycle Length: 100

Actuated Cycle Length: 97.4

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 18.7

Intersection LOS: B

Intersection Capacity Utilization 62.3%

ICU Level of Service B

Analysis Period (min) 15

90th %ile Actuated Cycle: 100

70th %ile Actuated Cycle: 99.9

50th %ile Actuated Cycle: 98.6

30th %ile Actuated Cycle: 96.4

10th %ile Actuated Cycle: 91.9

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Charles Street & Stuart Street








Intersection Summary		
Area Type:	Other	
Cycle Length:	90	
Actuated Cycle Length:	90	
Offset:	26 (29%), Referenced to phase 1:NBT, Start of Green	
Natural Cycle:	90	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	0.51	
Intersection Signal Delay:	17.8	Intersection LOS: B
Intersection Capacity Utilization	50.4%	ICU Level of Service A
Analysis Period (min)	15	
! Phase conflict between lane groups.		

 01 (R)	 02	 05
35 s	24 s	31 s

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	8 (7%), Referenced to phase 5:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	22.6
Intersection Capacity Utilization	50.4%
Analysis Period (min)	15
	Intersection LOS: C
	ICU Level of Service A

→ Ø1	→ Ø2	→ Ø5 (R)
35 s	24 s	51 s

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	45	108	336	0	0	0	0	0	1069	198	
Future Volume (vph)	0	0	45	108	336	0	0	0	0	0	1069	198	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor											1.00		
Frt			0.865								0.977		
Flt Protected				0.950	0.998								
Satd. Flow (prot)	0	0	1644	1535	3285	0	0	0	0	0	4911	0	
Flt Permitted				0.950	0.998								
Satd. Flow (perm)	0	0	1644	1535	3285	0	0	0	0	0	4911	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)			372	112	55						40		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		227			222			380			297		
Travel Time (s)		6.2			6.1			10.4			8.1		
Confl. Bikes (#/hr)						6						16	
Peak Hour Factor	0.60	0.60	0.60	0.87	0.87	0.87	0.25	0.25	0.25	0.97	0.97	0.97	
Heavy Vehicles (%)	0%	0%	0%	7%	5%	0%	2%	2%	2%	0%	3%	2%	
Adj. Flow (vph)	0	0	75	124	386	0	0	0	0	0	1102	204	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	0	75	112	398	0	0	0	0	0	1306	0	
Turn Type			Prot	Split	NA						NA		
Protected Phases			1!	1!	1						5		2
Permitted Phases													
Detector Phase			1	1	1						5		
Switch Phase													
Minimum Initial (s)			8.0	8.0	8.0						8.0		5.0
Minimum Split (s)			37.0	37.0	37.0						48.0		25.0
Total Split (s)			37.0	37.0	37.0						48.0		25.0
Total Split (%)			33.6%	33.6%	33.6%						43.6%		23%
Maximum Green (s)			32.0	32.0	32.0						43.5		21.0
Yellow Time (s)			3.5	3.5	3.5						3.5		4.0
All-Red Time (s)			1.5	1.5	1.5						1.0		0.0
Lost Time Adjust (s)			0.0	0.0	0.0						0.0		
Total Lost Time (s)			5.0	5.0	5.0						4.5		
Lead/Lag			Lead	Lead	Lead								Lag
Lead-Lag Optimize?			Yes	Yes	Yes								Yes
Vehicle Extension (s)			2.0	2.0	2.0						2.0		2.0
Recall Mode			Max	Max	Max						C-Max		None
Walk Time (s)			23.0	23.0	23.0						29.5		7.0
Flash Dont Walk (s)			9.0	9.0	9.0						14.0		14.0
Pedestrian Calls (#/hr)			0	0	0						0		500
Act Effct Green (s)			32.0	32.0	32.0						43.5		
Actuated g/C Ratio			0.29	0.29	0.29						0.40		
v/c Ratio			0.10	0.21	0.40						0.66		
Control Delay			0.3	6.6	28.2						9.5		
Queue Delay			0.0	0.1	0.0						0.3		
Total Delay			0.3	6.7	28.2						9.8		
LOS			A	A	C						A		
Approach Delay		0.3			23.5						9.8		
Approach LOS		A			C						A		
90th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
90th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
70th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
70th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
50th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
50th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
30th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
30th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
10th %ile Green (s)			32.0	32.0	32.0						43.5		21.0
10th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
Queue Length 50th (ft)			0	0	106						48		
Queue Length 95th (ft)			0	41	146						55		
Internal Link Dist (ft)		147			142			300			217		
Turn Bay Length (ft)													
Base Capacity (vph)			742	525	994						1966		
Starvation Cap Reductn			0	0	0						199		
Spillback Cap Reductn			96	79	0						52		
Storage Cap Reductn			0	0	0						0		
Reduced v/c Ratio			0.12	0.25	0.40						0.74		
















Intersection Summary

Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 15 (14%), Referenced to phase 5:SBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 53.1%	ICU Level of Service A
Analysis Period (min) 15	
! Phase conflict between lane groups.	

Splits and Phases: 5: St James Avenue/Park Plaza & Arlington Street



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↖	↗	
Traffic Volume (veh/h)	0	0	170	349	35	0
Future Volume (Veh/h)	0	0	170	349	35	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.95	0.95	0.42	0.42
Hourly flow rate (vph)	0	0	179	367	83	0
Pedestrians					21	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	565					
pX, platoon unblocked						
vC, conflicting volume			21		746	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			21		746	21
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		75	100
cM capacity (veh/h)			1557		327	1041
Direction, Lane #	WB 1	NB 1				
Volume Total	546	83				
Volume Left	179	83				
Volume Right	0	0				
cSH	1557	327				
Volume to Capacity	0.11	0.25				
Queue Length 95th (ft)	10	25				
Control Delay (s)	3.2	19.7				
Lane LOS	A	C				
Approach Delay (s)	3.2	19.7				
Approach LOS		C				
Intersection Summary						
Average Delay		5.4				
Intersection Capacity Utilization		37.8%		ICU Level of Service		A
Analysis Period (min)		15				

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Traffic Volume (veh/h)	17	39	33	3	2	5	1	40	127	0	0
Future Volume (Veh/h)	17	39	33	3	2	5	1	40	127	0	0
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.67	0.67	0.67	0.42	0.42	0.42	0.95	0.95	0.95	0.25	0.25
Hourly flow rate (vph)	25	58	49	7	5	12	1	42	134	0	0
Pedestrians	45			112			21				
Lane Width (ft)	12.0			12.0			12.0				
Walking Speed (ft/s)	3.5			3.5			3.5				
Percent Blockage	4			11			2				
Right turn flare (veh)											
Median type	None					None					
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	226	114	77	42				62	168 120		
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	226	114	77	42				62	168 120		
tC, single (s)	7.1	6.5	6.2	4.1				4.1	7.1 6.5		
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2				2.2	3.5 4.0		
p0 queue free %	96	92	95	100				100	100 100		
cM capacity (veh/h)	604	734	920	1580				1475	669 734		
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	132	24	43	134							
Volume Left	25	7	1	0							
Volume Right	49	12	0	134							
cSH	760	1580	1475	1700							
Volume to Capacity	0.17	0.00	0.00	0.08							
Queue Length 95th (ft)	16	0	0	0							
Control Delay (s)	10.7	2.1	0.2	0.0							
Lane LOS	B	A	A								
Approach Delay (s)	10.7	2.1	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay	4.4										
Intersection Capacity Utilization	26.0%			ICU Level of Service				A			
Analysis Period (min)	15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↖	
Traffic Volume (veh/h)	0	0	0	180	22	0
Future Volume (Veh/h)	0	0	0	180	22	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.95	0.95	0.75	0.75
Hourly flow rate (vph)	0	0	0	189	29	0
Pedestrians	35					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0	130	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	130	0	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	97	100	
cM capacity (veh/h)			1636	857	1091	
Direction, Lane #	WB 1	WB 2	NB 1			
Volume Total	94	94	29			
Volume Left	0	0	29			
Volume Right	0	0	0			
cSH	1700	1700	857			
Volume to Capacity	0.06	0.06	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	9.3			
Lane LOS			A			
Approach Delay (s)	0.0		9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			15.0%	ICU Level of Service	A	
Analysis Period (min)			15			

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑			↓	
Traffic Volume (veh/h)	168	723	0	0	40	0
Future Volume (Veh/h)	168	723	0	0	40	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	173	745	0	0	45	0
Pedestrians			18		156	
Lane Width (ft)			0.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		15	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		556	301			
pX, platoon unblocked						
vC, conflicting volume	156				892	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156				892	156
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				78	100
cM capacity (veh/h)	1210				208	739
Direction, Lane #	EB 1	EB 2	SB 1			
Volume Total	421	497	45			
Volume Left	173	0	45			
Volume Right	0	0	0			
cSH	1210	1700	208			
Volume to Capacity	0.14	0.29	0.22			
Queue Length 95th (ft)	12	0	20			
Control Delay (s)	4.3	0.0	27.0			
Lane LOS	A		D			
Approach Delay (s)	2.0		27.0			
Approach LOS			D			
Intersection Summary						
Average Delay		3.1				
Intersection Capacity Utilization		34.9%		ICU Level of Service	A	
Analysis Period (min)		15				

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations			↕	↕		↕	↕					↕	↕	↕	
Traffic Volume (vph)	13	0	359	159	2	138	534	0	0	0	0	68	276	147	
Future Volume (vph)	13	0	359	159	2	138	534	0	0	0	0	68	276	147	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)			0			100		0	0		0	1		1	
Storage Lanes			0			1		0	0		0	1		1	
Taper Length (ft)			25			25		25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	
Ped Bike Factor															
Frt				0.850										0.850	
Flt Protected			0.998			0.950						0.950			
Satd. Flow (prot)	0	0	3437	1599	0	1770	3539	0	0	0	0	1399	3471	1392	
Flt Permitted			0.678			0.434						0.950			
Satd. Flow (perm)	0	0	2335	1599	0	808	3539	0	0	0	0	1399	3471	1392	
Right Turn on Red				Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)				179									158		
Link Speed (mph)			25				25			25			25		
Link Distance (ft)			298				527			152			434		
Travel Time (s)			8.1				14.4			4.1			11.8		
Confl. Bikes (#/hr)				12				8						2	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.25	1.00	1.00	0.25	0.92	0.92	0.92	0.93	0.93	0.93	
Heavy Vehicles (%)	0%	0%	5%	1%	2%	2%	2%	2%	2%	2%	2%	29%	4%	16%	
Adj. Flow (vph)	15	0	403	179	8	138	534	0	0	0	0	73	297	158	
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	0	418	179	0	146	534	0	0	0	0	73	297	158	
Turn Type	Perm		NA	Prot	custom	D.P+P	NA					Split	NA	Prot	
Protected Phases			1	1		6	1 6					5	5	5	2
Permitted Phases	1				6	1									
Detector Phase	1		1	1	6	6	1 6					5	5	5	
Switch Phase															
Minimum Initial (s)	8.0		8.0	8.0	6.0	6.0						8.0	8.0	8.0	1.0
Minimum Split (s)	13.5		13.5	13.5	11.5	11.5						13.0	13.0	13.0	28.0
Total Split (s)	34.0		34.0	34.0	14.0	14.0						33.0	33.0	33.0	29.0
Total Split (%)	30.9%		30.9%	30.9%	12.7%	12.7%						30.0%	30.0%	30.0%	26%
Maximum Green (s)	28.5		28.5	28.5	8.5	8.5						28.0	28.0	28.0	26.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0						3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.5	2.5	2.5	2.5						1.5	1.5	1.5	1.0
Lost Time Adjust (s)			0.0	0.0		0.0						0.0	0.0	0.0	
Total Lost Time (s)			5.5	5.5		5.5						5.0	5.0	5.0	
Lead/Lag	Lead		Lead		Lag	Lag						Lead	Lead	Lead	Lag
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	C-Max		C-Max		C-Max	None	None					None	None	None	Ped
Walk Time (s)	7.0		7.0		7.0	6.0	6.0								7.0
Flash Dont Walk (s)	0.0		0.0		0.0	0.0	0.0								18.0
Pedestrian Calls (#/hr)	0		0		0	0	0								0
Act Effct Green (s)			34.6		34.6	50.2	55.7					15.8	15.8	15.8	
Actuated g/C Ratio			0.31		0.31	0.46	0.51					0.14	0.14	0.14	
v/c Ratio			0.57		0.29	0.29	0.30					0.36	0.60	0.47	
Control Delay			36.8		6.1	12.8	13.6					46.5	48.7	11.1	
Queue Delay			0.0		0.0	0.0	0.0					0.0	0.0	0.0	
Total Delay			36.8		6.1	12.8	13.6					46.5	48.7	11.1	
LOS			D		A	B	B					D	D	B	
Approach Delay			27.6				13.5						37.1		
Approach LOS			C				B					D			
90th %ile Green (s)	28.5		28.5		28.5	16.2	16.2					21.3	21.3	21.3	25.0
90th %ile Term Code	Coord		Coord		Coord	Max	Max					Gap	Gap	Gap	Ped
70th %ile Green (s)	28.5		28.5		28.5	19.4	19.4					18.1	18.1	18.1	25.0
70th %ile Term Code	Coord		Coord		Coord	Max	Max					Gap	Gap	Gap	Ped
50th %ile Green (s)	33.3		33.3		33.3	17.1	17.1					15.6	15.6	15.6	25.0
50th %ile Term Code	Coord		Coord		Coord	Gap	Gap					Gap	Gap	Gap	Ped
30th %ile Green (s)	38.6		38.6		38.6	14.3	14.3					13.1	13.1	13.1	25.0
30th %ile Term Code	Coord		Coord		Coord	Gap	Gap					Gap	Gap	Gap	Ped
10th %ile Green (s)	44.1		44.1		44.1	11.1	11.1					10.8	10.8	10.8	25.0
10th %ile Term Code	Coord		Coord		Coord	Gap	Gap					Gap	Gap	Gap	Ped
Queue Length 50th (ft)			131		0	76	158					47	104	0	
Queue Length 95th (ft)			195		51	140	228					88	141	55	
Internal Link Dist (ft)			218				447			72			354		
Turn Bay Length (ft)						100								170	
Base Capacity (vph)			734		625	505	1792					356	883	472	
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			0.57		0.29	0.29	0.30					0.21	0.34	0.33	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 9 (8%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 25.1

Intersection LOS: C

Intersection Capacity Utilization 46.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 10: Tremont Street & Stuart Street



Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	81.5 (74%), Referenced to phase 6:EBWB, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	38.5
Intersection Capacity Utilization	56.7%
Analysis Period (min)	15
m	Volume for 95th percentile queue is metered by upstream signal.
Intersection LOS:	D
ICU Level of Service	B

LPHS and Phases: N. Washington Street at Stuart Street/Colorado Street									
Ø1		Ø2		Ø5		Ø6 (R)			
24 s		32 s		24 s		30 s			

	→	↘	↙	↘	↓	↙	↘	↙	↘	↙	↘
Lane Group	EBT	EBR	EBR2	SBL	SBT	SBR	NER	NER2	SWL	SWT	Ø2
Lane Configurations	↕↕	↕		↕	↕↕	↕	↕↕			↕↕	
Traffic Volume (vph)	510	244	32	363	792	299	181	37	81	92	
Future Volume (vph)	510	244	32	363	792	299	181	37	81	92	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		50		0		0	0		0		
Storage Lanes		1		1		1	2		0		
Taper Length (ft)				25					25		
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.88	1.00	0.95	0.95	
Ped Bike Factor		0.69				0.98					
Frt		0.850				0.850	0.850				
Flt Protected				0.950						0.977	
Satd. Flow (prot)	3154	1441	0	1608	3185	1454	2524	0	0	3174	
Flt Permitted				0.950						0.977	
Satd. Flow (perm)	3154	997	0	1608	3185	1428	2524	0	0	3174	
Right Turn on Red			Yes					No			
Satd. Flow (RTOR)		109									
Link Speed (mph)	25				25					25	
Link Distance (ft)	317				380					156	
Travel Time (s)	8.6				10.4					4.3	
Confl. Peds. (#/hr)			138								
Confl. Bikes (#/hr)			2			8		10			
Peak Hour Factor	0.94	0.94	0.94	0.96	0.96	0.96	0.85	0.85	0.93	0.93	
Heavy Vehicles (%)	3%	1%	0%	1%	2%	0%	1%	3%	0%	0%	
Adj. Flow (vph)	543	260	34	378	825	311	213	44	87	99	
Shared Lane Traffic (%)											
Lane Group Flow (vph)	543	294	0	378	825	311	257	0	0	186	
Turn Type	NA	Perm		Perm	NA	Perm	Prot		Perm	NA	
Protected Phases	4			1	1	7			7	2	
Permitted Phases		4		1	1				7		
Detector Phase	4	4		1	1	1	7		7	7	
Switch Phase											
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	7.0
Minimum Split (s)	21.0	21.0		19.0	19.0	19.0	12.0		12.0	12.0	21.0
Total Split (s)	30.0	30.0		41.0	41.0	41.0	18.0		18.0	18.0	21.0
Total Split (%)	27.3%	27.3%		37.3%	37.3%	37.3%	16.4%		16.4%	16.4%	19%
Maximum Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	3.0	3.0		2.0	2.0	2.0	3.0		3.0	3.0	0.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.0	5.0	5.0	6.0		6.0	6.0	
Lead/Lag				Lead	Lead	Lead					Lag
Lead-Lag Optimize?				Yes	Yes	Yes					Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		C-Max	C-Max	C-Max	None		None	None	Ped
Walk Time (s)	7.0	7.0		6.0	6.0	6.0					7.0
Flash Dont Walk (s)	8.0	8.0		8.0	8.0	8.0					11.0
Pedestrian Calls (#/hr)	0	0		0	0	0					0
Act Effct Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0		
Actuated g/C Ratio	0.22	0.22		0.33	0.33	0.33	0.11		0.11		
v/c Ratio	0.79	0.97		0.72	0.79	0.67	0.93		0.54		
Control Delay	50.0	73.7		56.7	56.0	55.1	89.2		52.7		
Queue Delay	0.0	0.0		13.5	27.2	2.5	0.0		0.0		
Total Delay	50.0	73.7		70.2	83.2	57.7	89.2		52.7		
LOS	D	E		E	F	E	F		D		
Approach Delay	58.4			74.7					52.7		
Approach LOS	E			E					D		
90th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
90th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
70th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
70th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
50th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
50th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
30th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
30th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
10th %ile Green (s)	24.0	24.0		36.0	36.0	36.0	12.0		12.0	12.0	18.0
10th %ile Term Code	Max	Max		Coord	Coord	Coord	Max		Max	Max	Ped
Queue Length 50th (ft)	191	139		281	325	231	103		66		
Queue Length 95th (ft)	256	#319		381	393	325	#175		104		
Internal Link Dist (ft)	237			300					76		
Turn Bay Length (ft)		50									
Base Capacity (vph)	688	302		526	1042	467	275		346		
Starvation Cap Reductn	0	0		130	249	72	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	0.79	0.97		0.95	1.04	0.79	0.93		0.54		

Intersection Summary

Area Type: CBD

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 86 (78%), Referenced to phase 1:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 69.7

Intersection LOS: E

Intersection Capacity Utilization 76.4%

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.

Splits and Phases: 1: Columbus Avenue & Arlington Street & Stuart Street

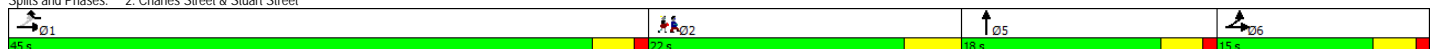
































Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	335	641	0	0	0	600	0	479	94	0	0	0	
Future Volume (vph)	335	641	0	0	0	600	0	479	94	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	150		0	0	0	0	0	0	0	0	0	0	
Storage Lanes	1		0	0	0	2	0	0	0	0	0	0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.91	0.91	1.00	1.00	1.00	
Ped Bike Factor						0.850		0.975					
Frt													
Flt Protected	0.950												
Satd. Flow (prot)	1608	3217	0	0	0	2558	0	4466	0	0	0	0	
Flt Permitted	0.950												
Satd. Flow (perm)	1608	3217	0	0	0	2558	0	4466	0	0	0	0	
Right Turn on Red	Yes		Yes			Yes		Yes				Yes	
Satd. Flow (RTOR)	353					1026		34					
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		305			255			371			608		
Travel Time (s)		8.3			7.0			10.1			16.6		
Confl. Bikes (#/hr)						1		2					
Peak Hour Factor	0.95	0.95	0.95	0.85	0.85	0.85	0.94	0.94	0.94	0.25	0.25	0.25	
Heavy Vehicles (%)	1%	1%	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	
Adj. Flow (vph)	353	675	0	0	0	706	0	510	100	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	353	675	0	0	0	706	0	610	0	0	0	0	
Turn Type	custom	NA				Prot		NA					
Protected Phases	6	1 6				1		5					2
Permitted Phases	1												
Detector Phase	6	1 6				1		5					
Switch Phase													
Minimum Initial (s)	5.0					12.0		8.0					5.0
Minimum Split (s)	15.0					45.0		18.0					22.0
Total Split (s)	15.0					45.0		18.0					22.0
Total Split (%)	15.0%					45.0%		18.0%					22%
Maximum Green (s)	11.0					41.0		14.0					18.0
Yellow Time (s)	3.0					3.0		3.0					4.0
All-Red Time (s)	1.0					1.0		1.0					0.0
Lost Time Adjust (s)	0.0					0.0		0.0					
Total Lost Time (s)	4.0					4.0		4.0					
Lead/Lag	Lag					Lead		Lead					Lag
Lead-Lag Optimize?	Yes					Yes		Yes					Yes
Vehicle Extension (s)	2.0					2.0		2.0					2.0
Recall Mode	None					Max		None					None
Walk Time (s)	11.0					32.0		5.0					8.0
Flash Dont Walk (s)	0.0					9.0		9.0					10.0
Pedestrian Calls (#/hr)	0					0		0					500
Act Effect Green (s)	56.0	56.0				41.0		14.0					
Actuated g/C Ratio	0.56	0.56				0.41		0.14					
v/c Ratio	0.33	0.37				0.43		0.93					
Control Delay	2.1	13.0				0.8		63.0					
Queue Delay	0.0	0.0				0.0		0.0					
Total Delay	2.1	13.0				0.8		63.0					
LOS	A	B				A		E					
Approach Delay		9.3			0.8			63.0					
Approach LOS		A			A			E					
90th %ile Green (s)	11.0					41.0		14.0					18.0
90th %ile Term Code	Max					MaxR		Max					Ped
70th %ile Green (s)	11.0					41.0		14.0					18.0
70th %ile Term Code	Max					MaxR		Max					Ped
50th %ile Green (s)	11.0					41.0		14.0					18.0
50th %ile Term Code	Max					MaxR		Max					Ped
30th %ile Green (s)	11.0					41.0		14.0					18.0
30th %ile Term Code	Max					MaxR		Max					Ped
10th %ile Green (s)	11.0					41.0		14.0					18.0
10th %ile Term Code	Max					MaxR		Max					Ped
Queue Length 50th (ft)	0	118				0		135					
Queue Length 95th (ft)	38	157				0		#209					
Internal Link Dist (ft)		225			175			291			528		
Turn Bay Length (ft)	150												
Base Capacity (vph)	1055	1801				1654		654					
Starvation Cap Reductn	0	0				0		0					
Spillback Cap Reductn	0	0				0		0					
Storage Cap Reductn	0	0				0		0					
Reduced v/c Ratio	0.33	0.37				0.43		0.93					

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 20.7
Intersection LOS: C
Intersection Capacity Utilization 66.6%
ICU Level of Service C
Analysis Period (min) 15
90th %ile Actuated Cycle: 100
70th %ile Actuated Cycle: 100
50th %ile Actuated Cycle: 100
30th %ile Actuated Cycle: 100
10th %ile Actuated Cycle: 100
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Charles Street & Stuart Street



																													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2																
Lane Configurations																													
Traffic Volume (vph)	561	543	0	0	0	217	0	798	178	0	0	0																	
Future Volume (vph)	561	543	0	0	0	217	0	798	178	0	0	0																	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900																	
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00																	
Ped Bike Factor								1.00																					
Frt						0.865		0.973																					
Flt Protected	0.950																												
Satd. Flow (prot)	3433	3574	0	0	0	1644	0	4924	0	0	0	0																	
Flt Permitted	0.950																												
Satd. Flow (perm)	3433	3574	0	0	0	1644	0	4924	0	0	0	0																	
Right Turn on Red	Yes		Yes			Yes			Yes			Yes																	
Satd. Flow (RTOR)	623					374		54																					
Link Speed (mph)		25			25			25			25																		
Link Distance (ft)		892			331			608			262																		
Travel Time (s)		24.3			9.0			16.6			7.1																		
Confl. Bikes (#/hr)								8																					
Peak Hour Factor	0.90	0.90	0.90	0.91	0.91	0.91	0.86	0.86	0.86	0.25	0.25	0.25																	
Heavy Vehicles (%)	2%	1%	0%	0%	0%	0%	0%	2%	3%	0%	0%	0%																	
Adj. Flow (vph)	623	603	0	0	0	238	0	928	207	0	0	0																	
Shared Lane Traffic (%)																													
Lane Group Flow (vph)	623	603	0	0	0	238	0	1135	0	0	0	0																	
Turn Type	Split	NA				Prot		NA																					
Protected Phases	5!	5				5!		1																					
Permitted Phases																													
Detector Phase	5	5				5		1																					
Switch Phase																													
Minimum Initial (s)	8.0	8.0				8.0		8.0																					
Minimum Split (s)	36.0	36.0				36.0		50.0																					
Total Split (s)	36.0	36.0				36.0		50.0																					
Total Split (%)	32.7%	32.7%				32.7%		45.5%																					
Maximum Green (s)	31.5	31.5				31.5		44.0																					
Yellow Time (s)	3.0	3.0				3.0		3.5																					
All-Red Time (s)	1.5	1.5				1.5		2.5																					
Lost Time Adjust (s)	0.0	0.0				0.0		0.0																					
Total Lost Time (s)	4.5	4.5				4.5		6.0																					
Lead/Lag								Lead																					
Lead-Lag Optimize?								Yes																					
Vehicle Extension (s)	2.0	2.0				2.0		2.0																					
Recall Mode	None	None				None		C-Max																					
Walk Time (s)	19.5	19.5				19.5		39.0																					
Flash Dont Walk (s)	12.0	12.0				12.0		5.0																					
Pedestrian Calls (#/hr)	0	0				0		0																					
Act Effct Green (s)	27.6	27.6				27.6		47.9																					
Actuated g/C Ratio	0.25	0.25				0.25		0.44																					
v/c Ratio	0.47	0.67				0.34		0.52																					
Control Delay	6.6	35.1				1.4		23.2																					
Queue Delay	0.0	0.0				0.0		0.0																					
Total Delay	6.6	35.1				1.4		23.2																					
LOS	A	D				A		C																					
Approach Delay		20.6			1.4			23.2																					
Approach LOS		C			A			C																					
90th %ile Green (s)	31.5	31.5				31.5		44.0																					
90th %ile Term Code	Max	Max				Max		Coord																					
70th %ile Green (s)	31.5	31.5				31.5		44.0																					

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 25 (23%), Referenced to phase 1:NBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 20.0

Intersection LOS: B

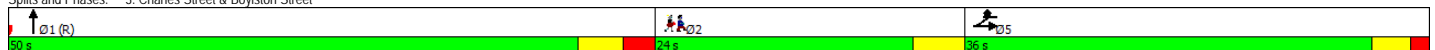
Intersection Capacity Utilization 61.3%































ICU Level of Service B

Analysis Period (min) 15

! Phase conflict between lane groups.

Splits and Phases: 3: Charles Street & Boylston Street



																												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2															
Lane Configurations																												
Traffic Volume (vph)	0	763	271	0	0	0	0	0	0	697	1136	0																
Future Volume (vph)	0	763	271	0	0	0	0	0	0	697	1136	0																
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900																
Lane Util. Factor	1.00	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.86	1.00																
Ped Bike Factor		0.99																										
Frt		0.961																										
Flt Protected										0.950	0.991																	
Satd. Flow (prot)	0	6068	0	0	0	0	0	0	0	1552	4858	0																
Flt Permitted										0.950	0.991																	
Satd. Flow (perm)	0	6068	0	0	0	0	0	0	0	1552	4858	0																
Right Turn on Red			Yes			Yes			Yes	Yes		Yes																
Satd. Flow (RTOR)		88								410	50																	
Link Speed (mph)		25			25				25		25																	
Link Distance (ft)		336			892				297		292																	
Travel Time (s)		9.2			24.3				8.1		8.0																	
Confl. Bikes (#/hr)			22																									
Peak Hour Factor	0.94	0.94	0.94	0.25	0.25	0.25	0.25	0.25	0.25	0.96	0.96	0.96																
Heavy Vehicles (%)	0%	2%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%																
Adj. Flow (vph)	0	812	288	0	0	0	0	0	0	726	1183	0																
Shared Lane Traffic (%)										36%																		
Lane Group Flow (vph)	0	1100	0	0	0	0	0	0	0	465	1444	0																
Turn Type		NA								Split	NA																	
Protected Phases		1								5	5																	
Permitted Phases																												
Detector Phase		1								5	5																	
Switch Phase																												
Minimum Initial (s)		8.0								8.0	8.0																	
Minimum Split (s)		24.0								22.0	22.0																	
Total Split (s)		41.0								45.0	45.0																	
Total Split (%)		37.3%								40.9%	40.9%																	
Maximum Green (s)		37.0								41.0	41.0																	
Yellow Time (s)		3.0								3.0	3.0																	
All-Red Time (s)		1.0								1.0	1.0																	
Lost Time Adjust (s)		0.0								0.0	0.0																	
Total Lost Time (s)		4.0								4.0	4.0																	
Lead/Lag		Lead																										
Lead-Lag Optimize?		Yes																										
Vehicle Extension (s)		2.0								2.0	2.0																	
Recall Mode		Max								C-Max	C-Max																	
Walk Time (s)		7.0								7.0	7.0																	
Flash Dont Walk (s)		8.0								8.0	8.0																	
Pedestrian Calls (#/hr)		0								0	0																	
Act Effct Green (s)		37.0								41.0	41.0																	
Actuated g/C Ratio		0.34								0.37	0.37																	
v/c Ratio		0.52								0.56	0.78																	
Control Delay		27.9								6.9	33.2																	
Queue Delay		0.0								0.0	0.7																	
Total Delay		27.9								6.9	33.9																	
LOS		C								A	C																	
Approach Delay		27.9									27.3																	
Approach LOS		C									C																	
90th %ile Green (s)		37.0								41.0	41.0																	
90th %ile Term Code		MaxR								Coord	Coord																	
70th %ile Green (s)		37.0								41.0	41.0																	
70th %ile Term Code		MaxR								Coord	Coord																	
50th %ile Green (s)		37.0								41.0	41.0																	
50th %ile Term Code		MaxR								Coord	Coord																	
30th %ile Green (s)		37.0								41.0	41.0																	
30th %ile Term Code		MaxR								Coord	Coord																	
10th %ile Green (s)		37.0								41.0	41.0																	
10th %ile Term Code		MaxR								Coord	Coord																	
Queue Length 50th (ft)		165								29	335																	
Queue Length 95th (ft)		201								126	399																	
Internal Link Dist (ft)		256			812				217		212																	
Turn Bay Length (ft)																												
Base Capacity (vph)		2099								835	1842																	
Starvation Cap Reductn		0								0	0																	
Spillback Cap Reductn		0								0	146																	
Storage Cap Reductn		0								0	0																	
Reduced v/c Ratio		0.52								0.56	0.85																	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 11 (10%), Referenced to phase 5:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 27.5

Intersection LOS: C

Intersection Capacity Utilization 61.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Boylston Street & Arlington Street

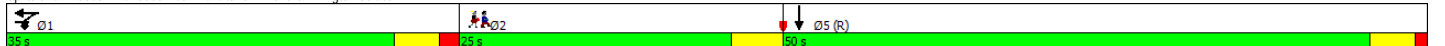


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	64	149	383	0	0	0	0	0	1240	149	
Future Volume (vph)	0	0	64	149	383	0	0	0	0	0	1240	149	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor													
Frt			0.865								0.984		
Flt Protected				0.950	0.998								
Satd. Flow (prot)	0	0	1644	1595	3382	0	0	0	0	0	5047	0	
Flt Permitted				0.950	0.998								
Satd. Flow (perm)	0	0	1644	1595	3382	0	0	0	0	0	5047	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)			354	156	55						23		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		227			222			380			297		
Travel Time (s)		6.2			6.1			10.4			8.1		
Confl. Bikes (#/hr)													19
Peak Hour Factor	0.80	0.80	0.80	0.86	0.86	0.86	0.25	0.25	0.25	0.93	0.93	0.93	
Heavy Vehicles (%)	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	0	0	80	173	445	0	0	0	0	0	1333	160	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	0	80	156	462	0	0	0	0	0	1493	0	
Turn Type			Prot	Split	NA						NA		
Protected Phases			1!	1!	1						5		2
Permitted Phases													
Detector Phase			1	1	1						5		
Switch Phase													
Minimum Initial (s)			8.0	8.0	8.0						8.0		5.0
Minimum Split (s)			35.0	35.0	35.0						50.0		25.0
Total Split (s)			35.0	35.0	35.0						50.0		25.0
Total Split (%)			31.8%	31.8%	31.8%						45.5%		23%
Maximum Green (s)			30.0	30.0	30.0						45.5		21.0
Yellow Time (s)			3.5	3.5	3.5						3.5		4.0
All-Red Time (s)			1.5	1.5	1.5						1.0		0.0
Lost Time Adjust (s)			0.0	0.0	0.0						0.0		
Total Lost Time (s)			5.0	5.0	5.0						4.5		
Lead/Lag			Lead	Lead	Lead								Lag
Lead-Lag Optimize?			Yes	Yes	Yes								Yes
Vehicle Extension (s)			2.0	2.0	2.0						2.0		2.0
Recall Mode			Max	Max	Max						C-Max		None
Walk Time (s)			21.0	21.0	21.0						31.5		7.0
Flash Dont Walk (s)			9.0	9.0	9.0						14.0		14.0
Pedestrian Calls (#/hr)			0	0	0						0		500
Act Effct Green (s)			30.0	30.0	30.0						45.5		
Actuated g/C Ratio			0.27	0.27	0.27						0.41		
v/c Ratio			0.11	0.28	0.48						0.71		
Control Delay			0.3	6.4	31.2						14.1		
Queue Delay			0.1	0.6	2.0						1.4		
Total Delay			0.4	7.0	33.2						15.5		
LOS			A	A	C						B		
Approach Delay		0.4			26.6						15.5		
Approach LOS		A			C						B		
90th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
90th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
70th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
70th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
50th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
50th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
30th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
30th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
10th %ile Green (s)			30.0	30.0	30.0						45.5		21.0
10th %ile Term Code			MaxR	MaxR	MaxR						Coord		Ped
Queue Length 50th (ft)			0	0	131						84		
Queue Length 95th (ft)			0	47	173						106		
Internal Link Dist (ft)		147			142			300			217		
Turn Bay Length (ft)													
Base Capacity (vph)			705	548	962						2101		
Starvation Cap Reductn			0	0	0						386		
Spillback Cap Reductn			182	168	343						102		
Storage Cap Reductn			0	0	0						0		
Reduced v/c Ratio			0.15	0.41	0.75						0.87		
















Intersection Summary

Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 18 (16%), Referenced to phase 5:SBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	
! Phase conflict between lane groups.	

Splits and Phases: 5: St James Avenue/Park Plaza & Arlington Street



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↖	↗	
Traffic Volume (veh/h)	0	0	173	402	68	0
Future Volume (Veh/h)	0	0	173	402	68	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.84	0.84	0.75	0.75
Hourly flow rate (vph)	0	0	206	479	91	0
Pedestrians	1				6	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	565					
pX, platoon unblocked						
vC, conflicting volume			6		898	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		898	6
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		66	100
cM capacity (veh/h)			1606		271	1076
Direction, Lane #	WB 1	NB 1				
Volume Total	685	91				
Volume Left	206	91				
Volume Right	0	0				
cSH	1606	271				
Volume to Capacity	0.13	0.34				
Queue Length 95th (ft)	11	36				
Control Delay (s)	3.2	24.9				
Lane LOS	A	C				
Approach Delay (s)	3.2	24.9				
Approach LOS		C				
Intersection Summary						
Average Delay		5.8				
Intersection Capacity Utilization		47.8%		ICU Level of Service		A
Analysis Period (min)		15				

											
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Traffic Volume (veh/h)	4	51	56	4	12	11	0	11	161	0	0
Future Volume (Veh/h)	4	51	56	4	12	11	0	11	161	0	0
Sign Control	Stop			Free			Free			Stop	
Grade	0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.75	0.75	0.75	0.84	0.84	0.84	0.25	0.25
Hourly flow rate (vph)	5	64	70	5	16	15	0	13	192	0	0
Pedestrians	54			93			6				
Lane Width (ft)	12.0			12.0			12.0				
Walking Speed (ft/s)	3.5			3.5			3.5				
Percent Blockage	5			9			1				
Right turn flare (veh)											
Median type	None					None					
Median storage (veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	194	100	84	13				85			
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	194	100	84	13				85			
tC, single (s)	7.1	6.5	6.2	4.1				4.1			
tC, 2 stage (s)											
tF (s)	3.5	4.0	3.3	2.2				2.2			
p0 queue free %	99	91	92	100				100			
cM capacity (veh/h)	638	750	926	1619				1446			
										673	743
Direction, Lane #	WB 1	NB 1	SB 1	SB 2							
Volume Total	139	36	13	192							
Volume Left	5	5	0	0							
Volume Right	70	15	0	192							
cSH	824	1619	1446	1700							
Volume to Capacity	0.17	0.00	0.00	0.11							
Queue Length 95th (ft)	15	0	0	0							
Control Delay (s)	10.3	1.0	0.0	0.0							
Lane LOS	B	A									
Approach Delay (s)	10.3	1.0	0.0								
Approach LOS	B										
Intersection Summary											
Average Delay	3.8										
Intersection Capacity Utilization	28.3%			ICU Level of Service				A			
Analysis Period (min)	15										

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑	
Traffic Volume (veh/h)	0	0	0	229	42	0
Future Volume (Veh/h)	0	0	0	229	42	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	0	0	0	244	45	0
Pedestrians	19					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0	141	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	141	0	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	95	100	
cM capacity (veh/h)			1636	843	1091	
Direction, Lane #	WB 1	WB 2	NB 1			
Volume Total	122	122	45			
Volume Left	0	0	45			
Volume Right	0	0	0			
cSH	1700	1700	843			
Volume to Capacity	0.07	0.07	0.05			
Queue Length 95th (ft)	0	0	4			
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			1.5			
Intersection Capacity Utilization			16.3%	ICU Level of Service	A	
Analysis Period (min)			15			

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕			↕	
Traffic Volume (veh/h)	54	923	0	0	160	0
Future Volume (Veh/h)	54	923	0	0	160	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.89	0.89
Hourly flow rate (vph)	59	1014	0	0	180	0
Pedestrians			5		246	
Lane Width (ft)			0.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		23	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		553	305			
pX, platoon unblocked					0.90	
vC, conflicting volume	246				876	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				642	246
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				33	100
cM capacity (veh/h)	1020				267	582
Direction, Lane #	EB 1	EB 2	SB 1			
Volume Total	397	676	180			
Volume Left	59	0	180			
Volume Right	0	0	0			
cSH	1020	1700	267			
Volume to Capacity	0.06	0.40	0.67			
Queue Length 95th (ft)	5	0	110			
Control Delay (s)	1.8	0.0	42.4			
Lane LOS	A		E			
Approach Delay (s)	0.7		42.4			
Approach LOS			E			
Intersection Summary						
Average Delay		6.7				
Intersection Capacity Utilization		42.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	O2		
Lane Configurations																	
Traffic Volume (vph)	25	0	459	129	1	100	392	0	0	0	0	196	369	143			
Future Volume (vph)	25	0	459	129	1	100	392	0	0	0	0	196	369	143			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Storage Length (ft)			0	0		100		0	0		0	0	0	1			
Storage Lanes			0	1		1		0	0		0	1		1			
Taper Length (ft)			25			25			25			25					
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00			
Frt				0.850										0.850			
Flt Protected			0.997			0.950						0.950					
Satd. Flow (prot)	0	0	3532	1583	0	1770	3505	0	0	0	0	1703	3505	1468			
Flt Permitted			0.604			0.337						0.950					
Satd. Flow (perm)	0	0	2140	1583	0	628	3505	0	0	0	0	1703	3505	1468			
Right Turn on Red				Yes				Yes			Yes			Yes			
Satd. Flow (RTOR)				142										155			
Link Speed (mph)			25				25			25			25				
Link Distance (ft)			299				499			356			413				
Travel Time (s)			8.2				13.6			9.7			11.3				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92			
Heavy Vehicles (%)	0%	0%	2%	2%	0%	2%	3%	0%	2%	2%	2%	6%	3%	10%			
Adj. Flow (vph)	27	0	504	142	1	108	422	0	0	0	0	213	401	155			
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	0	0	531	142	0	109	422	0	0	0	0	213	401	155			
Turn Type	Perm		NA	Prot	custom	D.P+P	NA					Split	NA	Prot			
Protected Phases			1	1		6	1 6					5	5	5	2		
Permitted Phases	1				6	1											
Detector Phase	1		1	1	6	6	1 6					5	5	5			
Switch Phase																	
Minimum Initial (s)	8.0		8.0	8.0	6.0	6.0						8.0	8.0	8.0	1.0		
Minimum Split (s)	13.5		13.5	13.5	11.5	11.5						13.0	13.0	13.0	28.0		
Total Split (s)	35.0		35.0	35.0	14.0	14.0						32.0	32.0	32.0	29.0		
Total Split (%)	31.8%		31.8%	31.8%	12.7%	12.7%						29.1%	29.1%	29.1%	26%		
Maximum Green (s)	29.5		29.5	29.5	8.5	8.5						27.0	27.0	27.0	26.0		
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0						3.5	3.5	3.5	2.0		
All-Red Time (s)	2.5		2.5	2.5	2.5	2.5						1.5	1.5	1.5	1.0		
Lost Time Adjust (s)			0.0	0.0		0.0						0.0	0.0	0.0			
Total Lost Time (s)			5.5	5.5		5.5						5.0	5.0	5.0			
Lead/Lag	Lead		Lead		Lag	Lag						Lead	Lead	Lead	Lag		
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	3.0		
Recall Mode	C-Max		C-Max	C-Max	None	None						None	None	None	Ped		
Walk Time (s)	7.0		7.0	7.0	6.0	6.0									7.0		
Flash Dont Walk (s)	0.0		0.0	0.0	0.0	0.0									18.0		
Pedestrian Calls (#/hr)	0		0	0	0	0									0		
Act Effect Green (s)			33.3	33.3		44.8	50.3					21.2	21.2	21.2			
Actuated g/C Ratio			0.30	0.30		0.41	0.46					0.19	0.19	0.19			
v/c Ratio			0.82	0.25		0.29	0.26					0.65	0.59	0.38			
Control Delay			48.8	6.4		21.3	20.0					49.6	43.5	8.2			
Queue Delay			0.0	0.0		0.0	0.0					0.0	0.0	0.0			
Total Delay			48.8	6.4		21.3	20.0					49.6	43.5	8.2			
LOS			D	A		C	B					D	D	A			
Approach Delay			39.8			20.3						38.0					
Approach LOS			D			C						D					
90th %ile Green (s)	29.5		29.5	29.5	8.5	8.5						28.0	28.0	28.0	25.0		
90th %ile Term Code	Coord		Coord	Coord	Max	Max						Max	Max	Max	Ped		
70th %ile Green (s)	29.5		29.5	29.5	11.4	11.4						25.1	25.1	25.1	25.0		
70th %ile Term Code	Coord		Coord	Coord	Max	Max						Gap	Gap	Gap	Ped		
50th %ile Green (s)	29.7		29.7	29.7	14.7	14.7						21.6	21.6	21.6	25.0		
50th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped		
30th %ile Green (s)	35.1		35.1	35.1	12.9	12.9						18.0	18.0	18.0	25.0		
30th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped		
10th %ile Green (s)	42.9		42.9	42.9	9.8	9.8						13.3	13.3	13.3	25.0		
10th %ile Term Code	Coord		Coord	Coord	Gap	Gap						Gap	Gap	Gap	Ped		
Queue Length 50th (ft)			192	0		44	94					139	136	0			
Queue Length 95th (ft)			#299	48		87	145					204	173	51			
Internal Link Dist (ft)			219				419			276			333				
Turn Bay Length (ft)						100									170		
Base Capacity (vph)			648	578		374	1602					421	866	479			
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			0.82	0.25		0.29	0.26					0.51	0.46	0.32			

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 10 (9%), Referenced to phase 1:EBWB, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 33.9

Intersection LOS: C

Intersection Capacity Utilization 48.4%

ICU Level of Service A

Analysis Period (min) 15

















95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 10: Tremont Street & Stuart Street



Intersection Summary		
Area Type:	Other	
Cycle Length:	114	
Actuated Cycle Length:	114	
Offset:	45 (39%), Referenced to phase 6:EBWB, Start of Green	
Natural Cycle:	100	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	0.73	
Intersection Signal Delay:	36.0	Intersection LOS: D
Intersection Capacity Utilization	58.2%	ICU Level of Service B
Analysis Period (min)	15	
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.	

   										   										   										   									
01										02										05										06 (R)									
23 €										32 €										24 €										35 €									

Appendix B

Shadow

SHADOW STUDY, MARCH 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



8:00 am
112.7 Az
23.4 Alt

= NET NEW SHADOW

MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



8:15 am
115.7 Az
25.9 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



8:30 am
118.9 Az
28.4 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

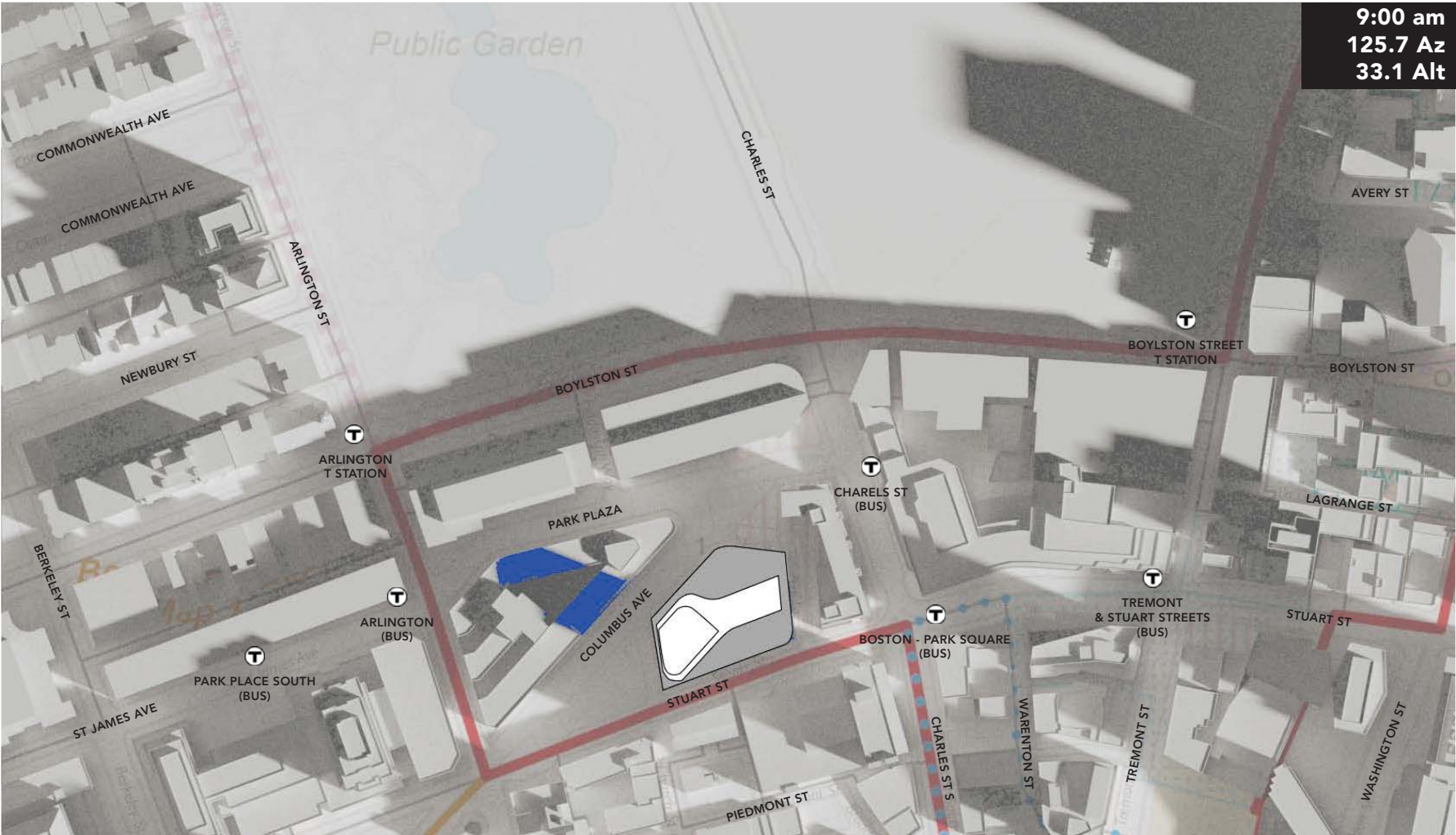
SHADOW STUDY, MARCH 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

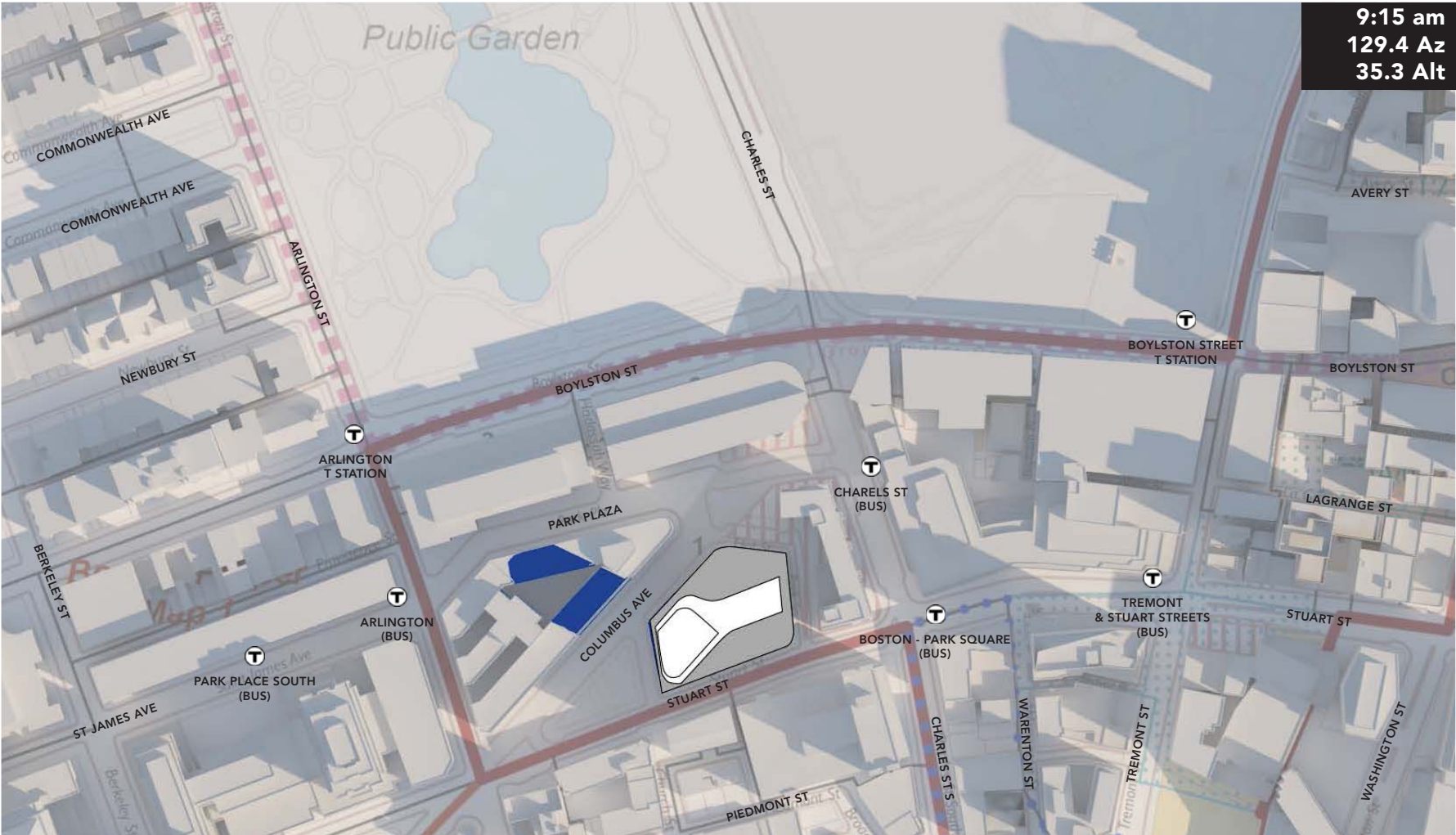
SHADOW STUDY, MARCH 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21

