40 Trinity Place

Draft Project Impact Report
July 17, 2013

SUBMITTED BY:

Trinity Stuart LLC
40 Trinity Place | Boston, MA 02116

SUBMITTED TO:

Boston Redevelopment Authority
One City Hall Square | Boston, MA 02201

DRAFT PROJECT IMPACT REPORT

Submitted Pursuant to Article 80 of the Boston Zoning Code

40 Trinity Place

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

Submitted by:
Trinity Stuart LLC
40 Trinity Place
Boston, MA 02116

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July 17, 2013

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Section 1.0

General Information

1.0 GENERAL INFORMATION

1.1 Introduction

Trinity Stuart LLC (the Proponent) proposes the redevelopment of the site at 40 Trinity Place, located in the Back Bay neighborhood of Boston, along with air rights over a portion of the adjacent property at 426 Stuart Street, which currently houses the University Club of Boston (collectively, the Project site). The development includes the demolition of the existing Boston Common Hotel and Conference Center, formerly known as the John Hancock Hotel and Conference Center, and the construction of a 33-story mixed-use building that will include hotel, residential, restaurant uses, expansion space for the University Club, and accessory parking (collectively, the Project).

The Project will transform the streetscape of a relatively lifeless block along Stuart Street, in the heart of the otherwise lively Back Bay, into a destination with an activated ground floor and a vibrant mix of uses generating new tax revenue, construction and permanent jobs, and affordable housing. The Project's exterior architecture, designed by Boston's The Architectural Team, will be a striking addition to the Stuart Street skyline and street-level experience. Its interior will house a variety of attractive, active uses. As can be seen in Figure 1-1, the Project will activate the ground floor on both Stuart Street and Trinity Place via a transparent first-floor wrapping. A signature casual neighborhood restaurant, anticipated to be operated by an acclaimed local chef, will reside at street level. An inviting, lively new approximately 227-room hotel designed by renowned hotel architect Paul Taylor (New York's NoMad, Crosby and Ace, among others) will fill the building's middle floors with approximately 115 elegant, modern condominium residences above. Figures 1-2 and 1-3 present the hotel's dramatic two-story "sky lobby" and conference and meeting facility on its 18th and 19th floors featuring a stunning restaurant, lounge and roof terrace open to the southern sky. A small, quiet third restaurant will round out the Project's program. With its 24-hour mix of uses, transit-oriented location adjacent to Back Bay Station, and management by the owners of Boston's renowned Lenox Hotel, the Project will become a favorite neighborhood gathering place for Back Bay, South End, Bay Village and other locals, its own hotel guests and condominium residents.

Trinity Stuart LLC is comprised of Gary Saunders, Jeffrey Saunders, and Jordan Warshaw. Together, their families have generations of roots in Boston's Back Bay as local developers and as owner-operators of prominent real estate within several blocks of the Project. Their real estate projects have included the adaptive re-use of the Boston Police Headquarters into Jury's Boston (now Loews Boston Back Bay Hotel), a four star 225-room boutique hotel, and management of the development of the mixed-use residential, retail and performing arts theatre complex Atelier|505. They are also present or former owner-operators of other notable properties, including the Lenox Hotel, Copley Square Hotel and Park Plaza Hotel, proximate to the Project site. Gary, Jeff and Jordan are involved in numerous civic and philanthropic activities and have proven themselves as owners, investors and managers of real estate development projects throughout Boston that have created hundreds of permanent and construction jobs, generated millions of dollars in property, hotel and meal tax revenues, and helped energize their neighborhoods. Their long-term ownership of many of these properties, averaging 50 years, demonstrates their commitment to Boston and the Back Bay.

Gary and Jeffrey Saunders, Chairman and President and CEO of Saunders Hotel Group (SHG), respectively, have been recognized as environmental leaders internationally, nationally and locally, bringing widespread attention to their properties in the Back Bay. In 2012 SHG was given the Community Benefit Award by the World Travel & Tourism Council, an award given "for a tourism initiative that has effectively demonstrated direct benefits to local people, including capacity building, the transfer of industry skills, and support for community development and enhancement and support for cultural heritage in the area."[1] SHG was also given the highest rank of any hospitality group by Climate Counts for its efforts to reduce its environmental footprint and communicate its best practices. Most recently, the Boston Business Journal recognized The Lenox Hotel, their flagship property, with the "Best Green Places to Work" award. Atelier|505, for which Jordan was the project manager while at Boston's The Druker Company, won the Urban Land Institute Award for Excellence, the industry's highest honor, in recognition of its transformation of a lifeless, underutilized city block of the South End.

This Draft Project Impact Report (DPIR) is being submitted to the Boston Redevelopment Authority (BRA) in response to the Scoping Determination issued by the BRA dated March 1, 2013.

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[1] World Travel & Tourism Council. "Tourism for Tomorrow Awards. http://www.wttc.org/tourismfortomorrow/awards/award-categories/community-benefit-award/

40 Trinity Place   Boston, Massachusetts

Figure 1-1

Stuart Street and Trinity Place Entries

40 Trinity Place Boston, Massachusetts

Figure 1-2
Sky Lobby

40 Trinity Place   Boston, Massachusetts

Figure 1-3

Sky Lobby Terrace

1.2 Project Identification and Development Team

Project Name:	40 Trinity Place
Location:	The intersection of Trinity Place and Stuart Street in the Back Bay neighborhood of Boston
Proponent:	Trinity Stuart LLC 40 Trinity Place Boston, MA 02116 (617) 851-9995 Jordan Warshaw Gary Saunders Jeffrey Saunders
Executive Architect:	The Architectural Team 50 Commandant's Way at Admiral's Hill Chelsea, MA 02150 (617) 889-4402 Michael Liu Gary Kane Al Donovan
Hotel Architect:	Stonehill & Taylor Architects, P.C. 31 West 27th Street, Fifth Floor New York, NY 10001 (212) 226-8898 Paul Taylor Christina Zimmer
Legal Counsel:	Goulston & Storrs 400 Atlantic Avenue Boston, MA 02110 (617) 574-6597 Matthew J. Kiefer Christian G. Regnier
	Dalton & Finegold, LLP 34 Essex Street Andover, MA 01810 (978) 470-8400 Kenneth MacKenzie

Permitting Consultant:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Cindy Schlessinger Geoff Starsiak
Transportation Consultant and Civil Engineer:	Howard/Stein-Hudson Associates, Inc. 38 Chauncy Street, 9th Floor Boston, MA 02111 (617) 482-7080 Guy Busa Joe SanClemente Richard Latini
Construction Manager:	Suffolk Construction 65 Allerton Street Boston, MA 02119 (617) 571-4520 John Fish Angus Leary Scott Menard
Construction Consultant:	C3 – Commercial Construction Consulting, Inc. 313 Congress Street Boston, MA 02210 (617) 330-9390 James Kirby Jay Murray
Community Relations:	The Strategy Group 40 Court Street, 11th Floor Boston, MA 02108 (617) 263-3333 Susan Tracy David Newman
Public Relations:	Tom Palmer Communication P.O. Box 590581 Newton, MA 02459 (617) 755-7250 Tom Palmer

Structural Engineer:	McNamara/Salvia, Inc. 160 Federal Street, 5th Floor Boston, MA 02110 (617) 737-0040 Joseph Salvia Adam McCarthy
Geotechnical Engineer:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Boston, MA 02129 (617) 886-7400 Mark Haley Marya Gorczyca Mike Atwood

1.3 Project Area

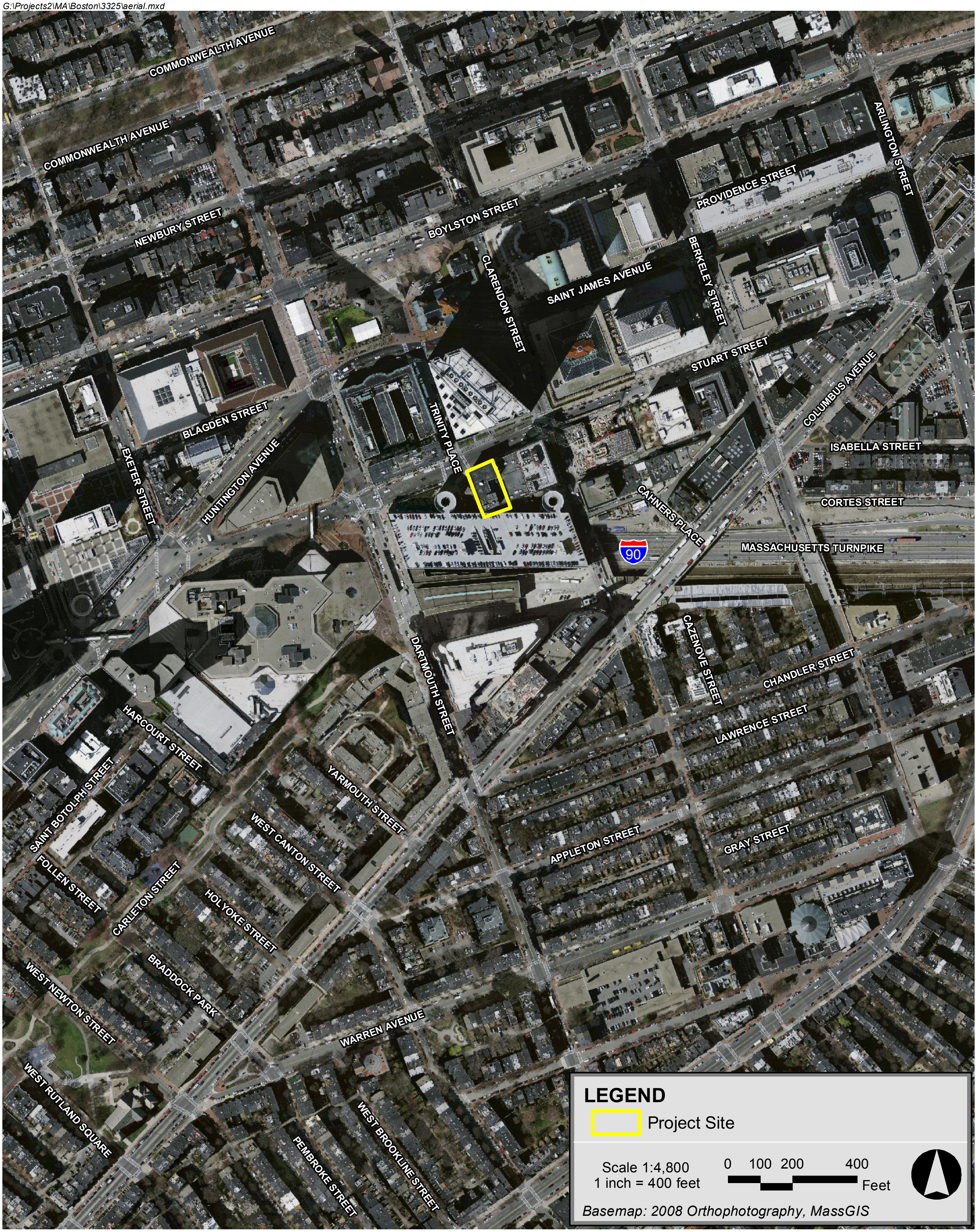
1.3.1 Project Site

The Project site, at the southeast corner of the intersection of Stuart Street and Trinity Place in the Back Bay neighborhood of Boston, comprises land at 40 Trinity Place, currently including the Boston Common Hotel and Conference Center owned by the Proponent, and a portion of the air rights appurtenant to the University Club parcel at 426 Stuart Street (see Figures 1-4 and 1-5). An exhibit plan of the site is included in Appendix A.

1.3.2 Proposed Development

The Project includes the construction of a new, mixed-use structure at the corner of Trinity Place and Stuart Street, a portion of which will cantilever over the existing University Club building. The existing four-story University Club building may be renovated and expanded by the University Club in the future, however renovation and expansion of the University Club is not included as part of this DPIR and would be subject to separate study and, if necessary, zoning relief by the University Club if and when it is proposed. The Project only includes University Club expansion space within the proposed building, as described below.

The Project involves demolition of the existing Boston Common Hotel and Conference Center building and construction of a new 33-story, approximately 400-foot-tall, mixed-use building totaling approximately 380,450 square feet (sf), with approximately 115 residential units, an approximately 227-room hotel with accessory conference center space, as well as three restaurants and lounges totaling approximately 11,300 sf. A shared health/fitness center will be for the use of residents and hotel guests. Residential parking for approximately 100 vehicles will be provided above grade on levels 4 and 5 and will be accessed via vehicle elevators.



40 Trinity Place Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 1-4
Aerial Locus

40 Trinity Place **Boston, Massachusetts**

Figure 1-5

Site Plan

The Project will also include approximately 5,550 sf to be occupied by the adjacent University Club to replace the University Club's space in the current building at 40 Trinity Place and to augment the University Club's existing facilities. The University Club's space within the Project will be connected internally to the University Club's building at 426 Stuart Street and will be for the sole use of the Club's members.

Section 2.2 includes additional information about the Project's program.

1.4 Public Benefits

The Proponent team has a strong connection to the Back Bay community and Boston as a whole. The principals of the Proponent have each lived in the Boston area and worked in Boston for the majority of their lives, and have a vested interest in seeing the neighborhood and city as a whole thrive. This desire is best manifested through their service to the public, including leadership of and membership on the boards of multiple Boston and Back Bay-focused community organizations, educational institutions and Boston nonprofits.

The principals of the Proponent between them have or have had leadership and board positions on the Back Bay Association, Boston Groundwater Trust, Boston Center for the Arts, Stop Handgun Violence, Topf Center for Dance Education, Winsor School, Roxbury Latin School, Massachusetts Lodging Association, Greater Boston Convention & Visitors Bureau, Board of Advisors of the Boston University School of Hospitality Administration, Museum of Science, The Wang Center and Boston Management Consortium. They were instrumental in the efforts to bring the swans back to the Public Garden. They have made and continue to make significant contributions through community service, donations and in-kind giving. They show their commitment to the City every day in the positive way they treat their employees, guests, and the businesses around them.

The Project has been designed to be consistent with the main goals outlined in the recently completed Stuart Street Planning Study Proposed Development Review Guidelines. As described below, the Project will generate many public benefits for the surrounding neighborhoods and the City of Boston as a whole, both during construction and on an ongoing basis upon completion.

Smart Growth/Transit-Oriented Development

The Project is consistent with smart-growth and transit-oriented development principles. In addition to being built on previously developed land, the Project is located adjacent to the Back Bay Commuter Rail, Amtrak and Orange Line Station, and therefore concentrates new commercial and residential uses in close proximity to major regional rapid transit, commuter rail, and bus lines that provide easy access to the Project site from other neighborhoods of the City of Boston and surrounding neighborhoods. The addition of hotel and residential uses to a predominately commercial area, and in particular to a block with minimal activity after work hours, will have the benefit of creating and supporting a vibrant area for people to live, work, and play.

Affordable Housing

As described in the Stuart Street Planning Study (defined below), the Project will exceed the goals of the Mayor's Inclusionary Development Policy and is anticipated to include affordable housing on-site equal to 17.5% of market rate units. The specific size and location of such units will be coordinated with the BRA.

Linkage

The Project will result in significant financial benefits to the City of Boston and its residents, including:

- Approximately $750,000 in Housing Linkage contributions
- Approximately $150,000 in Jobs Linkage contributions

This is based on approximately 196,150 sf of Development Impact Project Uses less the 100,000 sf exemption. The Proponent anticipates entering into a Development Project Impact Agreement with the BRA concerning these payments.

New Property Tax and Hotel Tax Revenue

Annually for the City of Boston at stabilization, the Project will generate approximately $1,050,000 in property taxes for the hotel and restaurant spaces, approximately $1,200,000 in property tax revenues for residential uses, approximately $1,080,000 in hotel occupancy tax revenues, and approximately $130,000 in meals tax revenues.

Annually for the state at stabilization, the Project will generate approximately $1,026,000 in hotel occupancy tax revenues, approximately $495,000 in Convention Center Fund tax revenues, and approximately $570,000 in state meals tax revenues.

Improved Street and Pedestrian Environment

The existing building presents a heavy masonry first floor with minimal pedestrian level activity and a separation of the uses within the building from the public realm. The new building will feature a transparent first floor wrapping Stuart Street and Trinity Place, bringing active uses, new energy and an improved streetscape that will strengthen the pedestrian environment on this currently lifeless block of the otherwise lively Back Bay. If approved by the public agencies, the Project will result in widening of the southern sidewalk along an important stretch of Stuart Street from Trinity Place to Clarendon Street, as well as rebuilding the eastern sidewalk on Trinity Place south of Stuart Street. Both will further enhance the pedestrian realm. This pedestrian realm attention is proposed to include the addition of street trees along the modified sidewalks as well as stone pavement at each of the new dedicated entrances for the Project's restaurant, hotel and residential spaces.

Sustainable Design/Green Building

As required by the Stuart Street Planning Study, the Proponent currently anticipates achieving the Gold level of the Leadership in Energy and Environmental Design (LEED) rating system by incorporating significant sustainable design features into the Project to preserve and protect the local environment. The Saunders Hotel Group has been at the forefront of sustainable practices in the hospitality industry and will extend these practices with the proposed Project. Please see Section 4.6 for more information regarding green building and sustainable practices.

Increased Employment

The Project will create approximately 700 construction jobs and approximately 338 permanent jobs. The Proponent will make reasonable good-faith efforts to have at least 50% of the construction employee work hours be for Boston residents, at least 25% such employee work hours be for minorities and at least 10% of such employee work hours be for women. The Proponent will enter into a Boston Permanent Employment Agreement with the City of Boston.

1.5 Regulatory Controls and Permits

1.5.1 Zoning

As described in Section 1.5 of the Project Notification Form (PNF), the Project site is located within: (i) Subdistrict K of the Downtown Interim Planning Overlay District (IPOD), governed by Article 27D of the Code; (ii) a Business 8 (B-8) District; (iii) the Restricted Parking Overlay District, governed by Section 3-1A(c) of the Code; and (iv) the Groundwater Conservation Overlay District, governed by Article 32 of the Code. Zoning relief will be required in connection with the Project, as summarized below.

The Project will occupy the site at 40 Trinity Place and will cantilever over a portion of the University Club property (as shown on Figure 1-2) in air space that the University Club will convey to the Proponent.

As described in Section 2.2, the Project will include hotel, health club, accessory hotel uses, multi-family residence, and restaurant uses, space to be occupied by the University Club, which currently leases space within the existing building on the Project site, and parking accessory to the residential use. All of the Project's uses are allowed as-of-right in the B-8 District. The Project studied in the DPIR does not include the existing University Club building nor any future University Club expansion space on the University Club's property, which would be subject to separate study and, if necessary, zoning relief by the

University Club if and when it is proposed. A private agreement with the University Club reserves approximately 10,000 sf of additional gross floor area on its property for possible future expansion.

Due to the inter-connected nature of the Project and the University Club, the two lots have been combined to evaluate compliance with the Stuart Street Planning Study which identifies the block that includes the Project site and University Club property as appropriate for heights of up to 400 feet and a FAR of up to 17.5. The combined FAR of the Project and the existing and future University Club gross floor area is approximately 17.5 excluding parking since, under Article 2A of the Code, floor area required to meet off-street parking requirements is exempt from the FAR calculation. The proposed FAR and height are consistent with the Stuart Street Planning Study.

The Project is anticipated to require relief from the building height and FAR requirements of underlying zoning and the Downtown IPOD, which are lower than the more recent Stuart Street Planning Study guidelines. Dimensional zoning relief may also be required for building or parapet setbacks. The Project will also require zoning relief because of being located in the Groundwater Conservation Overlay District and the Downtown IPOD.

1.5.2 Anticipated Permits, Reviews and Approvals

In addition to requiring zoning relief, as described above, Table 1-1 presents a preliminary list of federal, state, and local permits and approvals that may 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 1-1 Anticipated Permits and Approvals

Agency Name	Permit / Approval
FEDERAL	
Environmental Protection Agency	Coverage under NPDES Construction General Permit; Coverage under NPDES Remediation General Permit (as required)
Federal Aviation Administration	Determination of No Hazard to Air Navigation
STATE	
Department of Environmental Protection	Sewer Connection Permit or Self-Certification (as required); Fossil Fuel Utilization permit (as required); Notice of Demolition/Construction
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit
Massachusetts Historical Commission	Project Notification Form and Memorandum of Agreement
Massachusetts Department of Transportation	Access Permit/Non-Vehicular Access Permit (as required)

Table 1-1 Anticipated Permits and Approvals (Continued)

Agency Name	Permit / Approval
LOCAL	
Boston Redevelopment Authority	Article 80B Large Project Review; Cooperation Agreement; Affordable Housing Agreement
Office of Jobs and Community Service	Boston Permanent Employment Agreement
Boston Employment Commission	Boston Residents Construction Employment Plan
Boston Civic Design Commission	Design Review
Boston Landmarks Commission	Article 85 Demolition Delay Review
Boston Water and Sewer Commission	Site Plan Review; Water and Sewer Connection Permits; Cross Connection Backflow Prevention Approval (as required); Temporary Construction Dewatering Permit
Public Improvement Commission	Specific Repair Plan (as required); Permit/Agreement for Temporary Earth Retention Systems, Tie-Back Systems and Temporary Support of Subsurface Construction (as required); Permit for sign, awning, hood, canopy or marquee, etc. (as required); Street Layout (as required)
Boston Transportation Department	Construction Management Plan; Transportation Access Plan Agreement
Boston Public Works Department	Curb Cut Permit(s); Street Opening Permit (as required); Street/Sidewalk Occupancy Permit (as required)
Boston Air Pollution Control Commission	Parking Freeze Permit/Exemption
Public Safety Commission Committee on Licenses	Permit to Erect and Maintain Garage; Flammable Storage License
Boston Inspectional Services Department	Demolition Permits; Building Permits; Certificate of Occupancy
Boston Fire Department	Permit for fuel storage (as required)

1.5.3 MEPA Applicability

The Project is not expected to require MEPA review. Proposed demolition of the existing building at 40 Trinity Place, which is listed on the Inventory of Historic and Archaeological Assets of the Commonwealth, is a potential MEPA review trigger. However, no other MEPA review thresholds are anticipated to be triggered by the Project. The Proponent anticipates filing a MHC Project Notification Form and entering a Memorandum of Agreement with MHC in lieu of proceeding with MEPA review.

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 with respect to the Project.

1.6.2 History of Tax Arrears on Property

The Proponent does not have a history of tax arrears on property that it owns in the City of Boston.

1.6.3 Evidence of Site Control/Nature of Public Easements

The Proponent owns the property pursuant to a deed recorded on December 16, 2011 at the Suffolk County Registry of Deeds, in Book 639, Page 143 and as shown on Land Court Certificate of Title No. 78670 subject to certain easements in favor of abutters for support, maintenance and access. The Proponent has an agreement with the University Club to purchase air rights for the portion of the Project that cantilevers over the University Club property.

1.7 Community Groups

The Proponent has communicated with the following organizations regarding the Project: Neighborhood Association of the Back Bay, Ellis Neighborhood Association, St. Botolph Neighborhood Association, YWCA, Back Bay Association, Friends of Copley Square, Boston Preservation Alliance, Clarendon Condominium Association 40 Trinity Project Sub-committee, University Club, and Boston Properties. In addition to these groups, the Proponent has met with public agencies and public officials, and will continue to meet with interested parties as the Project progresses.

Section 2.0

Project Description

2.0 PROJECT DESCRIPTION

2.1 Project Site

The Project site, at the southeast corner of the intersection of Stuart Street and Trinity Place in the Back Bay neighborhood of Boston, consists of approximately 13,361 sf of land at 40 Trinity Place and air rights over a portion of the approximately 11,237 sf adjacent parcel at 426 Stuart Street (see Figure 1-5). The site currently includes the Boston Common Hotel and Conference Center, an approximately eight-story, 84,200 sf building operated as a 64-room hotel and approximately 13,650 sf conference facility with one floor of office space and ground floor retail use. The University Club leases a small area within the building for lockers. The air rights parcel includes the four-story, approximately 40,000 sf University Club of Boston. On its other side, the University Club abuts the 13-story Boston YWCA building at the corner of Stuart Street and Clarendon Street. A service alley located between a portion of this block of Stuart Street and the 100 Clarendon Street (former John Hancock) Parking Garage to the south serves all three parcels.

Stuart Street runs between Copley Place to the west and Washington Street to the east, and contains a variety of building types that include high-rise office, hotel and residential buildings, as well as parking garages, restaurants and smaller scale commercial businesses. At the western end of the Stuart Street corridor is the 38-story Boston Marriott Copley Place and the 38-story Westin Hotel at Copley Place; and at the eastern end of the corridor is the 25-story W Boston Hotel and Residences at the corner of Stuart and Tremont streets, which will soon be joined by the 29-story 45 Stuart Street residential tower. In between these buildings stand the original John Hancock building at the corner of Berkeley Street, the 32-story Clarendon condominiums and apartments at the corner of Clarendon Street, and the iconic "new" John Hancock Tower, Boston's tallest building, also at the corner of Clarendon Street and just across Stuart Street from the Project site. At the corner of Berkeley and Stuart streets, the new Liberty Mutual building is under construction. These buildings vary in character, and contribute in their own way to the existing Back Bay skyline which includes Boston's tallest and among its most iconic buildings. A major new 47-story residential tower by Simon Properties at Copley Place has been approved by the City and is expected to be added to the skyline as well.

The Project is located within the Stuart Street Planning Study area, bounded by St. James Avenue to the north, Dartmouth Street to the west, Columbus Avenue and Cortes Street to the south and Arlington Street to the east. The Stuart Street Planning Study was a multi-year planning process involving multiple stakeholders organized to propose development guidelines and zoning recommendations for the Stuart Street Planning Study area. In November 2010, the Stuart Street Planning Study Proposed Development Review Guidelines (henceforth the Stuart Street Planning Study) were issued, but they have not been formally adopted. The Project has been designed to be consistent with the intent of the Stuart Street Planning Study as described throughout the DPIR.

The Stuart Street Planning Study locates the block along Stuart Street within which the Project Site is located as one in which greater height and density are appropriate. The Proponent is in active discussions with the property owners along this block concerning coordinating planning and development of the respective properties. The Proponent has already entered into an agreement with the University Club in regard to these issues, and this agreement could be a model for such coordination among other owners.

2.2 Proposed Development

2.2.1 Description

The Project will bring new energy and an updated streetscape that will dramatically improve the character of the pedestrian environment on this currently lifeless block of the otherwise lively Back Bay area for residents, workers and visitors alike. The inclusion of hotel and residential uses, as well as new restaurants, in a predominately commercial area, and in particular to a block with minimal activity after work hours, will support a vibrant atmosphere in which people will want to live, work, and play. The new building features an active ground floor that will include a signature casual neighborhood restaurant, multiple public entrances, improved streetscape, and a transparent first floor wrapping Stuart Street and Trinity Place and allowing for visibility into and from the Project. The proposed street-level environment is a significant improvement over the existing building, with its first floor consisting of heavy masonry and small windows, minimal pedestrian level activity and separation of the uses within the building from the public realm. Current conditions are not pedestrian friendly, and the existing building does not meet modern urban design standards, and would not meet accessibility standards without significant alteration. Therefore, the Project's streetwall frontage, activated pedestrian environment and pedestrian entrances are consistent with the intent of the Stuart Street Planning Study.

As stated above, the Project includes the construction of approximately 227 guest rooms, conference and ballroom areas, and a pool and fitness center. Three restaurants and lounges totaling approximately 11,300 sf are also currently planned. The proposed building will replace the University Club's space in the current building as well as expand the University Club's existing space. The residential portion of the Project, comprising approximately 115 modern condominium units, will be located on the upper floors of the new building. A two level garage accessed by automobile elevators will be located on floors 4 and 5 of the new building and will provide approximately 100 on-site parking spaces for the residential units. Figures 2-1 to 2-4 show renderings of the Project and Figures 2-5 through 2-8 include a Section and Floor Plans.

The Project activates Stuart Street, Trinity Place and the building façade with two separate attractive pedestrian entrances. The residential entrance will be located nearest to the University Club, while the hotel entrance will be located in a more visible location, near the corner of Stuart Street and Trinity Place. Another highly visible entrance will be located

40 Trinity Place Boston, Massachusetts

tat | the architectural team

Figure 2-1

View from Berkeley Street Bridge

40 Trinity Place Boston, Massachusetts

Figure 2-2

View from Copley Square

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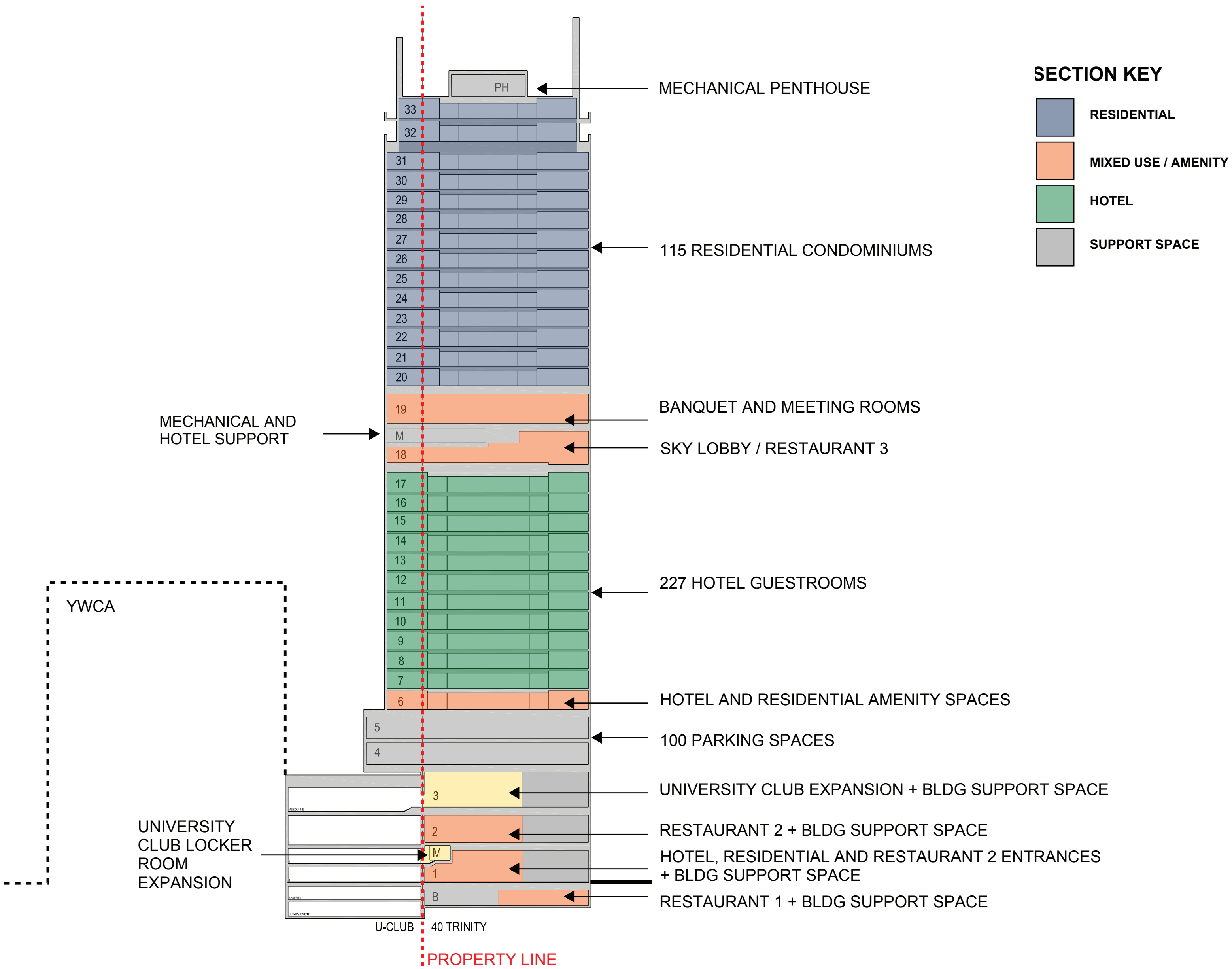
Figure 2-3

View from Dartmouth and Stuart Street Intersection

Figure 2-4

View from Southwest Corridor



40 Trinity Place Boston, Massachusetts

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Figure 2-5

Programmatic Building Section

40 Trinity Place   Boston, Massachusetts

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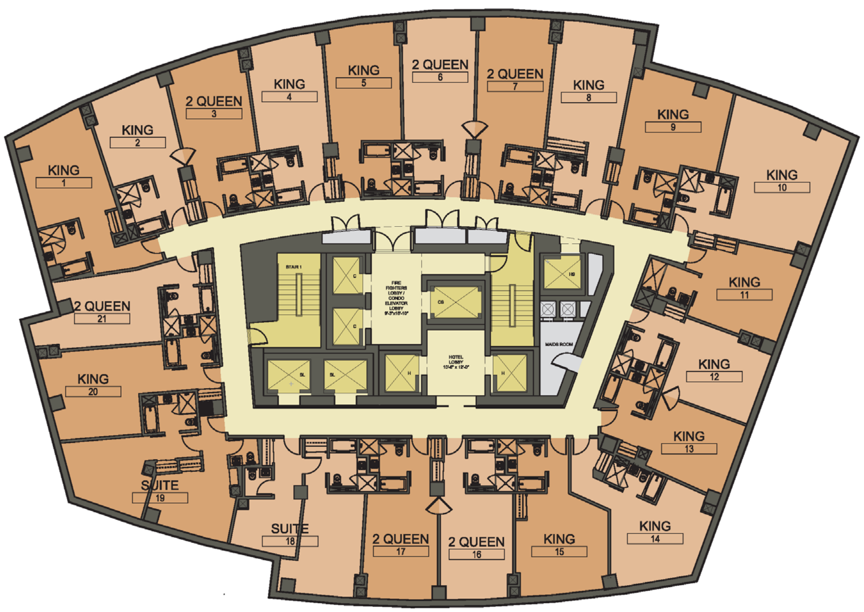
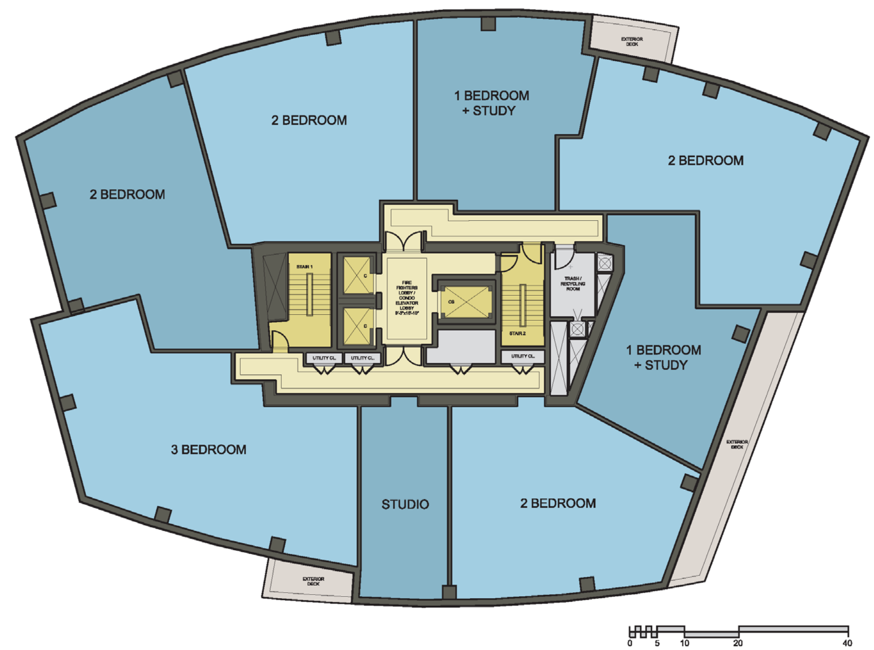
Figure 2-6

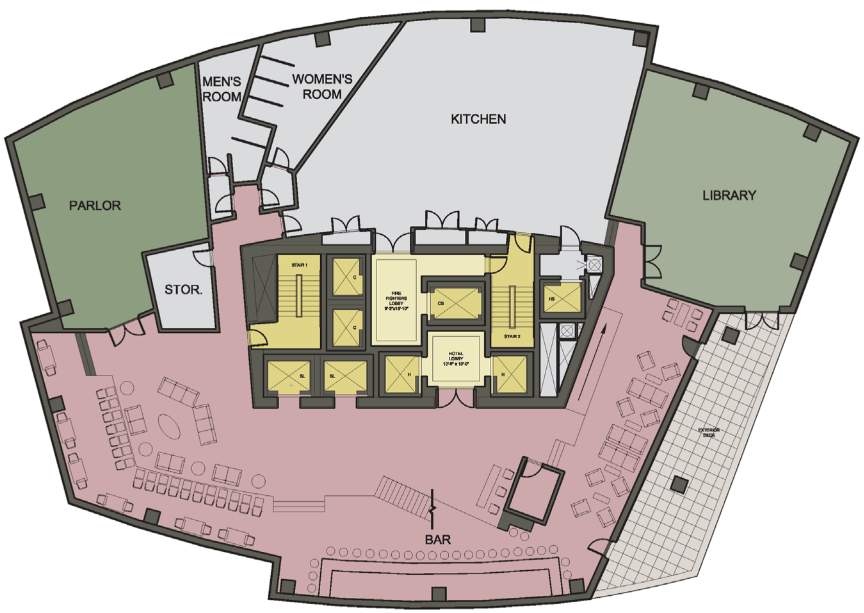
Ground Floor Plan



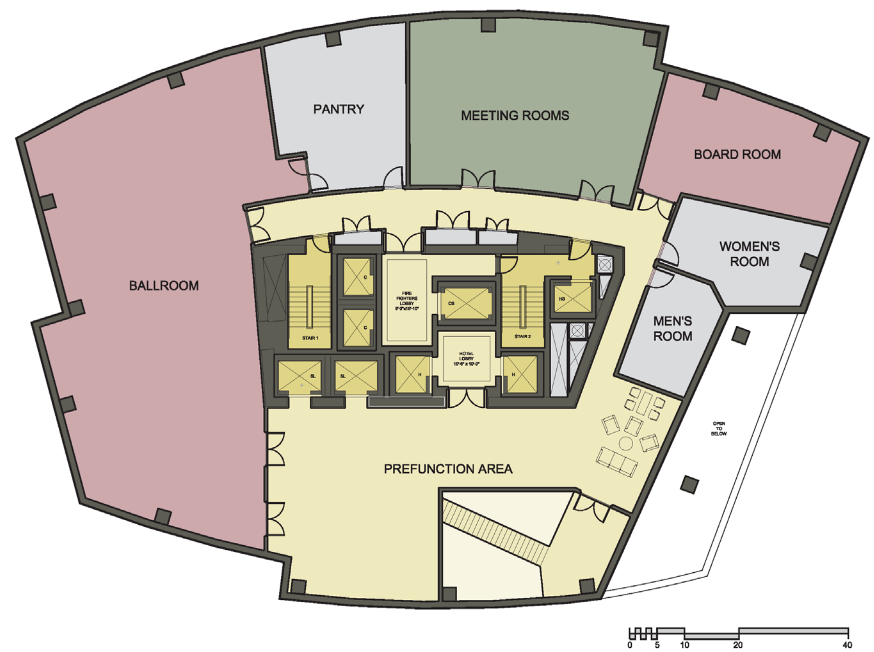
TYPICAL HOTEL FLOOR - LEVEL 7 TO 17
13,224 GSF



TYPICAL RESIDENTIAL FLOOR - LEVEL 20 TO 31
12,709 GSF



HOTEL SKY LOBBY - LEVEL 18
12,408 GSF



HOTEL BANQUET LEVEL - LEVEL 19
12,408 GSF

on the Trinity Place façade at the corner accessing a restaurant (see Figures 2-9 and 2-10). The public nature of the two corner entrances are enhanced by a widening of the sidewalk into a pocket plaza. Together with their locations on the façade, the three entrances are clearly distinguished from each other, with the most active ground floor uses accessible from the most visible areas. The public nature of the hotel and restaurant uses will be additionally "readable" from the public realm with the implementation of a highly transparent skin at the ground level and second floor.

The corner pocket plaza is anticipated to be developed with a rich pattern of curbing and special paving to mark it as a destination, and to distinguish it from adjacent sidewalks. This enhanced paving is anticipated to continue along the Stuart Street and Trinity Place sidewalks consistent with the level of pedestrian activity, and will meet applicable City standards. A continuous entry canopy will extend the length of the Stuart Street façade and wrap the corner to Trinity Place, sheltering the corner plaza and restaurant entrance.

The Proponent intends to add new street trees along the widened Trinity Place and Stuart Street sidewalks and will work with Boston Bikes and Boston Transportation Department to identify the appropriate number of bicycle racks for visitors in consideration of sidewalk constraints in the area.

The entrance to the hotel is at the ground floor. The ground floor lobby area is a modest-sized "welcome" area, from which guests are whisked by two dedicated express elevators up to the hotel's main lobby on the 18^{th} floor, a "sky lobby" that will be the first of its kind in Boston. The creation of the sky lobby and connected conference/meeting space on the 19^{th} floor will result in a unique new public realm for the City of Boston, where hotel guests, area residents and conference goers will enjoy dramatic spaces 200+ feet above the streets of the City (see Figures 2-11 and 2-12). Hotel guests will check in, local residents may enjoy dinner or cocktails either indoors overlooking the Back Bay skyline, or on an approximately 1,000 sf outdoor terrace gazing over the South End towards the Boston Harbor. Conference goers will hold meetings and functions in the hotel's meeting rooms, parlor, library or grand ballroom with views of the Hancock Building and Cambridge. Together with the hotel's signature restaurant and lower level lounge, these spaces will truly revitalize and rebalance Stuart Street, invigorating an area that is underused during the day and has historically been deserted after 6:00 p.m. The Project will become a favorite neighborhood destination for Back Bay and South End locals, its own hotel guests and condominium residents.

Figure 2-9

View From Stuart Street

40 Trinity Place   Boston, Massachusetts

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Figure 2-10

Stuart Street and Trinity Place Entries

40 Trinity Place **Boston, Massachusetts**

tat | the architectural team

Figure 2-11

Sky Lobby

40 Trinity Place Boston, Massachusetts

tat | the architectural team

Figure 2-12

Sky Lobby Terrace

The entrance to the garage elevators will be located on Trinity Place, roughly opposite the entrance to the 100 Clarendon Street garage entrance. Service and loading functions will be located on the south façade to the rear of the building as they are with the existing building (see Figure 2-5). The location of these uses at the rear of the building will clearly separate service and parking access functions from pedestrian paths of residents and visitors, whose entrances to the building will be located on Stuart Street and the corner of Trinity Place and Stuart Street. This clear separation of uses is consistent with the intent of the Stuart Street Planning Study regarding off-street parking and location of service areas. Additionally, locating these uses to the rear of the Project site will minimize the building's impact on Stuart Street traffic patterns. Please see Chapter 3 for more information regarding traffic.

The building's exterior architecture, designed by The Architectural Team of Chelsea, MA, is a striking addition to the Stuart Street skyline. The design of the Project responds to the sharp angularity of the neighboring Hancock Tower, the rectilinear, box-like form of the nearby The Clarendon, and the fluid curvature of the approved Simon Tower at Copley Place, without attempting to mimic any of those buildings. The building will complement the surrounding buildings, while at the same time distinguishing itself from its neighbors in the city skyline by its organic form combining gentle curves with dramatic angles, all in a unified glass and metal façade (see Figures 2-1 to 2-4).

The Project program is provided in Table 2-1.

Table 2-1 Project Program

Project Element	Approximate Dimension
Residential	115 units
Hotel	227 keys
Restaurant	11,300 sf
University Club Expansion	5,550 sf
Total Square Footage	**380,450 sf**
Parking	100 Spaces

2.2.2 Changes Since the PNF

Since the filing of the PNF, minor changes have been made to the Project. The number of residential units has decreased from approximately 142 units to 115 units. The number of hotel rooms has increased from approximately 220 to 227. The space allocated for the University Club Expansion has decreased from approximately 10,000 sf to approximately 5,550 sf. The number of restaurants has increased from two to three, and the total square footage of restaurant space has increased from approximately 7,810 sf to approximately 11,300 sf. The total square footage of the Project has increased only slightly from approximately 379,370 sf to approximately 380,450 sf.