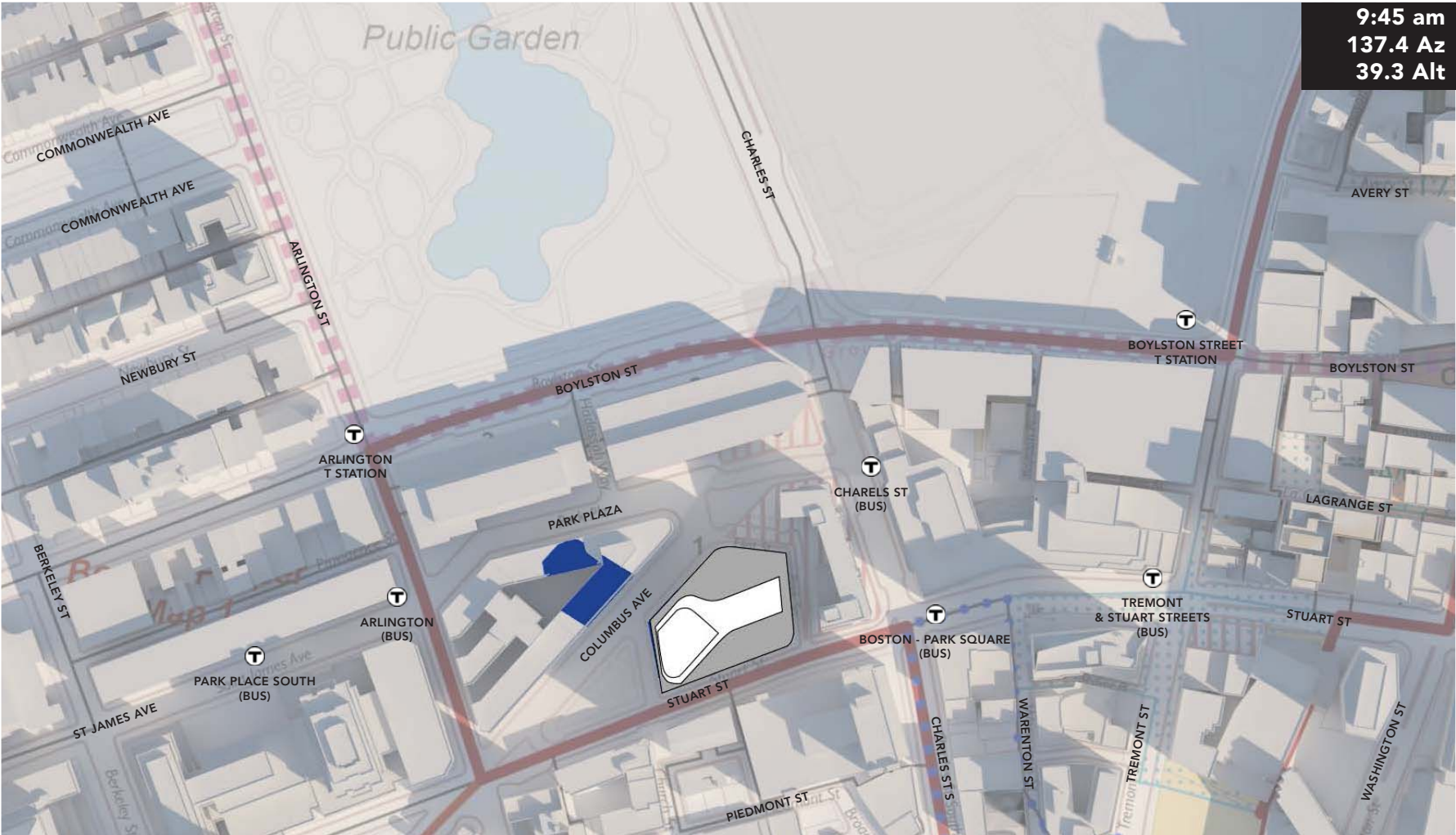


9:30 am
133.3 Az
37.4 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



10:15 am
146.2 Az
42.8 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



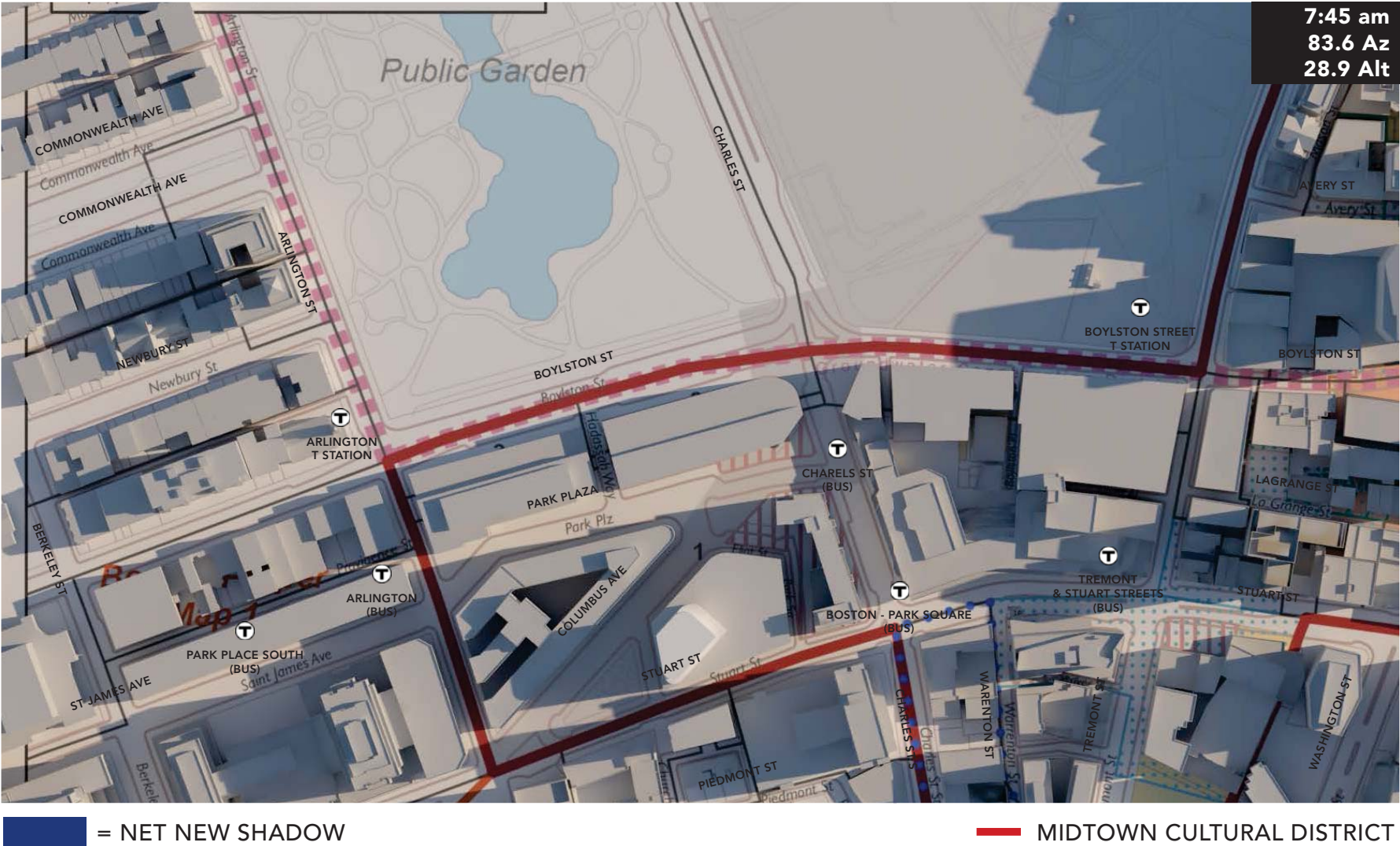
 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, MARCH 21



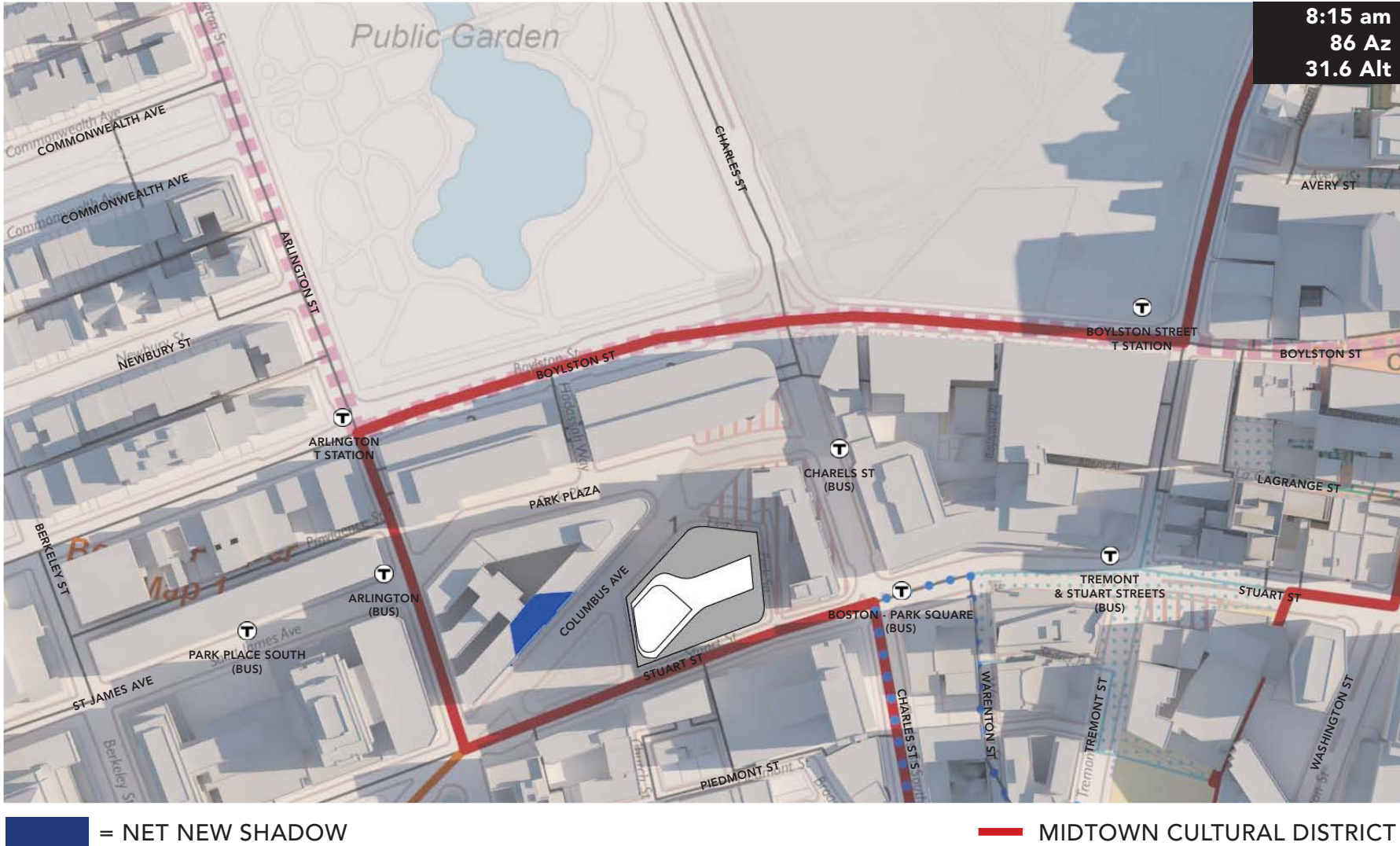
SHADOW STUDY, JUNE 21



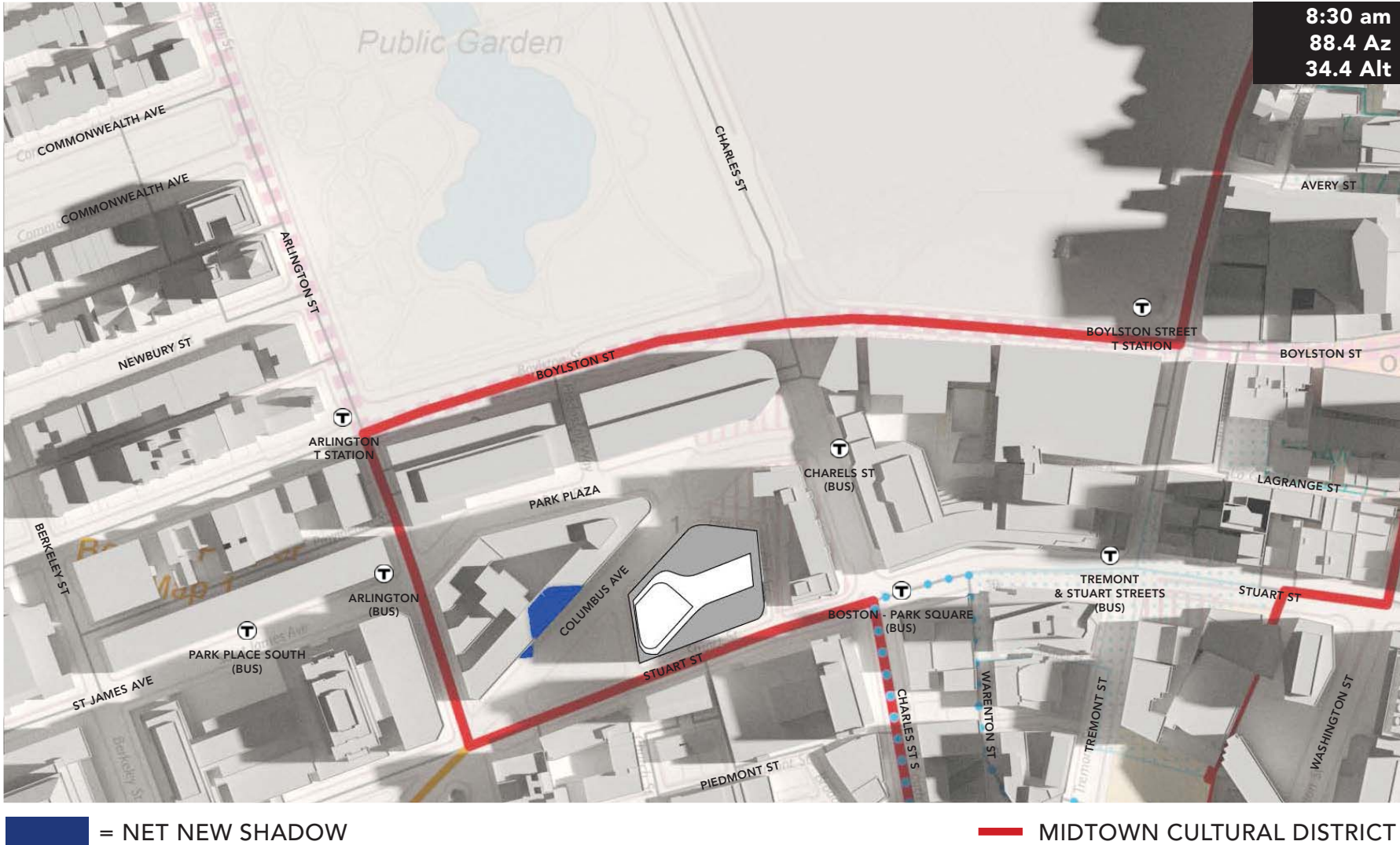
SHADOW STUDY, JUNE 21



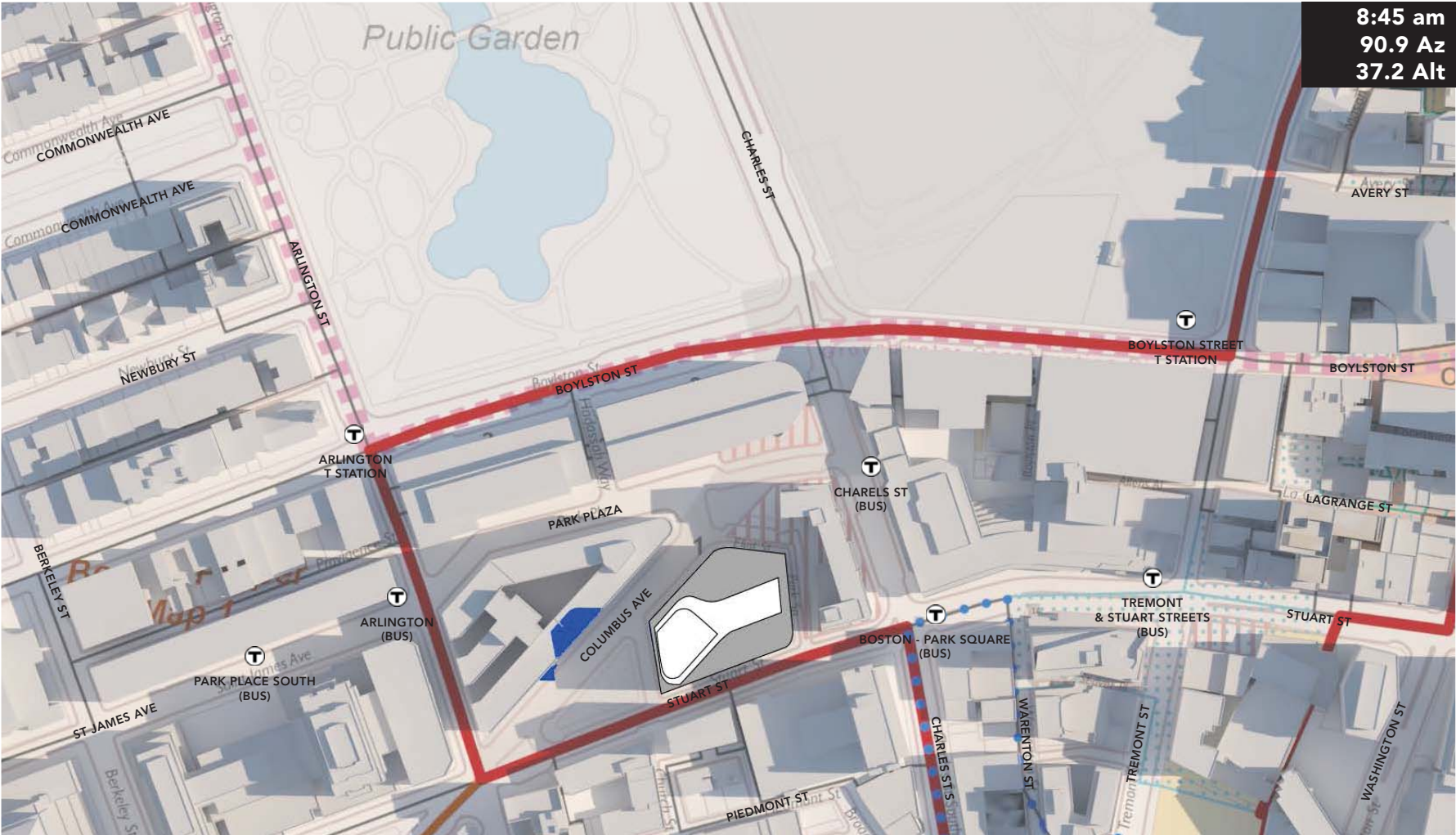
SHADOW STUDY, JUNE 21



SHADOW STUDY, JUNE 21



SHADOW STUDY, JUNE 21

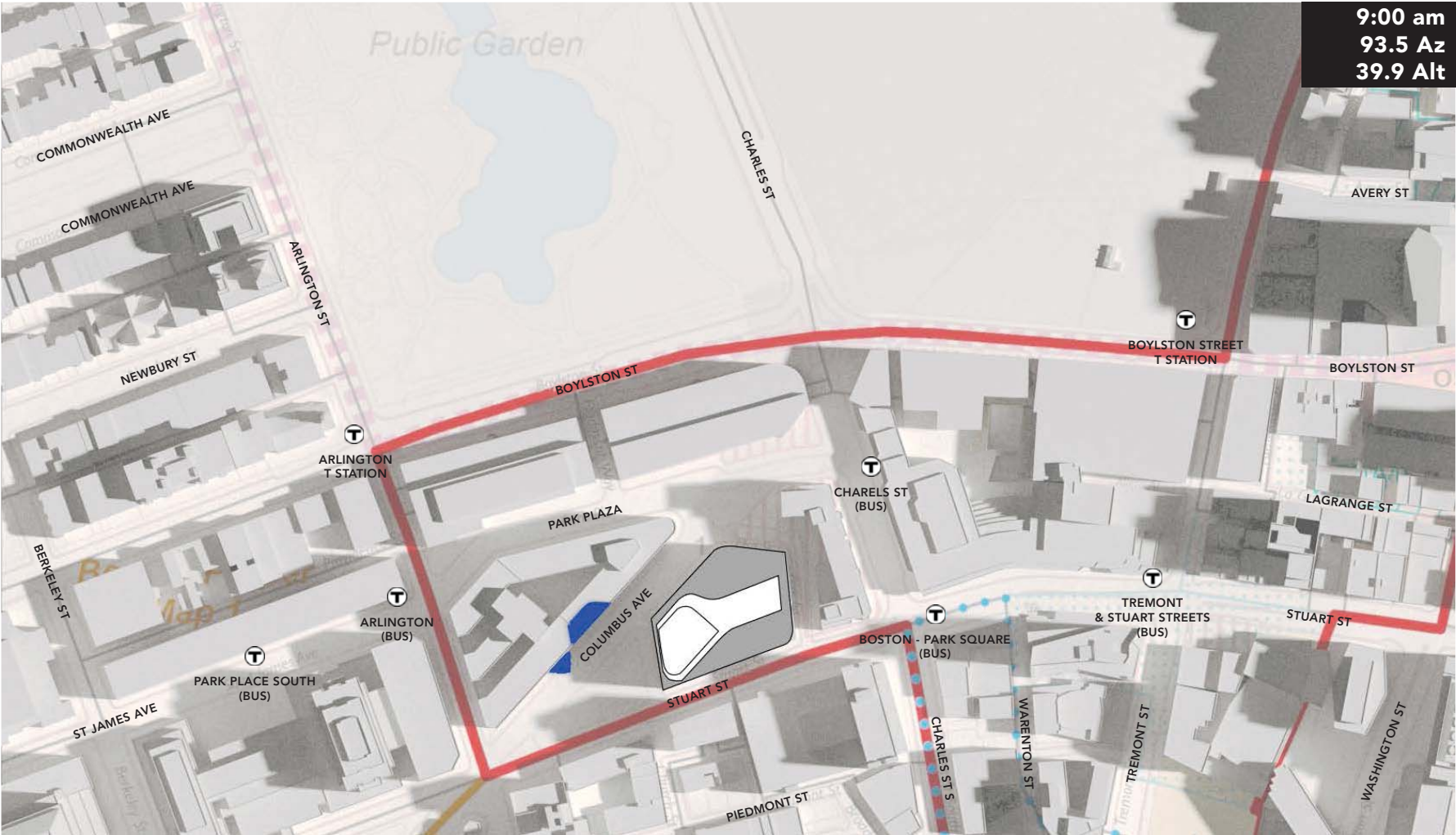


8:45 am
90.9 Az
37.2 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, JUNE 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

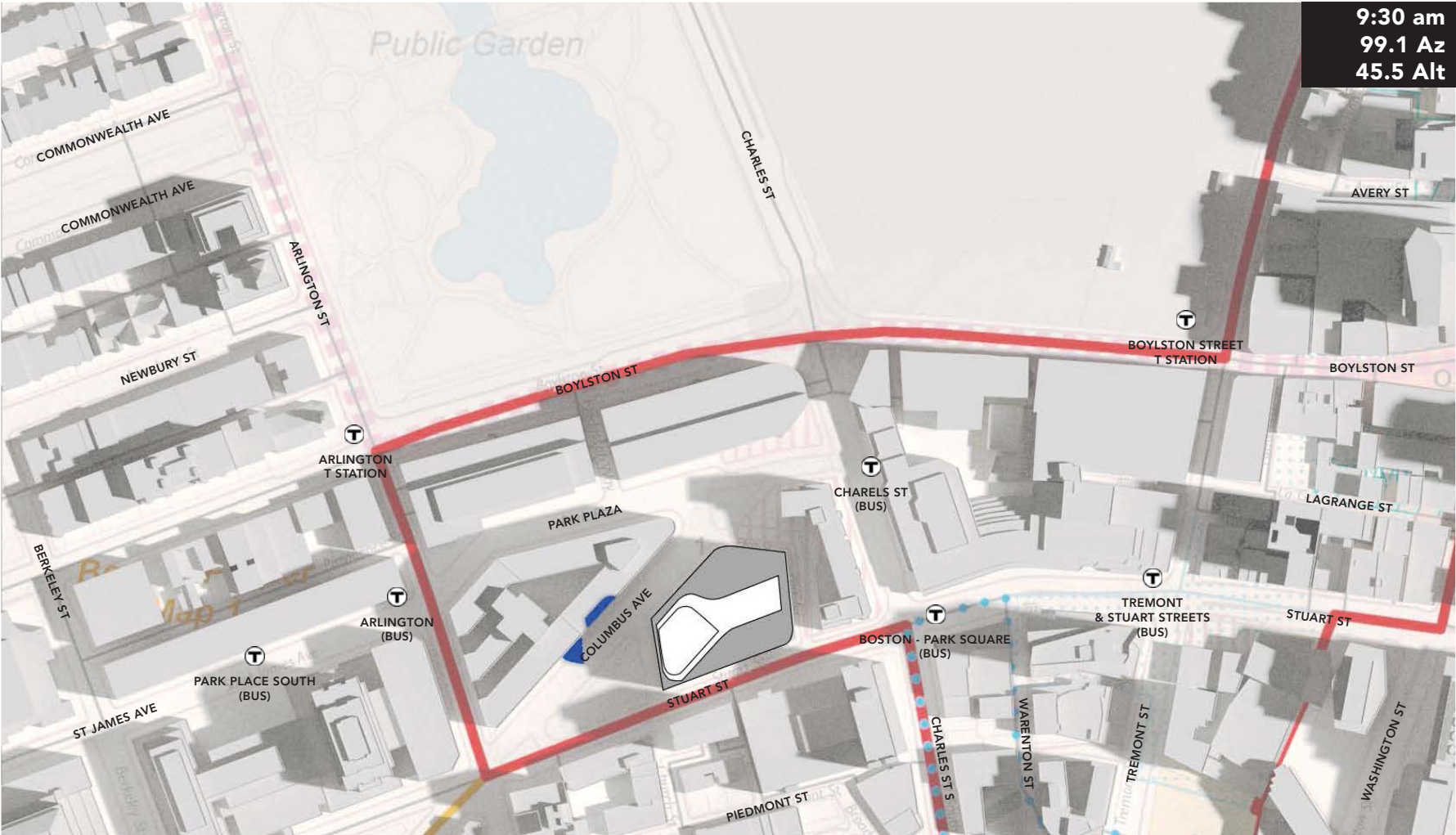
CIM



MOTOR MART GARAGE

cbt

SHADOW STUDY, JUNE 21

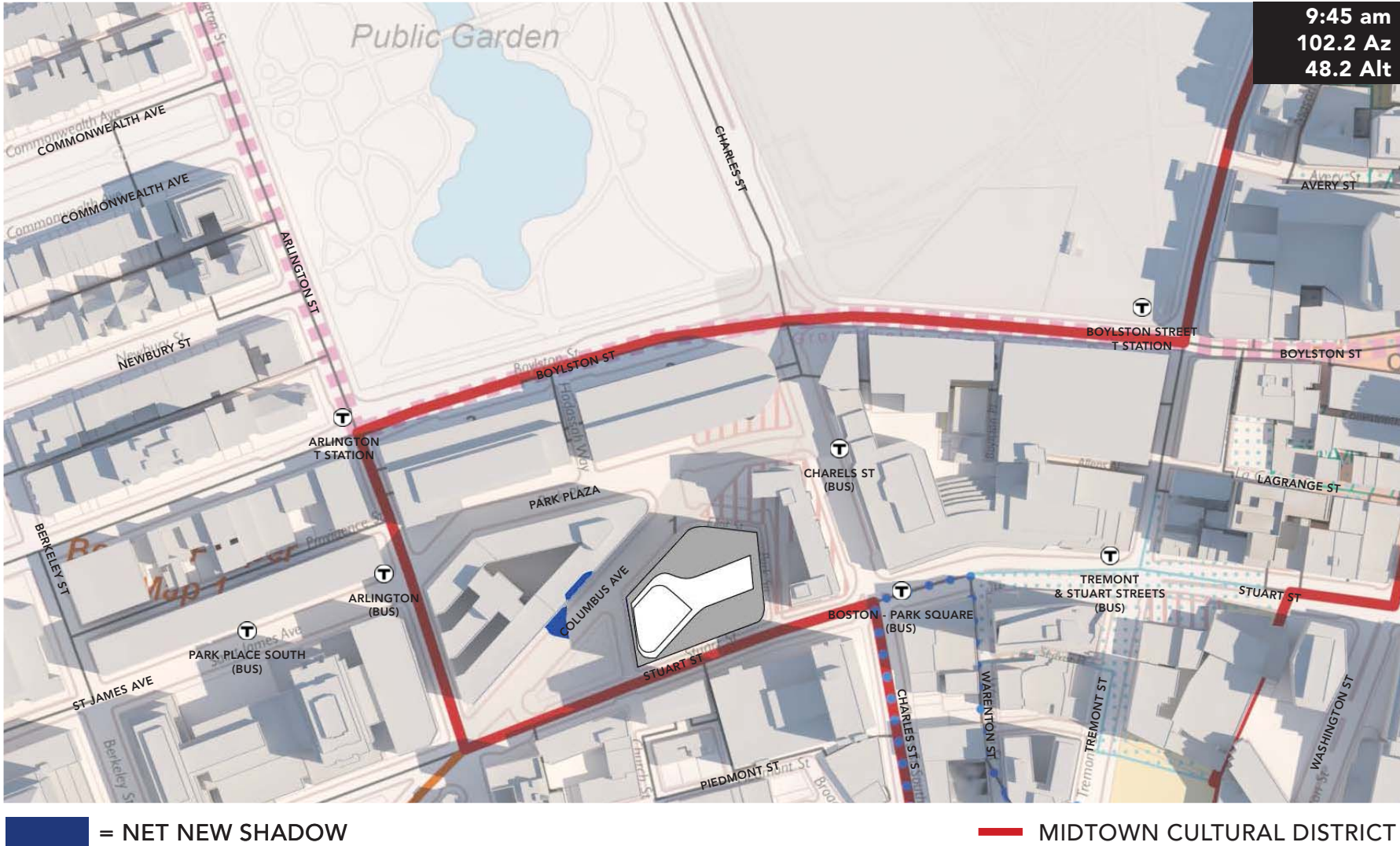


9:30 am
99.1 Az
45.5 Alt

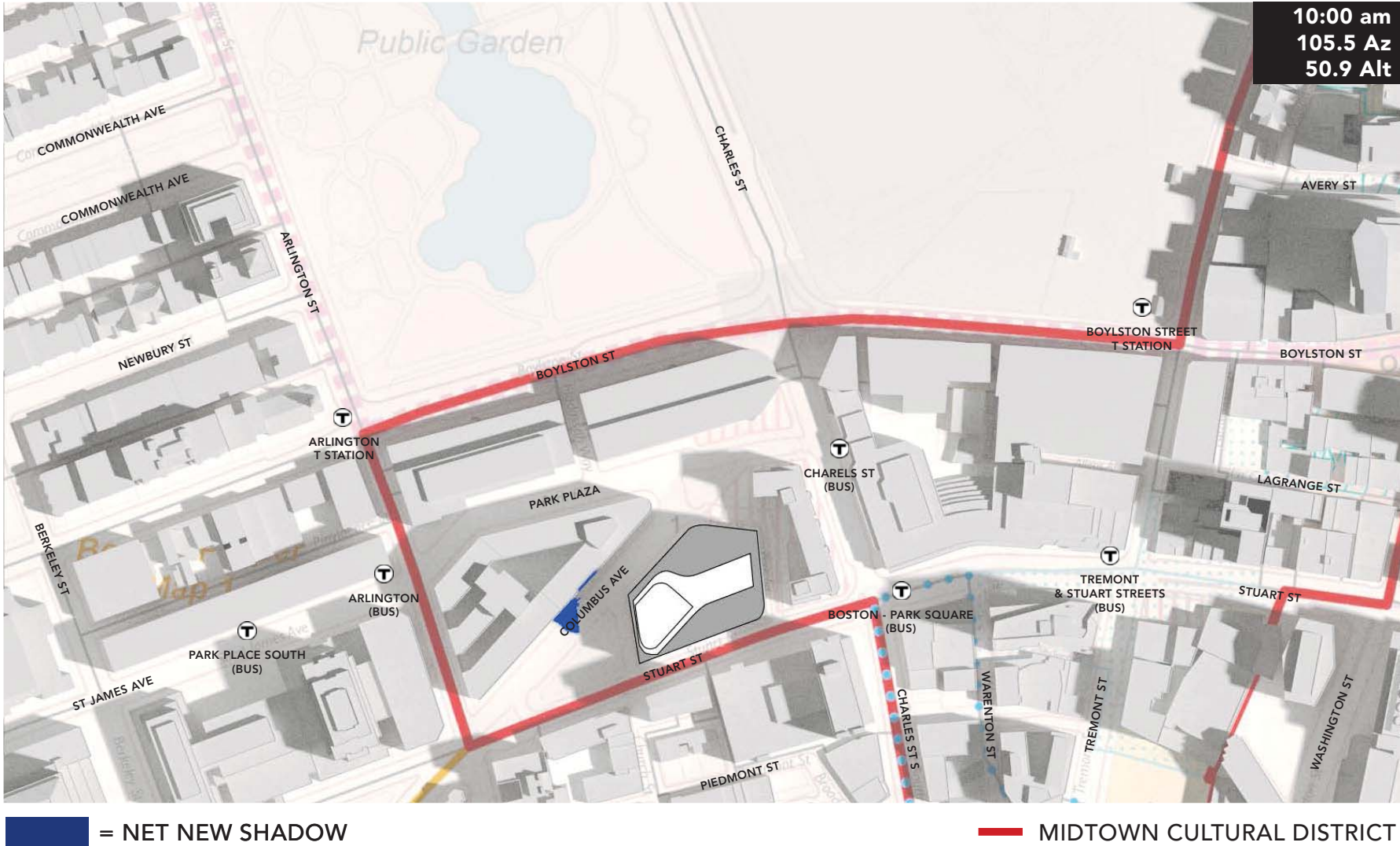
 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

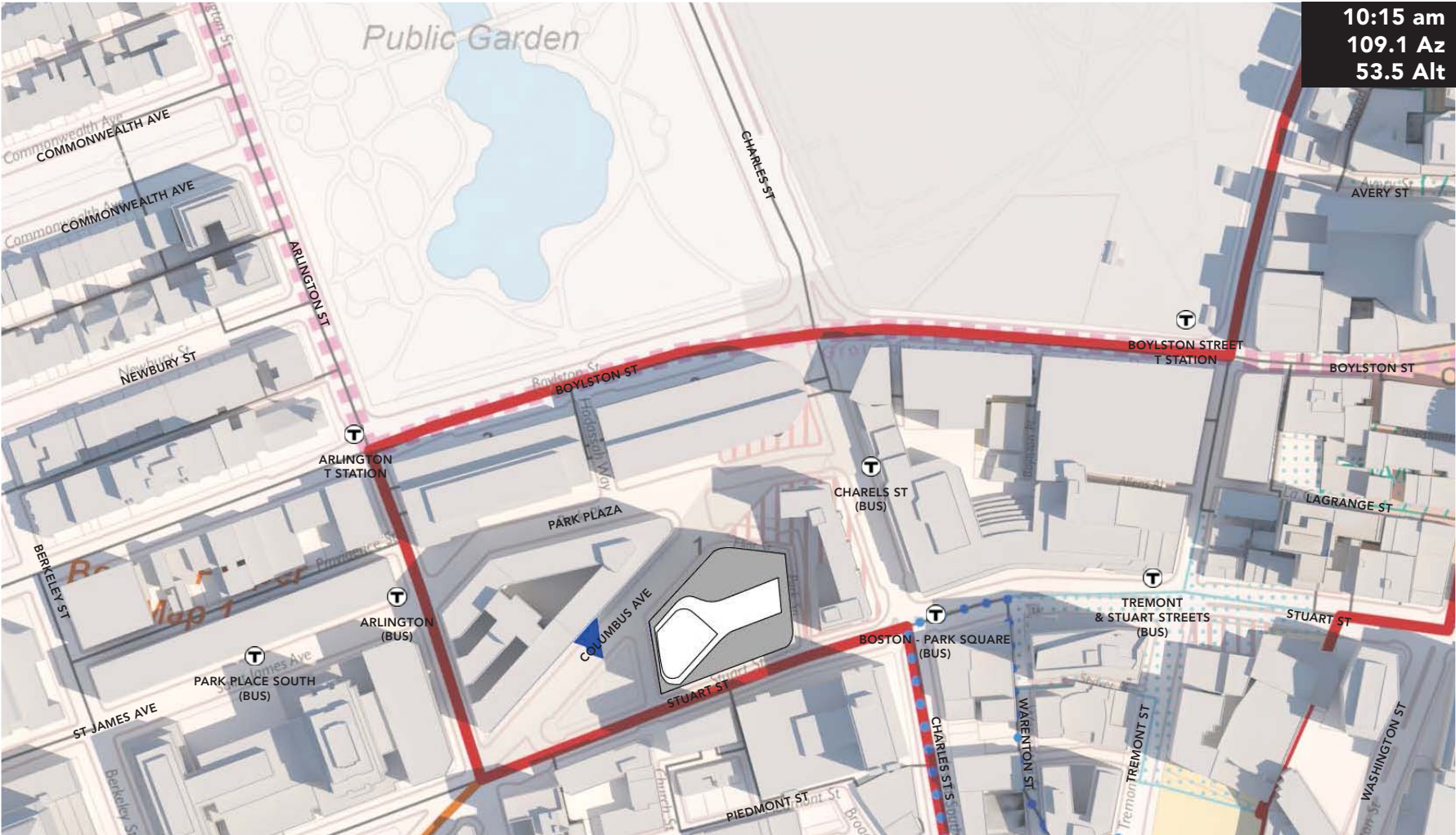
SHADOW STUDY, JUNE 21



SHADOW STUDY, JUNE 21



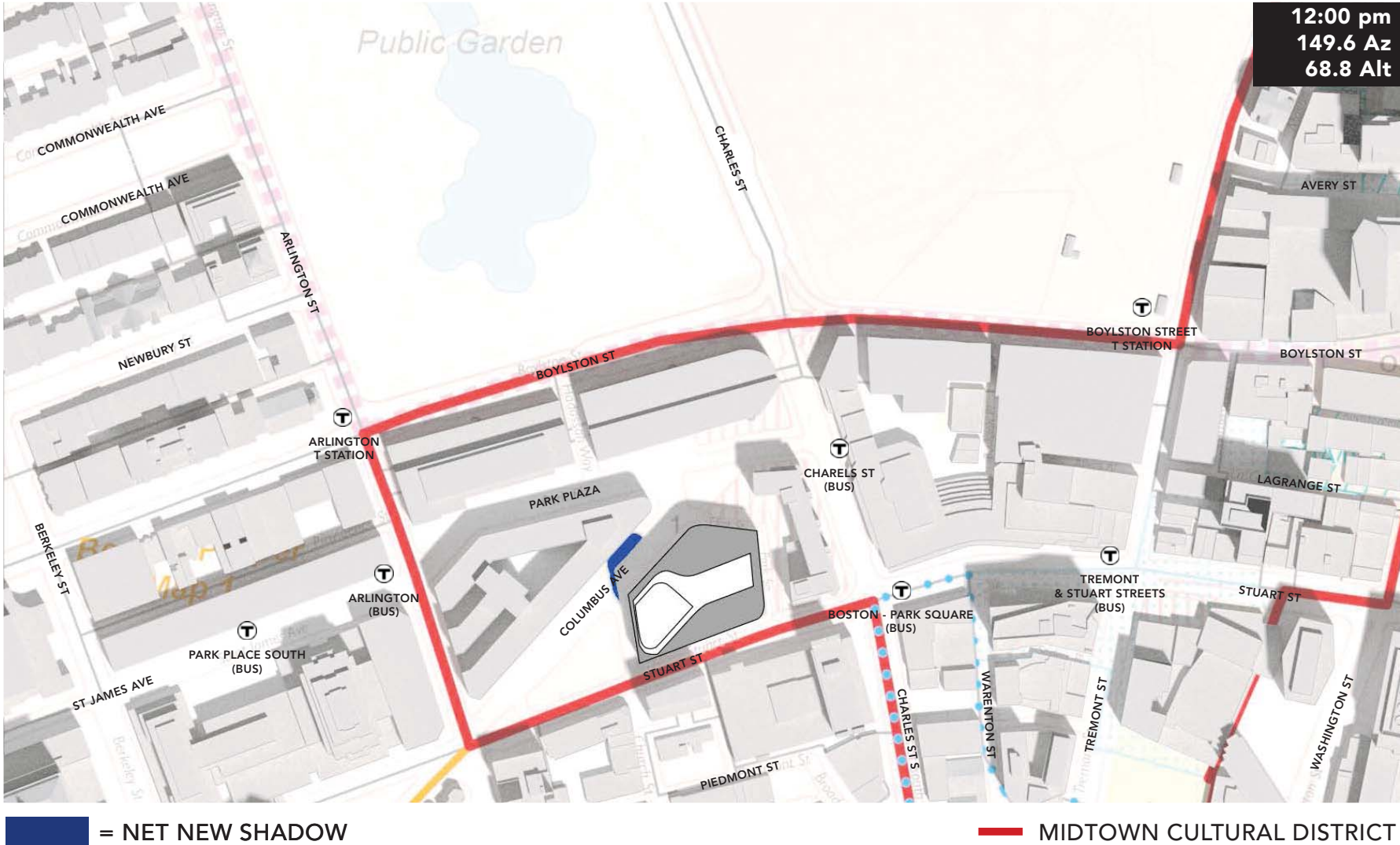
SHADOW STUDY, JUNE 21



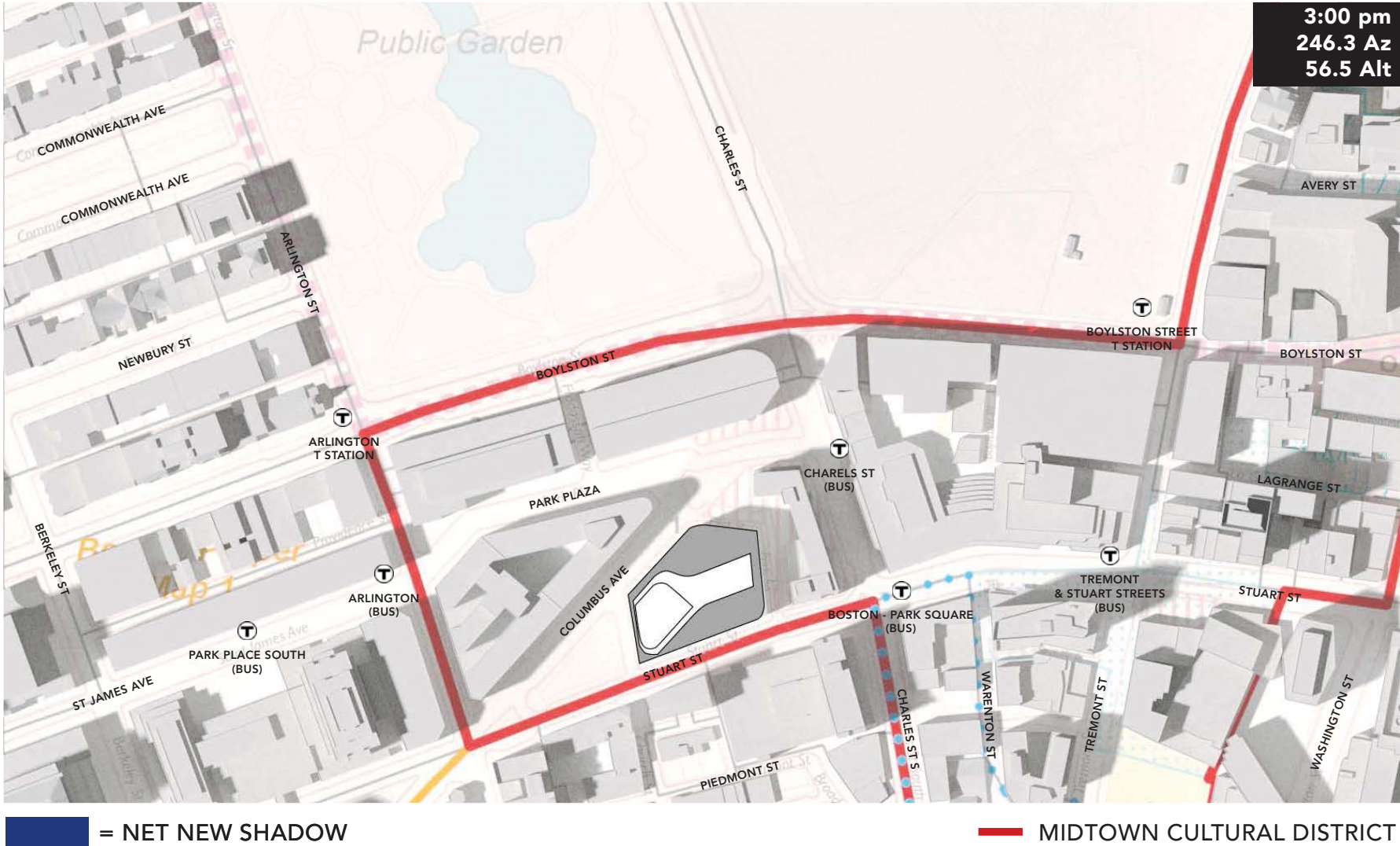
 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, JUNE 21



SHADOW STUDY, JUNE 21



SHADOW STUDY, JUNE 21

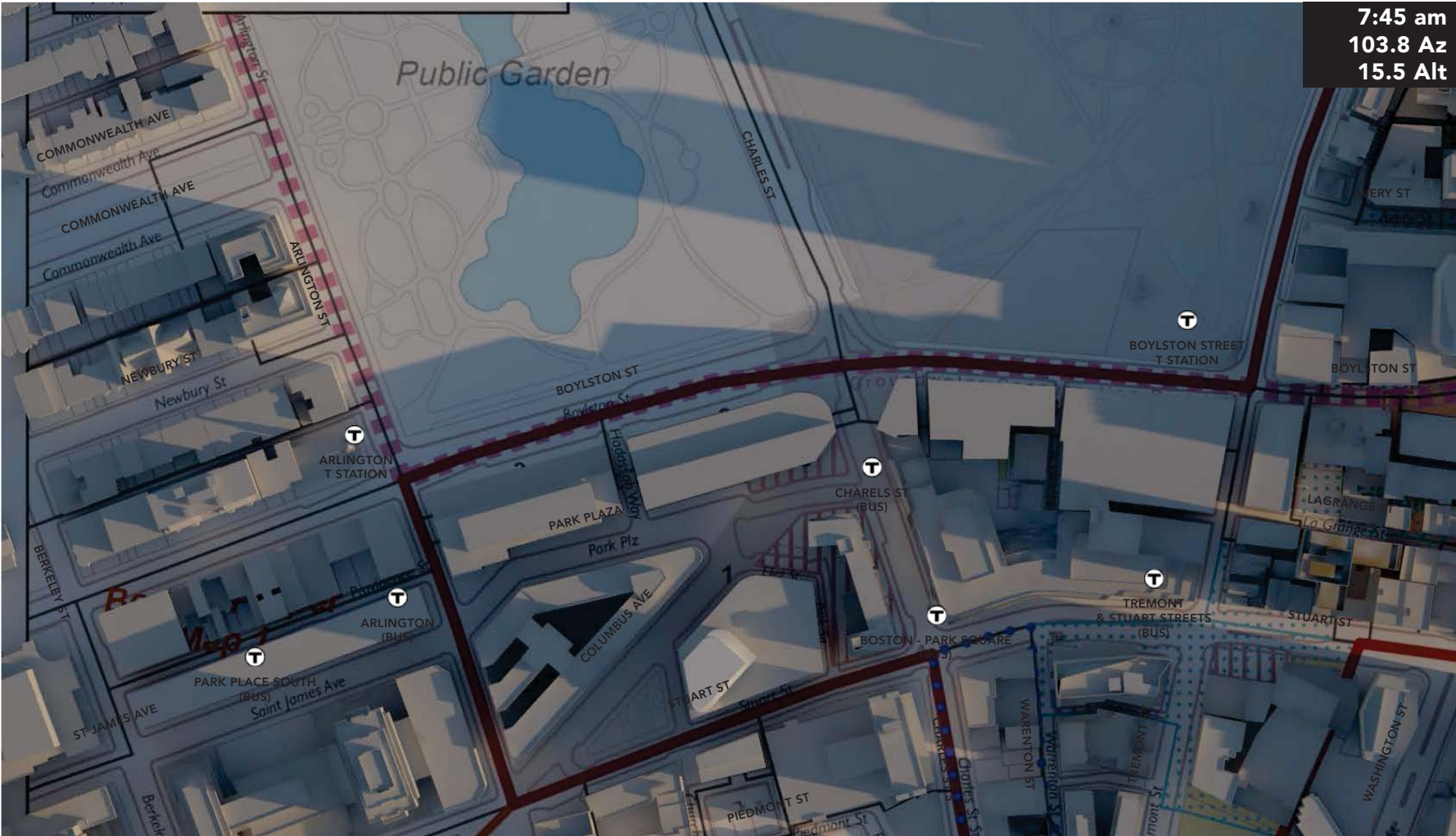


6:00 pm
280.7 Az
23.8 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

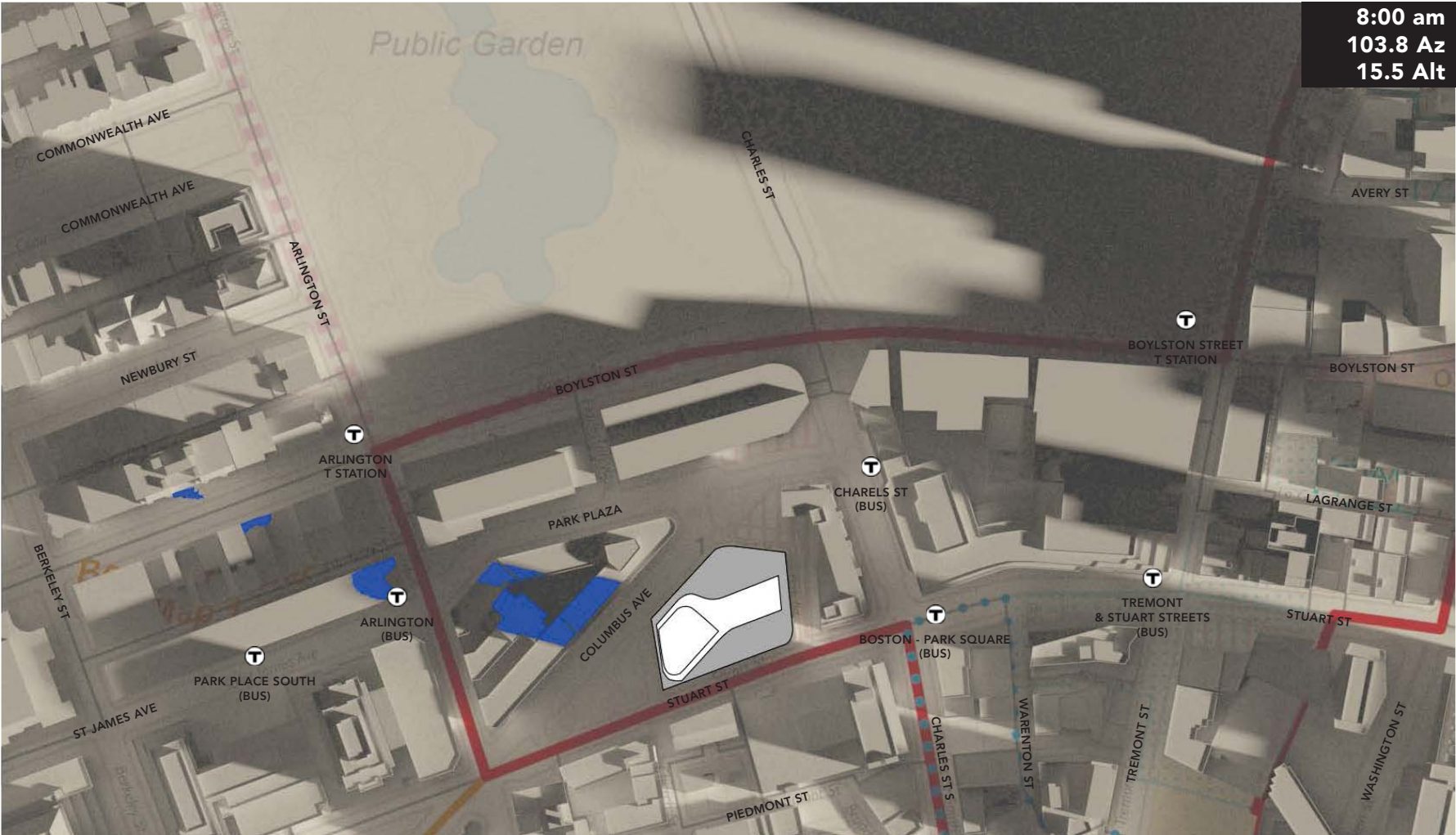
SHADOW STUDY, SEPTEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, SEPTEMBER 21



8:00 am
103.8 Az
15.5 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, SEPTEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, SEPTEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, SEPTEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

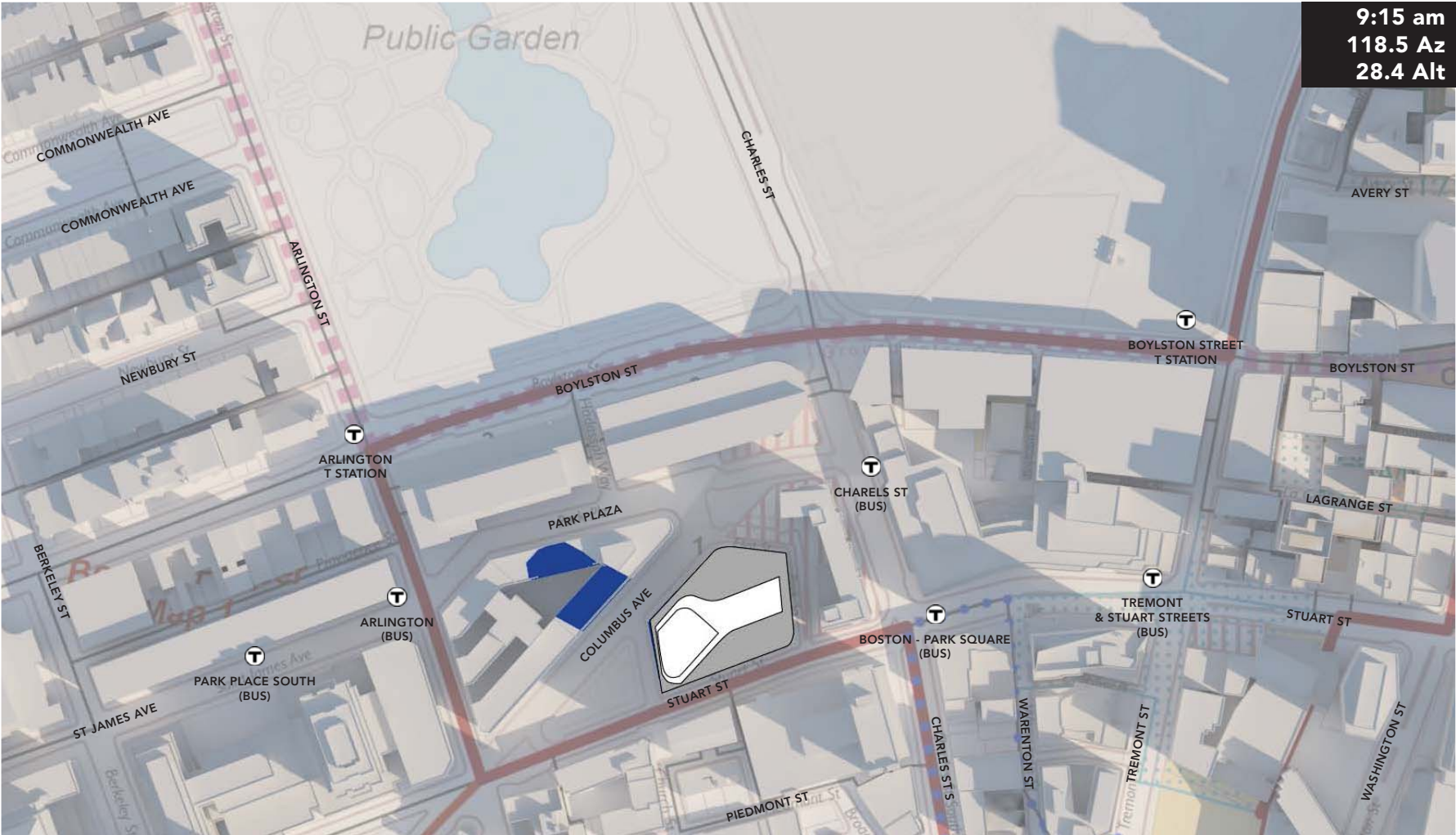
SHADOW STUDY, SEPTEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