2.3 Alternatives as Required by BRA Scoping Determination

2.3.1 No-Build Alternative

In the No Build Alternative, the Boston Common Hotel and Conference Center would remain on the proposed site. The streetscape would stay in its current condition, with minimal building-street interaction and a separation of the uses within the building from the public realm. This particular block would continue to have limited activity, and the City of Boston would not benefit from either the increased tax revenues or the new employment potential that the proposed building would generate.

2.3.2 As-of-right Alternative

The As-of-right Alternative would include a building that is 155 feet in height, approximately 45 feet above the existing building height, and would extend along Stuart Street from Trinity Place and over the University Club. The As-of-right Alternative would include a primarily office building in lieu of residential and hotel uses, along with restaurant and conference spaces. A full build-out of the site consistent with zoning is most appropriate for an office use given the shape and footprint. The As-of-right Alternative, however, would not include sufficient space to make the project financially feasible. This Alternative has been analyzed for its transportation, wind, shadow and daylight impacts in Sections 3.4, 4.1, 4.2 and 4.3, respectively, as required by the BRA Scoping Determination.

2.4 Schedule

Construction of the Project is estimated to last approximately 28-30 months (though the hotel will open sooner), with initial site work expected to begin in late 2013 or early 2014, and completion in the spring of 2016.

Section 3.0

Transportation

3.0 TRANSPORTATION

3.1 Introduction

In accordance with the City of Boston's *Transportation Access Plan Guidelines*, this section describes roadway, pedestrian, and bicycle conditions; parking and loading; pedestrian and bicycle circulation; proposed mitigation; transportation demand management (TDM); and transportation goals for the Project. Additionally, comments received from the Boston Transportation Department (BTD), as part of the Scoping Determination issued by the BRA, are addressed.

3.1.1 Project Description

The Project site, at 40 Trinity Place, is located in Boston's Back Bay neighborhood south of Stuart Street between Dartmouth and Clarendon streets. The site abuts 426 Stuart Street (University Club of Boston) to the east and the 100 Clarendon Street Garage to the south and west. The John Hancock Tower is across from the site on Stuart Street to the north.

Currently, the Boston Common Hotel and Conference Center occupies the site, with its entrance on Trinity Place. A Dunkin Donuts shop is located on the street level with a doorway onto Stuart Street. Additional ground floor retail space along Stuart Street is currently vacant.

The Project includes demolition of the existing building and construction of a new 33-story mixed-use building totaling approximately 380,450 sf, with 115 residential units, a 227-room hotel, and three restaurants. A shared health/fitness center will be provided for residents and hotel guests. Residential parking for 100 vehicles will be provided in an above grade garage accessed via vehicle elevators. The Project will also include approximately 5,550 sf of space to be occupied by the adjacent University Club.

Table 3-1 shows the summary of proposed land uses.

Table 3-1 40 Trinity Project Program

Land Use	Quantity
Residential	115 condominiums
Hotel	227 rooms
Restaurant	11,300 sf
University Club	5,550 sf
Parking Spaces	100 spaces

3.1.2 Methodology

In accordance with BTD Transportation Access Plan Guidelines (2001), the study team conducted a transportation analysis for the proposed Project. The analysis is summarized in the following sections:

- Section 3.2 (Existing Transportation Conditions) includes an inventory of existing transportation conditions, including intersection operation, parking, site access and circulation, public transportation, car sharing and pedestrian and bicycle conditions.
- Section 3.3 (Evaluation of Long-term Impacts) includes future transportation conditions and potential traffic impacts associated with the proposed development and other neighboring projects. Long-term impacts are evaluated for the year 2018, based on a five-year horizon from the 2013 base year. Expected roadway, parking, transit, pedestrian/bicycle, and loading conditions are identified. This section includes the following scenarios:
  - No Build Scenario (2018) includes general background growth and volumes from specific projects expected by the design year; and
  - Build Scenario (2018) includes specific travel demand forecasts for the proposed Project.
  - As-of-right Scenario includes trip generation comparison to the proposed Build Scenario.
- Section 3.4 includes a discussion of the As-of-right Alternative.
- Section 3.5 (Transportation Mitigation Measures) includes pedestrian mitigation, bicycle accommodations and Transportation Demand Management.
- Section 3.6 (Evaluation of Short-term Construction Impacts) will include short-term traffic impacts associated with construction activities

3.1.3 Study Area

The Project's traffic impact study area is generally bounded by St. James Avenue to the north, Stuart Street to the south, Clarendon Street to the east, and Dartmouth Street to the west. As shown in Figure 3-1, the study area includes the following six intersections:

- Stuart Street/Dartmouth Street;
- Stuart Street/Clarendon Street;
- St. James Avenue/Clarendon Street;
- St. James Avenue/Dartmouth Street;
- Stuart Street/Trinity Place; and
- St. James Avenue/Trinity Place.

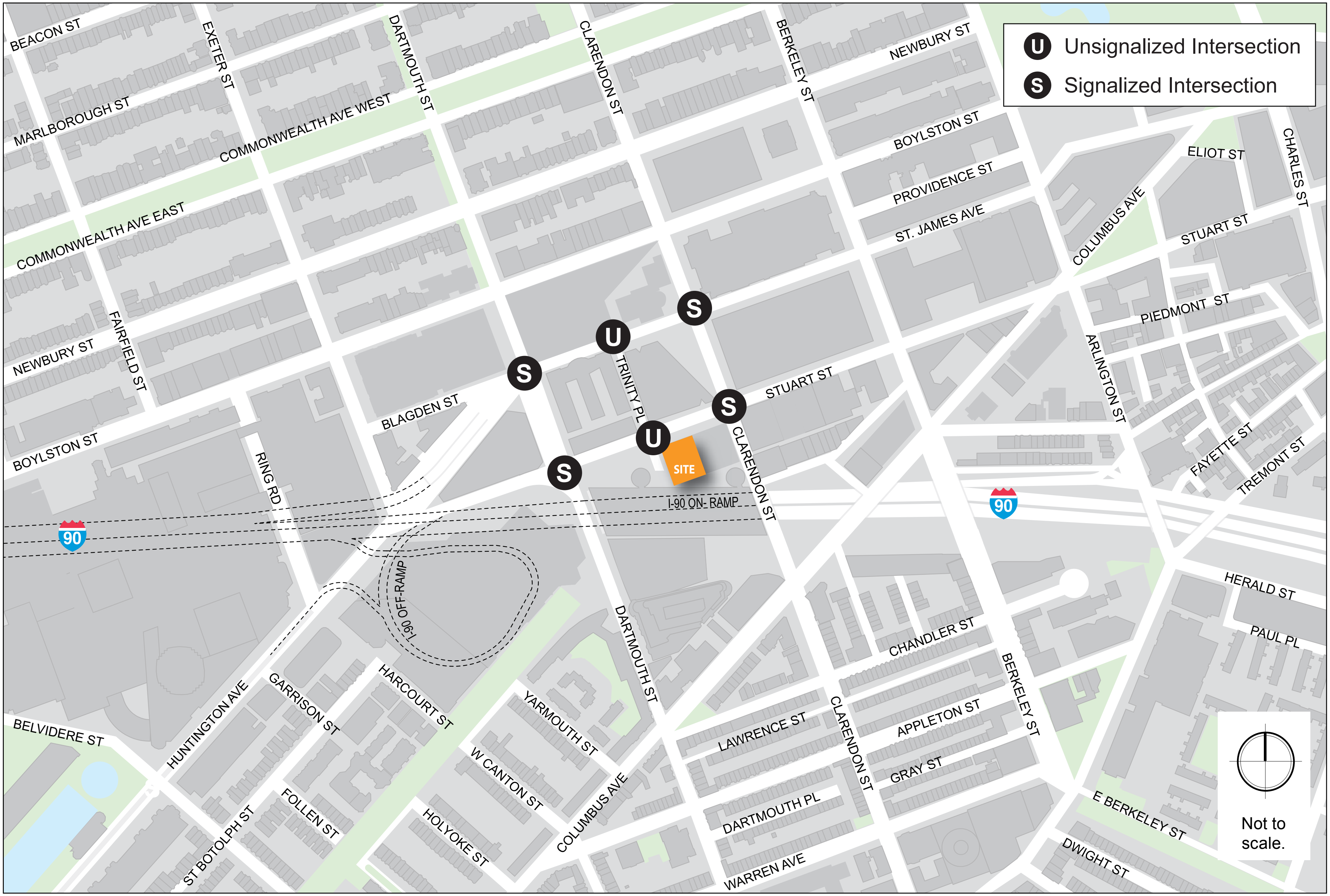

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Figure 3-1
Study Area Intersections

3.2 Existing Conditions

3.2.1 Existing Roadway Conditions

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

Stuart Street is an east–west urban principal arterial that runs from Huntington Avenue to Washington Street, where it becomes Kneeland Street. At the Project site, Stuart Street is one-way eastbound with three travel lanes, one of which becomes a right turn only lane at Clarendon Street. At the approach to Dartmouth Street, Stuart Street is four lanes wide narrowing to three lanes east of the intersection. Parking is restricted to valet parking for the University Club on the south side of Stuart Street and for the Farmer's Market along the north side between Trinity Place and Clarendon Street. Metered parking is provided on both the north and the south sides of the street west of Trinity Place and east of Clarendon Street. Food Truck parking is permitted west of Trinity Place on the south side of the street.

St. James Avenue is an urban principal arterial that runs from Arlington Street to Dartmouth Street. Between Arlington Street and Berkeley Street, St. James Avenue is two-way, with one eastbound lane and two westbound lanes. Between Berkeley Street and Dartmouth Street, it runs one-way westbound, providing three travel lanes. No parking is provided along St. James Avenue between Berkeley Street and Dartmouth Street, but metered parking is available on the north and south sides of St. James Avenue between Berkeley Street and Arlington Street.

Dartmouth Street is a north–south urban minor arterial from Tremont Street in the South End to Stuart Street in the Back Bay; it runs one-way northbound from Stuart Street to Beacon Street. Within the study area, Dartmouth Street widens from two travel lanes (one in each direction) south of Stuart Street to five lanes between Stuart Street and St. James Avenue, narrowing to three lanes north of St. James Avenue.

Clarendon Street is an urban minor arterial that runs one-way southbound from the Back Bay to the South End. The roadway consists of two travel lanes within the study area. Metered parking is provided on both sides of the street, with the exception of the block between St. James Avenue and Stuart Street. Residential parking is provided on both sides of the street south of Columbus Avenue.

Trinity Place is a north-south two-way local street that runs between St. James Avenue and the I-90/Mass Pike access ramp in the area behind 40 Trinity, the University Club, and the YWCA. The roadway consists of one travel lane in each direction. This street serves as an entry for the westerly drum of the 100 Clarendon Street Garage and as one of two exits for the easterly drum of the garage. Drivers from the easterly drum can also exit directly to the

Massachusetts Turnpike Clarendon Street ramp. North of Stuart Street, generally no parking is allowed on either side of Trinity Place, although a 40-foot commercial parking zone exists along the western side. The loading dock and a garage entrance for the John Hancock Tower are located on the east side. Taxis frequently queue back from the Fairmount Copley Plaza entrance on St. James Avenue along the Trinity Place west curb. South of Stuart Street, food truck parking is permitted along the west side and metered parking is available on the east side of Trinity Place.

3.2.2 Existing Intersection Conditions

Stuart Street/Dartmouth Street is a four-way, signalized intersection with approaches from Stuart Street eastbound and Dartmouth Street northbound. The eastbound Stuart Street approach consists of two exclusive channelized left-turn lanes, three through lanes, and an exclusive channelized right-turn lane. The Dartmouth Street northbound approach consists of three travel lanes: two through lanes and one right-turn-only turn bay. A taxi stand and pick-up/drop-off parking are located just south of the intersection. On the south side of the intersection, a concrete median separates northbound and southbound traffic on Dartmouth Street as Dartmouth Street becomes two-way in this block. Crosswalks and wheelchair ramps are provided across all four legs of the intersection, as well as across the channelized turn lanes.

Stuart Street/Clarendon Street is a four-way, signalized intersection with two approaches. The Stuart Street eastbound approach consists of three travel lanes: two through lanes and a right-turn lane. The Clarendon Street southbound approach comprises two travel lanes: one through lane and one shared left-turn/through lane. No parking is allowed on either side of the Clarendon Street approach. Crosswalks and wheelchair ramps are located across all four sides of the intersection.

St. James Avenue/Clarendon Street is a four-way, signalized intersection with approaches from St. James Avenue westbound and Clarendon Street southbound. The St. James Avenue westbound approach comprises three travel lanes: two through lanes and one left-turn lane. Clarendon Street southbound consists of two travel lanes: one through lane and one shared through/right-turn lane, with time-restricted metered parking on the east and west sides of the approach. Crosswalks and wheelchair ramps are located across all four sides of the intersection.

St. James Avenue/Dartmouth Street is a five-leg, signalized intersection with two approaches: Dartmouth Street northbound and St. James Avenue westbound. The Dartmouth Street northbound approach consists of two left-turn lanes and three through lanes. The St. James Avenue westbound approach consists of two through lanes and one right-turn lane. Blagden Street, Huntington Avenue, and an I-90 westbound on-ramp are located on the west side of the intersection.

Stuart Street/Trinity Place is a four legged, unsignalized intersection with three approaches: Stuart Street eastbound and Trinity Place northbound and southbound. The Stuart Street eastbound approach consists of two through travel lanes. The Trinity Place northbound and southbound approaches each have one travel lane. The Trinity Place approaches are controlled by stop signs. While currently unsignalized, the City will be installing a traffic signal at this intersection. Design of the associated roadway modifications and signal elements is nearly complete and construction will likely start in 2013.

St. James Avenue/Trinity Place is a three legged, unsignalized intersection with two approaches: St. James Avenue westbound and Trinity Place northbound. The St. James Avenue westbound approach consists of two through travel lanes. The Trinity Place northbound approach has one travel lane. The northbound approach is controlled by a stop sign and all northbound traffic must turn left onto St. James Avenue.

3.2.3 Existing Traffic Volumes

Turning movement counts were collected during the weekday morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak periods in March 2011[1]. Based on these counts, the weekday peak hours were identified as 8:00-9:00 a.m. and 5:00–6:00 p.m. To estimate Year 2013 conditions, a conservative annual growth factor of 0.5% per year was applied to the 2011 count data.

Figures 3-2 and 3-3 show the Year 2013 peak hour turning volumes for the study area intersections for the a.m. peak hour and p.m. peak hour, respectively. Peak hour pedestrian volumes and bicycle volumes are shown in Sections 3.2.7 and 3.2.9, respectively.

Count data are provided in Appendix B.

3.2.4 Existing Traffic Operations

Traffic operations are determined through a capacity analysis of intersections. Level of Service (LOS) and delay at the intersections were analyzed using the Synchro software developed by Trafficware. Synchro 6 was used to evaluate the effects that closely spaced intersections may have on one another. Synchro is based on the traffic operational analysis methodology of the Transportation Research Board's *2000 Highway Capacity Manual* (HCM); LOS and delay (in seconds) are determined based on intersection geometry and available traffic data for each intersection.

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1 Note that the Massachusetts Environment Policy Act (MEPA) office, Massachusetts Department of Transportation, and BTD sanction the use of traffic data that has been collected within three years prior to a proposed project's transportation evaluation.

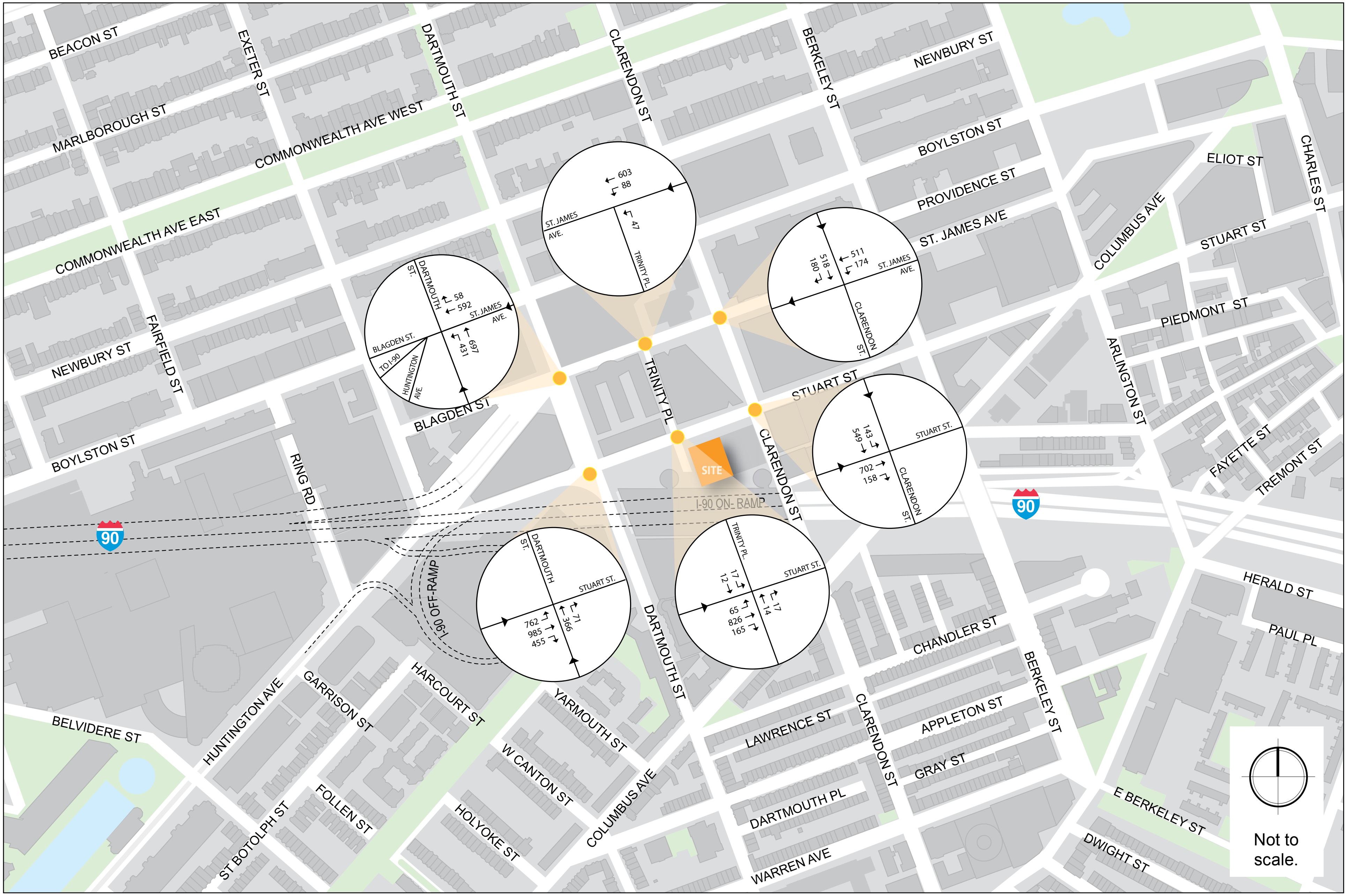

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Figure 3-2
Existing Conditions (2013) Turning Movement Counts, a.m. Peak Hour (8:00-9:00 a.m.)

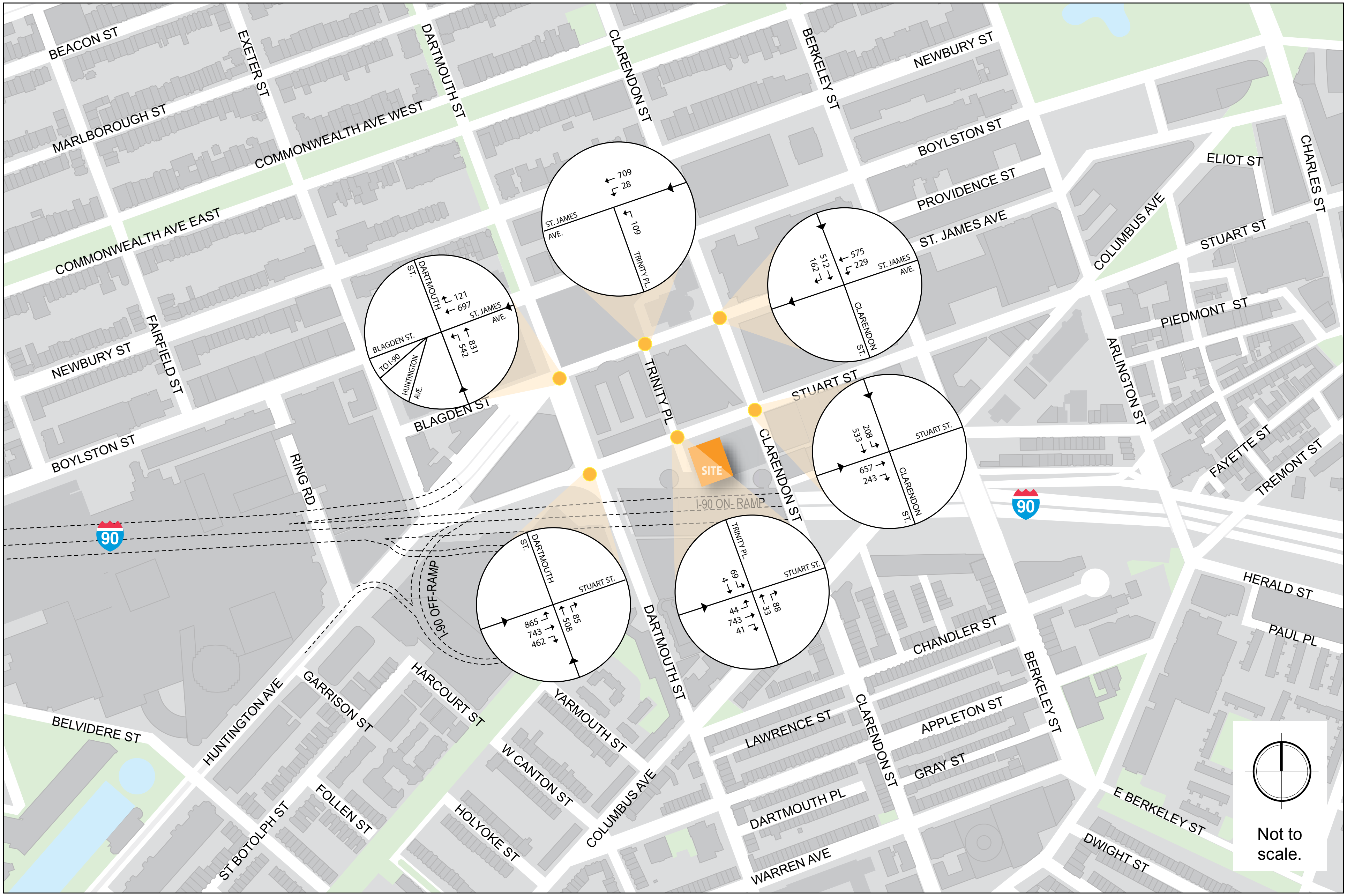

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Figure 3-3

Existing Conditions (2013) Turning Movement Counts, p.m. Peak Hour (5:00-6:00 p.m.)

The study team performed field observations to establish intersection geometry (i.e., number of turning lanes, lane length, and lane width). Signal timing and phasing used in this analysis were obtained from BTD and through field observations conducted by the study team.

Table 3-2, derived from the HCM, shows LOS criteria for signalized and unsignalized intersections. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (over capacity), with significant traffic delay. LOS D is generally considered acceptable in an urban environment, such as the Back Bay.

Table 3-2 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.		

Tables 3-3 and 3-4 show the Existing Conditions capacity analysis summary for study area intersections during the a.m. peak hour and p.m. hour, respectively. The tables show LOS, average delay, volume to capacity ratio, and 95th percentile queue length (feet) for the overall intersection and each approach.

All intersections, with the exception of Stuart Street/Trinity Place, operate at LOS D or better during each peak hour.

At the unsignalized intersection of Stuart Street/Trinity Place, both Trinity Place approaches operate at LOS F, primarily due to the pedestrian volumes in the Trinity Place crosswalks. Vehicular volumes on Trinity Place are relatively low (about 30 vehicles an hour) during the a.m. peak hour, but increase significantly during the p.m. peak hour as parkers in both the 100 Clarendon Street Garage and the garage within the John Hancock Tower exit onto Stuart Street (see Figures 3-2 and 3-3 for intersection volumes). As noted in Section 3.2.2, the City will be installing a traffic signal at the Stuart Street/Trinity Place intersection, which will provide safer crossing of pedestrians and better overall traffic flow. Design of the associated roadway modifications and signal elements is nearly complete and construction will likely start in 2013. The future conditions for Year 2018, presented later in this chapter, incorporate the new traffic signal.

Complete Synchro reports are provided in Appendix B.

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

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Stuart Street/Dartmouth Street	**B**	**18.5**		
Stuart EB left | left	A	3.5	0.43	76
Stuart EB thru | thru | thru	C	21.2	0.53	203
Stuart EB right	D	39.9	0.86	#369
Dartmouth NB thru | thru	B	13.7	0.28	97
Dartmouth NB right	B	15.7	0.32	47
Stuart Street/Clarendon Street	**B**	**10.7**		
Stuart EB thru |thru	A	8.5	0.57	250
Stuart EB right	A	3.6	0.37	24
Clarendon SB left/thru | thru	B	14.6	0.62	236
St. James Avenue/Clarendon Street	**B**	**17.1**		
St. James WB left/thru | thru	B	19.6	0.55	196
Clarendon SB thru | thru/right	B	14.7	0.47	170
St. James Avenue/Dartmouth Street	**C**	**27.3**		
St. James EB thru | thru	D	40.7	0.62	251
St. James EB right	C	32.4	0.16	m64
Dartmouth NB left | left	B	12.7	0.51	87
Dartmouth NB thru | thru | thru	C	24.9	0.61	146
Unsignalized Intersections				
Stuart Street/Trinity Place				
Stuart EB left/thru | thru | thru/right	D	31.7	0.51	60
Trinity NB thru/right	F	>50.0	>1.00	na
Trinity SB left/thru	F	>50.0	>1.00	na
St. James Avenue/Trinity Place				
St. James WB left/thru | thru	A	0.7	0.08	6
Trinity NB left	C	19.3	0.17	15

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicated unacceptable level of service.

Table 3-4 Existing Conditions (2013), Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Stuart Street/Dartmouth Street	**B**	**14.9**		
Stuart EB left | left	A	3.8	0.48	89
Stuart EB thru | thru | thru	B	13.7	0.36	121
Stuart EB right	C	22.4	0.69	306
Dartmouth NB thru | thru	C	21.3	0.40	164
Dartmouth NB right	C	32.9	0.40	49
Stuart Street/Clarendon Street	**B**	**12.3**		
Stuart EB thru |thru	B	12.0	0.52	88
Stuart EB right	A	6.2	0.57	44
Clarendon SB left/thru | thru	B	14.6	0.69	114
St. James Avenue/Clarendon Street	**B**	**17.2**		
St. James WB left/thru | thru	B	16.9	0.55	208
Clarendon SB thru | thru/right	B	17.6	0.50	180
St. James Avenue/Dartmouth Street	**C**	**20.3**		
St. James EB thru | thru	B	18.6	0.68	154
St. James EB right	B	15.2	0.28	63
Dartmouth NB left | left	B	17.2	0.69	120
Dartmouth NB thru | thru | thru	C	24.8	0.73	196
Unsignalized Intersections				
Stuart Street/Trinity Place				
Stuart EB left/thru | thru | thru/right	A	0.9	0.24	6
Trinity NB thru/right	F	>50.0	>1.00	na
Trinity SB left/thru	F	>50.0	>1.00	na
St. James Avenue/Trinity Place				
St. James WB left/thru | thru	A	0.4	0.30	2
Trinity NB left	C	20.0	0.33	36

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95^{th} percentile queue is metered by the upstream signal.
Grey shading indicated unacceptable level of service.

3.2.5 Existing Parking

The existing site has a small number of private parking spaces in the alley behind the site. As shown in Figure 3-4, additional parking is provided in this alley for the University Club and YW Boston. Permits are required to park in these spaces..

As shown in Figure 3-5, on-street curbside regulations adjacent to the Project site include a mix of metered parking, commercial loading, and evening valet spaces.

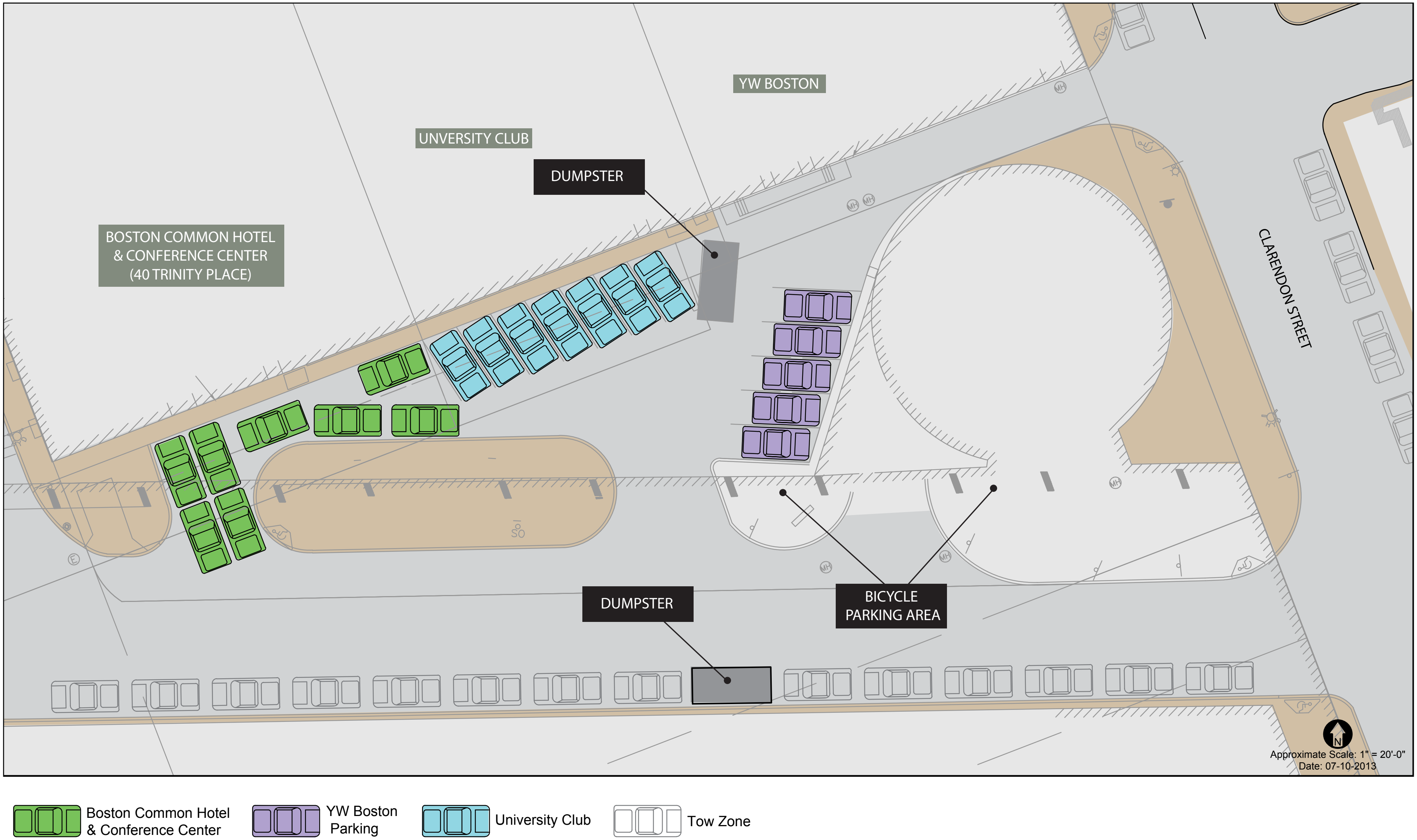

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Figure 3-4
Existing On-site Parking

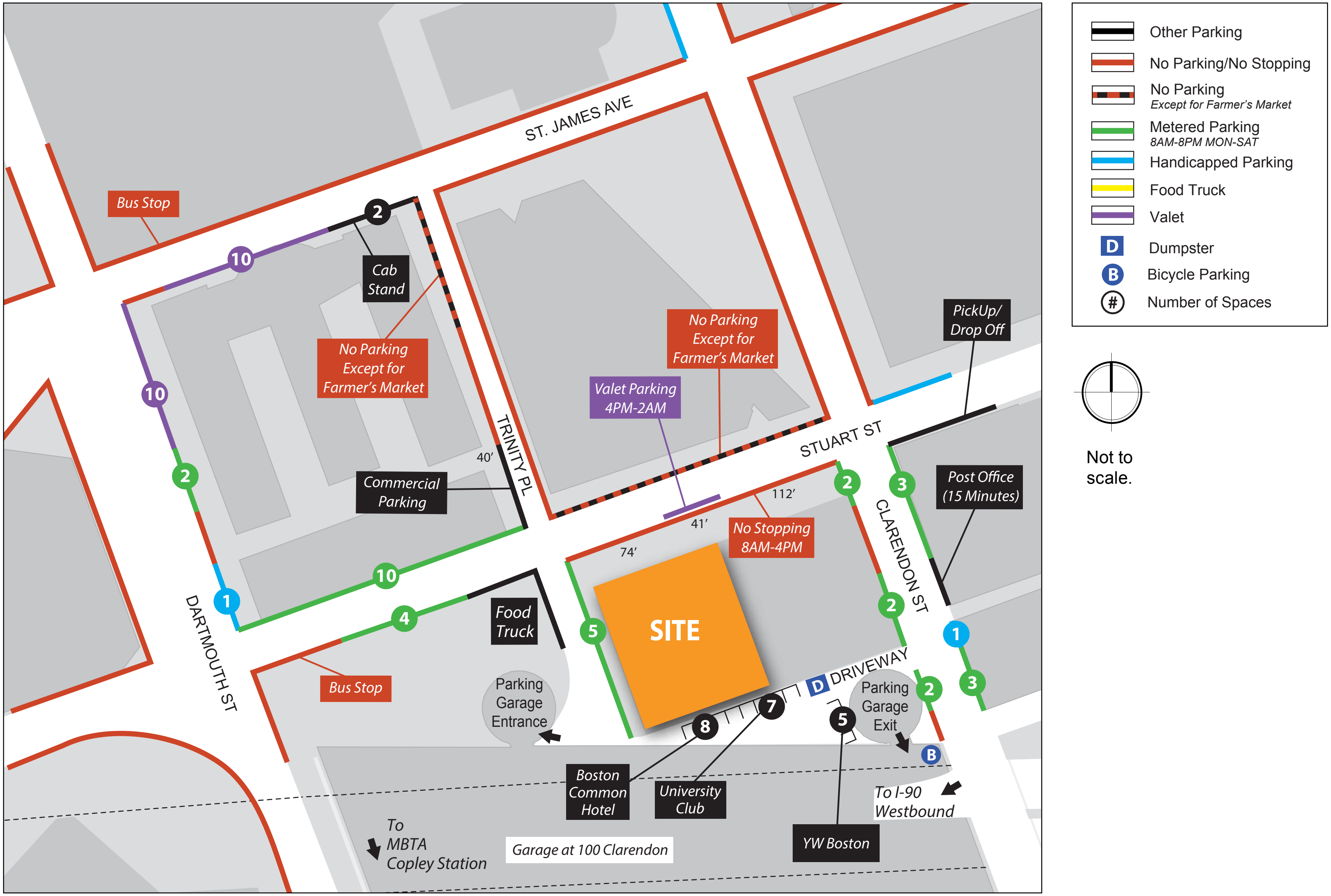

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Figure 3-5
Existing Curbside Inventory

Approximately 11,748 off-street parking spaces are provided in garages and lots within a quarter-mile radius of the Project site. Of these, approximately 6,900 are for private use and approximately 4,700 spaces are available for public use. These parking facilities and their capacities are identified in Table 3-5 and mapped in Figure 3-6.

3.2.6 *Existing Public Transportation*

The study area is well-served by public transportation. The Massachusetts Bay Transportation Authority (MBTA) Back Bay Station, a major rail transportation hub is adjacent to the Project site. Additionally, Copley Station is located within a five-minute walk (less than ¼ mile) of the Project site. At Back Bay Station, passengers can access Orange Line rapid transit service, commuter rail services to points west and south of Boston, Amtrak Northeast Regional and Acela train services, and Megabus, an intercity bus carrier. Copley Station serves the four branches of the MBTA Green Line light rail service. Four local bus routes and three express routes have stops within ¼ mile of the site. MBTA services in the study area summarized in Table 3-6 and shown in Figure 3-7.

3.2.7 *Existing Pedestrian Conditions*

Crosswalk pedestrian counts, as shown in Figure 3-8, were taken as part of the intersection turning movement counts. With numerous office buildings, institutions, residential buildings, restaurants, and transit stations, pedestrian activity is high throughout the day, although not unusual for a dense urban area such as the Back Bay. Additionally, the parking garage at 100 Clarendon Street has approximately 2,000 parking spaces and generates many pedestrian trips along Trinity Place between the garage and nearby destinations, including the John Hancock Tower.

Overall, the intersection pedestrian volumes tend to be higher in the p.m. peak hour than during the a.m. peak hour. Four of the six intersections have pedestrian volumes between 1,500 and 2,400 pedestrians per hour, including the three intersections along Stuart Street and St. James Avenue/Dartmouth Street. The remaining two intersections on St. James Avenue have hourly pedestrian volumes between 900 and 1,300 pedestrians per hour.

Sidewalks in the study area are generally in good condition, and supply more than adequate capacity. Handicapped-accessible ramps and crosswalks are provided at most study area intersections. Pedestrian counts are included as part of the traffic count data in Appendix B.

Table 3-5 Off-street Parking within a Quarter-mile of the Site

Map No.	Facility/Address	Capacity (spaces)	
		Private	Public
	Lots		
1	Dartmouth Street Lot *78-284 Dartmouth Street*	0	71
2	Restoration Hardware *60 Newbury Street*	64	0
3	Payette Lot *40 Isabella Street*	0	52
	Subtotal	**64**	**123**
	Garages		
A	The 100 Clarendon Street Garage *100 Clarendon Street*	1,437	576
B	The Clarendon *400-406 Stuart Street*	300	93
C	131 Dartmouth Street Garage *131 Dartmouth Street*	630	100
D	Back Bay Garage (NE Life Building) *500 Boylston Street*	375	625
E	Prudential Center *800 Boylston Street*	2,067	1,854
F	10 St. James *10 St. James Avenue*	230	170
G	Westin Hotel Garage *10 Huntington Avenue*	275	0
H	Trinity Place Garage 15-41 Huntington Avenue	160	0
I	Copley Place Garage *110 Huntington Avenue*	572	860
J	Tent City Garage *128 Dartmouth Street*	422	276
K	Bryant Back Bay *303 Columbus Avenue*	50	0
L	The Newb'ry *501 Boylston Street*	80	0
M	Greater Boston Community Development *95 Berkeley Street*	36	0
N	John Hancock *200 Clarendon Street*	176	0
O	Liberty Mutual 157 Berkeley Street	197	0
Subtotal		**7,007**	**4,554**
Total Off-street Parking Spaces		**7,071**	**4,677**
		11,748	

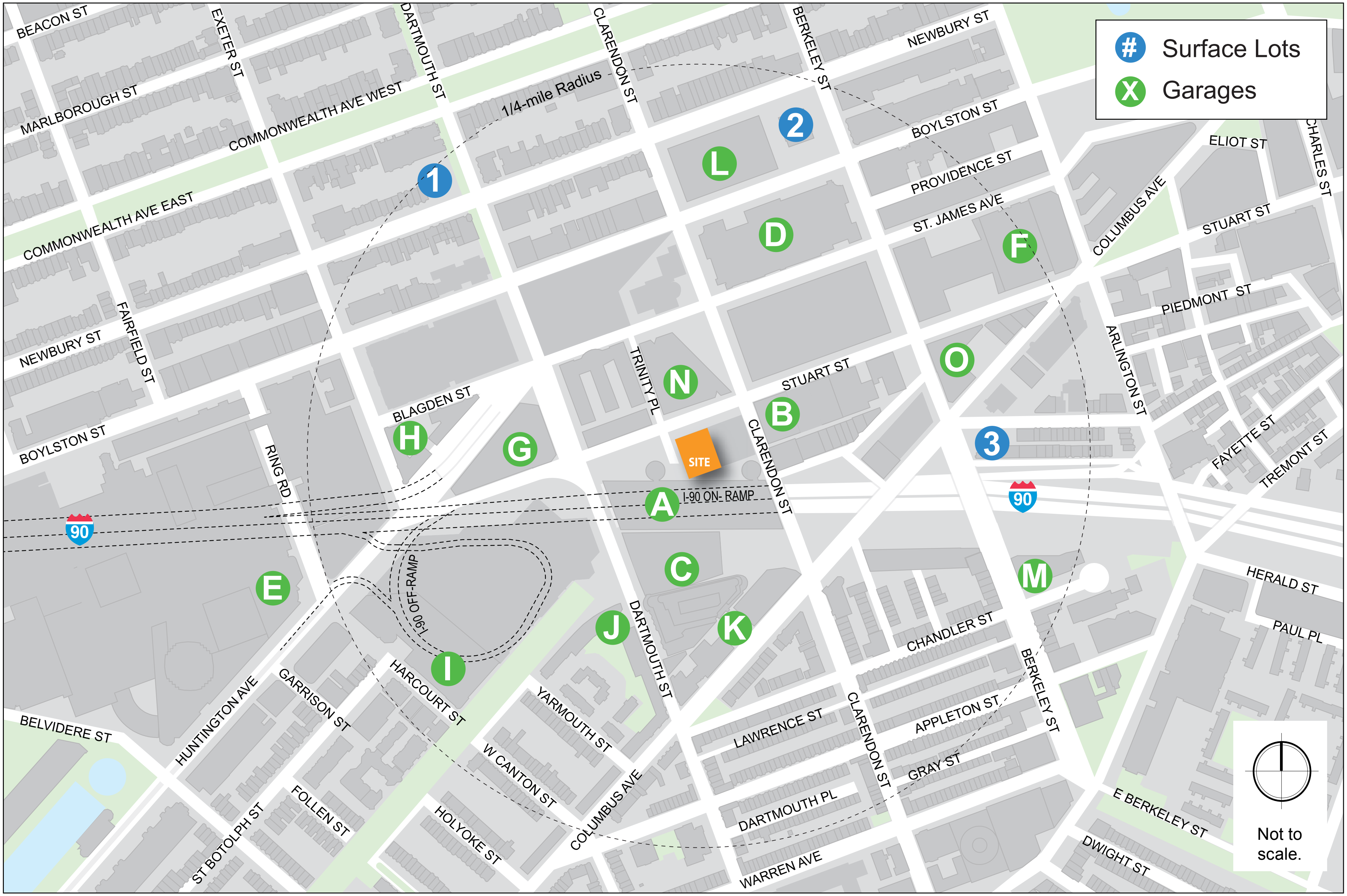

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Figure 3-6
Existing Off-street Parking

Table 3-6 MBTA Transit Service in the Study Area

Transit Service	Description	Peak-hour Headway (in minutes) [1]
Rapid Transit Routes		
Orange Line	Forest Hills–Oak Grove	5
Green Line	Lechmere–Boston College, Cleveland Circle, Riverside, or Heath Street	6-7
Local Bus Routes		
9	City Point–Copley Square via Broadway Station	5-9
10	City Point–Copley Square via Andrew Station and B.U. Medical Center	20–24
39	Forest Hills Station–Back Bay Station via Huntington Avenue	6
55	Jersey and Queensberry Streets–Copley Square or Park and Tremont streets via Ipswich Street	16–30
Express Bus Routes		
502	Watertown Yard–Copley Square via Newton Corner and Masspike	6–12
503	Brighton Center–Copley Square via Oak Square and Masspike	15-20
504	Watertown/Newton Corner–Downtown via Masspike	8–13
Commuter Rail Routes [2]		
Purple Line	Framingham/Worcester–South Station	12–40
Purple Line	Needham–South Station	28–45
Purple Line	Franklin–South Station	16–39
Purple Line	Providence/Stoughton–South Station	12–41

1) Headway is the time between trains or buses, as applicable.
2) Commuter rail routes have irregular headways; customers typically plan trips according to schedule rather than utilizing walk-up service.