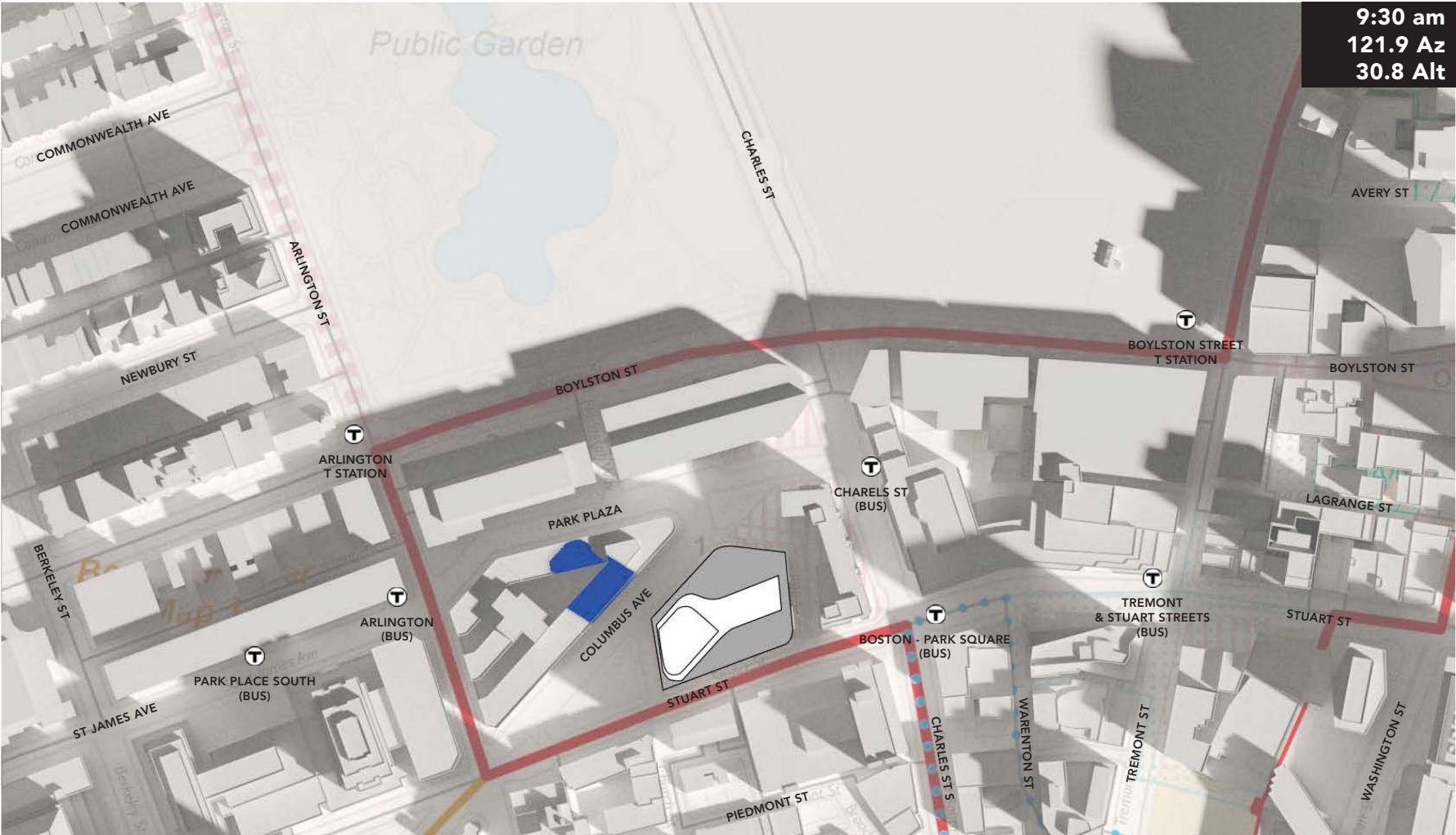
SHADOW STUDY, SEPTEMBER 21



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 MIDTOWN CULTURAL DISTRICT

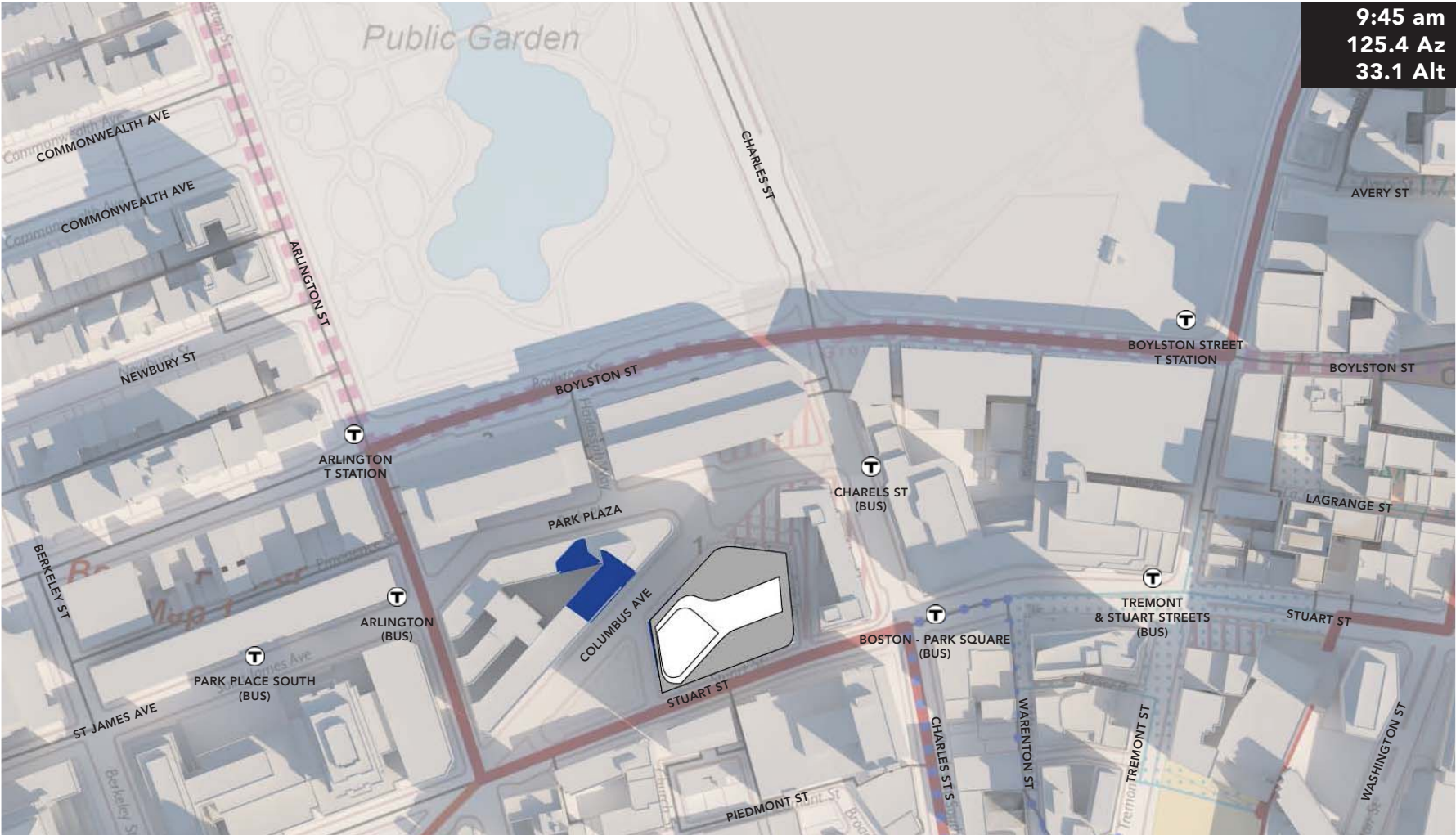
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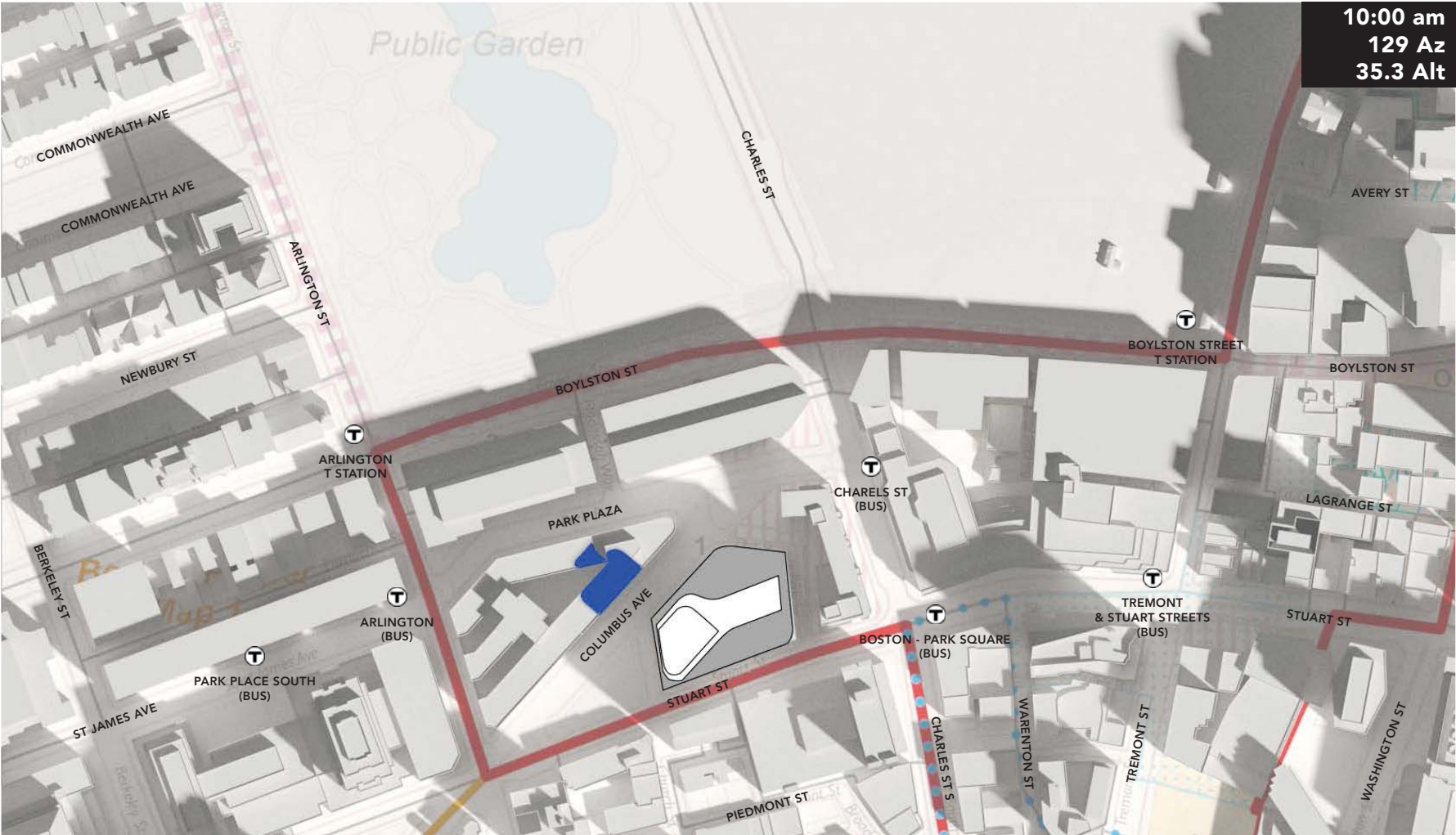
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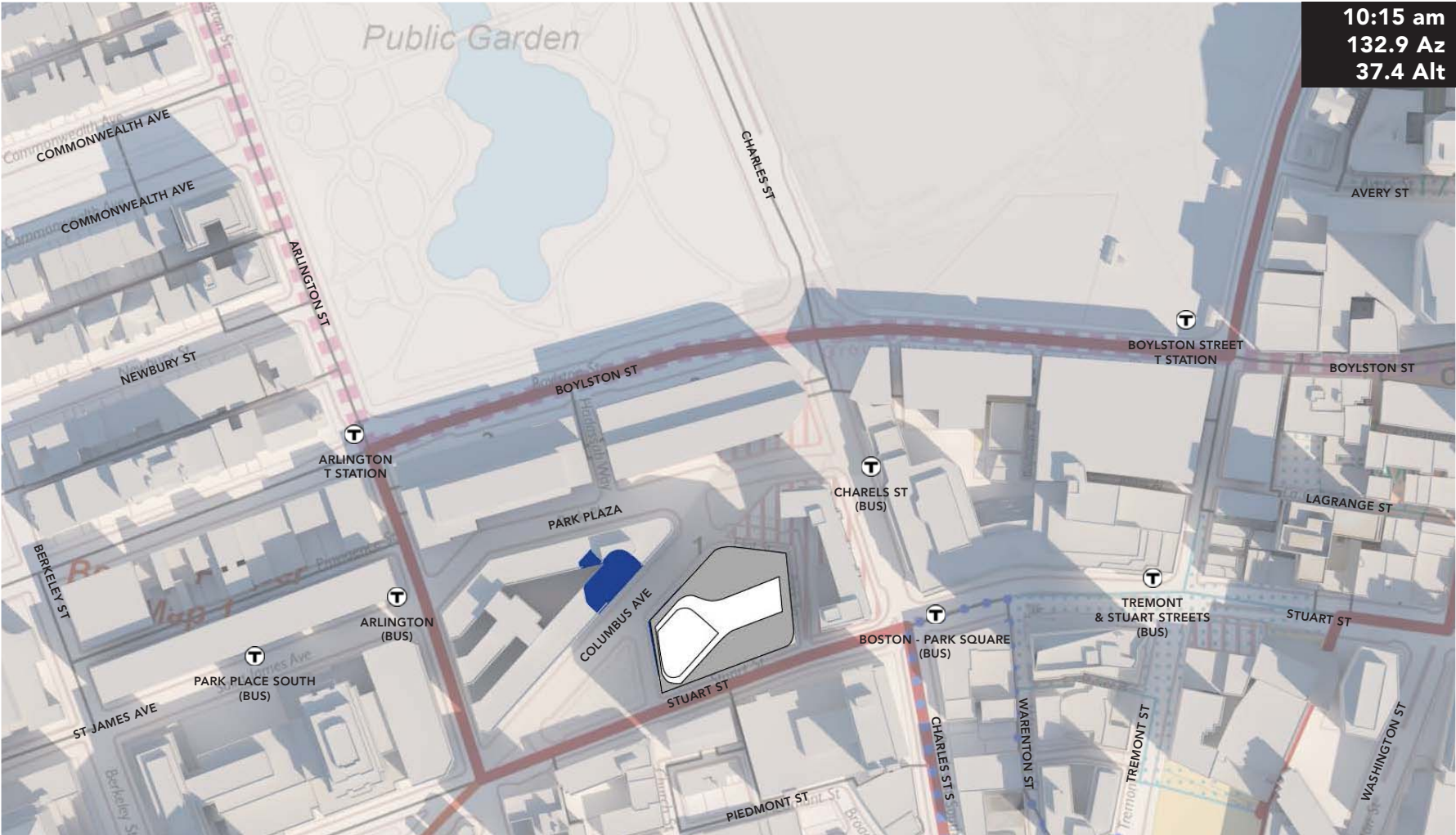
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MIDTOWN CULTURAL DISTRICT

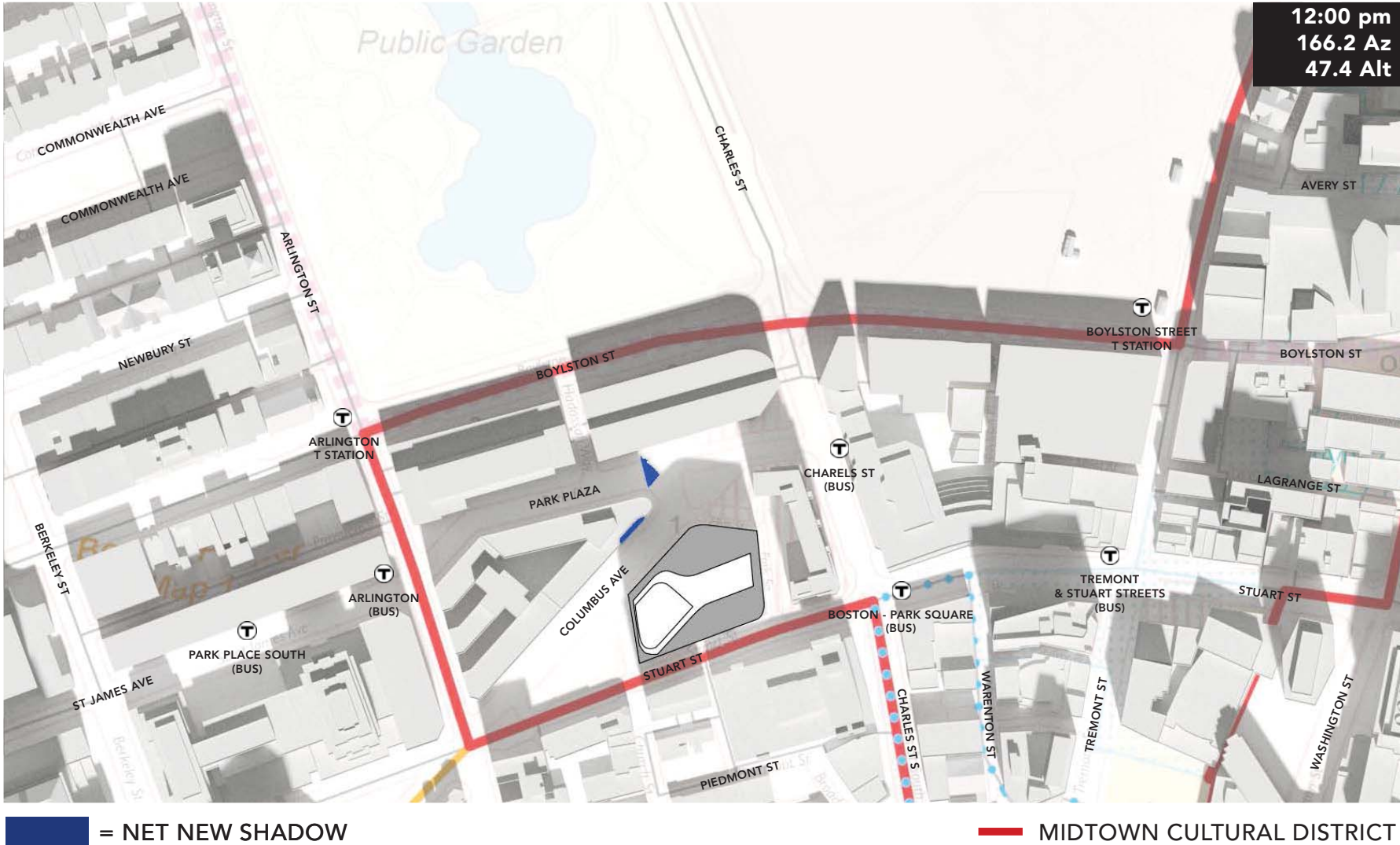
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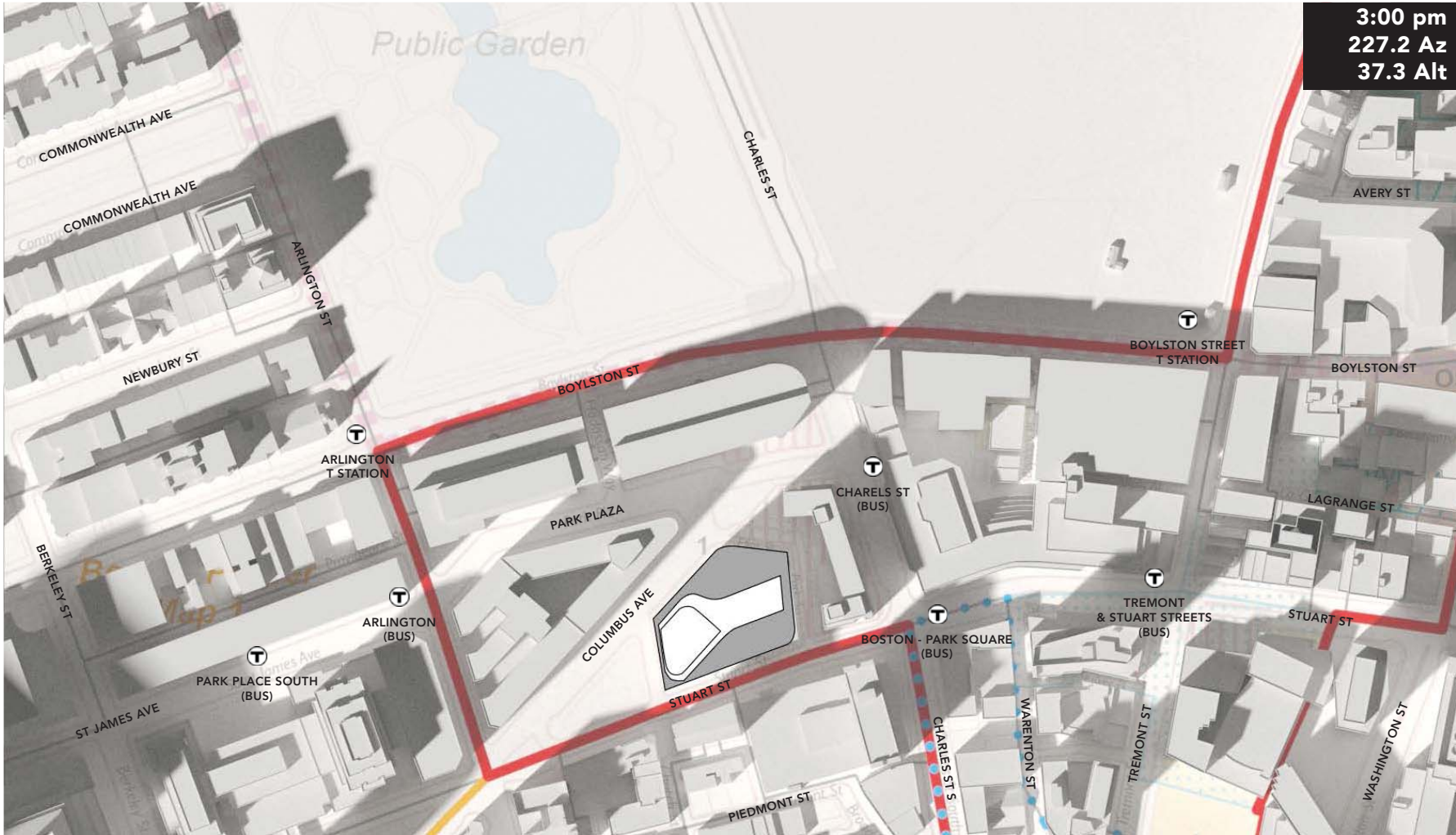
■ = NET NEW SHADOW

— MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, SEPTEMBER 21



SHADOW STUDY, SEPTEMBER 21



3:00 pm
227.2 Az
37.3 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, SEPTEMBER 21

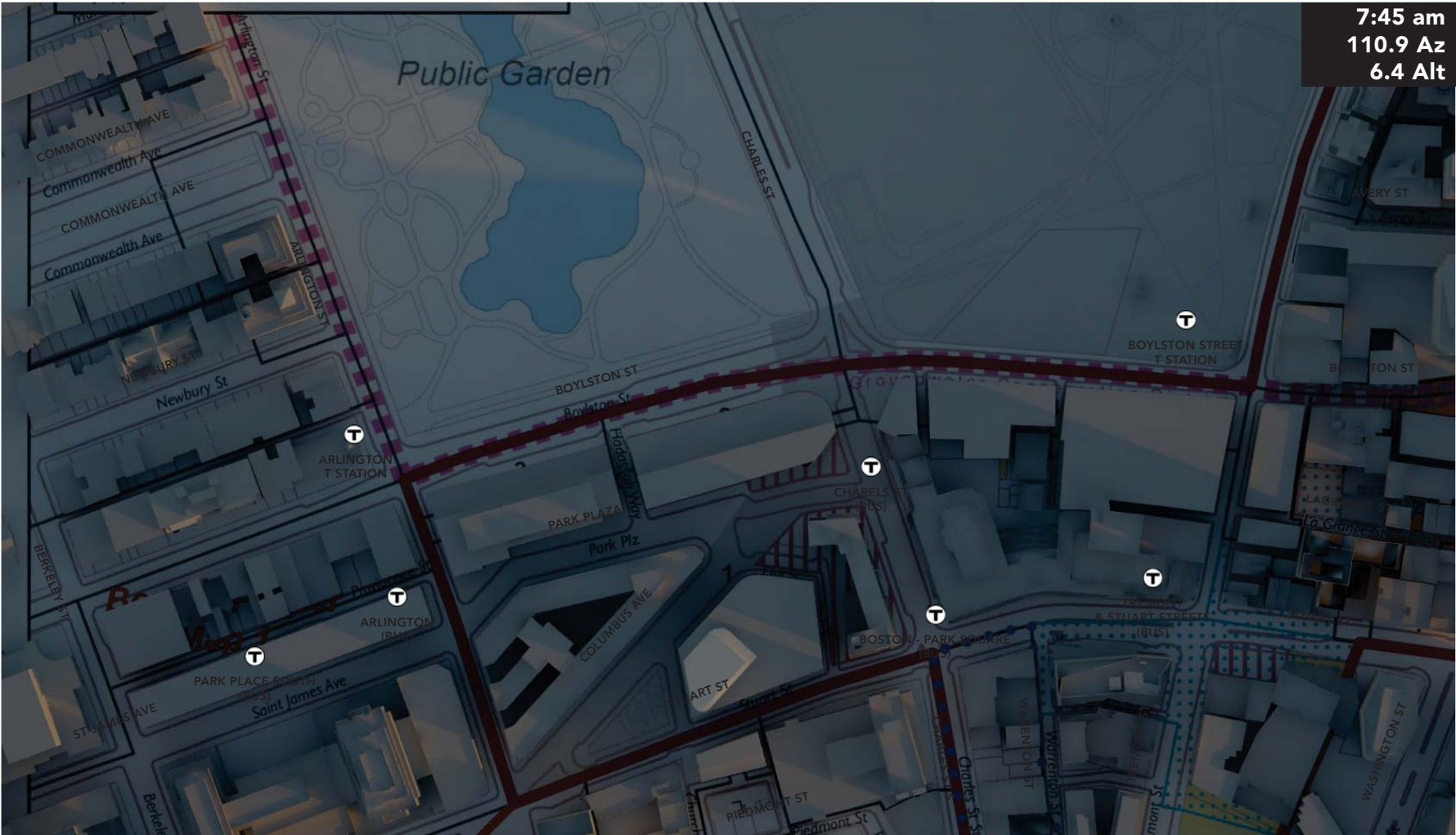


6:00 pm
264.0 Az
7.2 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, OCTOBER 21



SHADOW STUDY, OCTOBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, OCTOBER 21



8:15 am
116.3 Az
11.4 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, OCTOBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

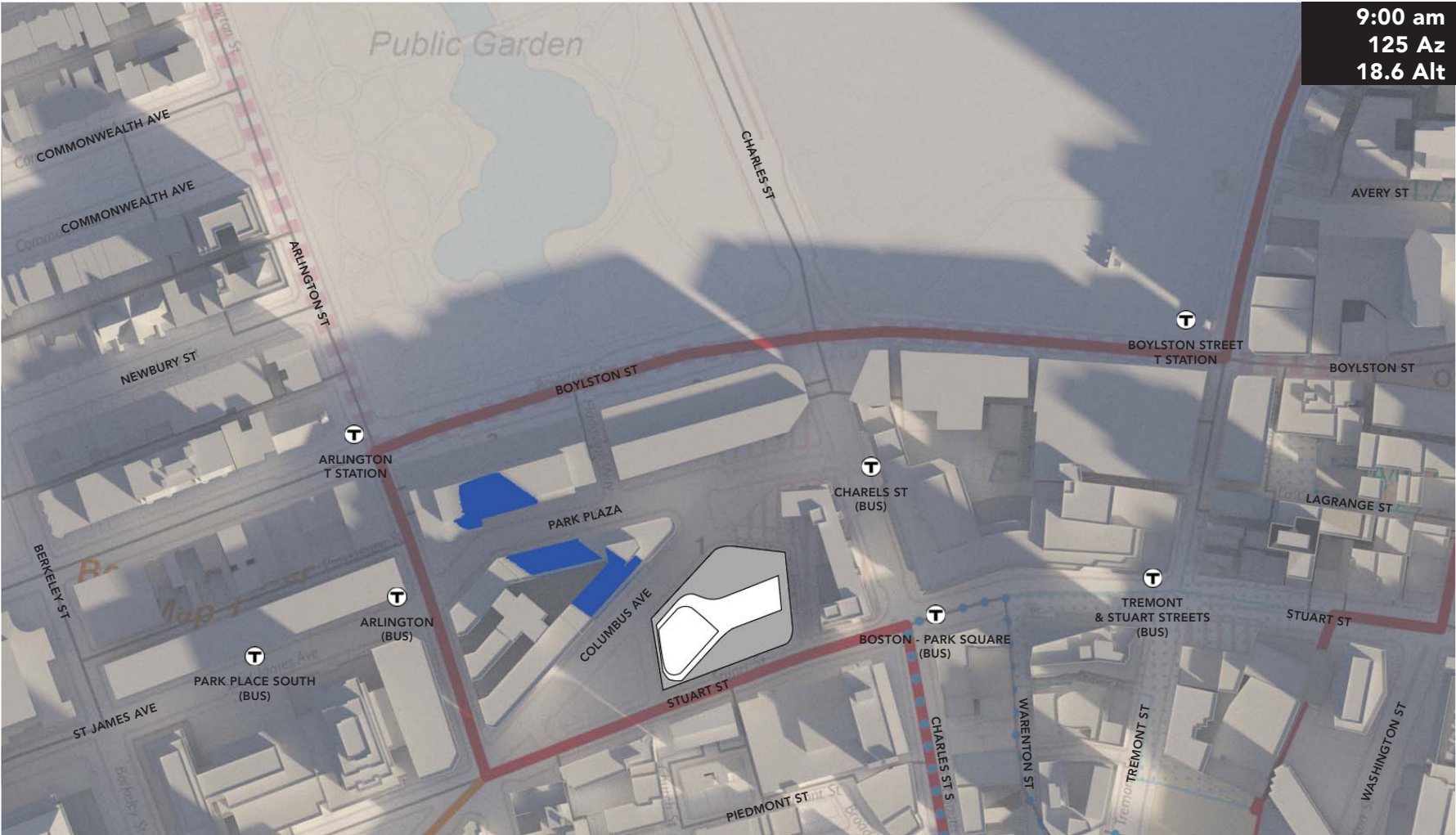
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MIDTOWN CULTURAL DISTRICT

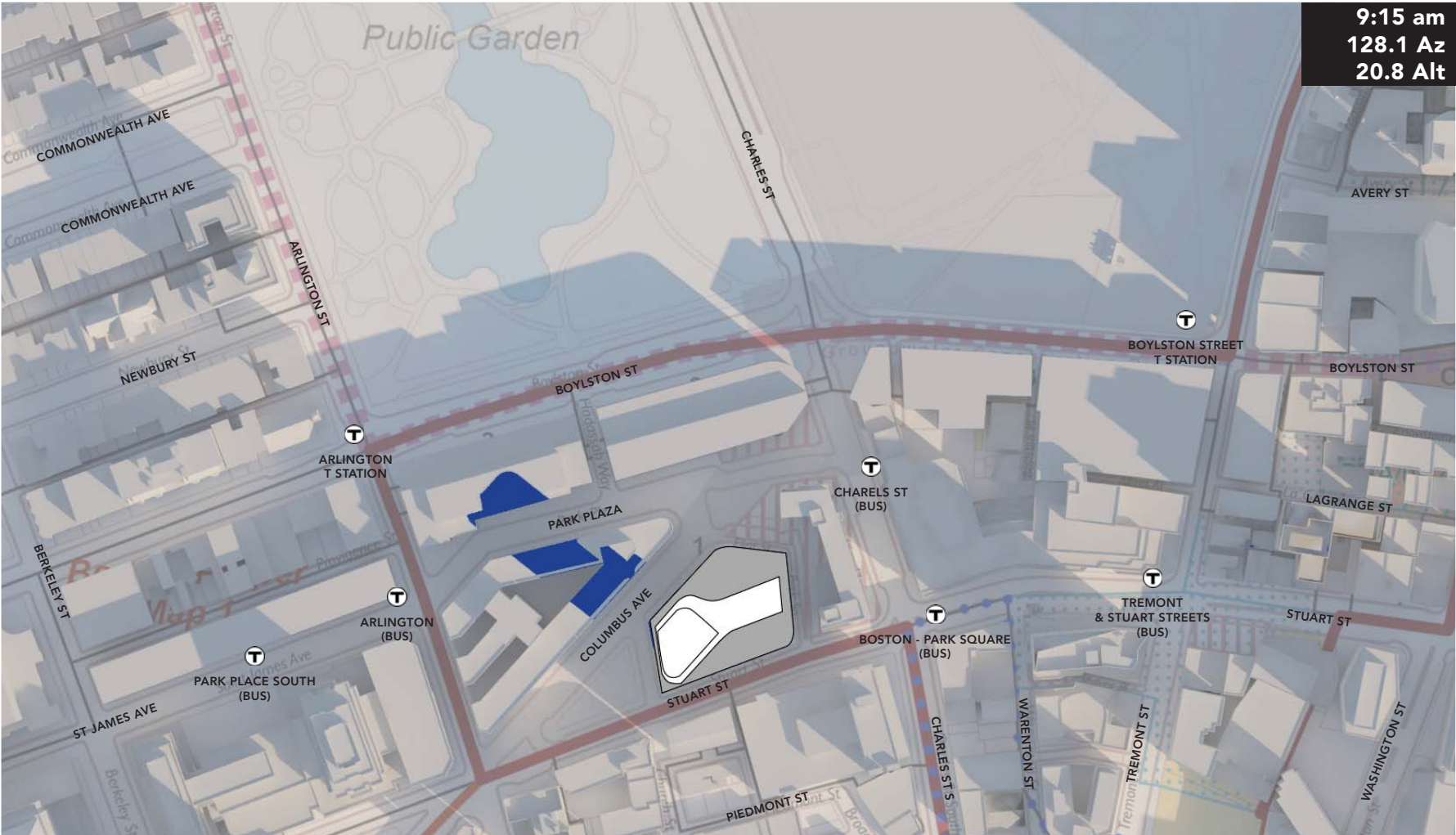
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 MIDTOWN CULTURAL DISTRICT

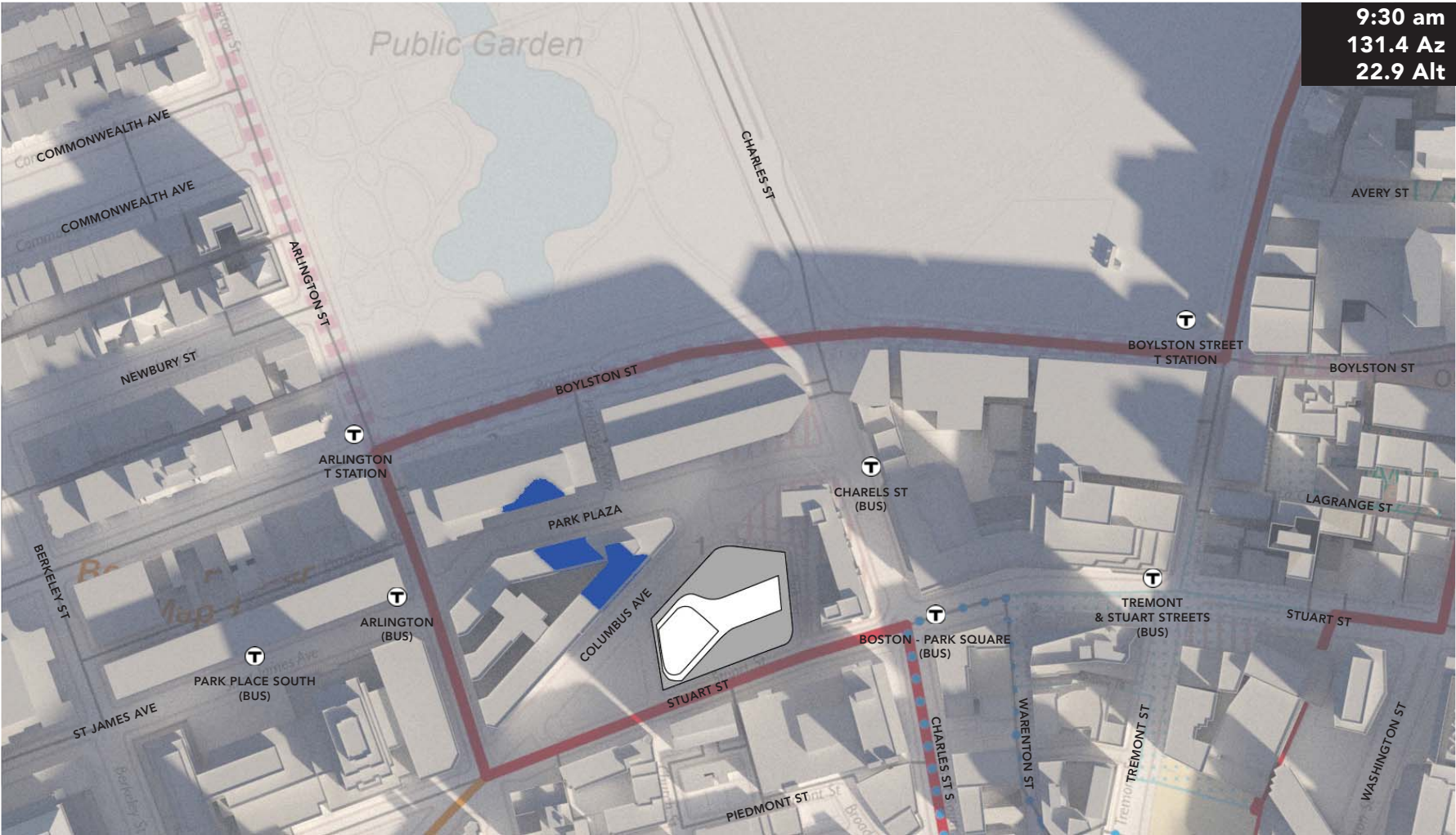
SHADOW STUDY, OCTOBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, OCTOBER 21

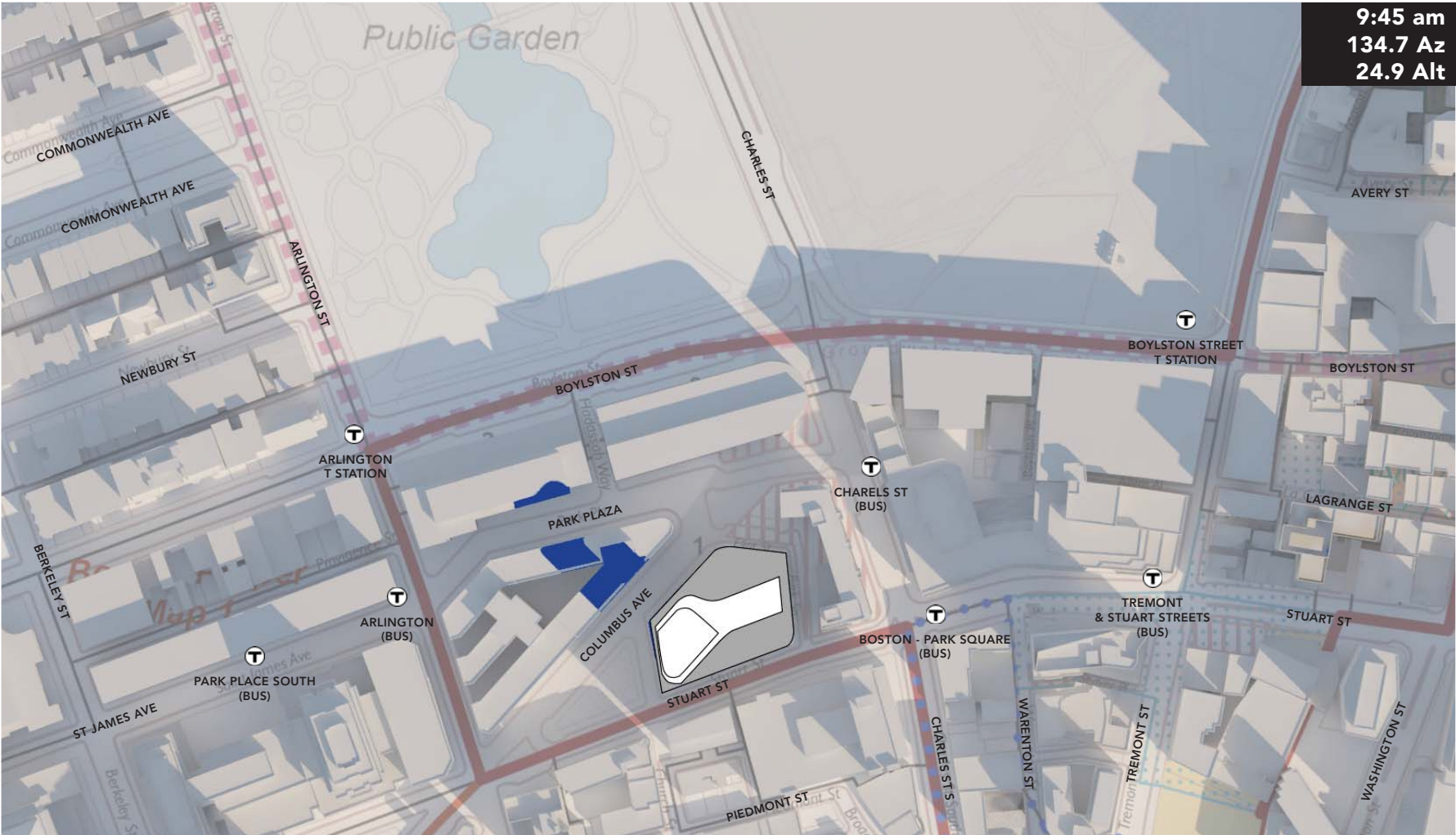


9:30 am
131.4 Az
22.9 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

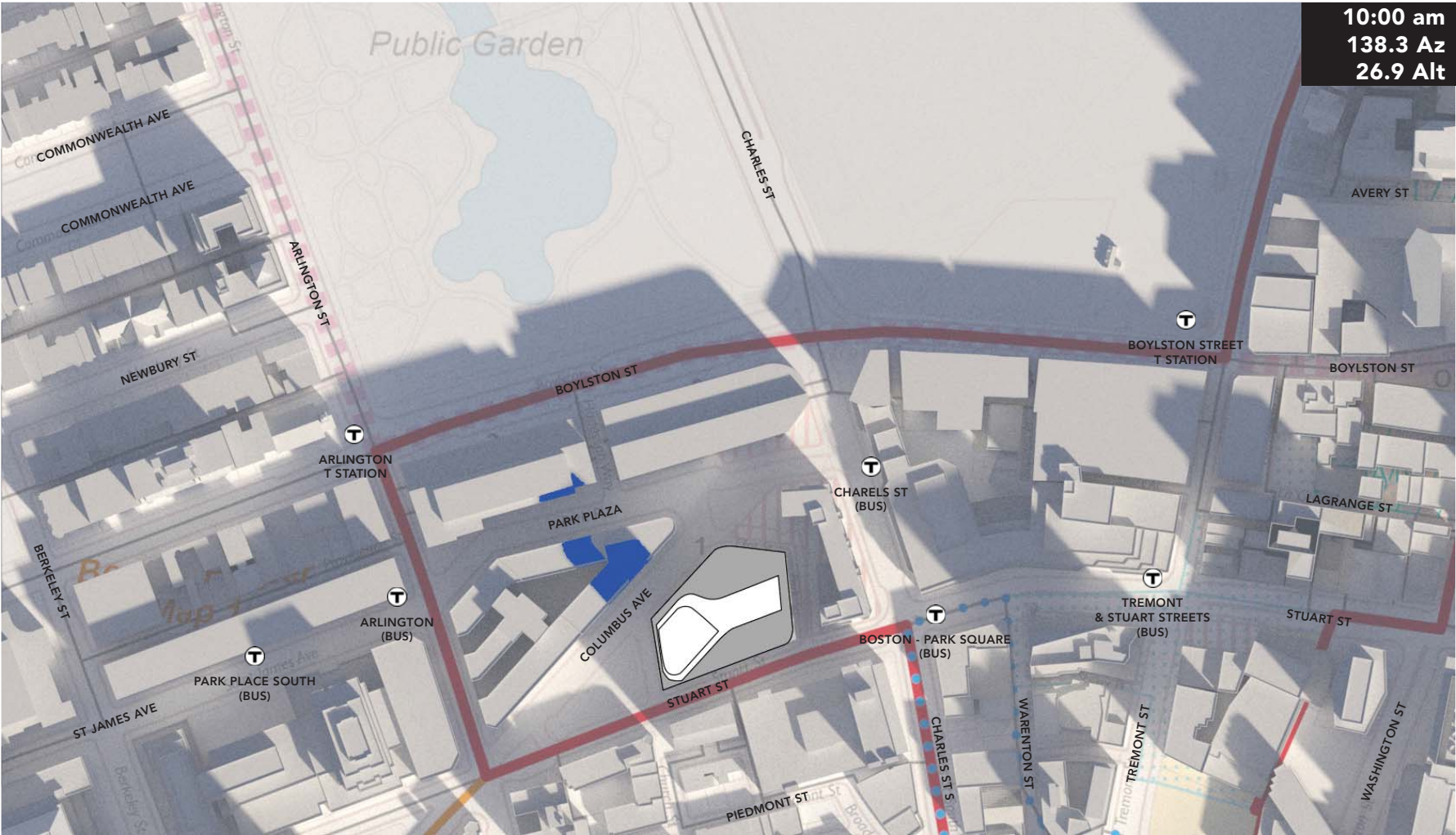
SHADOW STUDY, OCTOBER 21



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 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, OCTOBER 21

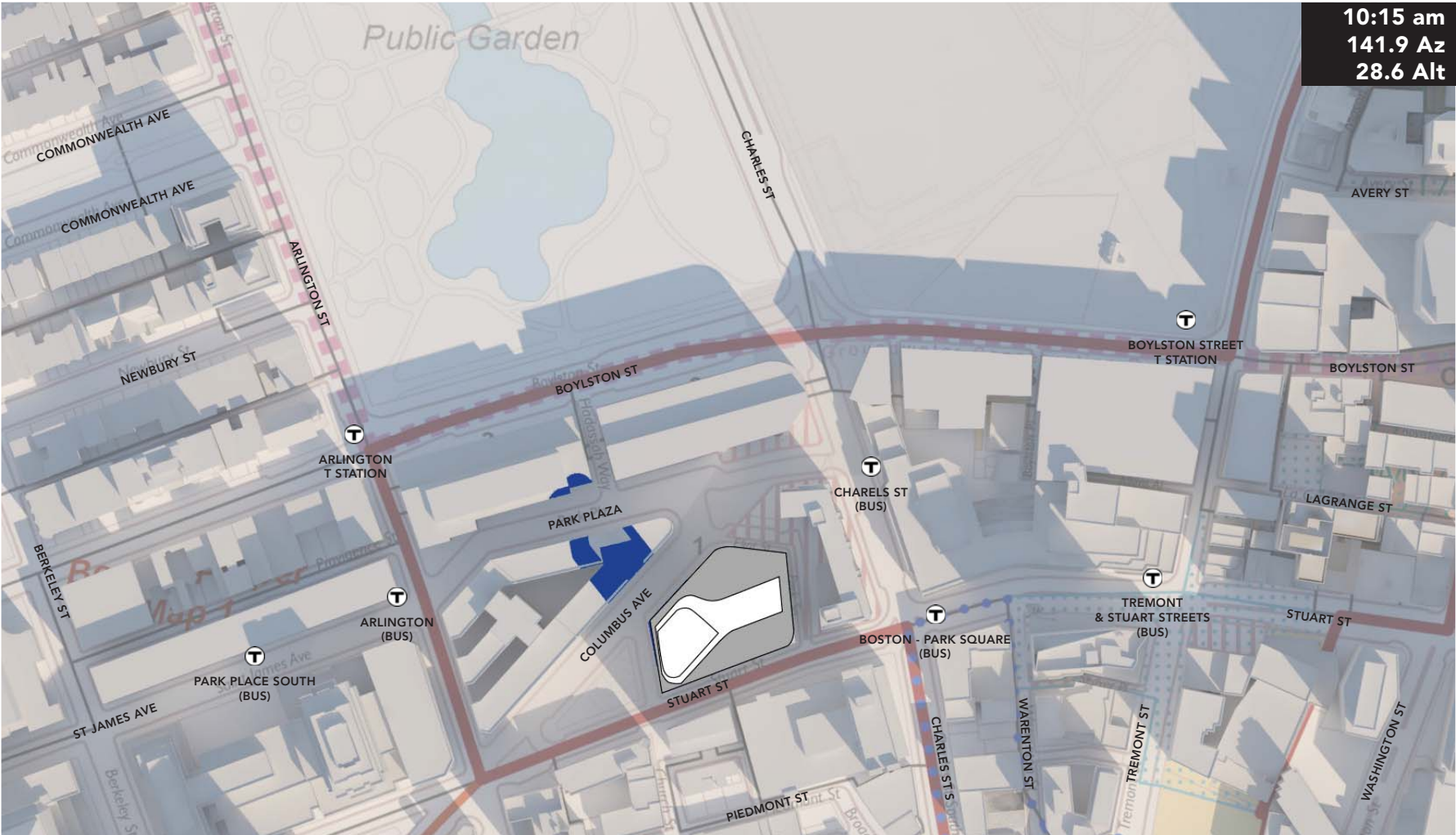


10:00 am
138.3 Az
26.9 Alt

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 MIDTOWN CULTURAL DISTRICT

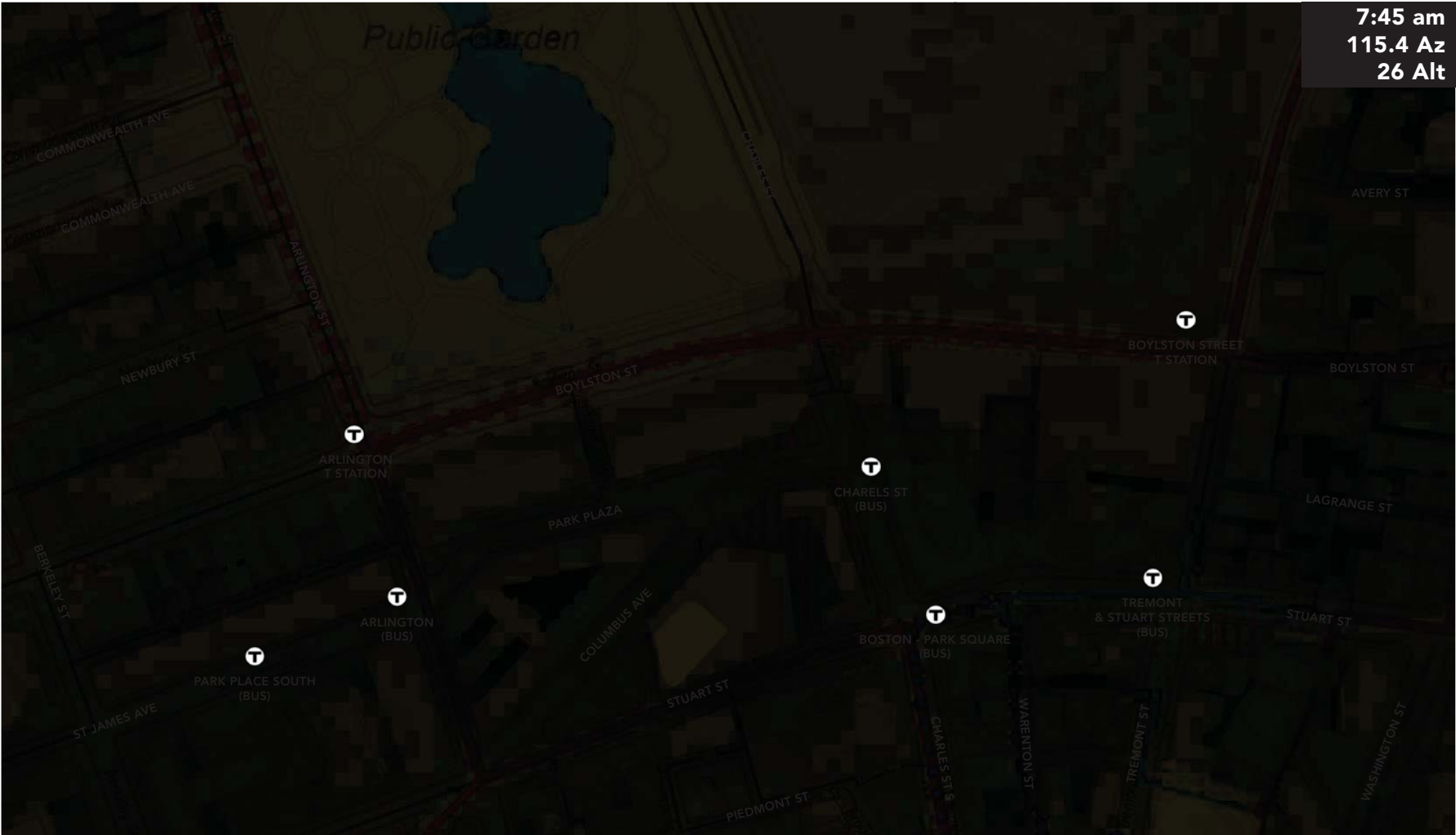
SHADOW STUDY, OCTOBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

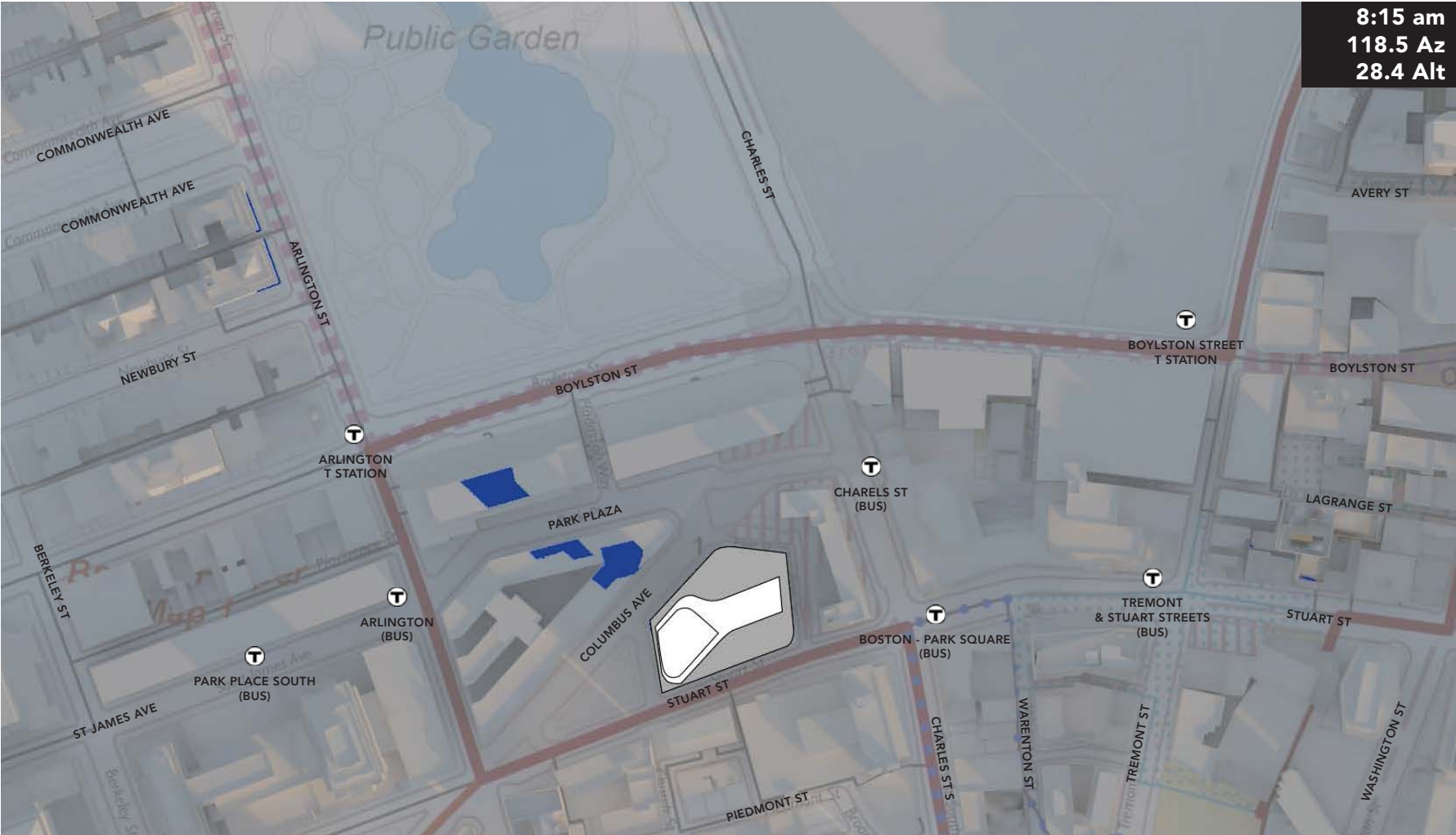


8:00 am
115.4 Az
26 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

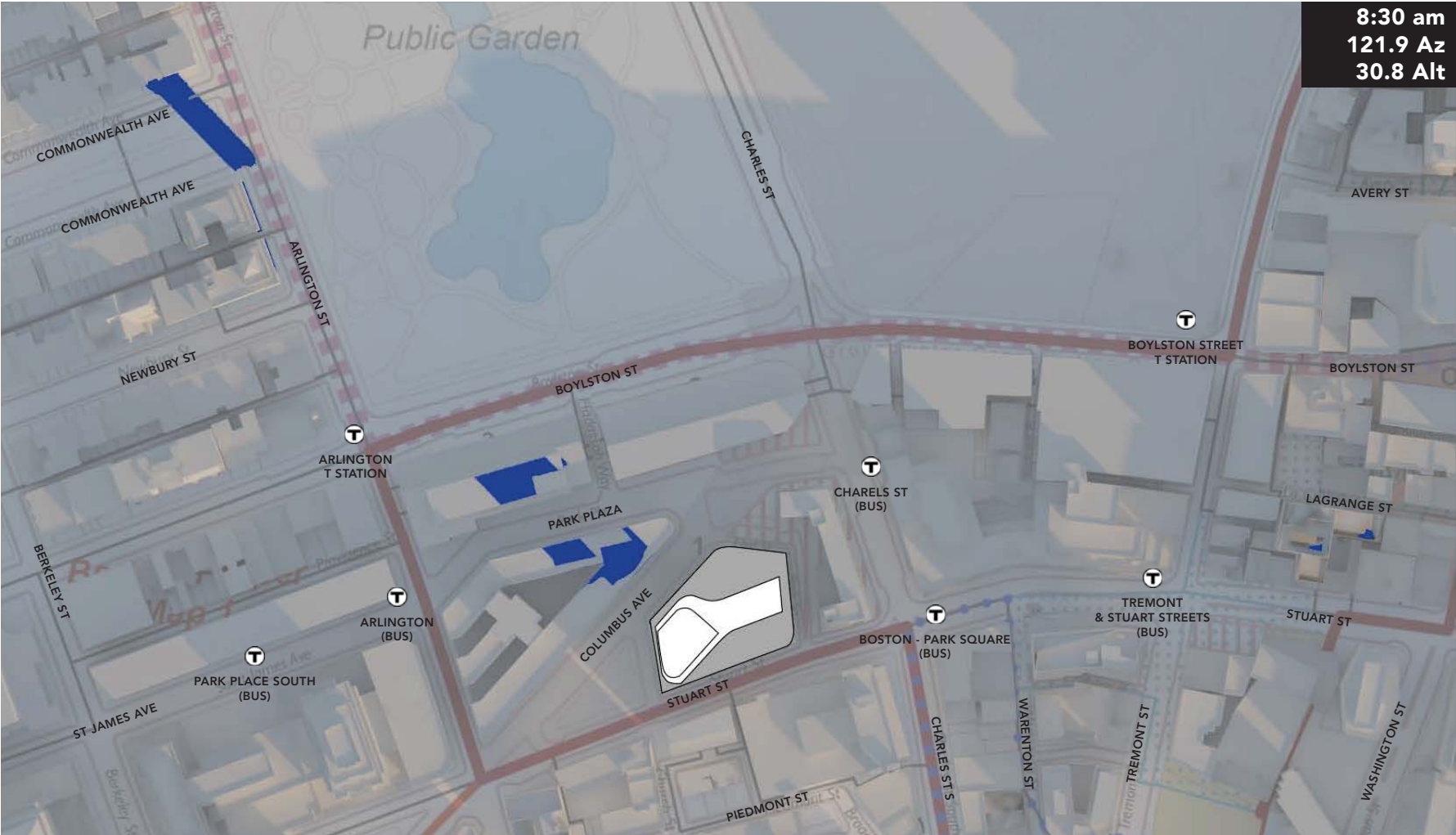
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



8:45 am
125.4 Az
33.1 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



9:00 am
129 Az
35.3 Alt

= NET NEW SHADOW

MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



9:30 am
137 Az
39.4 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

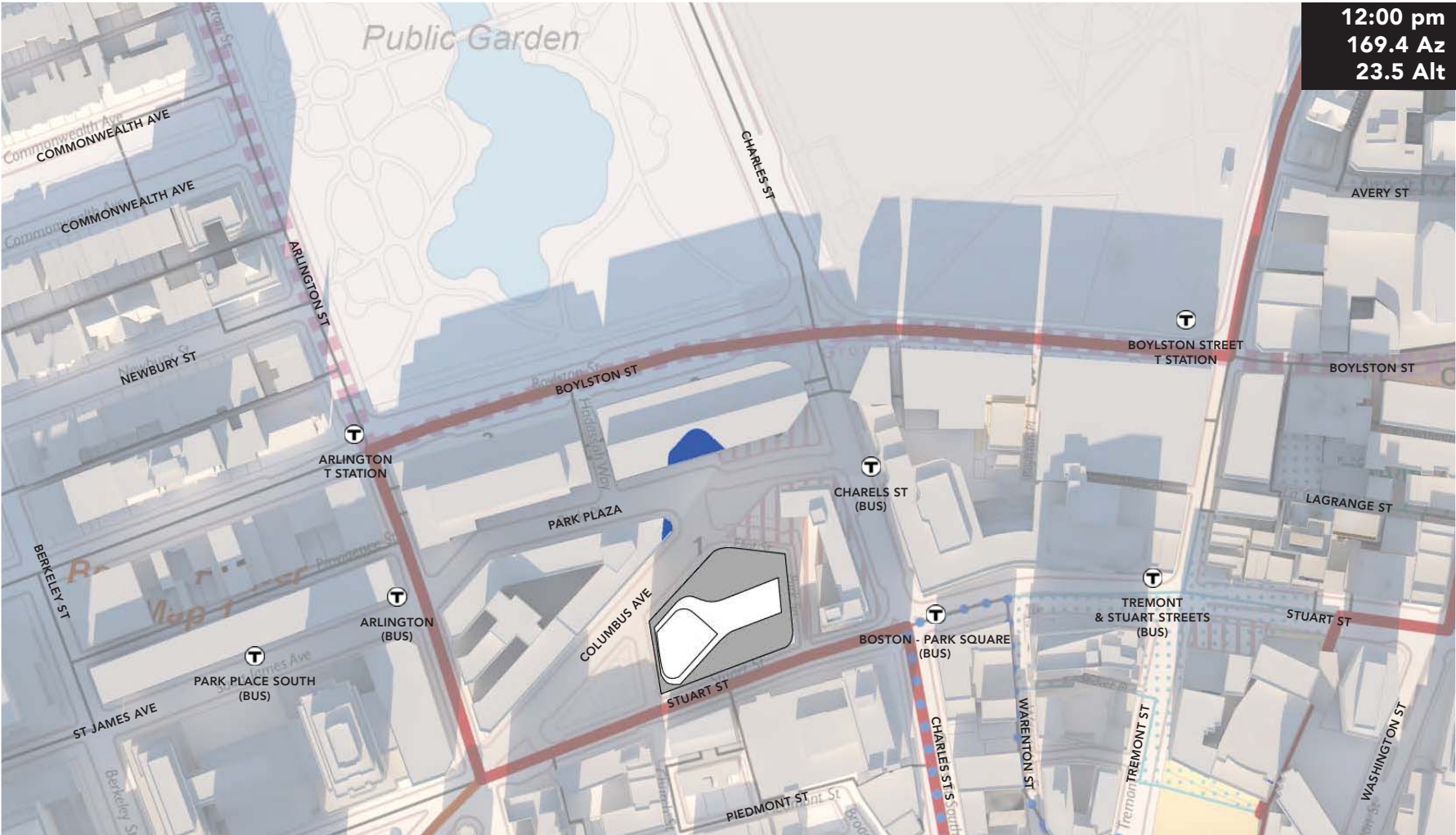
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

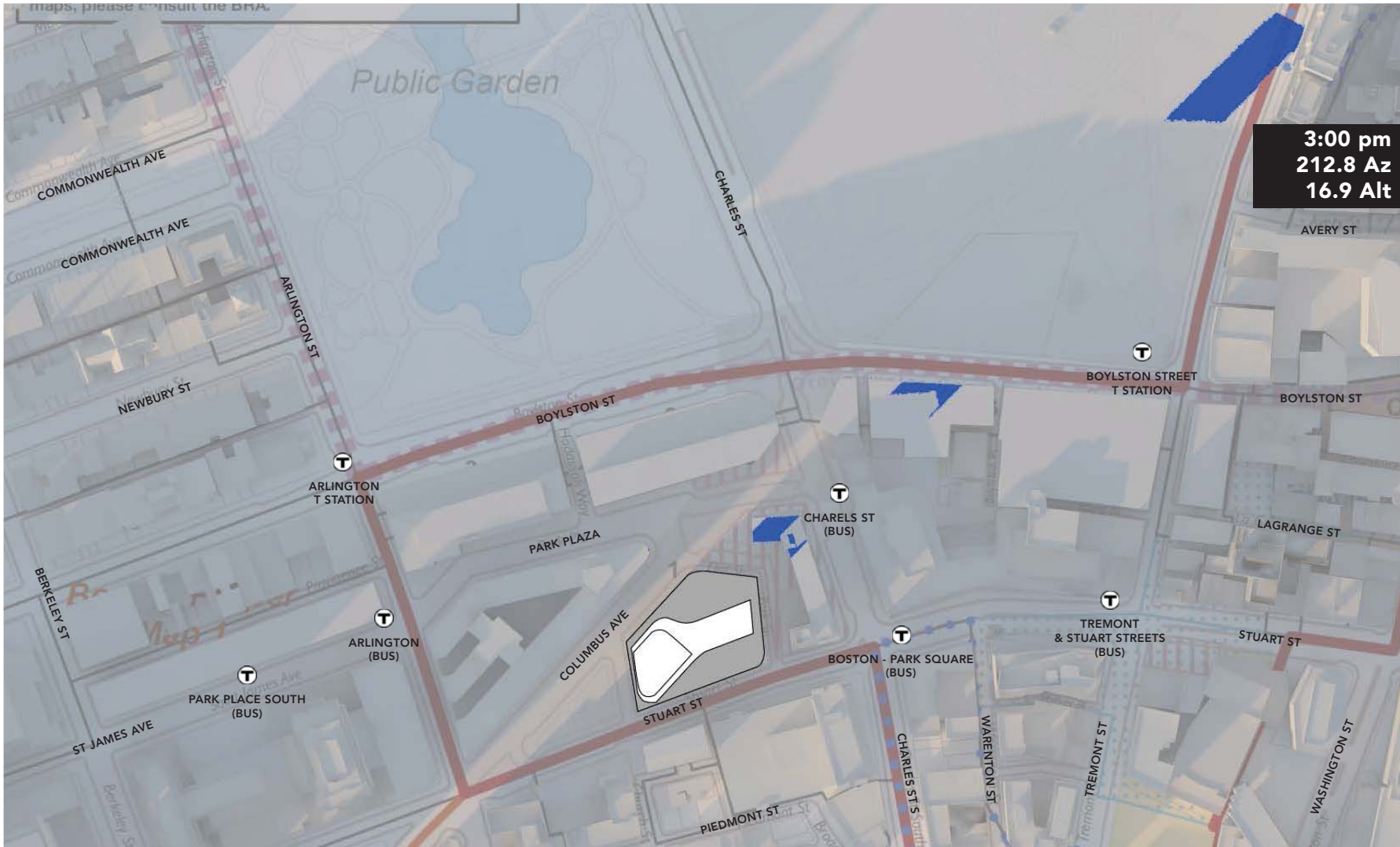


12:00 pm
169.4 Az
23.5 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

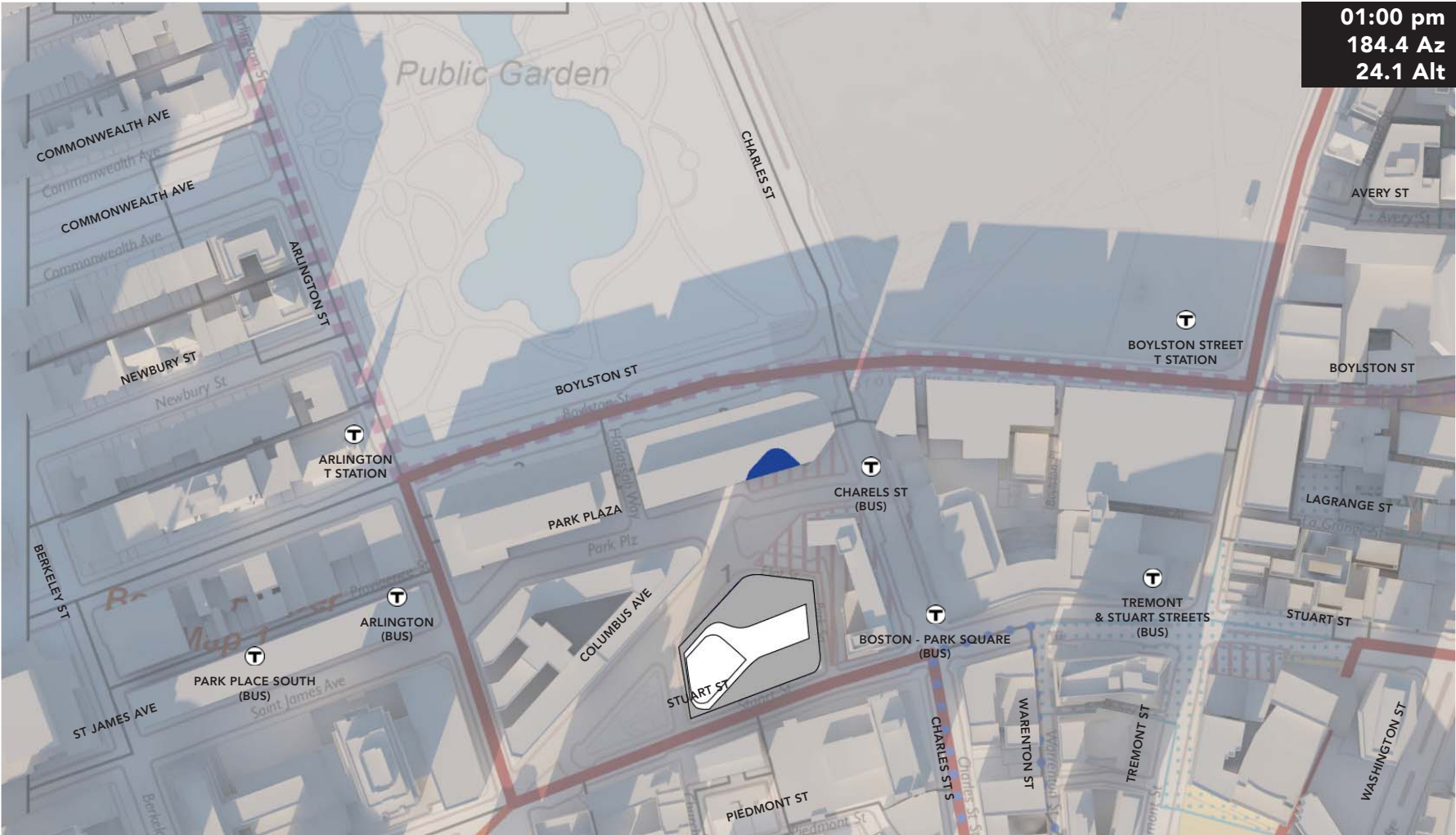
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

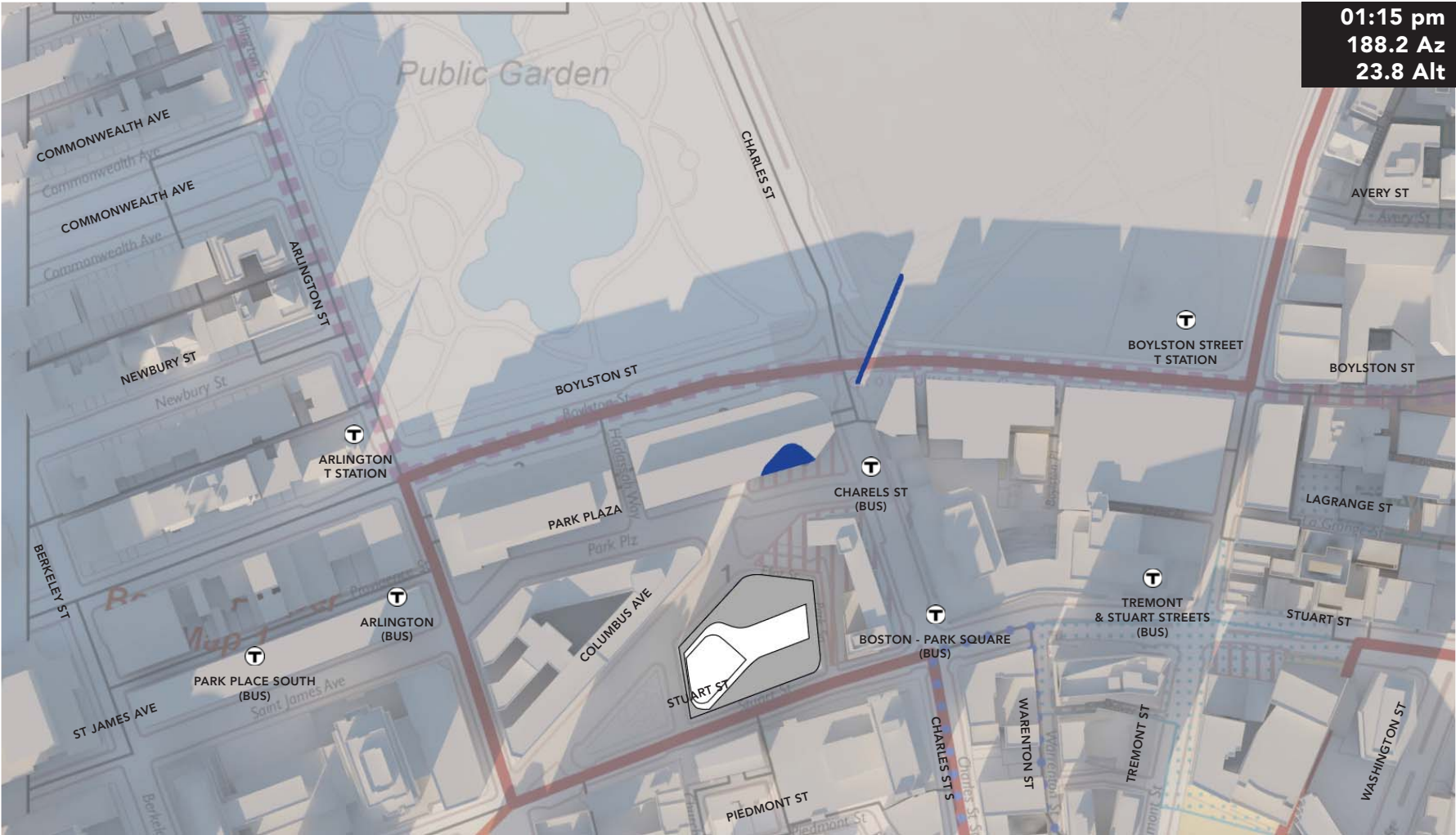


01:00 pm
184.4 Az
24.1 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

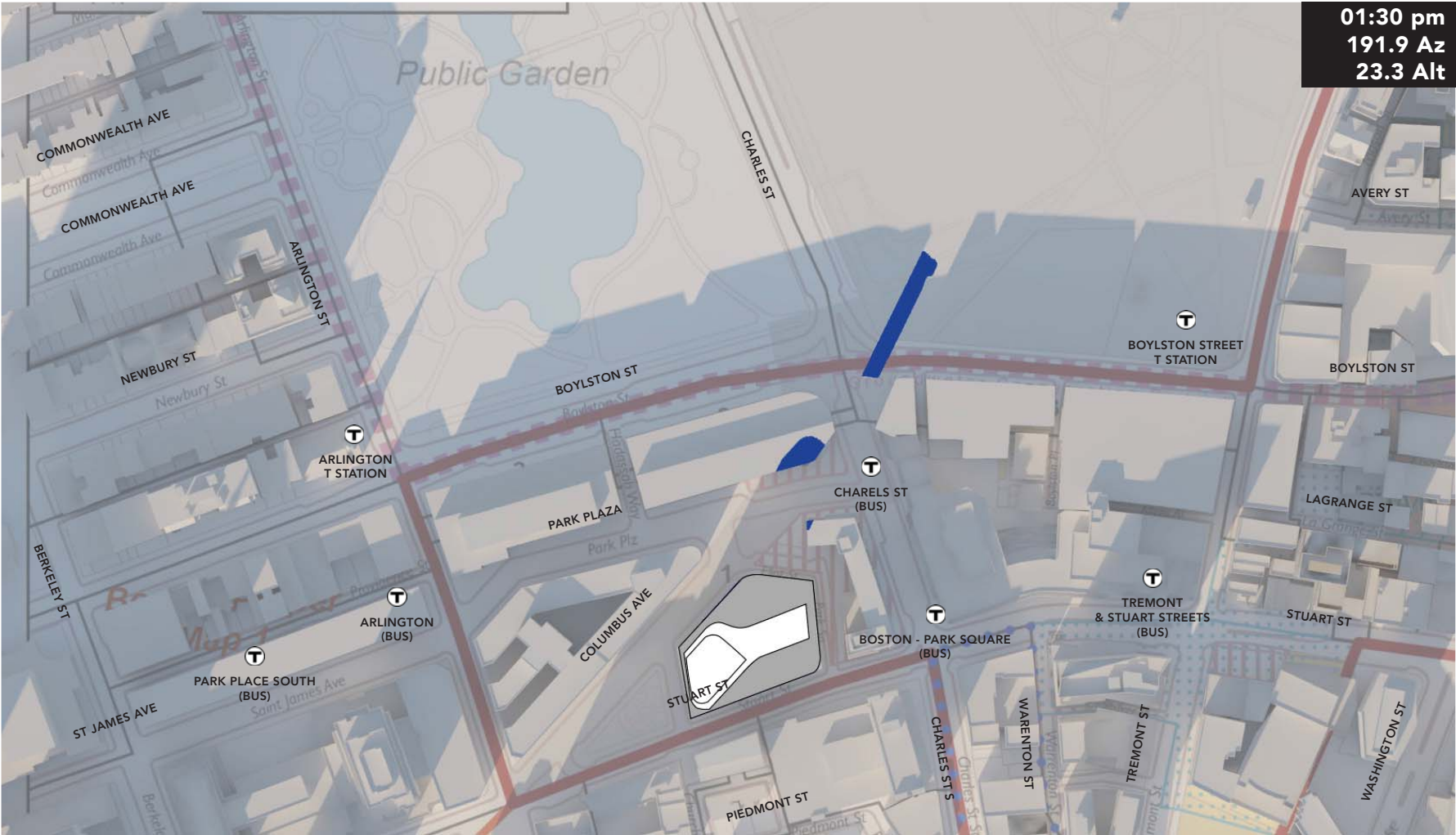


01:15 pm
188.2 Az
23.8 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

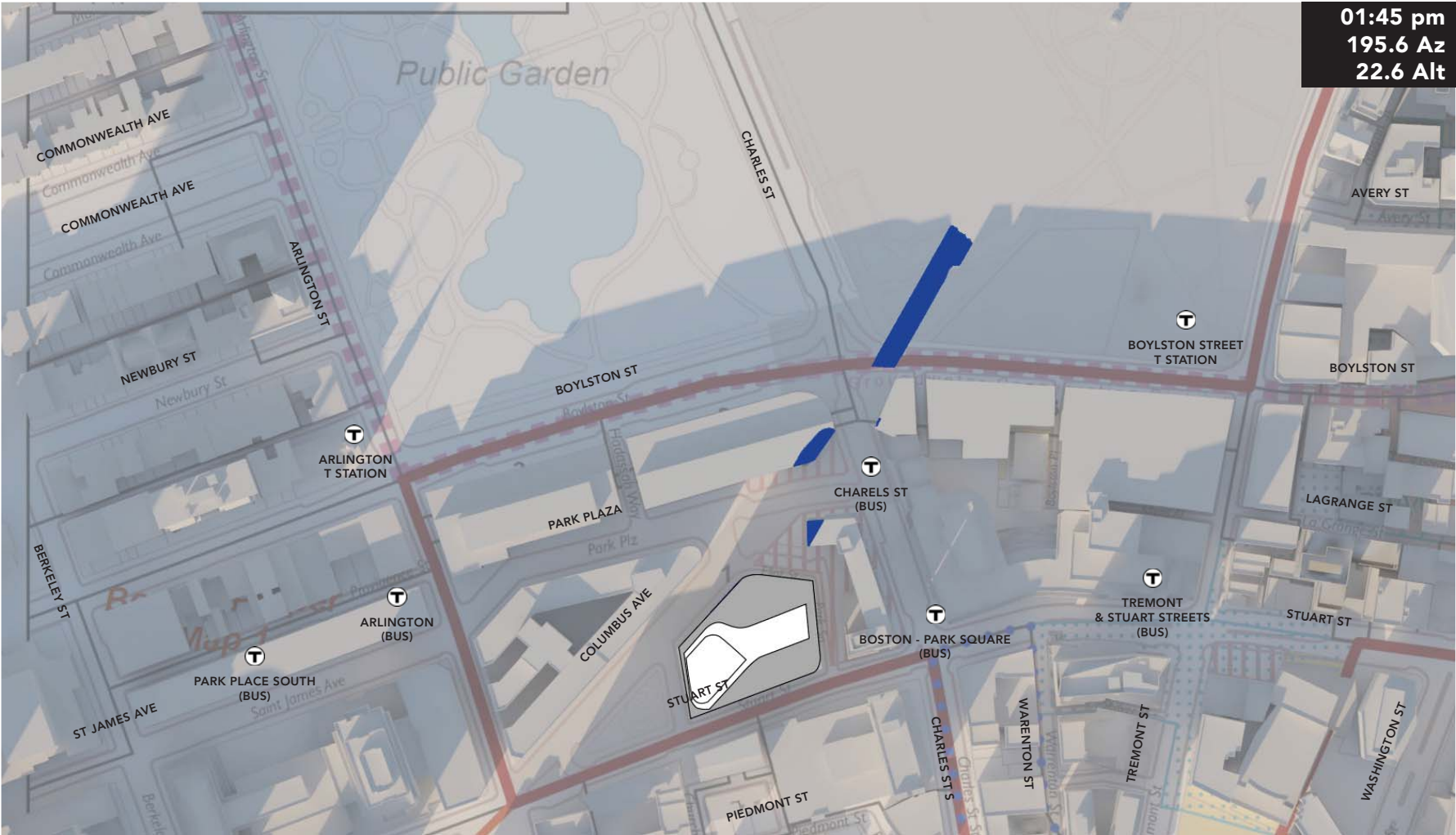


01:30 pm
191.9 Az
23.3 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

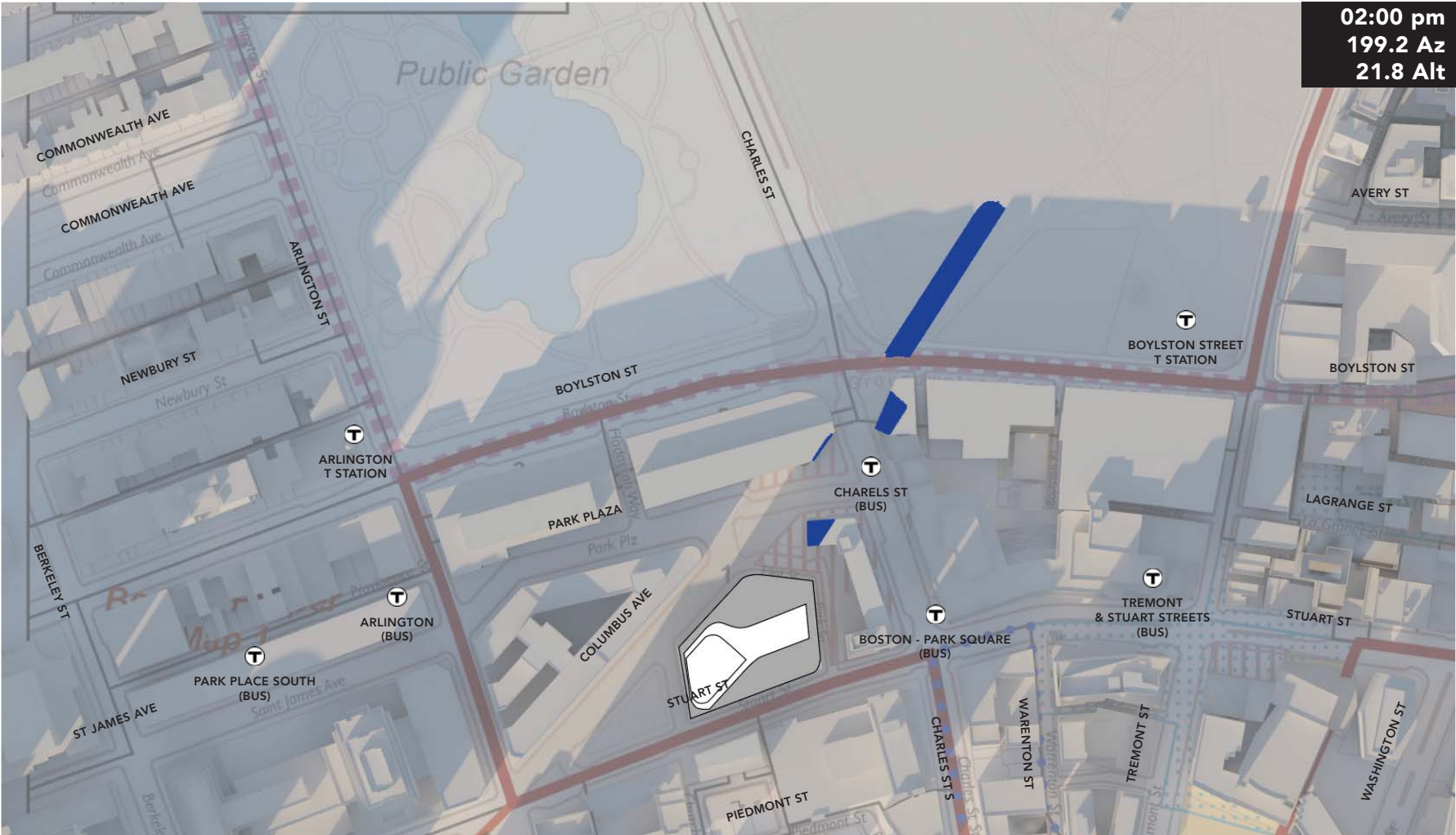
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



02:00 pm
199.2 Az
21.8 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



02:15 pm
202.7 Az
20.8 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

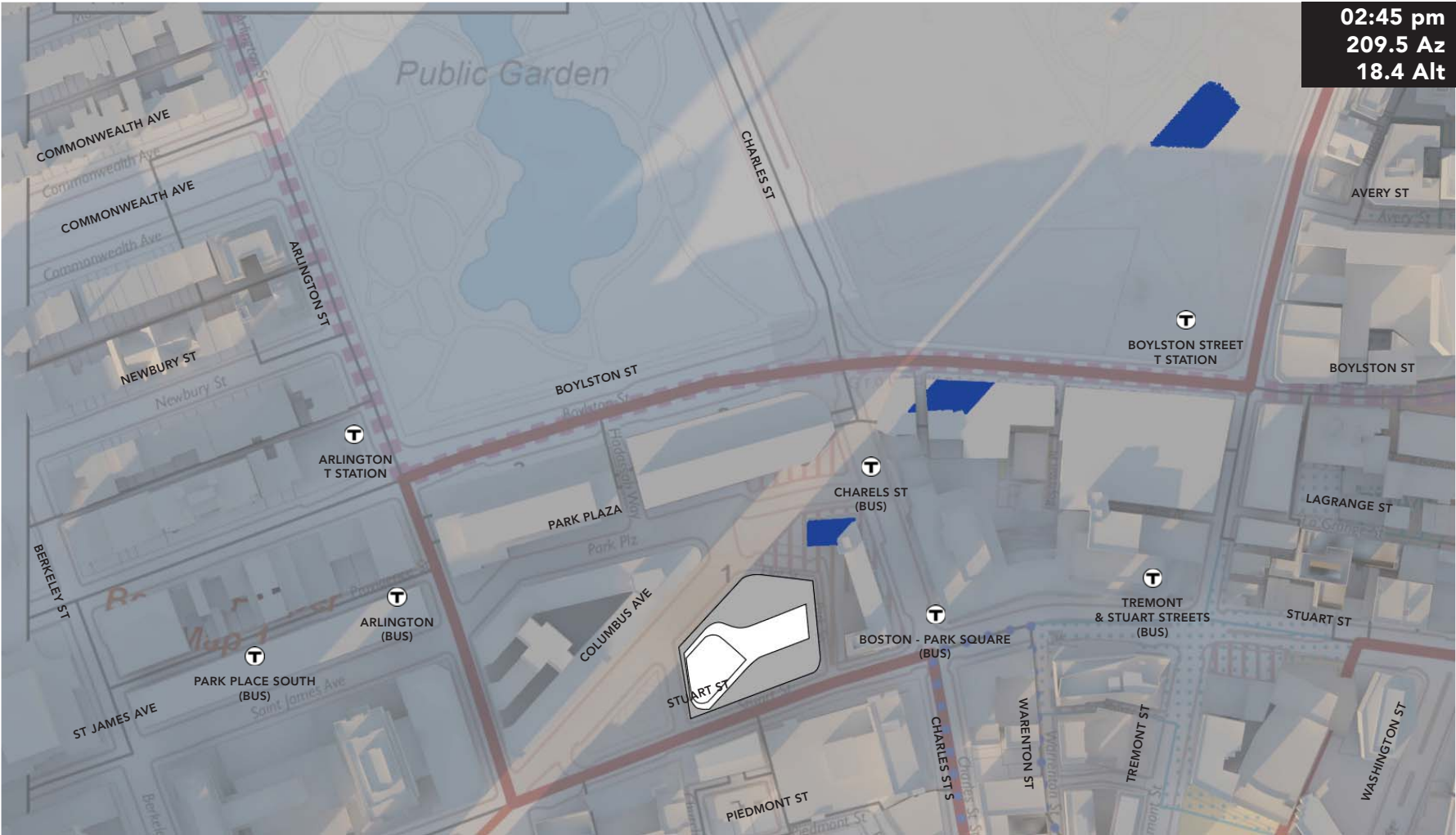


02:30 pm
206.2 Az
19.7 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21

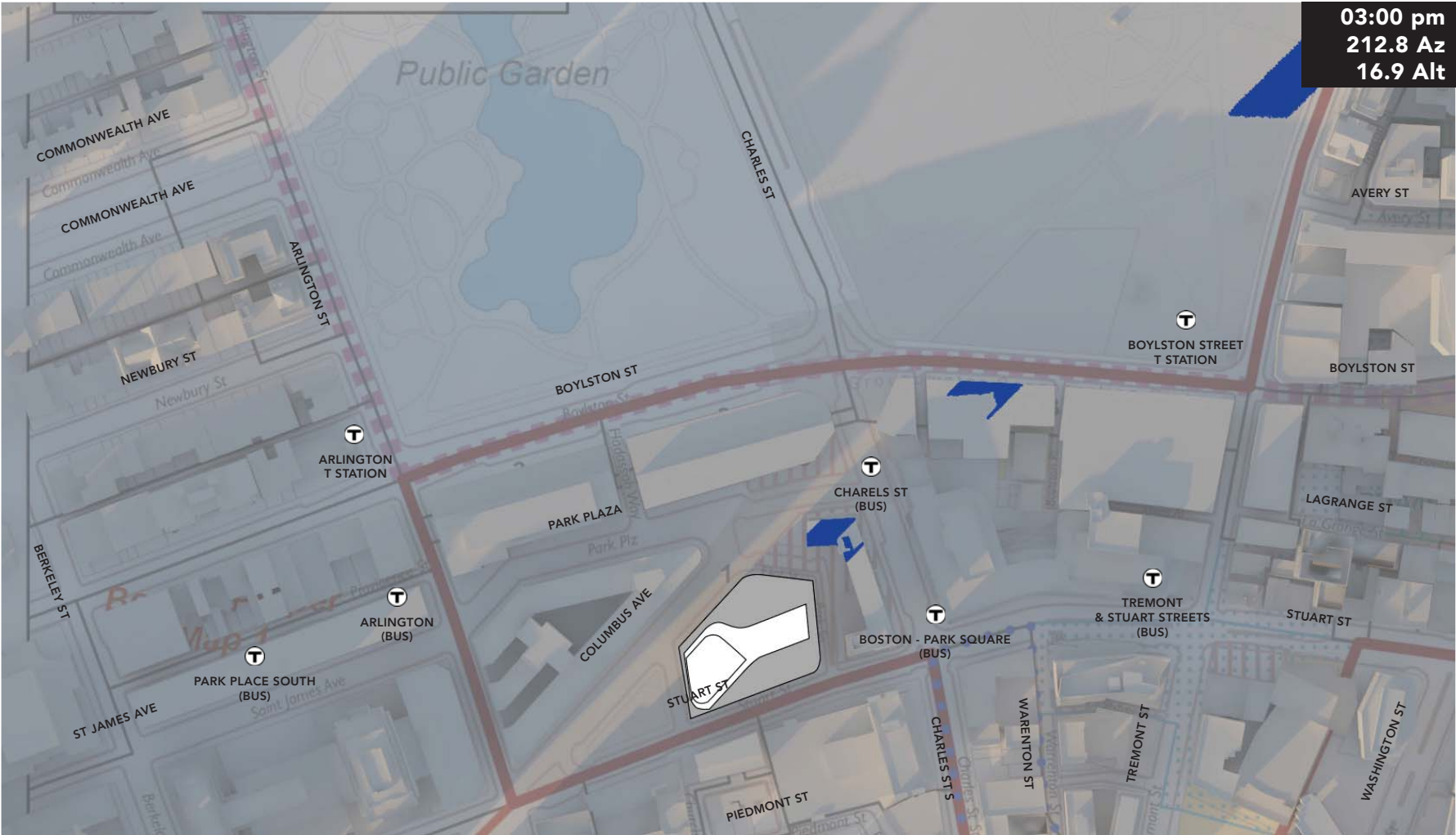


02:45 pm
209.5 Az
18.4 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

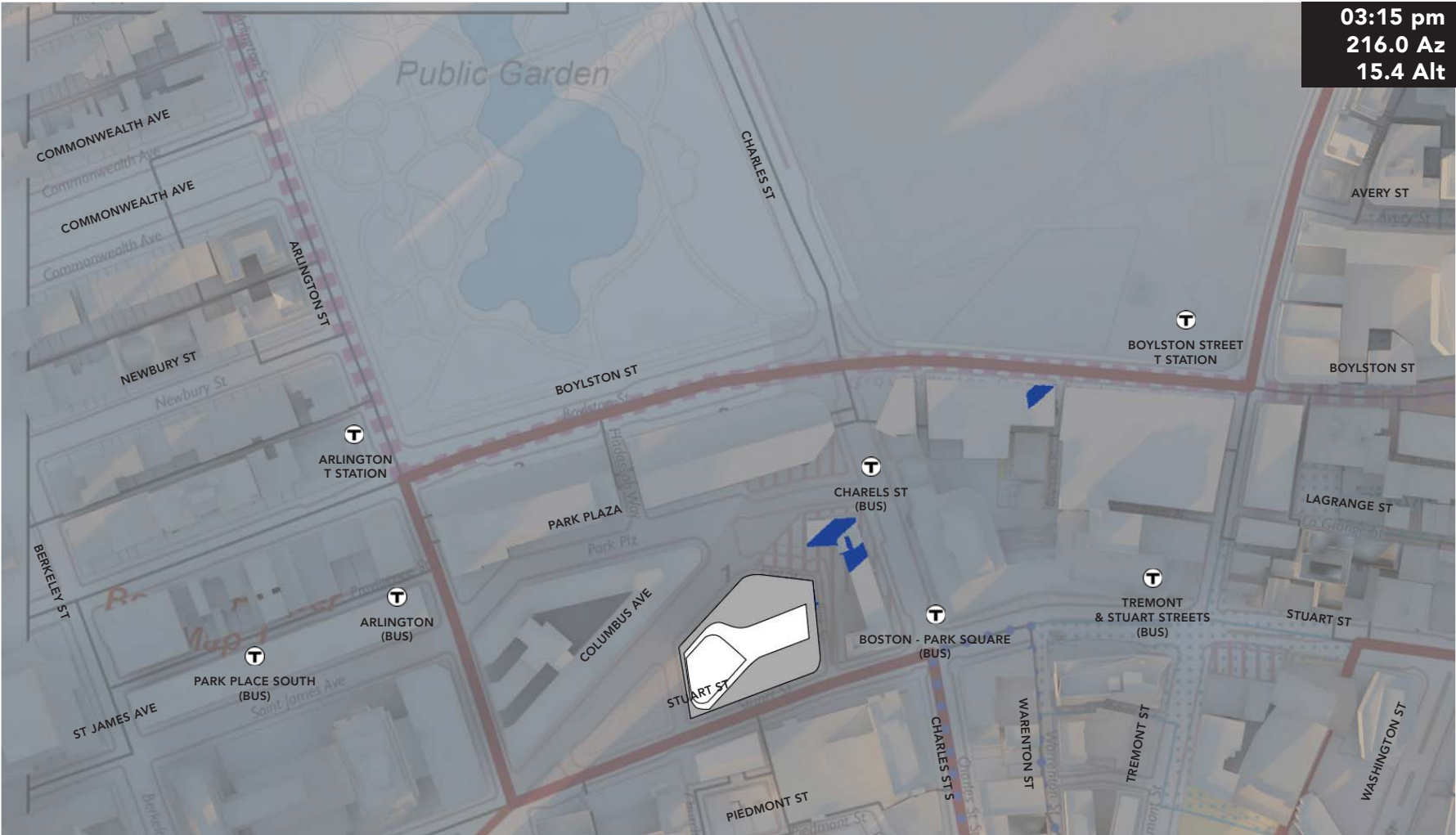
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

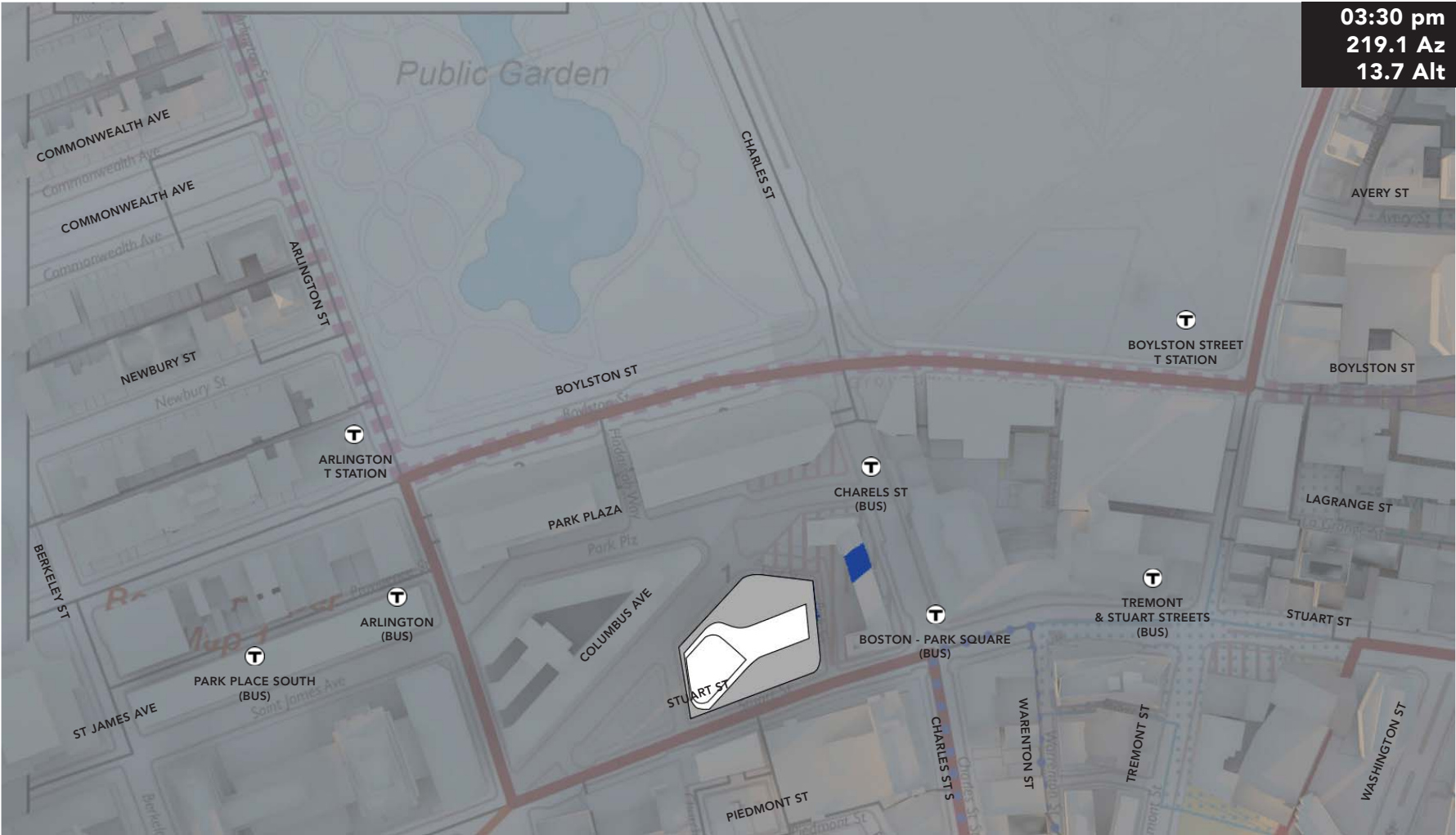
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

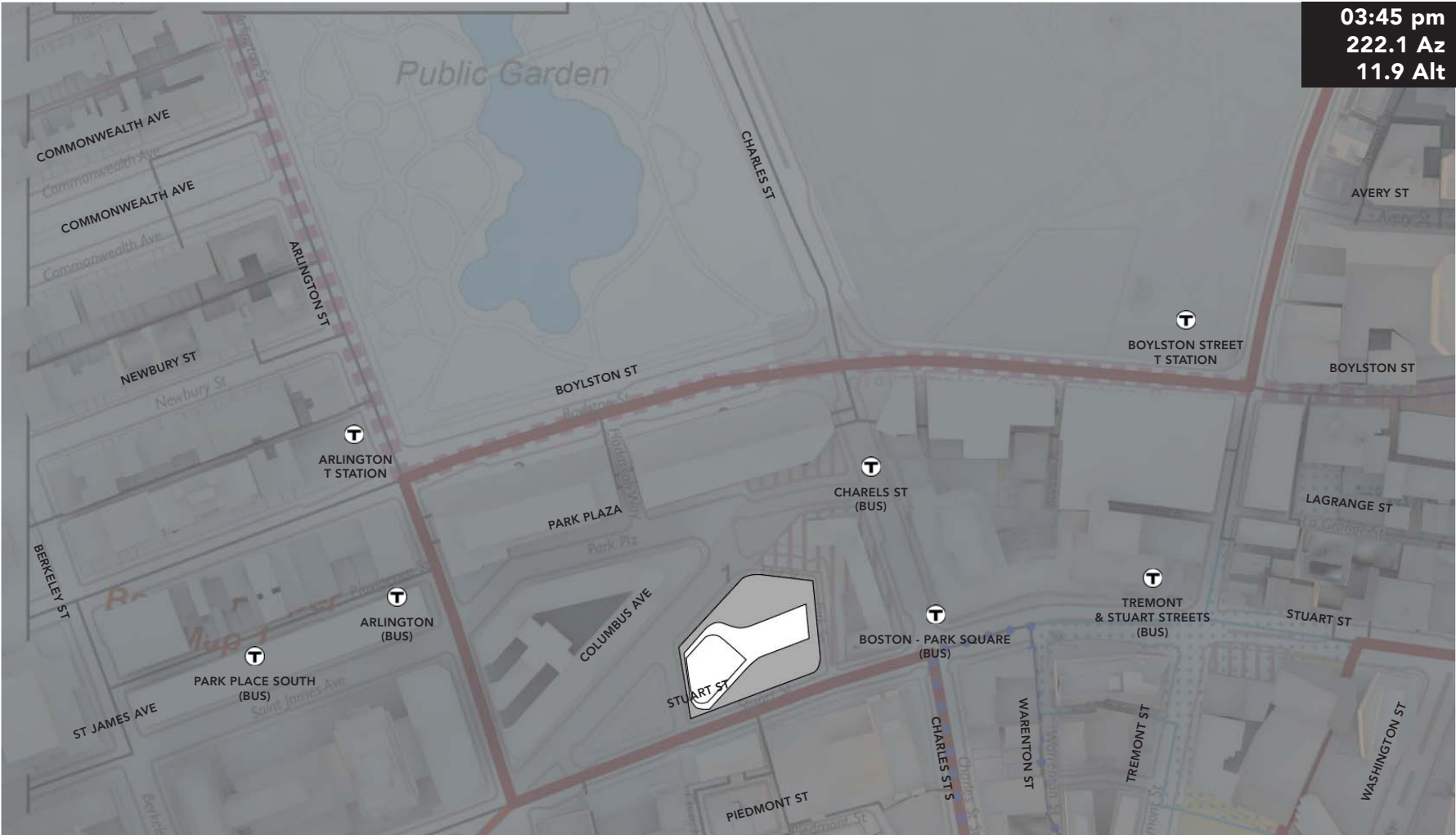
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

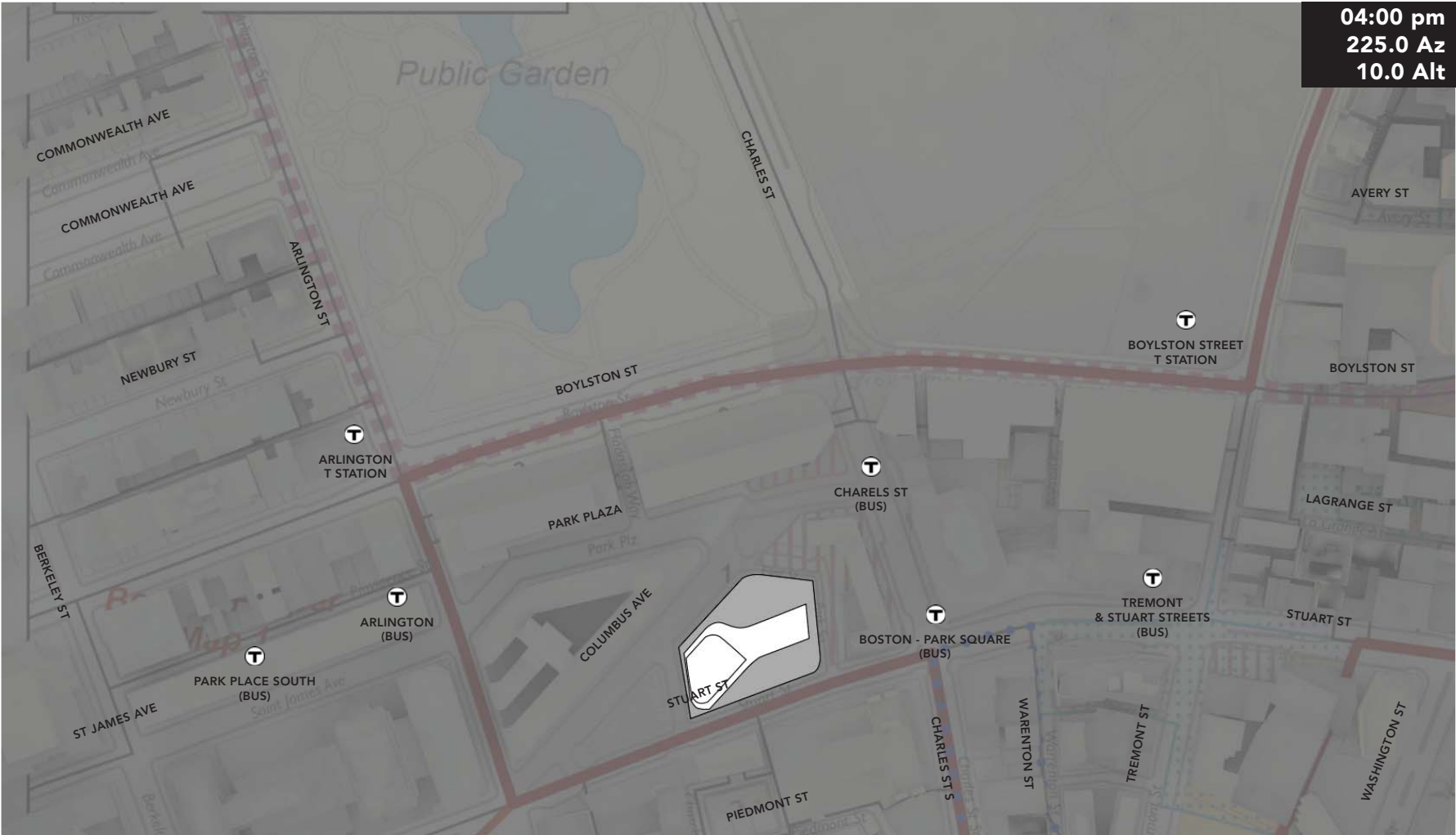
SHADOW STUDY, DECEMBER 21



 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

SHADOW STUDY, DECEMBER 21



04:00 pm
225.0 Az
10.0 Alt

 = NET NEW SHADOW

 MIDTOWN CULTURAL DISTRICT

Appendix C

Solar Glare

REPORT



MOTOR MART GARAGE

DETAILED SOLAR REFLECTION ANALYSIS

MARCH 21, 2019

PROJECT #1802314

SUBMITTED TO
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EXECUTIVE SUMMARY



RWDI was retained to investigate the impact that solar reflections emanating from the proposed Motor Mart Garage redevelopment will have on the surrounding public realm.