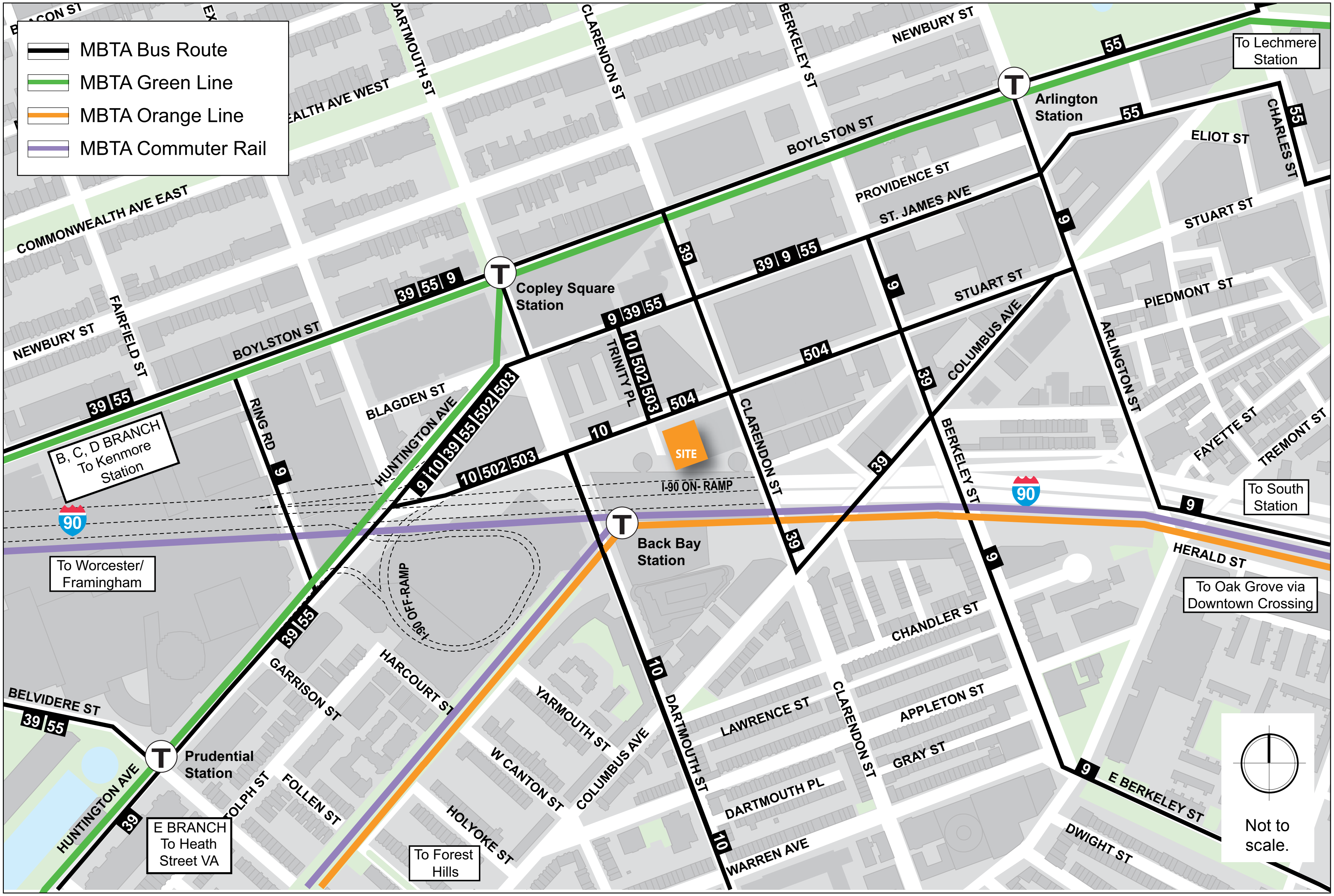

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Figure 3-7
Public Transportation

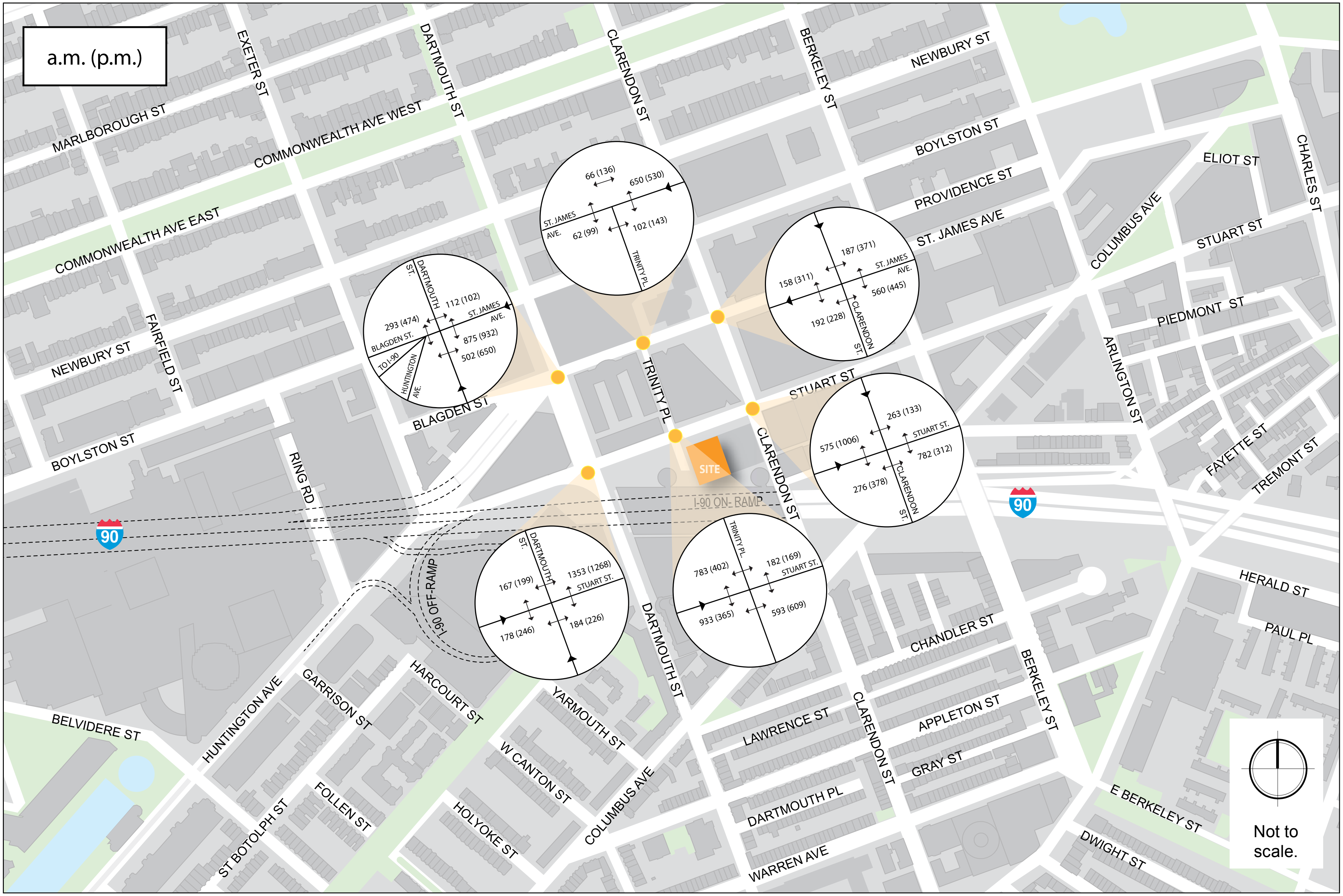

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Figure 3-8
Existing Conditions (2013) Pedestrian Volumes, a.m. and p.m. Peak Hour

3.2.8 Existing Bicycle and Car Sharing Locations

Hubway, launched in July 2011, is a bicycle sharing system with more than 100 stations and 1,000 bicycles available throughout Boston, Brookline, Cambridge, and Somerville. As shown in Figure 3-9, three Hubway stations with 59 bicycles are located within ¼ mile of the Project site. Bicycles are not available for rent during winter months.

The increasingly popular car-sharing services provide easy access to vehicular transportation for urban residents who do not own cars. The local car-sharing provider, Zipcar, offers short-term rental service for members. Vehicles are rented on an hourly and per-mile basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. The nearby Zipcar services provide an important transportation option for area residents, reducing the need for vehicle ownership. Figure 3-9 shows the nearby Zipcar locations with a total of 24 Zipcars.

3.2.9 Existing Bicycle Conditions

Bicycle counts were taken as part of the intersection turning movement counts (see Figure 3-10). Overall, the bicycle volumes are higher in the p.m. peak hour than during the a.m. peak hour. Fewer than 15 bicycles travel through each intersection during the a.m. peak hour. During the p.m. peak hour, about 30 bicycles per hour use the St. James Avenue corridor intersections with fewer along Stuart Street.

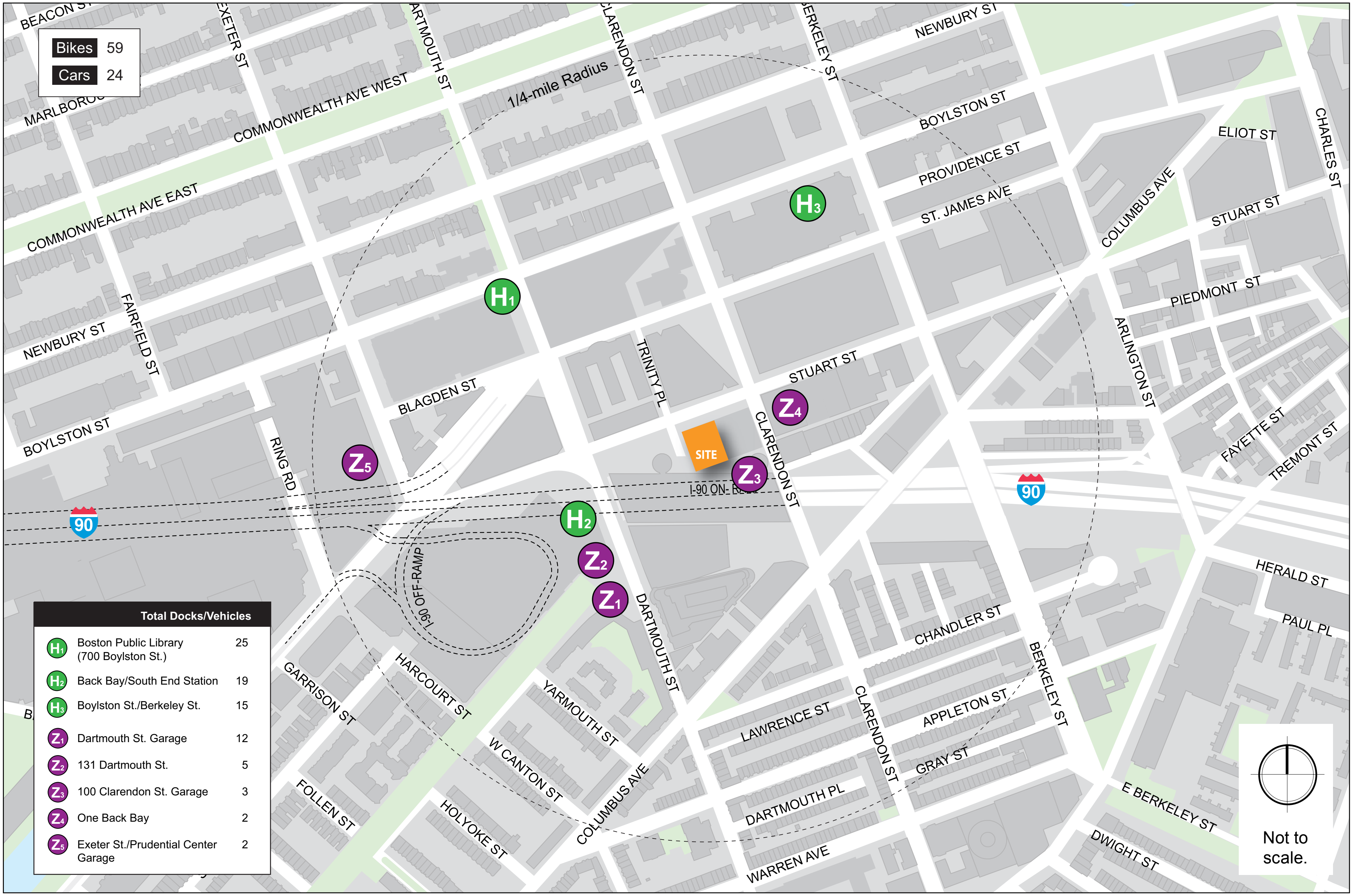
Within the study area, on-road bicycle accommodations exist on Dartmouth Street and Commonwealth Avenue. An off-road bicycle path is part of the linear Southwest Corridor Park, which connects Forest Hills to Back Bay Station.

3.2.10 Existing Loading and Service

Loading and service for the site currently occurs though a single loading dock located at the rear of the building along the area at the back of the site. Access to the loading area is from Clarendon Street via the I-90/Mass Pike west access roadway (located under the adjacent John Hancock Parking Garage at 100 Clarendon Street Garage).

3.3 Evaluation of Long-term Impacts

It is standard practice to evaluate No Build Conditions (without project) and Build Conditions (with project) and determine to what extent the traffic operations will be affected. Year 2018, five years from the existing condition, has been designated as the future design year. This section describes and evaluates the projected 2018 No Build and 2018 Build Conditions. It also provides a comparison assessment of an "as-of-right" build alternative in terms of level of traffic generation.



Total Docks/Vehicles

	Location	Total
H_1	Boston Public Library (700 Boylston St.)	25
H_2	Back Bay/South End Station	19
H_3	Boylston St./Berkeley St.	15
Z_1	Dartmouth St. Garage	12
Z_2	131 Dartmouth St.	5
Z_3	100 Clarendon St. Garage	3
Z_4	One Back Bay	2
Z_5	Exeter St./Prudential Center Garage	2

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Figure 3-9
Car Sharing and Hubway Locations

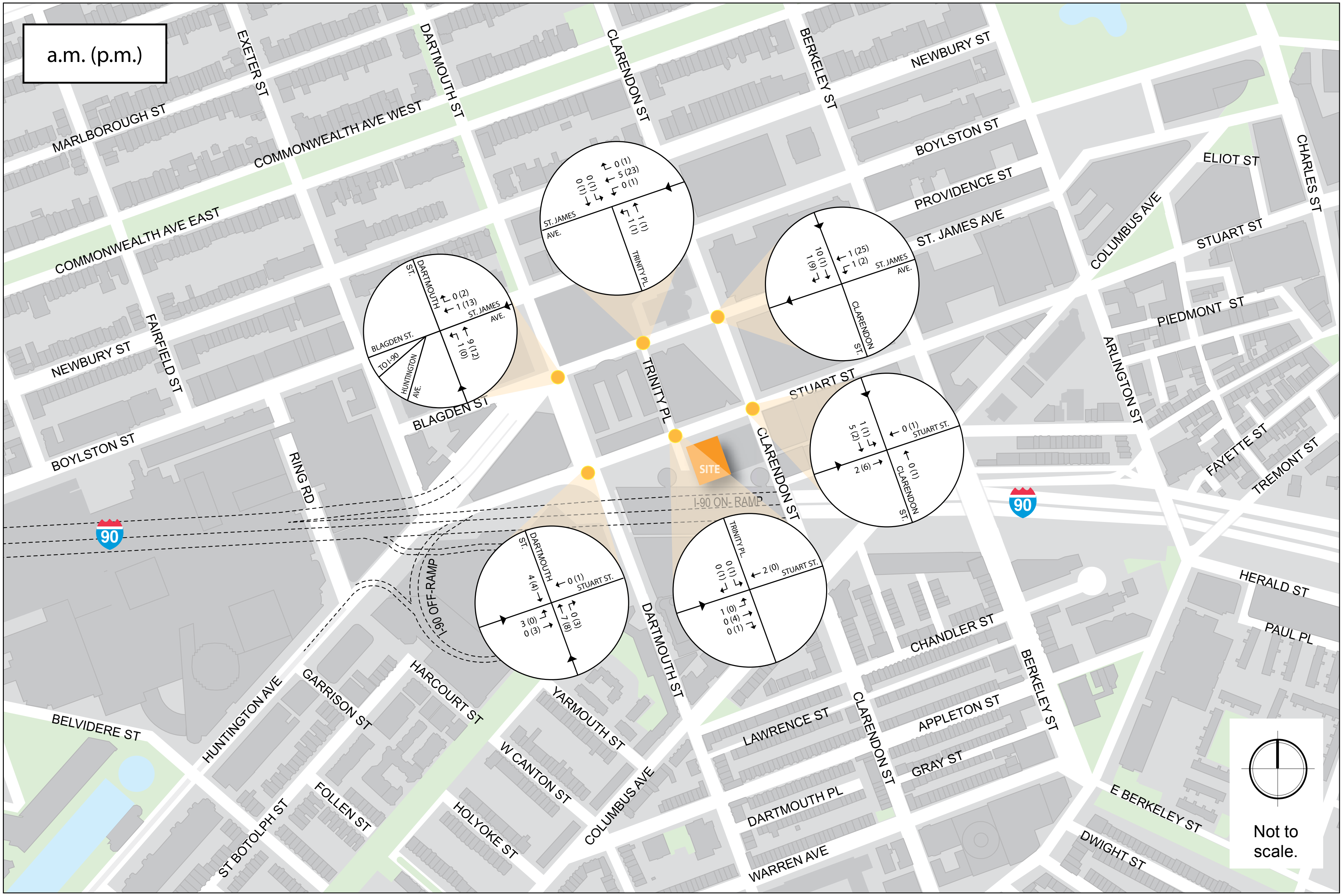

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Figure 3-10
Existing Conditions (2013) Bicycle Volumes, a.m. and p.m. Peak Hour

3.3.1 No Build Conditions

3.3.1.1 Background Traffic Growth

No Build traffic conditions are those that would occur independent of the Project and include existing traffic and new traffic resulting from both general background growth and any other future development projects in the area that have been permitted or are under review.

The general background growth rate accounts for anticipated changes in 1) demographics, auto usage, and auto ownership and 2) traffic volumes due to new, smaller development projects or projects near, but outside, the immediate study area. Based on a review of historical and recent traffic counts, a conservative 0.5% annual rate was applied to the existing intersection volumes to account for background growth. The background growth rate includes the following two redevelopment projects:

- ***John Hancock Tower Improvements.*** In 2012, building owners completed renovations to the John Hancock Tower, which included a ground floor restaurant in the lobby area and 176 underground parking spaces. A parking garage driveway was constructed on Trinity Place.
- ***100 Arlington Street.*** Formerly occupied by the Renaissance Charter School, 100 Arlington Street is currently under construction and being converted to 128 apartments with ground floor retail space. No on-site parking is being provided.

In addition to the growth rate, traffic volumes generated by the following new major developments have been added into the No Build conditions:

- ***Copley Place Residential and Retail Expansion.*** Based on the most recent available development plan filed with the BRA, this proposed expansion involves approximately 114,000 sf of new retail (54,000 sf expansion of Neiman Marcus and 60,000 sf of restaurant, shops, and a garden). In addition, the expansion will include approximately 280 new residential condominiums. It is understood that a revised development program for Copley Place will be filed shortly, however, at the writing of this transportation study these plans have not yet been filed.
- ***Exeter Residences.*** One of the final projects in the redevelopment of Prudential Center, this 188-unit residential project has been approved by the BRA and is currently under construction.
- ***157 Berkeley Street.*** Liberty Mutual is redeveloping the former Salvation Army site at 157 Berkeley Street across from its headquarters building into a 695,000-sf office tower, including a new 700-seat cafeteria and parking for up to 197 vehicles in a below-grade parking structure. In addition, Liberty Mutual is constructing a new

25,000 sf building to house office space and an expanded conference center at 30 St. James Avenue, replacing a 30-space surface parking lot. Occupancy is expected in 2013.

- ***350 Boylston Street.*** This approved nine-story office building will include 221,230 sf of office space, with ground level retail and restaurant space, a health club, and 150 underground parking spaces.
- ***Prudential Center/ 888 Boylston Street.*** The second project in the last phase of the Prudential Center renovation includes a maximum of 362,000 sf of office and a maximum of 100,000 sf of retail space.

The above background projects are mapped in Figure 3-11 and the resulting Year 2018 No Build traffic volumes are shown in Figures 3-12 and 3-13 for the a.m. and p.m. peak hour, respectively.

3.3.1.2 Background Transportation Improvements and Planning Initiatives

The following studies have been integrated into the assessment of future year conditions:

- ***BTD Traffic Signal Optimization (Back Bay).*** BTD is currently in the process of updating traffic signals in the Back Bay area. Some of the improvements include adjusting signal offsets and splits, converting from exclusive to concurrent pedestrian crossings, and updating the vehicle clearance times at specific locations. All of these changes will be implemented before 2015 and are therefore included in the No Build Conditions traffic model.
- ***Signalization of Stuart Street/Trinity Place.*** The City will be installing a traffic signal at this intersection. Design of the associated roadway modifications and signal elements is nearly complete and construction will likely start in 2013. This improvement is included in the No Build conditions traffic model.
- ***Stuart Street Planning Study.*** This study addresses development guidelines for the blocks along Stuart Street bounded by St. James Avenue to the north, Dartmouth Street to the west, Columbus Avenue and Cortes Street to the south, and Arlington Street to the east. These included guidelines for pedestrian and driveway entrances, streetscape elements, parking and loading, bicycle and car sharing incentives, and Transportation Demand Management measures.

3.3.1.3 No Build Conditions Traffic Operations

The Year 2018 No Build analysis uses the methodology described under Existing Conditions. The resulting intersection capacity analysis summaries are shown in Tables 3-7 and 3-8 for a.m. and p.m. peak hours, respectively. The tables show level of service, average delay, volume to capacity ratio, and 95th percentile queue length (feet) for the overall intersection and each approach.

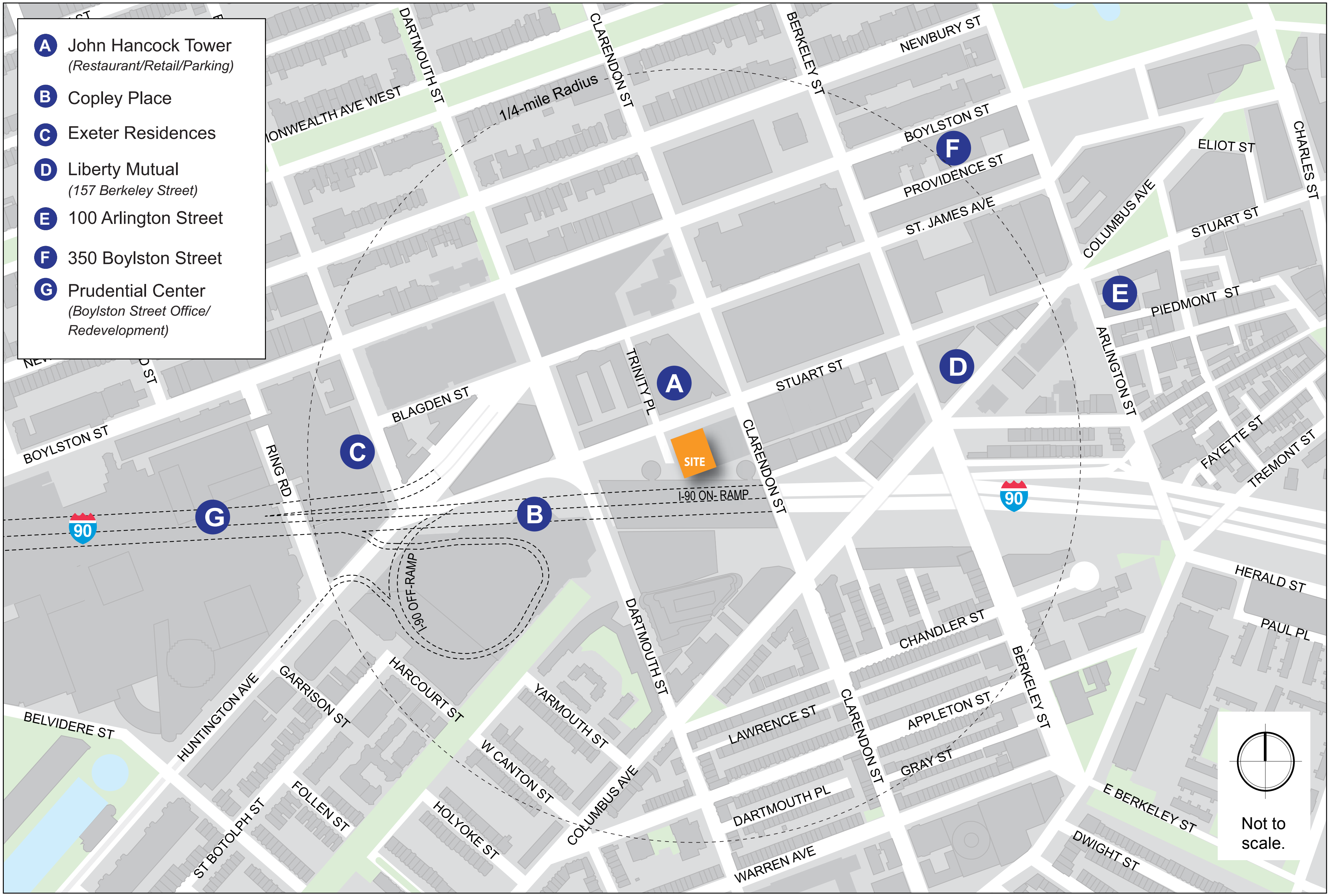

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Figure 3-11
Area Development Projects

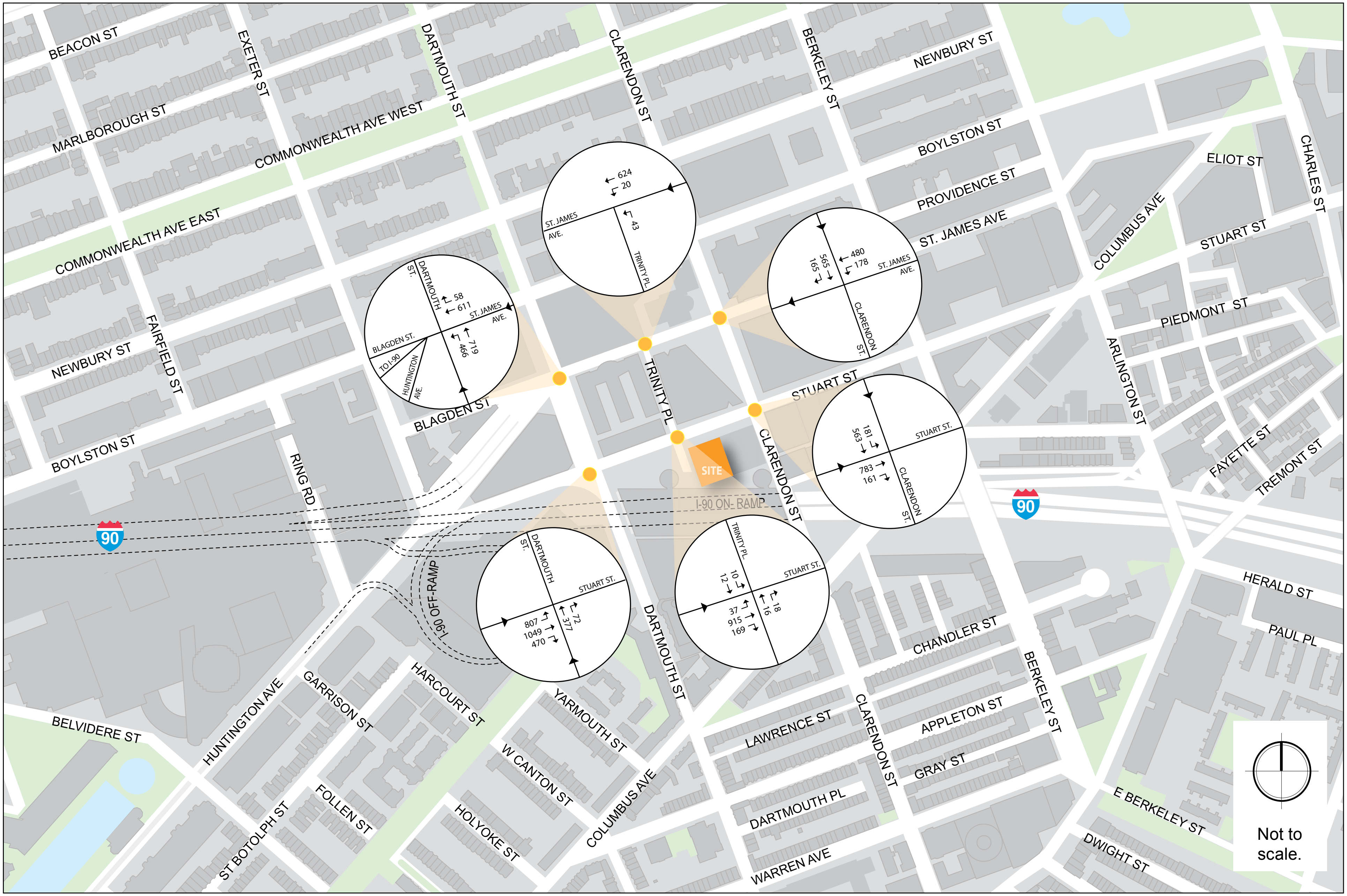

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Figure 3-12

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

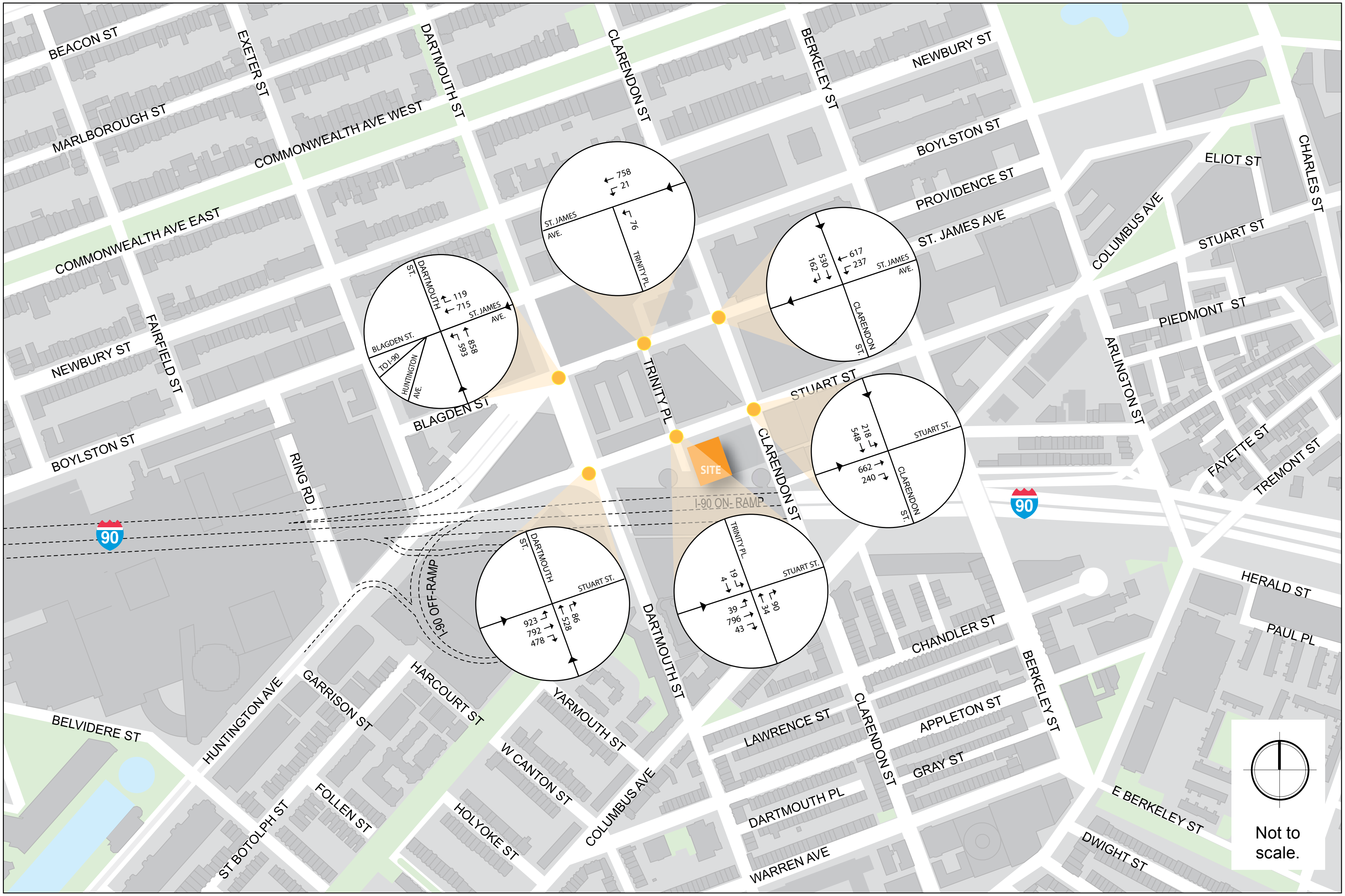

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Figure 3-13
No-Build Conditions (2018) Intersection Volumes, p.m. Peak Hour

Complete Synchro reports are provided in Appendix B.

Under No Build Conditions, all locations continue to operate at the same overall level of service as under Existing Conditions, with the exception of Stuart Street/Trinity Place which improves for both overall traffic operations and pedestrian safety with the installation of a traffic signal currently proposed by the City of Boston.

Table 3-7 No Build Conditions (2018), Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Stuart Street/Dartmouth Street	**B**	**19.4**		
Stuart EB left | left	A	3.7	0.46	84
Stuart EB thru | thru | thru	C	22.0	0.58	226
Stuart EB right	D	43.0	0.89	#415
Dartmouth NB thru | thru	B	13.8	0.29	100
Dartmouth NB right	B	16.5	0.34	50
Stuart Street/Clarendon Street	**B**	**12.5**		
Stuart EB thru |thru	B	12.0	0.64	298
Stuart EB right	A	4.1	0.38	22
Clarendon SB left/thru | thru	B	14.9	0.68	257
St. James Avenue/Clarendon Street	**B**	**17.7**		
St. James WB left/thru | thru	B	20.0	0.57	205
Clarendon SB thru | thru/right	B	15.5	0.50	188
St. James Avenue/Dartmouth Street	**C**	**27.7**		
St. James EB thru | thru	D	41.3	0.64	261
St. James EB right	C	32.4	0.16	m64
Dartmouth NB left | left	B	13.4	0.56	97
Dartmouth NB thru | thru | thru	C	25.5	0.62	154
Stuart Street/Trinity Place	**A**	**3.8**		
Stuart EB left/thru | thru | thru	A	0.4	0.26	10
Stuart EB right	B	10.3	0.44	103
Trinity NB thru/right	D	36.3	0.28	44
Trinity SB left/thru	D	39.7	0.31	m34
Unsignalized Intersections				
St. James Avenue/Trinity Place				
St. James WB left/thru | thru	A	1.0	0.27	6
Trinity NB left	C	19.7	0.18	16

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicated a decrease in LOS from Existing Conditions.

Table 3-8 No Build Conditions (2018), Capacity Analysis summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Stuart Street/Dartmouth Street	**B**	**15.3**		
Stuart EB left | left	A	4.1	0.51	98
Stuart EB thru | thru | thru	B	14.0	0.39	131
Stuart EB right	C	23.3	0.72	322
Dartmouth NB thru | thru	C	21.6	0.47	172
Dartmouth NB right	D	35.4	0.70	53
Stuart Street/Clarendon Street	**B**	**18.8**		
Stuart EB thru |thru	B	12.3	0.54	109
Stuart EB right	A	8.4	0.58	m32
Clarendon SB left/thru | thru	C	28.2	0.75	282
St. James Avenue/Clarendon Street	**B**	**17.9**		
St. James WB left/thru | thru	B	17.9	0.59	230
Clarendon SB thru | thru/right	B	17.9	0.51	187
St. James Avenue/Dartmouth Street	**C**	**25.8**		
St. James EB thru | thru	B	19.8	0.73	173
St. James EB right	B	15.8	0.29	68
Dartmouth NB left | left	C	20.8	0.76	204
Dartmouth NB thru | thru | thru	D	36.6	0.76	234
Stuart Street/Trinity Place	**B**	**10.8**		
Stuart EB left/thru | thru | thru	A	2.0	0.26	32
Stuart EB right	A	0.8	0.14	m0
Trinity NB thru/right	D	46.2	0.66	113
Trinity SB left/thru	E	55.7	0.69	m75
Unsignalized Intersections				
St. James Avenue/Trinity Place				
St. James WB left/thru | thru	A	0.4	0.32	2
Trinity NB left	C	21.3	0.36	39

\# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Grey shading indicated a decrease in LOS from Existing Conditions.

3.3.2 Build Conditions

3.3.2.1 Site Access and Circulation

As shown in the Project site plan in Figure 3-14, vehicular access to and egress from the Project's residential parking garage will be provided on Trinity Place. Access to parking in the garage will be by attendant-operated vehicle elevators; self-park will not be allowed in the parking garage. Loading and building servicing will be provided from the rear of the site, as they are today.

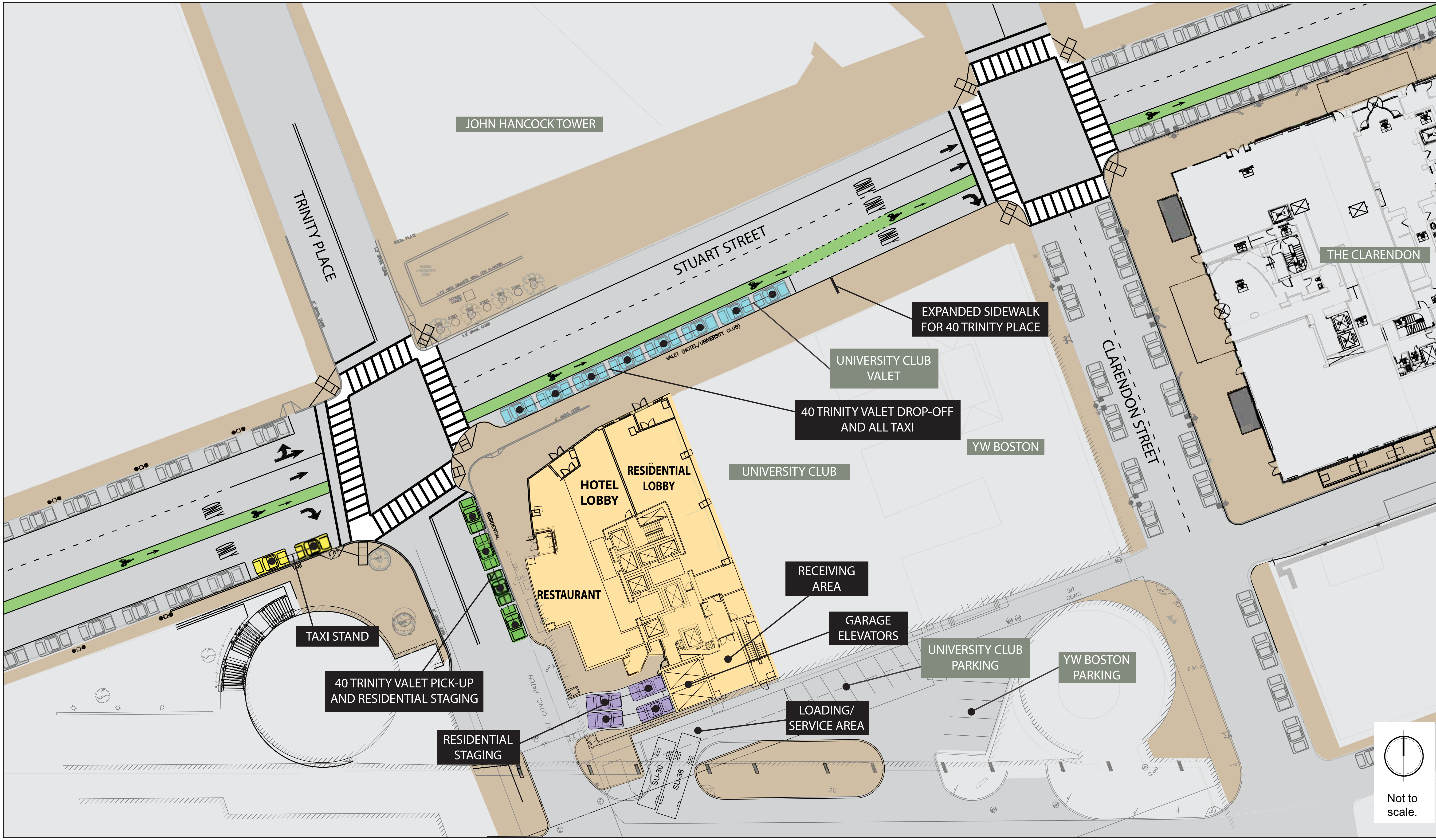

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Figure 3-14
Site Plan

The Project will have separate lobbies for residential and hotel uses. The residential and hotel lobbies will be located on Stuart Street; doorways to the restaurant will be located on Trinity Place. Secondary access to the residential lobby will be provided from the covered vehicle drop-off area adjacent to the garage vehicle elevators on Trinity Place.

The Proponent will work with the City of Boston to designate the curb use along Stuart Street at the site for all hotel and restaurant drop-off activity, including valet drop-off, and University Club valet uses in front of the University Club. The Trinity Place curb would be designated for all valet pick-up for the site and for overflow residential garage staging. A taxi stand serving the site is proposed on Stuart Street west of Trinity Place.

3.3.2.2 Trip Generation Overview and Land Use Codes

Trip generation is a complex, multi-step process that produces an estimate of vehicle, transit, walk, and bicycle trips associated with a proposed development and a specific land use program. It is not the size of a development alone that dictates the associated degree of traffic impacts, but rather the individual trip-making characteristics of the land uses and the availability of convenient transit options. Approximately 90% of the Project's square footage will be allocated to the 227-room hotel and the 115 residential units. Unlike office complexes that generate about 50% of all daily trips during the two peak commuter periods, hotels and residential uses generate only about 15% of their activity during peak hours. With trip activity distributed throughout the day, and not concentrated during peak hours, the result is fewer traffic impacts to the surrounding area.

Following standard industry practice, and as required by the BTD, trip generation for the Project was derived from the Institute of Transportation Engineers' (ITE) Trip Generation (9th edition, 2012). The ITE rates produce vehicle trip estimates, which are converted to person trips based on vehicle occupancy rates (VOR). Using appropriate mode split information for this specific study area, the total person trips are then allocated to vehicle, transit, and walk/bicycle trips. Existing trips now generated by the site are also estimated.

Existing Land Uses

The existing site is currently occupied by the Boston Common Hotel and Conference Center with primary pedestrian access from Trinity Place. A street level Dunkin Donuts currently occupies the site's Stuart Street frontage.

Trip generation estimates for the existing land uses are based on rates derived from ITE's *Trip Generation* (9th edition, 2012) fitted curve equations and average trip rates for the following land use codes (LUC):

Land Use Code 310 — Hotel. This land use code is defined as a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms, limited recreational facilities (e.g., pool, fitness room), and/or other retail services or shops.

Land Use Code 936 — Coffee/Doughnut Shop without Drive-Through Window. This land use includes single-tenant coffee and donut restaurants without drive-through windows. Freshly brewed coffee and a variety of coffee-related accessories are the primary retail products sold at these sites. Limited indoor seating is generally provided for patrons; table service is not provided. In an urban environment, particularly one with a high concentration of office use as the Back Bay, this land use exhibits a high pass-by capture rate. Pass-by trips are those already in the transportation network and not specifically destined to the particular land use. For this Stuart Street Dunkin' Donuts location, a capture rate of 90% was assumed.

Land Use Code 710 — General Office. General office is defined as an office building containing multiple tenants. Office use typically contains a mixture of professional services. Current office space at 40 Trinity is approximately 10,326 square feet occupied by the BAA. Calculation of the number of office trips use ITE's average rate per 1,000 sf.

Conference Center. Because ITE does not have a specific LUC for conference center, trip generation for this land use was based on knowledge of the capacity and operational characteristics of this specific, 29,142 square foot, 343 person capacity conference center facility. (Conference Center is also included in the as-of-right alternative.)

Future Project Land Uses

Trip generation estimates for the Project's new land uses are also based on rates derived from ITE's *Trip Generation* (9th edition, 2012) fitted curve equations and average trip rates. Trips associated with the new land uses on the site are based on the following land use codes (LUC):

Land Use Code 310 — Hotel. This land use code is defined as a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention centers, limited recreational facilities (e.g., pool, fitness room), and/or other retail services or shops.

Land Use Code 230 — Residential High-rise Condominium. This land use code refers to units with single-family ownership that have at least one other single-family-owned unit within the same building structure.

LUC 831 - Quality Restaurant. This land use consists of eating establishments of high quality, with average turnover rates of at least one hour or longer. Generally, quality restaurants do not serve breakfast, some do not serve lunch, and all serve dinner.

Land Use Code 492 — Health Club. This land use consists of privately owned facilities that primarily focus on individual fitness or training. These facilities are membership clubs that may allow access to the public for a fee. This land use code was used to estimate the new trips associated with the University Club space within the Project.

3.3.2.3 Travel Mode Share

The BTD publishes vehicle, transit, and travel mode shares specific to each area of Boston. The Project site is located within BTD Area 2. As is standard practice, these specific neighborhood mode shares are used to estimate the number of new vehicle trips, transit trips, and walk/bicycle trips generated by the Project. The mode share assumptions for the current Dunkin' Donuts on-site, however, were assumed to be much less auto and transit-centric than those provided by BTD for retail uses because this particular use in an urban setting generally exhibits very high pedestrian foot traffic. Customers typically do not take transit or drive for the sole purpose of patronizing this particular coffee/doughnut shop, although some will walk to the shop as a specific destination and not as a pass-by trip on their way to work or another destination. Most employees can be expected to use transit or walk, although some may drive if their shifts begin/end when transit is not available. BTD's travel mode share data for Area 2, and those adjusted for coffee/doughnut shop use are shown in Table 3-9.

3.3.2.4 Existing Site Trip Generation

Based on the land use trip rates and travel mode share assumptions (Table 3-9), the existing trips are shown in Table 3-10.

While it is standard practice for a future year analysis to subtract trips generated by existing uses prior to adding new Project trips to the local roadway network, no credit for existing uses has been taken in the calculation of future traffic volumes. Currently, the site's existing vehicle trips are distributed throughout the local area roadway network since all vehicles park off-site at nearby parking facilities and not at 40 Trinity Place. In the future, it is expected that most vehicle trips in particular will instead arrive at the site to either park in the residential garage or have curbside valet service to an area garage. Taxi pick-up and drop-off will also focus curbside at the site. As such, not taking credit of trips associated with existing on-site uses, particularly vehicle trips, is the most conservative methodology and will identify the most realistic impact assessment for the Project.

Table 3-9 Travel Mode Shares

Land Use	Direction	Walk Share	Transit Share	Auto Share	Local Vehicle Occupancy Rate
Daily					
Hotel	In	57%	19%	24%	1.1
	Out	57%	19%	24%	1.1
Office	In	24%	32%	44%	1.1
	Out	24%	32%	44%	1.1
Conference Center	In	24%	32%	44%	1.1
	Out	24%	32%	44%	1.1
Coffee/donut shop[2]	In	80%	15%	5%	1.1
	Out	80%	15%	5%	1.1
University Club Space	In	55%	16%	29%	2.2
	Out	55%	16%	29%	2.2
Residential	In	57%	19%	24%	1.1
	Out	57%	19%	24%	1.1
Restaurant	In	55%	16%	29%	2.2
	Out	55%	16%	29%	2.2
a.m. Peak Hour					
Hotel	In	59%	22%	19%	1.1
	Out	64%	15%	21%	1.1
Office	In	38%	25%	37%	1.1
	Out	28%	29%	43%	1.1
Conference Center	In	38%	25%	37%	1.1
	Out	28%	29%	43%	1.1
Coffee/donut shop [1]	In	100%	0%	0%	na
	Out	100%	0%	0%	na
University Club Space	In	57%	19%	24%	2.2
	Out	61%	13%	26%	2.2
Residential	In	59%	22%	19%	1.1
	Out	64%	15%	21%	1.1
Restaurant	In	57%	19%	24%	2.2
	Out	61%	13%	26%	2.2
p.m. Peak Hour					
Hotel	In	64%	15%	21%	1.1
	Out	59%	22%	19%	1.1
Office	In	28%	29%	43%	1.1
	Out	38%	25%	37%	1.1
Conference Center	In	28%	29%	43%	1.1
	Out	38%	25%	37%	1.1
Coffee/donut shop [1]	In	100%	0%	0%	na
	Out	100%	0%	0%	na

[2] Coffee/donut shop has been adjusted from BTD mode share guidelines based on engineering judgment. See Section 3.3.2.3.

Table 3-9 Travel Mode Shares (Cont.)

Land Use	Direction	Walk Share	Transit Share	Auto Share	Local Vehicle Occupancy Rate
p.m. Peak Hour					
University Club Space	In	61%	13%	26%	2.2
	Out	57%	19%	24%	2.2
Residential	In	64%	15%	21%	1.1
	Out	59%	22%	19%	1.1
Restaurant	In	61%	13%	26%	2.2
	Out	57%	19%	24%	2.2

Table 3-10 Trip Generation – Existing Land Uses

Land Use	Direction	Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Daily				
Hotel	In	171	57	69
	Out	171	57	69
Office	In	15	20	25
	Out	15	20	25
Coffee/Donut Shop	In	103	19	6
	Out	103	19	6
Conference Center	In	140	186	233
	Out	140	186	233
Total Daily	**In**	**429**	**282**	**333**
	Out	**429**	**282**	**333**
a.m. Peak Hour				
Hotel	In	14	5	4
	Out	12	3	4
Office	In	4	6	5
	Out	1	1	1
Coffee/Donut Shop	In	12	0	0
	Out	12	0	0
Conference Center	In	42	64	57
	Out	5	5	7
Total a.m. Peak Hour	**In**	**72**	**75**	**66**
	Out	**30**	**9**	**12**
p.m. Peak Hour				
Hotel	In	16	4	5
	Out	11	4	3
Office	In	1	1	1
	Out	3	5	5
Coffee/Donut Shop	In	5	0	0
	Out	5	0	0
Conference Center	In	5	5	8
	Out	42	65	57
Total p.m. Peak Hour	**In**	**27**	**10**	**14**
	Out	**61**	**74**	**65**

3.3.2.5 Project Trip Generation

Table 3-11 shows the projected trip generation by land use and travel mode share for the proposed Project (Appendix B includes detailed trip generation information). As discussed in Section 3.3.2.4, the total new Project traffic volumes, and not net new, were used to estimate Build conditions in the traffic analysis since the Project fundamentally changes the way vehicle trips arrive to the local area and at the site in particular. The addition of a parking garage to the site and active hotel curbside pick-up/drop-off and valet activity will redistribute these trips more locally to the site

As shown, the estimated daily vehicle trips generated by the site will be 475 trips in and 475 trips out. In the a.m. peak hour, there will be 18 entering vehicle trips and 22 exiting trips, while during the p.m. peak hour, there will be 40 entering vehicle trips and 26 exiting trips. Activity related to the new land uses (residential, hotel, restaurant, and University Club) will generally occur throughout the day, without a heavy concentration of trips during peak commuter travel periods.

3.3.2.6 Trip Distribution

A vehicular trip distribution pattern for new vehicle trips was developed based on origin-destination data from BTD for Area 2 and knowledge of the local roadway network. The trip distribution is shown in Figure 3-15.

New Project vehicle trips added to the study area intersections are shown in Figures 3-16 and 3-17 for the a.m. and p.m. peak hour, respectively. (Note that no credit/reduction for existing trips has been taken in the calculation of new Project vehicle trips.)

3.3.2.7 Build Conditions Traffic Operations

To estimate 2018 Build traffic volumes, the Project-generated trips were added to the 2018 No Build traffic volumes. The Year 2018 Build traffic volumes are shown in Figures 3-18 and 3-19 for the a.m. and p.m. peak hour, respectively.

The resulting capacity analysis summaries for Build Conditions are shown in Tables 3-12 and 3-13. The tables show LOS, average delay, volume to capacity ratio, and 95th percentile queue length (feet) for the overall intersection and each approach.

With the addition of the new Project vehicle trips, none of the study intersections or intersection approaches will experience a worsening in level of service, indicating that the traffic impacts from the Project will be minimal.

Complete Synchro reports are provided in Appendix B.

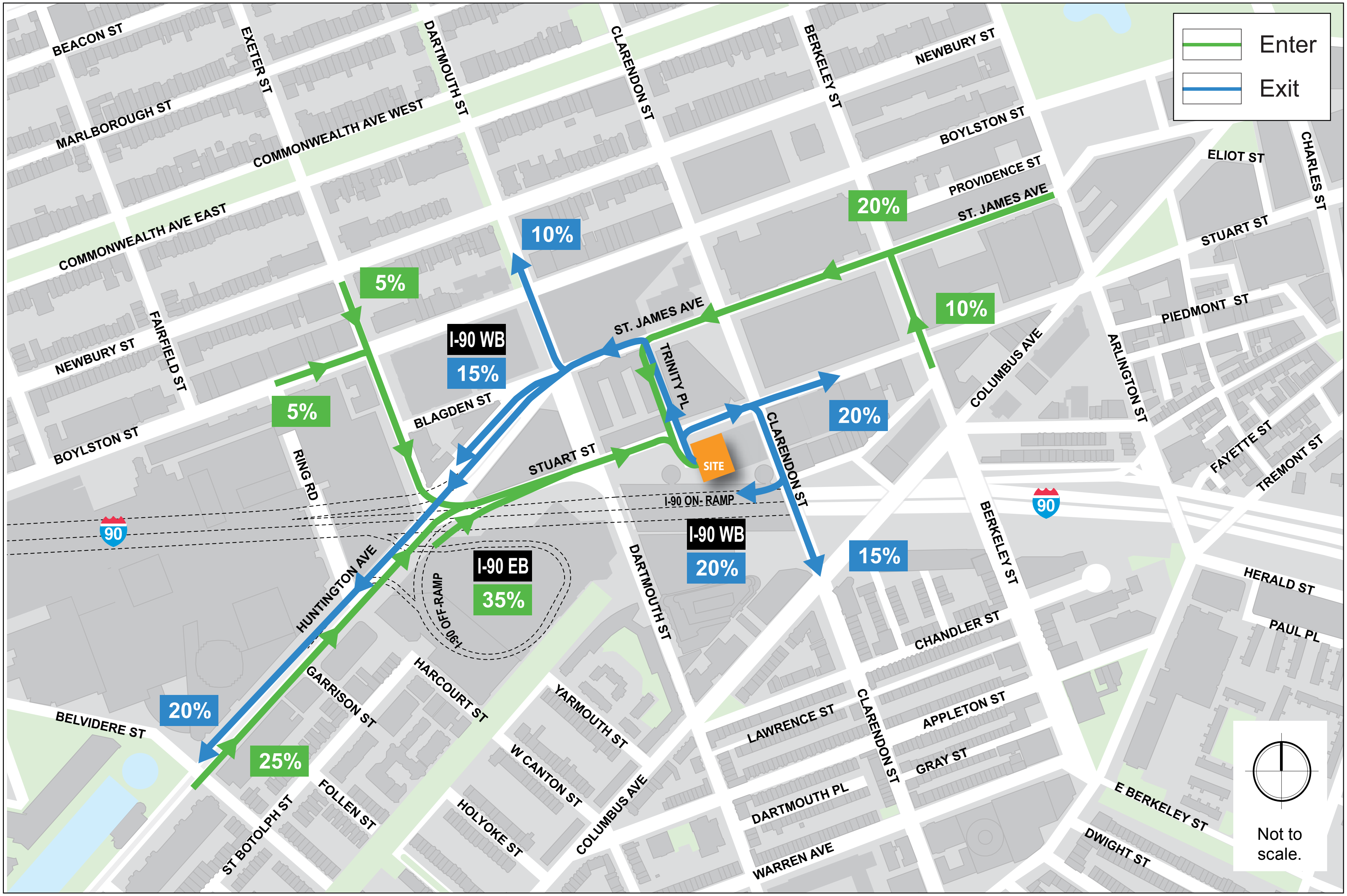

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Figure 3-15
Vehicle Trip Entering/Exiting Distribution

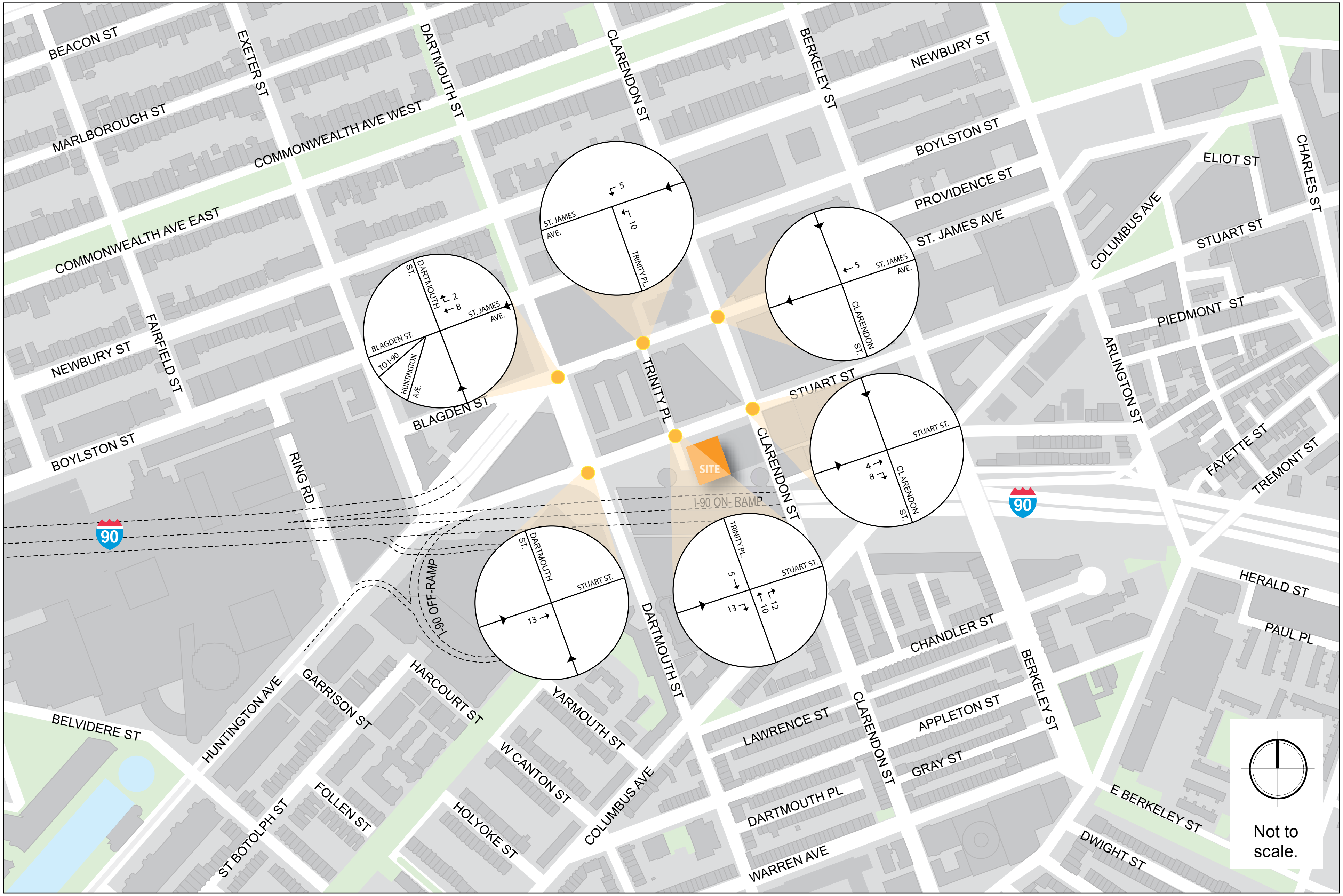

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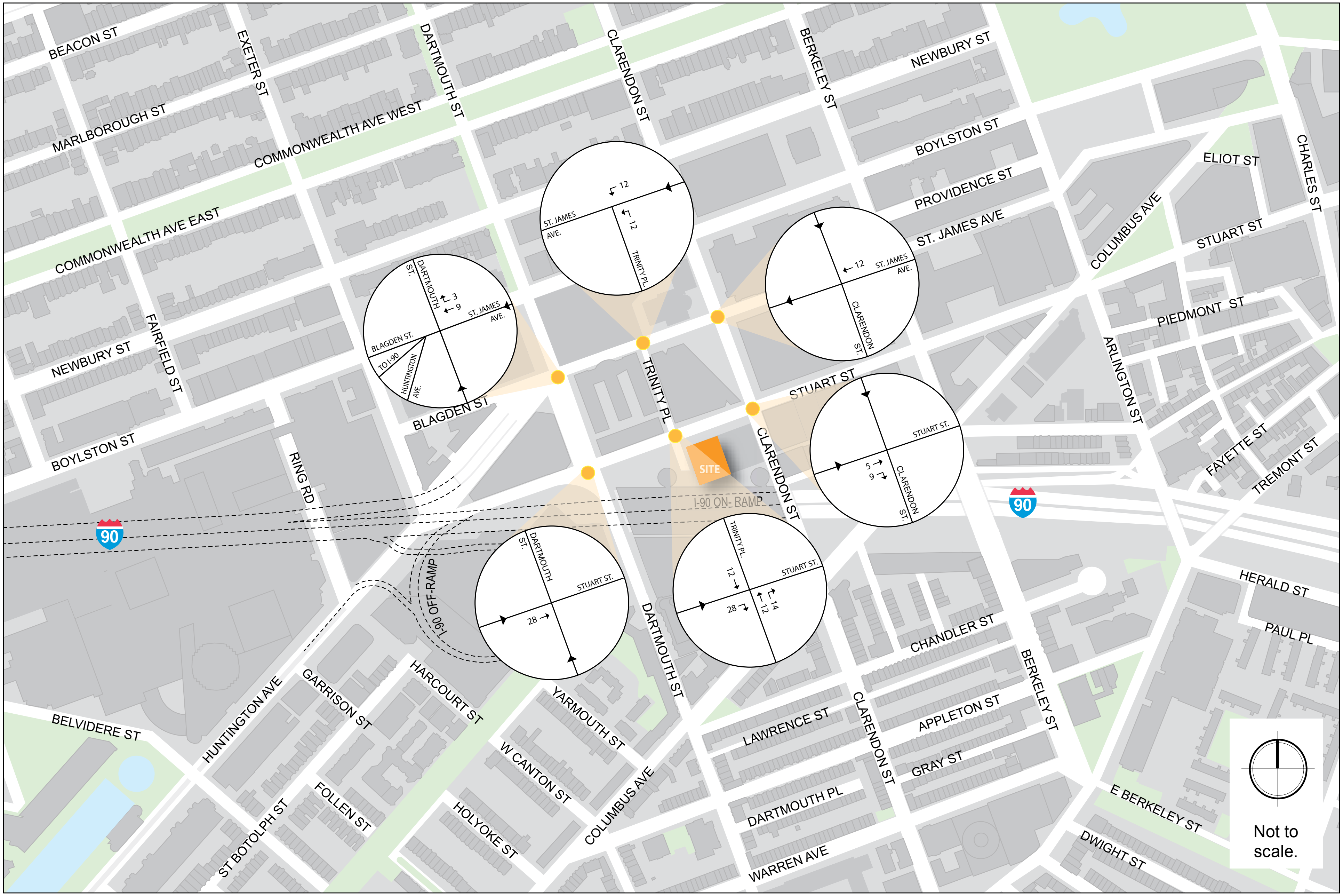
Figure 3-16
Project-generated Vehicle Trips, a.m. Peak Hour



40 Trinity Place **Boston, Massachusetts**

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Figure 3-17
Project-generated Vehicle Trips, p.m. Peak Hour

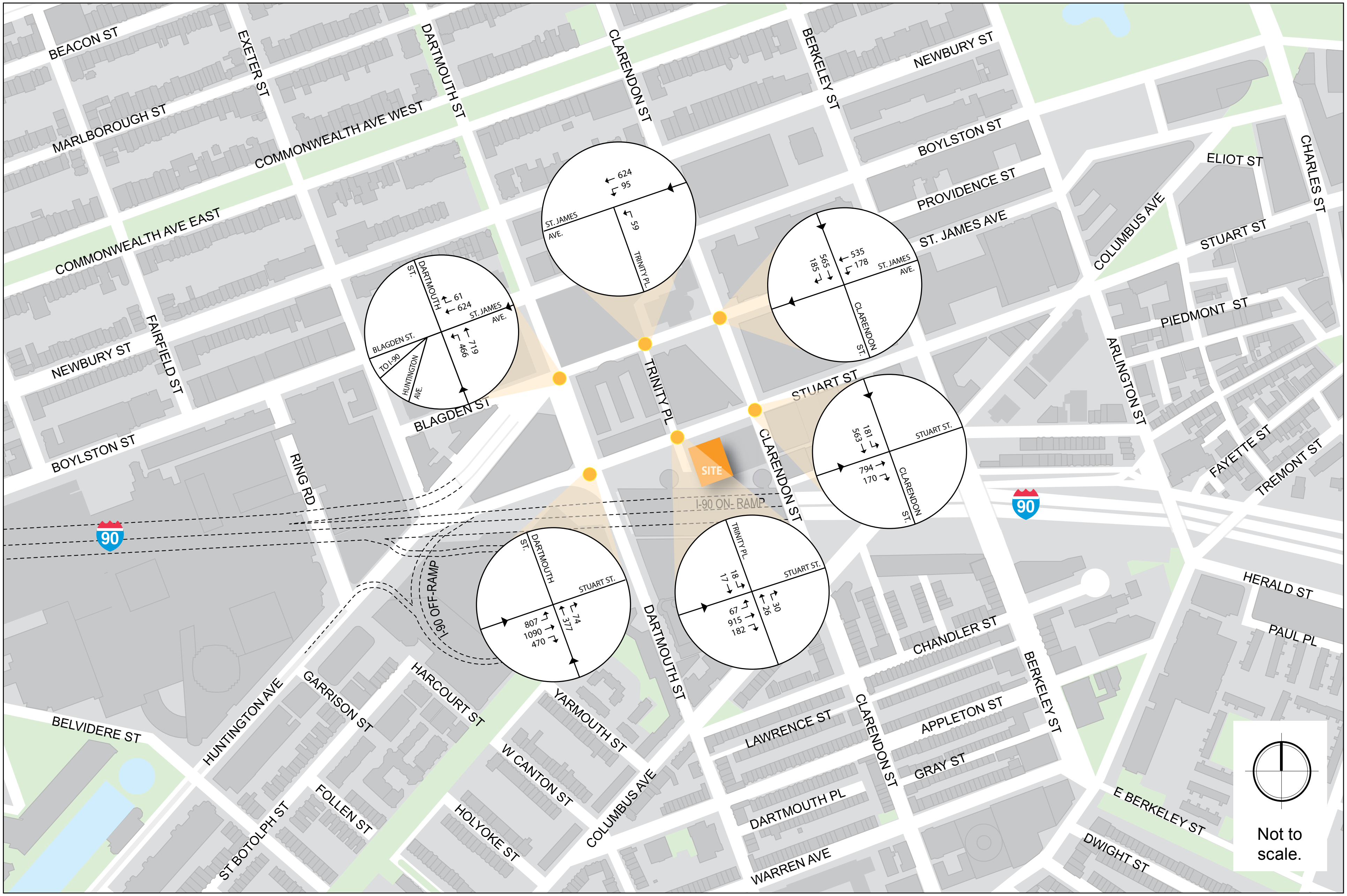

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Figure 3-18

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

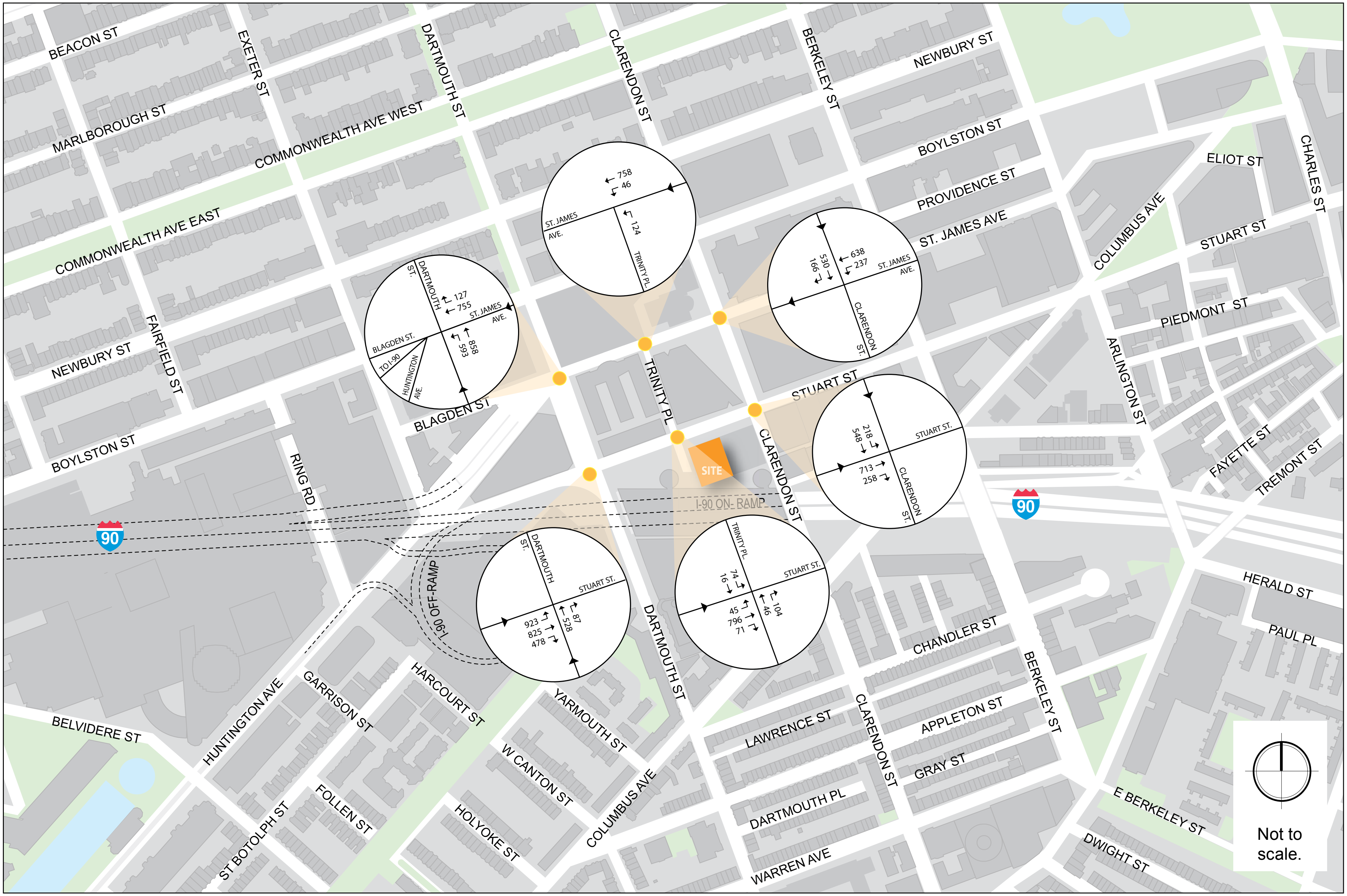

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Figure 3-19
Build Conditions (2018) Intersection Volumes, p.m. Peak Hour

Table 3-11 Trip Generation – Proposed Project

Land Use	Direction	Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Daily				
Hotel	In	581	194	223
	Out	581	194	223
Residential	In	206	69	79
	Out	206	69	79
Restaurant	In	615	179	147
	Out	615	179	147
University Club Space	In	110	32	26
	Out	110	32	26
Total Daily	**In**	**1,512**	**474**	**475**
	Out	**1,512**	**474**	**475**
a.m. Peak Hour				
Hotel	In	46	17	13
	Out	35	8	10
Residential	In	8	3	2
	Out	36	8	11
Restaurant	In	9	3	2
	Out	2	1	0
University Club Space	In	5	2	1
	Out	5	1	1
Total a.m. Peak Hour	**In**	**68**	**25**	**18**
	Out	**78**	**18**	**22**
p.m. Peak Hour				
Hotel	In	49	12	15
	Out	43	16	13
Residential	In	24	6	7
	Out	14	5	4
Restaurant	In	76	16	15
	Out	35	12	17
University Club Space	In	16	3	3
	Out	11	4	2
Total p.m. Peak Hour	**In**	**165**	**37**	**40**
	Out	**103**	**37**	**26**

Table 3-12 Build Conditions (2018), Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Stuart Street/Dartmouth Street	**B**	**19.5**		
Stuart EB left | left	A	3.7	0.46	84
Stuart EB thru | thru | thru	C	22.1	0.59	229
Stuart EB right	D	43.0	0.89	#415
Dartmouth NB thru | thru	B	13.8	0.29	100
Dartmouth NB right	B	16.5	0.34	50
Stuart Street/Clarendon Street	**B**	**13.6**		
Stuart EB thru |thru	B	14.0	0.69	311
Stuart EB right	A	6.0	0.44	35
Clarendon SB left/thru | thru	B	14.9	0.68	257
St. James Avenue/Clarendon Street	**B**	**17.7**		
St. James WB left/thru | thru	C	20.1	0.57	207
Clarendon SB thru | thru/right	B	15.5	0.50	188
St. James Avenue/Dartmouth Street	**C**	**27.8**		
St. James EB thru | thru	D	41.4	0.65	264
St. James EB right	C	32.3	0.17	m65
Dartmouth NB left | left	B	13.4	0.56	97
Dartmouth NB thru | thru | thru	C	25.5	0.62	154
Stuart Street/Trinity Place	**A**	**5.2**		
Stuart EB left/thru | thru | thru	A	0.5	0.28	10
Stuart EB right	B	12.3	0.48	114
Trinity NB thru/right	D	43.6	0.45	66
Trinity SB left/thru	D	38.7	0.32	m40
Unsignalized Intersections				
St. James Avenue/Trinity Place				
St. James WB left/thru | thru	A	1.0	0.27	7
Trinity NB left	C	20.8	0.22	21

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Light grey cell shading indicates a worsening in level of service from Year 2018 No Build Conditions that bring operations into LOS E or LOS F.
Black shading indicates an improvement in level of service from Year 2018 No Build Conditions that bring operations out of LOS E or LOS F.

Table 3-13 Build Conditions (2018), Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Stuart Street/Dartmouth Street	**B**	**15.3**		
Stuart EB left | left	A	4.1	0.51	98
Stuart EB thru | thru | thru	B	14.2	0.40	137
Stuart EB right	C	23.3	0.72	322
Dartmouth NB thru | thru	C	21.6	0.47	172
Dartmouth NB right	D	36.0	0.70	55
Stuart Street/Clarendon Street	**B**	**19.3**		
Stuart EB thru |thru	B	12.8	0.58	115
Stuart EB right	B	11.2	0.64	m136
Clarendon SB left/thru | thru	C	28.2	0.75	281
St. James Avenue/Clarendon Street	**B**	**18.0**		
St. James WB left/thru | thru	B	18.1	0.60	235
Clarendon SB thru | thru/right	B	17.9	0.51	187
St. James Avenue/Dartmouth Street	**C**	**25.8**		
St. James EB thru | thru	C	20.1	0.73	176
St. James EB right	B	15.9	0.30	70
Dartmouth NB left | left	C	20.8	0.76	204
Dartmouth NB thru | thru | thru	D	36.6	0.76	234
Stuart Street/Trinity Place	**B**	**12.2**		
Stuart EB left/thru | thru | thru	A	2.1	0.26	31
Stuart EB right	A	1.5	0.22	m2
Trinity NB thru/right	D	51.8	0.74	136
Trinity SB left/thru	D	49.9	0.68	m81
Unsignalized Intersections				
St. James Avenue/Trinity Place				
St. James WB left/thru | thru	A	0.5	0.32	3
Trinity NB left	C	23.8	0.42	49

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
Light grey cell shading indicates a worsening in level of service from Year 2018 No Build Conditions that bring operations into LOS E or LOS F.
Black shading indicates an improvement in level of service from Year 2018 No Build Conditions that bring operations out of LOS E or LOS F.

3.3.2.8 Build Conditions Parking

This section presents the Project's parking supply, an evaluation of the Project's parking demand, and an overview of expected curbside operations.

The Project will include approximately 100 on-site parking spaces for building residents. Parking for Project residents will be by garage attendant and not self-park. Given the extensive number of publically available spaces in the study area (see Table 3-5), no commercial public parking will be provided on-site.

Valet service will be available for Project hotel guests and restaurant patrons along the Stuart Street and Trinity Place curbs, as shown in Figure 3-14 and described in the sections below. It is anticipated that one valet company will manage all valet service at the site; hotel, restaurant, and the adjacent University Club. The site design and sight lines at the corner of Stuart Street/Trinity Place will allow for easy supervision by one valet manager along the Stuart Street and Trinity Place curbs.

Pick-up/drop off activities for the Project by taxi are primarily expected to be along the Stuart Street curb, although some are expected to occur along the Trinity Place curb.

Residential

BTD has set parking space goals and guidelines throughout the City to establish the amount of parking supply provided with new developments. With 100 planned residential parking spaces serving 115 condominium units, the resulting parking ratio is approximately 0.87 spaces per unit. BTD's maximum parking ratio guidelines for residential use in the Back Bay is between 0.5–1.0 spaces per unit; the resulting ratio of 0.87 spaces per unit is appropriate for this Project.

The 100 on-site parking spaces will be for residents only. Residents will drive to the covered garage driveway on Trinity Place (see Figure 3-14) and garage attendants will take and park their vehicles. Vehicles will be transported via attendant-operated vehicular elevators accessed from Trinity Place. Garage attendants will also retrieve vehicles from the garage for residents when they depart. The driveway to the garage elevators has capacity to stage four vehicles, which will be sufficient during most times of the day. As needed, curbside staging of vehicles waiting to be picked up by residents or serviced by the garage elevators will occur along the eastern curb of Trinity Place. See Section 3.3.2.9 for more discussion on curbside activity. These four curbside spaces, as shown in Figure 3-14, will be shared with valet pick-up operations for the Project. By nature of residential trip generation characteristics, and the longer dwell time for vehicle pick-up vs. drop-off, the demand for residential vehicle staging will be highest during the morning commuter departure time when these Trinity Place curbside spaces will be in lower demand by valet pick-up (hotel only in the morning) for the Project. Demand for the Trinity Place curbside spaces for resident vehicle staging will be lower during the evening commuter period when residents are leaving their vehicles to be parked at the on-site garage and dwell time is lower than pick-up activities.

Hotel

The maximum recommended BTD parking ratio for hotels is 0.40 parking spaces per room. The current trend for downtown Boston hotels, however, shows that actual parking demand is closer to about 0.25 spaces per room. While the Project will not provide on-site parking for hotel guests, valet service will be available. With 227 hotel rooms and a parking ratio of 0.25 spaces per room, the Project will need up to 57 parking spaces off-site to meet hotel peak occupancy parking demand. The Project currently has 26 deeded parking spaces in the 100 Clarendon Street Garage which will be made available to the Project's valets.

Hotel valet drop-off service will be provided along the Stuart Street curb with the valet pick-up along the Trinity Place curb. As shown in Figure 3-14, eight spaces along the southern curb of Stuart Street will be designated for valet drop-off use with two of these shared with University Club valet. The University Club already has a short segment (about two vehicle lengths) of this curb for its current valet operations. When a hotel guest arrives in a private vehicle, a valet will take and park the vehicle at a nearby facility. Some hotel guests may choose to self-park at one of the nearby public garages, mapped in Figure 3-6. The four spaces along Trinity Place will be used for all valet pick-up. It is anticipated that all taxi activity associated with the hotel will occur along the Stuart Street curb.

Should the 26 deeded spaces be insufficient for hotel guest demand, the hotel and/or valet operator will enter into an agreement with one of the nearby parking garages to satisfy hotel parking needs. Typically, hotel parking demand peaks in the evening and overnight hours, when commuter demand at surrounding garages is reduced, ensuring adequate capacity. It is expected that the valet service presently working with the Proponent's Lenox Hotel and the adjacent University Club, which has relationships with most area garages, or another operator with similar relationships, will manage the valet parking for the hotel.

Restaurant

All vehicle drop-off activity will be from Stuart Street and valet pick-up will be from Trinity Place. Similar to the hotel valet service, when a patron arrives in a private vehicle, a valet will take and park the vehicle at a nearby facility. Some patrons may choose to self-park at one of the nearby public garages, mapped in Figure 3-6.

University Club

While the University Club's 5,550 sf expansion space will be located in the Project's new building, interior access for members will continue to be through the Club's current entrance at 426 Stuart Street. New parking activity associated with expansion is expected to be negligible and will be managed by the University Club's existing valet service located on the Stuart Street curb (See Figure 3-14).

Taxis

All taxi pick-up/drop-off for the project will occur along Stuart Street. As shown in Figure 3-14, two taxi stand spaces are proposed to be designated on the southern curb, just west of Trinity Place. Taxis in these spaces will primarily serve the Project but also the variety of users in the area.

3.3.2.9 Curbside Activity

As shown in Figure 3-14, eight curbside spaces along the southern curb of Stuart Street will serve the Project's valet drop-off activity, all taxi pick-up/drop-off and all activity associated with the adjacent University Club. The four curbside spaces along the eastern curb of Trinity Place will be designated for the Project's valet pick-up activity and, as needed, staging for residential vehicles waiting to be serviced by the garage elevators. A taxi stand serving the site is proposed on Stuart Street west of Trinity Place.

To assess the operational capacity of these curbside spaces, a profile of curbside activity by time of day was developed. The estimated percent of total vehicle trips that will stop at the curb to discharge/pick-up a passenger was based on local hotel surveys, knowledge of drop-off activity patterns, automobile occupancy by land use, and engineering judgment.

In order to further confirm expected hotel curbside demand, an additional curbside survey was conducted at the Lenox Hotel on Boylston Street. The Lenox Hotel, located about ¼-mile from the Project site in the Back Bay, has 214 rooms, event space, and three restaurants. The Lenox Hotel is similar in size to the proposed Project hotel and on-site restaurants. The level of activity from the Lenox survey related to valets, drop-off/pick-up, taxi, and limos was used to assess the proposed curbside operations for these similar proportioned uses proposed by the Project.

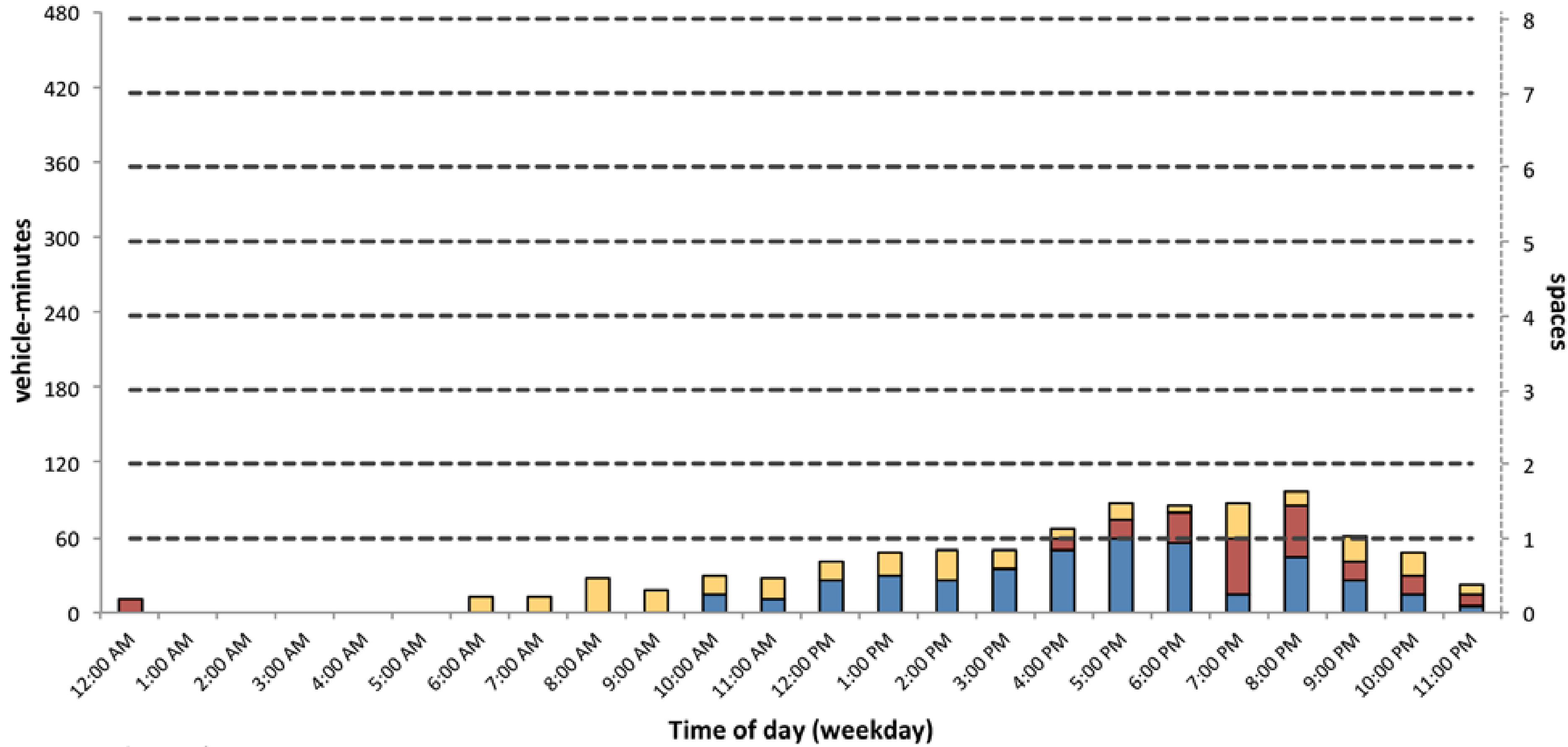
Stuart Street Curb

While the eight valet spaces along Stuart Street will be shared by the Project and University Club, it is assumed that six will generally be used by the Project and two by the University Club. Since the entire curb will be managed by a single valet operator, any overflow demand from either the Project or the University Club can be easily managed.

Activity by the Project at the Stuart Street curb will include all valet drop-off activity for the site, exclusive of on-site residential parking which will be on Trinity Place, and all taxi pick-up/drop-off activity. Activity by the University Club is not expected to change from current use and levels. Using the vehicle arrival/departure distribution and assumed curb dwell times per trip type, the number of occupied vehicle-minutes per hour on a typical weekday was calculated. Residential pick-up/drop-off activity by taxi expected at the Stuart Street curb was determined based on local area statistics of taxi demand at downtown residential buildings.