Overall Impact of Reflections

As with any modern building, the proposed development naturally creates reflections within its surroundings, the majority of which are minor in nature. We would consider the overall impacts of the building to be typical of any new construction.

Thermal Impacts on People and Facades

At all studied public realm facade and pedestrian areas, reflections are of low intensity and short duration. Hence, we would not expect these reflections to lead to a significant additional cooling load for a building. Should an individual choose to expose themselves to the reflected energy, they may feel warm, however this would be a temporary experience and one which would easily be remedied by closing window treatments.

Visual Glare Impact on Drivers

Reflection impacts are generally predicted to be low to moderate for drivers in the area. Occasional high impact reflections are noted to occur along Stuart Street, however these impacts are short in duration (less than 10 minutes at a time), and are possible in less than 0.1% of the daytime annually. Selecting a glazing unit with a lower visible reflectivity for Motor Mart Garage will reduce the impact of these reflections compared to the current design.

Visual Glare Impact on Pedestrians and Facades

Moderate levels of visual impact can occur in the immediate vicinity (i.e. within 600 feet) of the proposed building. These types of reflection impacts would likely occur due to any glazed building on the Motor Mart Garage site and represent at most visual nuisance, as viewers can easily look away. Selecting a glazing unit with a lower visible reflectivity for Motor Mart Garage will reduce the impact of these reflections compared to the current design.

The vertical fins in the facade design of the proposed tower also assist in lowering the visual impact of reflections from this building, particularly to the areas from east through south of the development.

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INTRODUCTION



This report provides the computer modeling results of reflected sunlight from the proposed redevelopment of the Motor Mart garage in Boston, MA. It is our understanding that the development will be surrounded by typical urban spaces such as busy roadways, parks, and other buildings.

RWDI was retained to investigate the impact that solar reflections emanating from the proposed development will have on the surrounding urban terrain.

A preliminary set of simulations was conducted to determine peak reflection intensities and the frequency of reflection occurrence for a broad area around the development. This served to identify areas which may experience high intensity or frequent reflections. This information informed the selection of twenty-five (25) points for a more detailed analysis.

These receptor points represent drivers, pedestrians, and building facades and the detailed results allow us to quantify the frequency, intensity and duration of glare events at the receptors as well as the sources of those reflections.

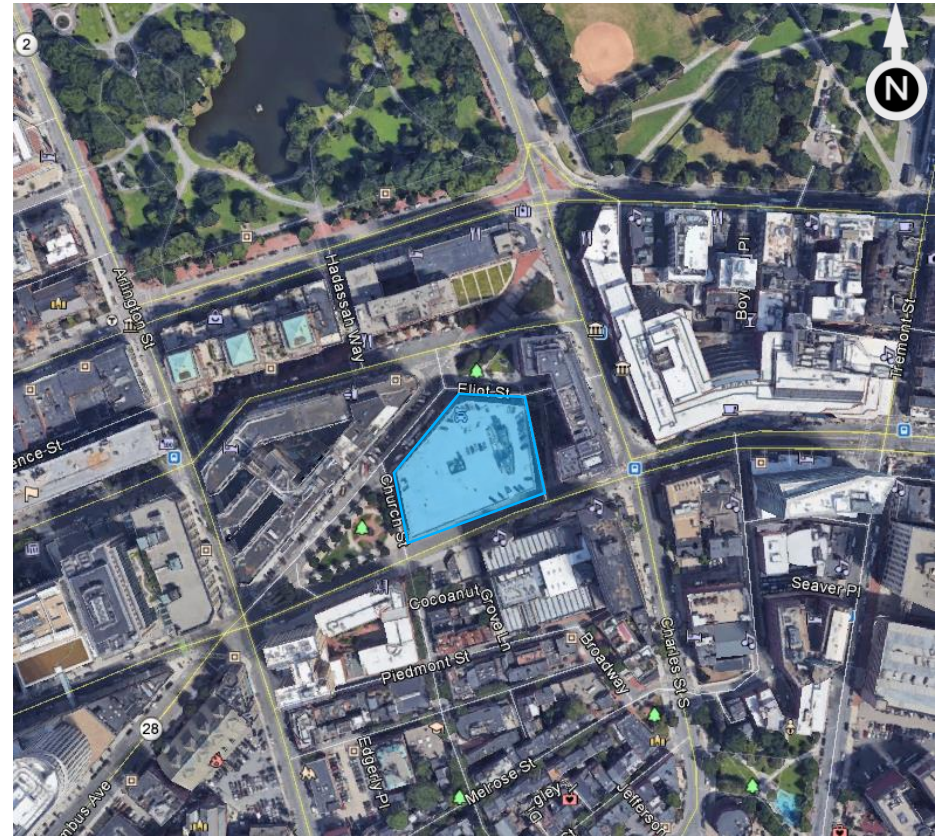


Figure 1: Location of the Motor Mart Garage (Blue Outline) (Map Credit: Google Earth)

Urban Reflections

While a common occurrence, solar reflections from buildings can lead to numerous visual and thermal issues.

Visual glare can:

- Impair the vision of motorists and others who cannot easily look away from the source;
- Cause nuisance to pedestrians or occupants of nearby buildings; and,
- Create undesirable patterns of light throughout the urban fabric.

Heat gain can:

- Affect human thermal comfort;
- Be a safety concern for people and materials, particularly if multiple reflections are focused in the same area; and,
- Create increased cooling needs in conditioned spaces affected by the reflections.

The most significant safety concerns with solar reflections occur with concave facades (Figure 2) which act to focus the reflected light in a single area. Due to the concave nature of some facades, the potential for this to occur is investigated further in this report.

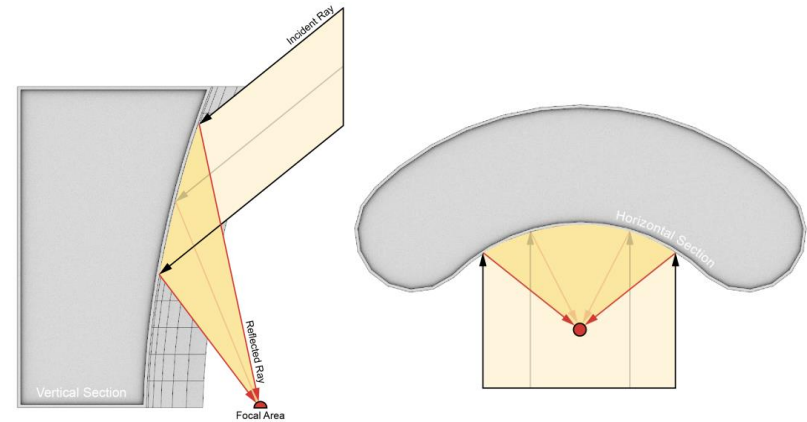


Figure 2: Illustration of Reflection Focusing Due to a Concave Facade

BACKGROUND AND APPROACH



Methodology

RWDI assessed the potential reflection issues using RWDI's in-house proprietary *Eclipse* software, in two phases as per the steps outlined below:

- The Phase 1 'Screening' assessment began with the development of a 3D model of the area of interest (as shown in Figure 3). This was then subdivided into many smaller triangular patches (see Figure 4).
- For each hour in a year, the expected solar position was determined, and "virtual rays" were drawn from the sun to each triangular patch of the 3D model. Each ray that was considered to be "unobstructed" was reflected from the building surface and tracked through the surrounding area. The study domain included the entire pedestrian realm within 2000 feet of the proposed building.
- The total reflected energy at that hour from all of the patches was computed and its potential for visual and thermal impacts was assessed.
- Finally, a statistical analysis was performed to assess the frequency, and intensity of the glare events occurring throughout the year within the nearby airspace. The criteria used to assess the level of impact can be found in Appendix B of this report.

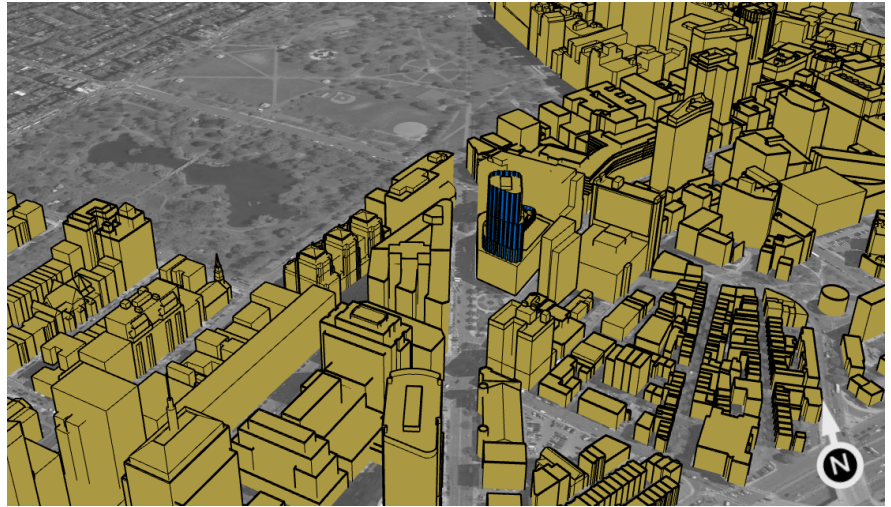


Figure 3: 3D Computer Model of the Proposed Development and Surrounding Context

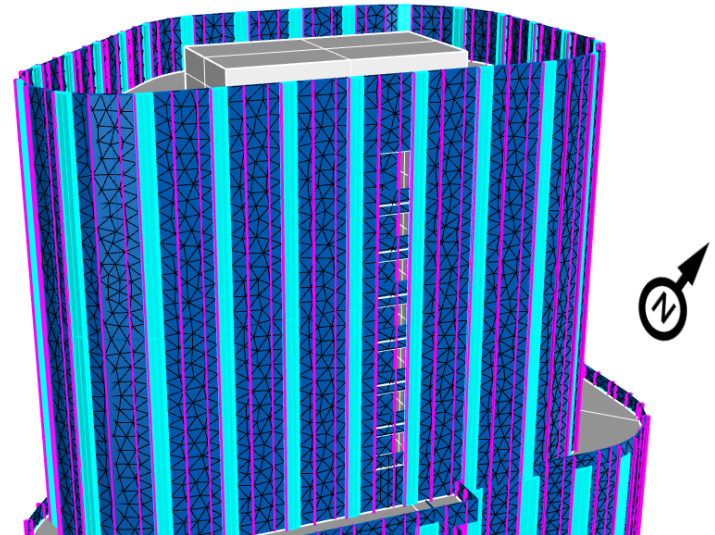


Figure 4: Close-up View of the Model, Showing Surface Subdivisions

BACKGROUND AND APPROACH



Methodology (cont'd)

- Based on the findings of the Screening Analysis, twenty-five (25) representative 'receptor points' were selected to undergo the Phase 2 'Detailed' analysis.
- The points were chosen to understand in greater detail how reflections from the building will impact drivers, pedestrians and the rest of the built environment. The selected locations of the points are discussed further in the Detailed Analysis section this report.
- The Detailed Analysis process is similar to the Screening Analysis, except reflections are analyzed at one minute increments for the entire year.
- In addition to the frequency and duration of reflection impacts, the Detailed Analysis allows for the prediction of when impacts can occur, how long they can occur for and which building element is the source.

BACKGROUND AND APPROACH



Assumptions and Limitations

Meteorological Data

This analysis used 'clear sky' solar data computed at the location of Logan International Airport. This approach uses mathematical algorithms to derive solar intensity values for a given location, ignoring local effects such as cloud cover. This provides a 'worst case' scenario showing the full extent of when and where glare could ever occur.

Radiation Model

RWDI's analysis is only applicable to the thermal and visual impacts of solar radiation (i.e. ultraviolet, visible and infrared wavelengths) on people and property in the vicinity of the development. It does not consider the impact of the building related to any other forms of radiation, such as cellular telephone signals, RADAR arrays, etc.

Study Building and Surrounds Models

The analysis was conducted based on a 3D model of the proposed development provided to RWDI on January 23, 2019.

The model of the surrounds and ground surface were developed based on publicly available data and topographically corrected based on a high-resolution LiDAR survey conducted by the National Oceanic and Atmospheric Administration (NOAA) in 2013-2014. NOAA states that the horizontal accuracy of this data set is 16.5 inches at a 95% confidence level. Its vertical accuracy is stated as 4.8 inches at a 95% confidence level.

Potential reductions of solar reflections due to the presence of vegetation or other non-architectural obstructions were not included, nor are reflections from other buildings. Light that has reflected off several surfaces is assumed to have a negligible impact. As such, only a single reflection from the development was included in the analysis.

BACKGROUND AND APPROACH



Assumptions and Limitations (cont'd)

Facade Material Reflectance

Based on correspondence with the design team on January 24, 2018, RWDI was informed of two potential insulating glazing units (IGUs) being considered for the facade of this project.

We have conservatively used the more reflective of the two options in this report, though we do discuss the implications of using the less reflective glazing in the Overall Observations and Conclusions section of this report.

The selected glazing unit is Viracon VRE1-59, which has a nominal visual reflectance of 30%, and a full spectrum reflectance of 38%. It is our understanding that all other surfaces on the proposed tower will be matte in finish and as such are not included as reflection sources in this analysis.

The reflectance properties of the reflective elements are summarized in Table 1. Figure 5 illustrates the location of the reflective materials on the facades.

Applicability of Results

The results presented in this report are highly dependent on both the form and materiality of the facade. Changes in the design may result in changes to the findings of this report.

This report has endeavored to provide a robust and suitably conservative analysis of the potential effects of reflected sunlight, contextualized based on current industry and academic research, and common best practices.

BACKGROUND AND APPROACH



Assumptions and Limitations (cont'd)

Table 1: Nominal Visible and Full Spectrum Reflectance Values of the Reflective Building Elements

Location	Material	Visible Reflectance	Full Spectrum Reflectance
All Glazing	VRE 1-59	30%	38%

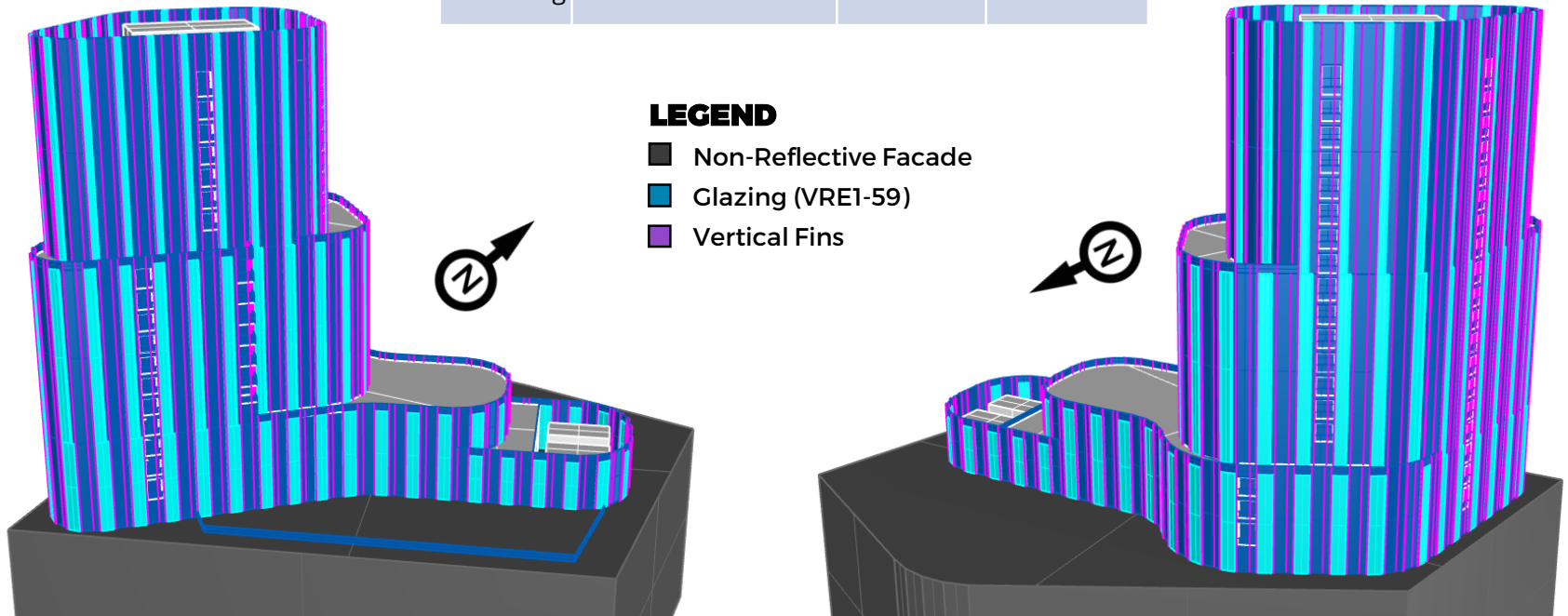


Figure 5: Locations of Reflective Building Elements (Surrounding Context removed for Clarity)

SCREENING ANALYSIS RESULTS



Presentation of Results

This section presents the solar impacts at the following locations:

- Pedestrian level at grade
- Four Seasons Hotel and One Charles building facades

For each location, the following plots are presented:

Peak Annual Reflected Irradiance

This plot displays the annual peak intensity of all reflections emanating from the development.

Two versions of this plot are included:

- **Visible Reflectance (Visual Glare):** These plots (Figures 6a and 7a) display the intensity of reflected visible light only. Depending on the ambient conditions, reflection intensities as low as 50 W/m^2 could be visible to people outdoors.
- **Full Spectrum Reflectance (Heat Gain):** These plots (Figures 6b and 7b) present the total intensity of a reflection, including both visible light and thermal energy which relates to the risk of excessive heat gain. For full spectrum reflectance, RWDI considers 1500 W/m^2 as a short term thermal comfort threshold and reflections above 2500 W/m^2 as a human safety threshold (refer to Appendix B).

Frequency of Significant Visual Reflections

These plots (Figures 6c and 7c) identify the locations of the most frequent significant reflections emanating from the facades. In this context a 'significant' reflection is one that is at least 50% as intense as one that would cause after imaging on a viewer (refer to Appendix B).

As this criteria is visually based, the visible reflectance of the facade was used.

In order to attain a complete understanding of the impact that reflections may have on drivers, other factors must be considered, including the duration of the reflections and when they occur. The following plots serve to illustrate the general characteristics of reflections from the development and inform the locations of the receptor points used in the detailed phase of work which will analyze these factors in greater detail.

SCREENING ANALYSIS RESULTS – GRADE LEVEL



Peak Annual Reflected Irradiance - Visible Reflectance (Visual Glare)

Reflections as low as 50 W/m² may be visible to people, depending on outdoor lighting levels.

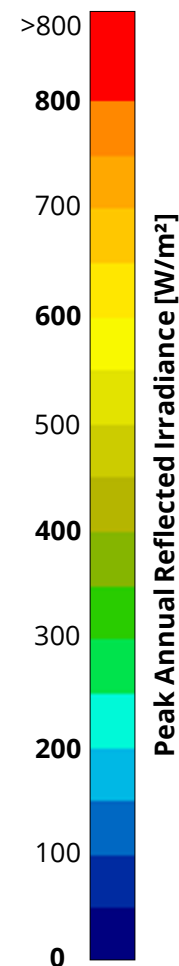
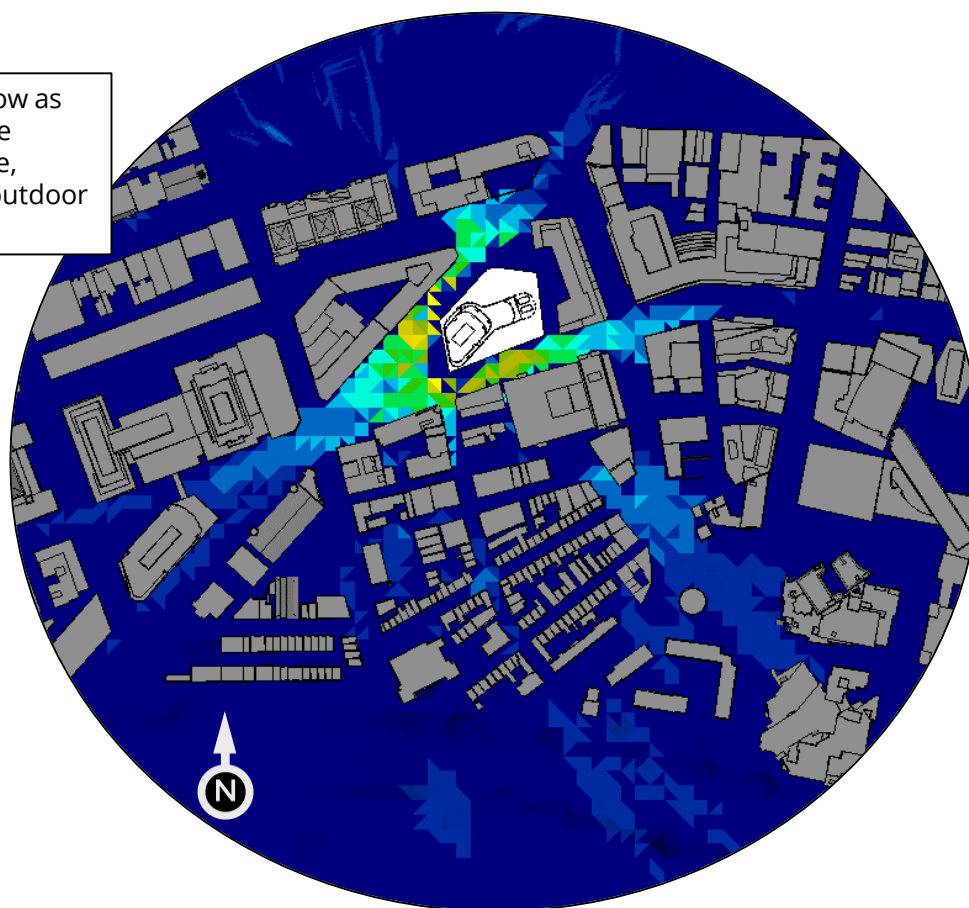


Figure 6a: Maximum Annual Intensity of Visible Reflections at Pedestrian Height

SCREENING ANALYSIS RESULTS – GRADE LEVEL



Peak Annual Reflected Irradiance - Full Spectrum Reflectance (Heat Gain)

800 W/m² represents a
typical intensity for
direct sunlight.

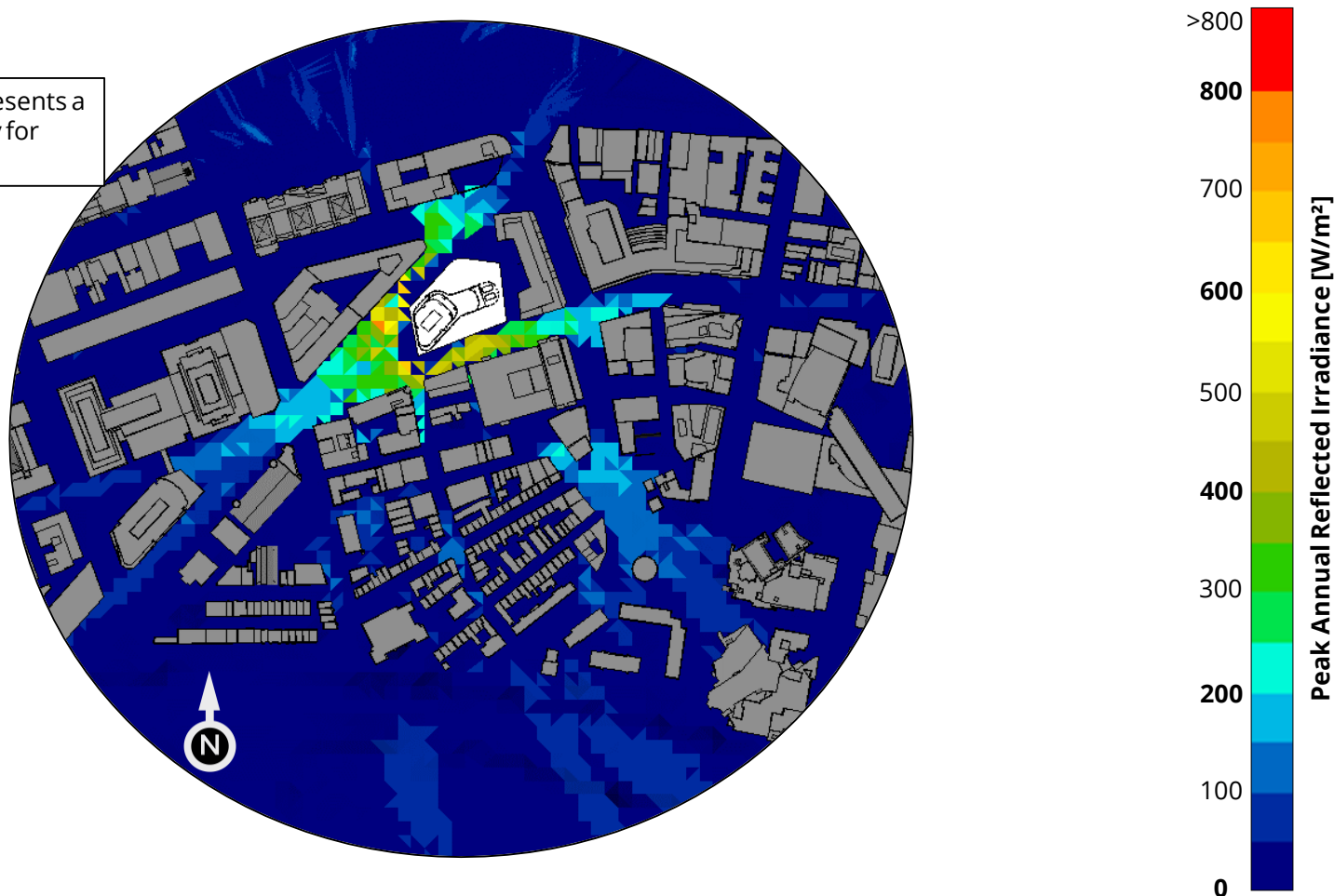


Figure 6b: Maximum Annual Intensity of Full Spectrum Reflections at Pedestrian Height

SCREENING ANALYSIS RESULTS – GRADE LEVEL



Frequency of Significant Visible Reflections

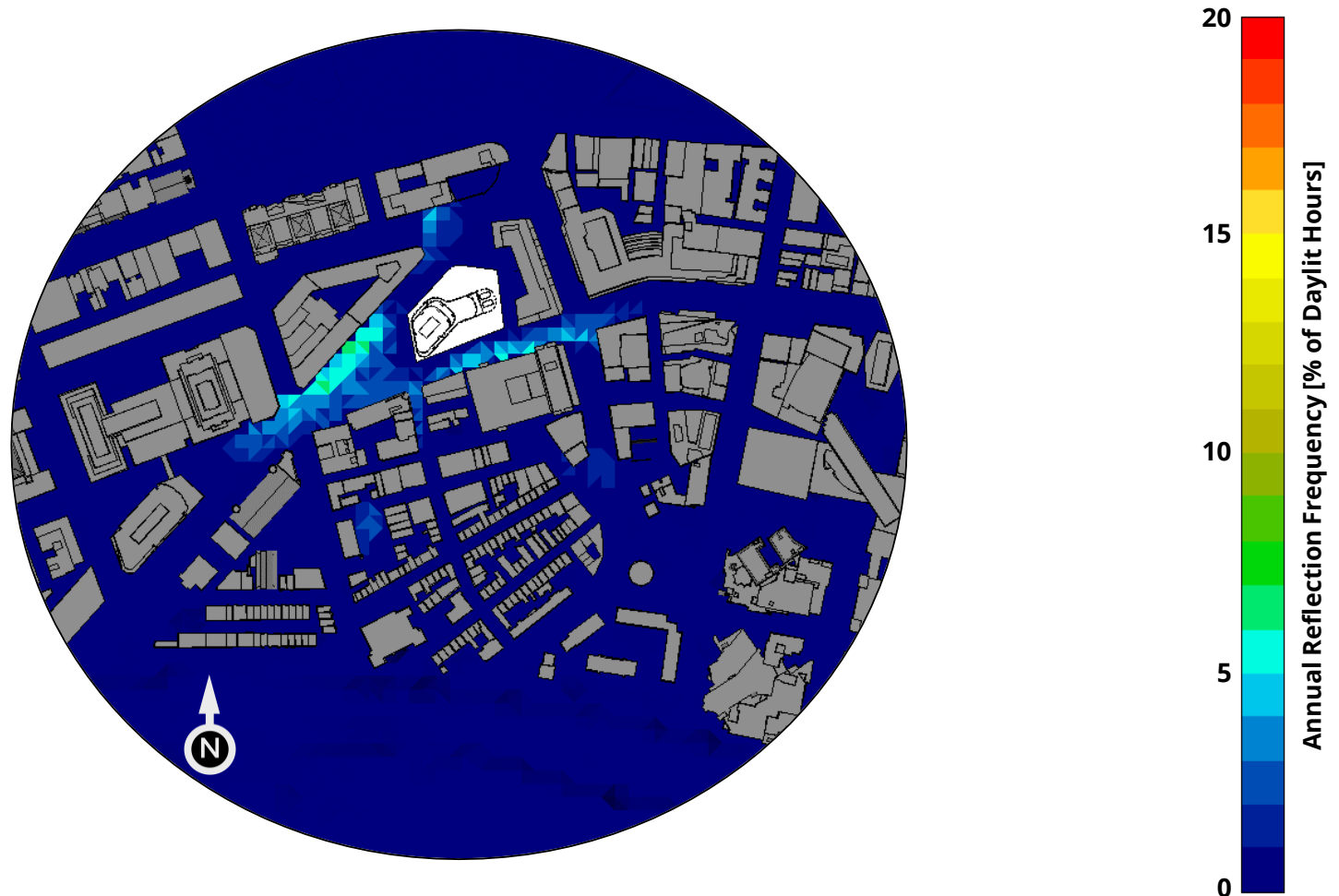


Figure 6c: Frequency (% of Daylit Hours) Where Significant Visible Reflections Can Occur

SCREENING ANALYSIS RESULTS – FOUR SEASONS HOTEL AND ONE CHARLES BUILDING



Peak Annual Reflected Irradiance - Visible Reflectance (Visual Glare)

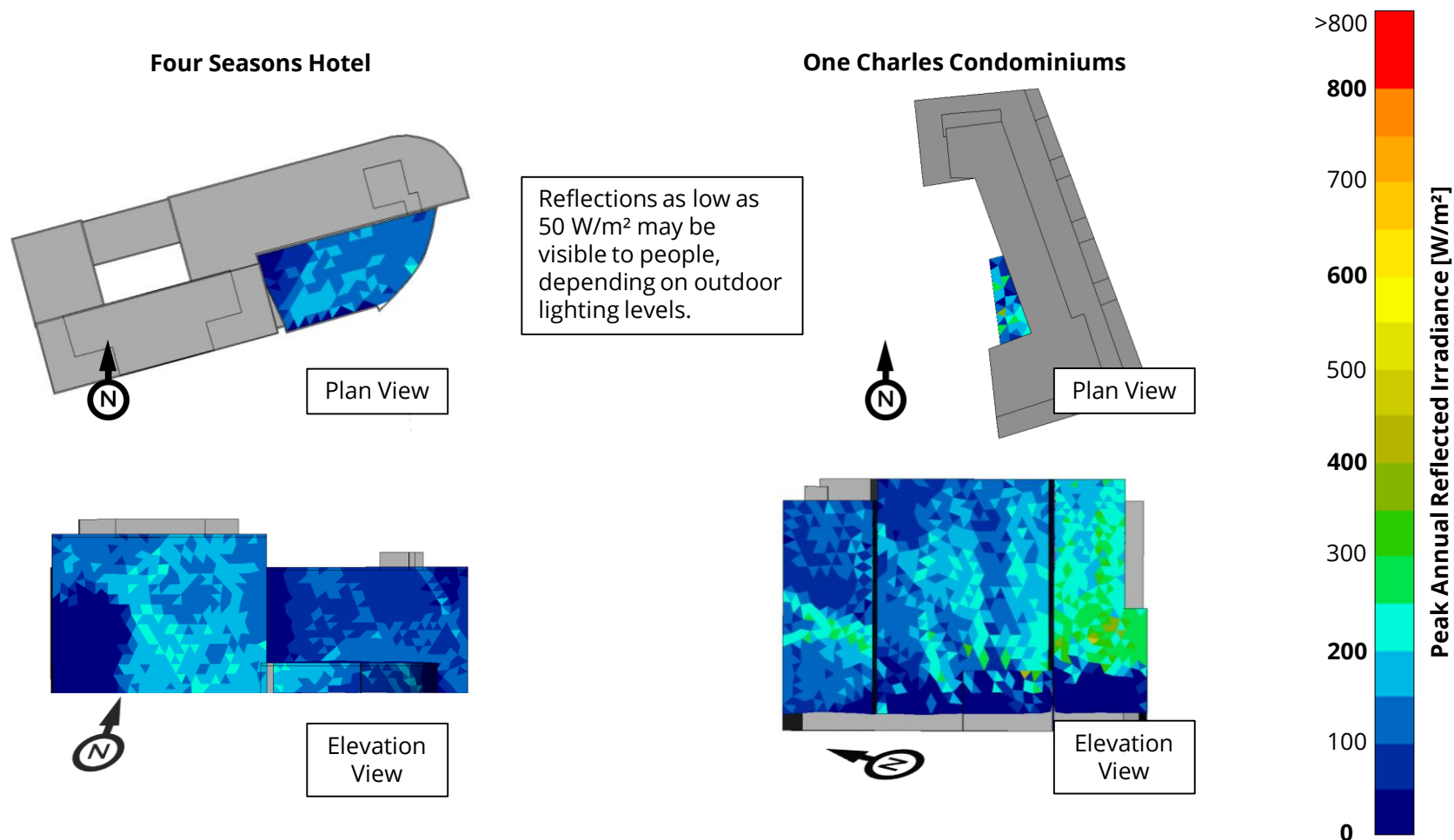


Figure 7a: Maximum Annual Intensity of Visible Reflections on the Podium Roof and Facades of the Four Seasons Hotel and One Charles building

SCREENING ANALYSIS RESULTS – FOUR SEASONS HOTEL AND ONE CHARLES BUILDING



Peak Annual Reflected Irradiance - Full Spectrum Reflectance (Heat Gain)

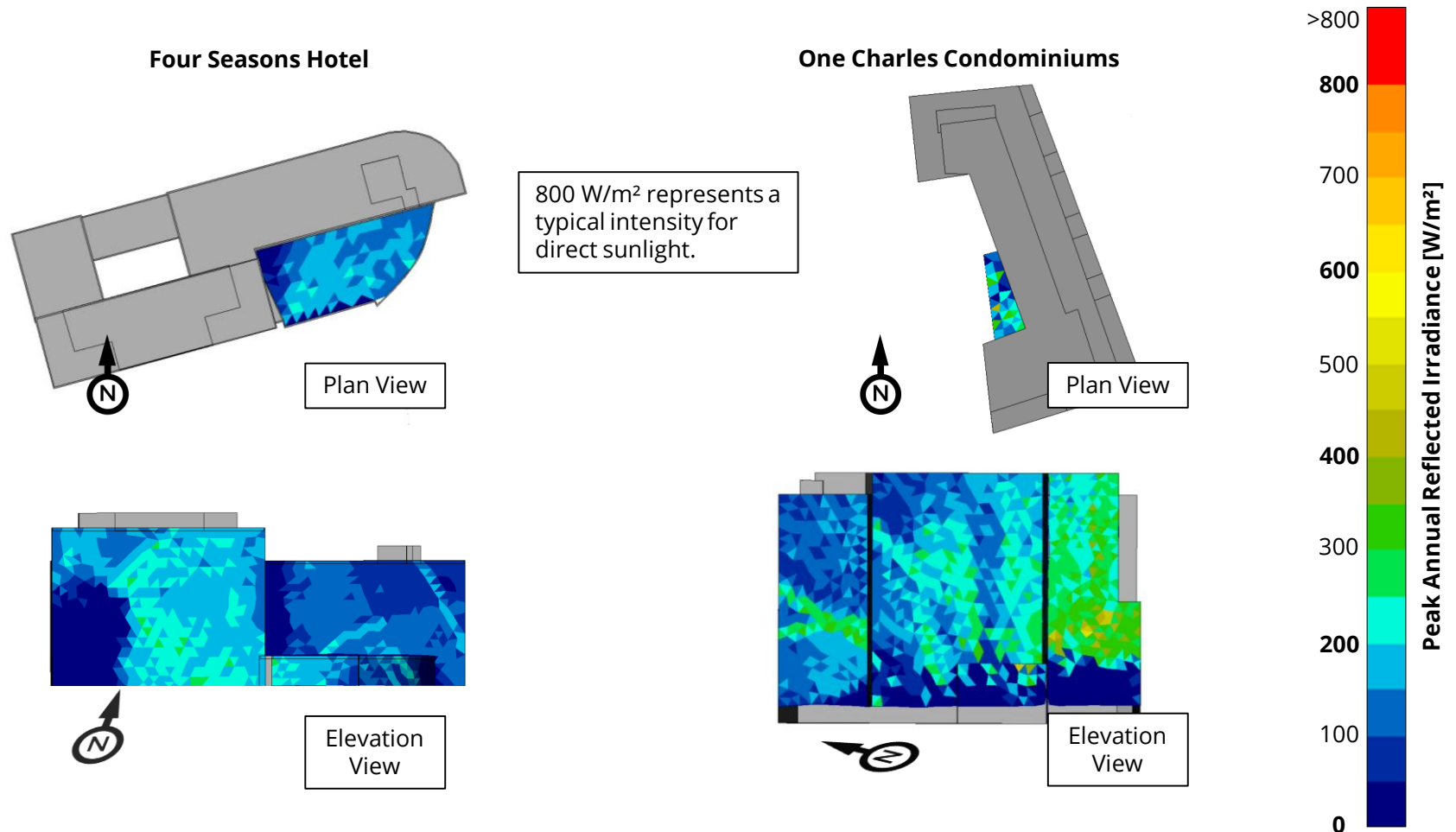


Figure 7b: Maximum Annual Intensity of Full Spectrum Reflections on the Podium Roof and Facades of the Four Seasons Hotel and One Charles building

SCREENING ANALYSIS RESULTS – FOUR SEASONS HOTEL AND ONE CHARLES BUILDING



Frequency of Significant Visible Reflections

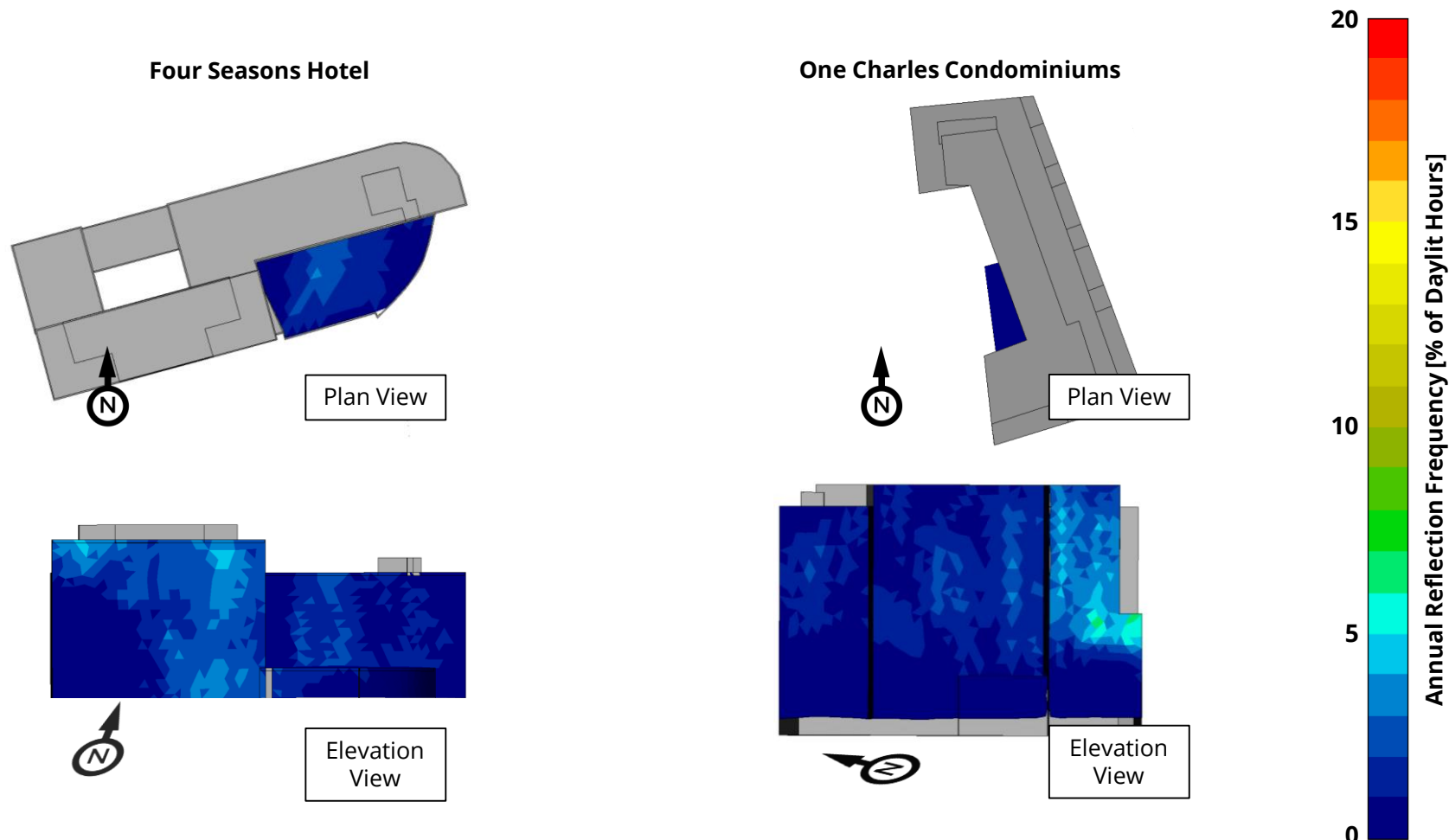


Figure 7c: Frequency (% of Daylit Hours) Where Significant Visible Reflections Can Occur on the Podium Roof and Facades of the Studied Buildings

SCREENING ANALYSIS OBSERVATIONS



1. No public realm locations were predicted to receive reflections of an intensity exceeding RWDI's thermal comfort and human safety thresholds.
2. At grade level, reflections from the proposed building are expected to fall most frequently onto the areas immediately west and south of the development, in particular on Statler Park as well as along Stuart Street and Columbus Avenue. The maximum frequency of glare occurrence found at pedestrian level is approximately 8% of daytime hours. Based on our experience in studies of other buildings in Boston, this frequency of reflections is not atypical.
3. Reflections emanating from the south facades of the development are expected to fall onto Stuart Street. The reflections from this facade may impact drivers traveling along Stuart Street as they approach the development. The potential for these reflections to cause impact to drivers depends on other factors (like a driver's view direction) which are investigated in the Detailed Analysis section. Though, we do note that the frequency at which these reflections can occur is quite low (less than 5% of daytime hours).
4. While reflections are predicted to fall on Columbus Avenue, the one-way nature of the street means that any reflections will impact a driver from behind, and therefore present little risk of visual impairment.
5. Reflections are predicted to impact the south facades of the Four Seasons Hotel as well as the west facades of the One Charles building. The glare impacts are generally infrequent, as the maximum frequency of glare occurrence is predicted to be less than 6% of daytime hours. Very infrequent impacts may also fall on to the podium levels of these buildings. At worst, these reflections may be a nuisance for occupants and pedestrians. The durations of reflections on these neighboring buildings and the dates they may occur is discussed in the Detailed Analysis section of this report.
6. The occupants of other buildings located in the vicinity of the development are expected to experience visible reflections from the development. That being said, the reflections do not pose a risk to safety, and are likely a nuisance at worst, as the occupants can look away or close blinds. The durations of reflections on these neighboring buildings and the dates they may occur is discussed in the Detailed Analysis section of this report.
7. The vertical fins on the current facade design are a positive design feature. This aids in preventing the occurrence of glancing reflections that usually carry higher solar energy levels, and hence reduces the frequency and intensity of impacts on the adjacent streets, pedestrian areas and neighboring buildings.

SCREENING ANALYSIS OBSERVATIONS



5. Statler Park and Lincoln Square are exposed to visible reflections from the proposed development during a small percentage of daytime hours. The durations of reflections on these greenspaces and the dates they may occur is discussed in the Detailed Analysis section of this report.
8. The preliminary simulations do not predict any significant visual impact from the reflections on either Boston Common nor the Public Garden.

DETAILED ANALYSIS RESULTS



Based on the findings of the Screening Analysis and the risk levels associated with reflections effecting specific areas, twenty-five (25) representative points were selected for the Detailed Analysis. These points are described in Table 2 and illustrated in Figure 8.

Table 2: Receptor Descriptions

Receptor Number	Receptor Description
D1	Westbound driver on Park Plaza
D2	Northbound driver on Charles St. S.
D3	Westbound driver on Stuart St.
D4-D5	Eastbound drivers on Stuart St.
D6	Northbound drivers on Coconut Grove Ln.
P7	Pedestrian on the podium roof of the Four Seasons Hotel
P8-P9	Pedestrians in Lincoln Square
P10-P11	Pedestrians in Statler Park
P12-P13	Pedestrians in the Public Garden
P14-P15	Pedestrians in Boston Common
F16-F18	South facing facades of the Four Seasons Hotel
F19-F21	West facing facades of the One Charles Condominiums
F22-F23	Facades of the Boston Park Plaza Hotel
F24-F25	North facing facades of the future building at 212-222 Stuart St.

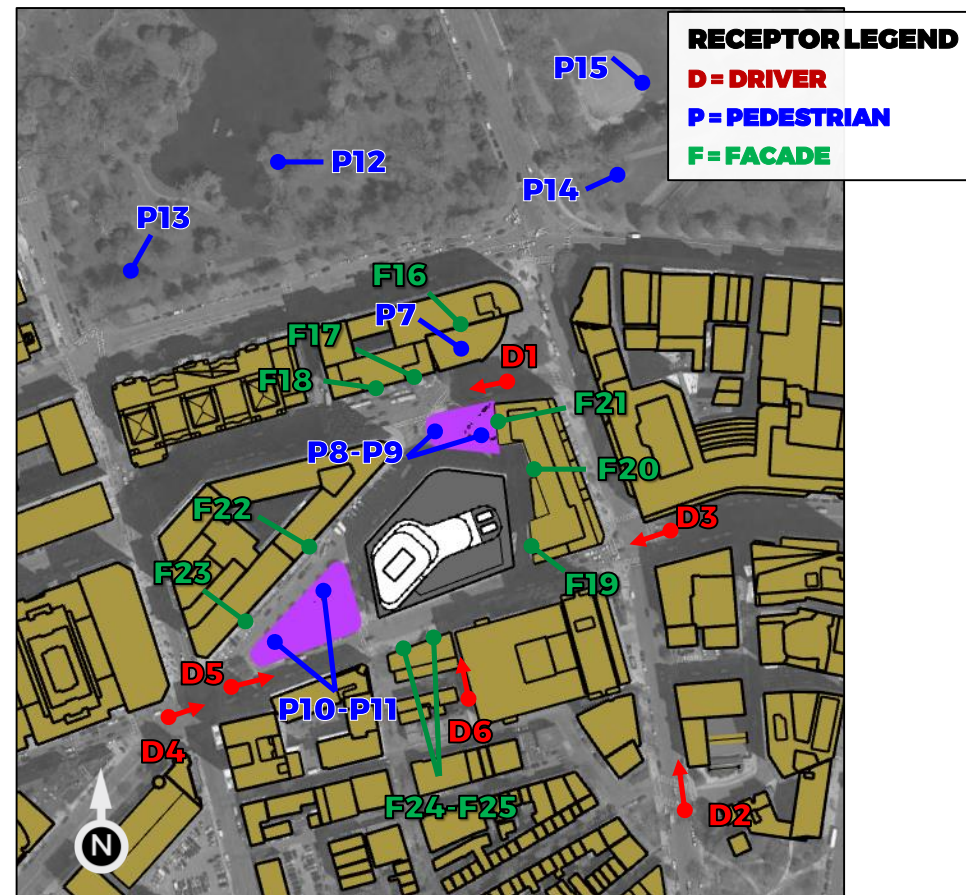


Figure 8: Receptor Locations (Map Underlay Credit: Google Earth)

DETAILED ANALYSIS RESULTS



Table 3 summarizes the level of visual and thermal impact from the development's reflections at each of the studied locations. For each category (visual impact, thermal impacts on people, thermal impacts on facades/property) the point is classified as experiencing one of three impact levels:

- **Low** impacts indicate that either no reflections reach the receptor, or that reflections which do reach the location are unlikely to lead to visual or thermal concerns.
- **Moderate** impacts indicate the potential for visual nuisance, minor thermal discomfort to people, or heating of materials. Moderate impacts do not indicate a significant safety risk and are common in urban areas. They represent effects such as intermittent visual glare on pedestrians or occupants of adjacent buildings which can be safely self-mitigated.
- **High** impacts indicate the potential for risks to safety, either through impairing the visual acuity of a vehicle operator or through reflection intensities high enough to cause injury or property damage. When the sun is also in a driver's field of view, we would expect that brightness of the sun to dominate over the less intense reflected light, likely reducing the perceived effect of high impact reflections. This situation is noted in Table 3 where applicable, as are notes on high impact reflection frequencies and durations.

The minute-by-minute results for each point are presented as 'Annual Reflection Impact Diagrams' which distill an entire years worth of data into a single diagram. The diagrams for each of the receptor points as well as an explanation for how to read the diagrams are provided in Appendix A.

For further detail on RWDI's criteria refer to Appendix B.

The level of mitigation required (discussed further in the Overall Observations & Conclusions section), is determined based on a combination of factors including the predicted level of impact, the frequency and duration of the impacts, and the risk level associated with activities likely to be engaged in at the location.

DETAILED ANALYSIS RESULTS



Table 3: Summary of Overall Predicted Impacts on Receptors

Receptor Number	Receptor Type	Assumed Activity Risk Level	Assumed Ability to Self-Mitigate	Peak Reflected Light Visual Impact	Sun in Field of View During High Impact Reflection	Duration / Number of Days with High Impact Reflection	Peak Reflected Solar Thermal Impact on People	Peak Reflected Solar Thermal Impact on Facade
D1-D2	Driver	High	Low	<i>Moderate</i>	N/A	N/A	<i>Low</i>	N/A
D3	Driver	High	Low	<i>High*</i>	No	Longest Duration: 4 minutes Average Duration: 3 minutes No. of days: 12	<i>Low</i>	N/A
D4	Driver	High	Low	<i>Moderate</i>	N/A	N/A	<i>Low</i>	N/A
D5	Driver	High	Low	<i>High*</i>	No	Longest Duration: 8 minutes Average Duration: 5 minutes No. of days: 34	<i>Low</i>	N/A
D6	Driver	High	Low	<i>Moderate</i>	N/A	N/A	<i>Low</i>	N/A
P7-P11	Pedestrian	Low	High	<i>Moderate</i>	N/A	N/A	<i>Low</i>	N/A
P12-P15	Pedestrian	Low	High	<i>Low</i>	N/A	N/A	<i>Low</i>	N/A
F16-F25	Facade	Low	High	<i>Moderate</i>	N/A	N/A	N/A	<i>Low</i>

* The high impact reflections are generally infrequent and short in duration and are not atypical for any contemporary building in Boston.

OVERALL OBSERVATIONS & CONCLUSIONS



Visual Glare Impact on Drivers

1. As with the addition of any glazed building, drivers traveling in the vicinity of the development are expected to experience an increased level of visual glare impact. Some reflections with a high visual impact potential were noted, but they are infrequent and short in duration.
2. Drivers on Stuart Street traveling west (receptor D3) or east (receptor D5) may experience intermittent high impact reflections as they approach the development. These impacts can occur between approximately 2:00 pm and 3:30 pm EST in January, February, and November. These impacts may alter a driver's current experience since the glare occurs at times when the sun would not ordinarily be within a driver's field-of-view. That said, these reflections are predicted to be at most 8 minutes in duration and are possible in only 0.09% of the daytime annually.
3. For other driver receptors (receptors D1-D2, D4, D6), visual glare impacts are predicted to be moderate for the proposed design. Hence the impacts are not expected to pose a safety concern to drivers. For further details refer to the visual impact diagram for driver receptors D1-D6 illustrated in Appendix A.