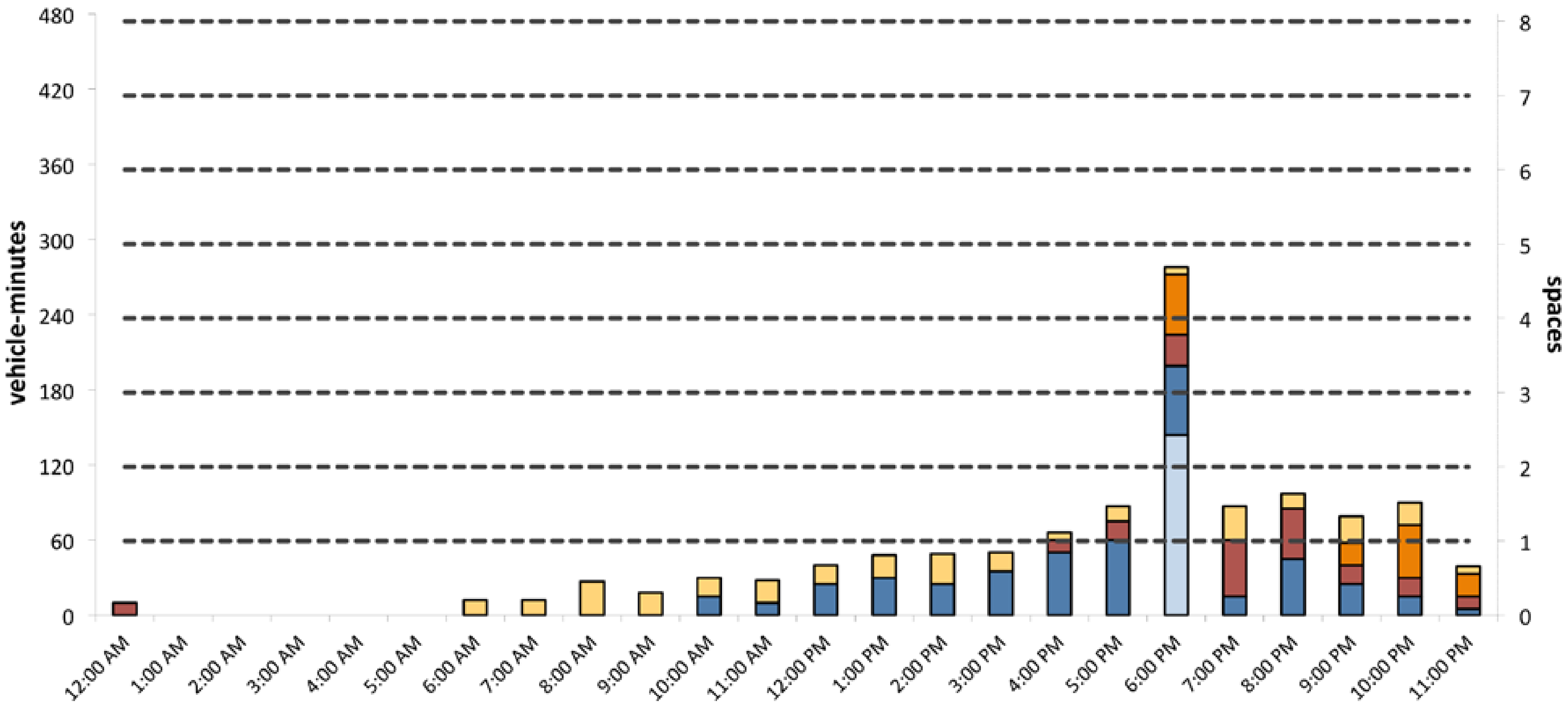
The expected average weekday Stuart Street curbside demand is graphed in Figure 3-20. The six curbside spaces have an estimated hourly capacity of 360 vehicle-minutes (60 minutes per each of six spaces). The estimated number of occupied vehicle-minutes per hour at the Stuart Street curb was calculated based on hotel and restaurant valet drop-off and hotel, restaurant, and residential taxi arrivals/departures by identified time-of-day patterns and curb dwell times per trip type. The results of this assessment indicate that the projected occupancy of the Stuart Street curb lane is generally no higher than two vehicles on a typical weekday, indicating that the curb lane will adequately serve the Project's typical hotel and restaurant drop-off and all taxi pick-up/drop-off demand with available capacity to serve typical fluctuations in demand for valet service.

Additionally, the curbside demand associated with a weeknight meeting/event was estimated. Ancillary to the hotel and restaurant use, the Project will provide space for corporate events/weddings of up to approximately 250 persons. The Stuart Street curb will provide valet drop-off and all taxi pick-up/drop off for meetings/events at the Project's facilities. The highest curbside demand for the expected type of meetings/events would be an evening corporate event that would add to the higher evening demand for everyday curb use along Stuart Street. Event data that was collected at the Four Seasons Hotel Boston during a major evening corporate event (200 attendees) was added to the typical weekday data documented above, with the results graphed in Figure 3-21. While the specific nature of the event will influence arrival and departure times and patterns, the curbside activity with a major weeknight event would expect to spike around 6:00 p.m. as visitors arrive, and is again higher as visitors leave the event, typically between 9:00 p.m. and midnight. During events, valet staffing will be increased to reduce curb dwell time. Overall, the six Stuart Street curbside valet spaces will adequately serve the combined everyday Project demand as well as a fully attended corporate weeknight event. Coordination with the University Club valets (who are expected to be the same company as the Project's valets) will allow for shared use of the University Club's valet spaces for any unexpected overflow during peak periods. Similarly, should the University Club encounter any peak period overflow, the Project's valet spaces will be available to the University Club. As a result of the large number of total valet spaces available, congestion on this block of Stuart Street will be minimized.



Assumptions:
Average taxicab dwell time = 3 minutes for drop-off and 3 minutes for pick-up.
Restaurant valet vehicle dwell time = 5 minutes for drop-off .
Hotel valet vehicle dwell time = 5 minutes for drop-off .

Figure 3-20
Stuart Street – Curbside Spaces by Time of Day, Typical Day



Assumptions:

Average taxicab dwell time = 3 minutes for drop-off and 3 minutes for pick-up.
Restaurant valet vehicle dwell time = 5 minutes for drop-off .
Hotel valet vehicle dwell time = 5 minutes for drop-off .
Corporate Event valet vehicle dwell time = 3 minutes for drop-off .

Figure 3-21

Stuart Street - Curbside Spaces by Time of Day, Weeknight Corporate Event

Trinity Place Curb

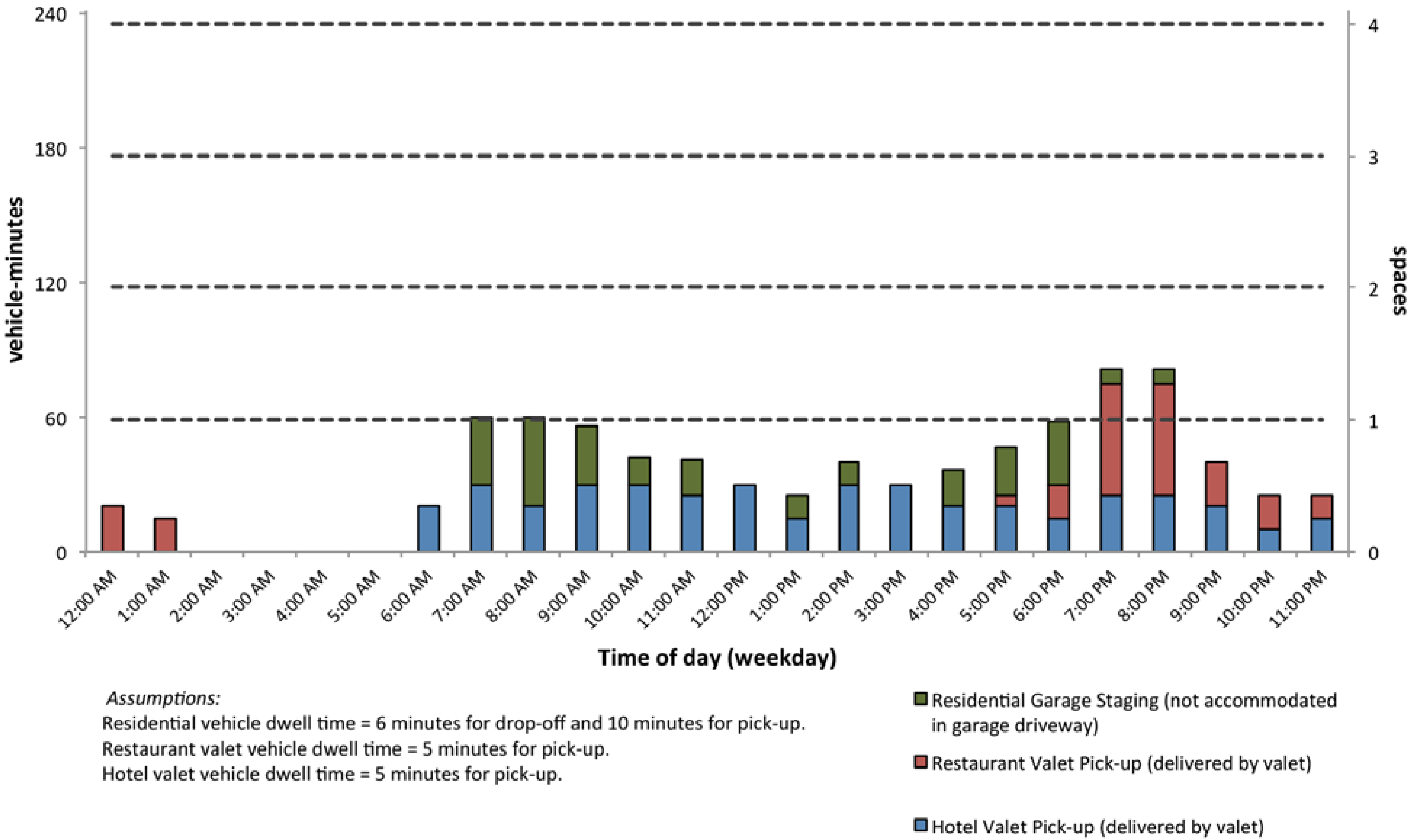
The four curbside spaces on the western side of Trinity Place, with an hourly capacity of 240 vehicles-minutes (60 minutes per each of four spaces), will serve all hotel and restaurant valet pick-up activities and any overflow residential garage staging.

The driveway serving the residential garage elevators has capacity for up to four vehicles, either to be picked up by residents or to be parked by the garage attendant. Based on a survey of residential valet operations at the Ritz Carlton Residences on Avery Street, the vehicle activity at the Project's residential garage was estimated. The curbside spaces along Trinity Place will be used only as secondary resident vehicle staging when the garage driveway is occupied. Because of the nature of residential trip generation characteristics and longer dwell time for vehicle pick-up vs. drop-off, residential garage activity will be highest during the morning hours and lowest after 7:00 p.m. The residential garage staging activity requiring secondary use of Trinity Place (i.e., above the driveway capacity) was estimated.

Hotel valet pick-up activity varies throughout the day being a bit higher in the morning and evening but is generally steady at about one vehicle per hour. Restaurant valet activity, however, does not generally start until about 4:00 p.m. and peaks in the later evening hours. Based on the time-of-day activity patterns for hotel guests and restaurant patrons, along with assumed curb dwell times per trip type, the number of occupied vehicle-minutes per hour was calculated for valet pick-up.

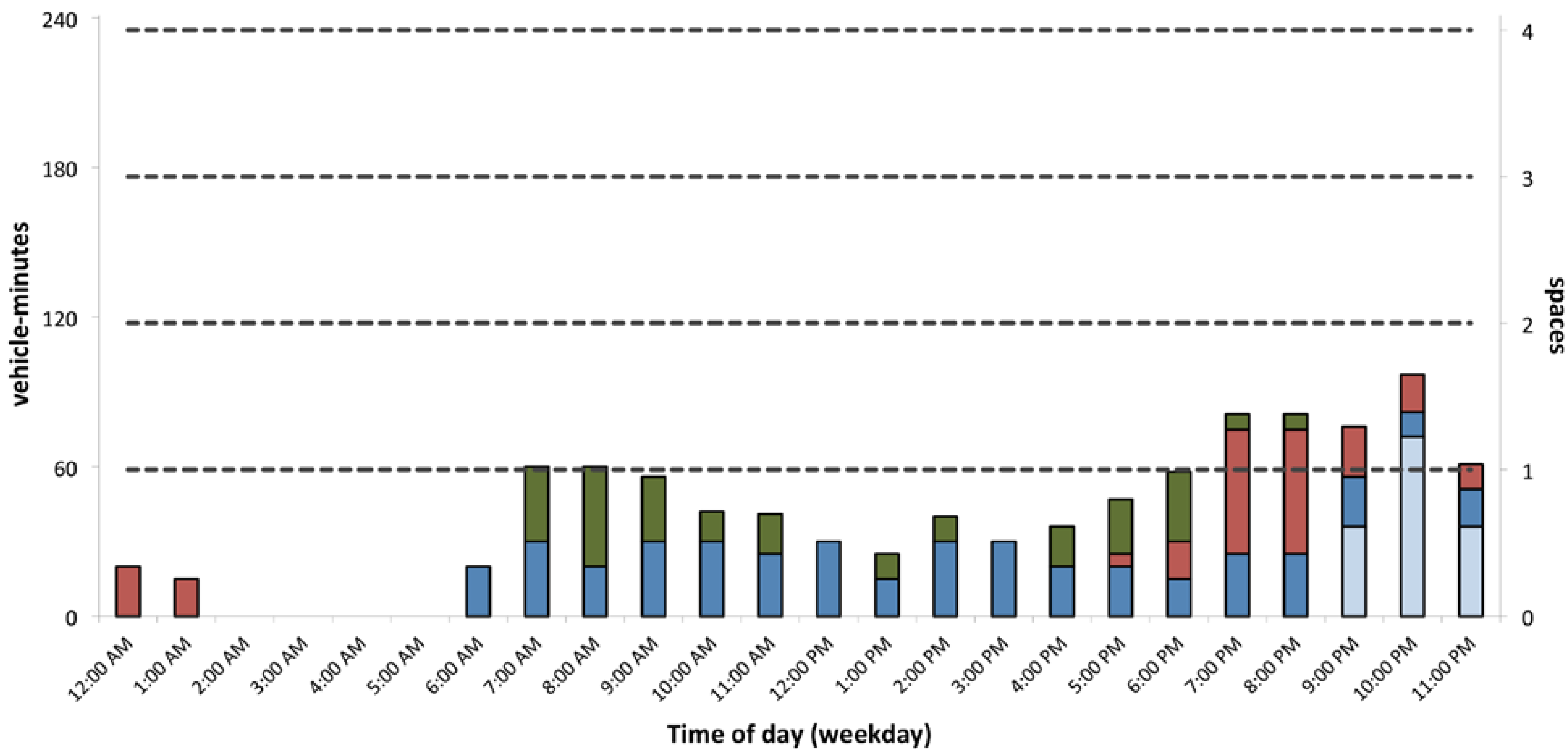
As presented in Figure 3-22, the projected average occupancy of the Trinity Place curb lane by both residential garage valet overflow or hotel and restaurant valet pick-up activity is generally no higher than about two spaces, indicating that the curb lane will adequately serve both the hotel and restaurant valet pick-up and residential garage staging. The projections also indicate that mid-day capacity exists at the Trinity Place curb that would allow for deliveries to the Project and residential move-in/move-out activities at that curb, should it be needed.

The Trinity Place curbside demand associated with a weeknight meeting/event was also estimated for a corporate event of up to 250 persons to match the assessment completed above for the Stuart Street curb. The Trinity Place curb will provide valet pickup for meetings/events at the Project's facilities. Event attendee departure times are expected to peak around 9:00 p.m., although this is dependent on the specific nature of the event. As presented in Figure 3-23, during the peak event departure time, approximately three curbside spaces will adequately serve the combined everyday Project demand as well as a fully attended corporate weeknight event.



Assumptions:
Residential vehicle dwell time = 6 minutes for drop-off and 10 minutes for pick-up.
Restaurant valet vehicle dwell time = 5 minutes for pick-up.
Hotel valet vehicle dwell time = 5 minutes for pick-up.

Figure 3-22
Trinity Place – Curbside Spaces by Time of Day, Typical Day



Assumptions:
Residential vehicle dwell time = 6 minutes for drop-off and 10 minutes for pick-up.
Restaurant valet vehicle dwell time = 5 minutes for pick-up.
Hotel valet vehicle dwell time = 5 minutes for drop-off .
Corporate Event valet vehicle dwell time = 3 minutes for pick-up.

Figure 3-23
Trinity Place – Curbside Spaces by Time of Day, Weeknight Corporate Event

3.3.2.10 Build Conditions Public Transportation

As shown in Table 3-11, the Project will generate an estimated 948 public transportation trips daily, with 43 new trips during the a.m. peak hour and 74 new trips during the p.m. peak hour. Given the variety and frequency of transit services at Back Bay and Copley stations, along with seven bus routes, the estimated increase in transit riders (about one new rider or less per minute) can adequately be served by existing transit options.

3.3.2.11 Build Conditions Pedestrian and Bicycle Conditions

As shown in Table 3-11, the Project will generate an estimated 3,024 walk/bicycle trips on a typical weekday. During peak hours, 146 new walk/bicycle trips and 268 new walk/bicycle trips will be generated by the Project for the a.m. peak and p.m. peak hours, respectively. This level of new walk/bicycle trips, at a rate of less than five trips per minute can be accommodated on the existing sidewalk system serving the site. The new traffic signal at Stuart Street/Trinity Place will facilitate safer crossings for Project pedestrians and bicyclists.

The Project's setback at the Stuart Street/Trinity Place corner provides for improved pedestrian circulation and for outdoor restaurant seating. As discussed below in the Transportation Mitigation Measures section, the Proponent will install new sidewalks along Stuart Street and Trinity Place adjacent to the Project. The sidewalk along the southern curb of Stuart Street between Trinity Place and Clarendon Street will be widened seven feet from 12 feet to 19 feet. As part of the sidewalk improvements, the Project will further extend the sidewalks at the southeast corner of the Stuart Street/Trinity Place intersection with bulb-outs that will both shorten the pedestrian crossings and allow for relocation of the BTD proposed traffic signal mast arm which will be located tight against the property line and existing building façade on this corner (see Figure 3-13).

The Proponent will provide adequate secured bicycle storage and racks to encourage bicycle use. See Section 3.5.2 for further discussion of bicycle accommodations.

3.3.2.12 Build Conditions Loading and Service Activity

As shown in Figure 3-13, the Project's service and loading dock will be located in the area at the back of the site, as they are for the current building and uses on site. Delivery vehicles will access the loading area from Clarendon Street via the Massachusetts Turnpike west access roadway (located under the adjacent 100 Clarendon Street Garage) and will exit to Trinity Place.

The proposed loading area for the Project will include one loading bay with two loading areas; one accessible by 36-foot, single-unit box trucks (SU-36) and the other by a 30-foot single unit box truck (SU-30). Additional weekday deliveries can be from the Trinity Place curb which, while being used residential valet staging and other valet pick-up, will be more lightly used during the middle of the day. Residential move-in/move-out will be managed by building management and can be either from one of the loading areas to the rear of the site or by permit from BTD along Trinity Place. Trash will be managed interior to the building and brought to the loading bay for pick-up.

Because pedestrian activity will be limited near all loading dock activity, conflicts between delivery vehicles and pedestrians will be minimal.

A summary of anticipated loading/service activity by land use is presented in Table 3- 14; the sources of the assumptions are presented below.

Hotel/Restaurant Use. Hotel delivery trip estimates were based on observations at the Lenox Hotel in Boston. At 214 keys and three restaurants, the Lenox Hotel is very similar to that proposed for 40 Trinity Place.

Residential Use. Residential units primarily generate delivery trips related to small packages and prepared food. Delivery trip estimates were based on National Cooperative Highway Research Program (NCHRP) data for Boston[3] with an additional factor to account for the added trips generated by increased internet shopping.

Table 3-14 Delivery Activity by Land Use

Land Use	Number of Deliveries			General Delivery Times
	SU-30 or smaller	*Larger than SU-30*	*Total*	
Hotel/Restaurant[1 2]	10	4	14	80% between 7:00 a.m. and 1:00 p.m. 20% after 1:00 p.m.
Residential	4	0	4	100% between 7:00 a.m. and 1:00 p.m.
Total	**14**	**4**	**18**	

[1] Incorporates reduction for shared-use deliveries.
[2] Includes destination restaurants and lounge.

Over the four-day period of the Lenox Hotel survey, an average of 14 deliveries occurred for the combined hotel and restaurant use. Most of the deliveries occurred between 7:00 a.m. and 1:00 p.m., with 20% occurring after 1:00 p.m. The majority of deliveries occurred in vans or SU-30 box trucks or smaller with about 25% of deliveries arrived in trucks larger than SU-30. Combined with the residential use, the Project is expected to generate approximately 18 deliveries per day. It is anticipated that 14 of these deliveries will occur

[3] "Truck Trip Generation Data –Synthesis 298", NCHRP, Transportation Research Board, Washington D.C. 2001.

between 7:00 a.m. and 1:00 p.m., or, on average, about two to three deliveries per hour during this period. Based on observations of deliveries at the Lenox Hotel, the average duration of a delivery is about 8 to 12 minutes, indicating that the Project is providing adequate loading capacity.

Note that trash truck trips are not included in these numbers. In downtown Boston for this type of development, trash truck trips generally occur between 5:00 a.m. and 7:00 a.m.

3.4 As-of-right Alternative

The proposed development program will generate substantially lower vehicle trips than the As-of-right Alternative, which includes approximately 127,500 sf of office, an approximately 6,000 sf conference center, approximately 11,300 sf of restaurant space, and approximately 5,550 sf of University Club space. Over the course of a day, the As-of-right Alternative building program would be expected to generate approximately 1,164 daily vehicle trips compared to 950 for the proposed Project. During the a.m. peak hour, the As-of-right Alternative would be expected to generate more than two times the level of vehicle trips as the proposed Project (104 vehicle trips to 40 vehicle trips for the proposed Project), and almost two times as many vehicle trips during the p.m. peak hour (125 vehicle trips to the proposed 66 vehicle trips). The higher number of overall daily vehicle trips and the significantly higher peak hour trips are due to the office component of the As-of-right alternative which is absent from the proposed Project.

3.5 Transportation Mitigation Measures

While the traffic impacts associated with the new trips are minimal, the Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use.

The Proponent is responsible for preparation of the Transportation Access Plan Agreement (TAPA), a formal legal agreement between the Proponent and the BTD. The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, travel demand management measures, and any other responsibilities that are agreed to by both the Proponent and the BTD. Because the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed. The transportation mitigation elements that the Proponent has recommended in this section will be discussed with BTD and, if committed to, will be documented in the TAPA.

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

Certain streetscape improvements surrounding the site on Trinity Place and Stuart Street may require Public Improvement Commission (PIC) review and approval. As is standard practice, the Proponent will work with the City in continuing to develop and obtain approval of these improvements.

3.5.1 Pedestrian Mitigation

The Project is proposing to widen the south sidewalk of Stuart Street along the site and the full distance between Trinity Place and Clarendon Street by approximately seven feet. Stuart Street will provide for two travel lanes, a bicycle lane, and a right turn only lane at Clarendon Street. A bulb-out will be added to the southeast corner of the Stuart Street/Trinity Street intersection to further reduce pedestrian crossing distances. The traffic signal mast arm currently proposed to be installed by the City in the southeast corner of the intersection will be relocated into the bulb-out and away from the face of the building, further improving the pedestrian environment. The corner at Stuart Street/Trinity Place and the Trinity Place sidewalk will also be improved and widened by pulling the building face in from the property line. .

3.5.2 Bicycle Accommodations

The Proponent will provide bicycle amenities for the Project's residents, guests, tenants, and visitors to encourage bicycle use. BTD has established guidelines for projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for employees and short-term bicycle racks for visitors. Based on BTD guidelines, Table 3-15 presents a breakdown of the suggested Project's on-site bicycle accommodation.

Table 3-15 On-Site Bicycle Accommodations

Use	Bicycle Storage *for employees/residents*	Showers[1)]	Bicycle Racks *for visitors*
Hotel	11	na	3
Residential	115	na	23
Restaurant	2	na	1
Total	128	na	27

1) Shower facilities at the hotel will be made available for Project employees who bicycle to work.

The Project will provide secure bicycle storage inside the building for residents and employees. The Proponent will work with Boston Bikes and BTD to identify the appropriate number of bicycle racks for visitors given sidewalk constraints in the area. All bicycle racks, signs, and parking areas will conform to BTD standards.

3.5.3 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to minimize automobile usage and Project related traffic impacts. The TDM program supports the City's efforts and those outlined in the Stuart Street Planning Study to reduce dependency on the automobile by encouraging travelers to use alternatives to driving alone, especially during peak time periods. TDM will be facilitated by the nature of the Project (which does not generate significant peak hour trips) and its proximity to numerous public transit alternatives.

The Proponent is prepared to take advantage of good transit access in marketing the site to future condominium buyers and restaurant tenants by working with them to implement the following demand management measures to encourage the use of public transportation, bicycling, and walking.

TDM measures may include the following:

- ♦ Orientation Packets: The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby Zipcar locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.

- ♦ Promotional Materials: The Proponent will encourage the hotel operator to provide guests with public transit system maps and schedules, and provide such information in a prominent location within the hotel, as well as on the hotel's website. The hotel operator will be encouraged to supply hotel guests with loaner umbrellas and WalkBoston's walking map of downtown Boston.

- ♦ Bicycle Accommodation: The Proponent will provide bicycle storage in secure, sheltered areas for residents. Secure bicycle storage will also be made available to employees to encourage bicycling as an alternative mode of transportation. Subject to necessary approvals, public use bicycle racks for visitors will be placed near building entrances. For building employees who bicycle to work, shower facilities will be available on-site.

- ♦ Electric Vehicle Charging: As demand mandates, the Project will commit to providing up to 5% of total on-site parking supply with electric vehicle charging stations.

- Transportation Coordinator: The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, shuttle and valet service, and service and loading, and will work with residents as they move in to raise awareness of public transportation alternatives.

- The Proponent will join the local Transportation Management Association (TMA).

- The Proponent will provide payroll deduction and distribution of MBTA passes for hotel employees.

3.6 Evaluation of Short-term Construction Impacts

Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a CMP to be filed with BTD.

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

- No construction worker parking on-site;

- Encouragement of worker carpooling;

- Consideration of a subsidy for MBTA passes for full-time employees; and

- Providing secure spaces on-site for workers' supplies and tools so they do not have to be brought to the site each day.

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

Section 4.0

Environmental Protection Component

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Wind

4.1.1 Introduction

A pedestrian wind study was conducted for the proposed Project by Rowan Williams Davies & Irwin Inc. (RWDI). The objective of the study was to assess the effect of the Project on local wind conditions in pedestrian areas around the site. The No Build (present condition including approved, but not yet built projects in the area) and Build (the Project) construction conditions were tested by placing specially designed wind sensors at 92 locations, chosen in consultation with the BRA, surrounding the Project site on a scaled model of the Project area as described more fully in Section 4.1.3.

This area of the City of Boston is one of the City's windiest, primarily due to the nearby presence of the John Hancock Tower, which due to its shape, flatness and orientation directs strong winds to the surrounding city streets. An initial wind tunnel study of the Project was conducted in May 2013, which included the Build Condition with the initial shape of the Project, and a report was issued dated May 17, 2013. The results from that study predicted negative effects from the Project on several surrounding city streets. Based in part on advice and recommendations from RWDI, the Project's design team considered various design options with façade breaks, protrusions (balconies), chamfered building corners and a large canopy above street level in an effort to minimize its wind impacts. A total of nine design options were studied of which the design that produced minimal wind impacts on the surroundings has been chosen and presented as the Build Condition in this report.

Wind comfort categories at most of the locations tested are expected to remain the same in the Build and No Build Conditions. Wind comfort categories are predicted to essentially remain unchanged with or without the Project, or improve with the Project at approximately 88 percent of the locations studied. Of the remaining locations, winds at only three locations are expected to exceed the comfort criteria for walking with the addition of the Project. The addition of the Project is also expected to mitigate the annual gust velocity exceedance at one location. The number of locations where winds exceed the effective gust velocity criteria in the Build Condition is 10, which is an improvement over the No Build Condition, in which winds at 11 locations exceeded the criterion.

4.1.2 Overview

Major buildings, especially those that protrude above their surroundings, often cause increased local wind speeds at the pedestrian level. Typically, wind speeds increase with elevation above the ground surface, and taller buildings intercept these faster winds and deflect them down to the pedestrian level. The funneling of wind through gaps between buildings and the acceleration of wind around corners of buildings may also cause increases in wind speed. Conversely, if a building is surrounded by others of equivalent height, it may be protected from the prevailing upper level winds, resulting in no significant changes to the local pedestrian level wind environment. The most effective way to assess potential pedestrian level wind impacts around a proposed new building is to conduct scale model tests in a wind tunnel.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.

4.1.3 Methodology

The study involved wind simulations on a 1:400 scale model of the Project and surroundings. These simulations were then conducted in RWDI's boundary-layer wind tunnel at Guelph, Ontario, for the purpose of quantifying local wind speed conditions and comparing to appropriate criteria for gauging wind comfort in pedestrian areas. The model was constructed based on information from the Proponent. The criteria recommended by the BRA were used in this study. The following section includes a discussion of the methods and the results of the wind tunnel simulations. Information concerning the site and surroundings was derived from information provided by the Proponent. The following Conditions were simulated:

- No Build Condition: existing on-site buildings, in the presence of all existing and approved surroundings; and
- Build Condition: the proposed Project, in the presence of all existing and approved surroundings.

As shown in Figures 4.1-1 and 4.1-2, the wind tunnel model included the Project and all relevant surrounding buildings and topography within a 1,500 foot radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modeled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 92 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full scale height of five feet above grade in pedestrian areas throughout the study site. The locations of the 92 wind speed sensors were determined in consultation with the BRA. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting

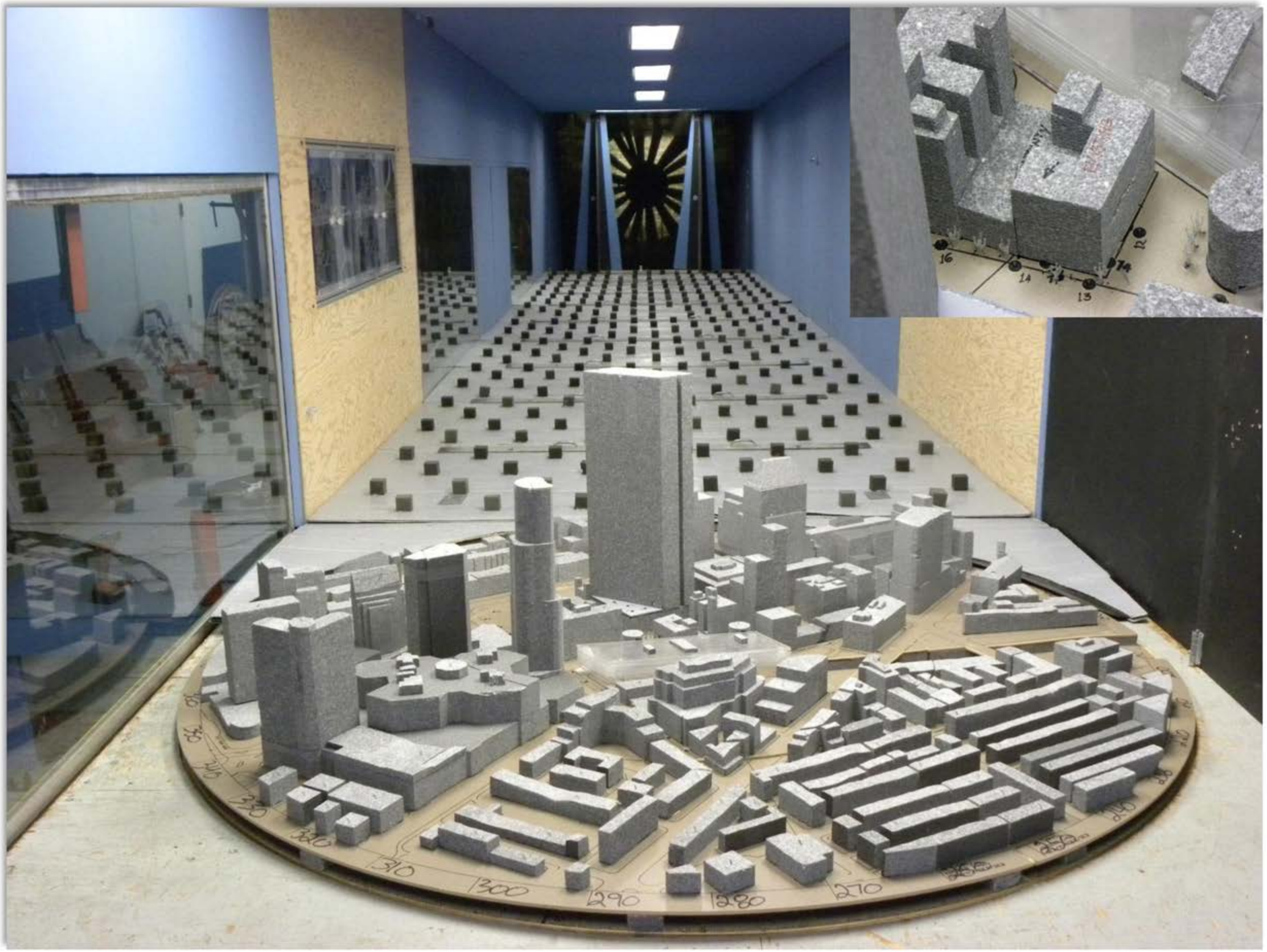


Figure 4.1-1

Wind Tunnel Study Model: No Build

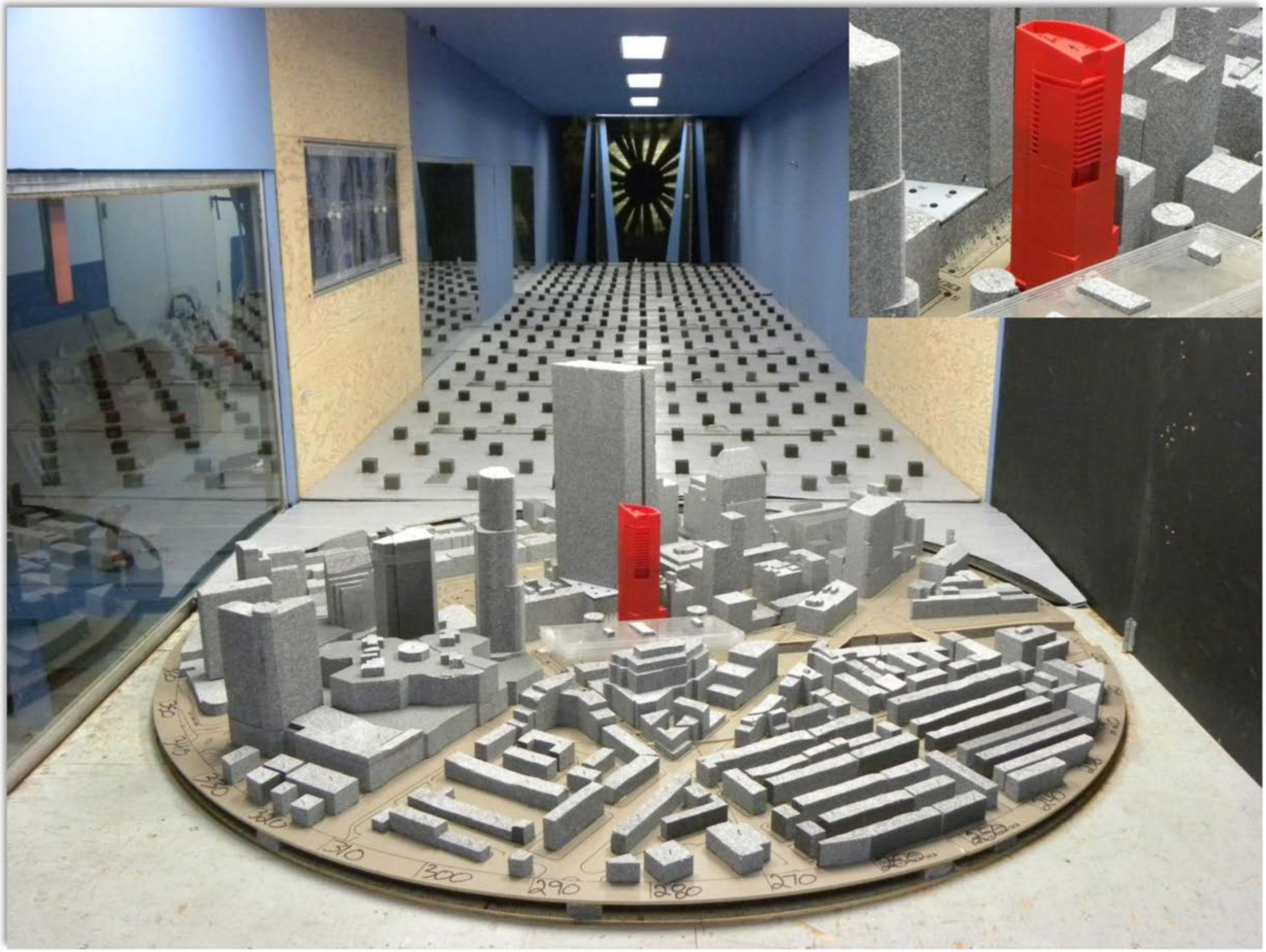


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Figure 4.1-2

Wind Tunnel Study Model: Build

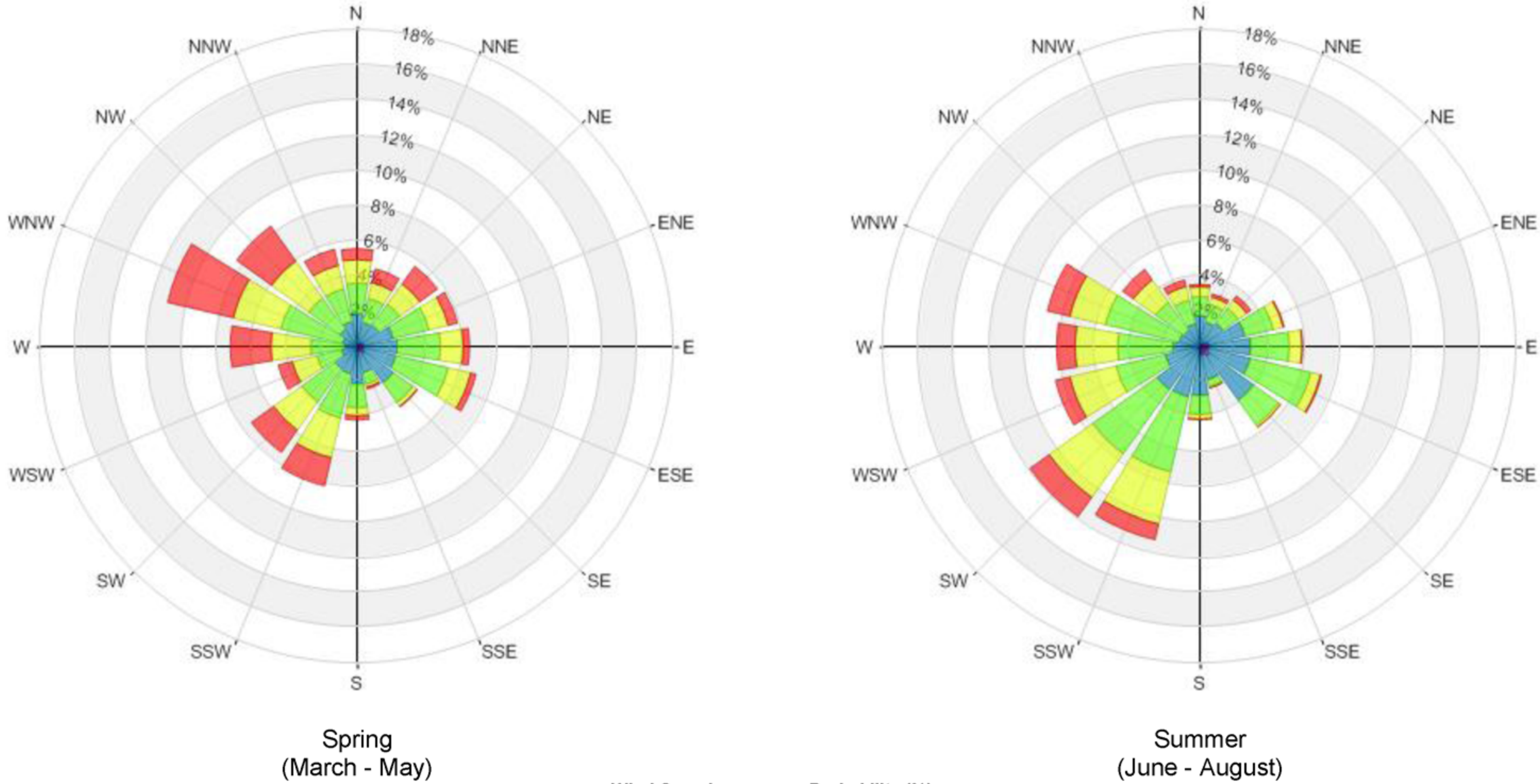
from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model. The results were then combined with long term meteorological data, recorded during the years 1981 to 2011 at Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year.

Figures 4.1-3 to 4.1-5 present "wind roses", summarizing the annual and seasonal wind climates in the Boston area, based on the data from Logan International Airport. The wind roses, in Figures 4.1-3 and 4.1-4, are based on all observed wind readings for the given season. The left-hand side wind rose in Figure 4.1-3, for example, summarizes the spring (March, April, and May) wind data. In general, the prevailing winds are from the west northwest, northwest, west and southwest. In the case of strong winds, however, the most common wind direction is northwest and west. On an annual basis (Figure 4.1-5) the most common wind directions are those between southwest and northwest. These are also the dominant directions for strong winds.

This study involved state of the art measurement and analysis techniques to predict wind conditions at the study site. Wind speeds and directions collected at Logan International Airport were adjusted for the Project site, based on a well-established analytical procedure that considered the topographic and building features of surrounding areas around both the airport and the Back Bay. Nevertheless, some uncertainty remains in predicting wind comfort, and this must be kept in mind. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this section represent an average for the total population. Also, unforeseen changes in the Project area, such as the construction or removal of buildings, can affect the conditions experienced at the site. Finally, the prediction of wind speeds is necessarily a statistical procedure. The wind speeds reported are for the frequency of occurrence stated (one percent of the time). Higher wind speeds will occur, but on a less frequent basis and the other 99% of the time, the winds will be lower than the speeds stated.

4.1.4 Pedestrian Wind Comfort Criteria

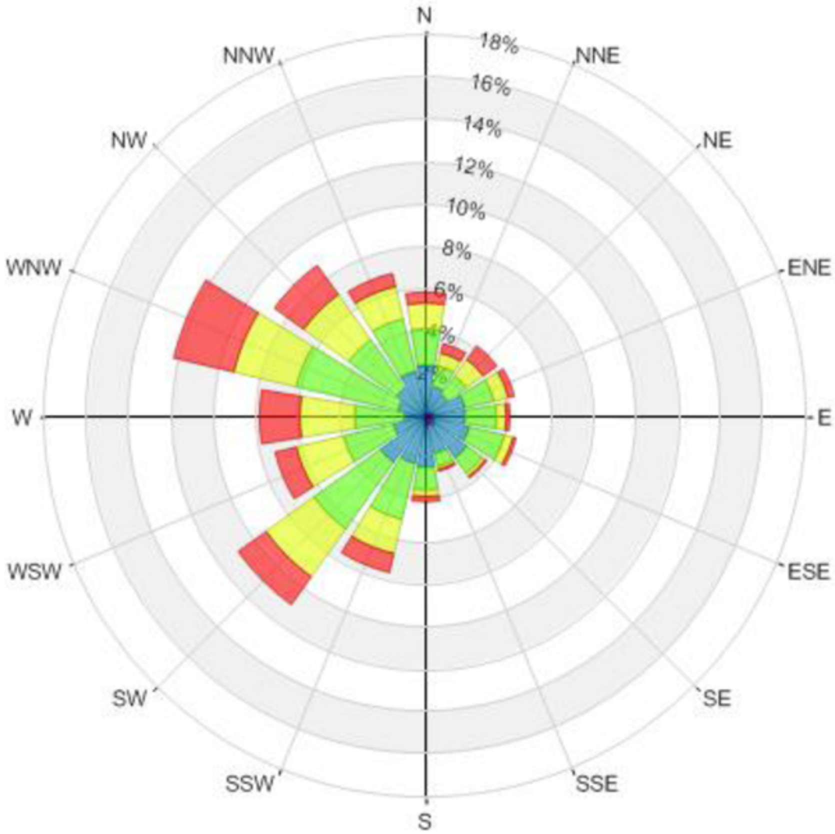
The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root mean square wind speed) of 31 miles per hour (mph) should not be exceeded more than one percent of the time. The second set of criteria used



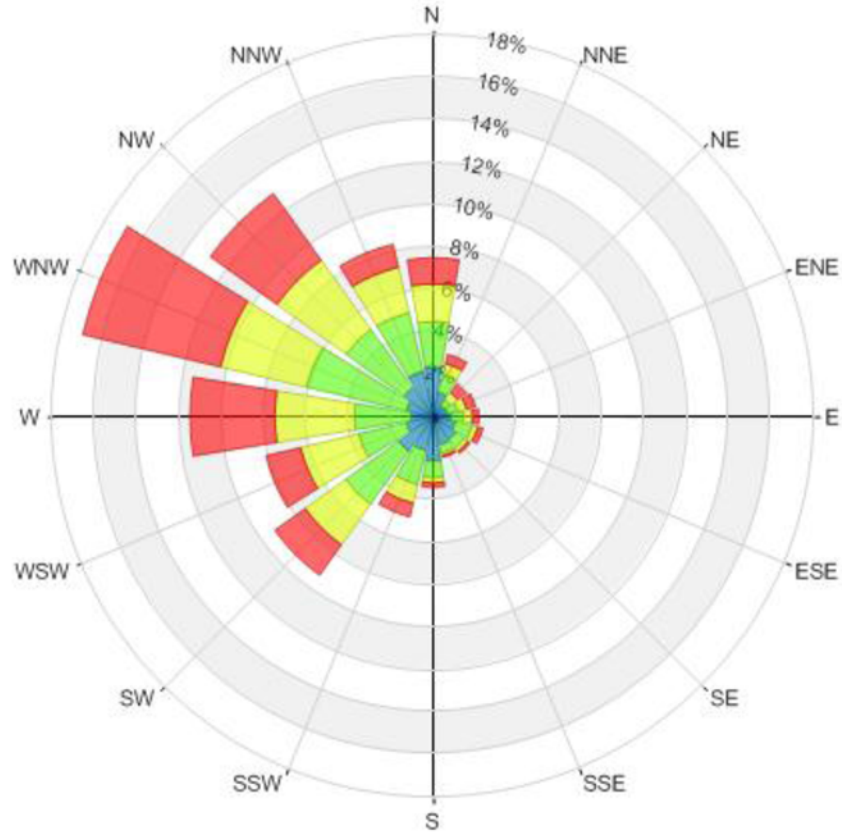
Wind Speed (mph)	Probability (%) Spring	Probability (%) Summer
Calm	1.7	1.8
1-5	3.5	4.6
6-10	22.5	30.3
11-15	31.5	36.4
16-20	23.0	19.5
>20	17.8	7.4

Figure 4.1-3

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



Fall
(September - November)

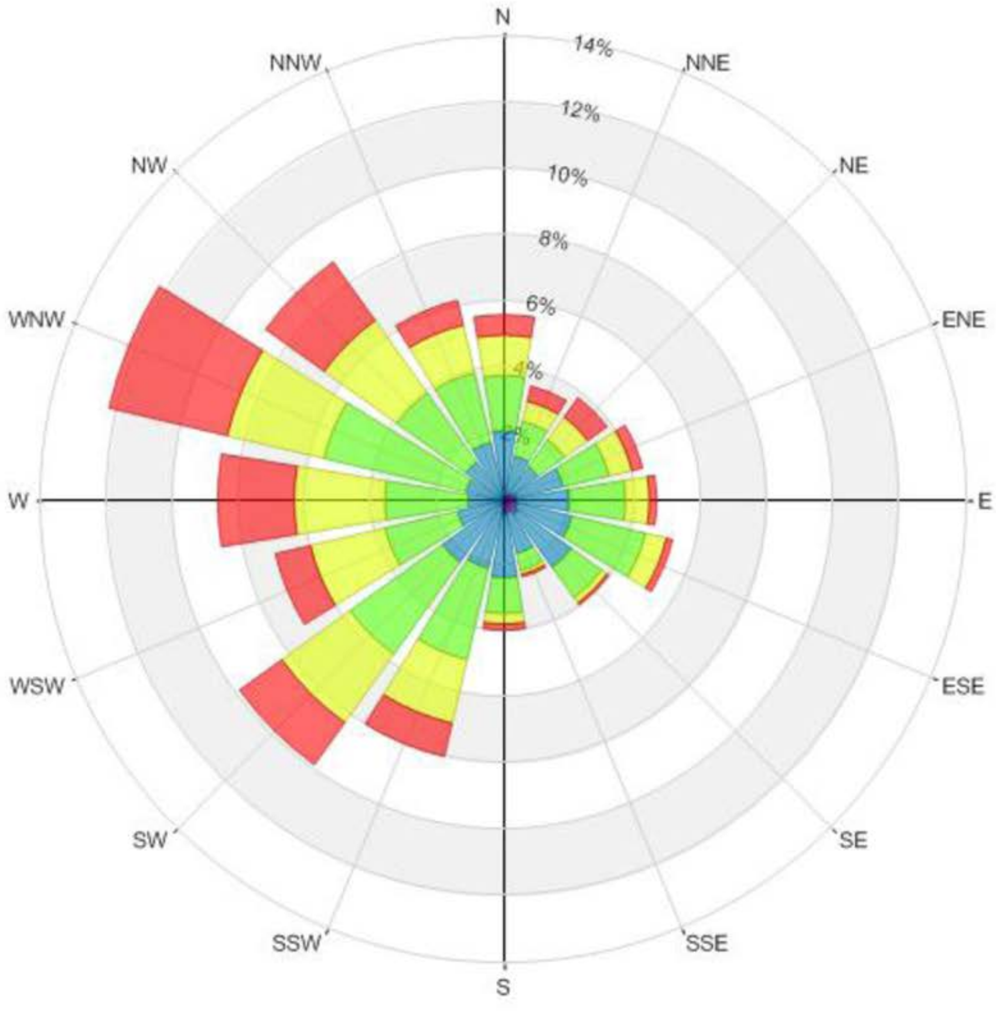


Winter
(December - February)

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

Figure 4.1-4

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



Annual Winds

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

Figure 4.1-5

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

by the BRA to determine the acceptability of specific locations is based on the work of Melbourne.[1] This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the one-hour mean wind speed exceeded one percent of the time (i.e., the 99-percentile mean wind speed). They are shown in Table 4.1-1 below.

Table 4.1-1 Boston Redevelopment Authority Mean Wind Criteria*

Level of Comfort	Wind Speed
Dangerous	> 27 mph
Uncomfortable for Walking	>19 and <27 mph
Comfortable for Walking	>15 and <19 mph
Comfortable for Standing	>12 and <15 mph
Comfortable for Sitting	<12 mph

* Applicable to the hourly mean wind speed exceeded one percent of the time.

4.1.5 Test Results

Appendix C presents the mean and effective gust speeds for each season as well as annually. Figures 4.1-6 through 4.1-9, at the end of this section, graphically depict the gust wind and mean wind conditions at each wind measurement location based on the annual winds for each of the Conditions tested. Figure 4.1-10, at the end of this section, shows the change in comfort categories between the No Build and Build Conditions.

A total of 92 sensors were used in the model. Sensors 1 through 5 were located at grade level along the building perimeter. Sensors 2 and 4 were located below the canopy of the Project, and the data from these sensors were not applicable for the No Build Condition.

Typically, the summer and fall winds tend to be more comfortable than the annual winds, while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each Condition tested, except where noted below in the text.

In general, wind conditions suitable for walking are appropriate for sidewalks, and lower wind speeds conducive to standing are preferred at building entrances.

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

4.1.5.1 No Build Condition

As shown in Figure 4.1-8, on an annual basis, mean wind speeds are predicted to be comfortable for walking or better at many test locations, but uncomfortable at a number of locations as well due in significant part to the nearby presence of the Hancock Tower, as previously mentioned. Uncomfortable wind conditions were detected on an annual basis at a total of 20 locations, including areas on the sidewalk along Stuart Street (Locations 8, 9, 10, 12, 17, 19, 23 and 25), Clarendon Street (Locations 44 through 49, 53 and 54), Avenue (Location 61), Huntington Avenue (Locations 71 and 72) and Trinity Place (Location 79). Higher mean winds categorized as dangerous on an annual basis were detected at the northwest corner of the intersection of Stuart and Clarendon streets (Location 20) and along St. James Avenue (Locations 56 and 57), as can be seen in Figure 4.1-8.

The effective gust velocity criterion was exceeded at 11 locations on an annual basis (Locations 10, 17, 20, 45, 47, 54, 56, 57, 71, 72 and 79 in Figure 4.1-6 and in Appendix C).

4.1.5.2 Build Condition

At 83% of the locations tested, wind comfort categories are predicted to remain unchanged with or without the Project. There are two locations that are presently considered “uncomfortable” that will improve to being “comfortable for walking” with the addition of the project, and two locations that are presently considered “comfortable for walking”, or better, that will be in the “uncomfortable” category in the Build condition.

There is a net improvement in pedestrian comfort on the windiest days, however, as in the Build Condition, the number of locations where winds exceed the effective gust velocity criteria drops to 10, which is an improvement over the No Build Condition, in which winds at 11 locations exceeded the criterion. At the northeast corner of the intersection of Stuart Street and Trinity Place (Location 17), the annual effective gust velocity was improved to acceptable levels with the placement of the Project (see Figure 4.1-7 and Appendix C). No new areas of annual effective gust velocity exceedance were created with the addition of the Project.

As described above, with the addition of the Project, wind comfort categories at most areas tested are expected to remain unchanged as can be seen in Figures 4.1-9 and 4.1-10. The No Build and Build Conditions are similar with two locations improving to comfortable categories and two new locations having uncomfortable winds. Of the 92 locations studied, 74 of the 90 locations applicable to both Build and No Build Conditions remain in the same wind speed category in both Conditions. Six locations had improved wind conditions (lower average wind speeds) with the proposed Project (Locations 8, 31, 49, 52, 55 and 82 as shown on Figures 4.1-9 and 4.1-10). Ten locations had increased average wind speeds with the Project in place. Of those 10, seven are adjacent to the Project and all but one changed by only one wind speed category. A marginal exceedance of the comfort criteria for walking, by 1 mph in the mean wind speed, is predicted to occur at Locations 6 and 18 (see Figure 4.1-9 and Appendix C). With the Project in place, mean annual wind speeds are expected to improve from being uncomfortable to comfortable for walking or better at Locations 8 and 49. Of the five comfort categories, three are considered to be comfortable.

The walk down Clarendon Street, which many consider one of the windier locations in the City, will be improved with the Project in place. Three of the locations on Clarendon Street between Boylston Street and the Massachusetts Turnpike are predicted to improve (Locations 52, 49 and 55) and only one location is predicted to becomewindier (Location 45). The wind comfort categorization at Location 45 is expected to be lowered by one classification; however, as is shown in Figures 4.1-6 and 4.1-7, winds at this location exceed the annual effective gust velocity criterion both with and without the Project in place.

4.1.5.3 Conclusion

The wind analysis shows that with the Proponent's final design, the overall wind conditions expected in the surrounding area are largely similar in the No Build and Build Conditions. Locations where wind comfort levels are reduced are offset by locations where wind comfort levels are improved. The number of locations where winds exceed the effective gust velocity criteria in the Build Condition is 10, which is an improvement over the No Build Condition, in which winds at 11 locations exceeded the criterion.

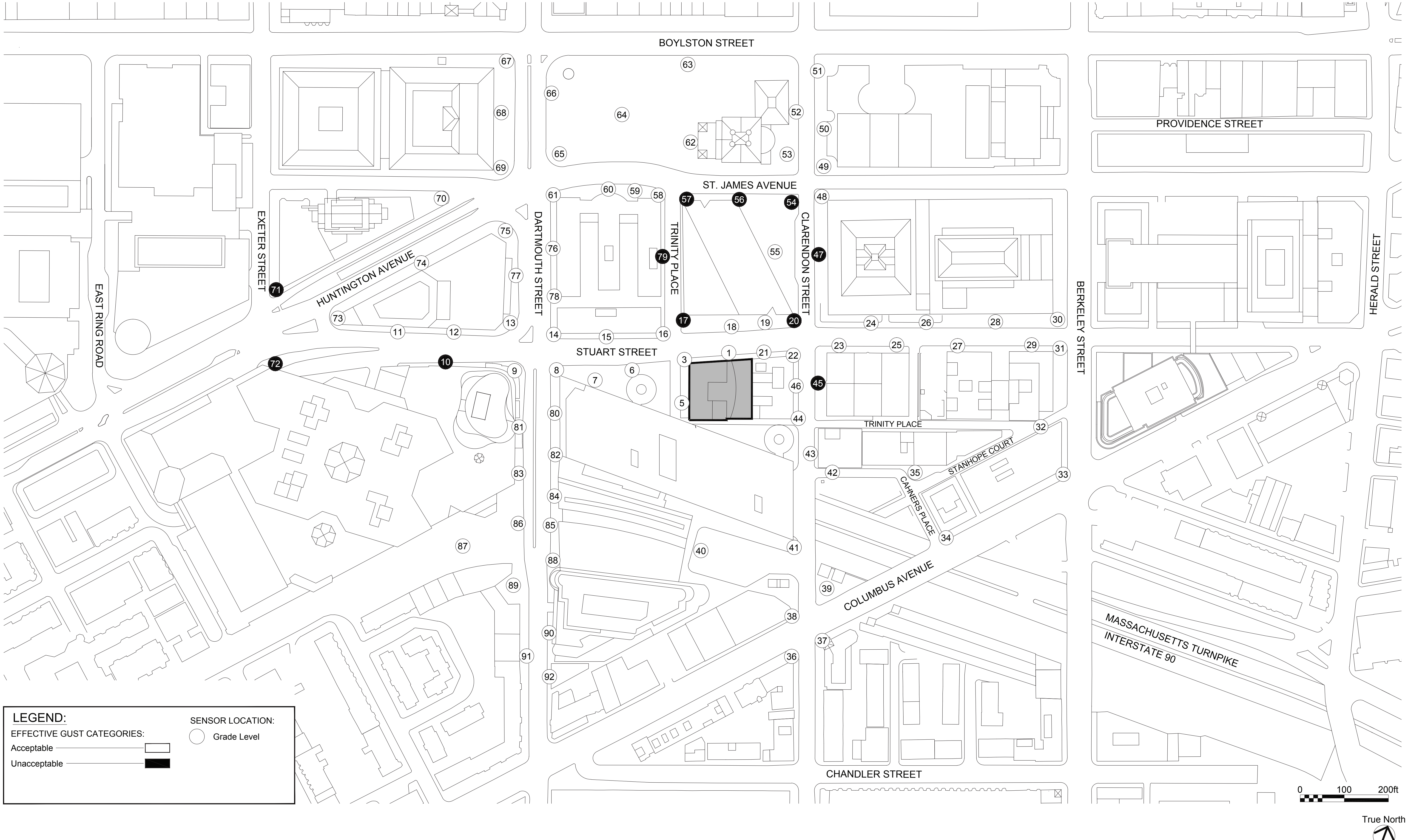

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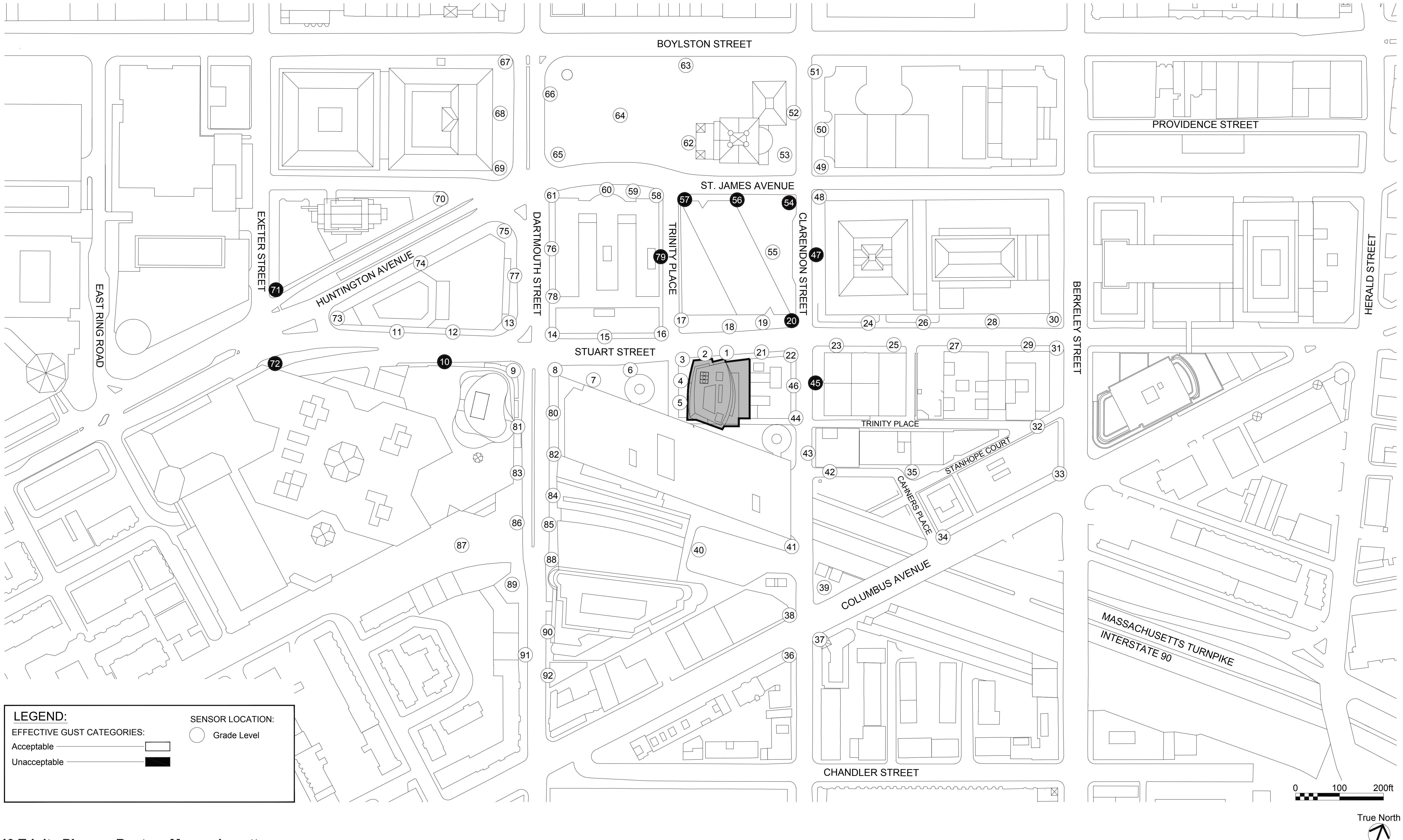
Figure 4.1-6

Pedestrian Wind Conditions - Effective Gust - No Build, Annual



40 Trinity Place Boston, Massachusetts

Figure 4.1-7

Pedestrian Wind Conditions - Effective Gust - Build, Annual

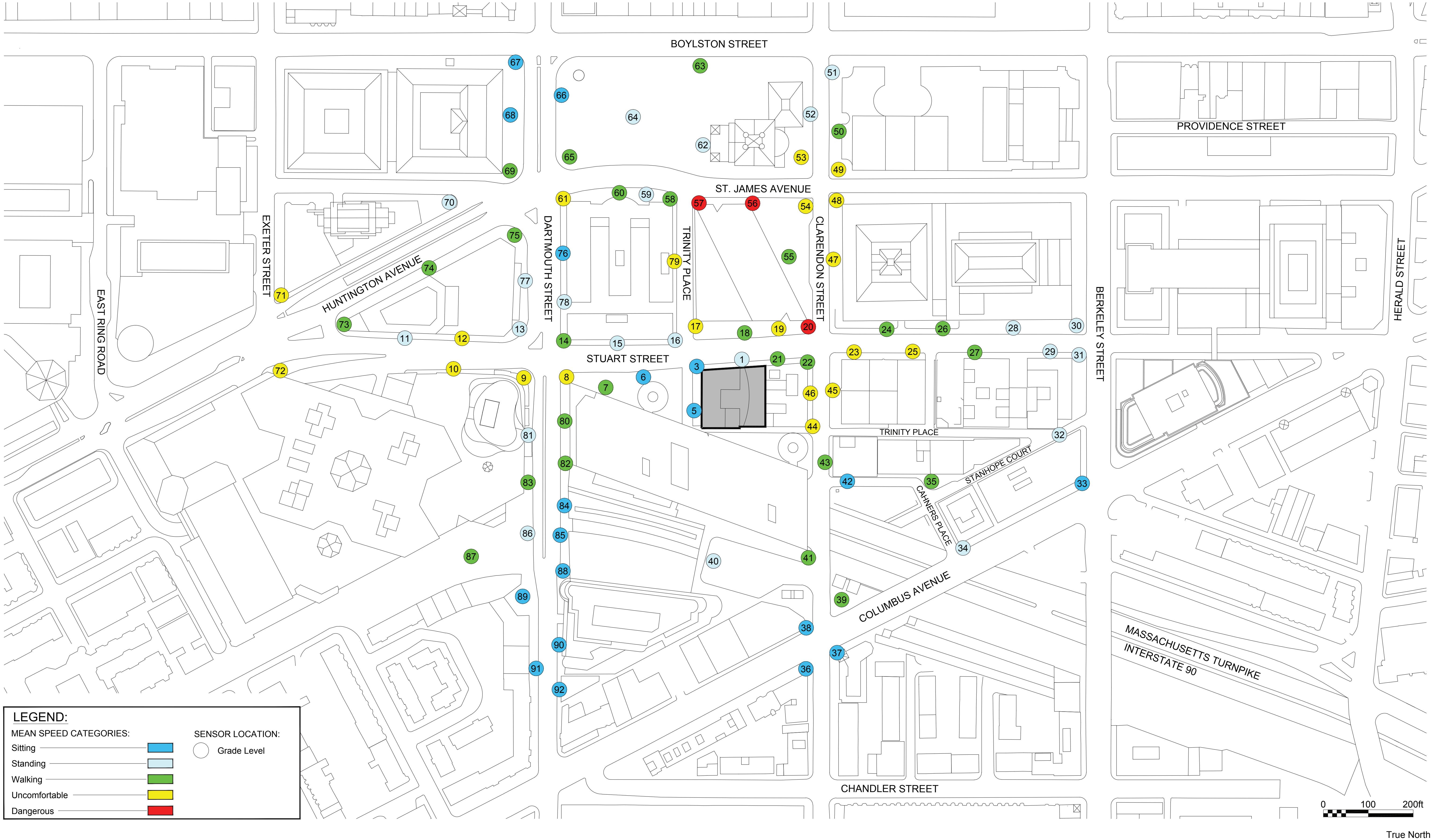


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Figure 4.1-8

Pedestrian Wind Conditions - Mean Speed - No Build, Annual

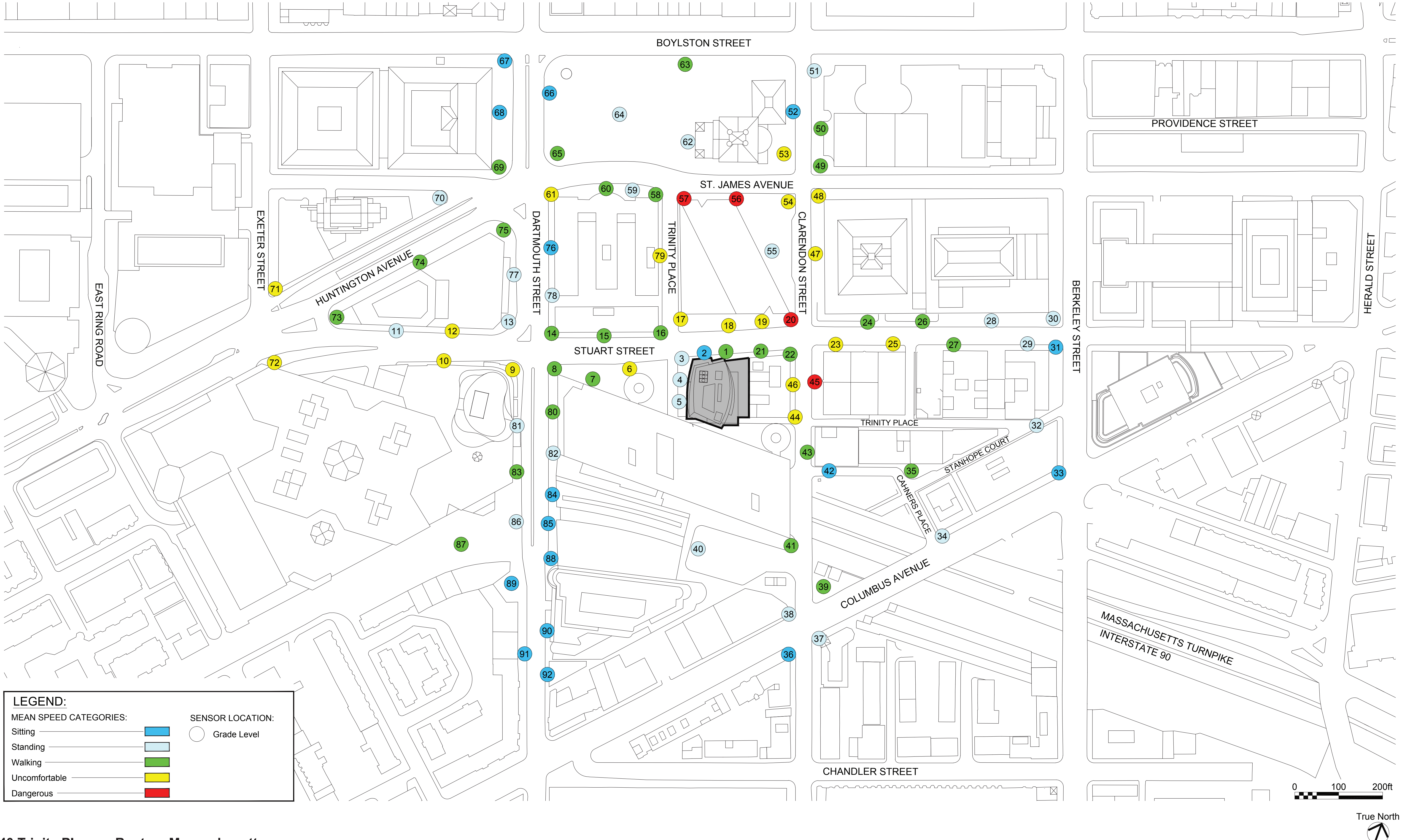

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Figure 4.1-9

Pedestrian Wind Conditions - Mean Speed - Build, Annual

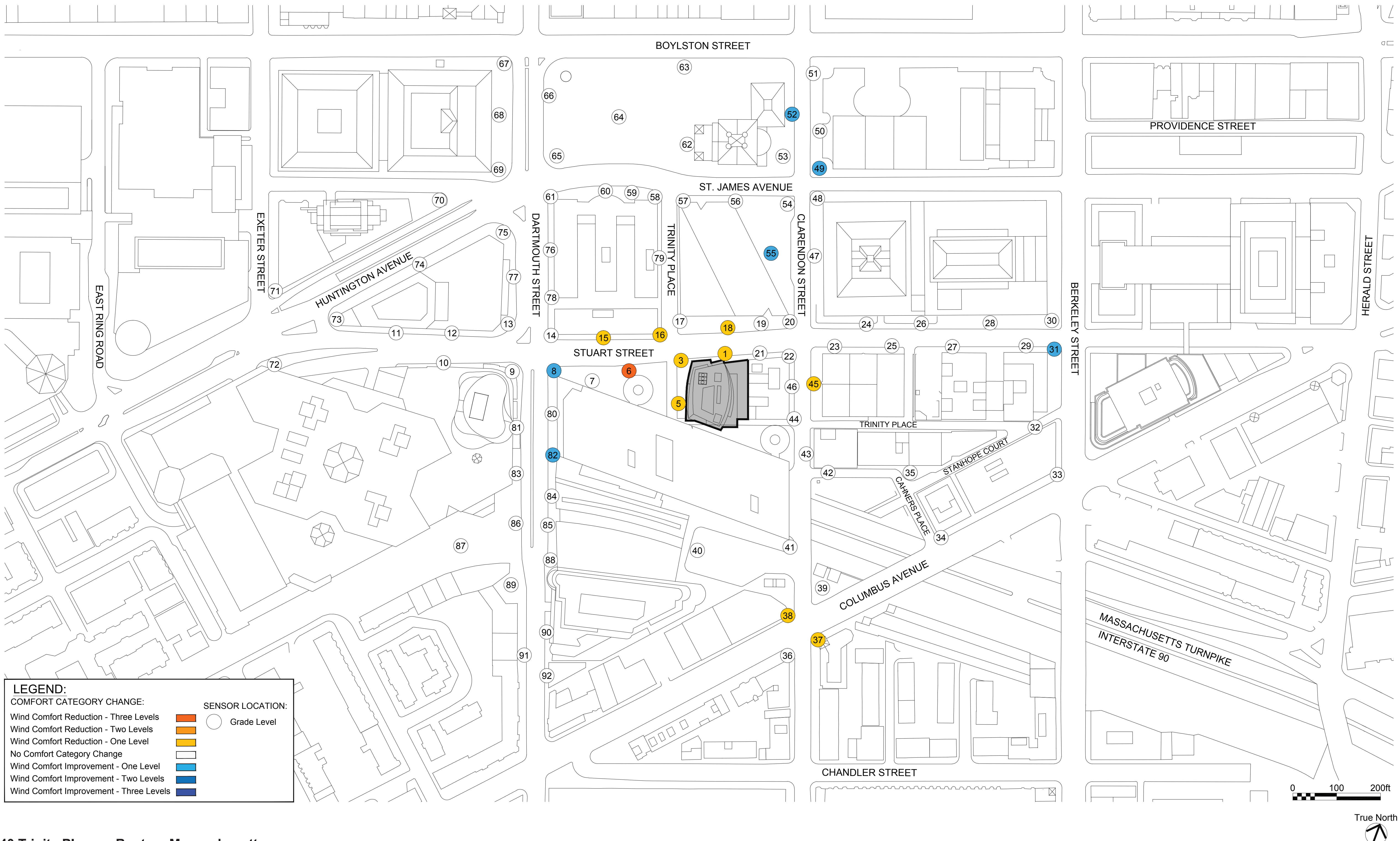

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Figure 4.1-10

Pedestrian Wind Conditions - Category Change - No Build to Build, Annual

4.2 Shadow

4.2.1 Introduction

Two shadow impact analyses have been prepared in compliance with the BRA Scoping Determination, and show the anticipated impacts from the Project in comparison to the existing condition and As-of-right Alternative. The Proponent has completed a third analysis in response to comments on the Project that describe anticipated shadow impacts on the facades of nearby historic resources.

The Proponent's architect has deliberately designed the building to be slender and gently curved, with its narrowest façade facing Copley Square. This was done to narrow the building's shadow towards Copley Square, and to reduce the duration of time that any portion of Copley Square receives any new shadow from the Project.

The first analysis describes the shadow study done for March 21, June 21, September 21, and December 21 at 9:00 a.m., 12:00 p.m. and 3:00 p.m., as well as 6:00 p.m. for June 21 and September 21.

The results of the first analysis show that new shadow from the Project is typically cast across Stuart Street and portions of nearby streets and sidewalks. Of the 14 time periods studied, new shadow will be cast onto the area on the east side of the Boston Public Library during one time period (September 21 at 9:00 a.m.), onto Copley Square, Commonwealth Avenue Mall and Dartmouth Mall during one time period (December 21 at 9:00 a.m.), and onto Frieda Garcia Park during one time period (June 21 at 6:00 p.m.). No new shadow is cast onto other open spaces or any bus stops in the vicinity of the Project. The extent of the Project's impacts on these open spaces beyond simply the 14 required study time periods is studied in more depth in the second analysis.

The second analysis describes the shadow impacts on Copley Square to show the Project's compliance with the criteria in the Stuart Street Planning Study, which states that "each proposed project shall be arranged and designed in a way to assure that it does not cast shadows for more than two hours from 8:00 a.m. through 2:30 p.m., on any day from March 21 through October 21, in a calendar year, on any portion of Copley Square Park."[2] To further examine the Project's shadow impacts to Copley Square, five locations on Copley Square were analyzed by minutes of shadow cast in order to determine the Project's impacts by amount of time and number of days when shadow occurs on these five locations between March 21 and October 21. The second analysis also describes the Project's impacts on other nearby open spaces, focusing on the 21st of March, June, September, October and December as a conservative representation of the Project's greatest impact. As

[2] Note that although the Stuart Street Planning Study includes this criteria for Copley Square Park only, the criteria have been extended voluntarily to other nearby open spaces.

requested in public meetings, shadows on open spaces are shown in 15-minute increments. The third analysis has been completed in response to comments regarding the Project's impact on the facades of nearby historic resources, and is included in Section 6.2.

The results of the second analysis show that the Project complies with the Stuart Street Planning Study—no new shadow will be cast onto any one area of Copley Square for more than two hours, and further, as a result of the narrow shape of the building, no new shadow will be cast onto any one area of Copley Square for greater than one hour during any of the time periods studied. As mentioned above, five locations on Copley Square were analyzed in regard to shadow impacts, and the results show that none of these five locations within Copley Square are in new shadow from the Project for more than one hour on any day between March 21 and October 21. In fact, at two of the points studied, there are no days between March 21 and October 21 where the new shadow exceeds 30 minutes. Most notably, on 191 of the 214 days during this period, there is no new shadow impact whatsoever from the Project on any of the points studied within Copley Square. The second analysis also shows that no new shadow will be cast onto any area of the surrounding open spaces for more than one hour on the time periods studied.

4.2.2 Methodology

A shadow impact analysis was conducted in accordance with BRA requirements to investigate shadow impacts from the Project during three time periods (9:00 a.m., 12:00 p.m., and 3:00 p.m.) during the summer solstice (June 21), autumnal equinox (September 21), vernal equinox (March 21), and the 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 addition to these time periods, a shadow analysis was completed according to the criteria in the Stuart Street Planning Study to identify any location on Copley Square that would be under new shadow from the proposed Project for more than two hours between 8:00 a.m. and 2:30 p.m. during the period from March 21 to October 21. A shadow analysis was also completed for the 21st of March, June, September, October and December to show the duration of new shadow from the Project on nearby open spaces, including Copley Square; for the time periods where the Project will create new shadow on the studied open spaces, new shadow is shown in 15-minute increments. The BRA Scoping Determination requires a duration analysis for any area of an open space where new shadow lasts longer than one hour; during the time periods studied, no new shadow will be cast onto any area of the open spaces in the vicinity of the Project for more than one hour, and therefore an overlap study (duration analysis) was not necessary.

The shadow analysis presents the existing shadow, shadow created by the As-of-right Alternative, and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. The analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project site. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 4.2-1 to 4.2-14 at the end of this section. Figures 4.2-15 to 4.2-26 at the end of this section show the results of the shadow impact studies on open spaces in 15-minute increments, and the detailed shadow impacts on five locations on Copley Square.

4.2.3 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow from the Project will be cast to the northwest. The shadow from the As-of-right Alternative would be cast across areas already under shadow. New shadow from the Project will be cast onto a small portion of Huntington Avenue and Blagden Street, as well as a portion of the northern sidewalk on Blagden Street. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

At 12:00 p.m., new shadow from the Project will be cast to the north. The shadow from the As-of-right Alternative would be cast onto a small portion of Stuart Street and its northern sidewalk. New shadow from the Project will not be cast onto nearby, sidewalks, open spaces or bus stops.

At 3:00 p.m., new shadow from the Project will be cast to the northeast. Shadow from the As-of-right Alternative would be limited to a small portion of Stuart Street. New shadow from the Project will be limited to a small portion of Stuart Street and its northern sidewalk, as well as a small portion of Clarendon Street. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

4.2.4 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow will be cast to the west. The shadow from the As-of-right Alternative would be cast onto a portion of Stuart Street and Trinity Place. New shadow from the Project will extend farther across Stuart Street to the northern sidewalk and across a portion of Dartmouth Street and small portions of its western sidewalk. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

At 12:00 p.m., new shadow will be cast to the north. The shadow from the As-of-right Alternative would be cast onto a portion of Stuart Street. New shadow from the Project will extend across a small portion of Stuart Street and its northern sidewalk, as well as a small portion of Trinity Place. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

At 3:00 p.m., new shadow will be cast to the east. Shadow from the As-of-right Alternative would not be cast onto any nearby streets or sidewalks. New shadow from the Project will be cast onto a small portion of Clarendon Street, as well as a small portion of the alley between Stuart Street and Stanhope Street and its northern sidewalk. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

At 6:00 p.m., new shadow will be cast to the southeast. Shadow from the As-of-right Alternative would be cast across a small portion of Frieda Garcia Park (see Section 4.2.7 for more information regarding shadow impacts on Frieda Garcia Park). New shadow from the Project will be cast across a portion of Columbus Avenue and its sidewalks, Berkeley Street and its sidewalks, and the Massachusetts Turnpike. No new shadow is cast onto other open spaces or bus stops in the vicinity of the Project.

4.2.5 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, new shadow from the Project will be cast to the northwest. The shadow from the As-of-right Alternative would be cast onto a small portion of Stuart Street and its northern sidewalk. New shadow from the Project will be cast onto a portion of Huntington Avenue, as well as Blagden Street and its northern sidewalk. New shadow will also be cast onto the sidewalk area to the east of the Boston Public Library. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

At 12:00 p.m., new shadow from the Project will be cast to the north. The shadow from the As-of-right Alternative would be cast onto a small portion of Stuart Street and its northern sidewalk. New shadow from the Project will not be cast onto nearby sidewalks, open spaces or bus stops.

At 3:00 p.m., new shadow from the Project will be cast to the northeast. Shadow from the As-of-right Alternative would be limited to a small portion of Stuart Street. New shadow from the Project will be limited to a small portion of Stuart Street and its northern sidewalk, as well as a small portion of Clarendon Street. No new shadow is cast onto open spaces or bus stops in the vicinity of the Project.

At 6:00 p.m., most of the area will be under existing shadow. The As-of-right Alternative would not cast new shadow in the area. New shadow from the Project will not be cast onto any nearby sidewalks, open spaces or bus stops.

4.2.6 Winter Solstice (December 21)

At 9:00 a.m., new shadow will be cast to the northwest. Shadow from the As-of-right Alternative would be cast across a portion of Copley Square. New shadow from the Project will be cast across a small portion of Copley Square (see Section 4.2.7 for more information), and across a portion of Boylston Street and its southern and northern sidewalks, as well as a small portion of Dartmouth Street, Dartmouth Mall, and Commonwealth Avenue Mall. No new shadow is cast onto other open spaces or bus stops in the vicinity of the Project

At 12:00 p.m., new shadow is cast to the north. Shadow from the As-of-right Alternative would not be cast onto nearby streets, sidewalks, open spaces or bus stops. New shadow from the Project will not be cast onto nearby streets, sidewalks, open spaces or bus stops.

At 3:00 p.m., most of the area is under existing shadow cast to the northeast. Shadow from the As-of-right Alternative would not be cast onto nearby streets, sidewalks, open spaces or bus stops. New shadow from the Project will not be cast onto nearby streets, sidewalks, open spaces or bus stops.

4.2.7 Open Spaces

The Stuart Street Planning Study states that "each proposed project shall be arranged and designed in a way to assure that it does not cast shadows for more than two hours from 8:00 a.m. through 2:30 p.m., on any day from March 21 through October 21, in a calendar year, on any portion of Copley Square Park."

Shadow impacts were studied for the As-of-right Alternative and the proposed Project for Copley Square to show consistency with the Stuart Street Planning Study, as well as for Frieda Garcia Park, Dartmouth Mall and Commonwealth Avenue Mall. The Project and the As-of-right Alternative will not cast new shadow on the Southwest Corridor or The Courtyard at the Boston Public Library, and therefore, these open spaces are not included in the discussion below. As discussed below, the Project's shadow impacts are consistent with the Stuart Street Planning Study.

Copley Square

Neither the proposed Project, nor the As-of-right Alternative, cast new shadow on any part of Copley Square for more than two hours between 8:00 a.m. and 2:30 p.m. between March 21 and October 21, or on December 21. Figures 4.2-15 to 4.2-19 show the new shadow from the Project cast onto Copley Square in 15-minute increments from when new shadow first touches Copley Square to when it leaves. Figure 4.2-20 shows the new shadow from the As-of-right Alternative cast onto Copley Square, which only occurs on December 21, in 15-minute increments.

In order to most fully understand the potential impact of the Project on Copley Square, specific shadow impacts were also studied at five key points within Copley Square, as shown on Figure 4.2-21: a) the BosTix kiosk, B) Benches near the southwestern corner of Copley Square (Benches), C) the fountain near the northwestern edge of Copley Square (Fountain), D) the Trinity Rosette near the southeastern corner of Copley Square, and E) the lawn in the center of Copley Square (Lawn). As is shown on Table 4.2-1, none of these key points within Copley Square are in new shadow from the Project for more than one hour on any day between March 21 and October 21, and therefore do not exceed the requirements of the Stuart Street Planning Study. In fact, at two of the points studied, there are no days between March 21 and October 21 where the new shadow exceeds 30 minutes. Most significantly, on 191 of the 214 days during this period, there is no new shadow impact whatsoever from the Project on any of the points studied within Copley Square.

Table 4.2-1 Copley Square Shadow Analysis Locations (March 21 through October 21)

	Shadow Duration (Number of Days Affected)				
	Total Days Affected	0 hour	0 to 30 minutes	30 minutes to 1 hour	1+ hours
Kiosk	16	198	4	12	0
Benches	15	199	9	6	0
Fountain	7	207	7	0	0
Trinity Rosette	7	207	7	0	0
Lawn	23	191	4	19	0

Frieda Garcia Park

The Project does not cast new shadow on any part of Frieda Garcia Park for more than two hours between March 21 and October 21 between 8:00 a.m. and 2:30 p.m. New shadow from the Project on Frieda Garcia Park is limited and occurs only in midsummer afternoons. Figure 4.2-22 shows the new shadow on Frieda Garcia Park in 15-minute increments. No new shadow impacts on Frieda Garcia Park are anticipated on the 21st of March, September, October or December.

The new shadow impacts on Frieda Garcia Park for the As-of-right Alternative are also limited to June 21, and are shown on Figure 4.2-23 in 15-minute increments. The As-of-right Alternative will create new shadow on a slightly smaller area as compared with the proposed Project.

Dartmouth Mall

New shadow will also be cast onto Dartmouth Mall on October 21 between 9:10 a.m. and 9:48 a.m., as shown in 15-minute increments on Figure 4.2-24. New shadow from the Project is cast onto a small portion of the Dartmouth Mall on December 21 between 8:10 a.m. and 9:15 a.m. Figure 4.2-25 shows the passage of the new shadow in 15-minute increments. New shadow will not occur on the 21st of March, June or September. The As-of-right Alternative would not create new shadow on the Dartmouth Mall during any time of year.

Commonwealth Avenue Mall

New shadow from the Project will be cast onto a small area of the Commonwealth Avenue Mall, between 8:45 a.m. and 9:15 a.m. on December 21, as shown in 15-minute increments on Figure 4.2-26. No new shadow will be cast onto the Commonwealth Avenue Mall on the 21st of March, June, September or October. The As-of-right Alternative will not cast new shadow on the Commonwealth Avenue Mall.

4.2.8 Conclusions

The two shadow impact analyses, described above, have been prepared in compliance with the BRA Scoping Determination, and show the anticipated impacts from the Project in comparison to the existing condition and As-of-right Alternative. The first shadow impact analysis looked at net new shadow created by the Project during fourteen time periods. New shadow will generally be limited to the immediately surrounding streets and sidewalks. New shadow will be cast onto the area on the east side of the Boston Public Library during one time period (September 21 at 9:00 a.m.), onto Copley Square, Commonwealth Avenue Mall and Dartmouth Mall during one time period (December 21 at 9:00 a.m.), and onto Frieda Garcia Park during one time period (June 21 at 6:00 p.m.). No new shadow is cast onto other open spaces or any bus stops in the vicinity of the Project.

The extent of the Project's impacts on nearby open spaces has been studied in more depth in a second analysis that looked at the Project's impacts on Copley Square in regard to the Stuart Street Planning Study, the Project's impacts on five locations within Copley Square, and the Project's impacts on surrounding open spaces in 15-minute increments. The Project will comply with the Stuart Street Planning Study, which seeks to limit new shadow on any portion of Copley Square for more than two hours. For the five locations within Copley Square, on 191 of the 214 days, there is no new shadow impact whatsoever from the Project. None of these five locations within Copley Square are in new shadow from the Project for more than one hour on any day between March 21 and October 21. In fact, at two of the points studied, there are no days between March 21 and October 21 where the new shadow exceeds 30 minutes. The Project will not create new shadow in any one location on Copley Square, Frieda Garcia Park, Dartmouth Mall or Commonwealth Avenue Mall, for more than one hour.