Visual Glare Impact on Pedestrians and Facades

4. Scattered reflections with moderate levels of visual impact are predicted to fall on the south facade of the Four Seasons Hotel (receptors P7, and F16-F18) and the west facade of the One Charles Condominium building (receptors F19-F21). The reflections that fall onto the areas are predicted to be infrequent and occur at most 2.1% and 4.2% of the daytime annually for the Four Seasons Hotel and One Charles buildings, respectively. These types of reflection impacts would likely occur from any glazed building on the Motor Mart Garage site and represent at worst a visual nuisance, as viewers can look away or close blinds.
5. Occupants of other adjacent buildings such as Boston Park Plaza Hotel (receptors F22-F23) and the future 212-222 Stuart Street building (receptors F24-F25) will similarly experience moderate impact visible reflections from the development. This equates to glare being possible 8.0% and 14.2% of the daytime annually for the Boston Park Plaza Hotel and 212-222 Stuart Street buildings respectively. The potential visual impacts do not present a safety risk, but rather a temporary nuisance which at worst can be mitigated by briefly closing blinds or looking away from the glare source.

OVERALL OBSERVATIONS & CONCLUSIONS (CONT'D)



6. Statler Park is exposed to visible reflections from the proposed development for less than 4% of the daytime annually (receptors P10-P11). The impacts on Lincoln Square are very brief and they occur at approximately 0.9% of annual daytime (receptors P8-P9).
7. The simulations do not predict any significant visual impact from reflections in Boston Common or the Public Gardens (receptors P12-P15).

Thermal Impacts on People

8. No receptors were predicted to receive reflections which exceed RWDI's thermal comfort or human safety thresholds. Therefore, RWDI does not expect any significant thermal impacts (i.e. risks to human safety or property damage) to occur in the surrounding neighborhood.

Thermal Impacts on Facades

10. The reflected solar energy predicted at the studied facade areas is of a low intensity (less than 200 W/m²) and short duration. Hence, we would not expect these reflections to lead to a significant additional cooling load for a building. Should an individual choose to expose themselves to the reflected energy, they may feel warmth, however this would be a temporary experience and once which would easily be remedied by closing window treatments.

General Observations

11. The vertical fin arrangement on the facade of the proposed redevelopment is a positive design feature which assists in lowering the visual impact of reflections from this building on the surrounding urban terrain, particularly to the areas to the south and northwest of the development.
12. This analysis assumed that the glazing units on the building were the more reflective of the two options under consideration. Should the lower reflectance units be selected then we would expect reflection effects to be lower compared to what is presented in this report.
13. The reflection effects predicted in this report are typical of those that occur in any urban environment.

MITIGATION



Overall, we would consider the reflections emanating from the proposed building onto the surrounding neighborhood to be comparable to what occurs in any urban area. If however, there are concerns about the predicted reflection impacts, mitigation approaches can be explored as the design evolves.

RWDI would be happy to provide further consultation on the specific requirements and any challenges associated with a given mitigation approach or approaches.

APPENDIX A

ANNUAL REFLECTION IMPACT DIAGRAMS

ANNUAL REFLECTION IMPACT DIAGRAMS



Presentation of Results

The frequency, duration, and intensity of glare events throughout the year is illustrated using “annual impact diagrams” (see Figure A1 below for the general layout of these plots). The color of the plot for a given combination of date and time indicates the relative impact of any glare sources found. The horizontal axis of the diagram indicates the date, and the vertical axis indicates the hour of the day.

We note that the referenced times are in local standard time, so in jurisdictions where Daylight Savings Time is used, the time should be shifted by an hour when appropriate.

The following pages present the impact categories for three types of Annual Impact Diagrams: Visual Impact, Thermal Impact on People, and Thermal Impact on Property. More information on RWDI’s criteria is available in Appendix B.

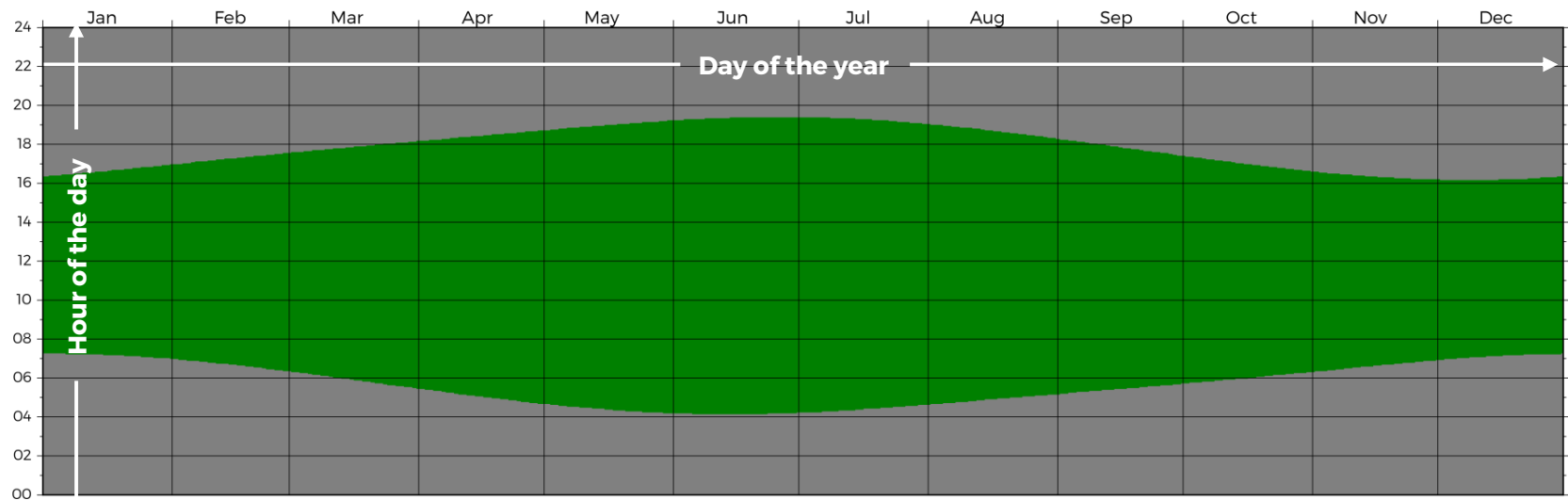


Figure A1: Layout of Annual Reflection Impact Diagram

ANNUAL REFLECTION IMPACT DIAGRAMS



Visual Impact Categories

Low: Either no significant reflections occur or the reflections will have a minimal effect on a viewer, even when looking directly at the source.

Moderate: The reflections can cause some visual nuisance only to viewers looking directly at the source.

High: The reflections can reduce visual acuity for viewers operating vehicles or performing other high-risk tasks who are unable to look away from the source, posing a significant risk of distraction.

Damaging: The brightest glare source is bright enough to permanently damage the eye for a viewer looking directly at the source.

Hatched areas indicate times and dates when the sun would also be in a driver's field of view.

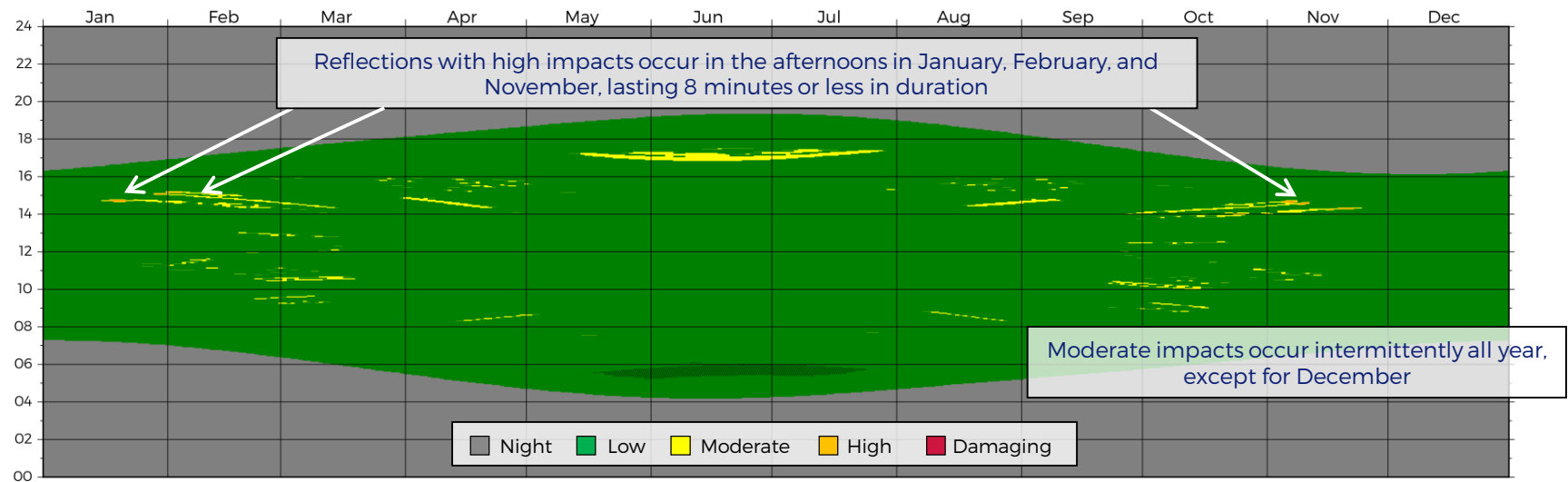


Figure A2: Example of Annual Visual Glare Impact Diagram – Receptor D5

ANNUAL REFLECTION IMPACT DIAGRAMS



Thermal Impact Categories for People

Low: Either no significant reflections occur or the reflection intensity is below the short-term exposure threshold of 1500 W/m².

Moderate: The reflection intensity is above the short-term exposure threshold of 1500 W/m² but below the safety threshold of 2500 W/m². Such reflections would quickly cause thermal discomfort in people.

High: The reflection intensity is above the safety threshold of 2500 W/m² but below 3500 W/m². This level of exposure to bare skin would lead to the onset of pain within 30 seconds.

Very High: Reflection intensity exceeds 3500 W/m². This level of exposure leads to second degree burns on bare skin within 1 minute.

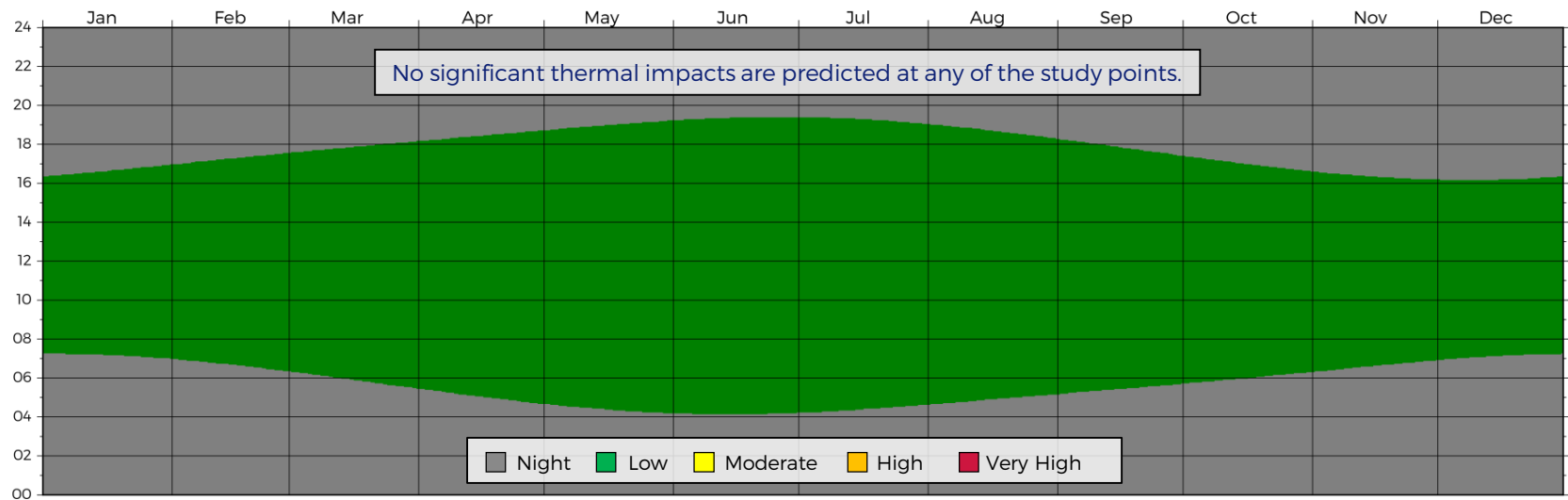


Figure A3: Example of Annual Pedestrian Thermal Impact Diagram – Receptor P10

ANNUAL REFLECTION IMPACT DIAGRAMS



Thermal Impact Categories for Property

A different scale is used to illustrate the reflected thermal energy on facades in order to provide further clarity on the potential for heat gain issues. The diagrams illustrate the irradiance levels of all predicted reflection events along with their frequency and duration.

The format of the diagram is similar to the diagrams described in the previous pages. The color of the plot for a given combination of date and time indicates the intensity of the reflected light at that point in time.

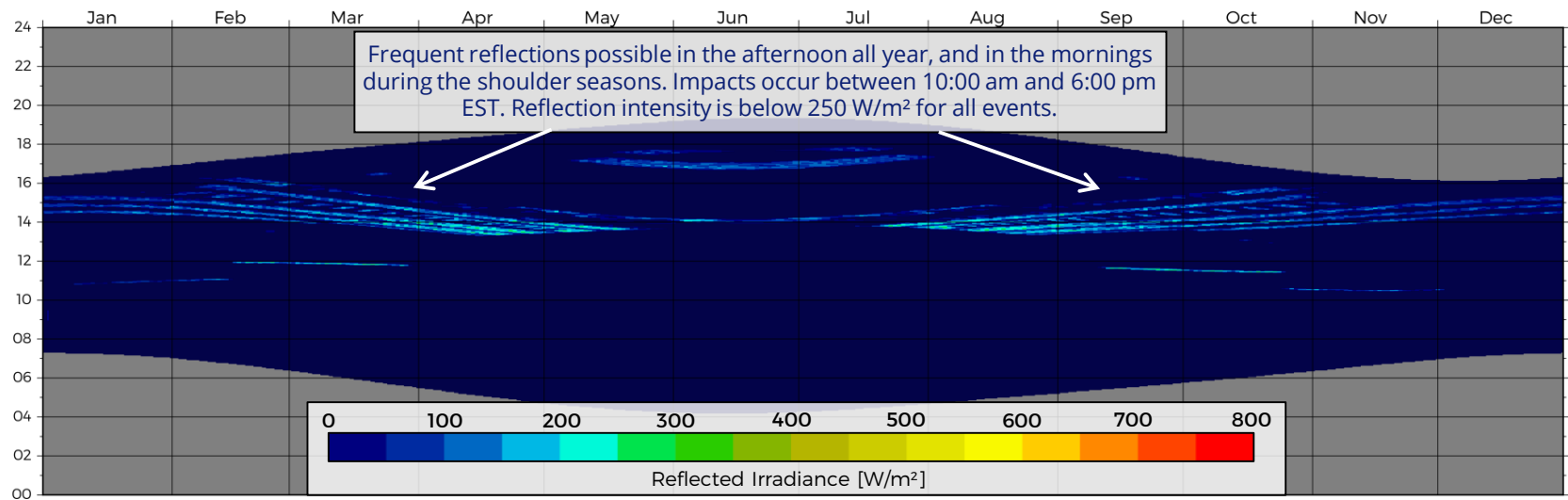


Figure A4: Example of Annual Property Thermal Impact Diagram – Receptor F22

ANNUAL VISUAL IMPACT

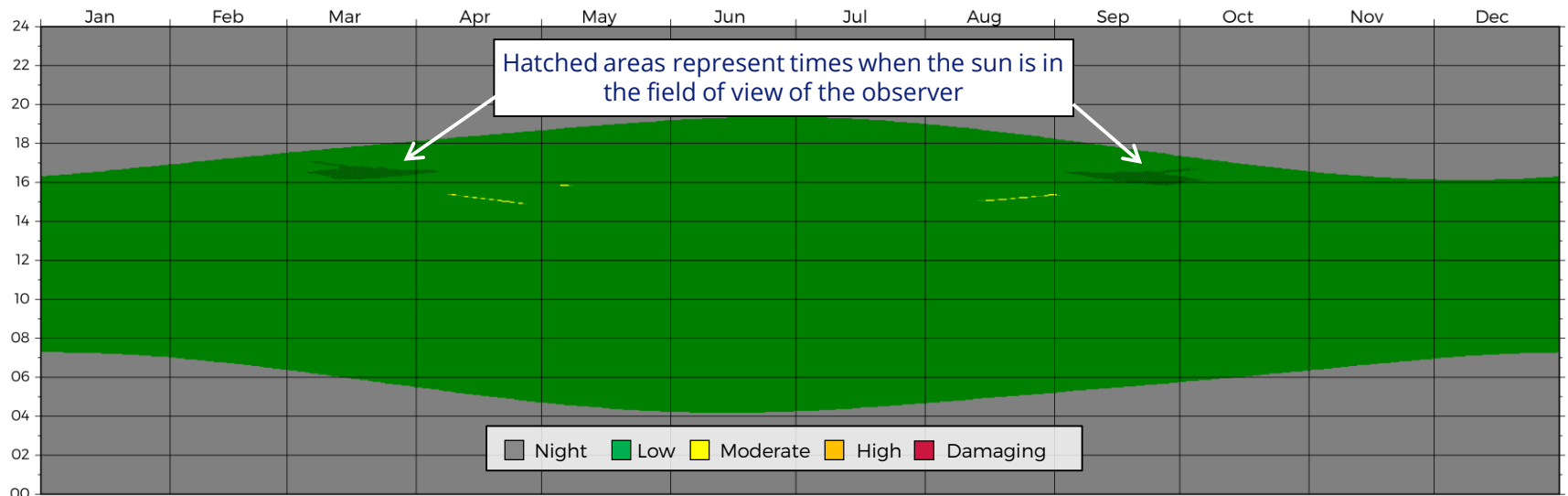
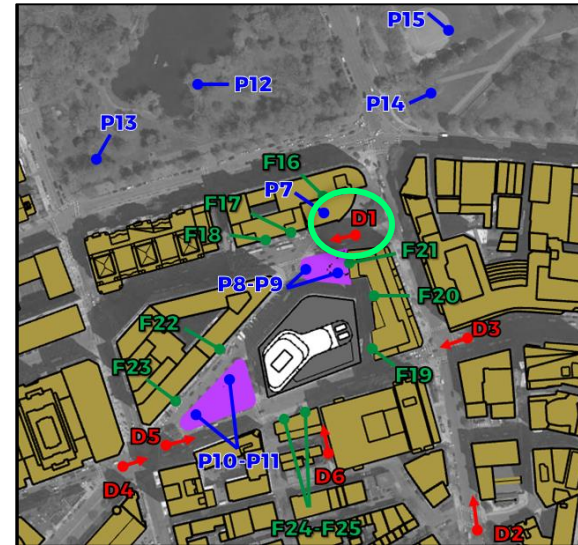


Driver Receptor D1

Receptor D1 was chosen to assess the visual impact associated with solar reflections affecting westbound driver on Park Plaza.

Please note that the referenced times are in Eastern Standard Time.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.



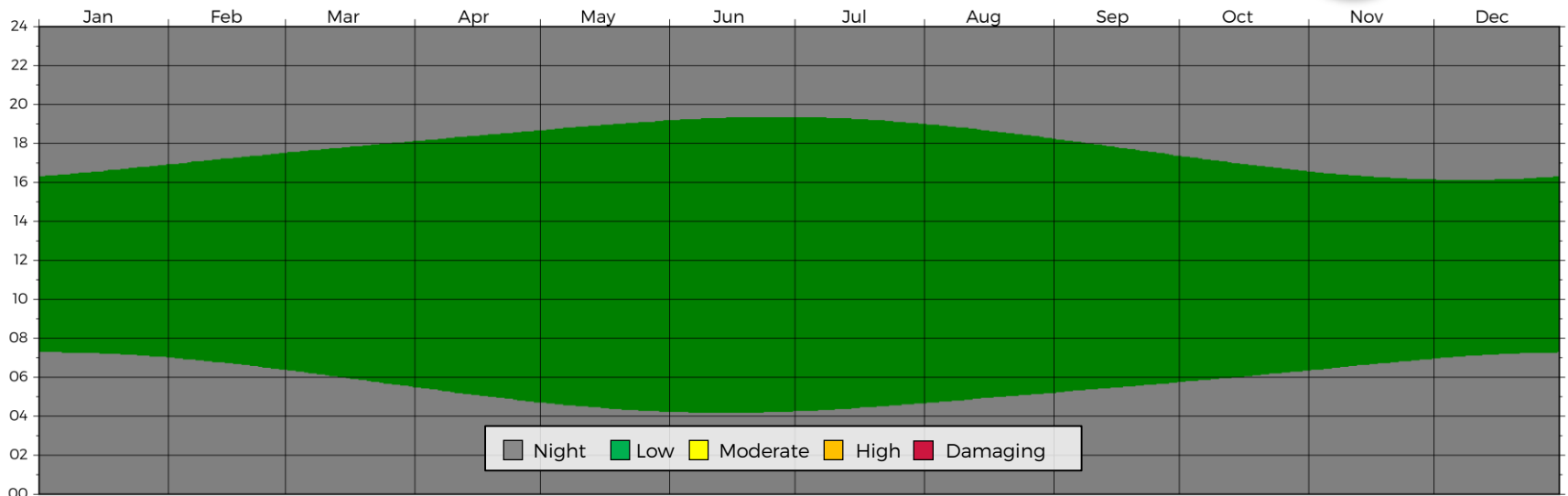
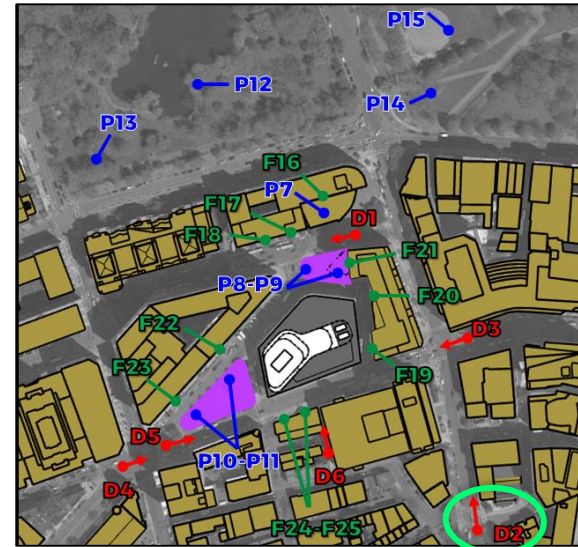
ANNUAL VISUAL IMPACT



Driver Receptor D2

Receptor D2 was chosen to assess the visual impact associated with solar reflections affecting northbound driver on Charles St. S.

Please note that the referenced times are in Eastern Standard Time.



ANNUAL VISUAL IMPACT

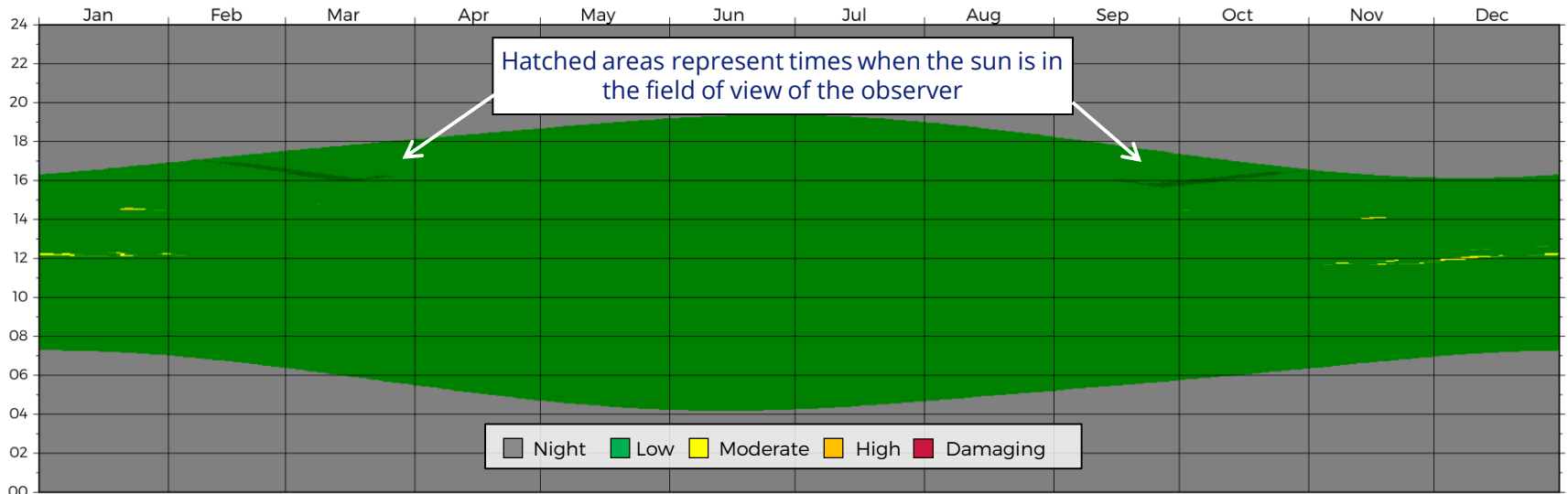
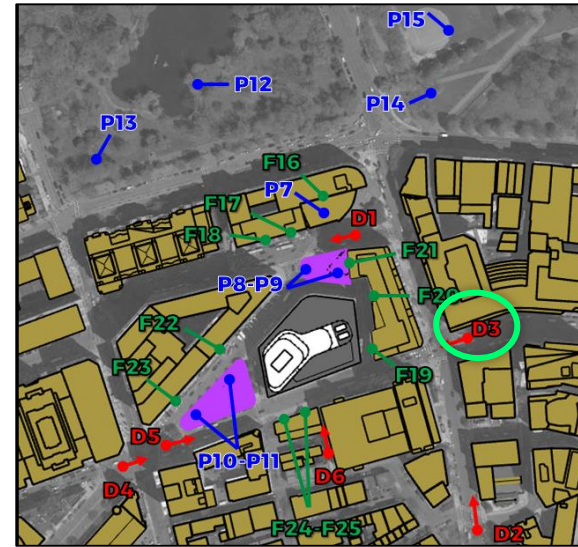


Driver Receptor D3

Receptor D3 was chosen to assess the visual impact associated with solar reflections affecting westbound driver on Stuart St.

Please note that the referenced times are in Eastern Standard Time.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.



ANNUAL VISUAL IMPACT

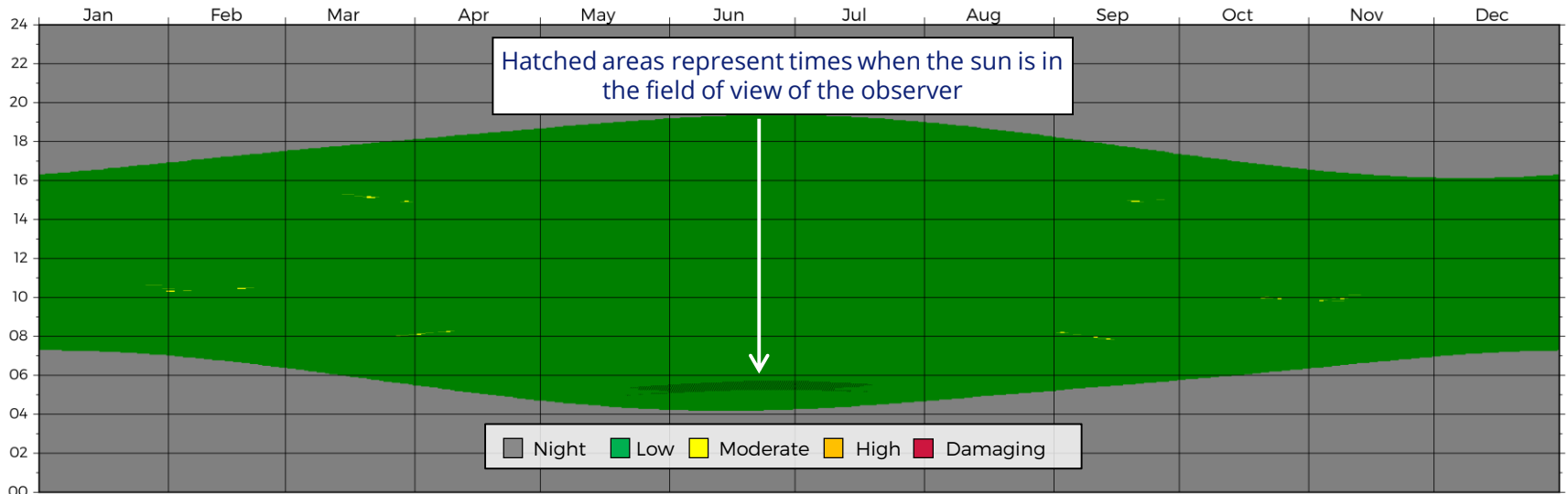
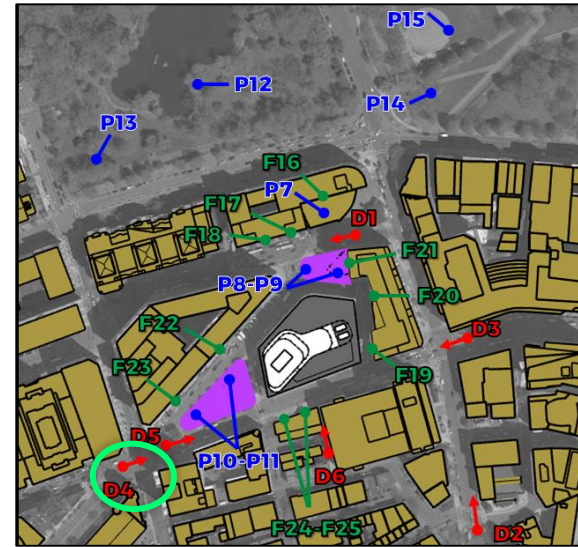


Driver Receptor D4

Receptor D4 was chosen to assess the visual impact associated with solar reflections affecting eastbound drivers on Stuart St.

Please note that the referenced times are in Eastern Standard Time.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.



ANNUAL VISUAL IMPACT

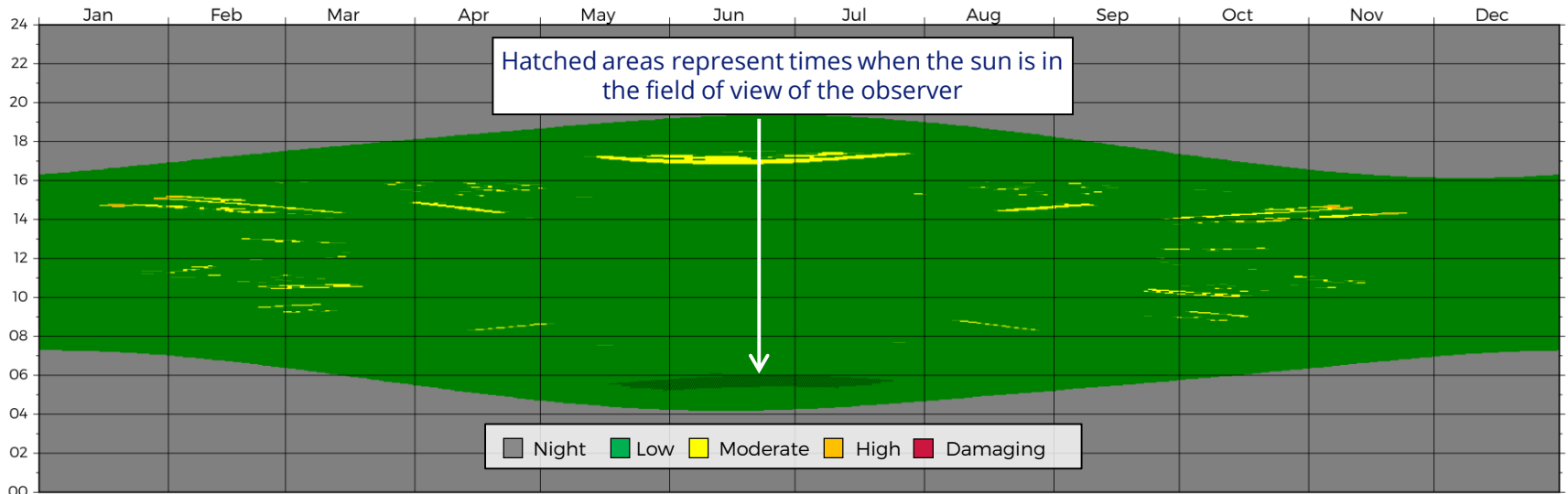
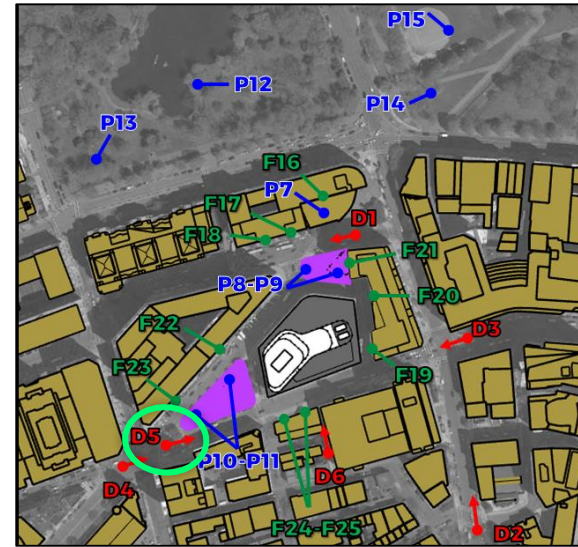


Driver Receptor D5

Receptor D5 was chosen to assess the visual impact associated with solar reflections affecting eastbound drivers on Stuart St.

Please note that the referenced times are in Eastern Standard Time.

Hatched areas on the plot indicate times when the sun is within a driver's field of view.



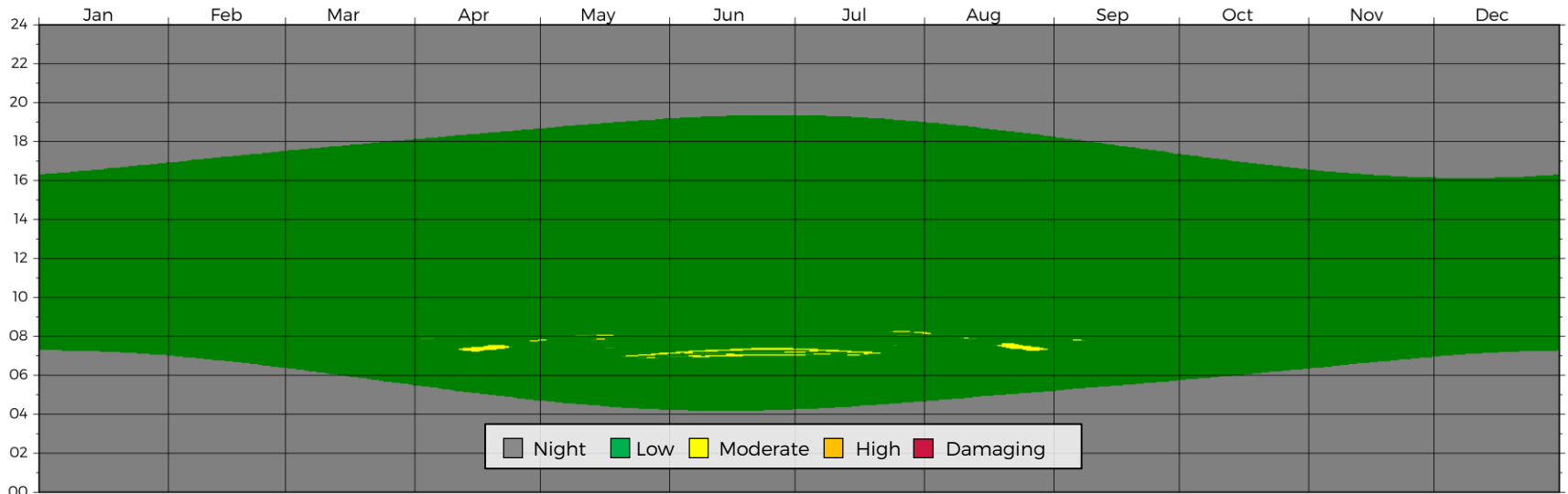
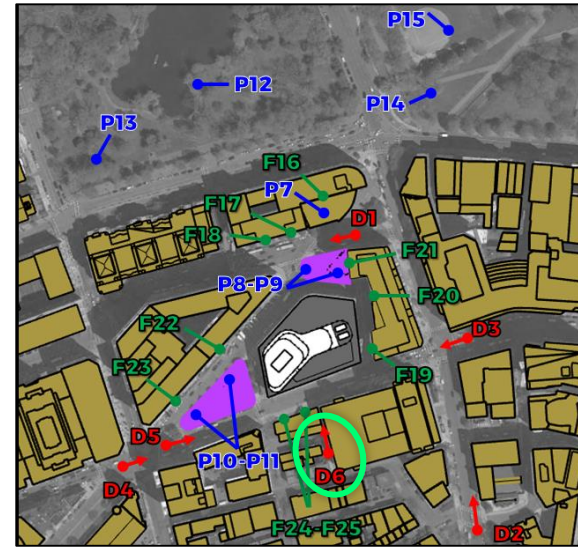
ANNUAL VISUAL IMPACT



Driver Receptor D6

Receptor D6 was chosen to assess the visual impact associated with solar reflections affecting northbound driver on Coconut Grove Ln.

Please note that the referenced times are in Eastern Standard Time.



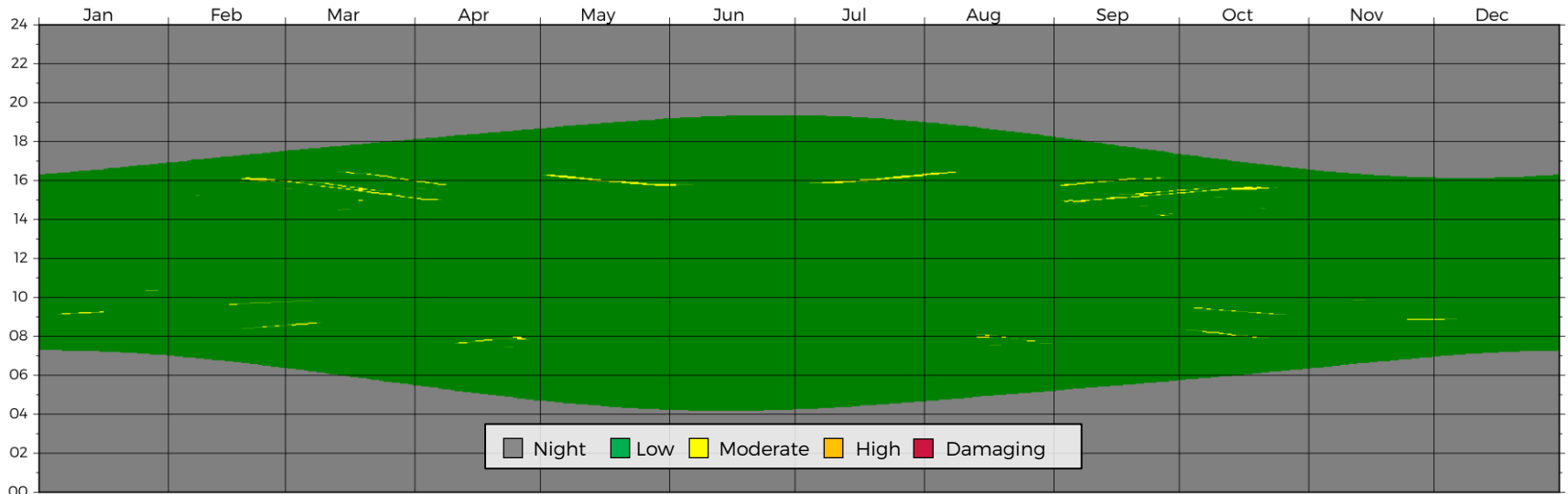
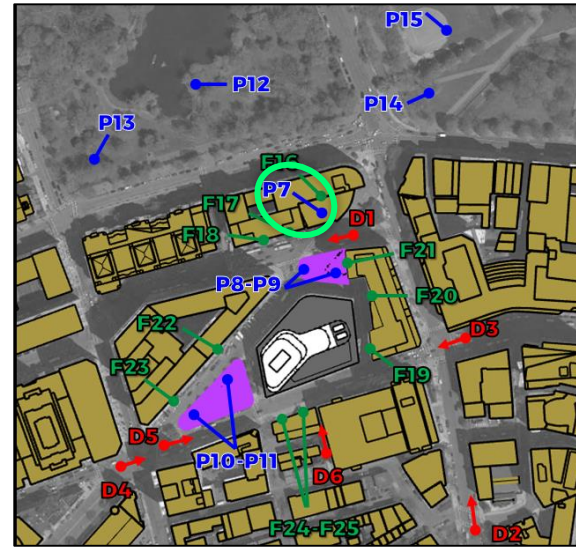
ANNUAL VISUAL IMPACT



Pedestrian Receptor P7

Receptor P7 was chosen to assess the visual impact associated with solar reflections affecting pedestrians on the podium roof of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



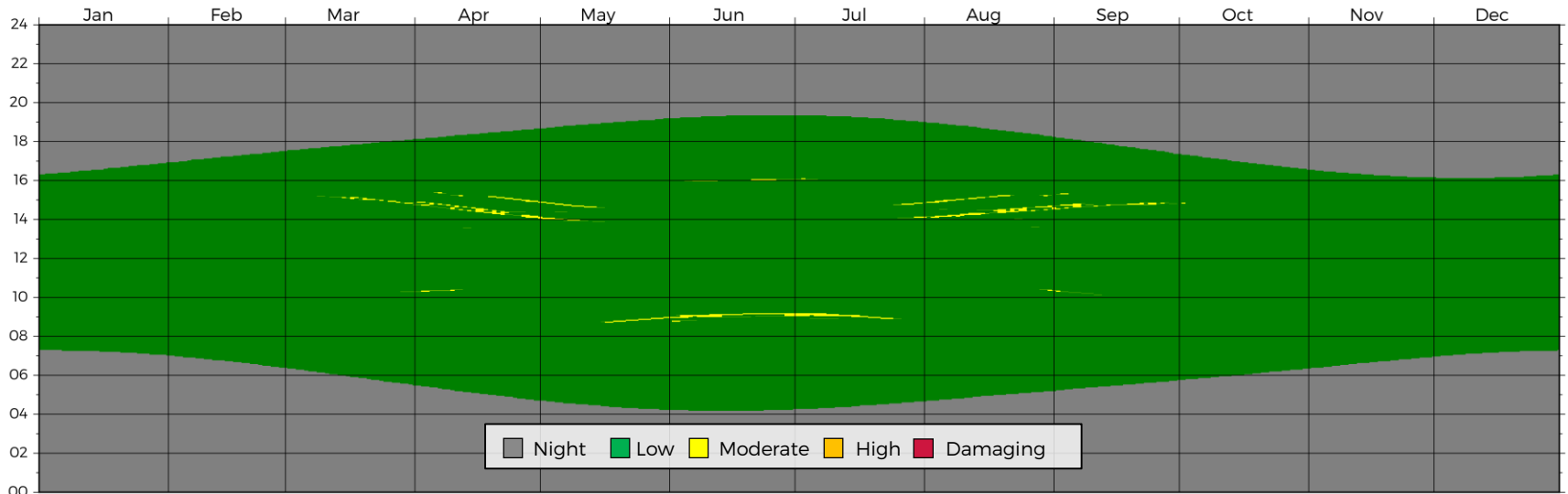
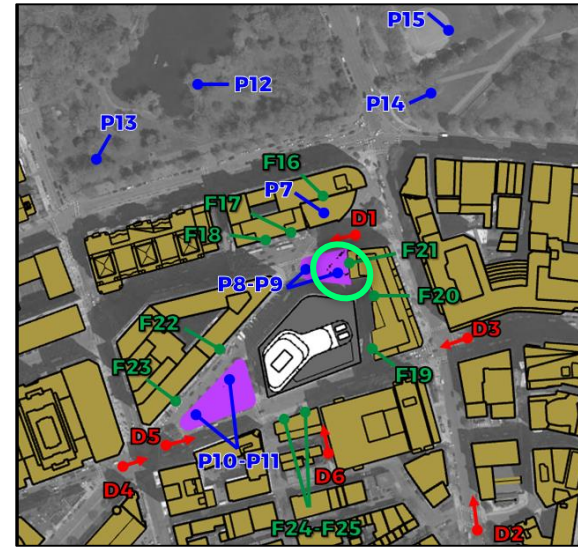
ANNUAL VISUAL IMPACT



Pedestrian Receptor P8

Receptor P8 was chosen to assess the visual impact associated with solar reflections affecting pedestrians in the Lincoln Square green space.

Please note that the referenced times are in Eastern Standard Time.



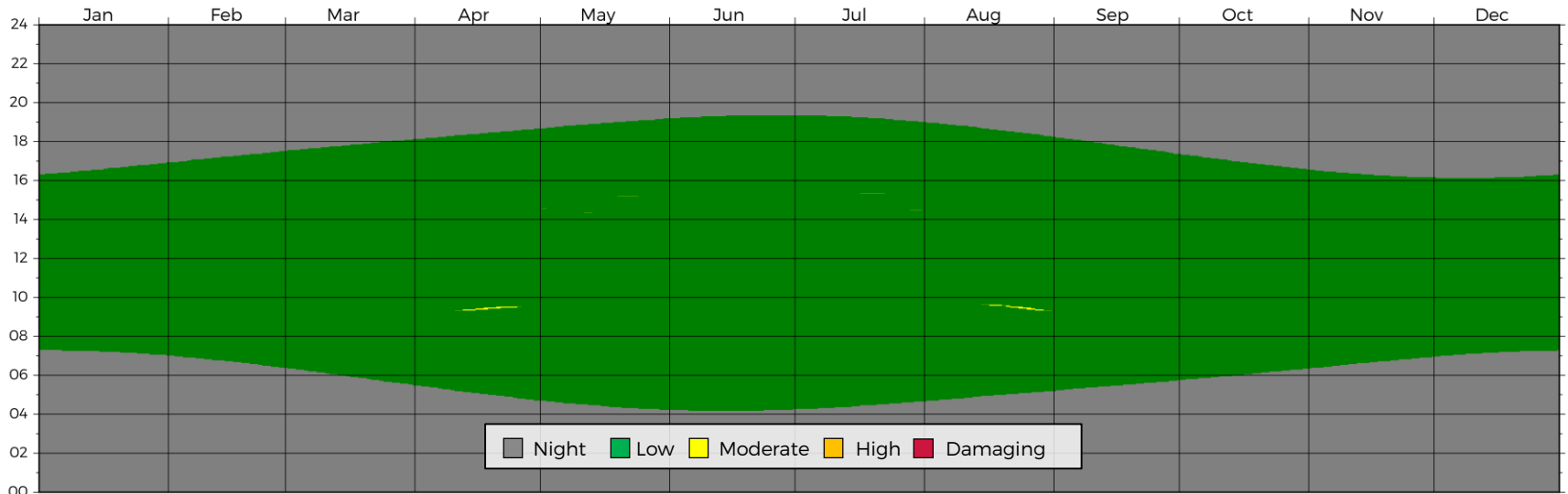
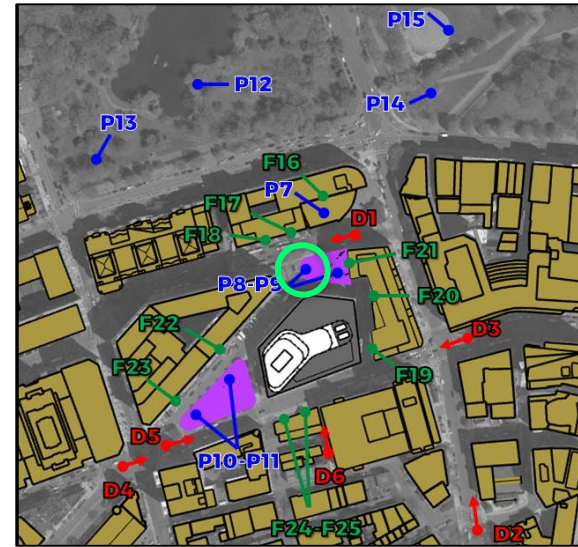
ANNUAL VISUAL IMPACT



Pedestrian Receptor P9

Receptor P9 was chosen to assess the visual impact associated with solar reflections affecting pedestrians in the Lincoln Square green space.

Please note that the referenced times are in Eastern Standard Time.



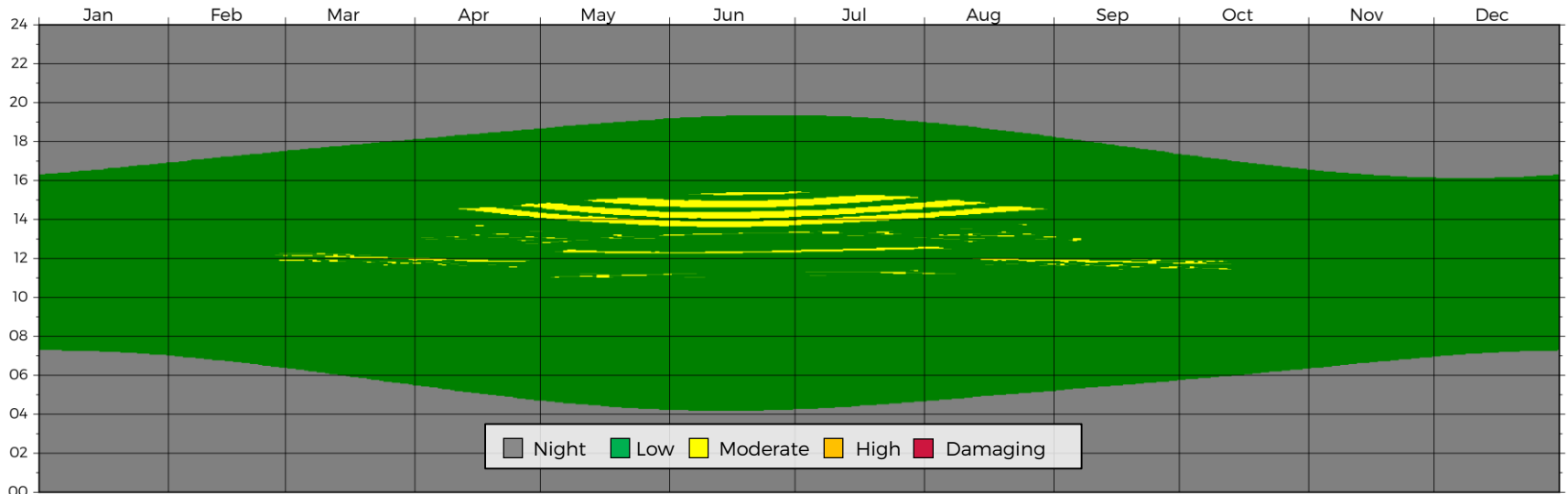
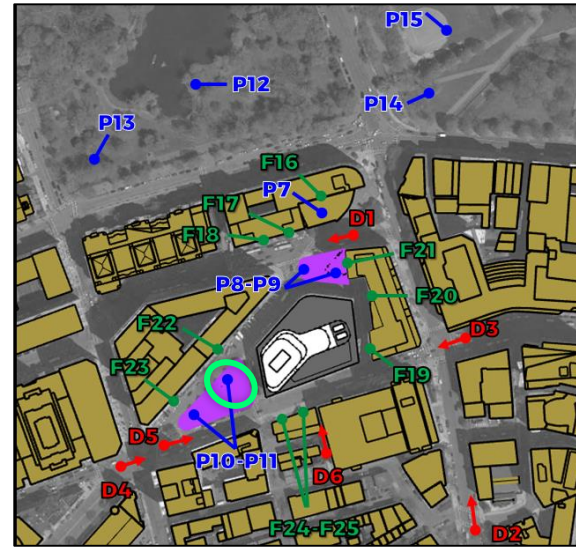
ANNUAL VISUAL IMPACT



Pedestrian Receptor P10

Receptor P10 was chosen to assess the visual impact associated with solar reflections affecting pedestrians in the Statler Park.

Please note that the referenced times are in Eastern Standard Time.



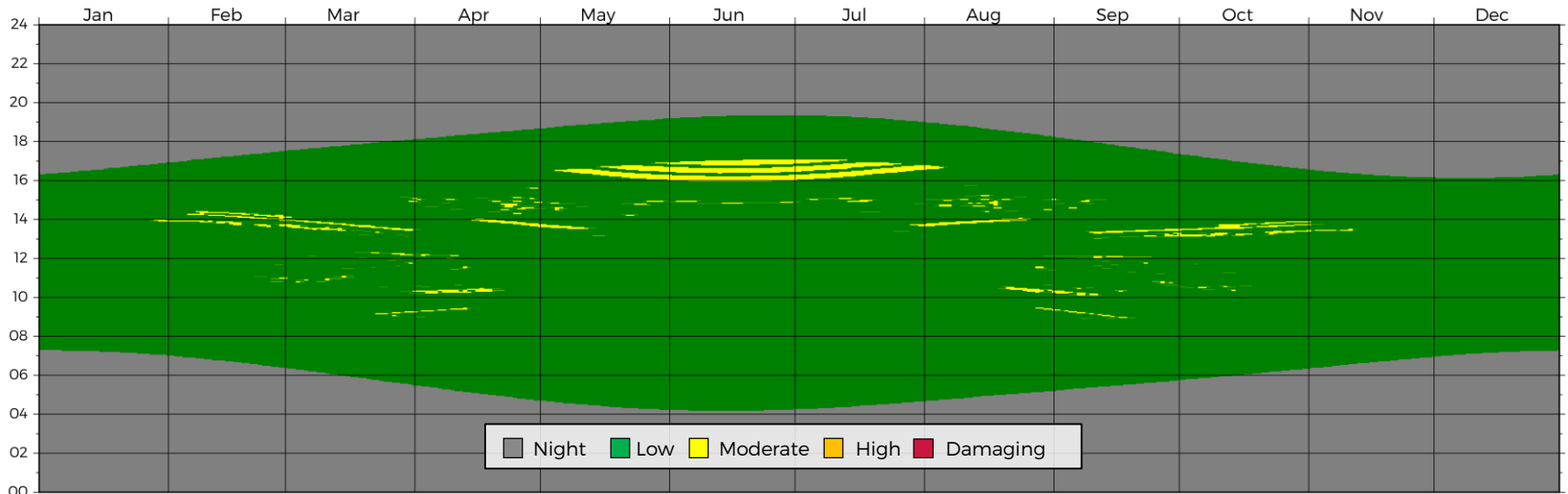
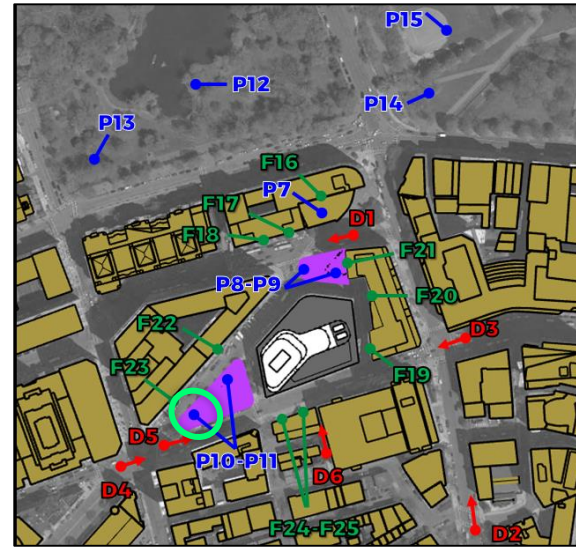
ANNUAL VISUAL IMPACT



Pedestrian Receptor P11

Receptor P11 was chosen to assess the visual impact associated with solar reflections affecting pedestrians in the Statler Park.