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Figure 4.2-1

Shadow Study: March 21, 9 AM

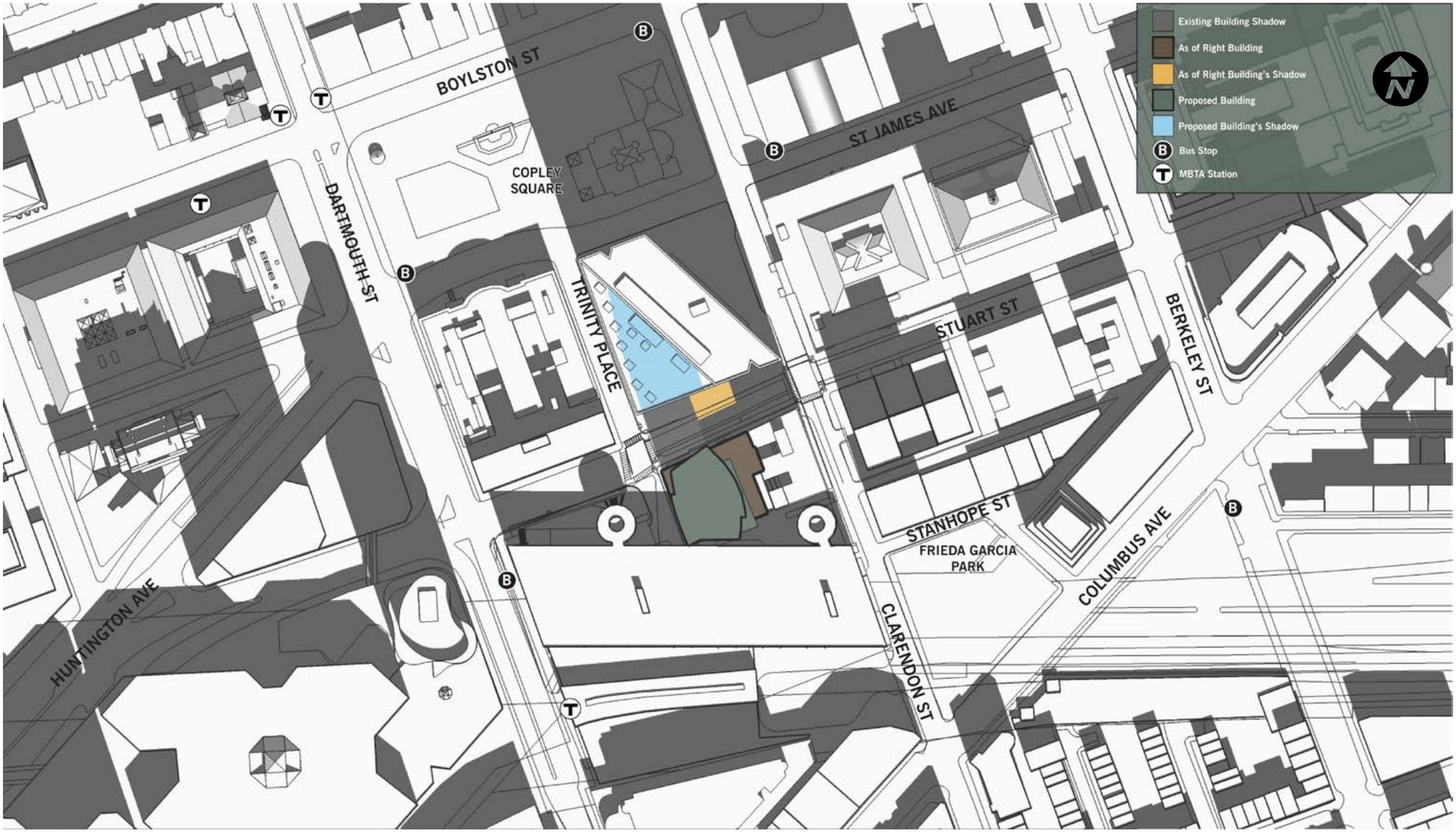

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Figure 4.2-2

Shadow Study: March 21, 12 PM

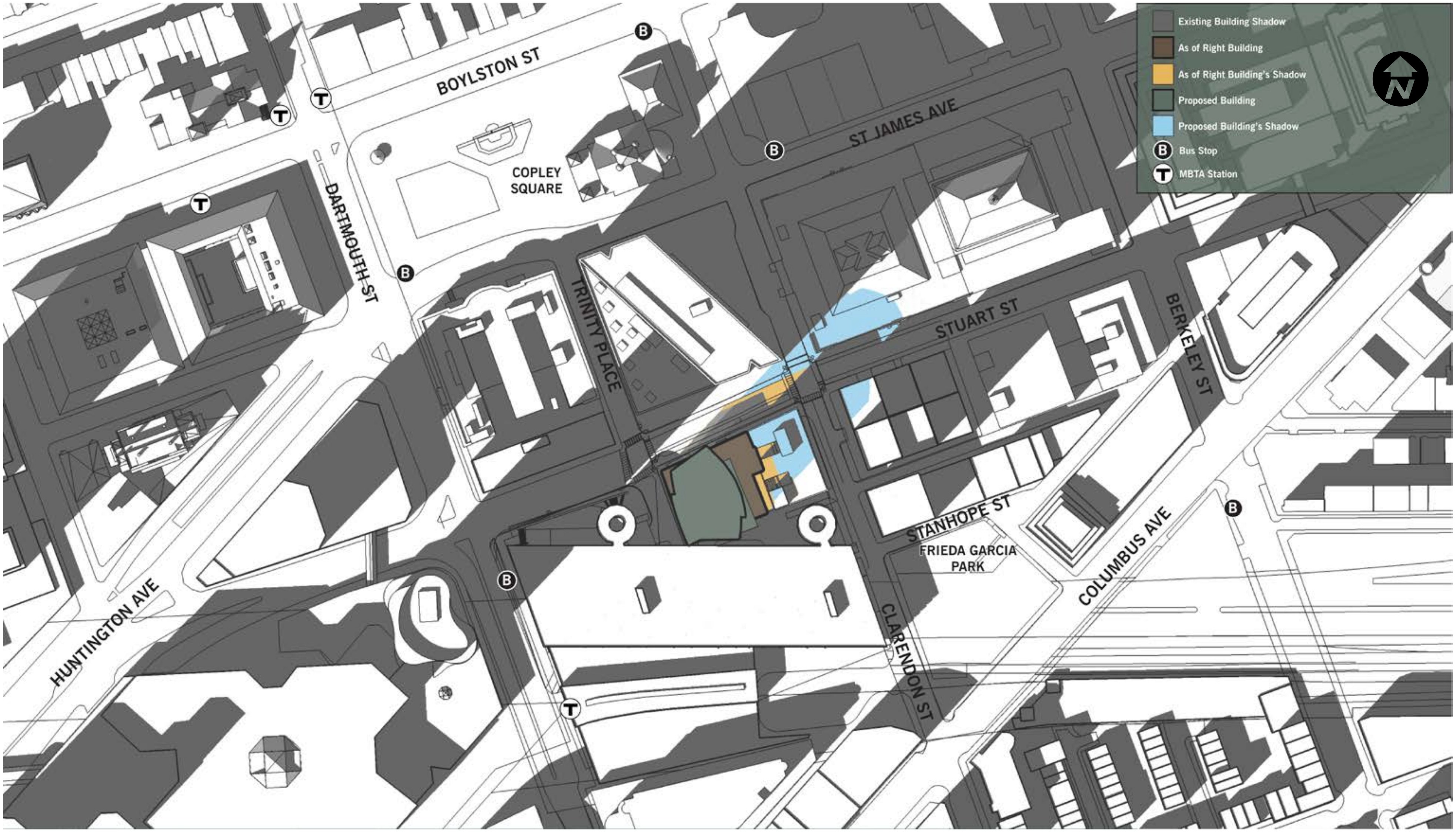

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Figure 4.2-3

Shadow Study: March 21, 3 PM

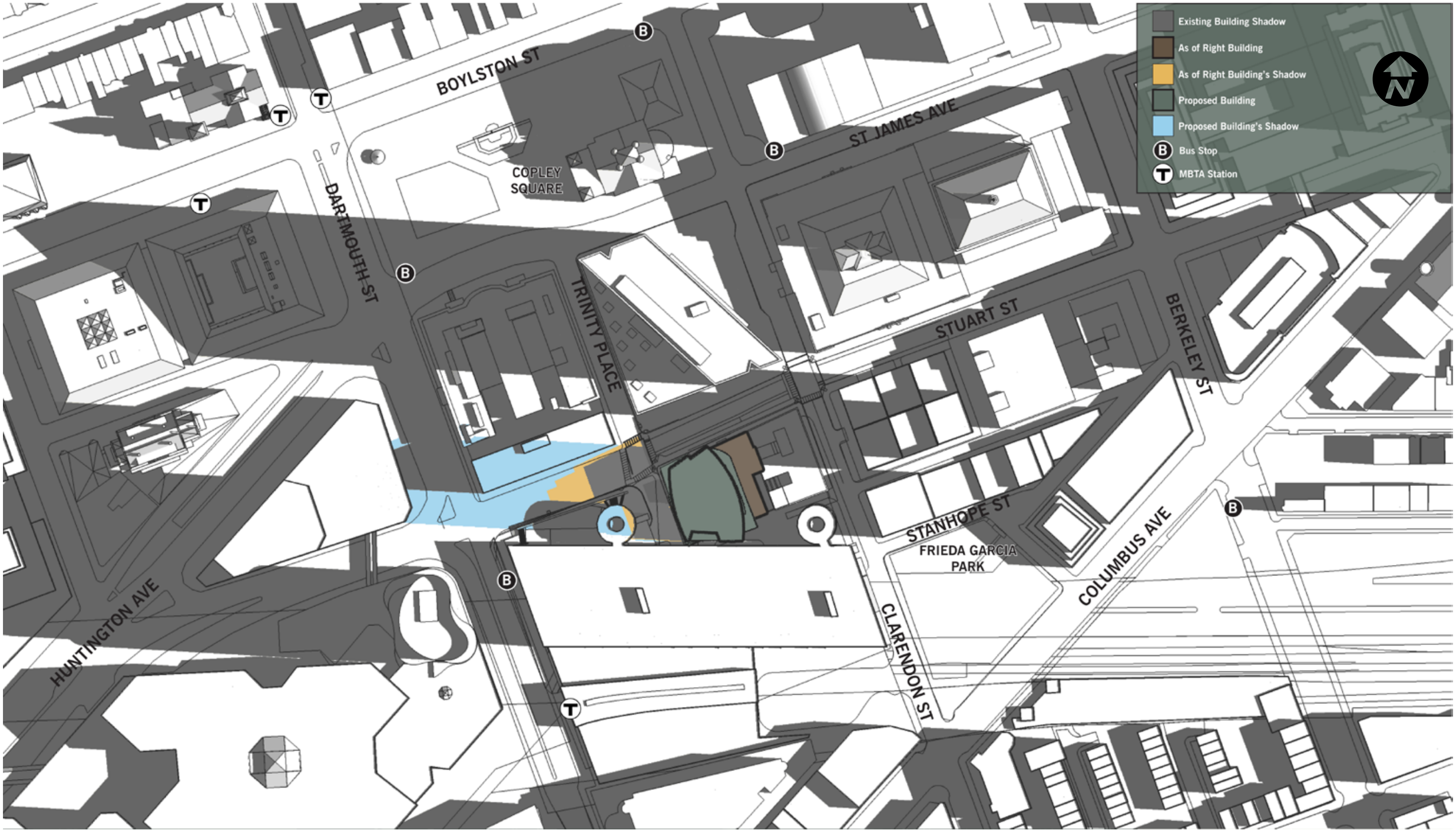

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Figure 4.2-4

Shadow Study: June 21, 9 AM

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Figure 4.2-5

Shadow Study: June 21, 12 PM

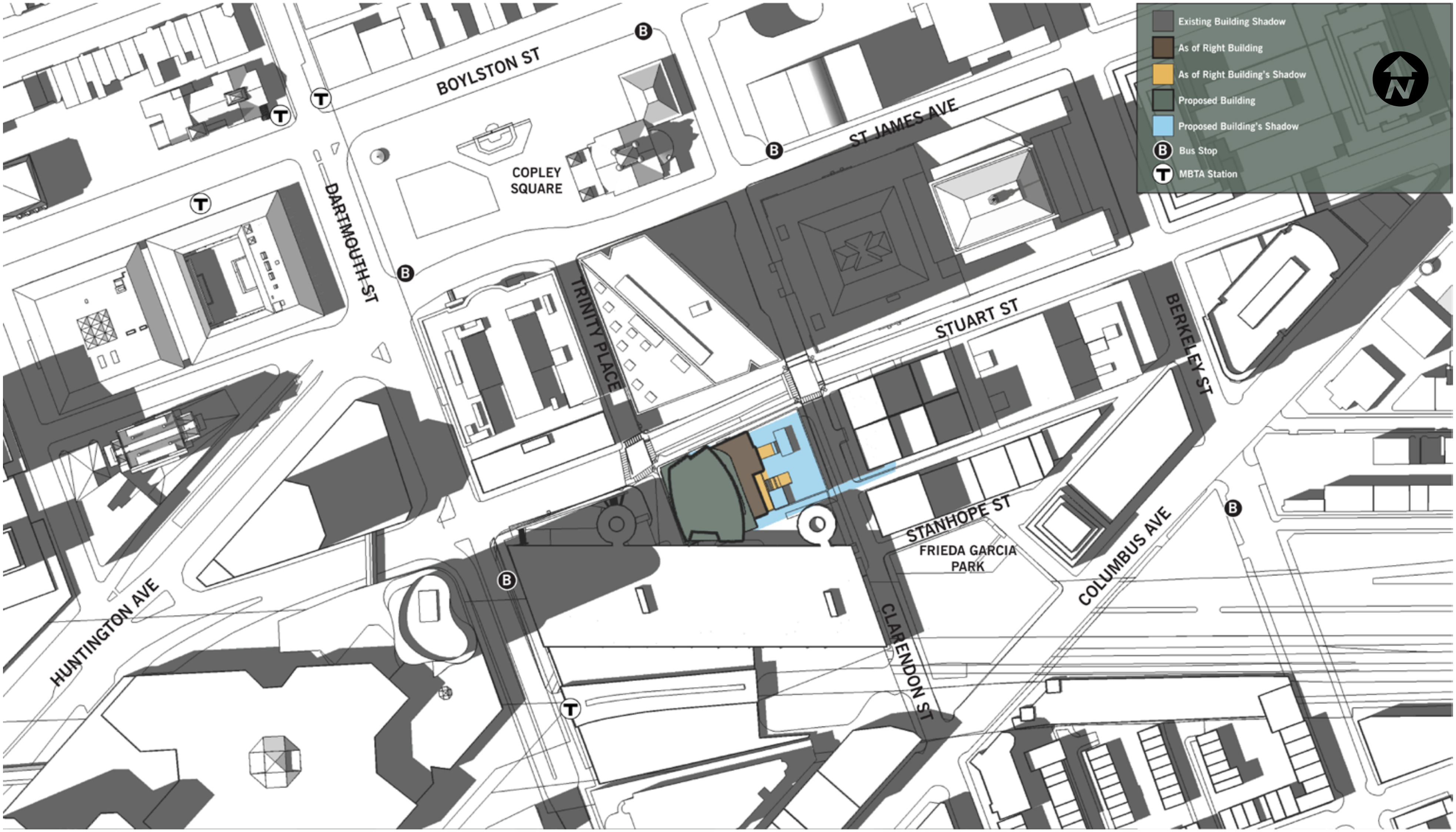

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Figure 4.2-6

Shadow Study: June 21, 3 PM

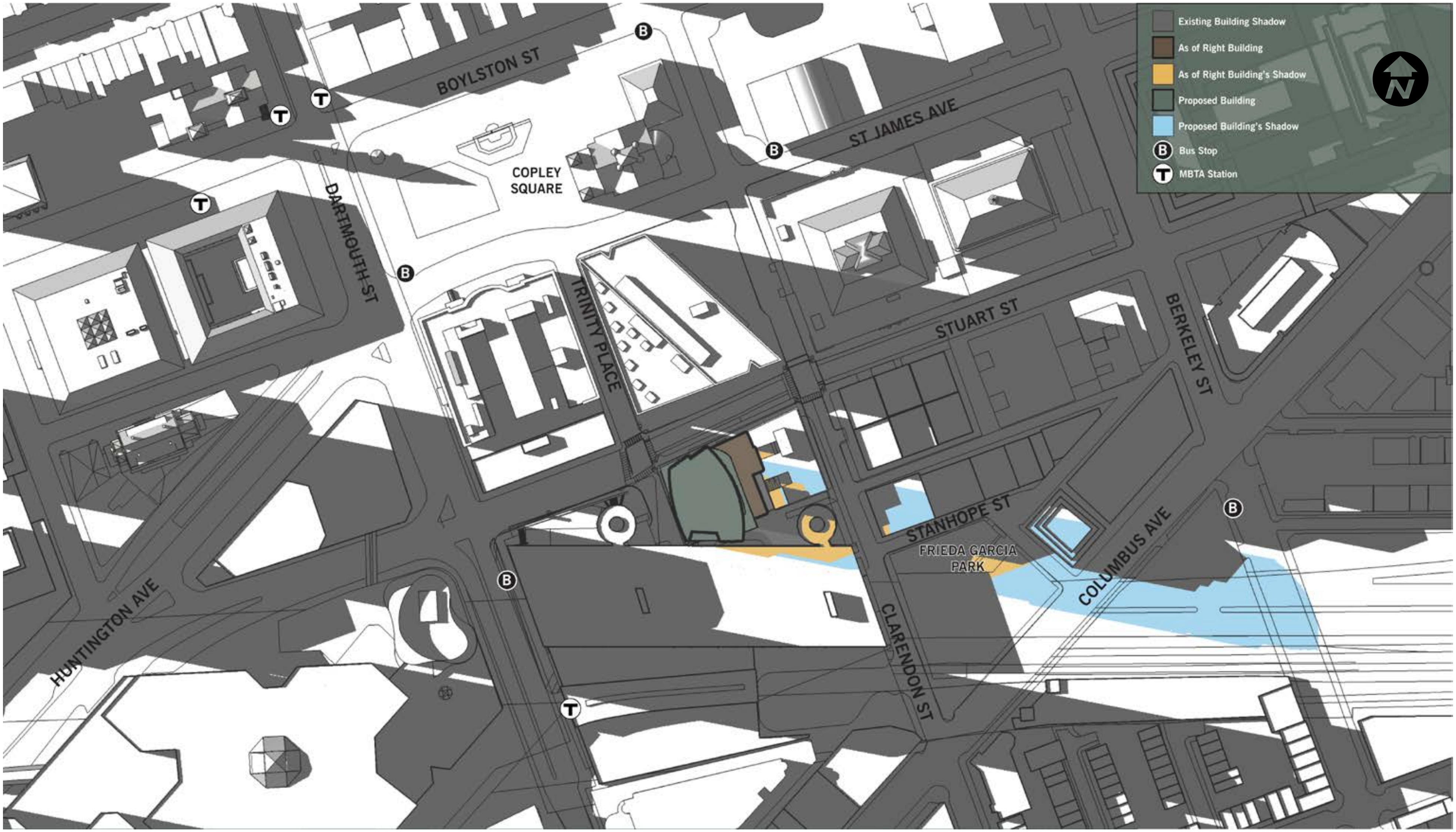

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Figure 4.2-7

Shadow Study: June 21, 6 PM

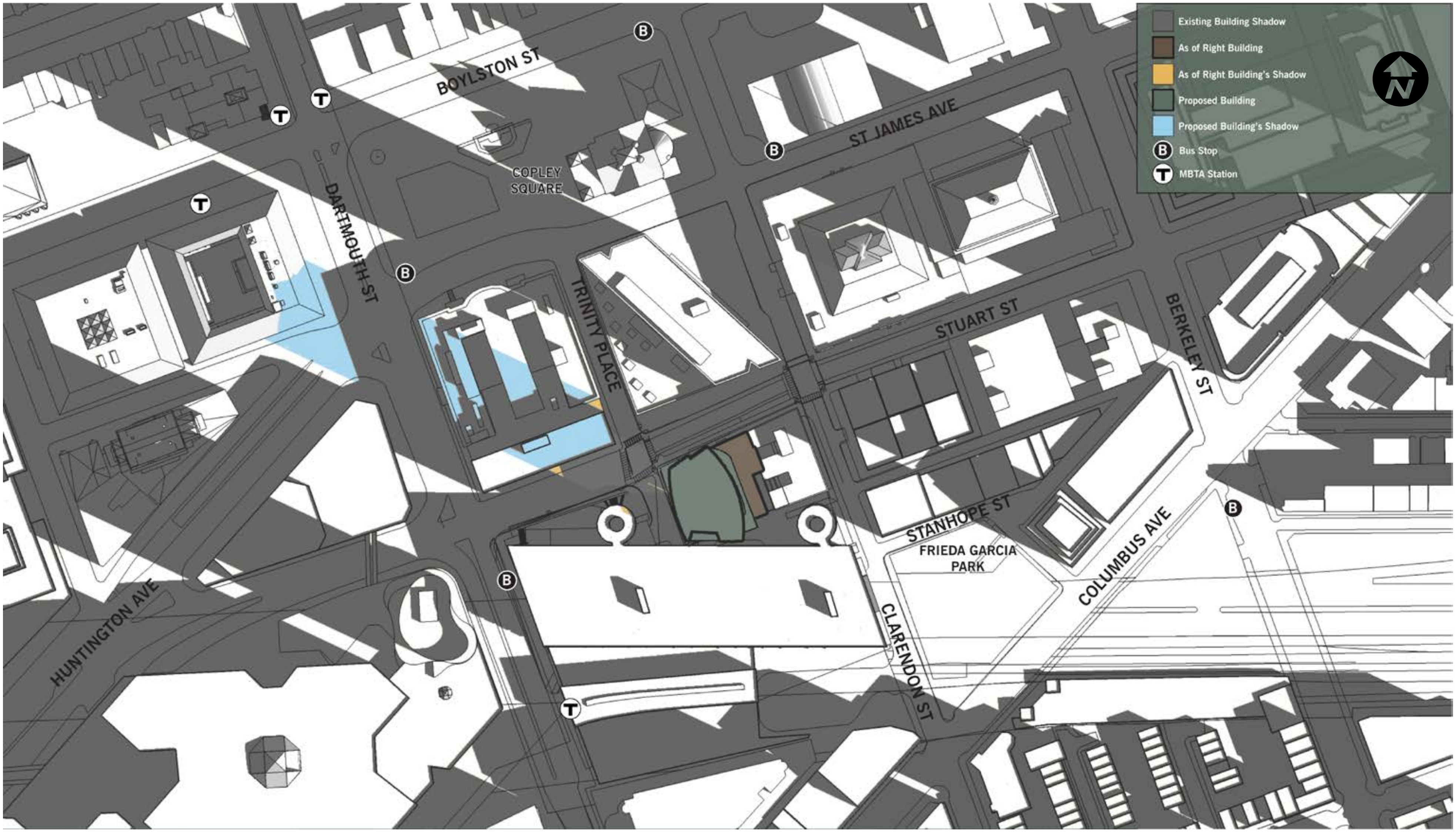

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Figure 4.2-8

Shadow Study: September 21, 9 AM

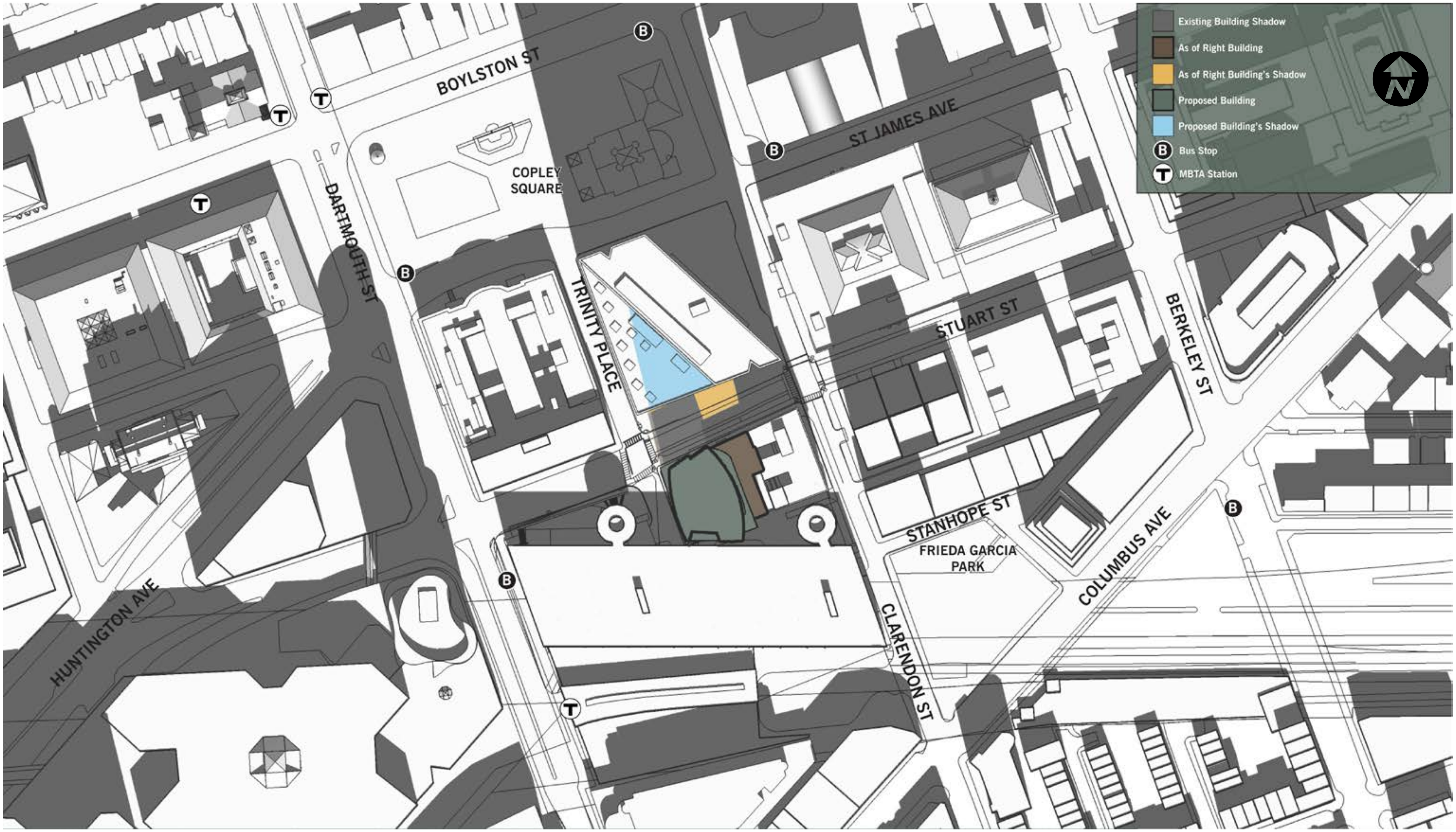

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Figure 4.2-9

Shadow Study: September 21, 12 PM

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Figure 4.2-10

Shadow Study: September 21, 3 PM

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Figure 4.2-11

Shadow Study: September 21, 6 PM

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Figure 4.2-12

Shadow Study: December 21, 9 AM

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Figure 4.2-13

Shadow Study: December 21, 12 PM

40 Trinity Place Boston, Massachusetts

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Figure 4.2-14

Shadow Study: December 21, 3 PM

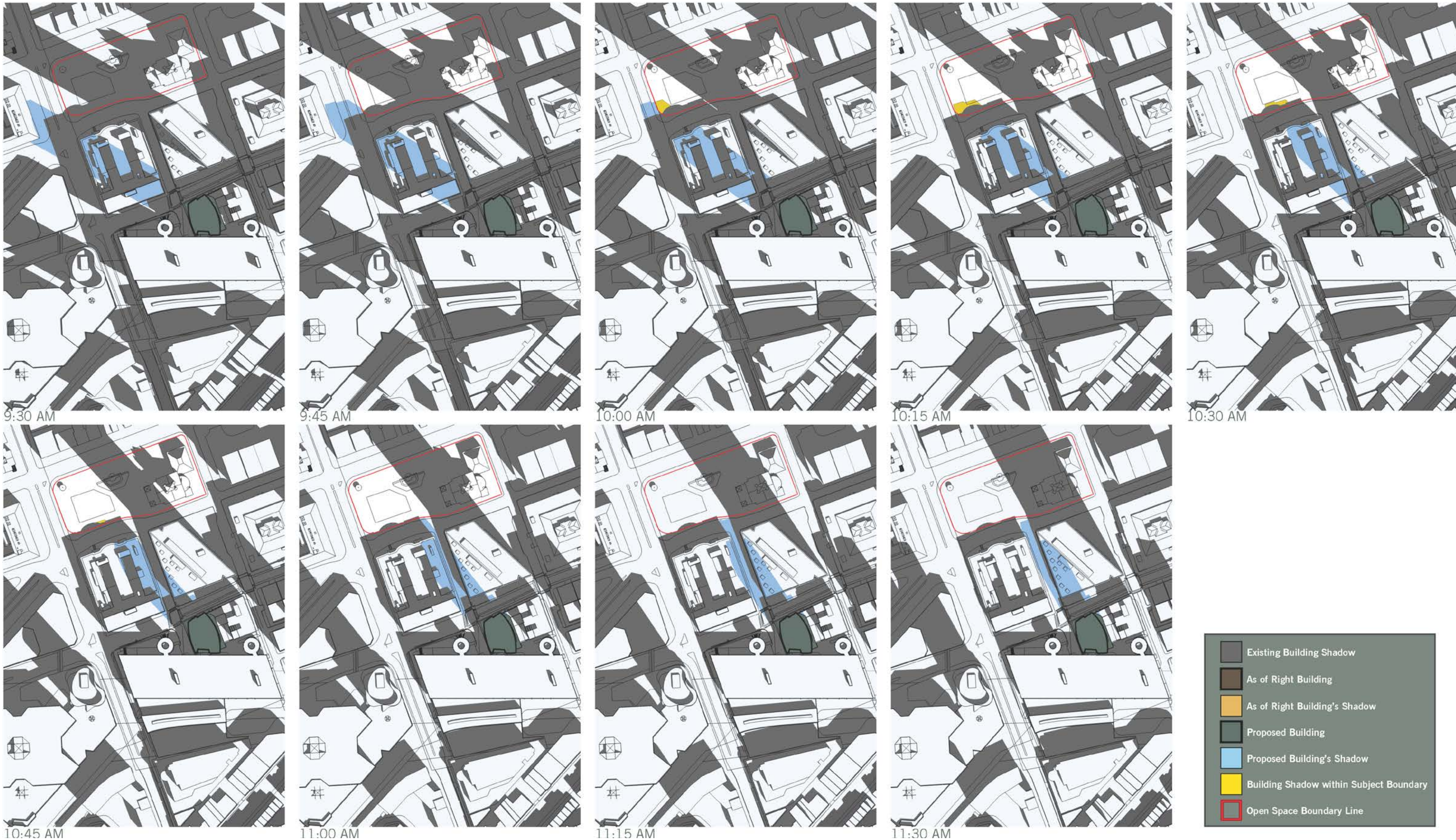

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Figure 4.2-15

Shadow Study – Proposed: Copley Square, March 21

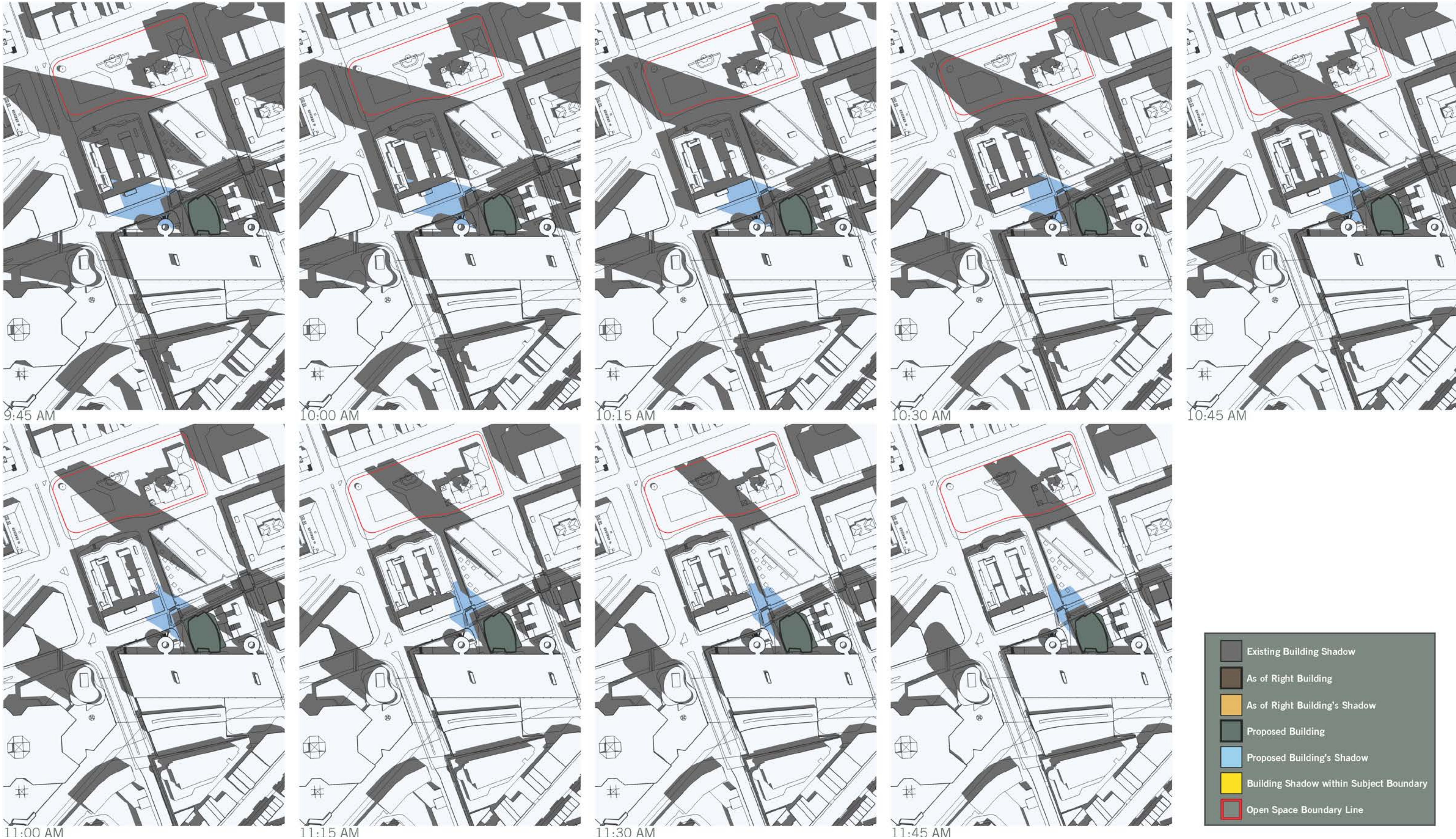

Figure 4.2-16

Shadow Study – Proposed: Copley Square, June 21

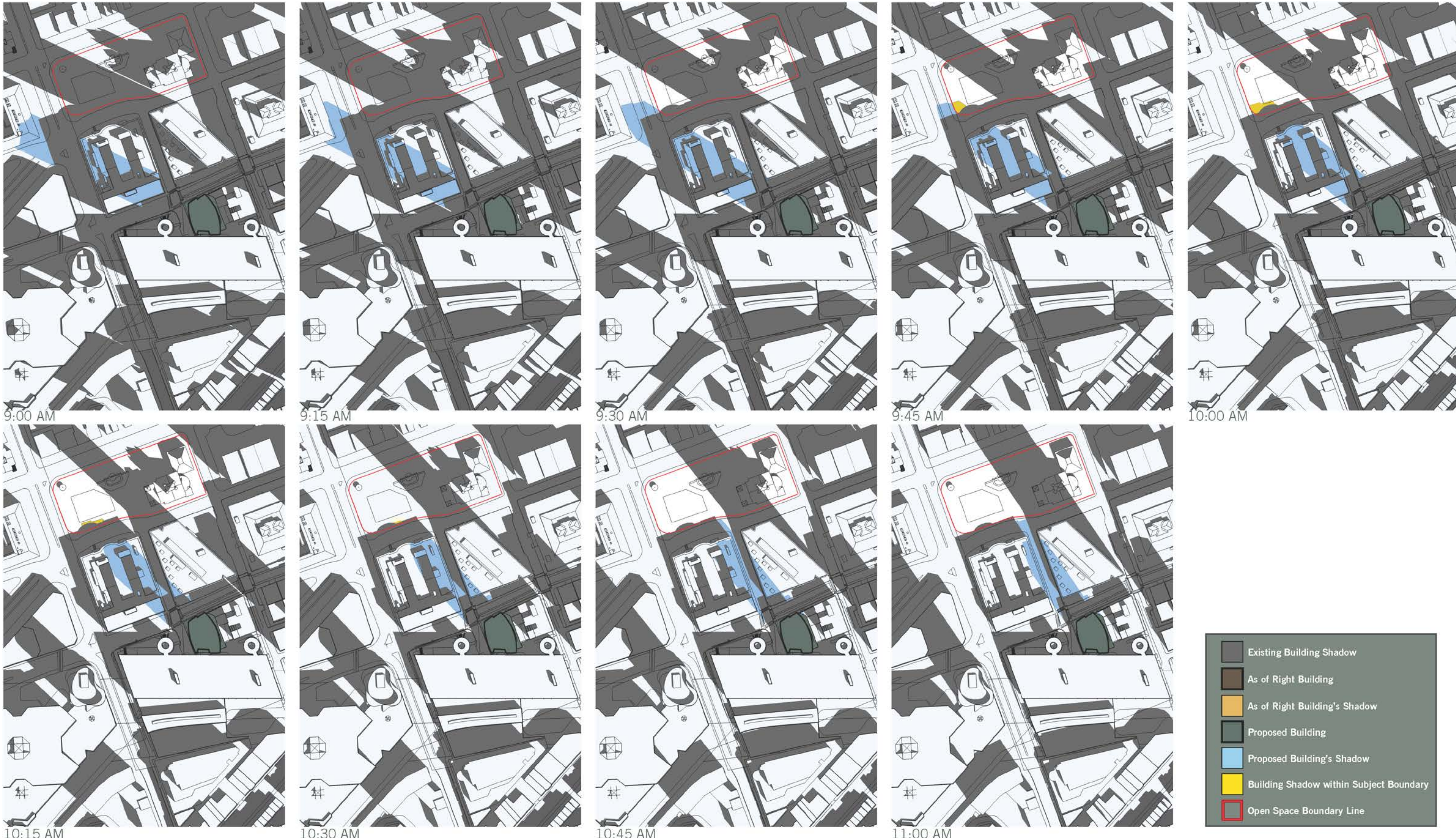

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Figure 4.2-17

Shadow Study – Proposed: Copley Square, September 21

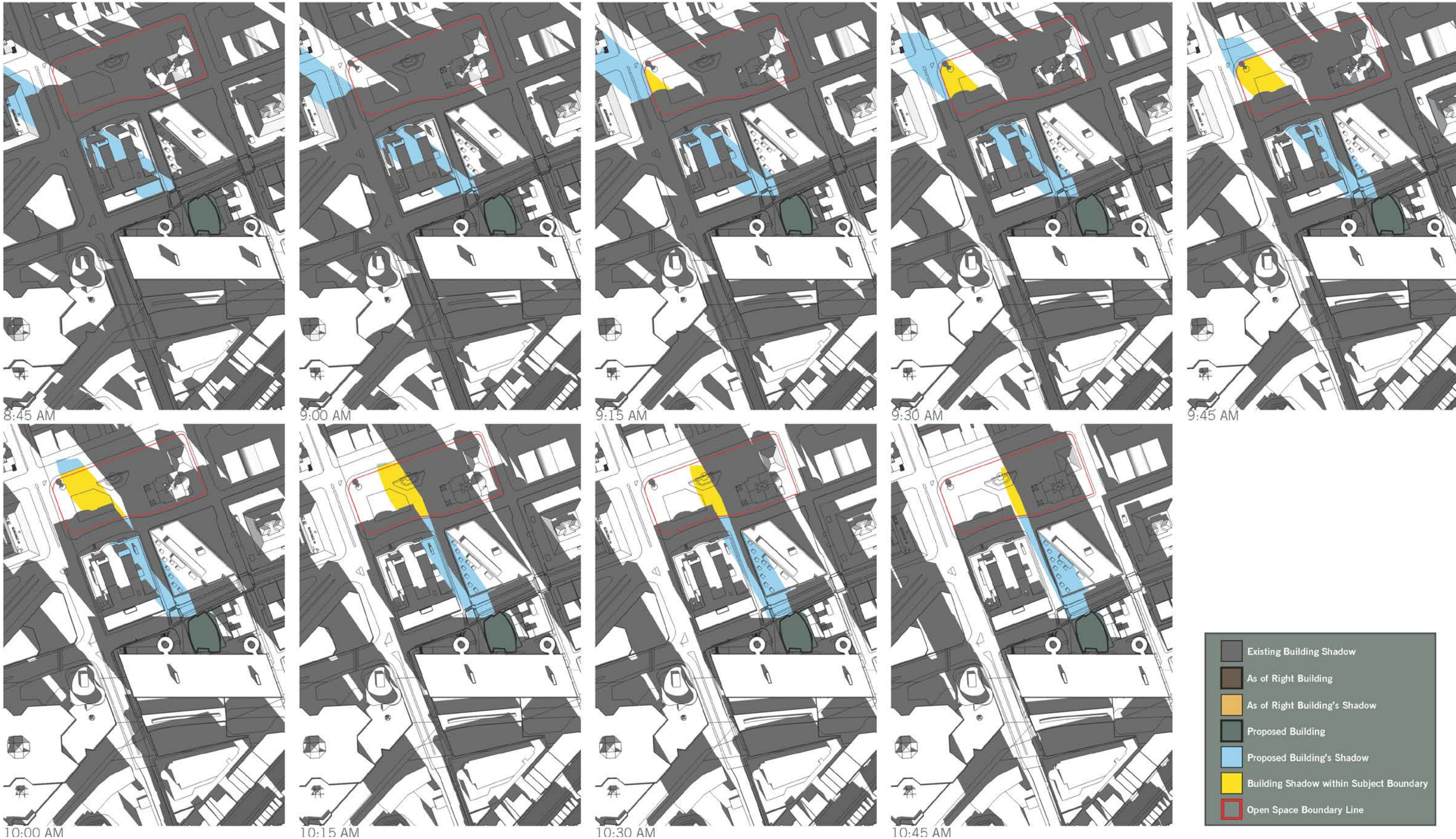

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Figure 4.2-18

Shadow Study – Proposed: Copley Square, October 21

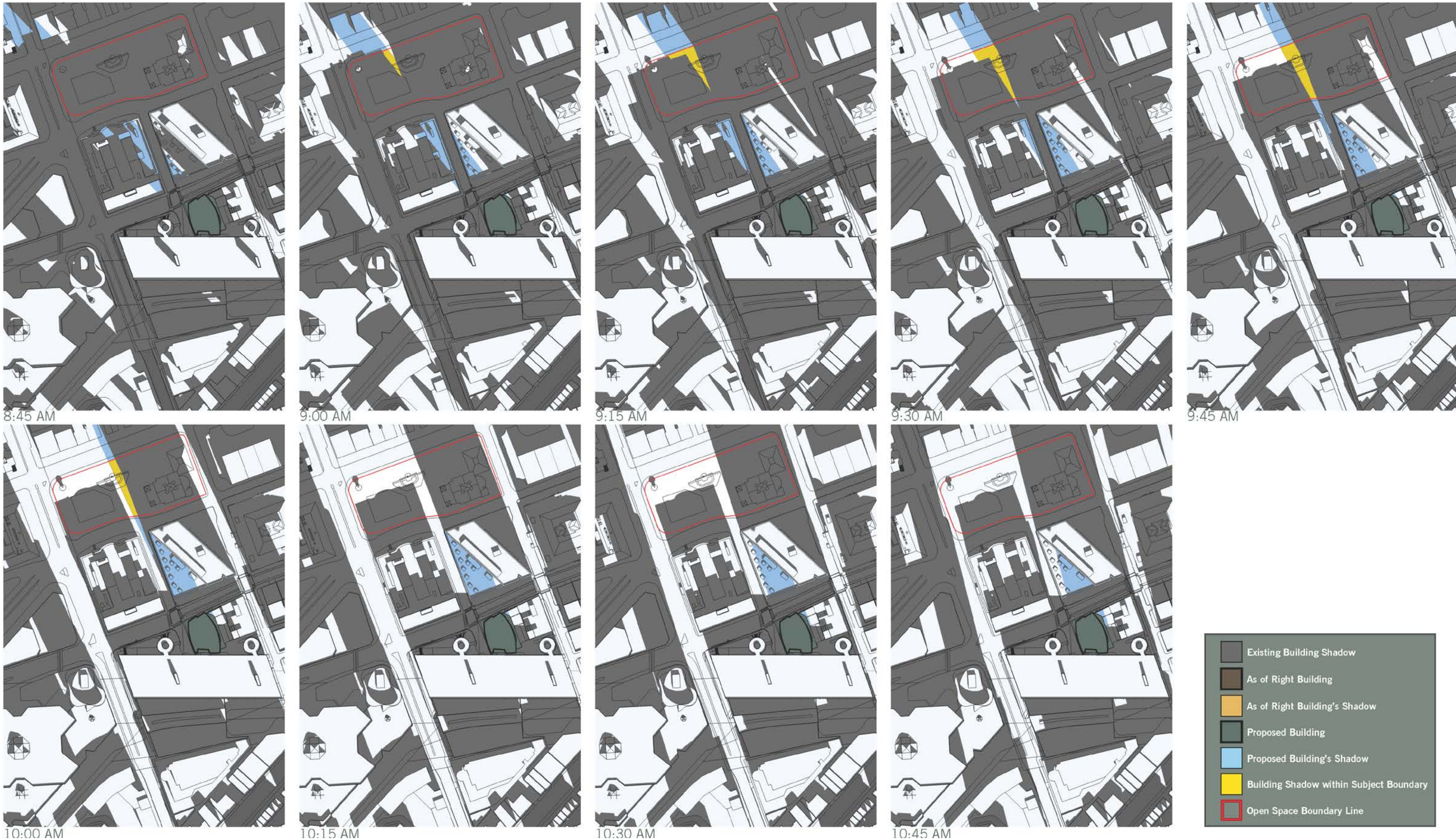


Figure 4.2-19

Shadow Study – Proposed: Copley Square, December 21

*March 21, June 21, September 21, October 21: Not Shown - No new shadow on subject area