Please note that the referenced times are in Eastern Standard Time.



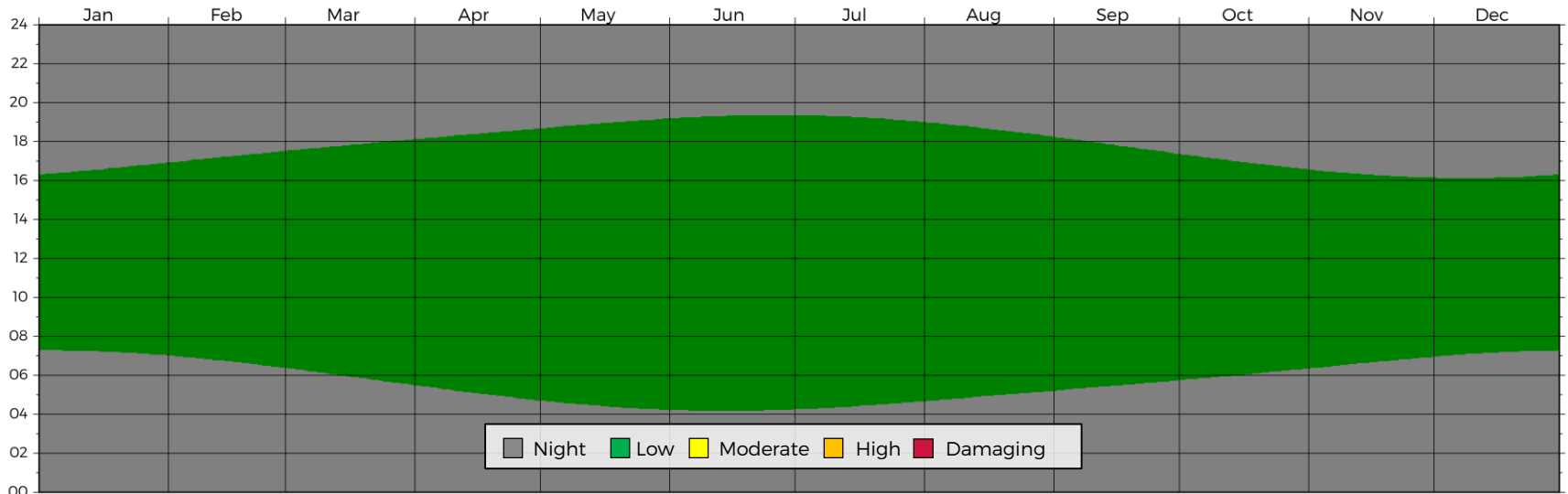
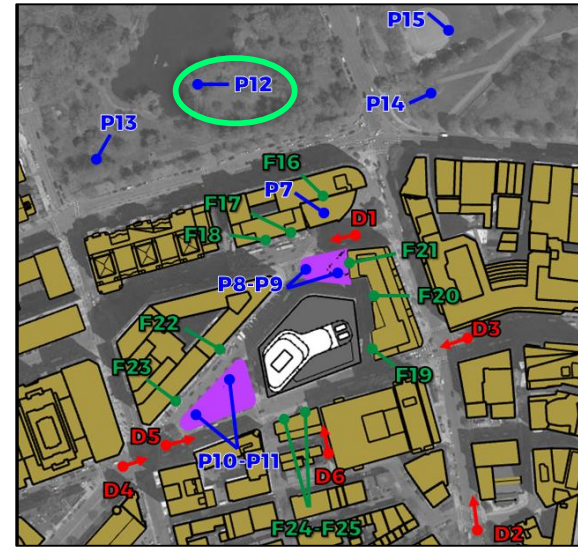
ANNUAL VISUAL IMPACT



Pedestrian Receptor P12

Receptor P12 was chosen to assess the visual impact associated with solar reflections affecting pedestrians at the Boston Public Garden.

Please note that the referenced times are in Eastern Standard Time.



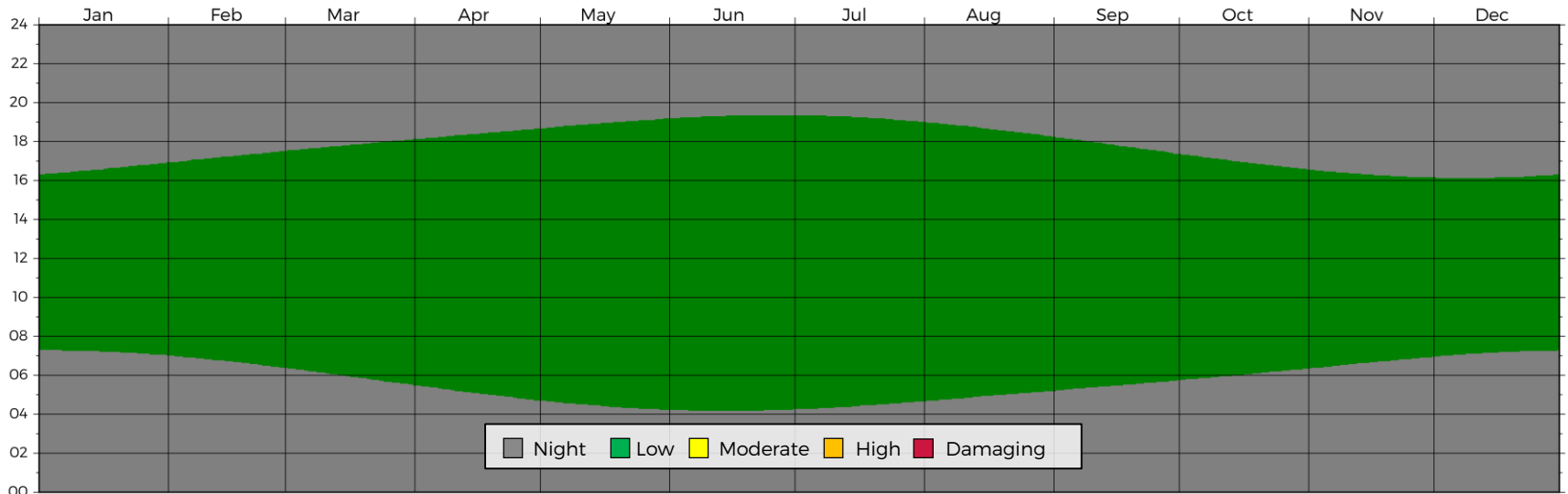
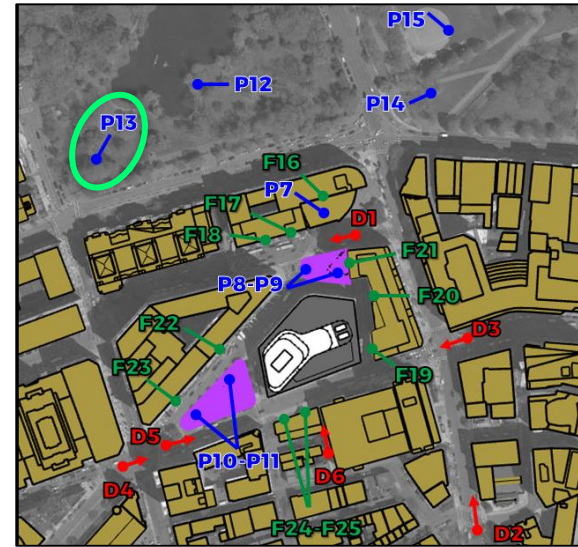
ANNUAL VISUAL IMPACT



Pedestrian Receptor P13

Receptor P13 was chosen to assess the visual impact associated with solar reflections affecting pedestrians at the Boston Public Garden.

Please note that the referenced times are in Eastern Standard Time.



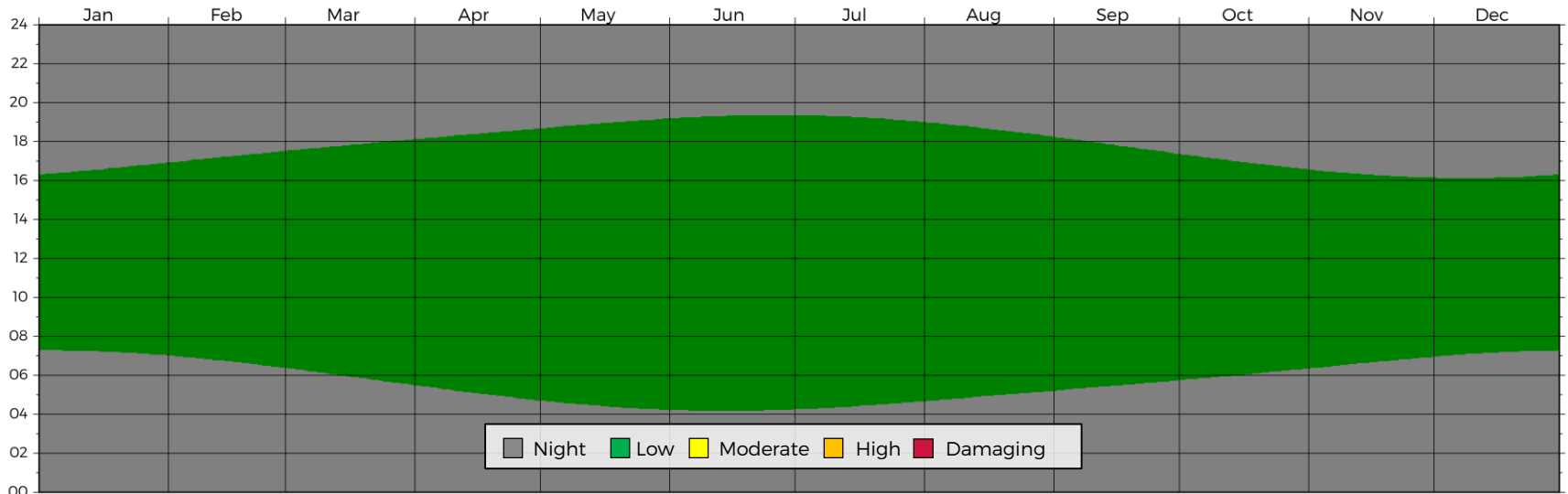
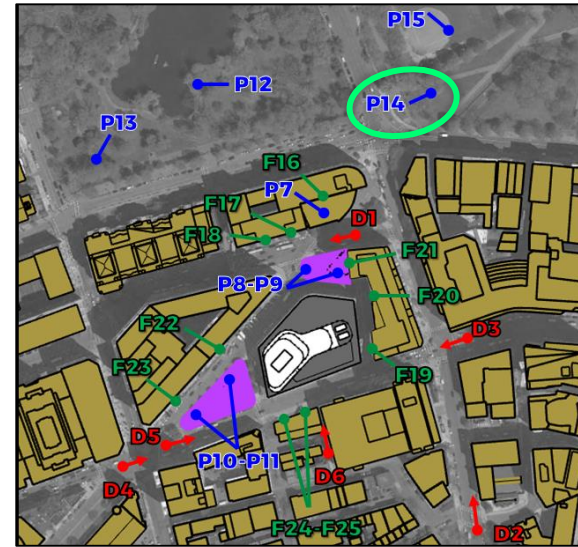
ANNUAL VISUAL IMPACT



Pedestrian Receptor P14

Receptor P14 was chosen to assess the visual impact associated with solar reflections affecting pedestrians at the Boston Common.

Please note that the referenced times are in Eastern Standard Time.



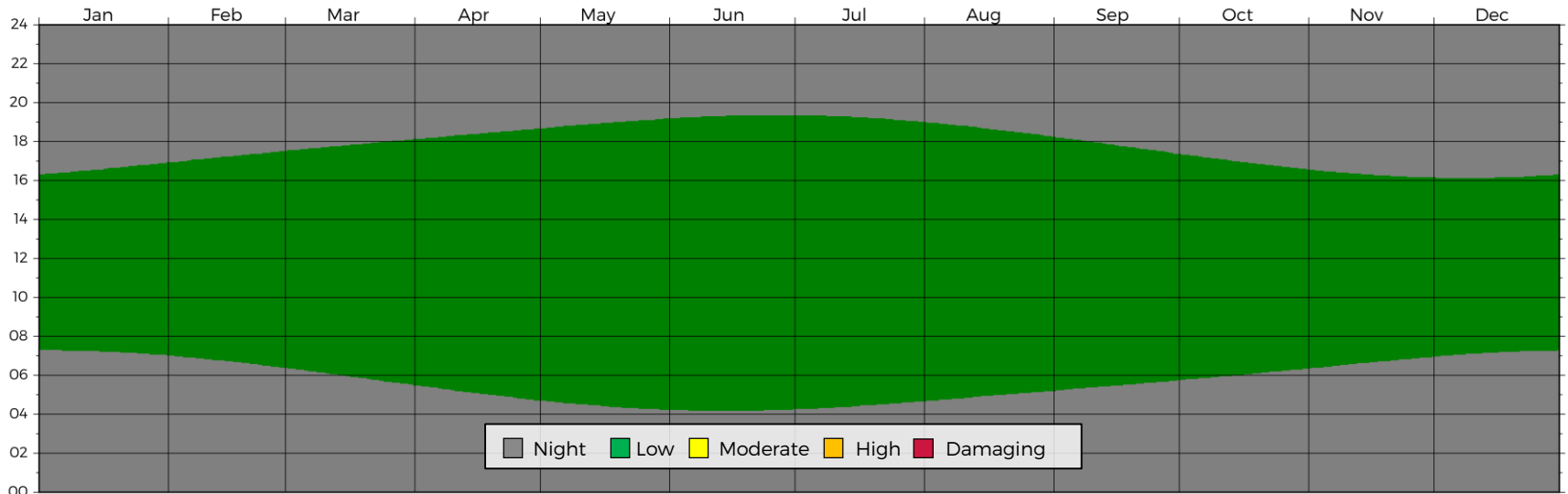
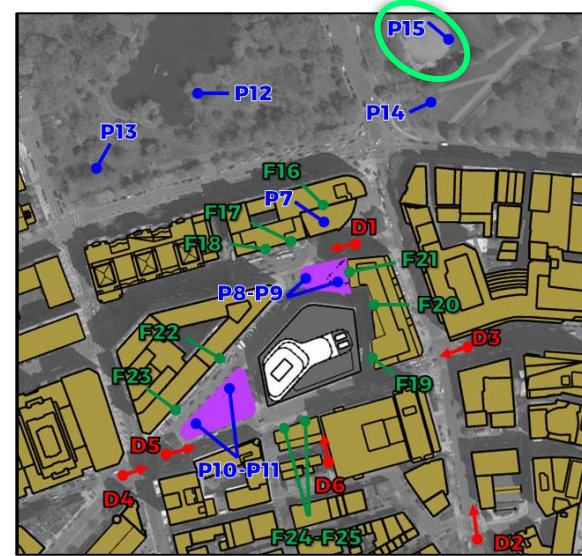
ANNUAL VISUAL IMPACT



Pedestrian Receptor P15

Receptor P15 was chosen to assess the visual impact associated with solar reflections affecting pedestrians at the Boston Common.

Please note that the referenced times are in Eastern Standard Time.



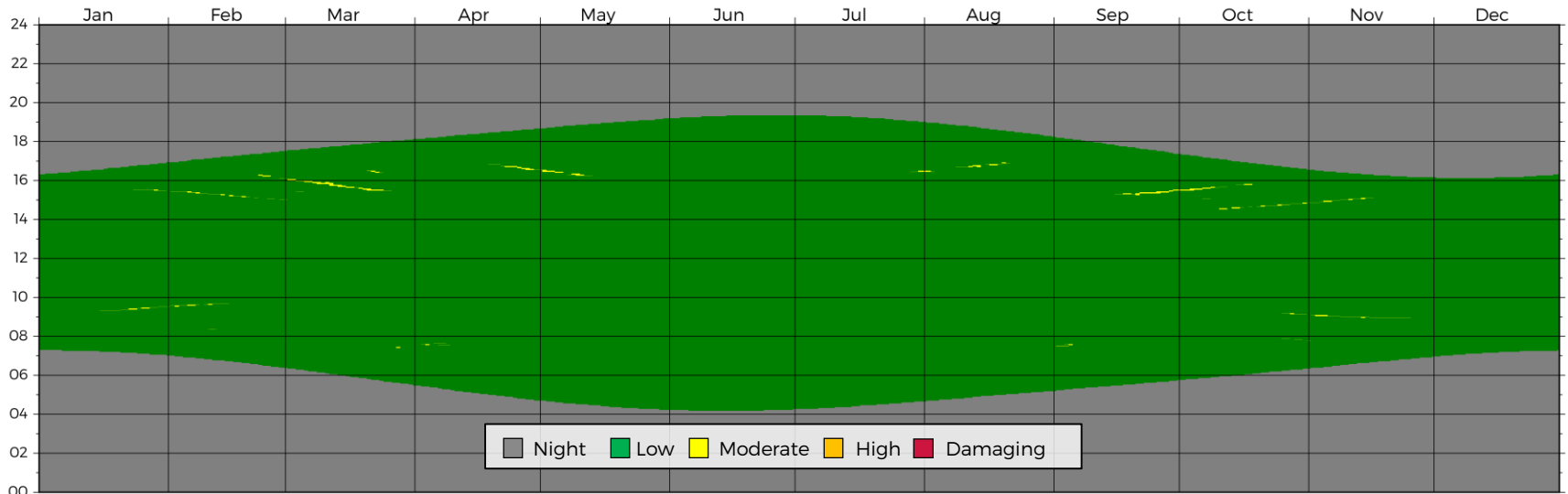
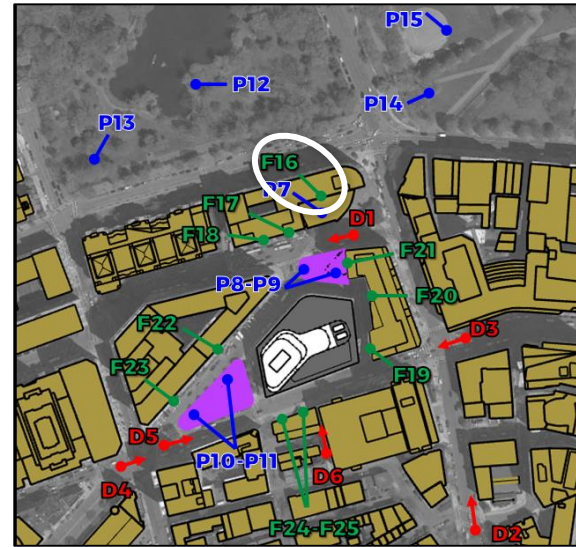
ANNUAL VISUAL IMPACT



Facade Receptor F16

Receptor F16 was chosen to assess the visual impact associated with solar reflections affecting occupants at the south facing facades of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



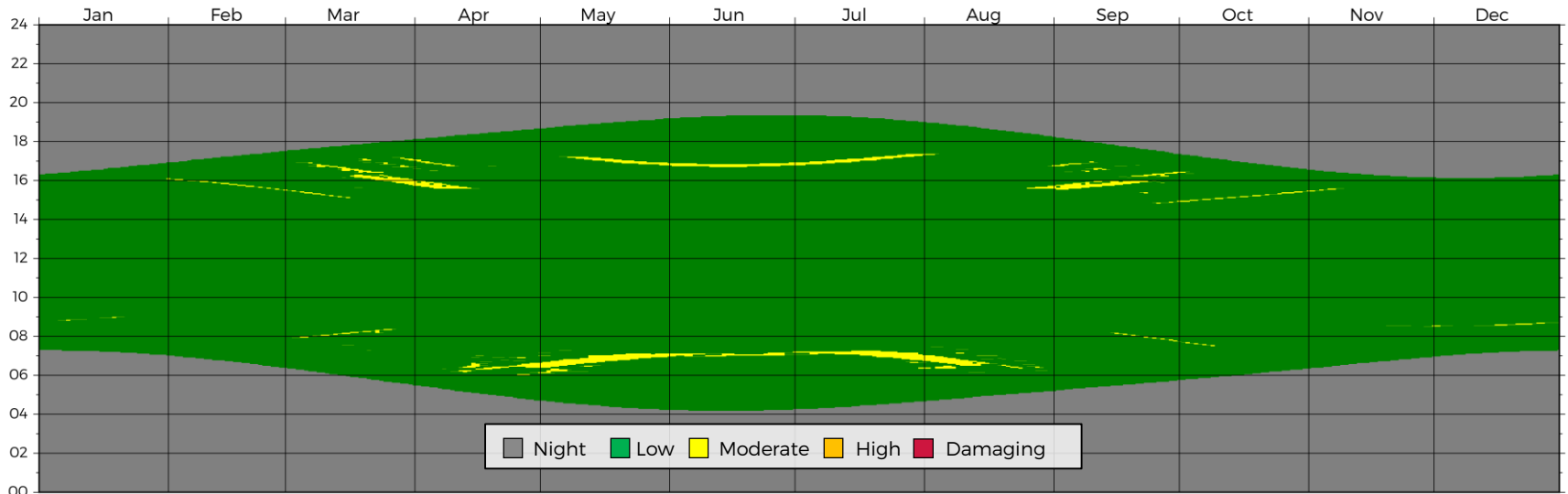
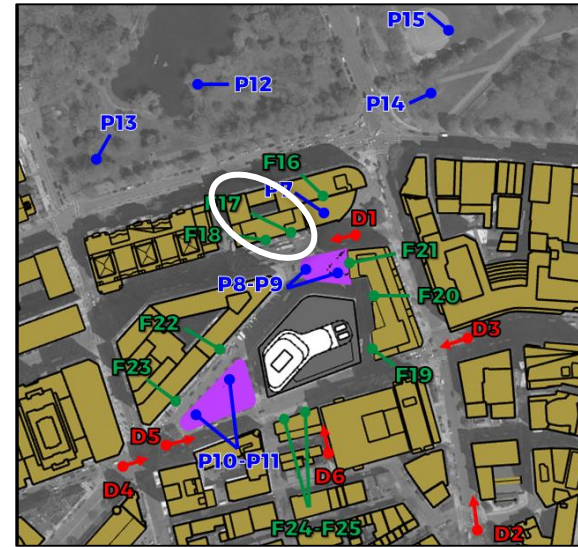
ANNUAL VISUAL IMPACT



Facade Receptor F17

Receptor F17 was chosen to assess the visual impact associated with solar reflections affecting occupants at the south facing facades of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



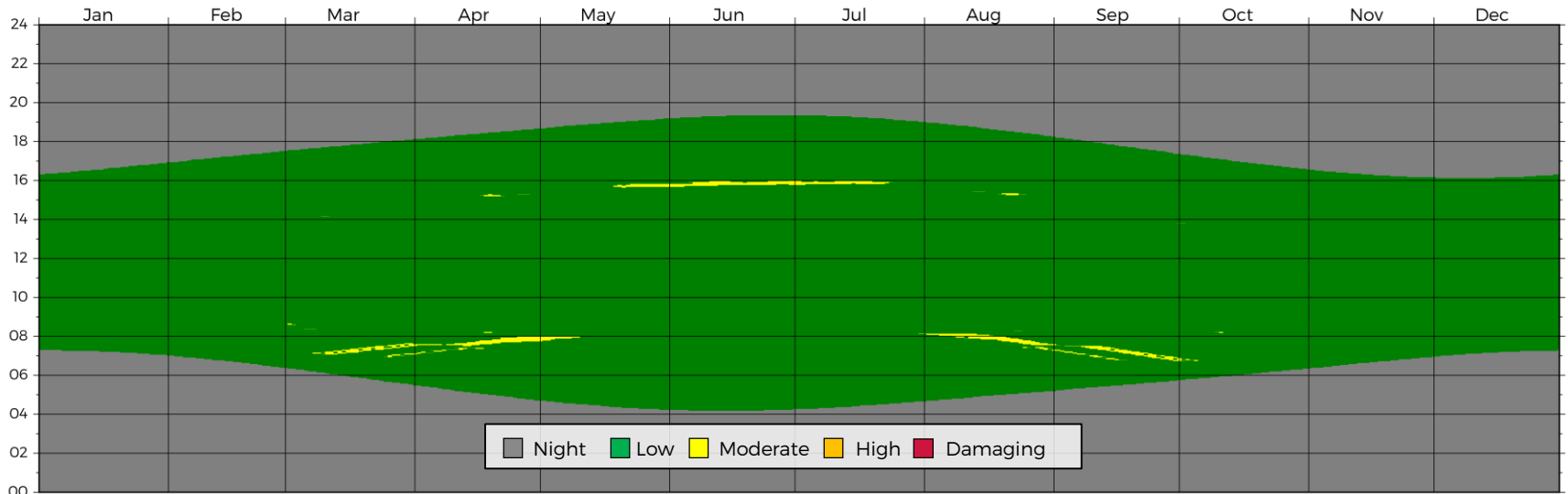
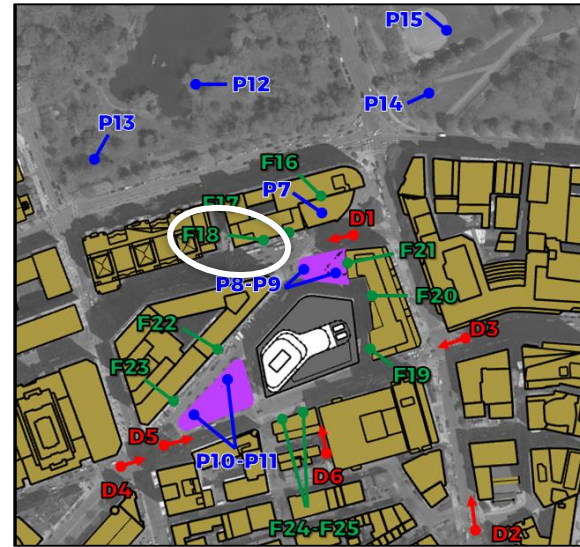
ANNUAL VISUAL IMPACT



Facade Receptor F18

Receptor F18 was chosen to assess the visual impact associated with solar reflections affecting occupants at the south facing facades of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



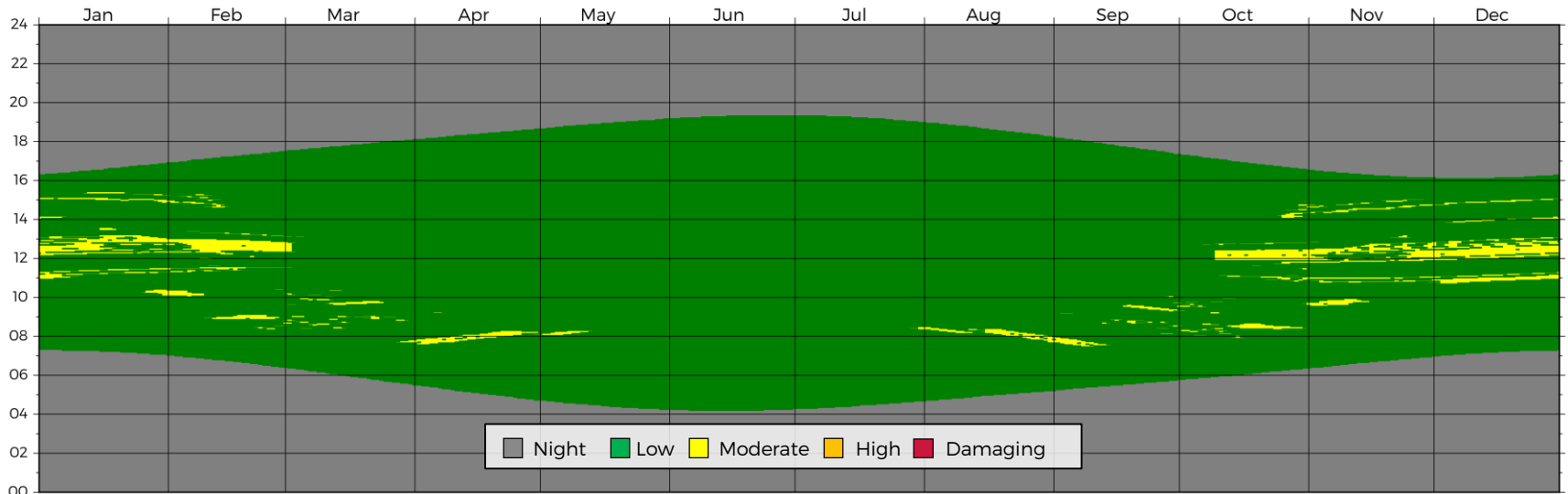
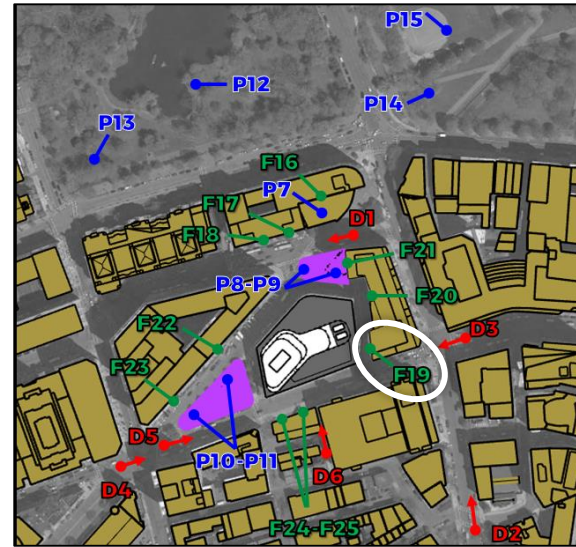
ANNUAL VISUAL IMPACT



Facade Receptor F19

Receptor F19 was chosen to assess the visual impact associated with solar reflections affecting occupants at the west facade of One Charles Condominium.

Please note that the referenced times are in Eastern Standard Time.



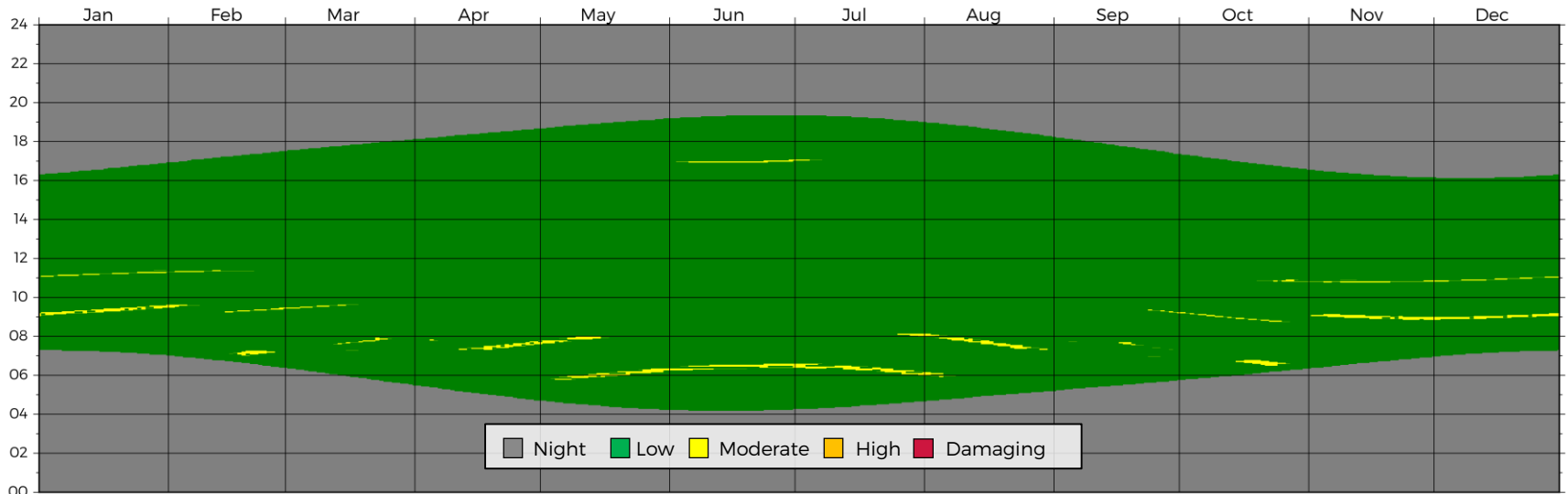
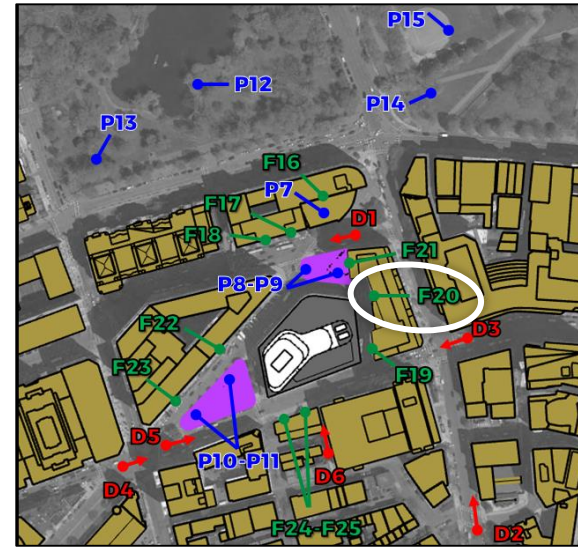
ANNUAL VISUAL IMPACT



Facade Receptor F20

Receptor F20 was chosen to assess the visual impact associated with solar reflections affecting occupants at the west facade of One Charles Condominium.

Please note that the referenced times are in Eastern Standard Time.



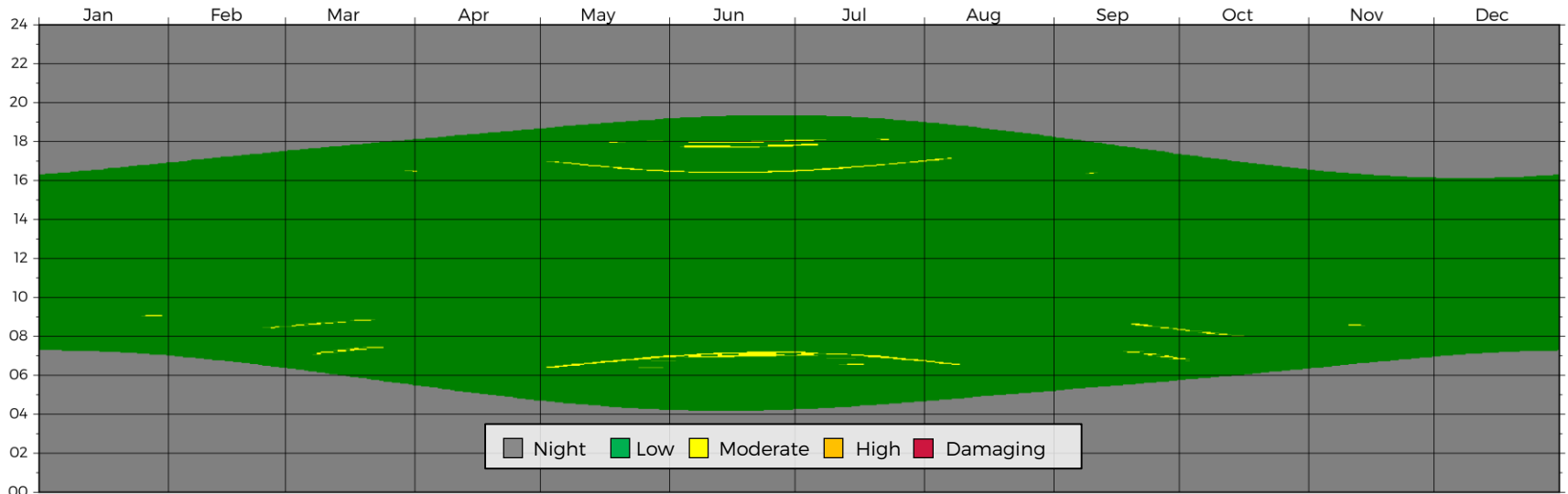
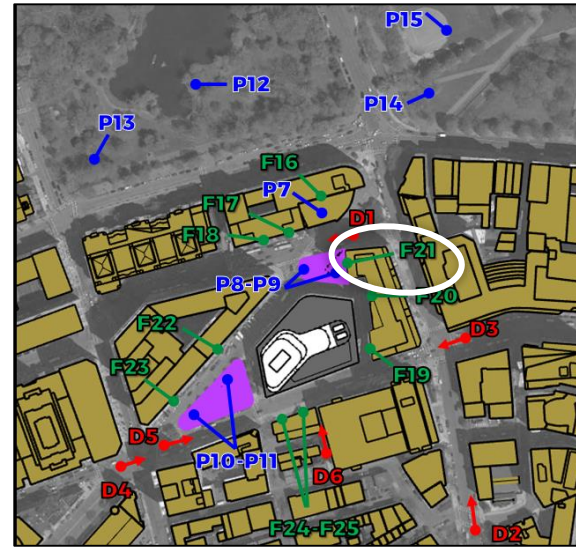
ANNUAL VISUAL IMPACT



Facade Receptor F21

Receptor F21 was chosen to assess the visual impact associated with solar reflections affecting occupants at the west facade of One Charles Condominium.

Please note that the referenced times are in Eastern Standard Time.



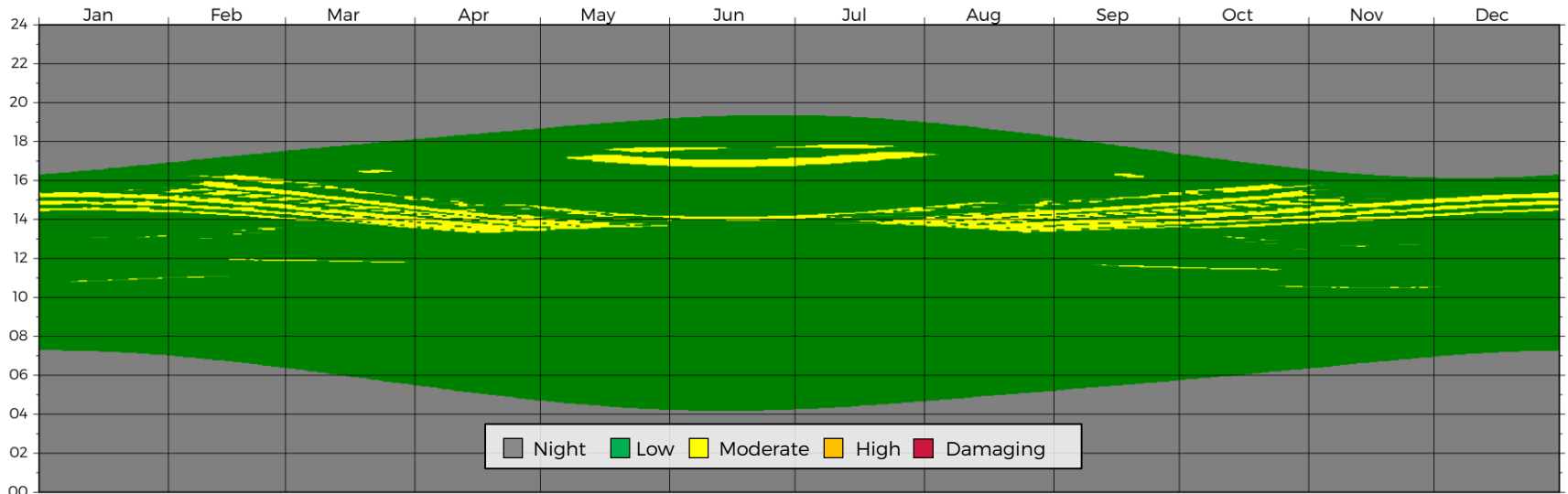
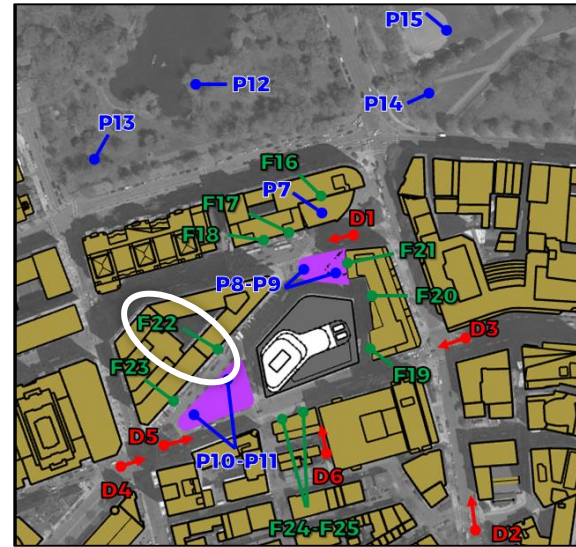
ANNUAL VISUAL IMPACT



Facade Receptor F22

Receptor F22 was chosen to assess the visual impact associated with solar reflections affecting occupants at the east of the Boston Park Plaza Hotel.

Please note that the referenced times are in Eastern Standard Time.



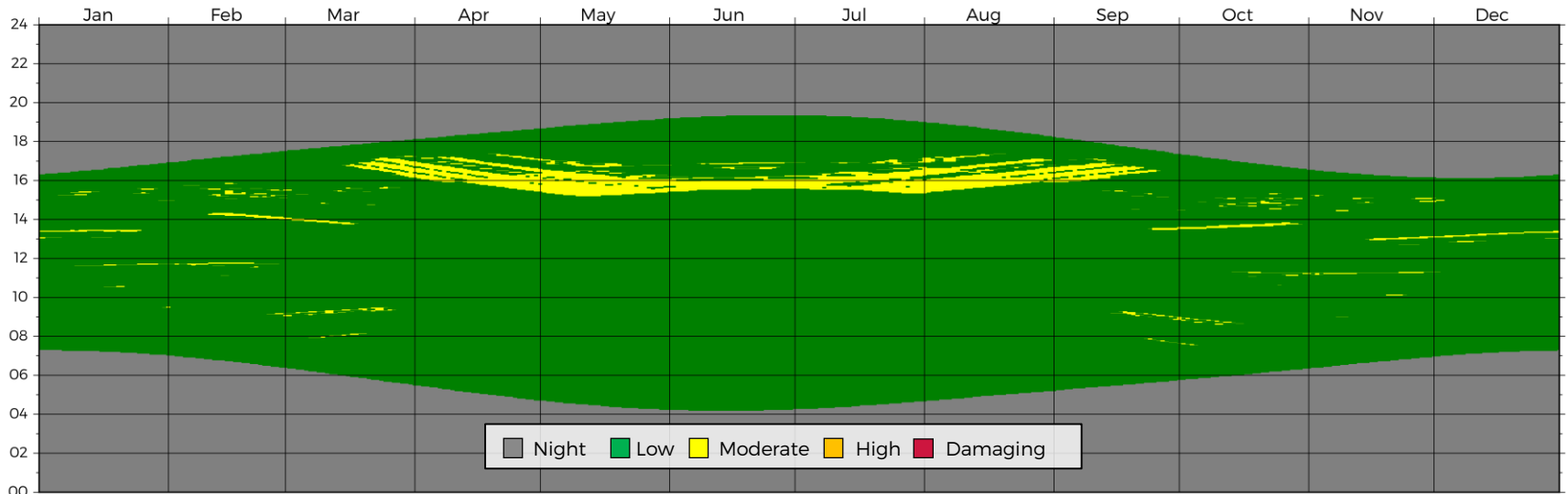
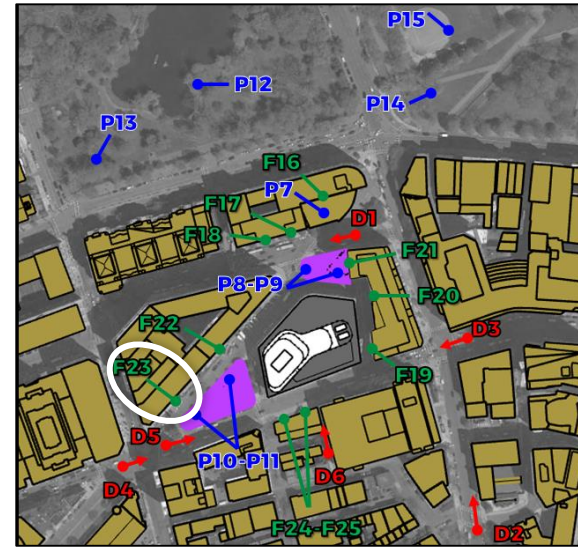
ANNUAL VISUAL IMPACT



Facade Receptor F23

Receptor F23 was chosen to assess the visual impact associated with solar reflections affecting occupants at the south of the Boston Park Plaza Hotel.

Please note that the referenced times are in Eastern Standard Time.



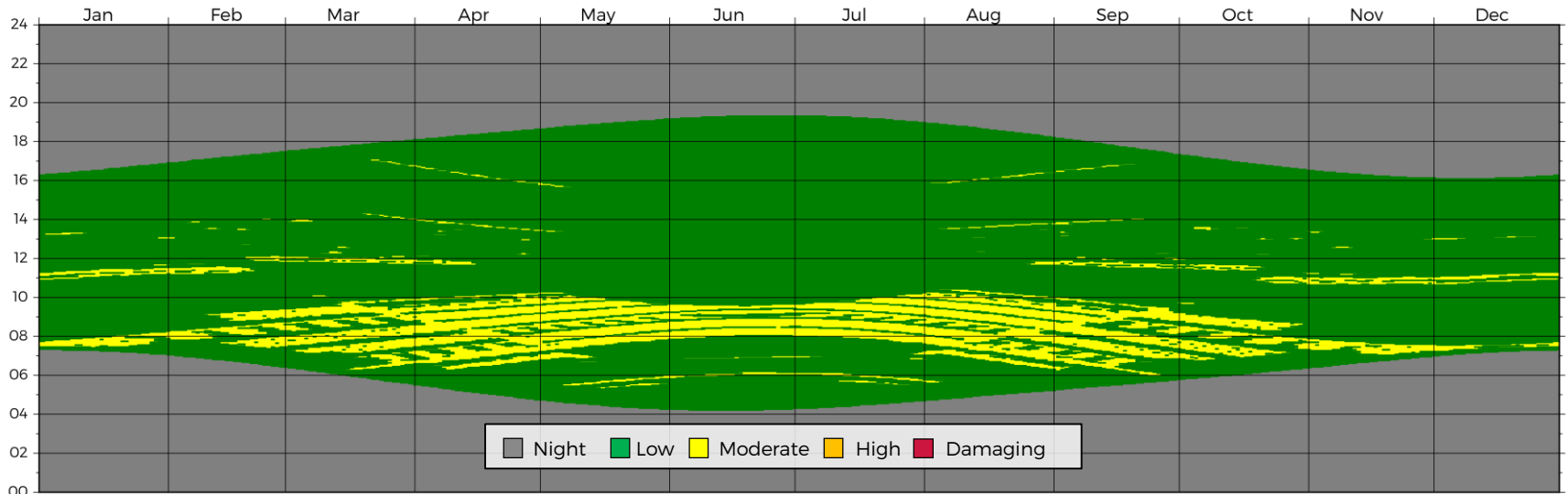
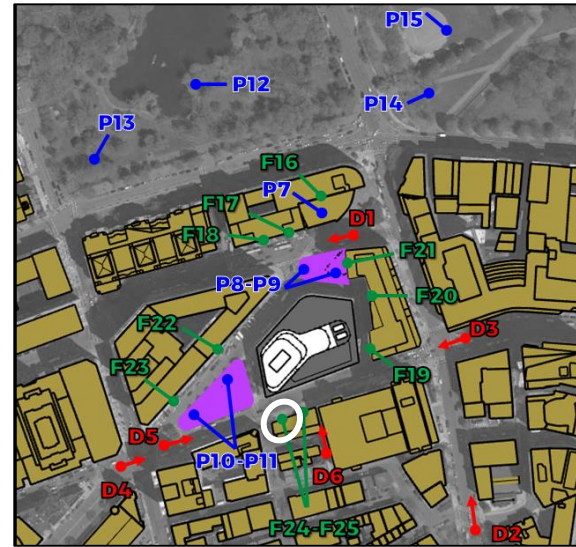
ANNUAL VISUAL IMPACT



Facade Receptor F24

Receptor F24 was chosen to assess the visual impact associated with solar reflections affecting north facing facades of the 212-222 Stuart St. future building.

Please note that the referenced times are in Eastern Standard Time.



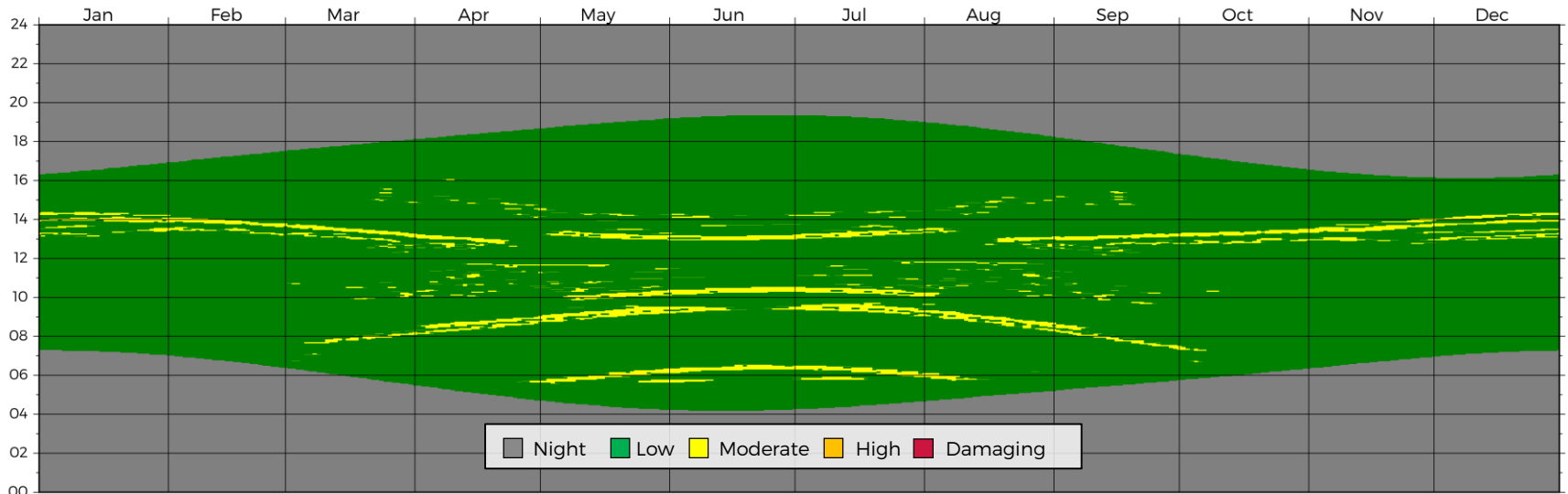
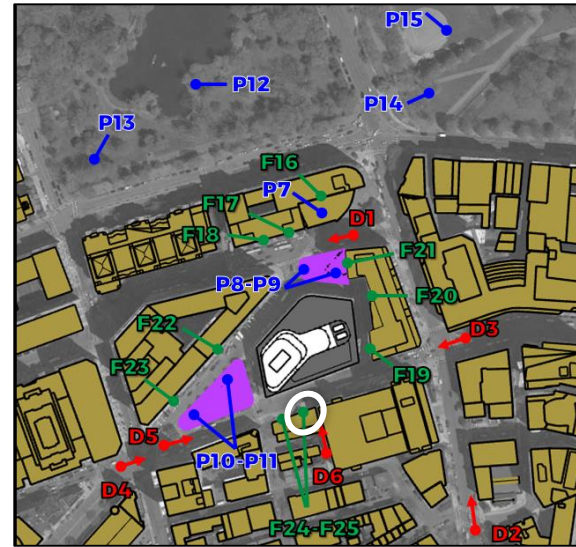
ANNUAL VISUAL IMPACT



Facade Receptor F25

Receptor F25 was chosen to assess the visual impact associated with solar reflections affecting north facing facades of the 212-222 Stuart St. future building.

Please note that the referenced times are in Eastern Standard Time.



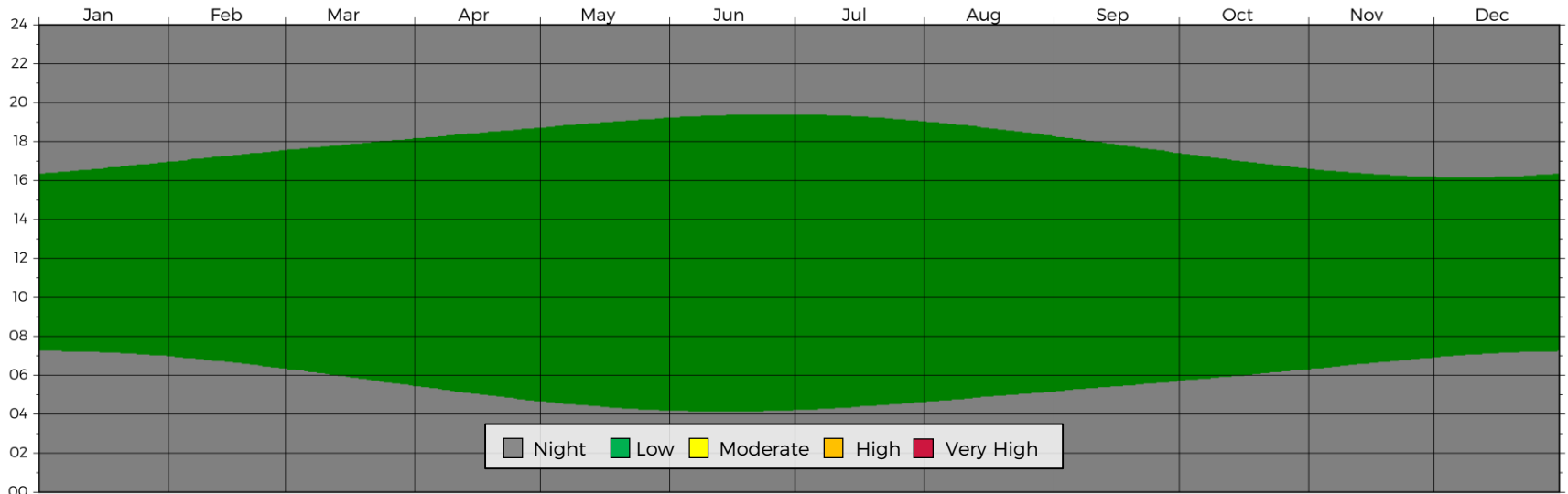
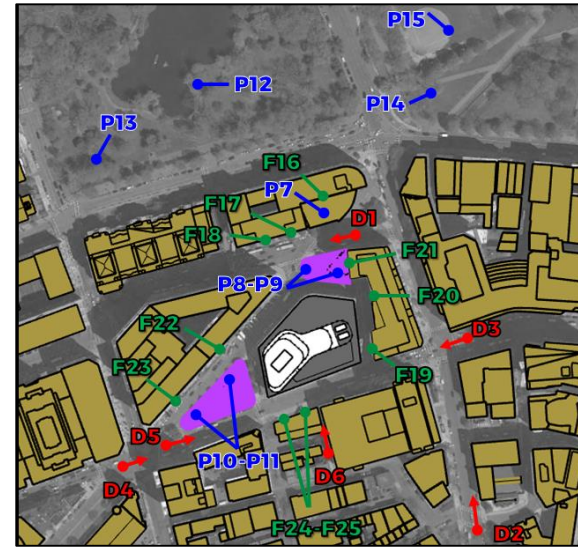
ANNUAL THERMAL IMPACT - PEOPLE



All Receptors

All reflection impacts at all receptors were found to have intensities below RWDI's short-term and human safety threshold values.

Please note that the referenced times are in Eastern Standard Time.



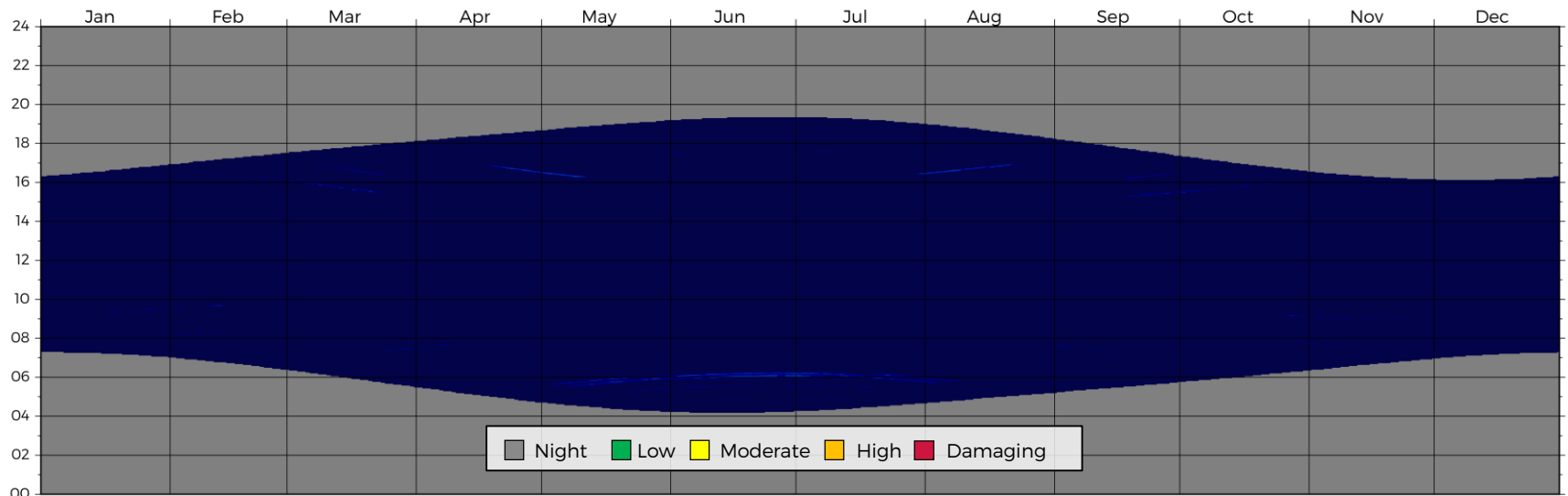
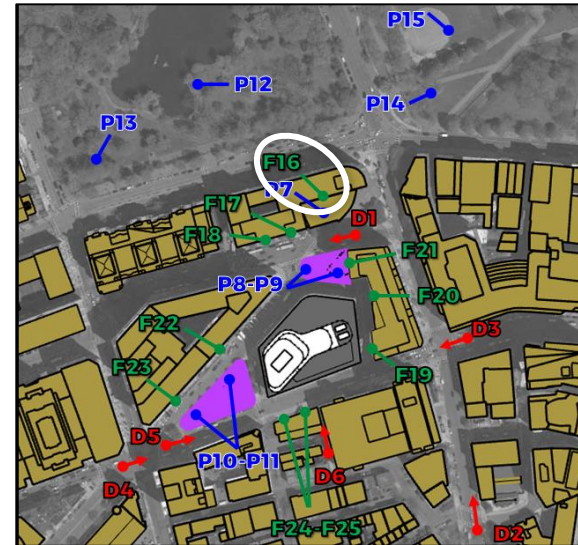
ANNUAL THERMAL IMPACT



Facade Receptor F16

Receptor F16 was chosen to assess the thermal impact associated with solar reflections reaching south facing facades of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



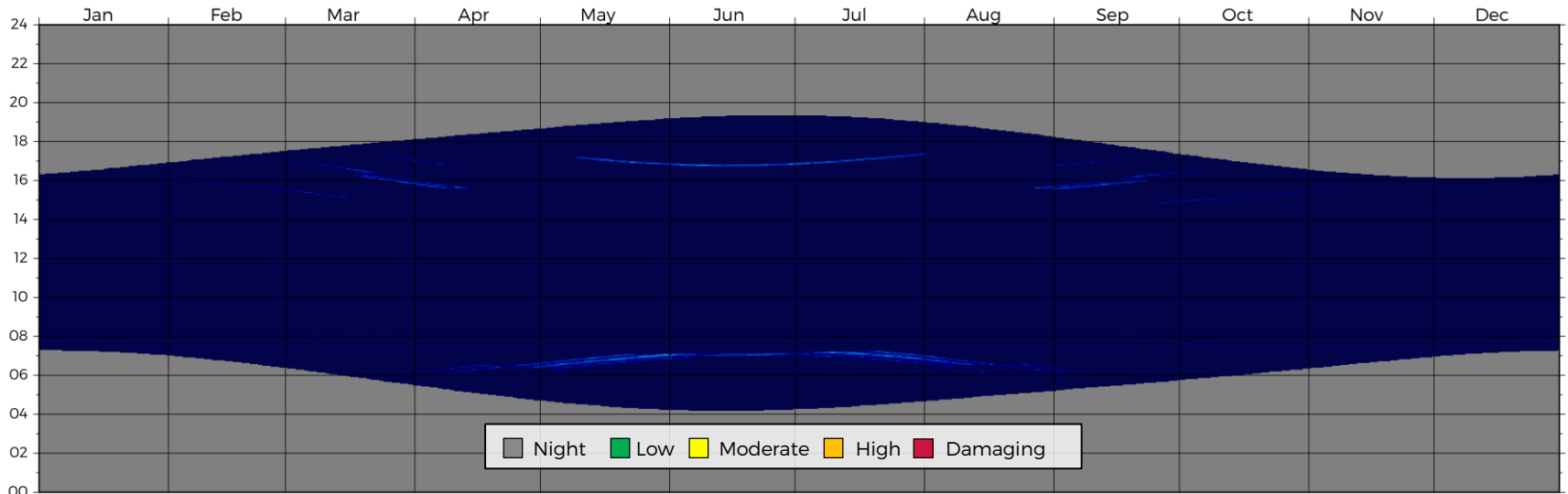
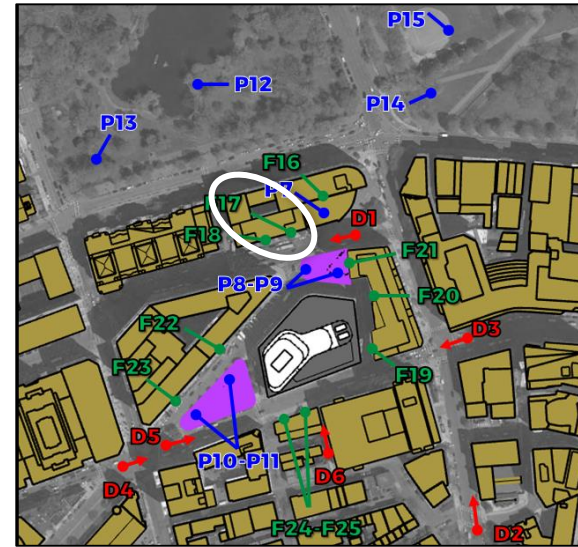
ANNUAL THERMAL IMPACT



Facade Receptor F17

Receptor F17 was chosen to assess the thermal impact associated with solar reflections reaching south facing facades of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



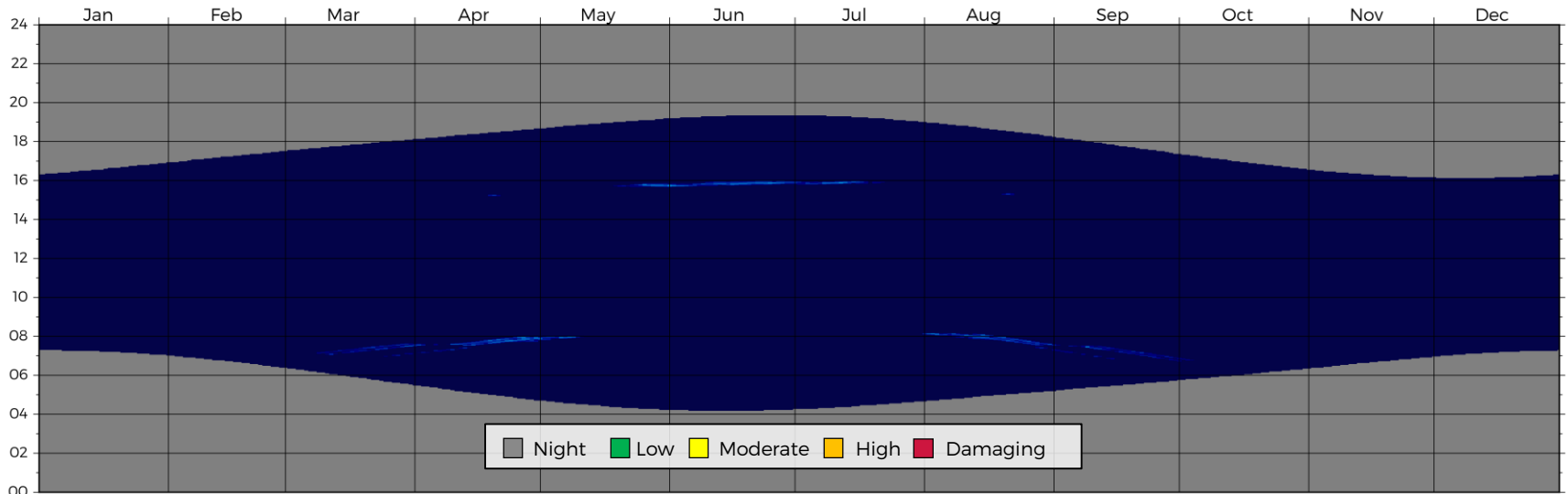
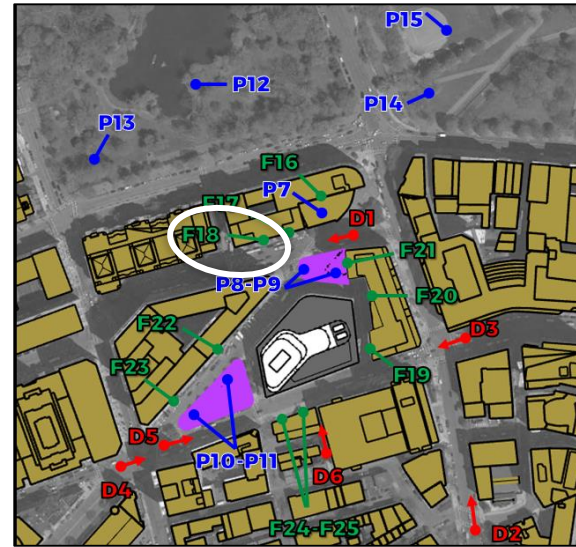
ANNUAL THERMAL IMPACT



Facade Receptor F18

Receptor F18 was chosen to assess the thermal impact associated with solar reflections reaching south facing facades of the Four Seasons Hotel.

Please note that the referenced times are in Eastern Standard Time.



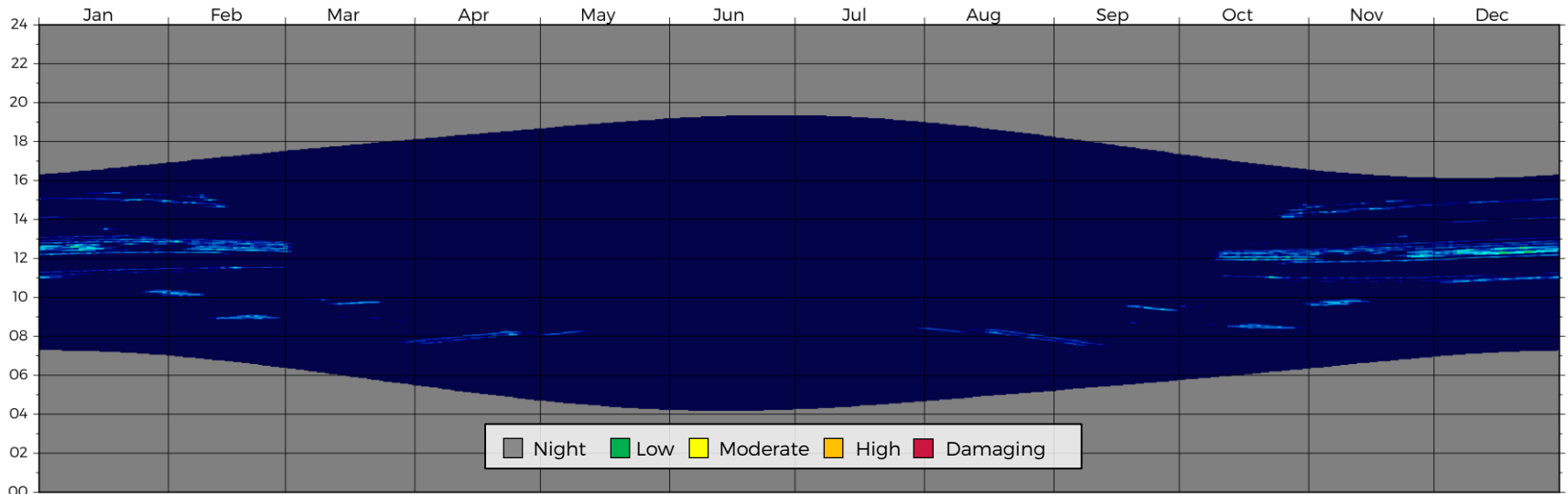
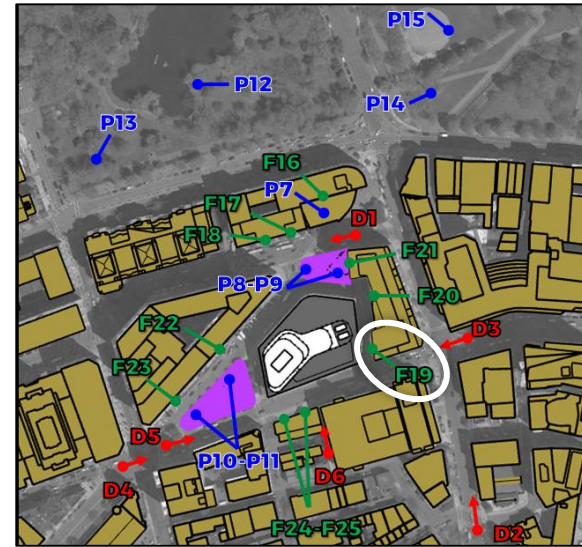
ANNUAL THERMAL IMPACT



Facade Receptor F19

Receptor F19 was chosen to assess the thermal impact associated with solar reflections reaching the west facade of One Charles Condominium.

Please note that the referenced times are in Eastern Standard Time.



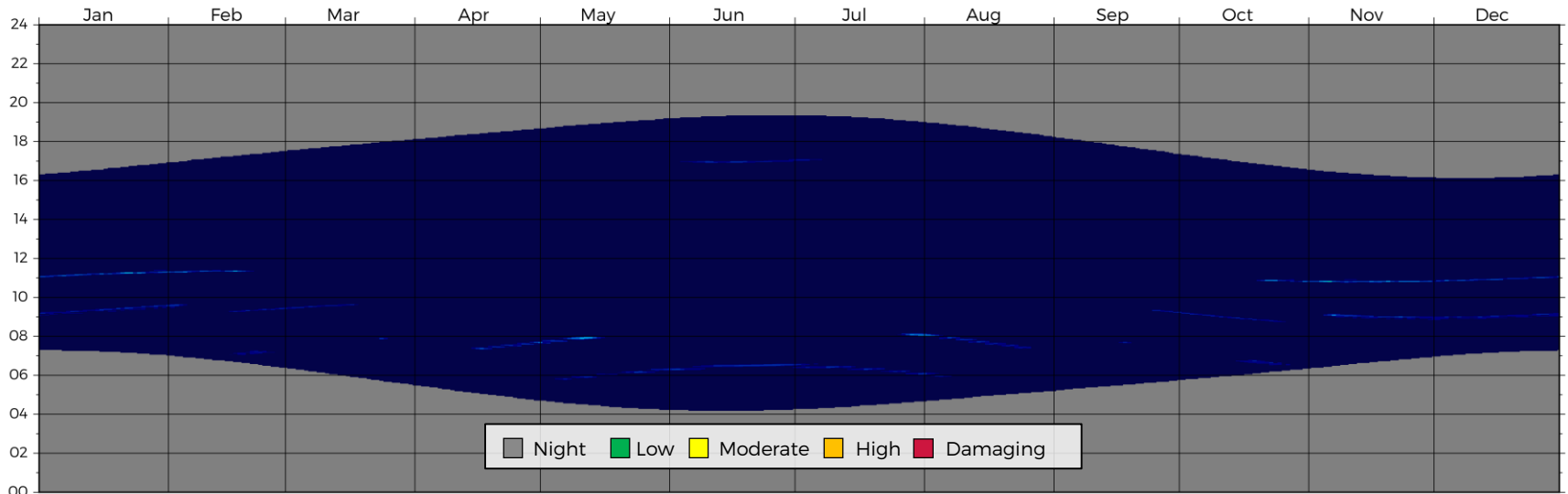
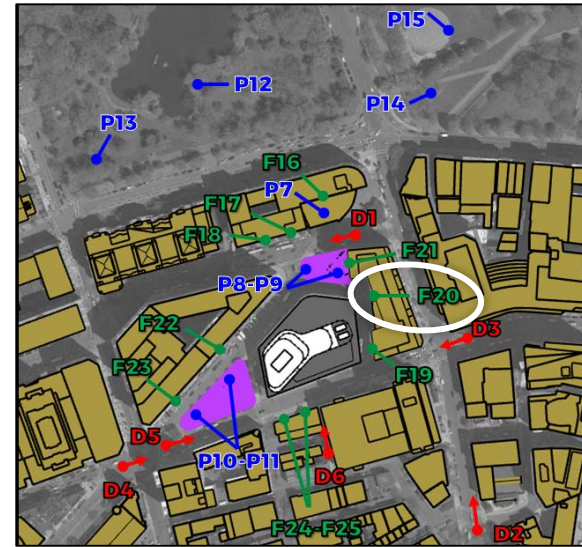
ANNUAL THERMAL IMPACT



Facade Receptor F20

Receptor F20 was chosen to assess the thermal impact associated with solar reflections reaching the west facade of One Charles Condominium.

Please note that the referenced times are in Eastern Standard Time.



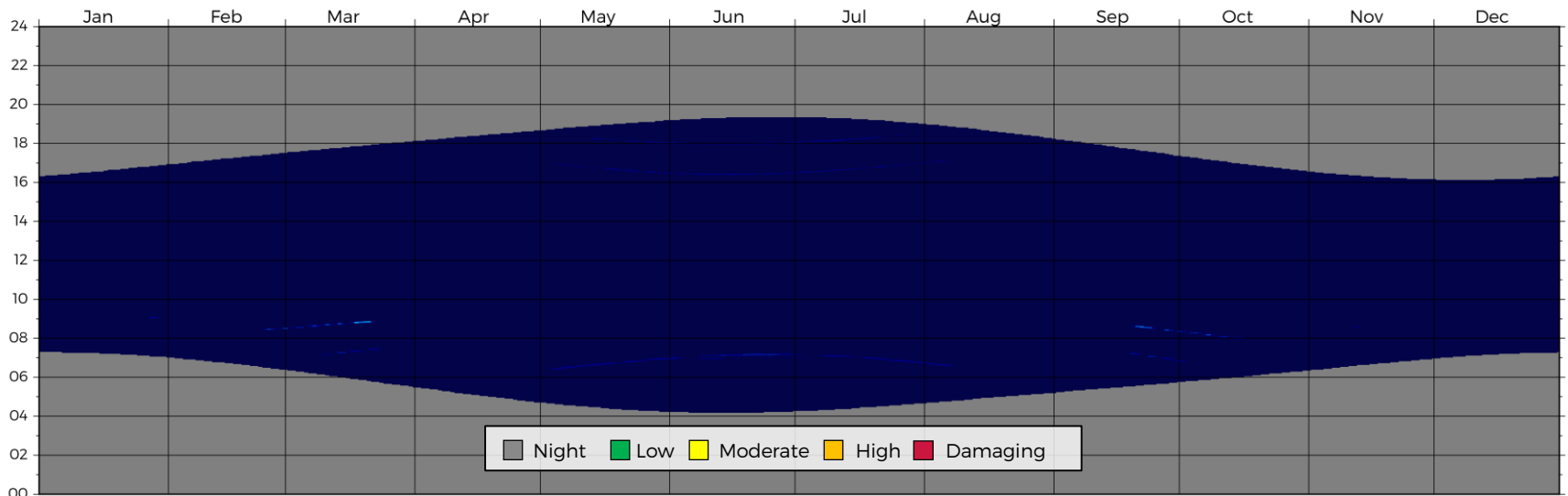
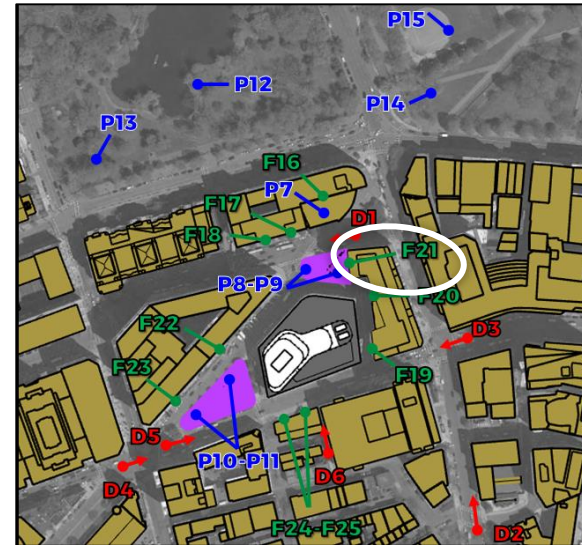
ANNUAL THERMAL IMPACT



Facade Receptor F21

Receptor F21 was chosen to assess the thermal impact associated with solar reflections reaching the west facade of One Charles Condominium.

Please note that the referenced times are in Eastern Standard Time.



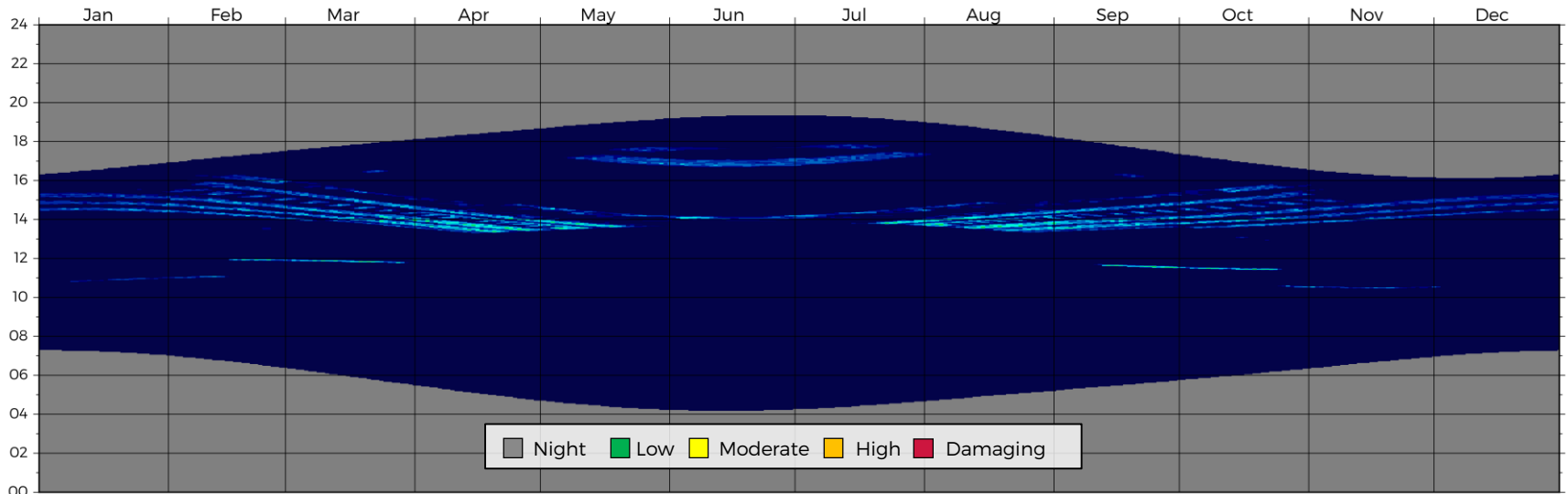
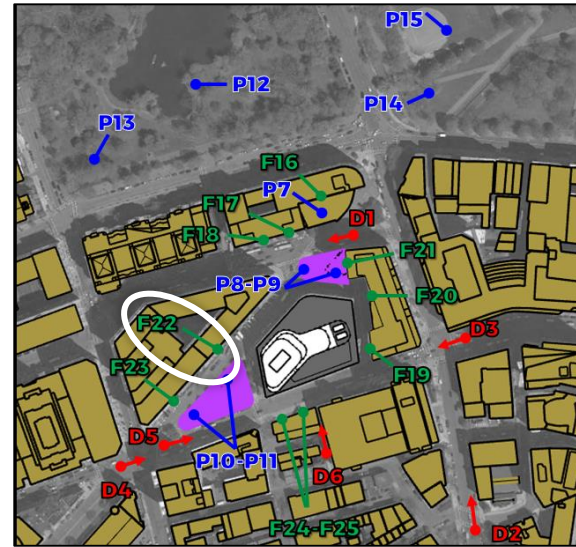
ANNUAL THERMAL IMPACT



Facade Receptor F22

Receptor F22 was chosen to assess the thermal impact associated with solar reflections reaching the east of the Boston Park Plaza Hotel.

Please note that the referenced times are in Eastern Standard Time.



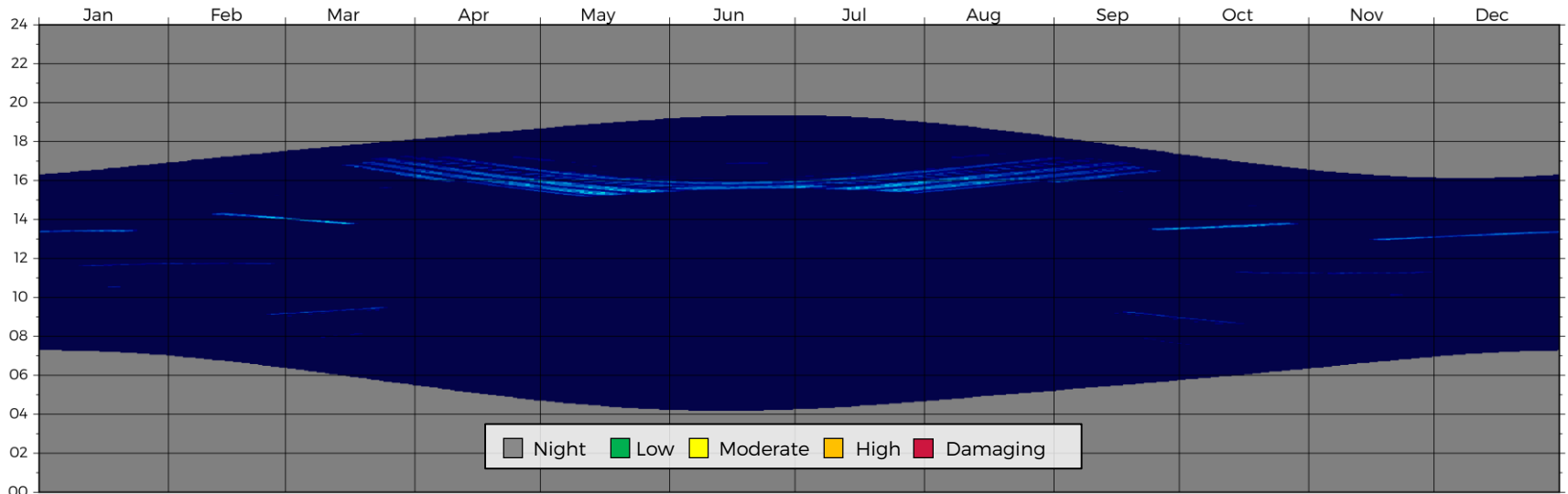
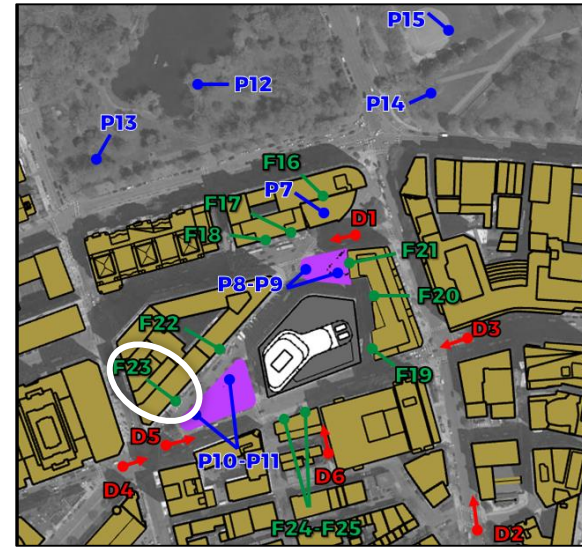
ANNUAL THERMAL IMPACT



Facade Receptor F23

Receptor F23 was chosen to assess the thermal impact associated with solar reflections reaching the south of the Boston Park Plaza Hotel.

Please note that the referenced times are in Eastern Standard Time.



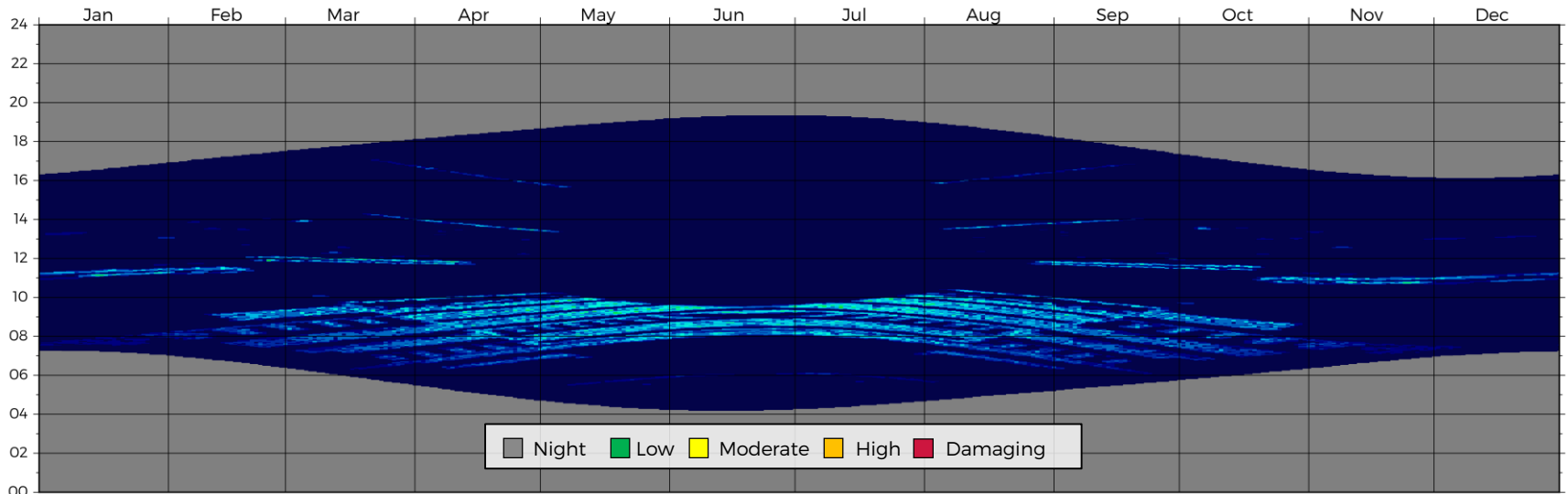
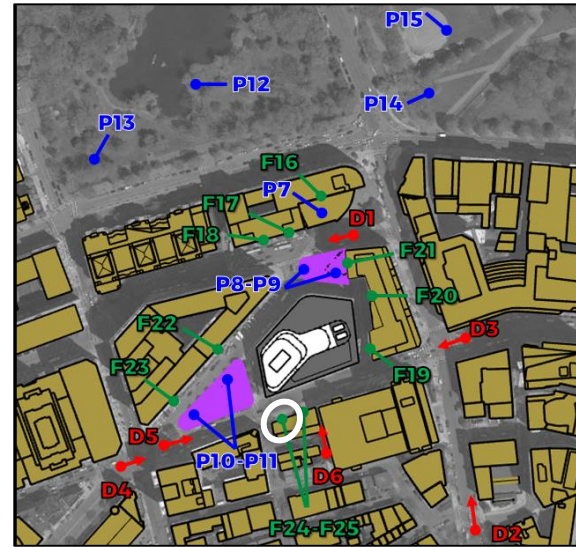
ANNUAL THERMAL IMPACT



Facade Receptor F24

Receptor F24 was chosen to assess the thermal impact associated with solar reflections reaching the facades of the 212-222 Stuart St. future building.

Please note that the referenced times are in Eastern Standard Time.



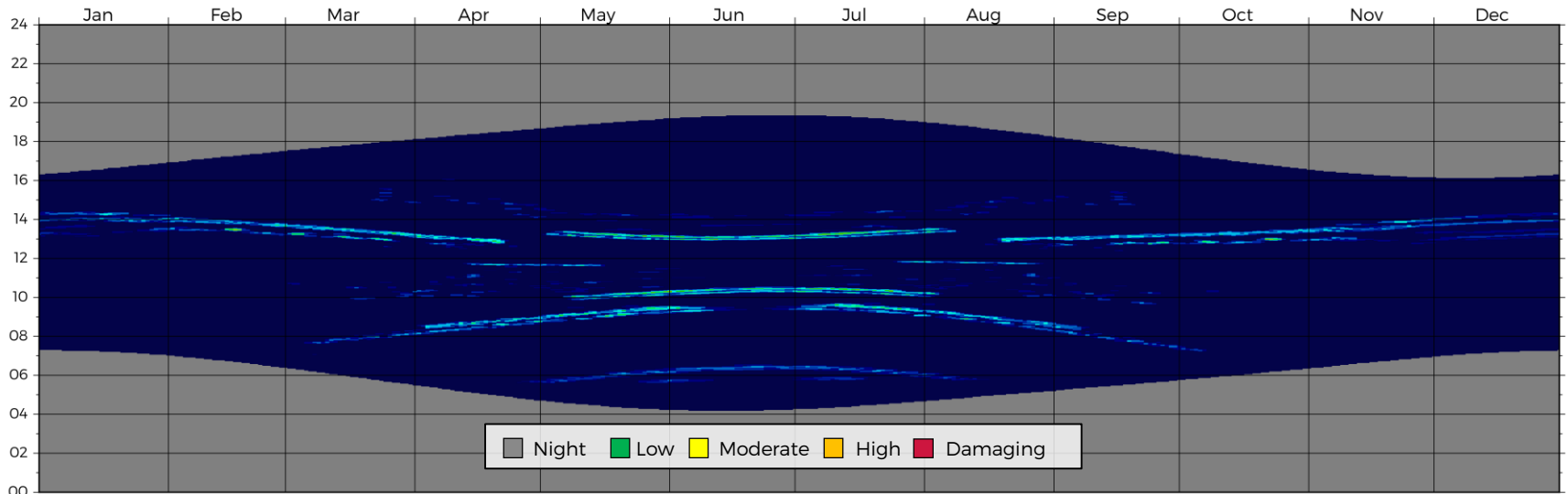
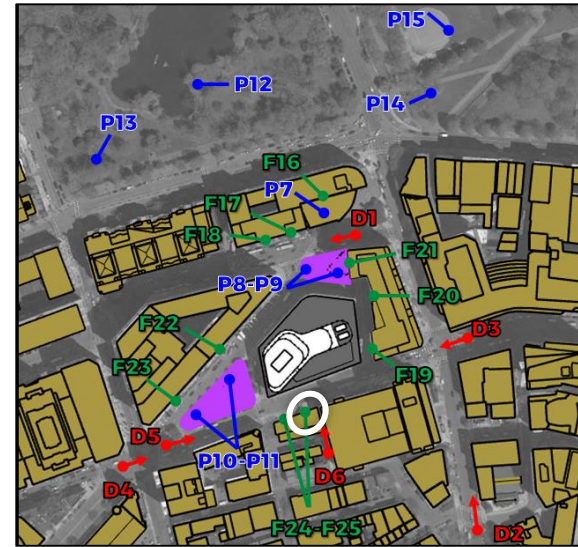
ANNUAL THERMAL IMPACT



Facade Receptor F25

Receptor F25 was chosen to assess the thermal impact associated with solar reflections reaching the north facing facades of the 212-222 Stuart St. future building.

Please note that the referenced times are in Eastern Standard Time.



APPENDIX B

RWDI REFLECTION CRITERIA

Visual Glare

There are currently no criteria or standards that define an “acceptable” level of reflected solar radiation from buildings. RWDI has conducted a literature review of available scientific sources¹ to determine levels of solar radiation that could be considered acceptable to individuals from a visual standpoint.

Many glare metrics are designed for interior use and have been found to not correlate well with the glare impact humans perceive from direct sun or in outdoor environments. RWDI uses the methodology of Ho et al², which defines glare impact based on a physical reaction rather than on a preference based correlation.

Based on the intensity of the glare source and the size of the source in the field of view (Figure B1), the risk of that source causing temporary flash blindness (i.e. the after images visible after one is exposed to a camera flash in a dark room) faster than a person can reflexively close their eyes can be determined.

If this ‘after-imaging’ can occur faster than the human blink reflex, it presents an unavoidable effect on a person based on physiology rather than preference. This forms the basis of how we determine if a reflection is ‘significant’.

This methodology has also been adopted by the United States Federal Aviation Administration (FAA) for determining the risk of glare to pilots and other airport staff under FAA Interim Policy 78 FR 63276.

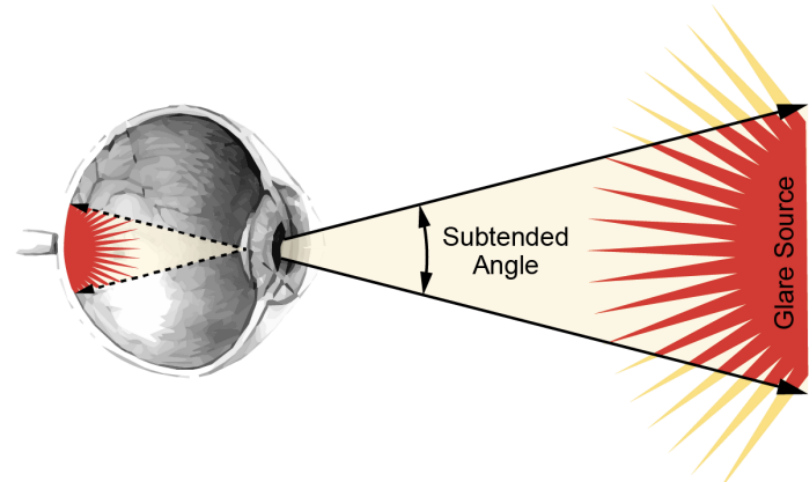


Figure B1: Schematic Illustrating the Subtended Angle of a Glare Source

RWDI REFLECTION CRITERIA



Visual Glare (cont'd)

At the screening level, we conservatively take any reflections at least 50% of the intensity required to cause after-images as a “significant” reflection to be counted in the frequency analysis. In the detailed phase of work, we use the typical threshold level.

As a reference, point 1 on Figure B2 illustrates where looking directly at the sun falls in terms of irradiance on the retina (the back of the eye) and the size of the angle that the sun subtends in the sky. This puts it just at the border of causing serious damage before the blink reflex can close the eye.

The other points in Figure B2 correspond to the following:

2. Direct viewing of high-intensity car headlamp from 50 feet / 15 m
3. Direct viewing of typical camera flash from 7 feet / 2 m
4. Direct viewing of high-intensity car headlamp from 5 feet / 1.5 m
5. Direct viewing of frosted 60W light bulb from 5 feet / 1.5 m
6. Direct viewing of average computer monitor from 2 feet / 0.6 m

Note that the retinal irradiances described on this page are significantly higher than the irradiance levels discussed elsewhere in this report. This is because the human eye focuses the energy on to the retina. The magnitude of the increase is dependent on the geometry of the human eye and the source of the glare, both of which are computed per the Ho et al methodology.

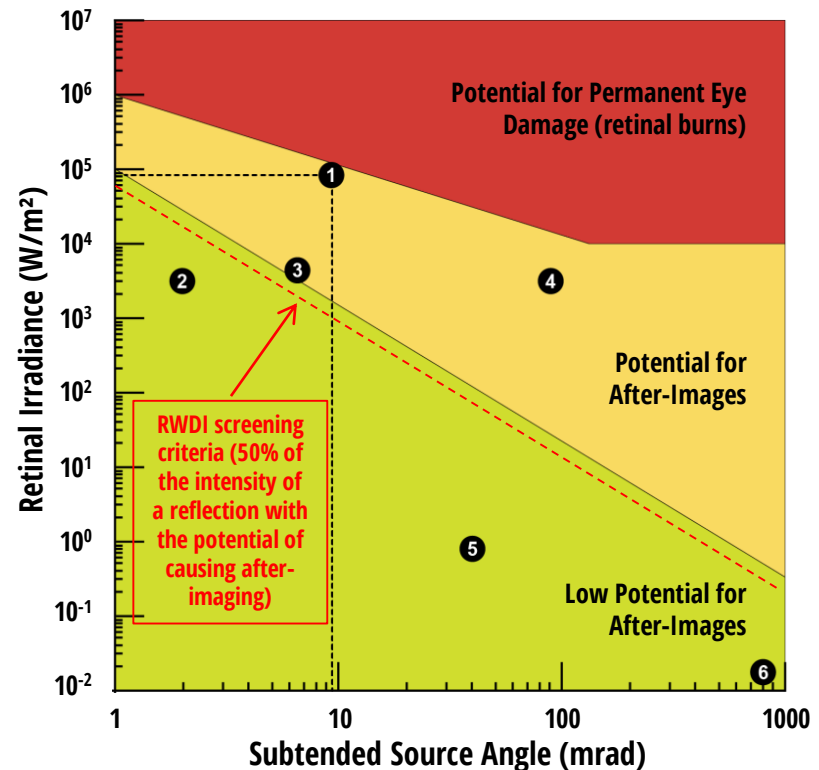


Figure B2: After-Imaging Potential From Various Glare Sources

Visual Glare (cont'd)

Significant glare impacts on the operators of vehicles or heavy equipment pose a particular risk to public safety due to operator distraction or reduction in their visual acuity. Thus, in the detailed analysis, RWDI assigns an assumed view direction to those engaged in “high-risk” activities (e.g. driving a car or flying a plane) as well as an assumed field of view.

The assigned directions and fields of view acknowledge that an operator is particularly sensitive to reflections emanating from the direction in which they are travelling (and therefore cannot safely look away from) and also that the opaque elements of the vehicle will act to obstruct reflections beyond a given angle.

For drivers the critical angle is taken to be 20° away from the direction of view³. Thus, any reflections emanating from within this 20° field of view are considered ‘high’ impacts, whereas reflections emanating from outside this cone are classified as ‘moderate’ impacts. This angle is adjusted as needed for impacts on other vehicles such as aircraft⁴, trains⁵, and other heavy equipment⁶.

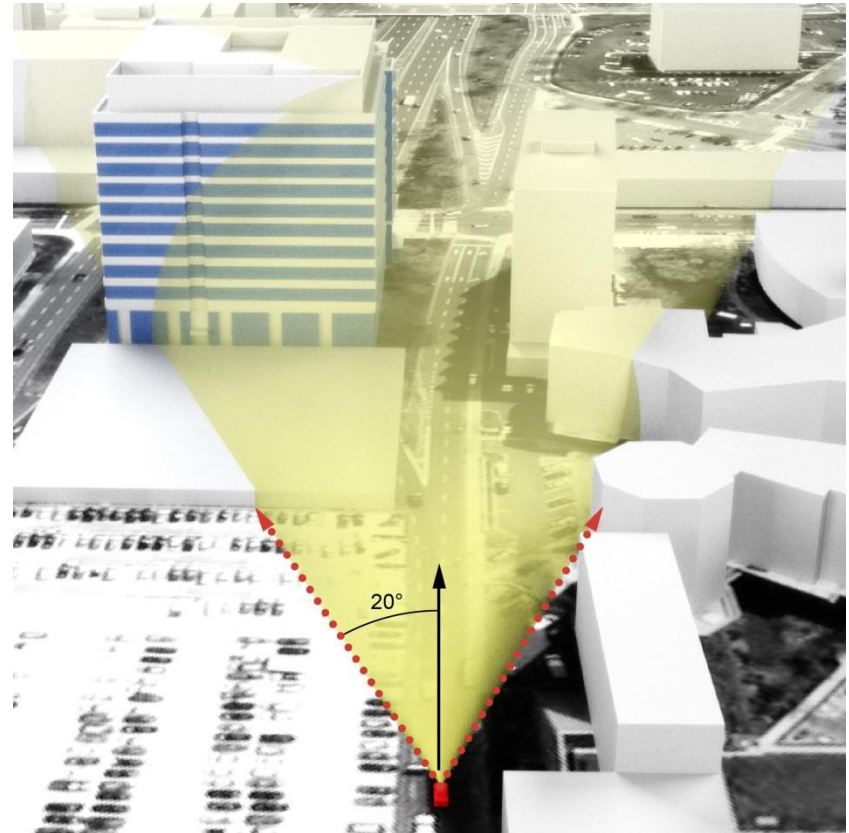


Figure B3: Illustration of a Driver's 20° Field of View



Thermal Impact (Heat Gain) on People

The primary sources for exposure limits to thermal radiation come from fire protection literature. The U.S. National Fire Protection Association (NFPA) defines 2,500 W/m² as an upper limit for a tenable egress environment⁷. That being said, while an individual could move through such an environment, they would not necessarily emerge unscathed. Both the British Standards Institution⁸ and the U.S. Federal Energy Management Agency⁹ indicate that individuals are likely to feel pain within 30 seconds at such exposure levels on bare skin. With second degree burns possible within minutes of exposure. Additionally, this level of additional heat flux can lead to rapid heating of exposed objects which could present a further risk to human safety.

It should be noted that these numbers are guideline values only, and that in reality many factors (skin color, age, clothing choice, etc.) influence how a person reacts to thermal radiation. **For our work RWDI has established 2,500 W/m² as a ceiling exposure limit which reflection intensity should not exceed for any length of time.**

Lower reflection intensities, while not posing as serious of a risk to human safety, can still negatively impact human comfort. There are no definitive guidelines or criteria with respect to this issue. We know this criterion should be less than 2,500 W/m² and greater than typical peak solar noon levels of 1,000 W/m² which people commonly experience. RWDI's opinion at this time is that a reasonable criterion is to limit reflected irradiance exposure to 1,500 W/m² or less. Based on our assessment, we believe at this level of irradiance most people would be able to tolerate it for several minutes before the onset of discomfort. Additionally reflections at this intensity level will heat surfaces more slowly.

Thus we feel reflections below 1,500 W/m² pose a reduced risk to people and should therefore be considered a short term exposure limit. We would conservatively define "short term" as 10 minutes or less which is slightly shorter than the standard 15 minute definition of short term used in the occupational safety context.

Thermal Impact (Heat Gain) on Property

The impact of solar irradiance on different materials is primarily based on the temperature gains to the material which can cause softening, deformation, melting, or in extreme cases, combustion. These temperature gains are difficult to predict as they are highly dependent on the convective heat transfer from air movement around the object and long-wave radiative heat transfer to the surroundings.

Generally, irradiance levels at or above 10,000 W/m² for more than 10 minutes are required to ignite common building and automotive materials in the presence of a pilot flame. That value increases to 25,000 W/m² when no pilot flame is present^{10,11,12}. However, some materials like plastics and even some asphalts may begin to soften and deform at lower temperatures. For example, some plastics can deform at a temperature of 140°F (60°C), or lower if force is applied. The applied force typically comes from the thermal expansion of the material, the force of gravity acting on the material or an external mechanical force (i.e. someone or something pushing or pulling on it).

Aside from the risk of damage to the material itself, a hot surface poses a safety risk to any person who may come into contact with it. This is particularly important in an urban context as the individual may not expect the object to be heated. NASA¹³ defines an upper limit of 111°F (44°C) for surfaces that require extended contact time with bare skin. Surface temperatures below this limit can be handled for any length of time without causing pain.

Because of the difficult nature of determining material temperatures, RWDI takes a conservative approach and uses a **threshold value of 1,000 W/m² which is approximately the peak intensity of natural sunlight that could be expected to occur over the course of a year**. Intensities beyond this value exceed the levels of irradiance that common exterior building materials are presumably designed for, and depending on the duration, may lead to deformation or damage. Though, as noted this would depend heavily on environmental conditions and the material properties of the exposed object or assembly.



References

1. Danks, R., Good, J., & Sinclair, R., "Assessing reflected sunlight from building facades: A literature review and proposed criteria." *Building and Environment*, 103, 193-202, 2016.
2. Ho, C., Ghanbari, C. and Diver, R., "Methodology to Assess Potential Glint and Glare Hazards From Concentrating Solar Power Plants: Analytical Models and Experimental Validation," *Journal of Solar Energy Engineering*, vol. 133, no. 3, 2011.
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4. Rogers, J.A., et al, "Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach." *Federal Aviation Administration* (2015).
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6. Hinze, J.W., and Teizer J., "Visibility-related fatalities related to construction equipment." *Safety Science* 49, no. 5 (2011): 709-718.
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8. The application of fire safety engineering principles to fire safety design of buildings – Part 6: Human Factors' PD 7974-6:2004, British Standards Institution 2004.
9. Federal Emergency Management Agency, U.S. Department of Transportation, and U.S. Environmental Protection Agency. 1988. Handbook of Chemical Hazard Analysis Procedures. Washington, D.C.: Federal Emergency Management Agency Publications Office.
10. Building Research Establishment: 'Fire spread in car parks' BD2552, Department of Communities and Local Government 2010.
11. SFPE Handbook of Fire Protection Engineering 4th Edition NFPA/SPFE 2008 USA.
12. V. Babrauskas 'Ignition Handbook' Fire Science Publishers + SFP, 2003.
13. E Ungar, K Stroud 'A New Approach to Defining Human Touch Temperature Standards' National Aeronautics and Space Agency, 2010.

Appendix D

Broadband Ready Checklist

9				03/22/2019 14:47:46
		Form Publisher Template		
03/22/2019				

This is a simple template document automatically generated by Form Publisher.
Feel free to personalize it like any other Google Spreadsheet.



FormPublisher

Questions list:				
Project Name::				
Project Address Primary: :				
Project Address Additional: :				
Project Contact (name / Title / Company / email / phone): :				
Expected completion date:				
Owner / Developer:	201 Stuart Owner, LLC			
Architect:	CBT Architects			
Engineer (building systems)::	R. G. Vanderweil Engineers			
Permitting::	Epsilon Associates, Inc.			
Construction Management:				
Number of Points of Entry:	Two geographically diverse entrance points are being considered			
Locations of Points of Entry:				
Quantity and size of conduits:				
Location where conduits connect (e.g. building-owned manhole, carrier-specific manhole or stubbed at property line) :				
Other information/comments:				
Do you plan to conduct a utility site assessment to identify where cabling is located within the street? This information can be helpful in determining the locations of POEs and telco rooms. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.:	Yes			
Number of risers:	Centrally located risers will reach all floors with a minimum of four 4" sleeves through each level			
Distance between risers (if more than one):				
Dimensions of riser closets:				
Riser or conduit will reach to top floor :				
Number and size of conduits or sleeves within each riser:				
Proximity to other utilities (e.g. electrical, heating):				
Other information/comments:				
What is the size of the telecom room?:	Unknown			
Describe the electrical capacity of the telecom room (i.e. # and size of electrical circuits):	Electrical capacity will be provided to support multiple carrier terminations and related systems			

Will the telecom room be located in an area of the building containing one or more load bearing walls?:	No			
Will the telecom room be climate controlled? :	Yes			
If the building is within a flood-prone geographic area, will the telecom equipment will be located above the floodplain?:	Yes			
Will the telecom room be located on a floor where water or other liquid storage is present?:	No			
Will the telecom room contain a flood drain?:	No			
Will the telecom room be single use (telecom only) or shared with other utilities?:	Yes			
Other information/comments:				
Will building/developer supply common inside wiring to all floors of the building? :				
If yes, what transmission medium (e.g. coax, fiber)? Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.:	Fiber optic cabling to the units and Category cabling within the units.			
Is the building/developer providing wiring within each unit? :	Yes			
If yes, what transmission medium (e.g. coax, fiber)? Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.:	Fiber optic cabling to the units and Category cabling within the units.			
Will the building conduct any RF benchmark testing to assess cellular coverage?:	Yes			
Will the building allocate any floor space for future in-building wireless solutions (DAS/small cell/booster equipment)?:	Yes			
Will the building be providing an in-building solution (DAS/ Small cell/ booster)? :				
If so, are you partnering with a carrier, neutral host provider, or self-installing?:				
Will you allow cellular providers to place equipment on the roof?:	Yes			
Will you allow broadband providers (fixed wireless) to install equipment on the roof? :	Unknown			
Will you allow broadband providers (fixed wireless) to install equipment on the roof? :	Unknown			
Date contacted:				
Does Comcast intend to serve the building?:				
Transmission Medium:				
If no or unknown, why?:				
Date contacted:				
Does RCN intend to serve the building?:				
Transmission Medium:				

If no or unknown, why?:				
Date contacted:				
Does Verizon intend to serve the building?:				
Transmission Medium:				
If no or unknown, why?:				
Date contacted:				
Does netBlazr intend to serve the building?:				
Transmission Medium:				
If no or unknown, why?:				
Date contacted:				
Does WebPass intend to serve the building?:				
Transmission Medium:				
If no or unknown, why?:				
Date contacted:				
Does Starry intend to serve the building?:				
Transmission Medium:				
If no or unknown, why?:				
Do you plan to abstain from exclusivity agreements with broadband and cable providers? :	Yes			
Do you plan to make public to tenants and prospective tenants the list of broadband/cable providers who serve the building?:	Yes			