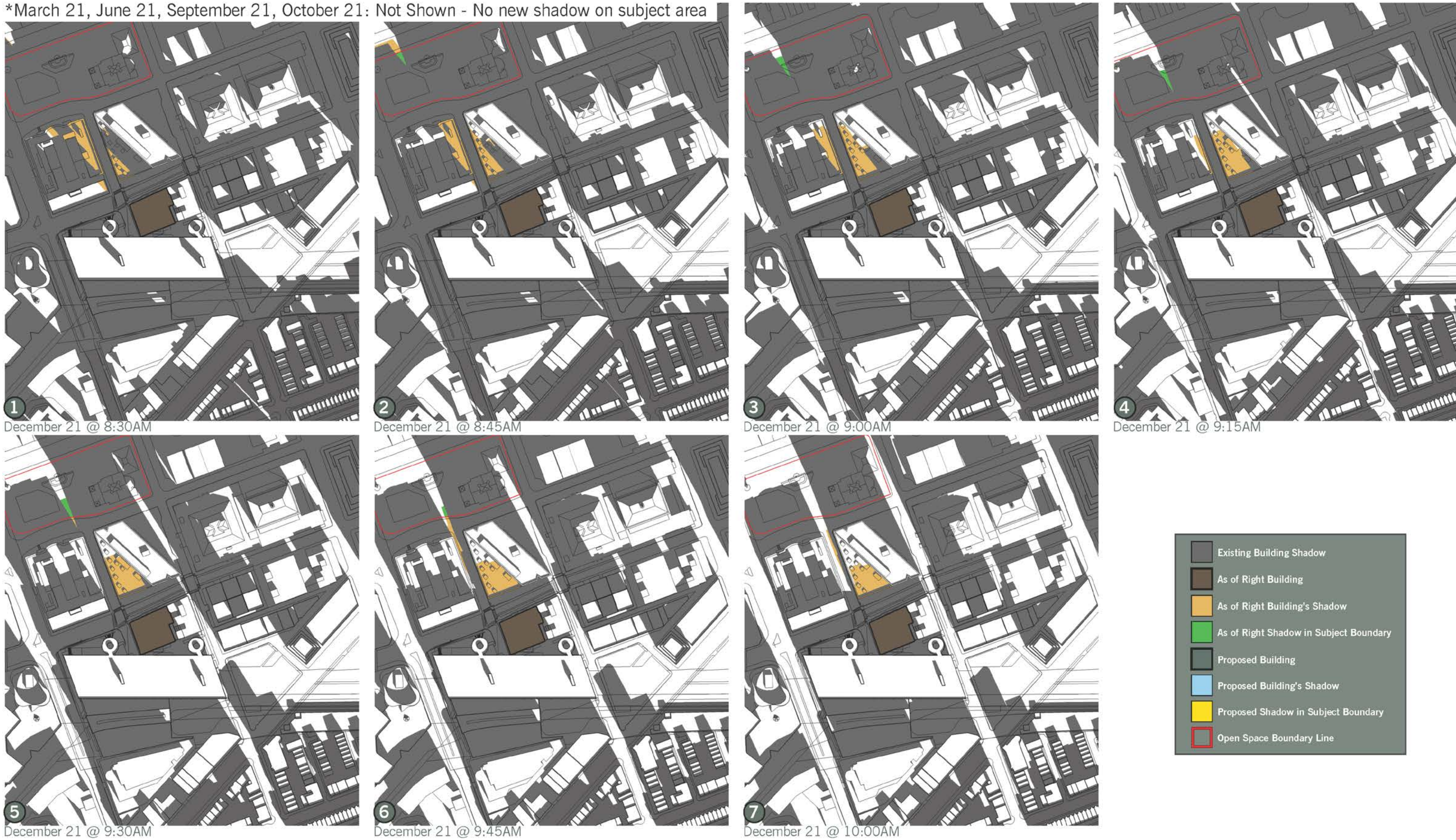


Figure 4.2-20

Shadow Study – As of Right: Copley Square

Copley Square Shadow Duration Study for Proposed Building - 5 Point Study

Study Period - March 21 through October 21 (214 Days)

	Shadow Durations (Number of Days Affected)				
	Total Days Affected	0 Hour	0 to 30 Mins	30 Mins to 1 Hr	1 + Hours
Kiosk (A)	16 Days	198 Days	4 Days	12 Days	0 Days
Benches (B)	15 Days	199 Days	9 Days	6 Days	0 Days
Fountain (C)	7 Days	207 Days	7 Days	0 Days	0 Days
Trinity Rosette (D)	7 Days	207 Days	7 Days	0 Days	0 Days
Lawn (E)	23 Days	191 Days	4 Days	19 Days	0 Days

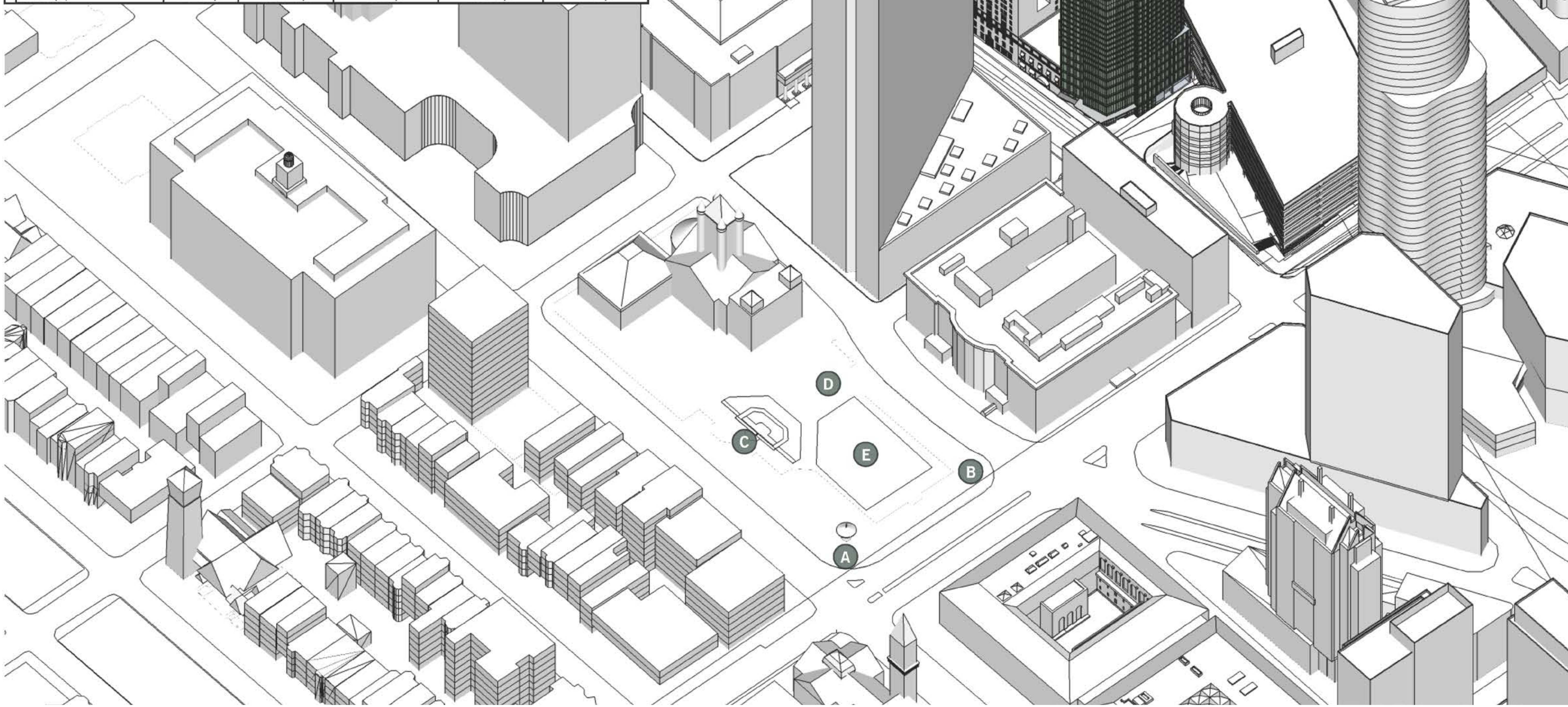


Figure 4.2-21

Shadow Study - Duration on Copley Square Study Areas

*March 21, September 21, October 21, December 21: Not Shown - No new shadow on subject area

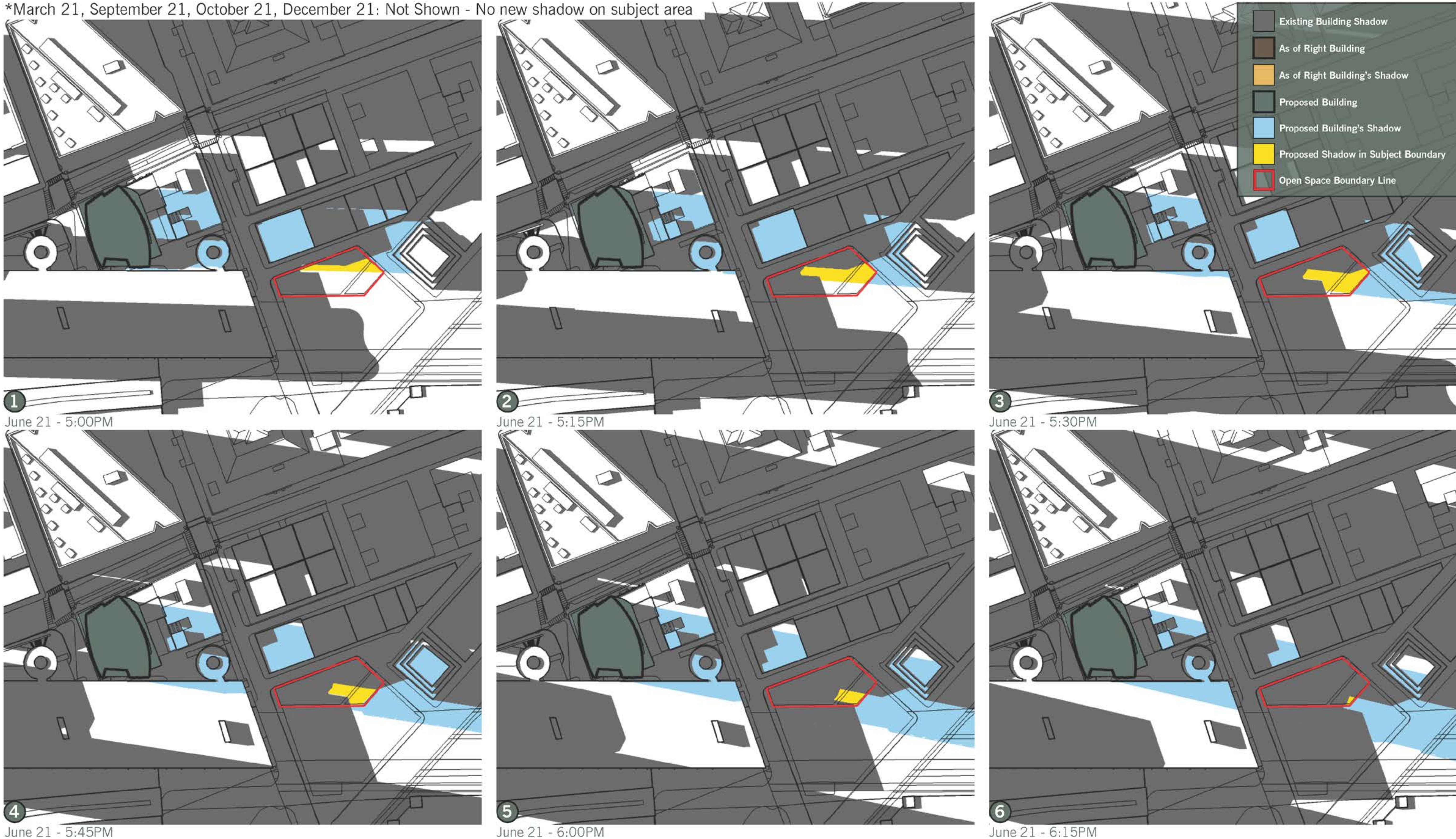
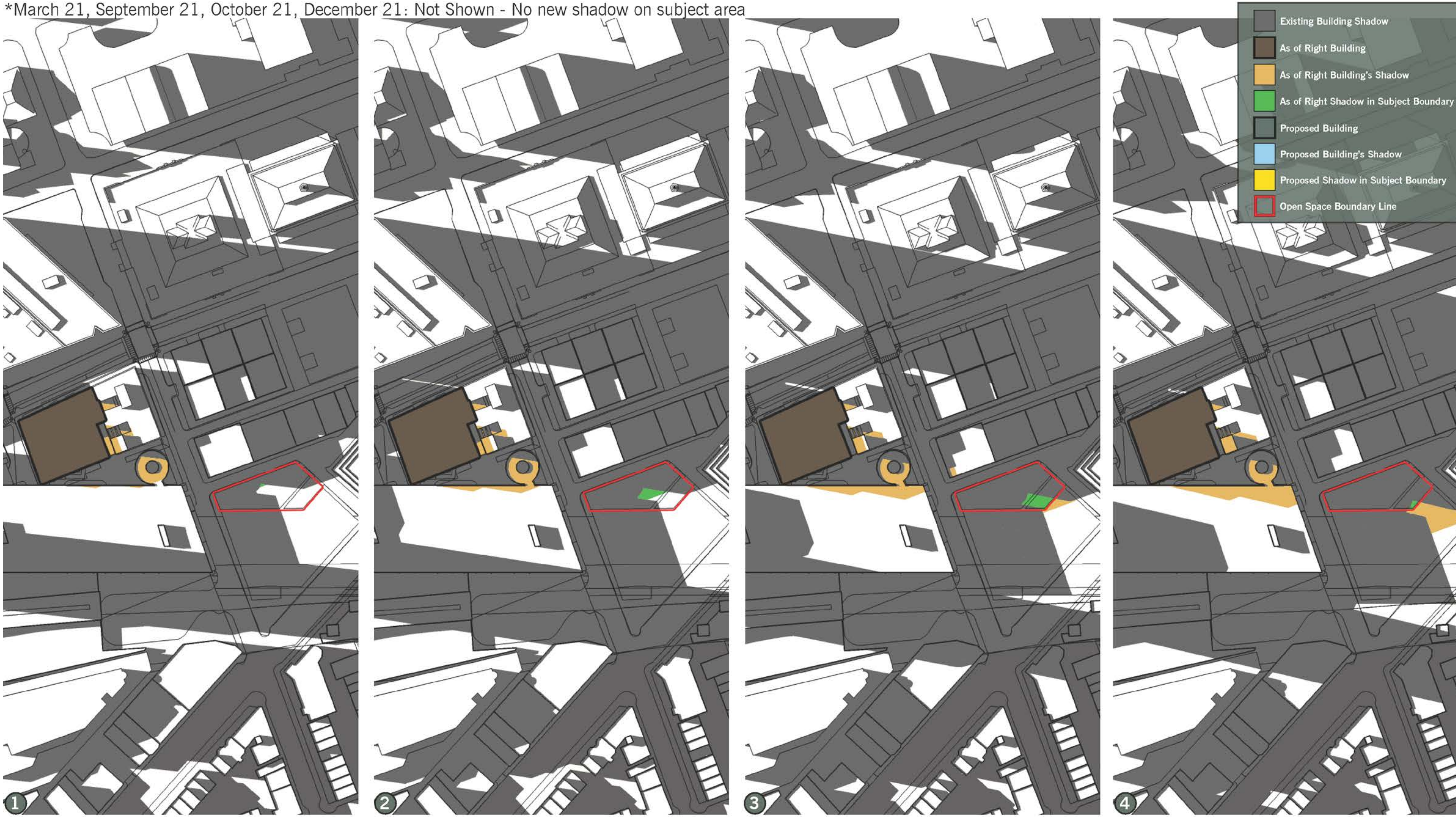


Figure 4.2-22

Shadow Study – Proposed: Frieda Garcia Park

*March 21, September 21, October 21, December 21: Not Shown - No new shadow on subject area



June 21 @ 5:30PM

June 21 @ 5:45PM

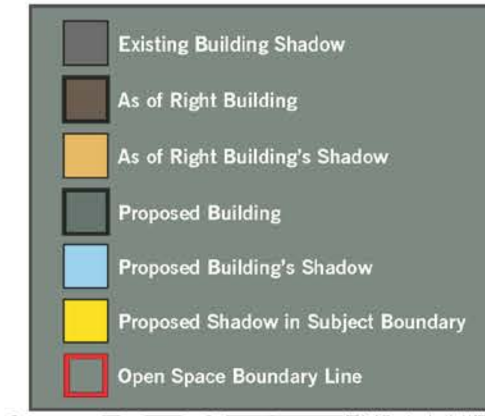
June 21 @ 6:00PM

June 21 @ 6:15PM

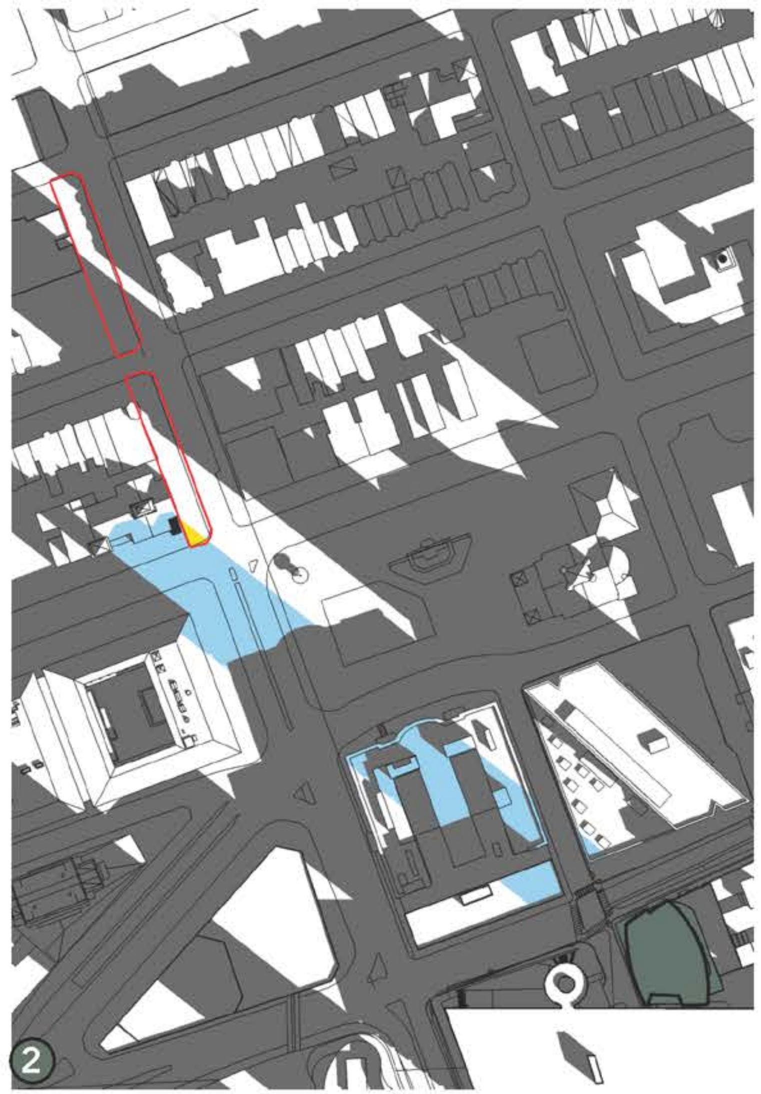
Figure 4.2-23

Shadow Study – As of Right: Frieda Garcia Park

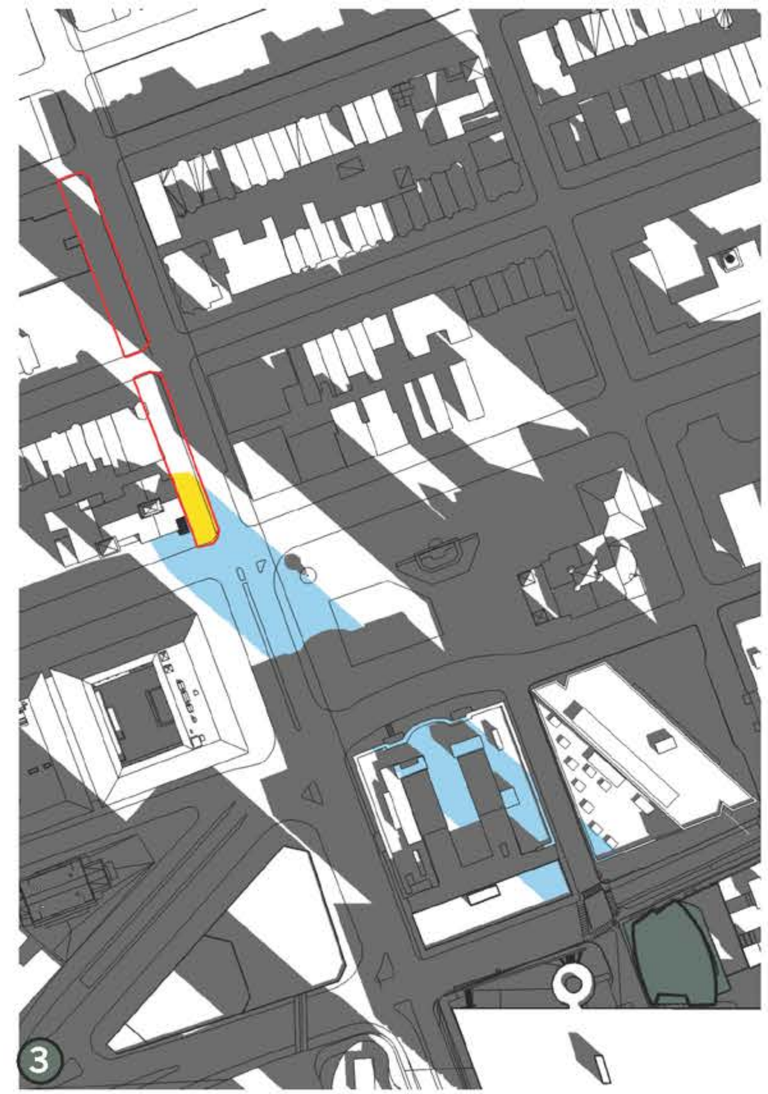
*March 21, June 21, September 21: Not Shown - No new shadow on subject area



October 21 @ 9:00AM



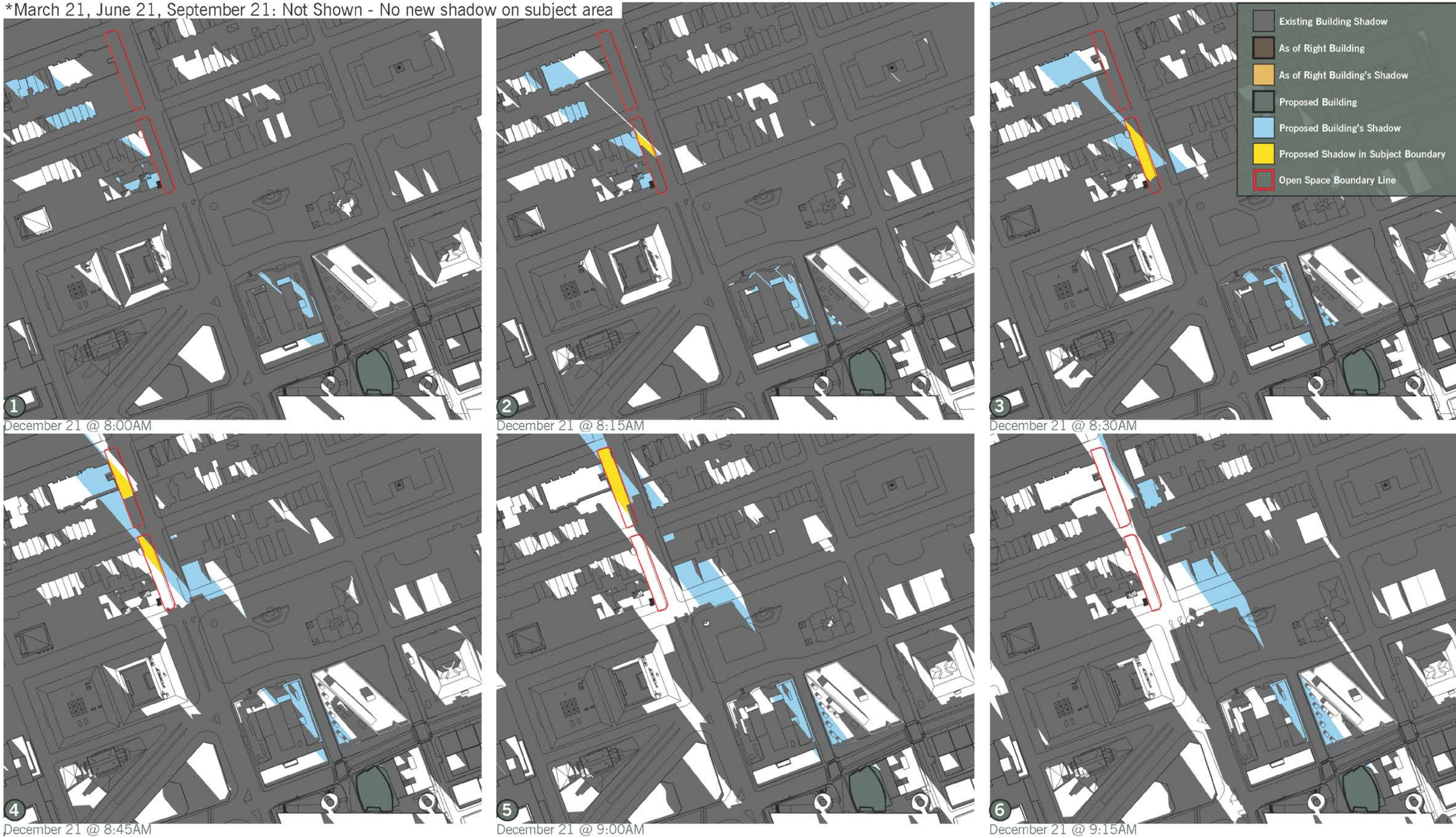
October 21 @ 9:15AM



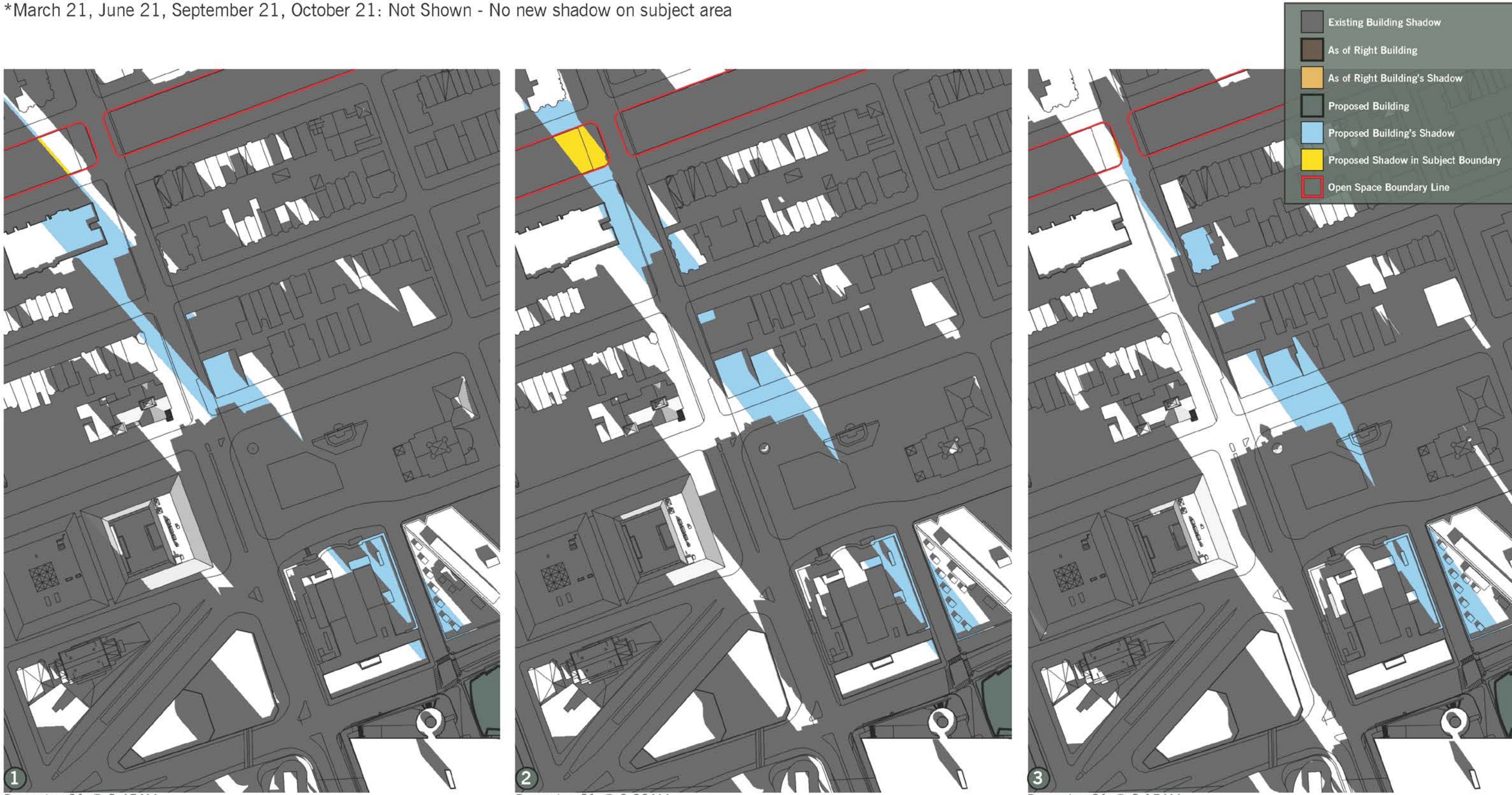
October 21 @ 9:30AM

October 21 @ 9:45M

*March 21, June 21, September 21: Not Shown - No new shadow on subject area



*March 21, June 21, September 21, October 21: Not Shown - No new shadow on subject area



December 21 @ 8:45AM

December 21 @ 9:00AM

December 21 @ 9:15AM

Figure 4.2-26

Shadow Study – Proposed: Commonwealth Mall

4.3 Daylight

4.3.1 Introduction

A daylight analysis has been prepared in compliance with the BRA Scoping Determination. The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in the immediate vicinity of a project site. The daylight analysis for the Project considers the existing, as-of-right and proposed conditions, as well as typical daylight obstruction values of the surrounding area.

Because the Project site is currently developed, the proposed Project will have a minimal impact on daylight obstruction compared to the existing conditions. The resulting conditions will be typical of the area and other urban areas of Boston.

4.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program[3]. This program measures the percentage of sky-dome that is obstructed by a project and is a useful tool in evaluating the net change in obstruction from existing to build conditions at a specific site.

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

The analysis compares three conditions for the Project site: Existing Condition; Proposed Condition; and As-of-right Alternative Condition; as well as the context of the area.

Two viewpoints were chosen to evaluate daylight obstruction for the Existing, Proposed and As-of-right Alternative conditions; one from Trinity Place and one from Stuart Street. Four area context points were considered in order to provide a basis of comparison to existing conditions in the surrounding area. The viewpoints were taken in the following locations and are shown on Figure 4.3-1.

---

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

G:\Projects2\MA\Boston\3325\viewpoints.mxd

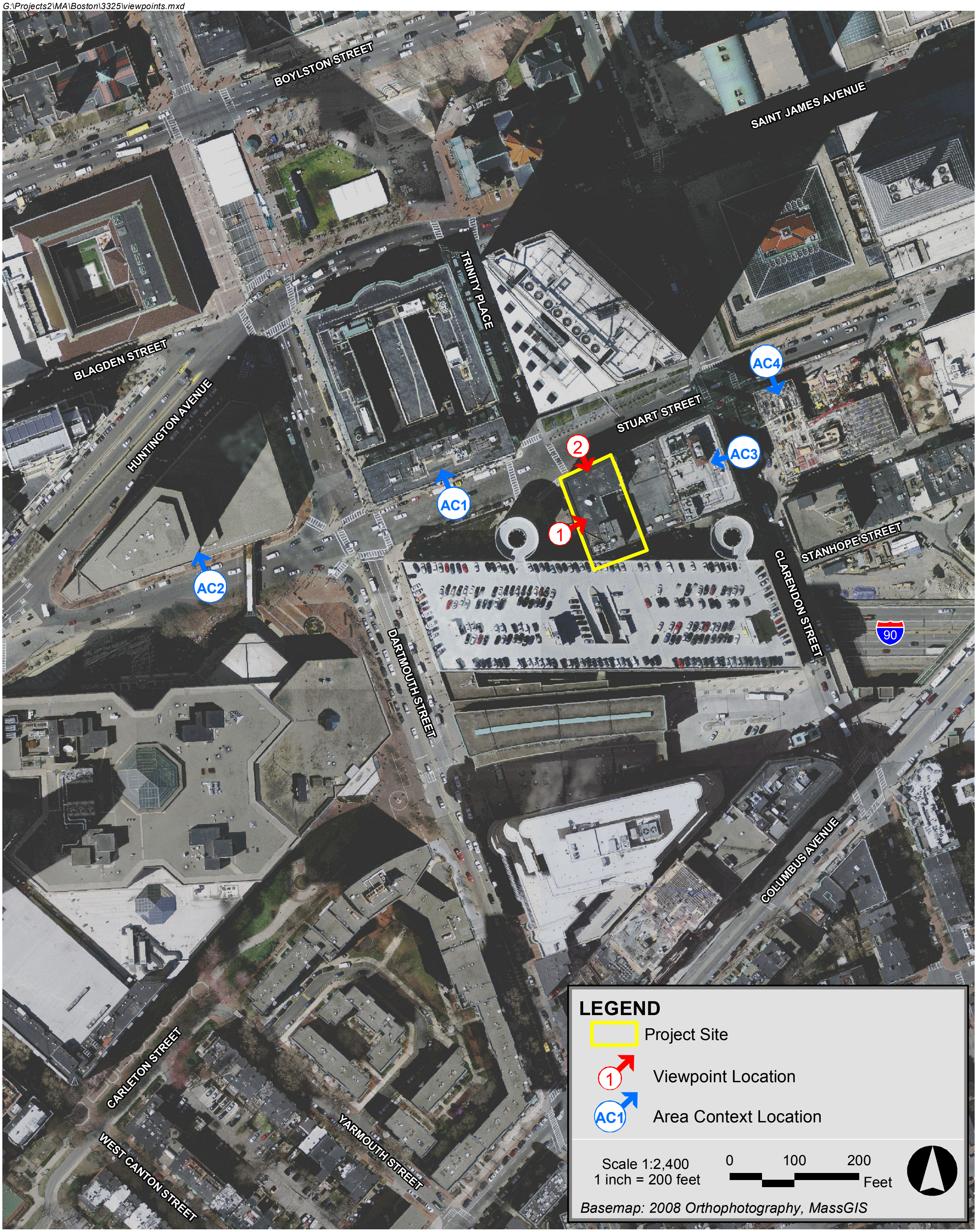


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Figure 4.3-1

Viewpoint and Area Context Locations

- **Viewpoint 1**: View from Trinity Place facing east toward the Project site
- **Viewpoint 2**: View from Stuart Street facing south toward the Project site
- **Area Context Viewpoint (AC1)**: View from Stuart Street facing north toward 441 Stuart Street
- **Area Context Viewpoint (AC2)**: View from Stuart Street facing north toward 10 Huntington Avenue
- **Area Context Viewpoint (AC3)**: View from Clarendon Street facing west toward 140 Clarendon Street
- **Area Context Viewpoint (AC4)**: View from Stuart Street facing south toward 400 Stuart Street

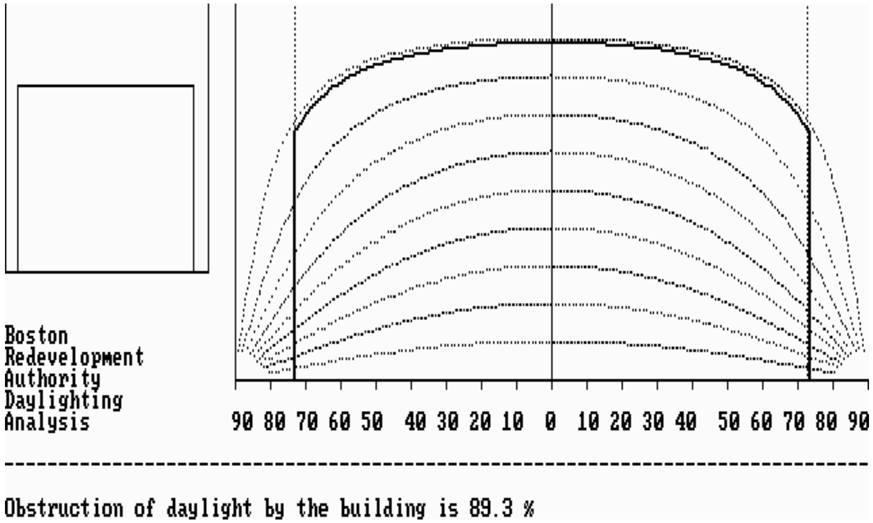
4.3.3 Results

The results for each viewpoint under each alternative condition are described in Table 4.3-1. Figures 4.3-2 to 4.3-4 illustrates the BRADA results for each analysis.

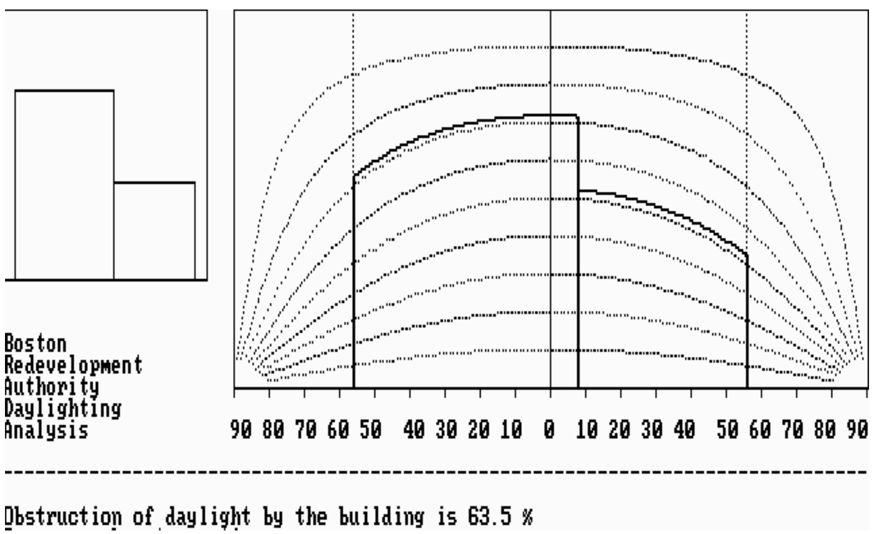
Table 4.3-1 Daylight Analysis Results

Viewpoint Locations		Existing Conditions	Proposed Conditions	As-of-right Alternative
Viewpoint 1	View from Trinity Place facing east toward the Project site	89.3%	96.3%	93.3%
Viewpoint 2	View from Stuart Street facing south toward the Project site	63.5%	75.3%	78.0%
Area Context Points				
AC1	View from Stuart Street facing north toward the building at 441 Stuart Street	80.7%	N/A	N/A
AC2	View from Stuart Street facing north toward the building at 10 Huntington Avenue	77.2%	N/A	N/A
AC3	View from Clarendon Street facing west toward the building at 140 Clarendon Street	90.8%	N/A	N/A
AC4	View from Stuart Street facing south toward the building at 400 Stuart Street	74.3%	N/A	N/A

EXISTING

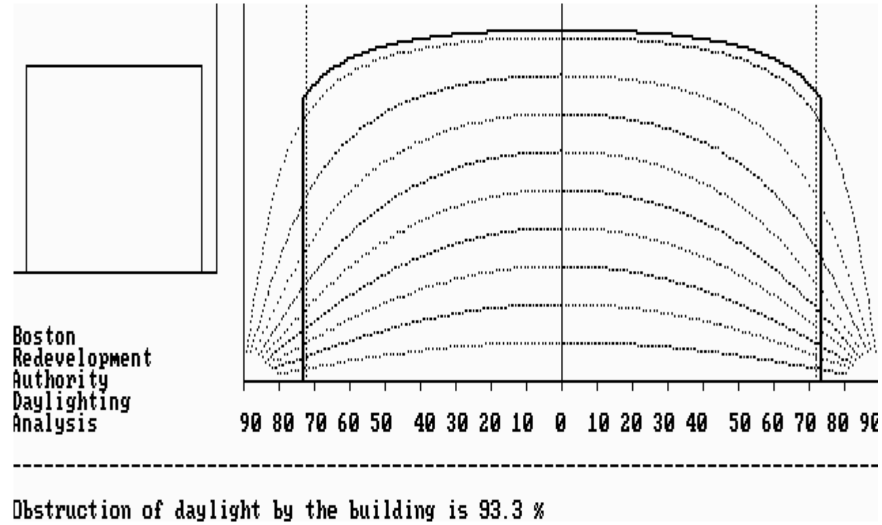


Viewpoint 1: View from Trinity Place facing east toward the Project site

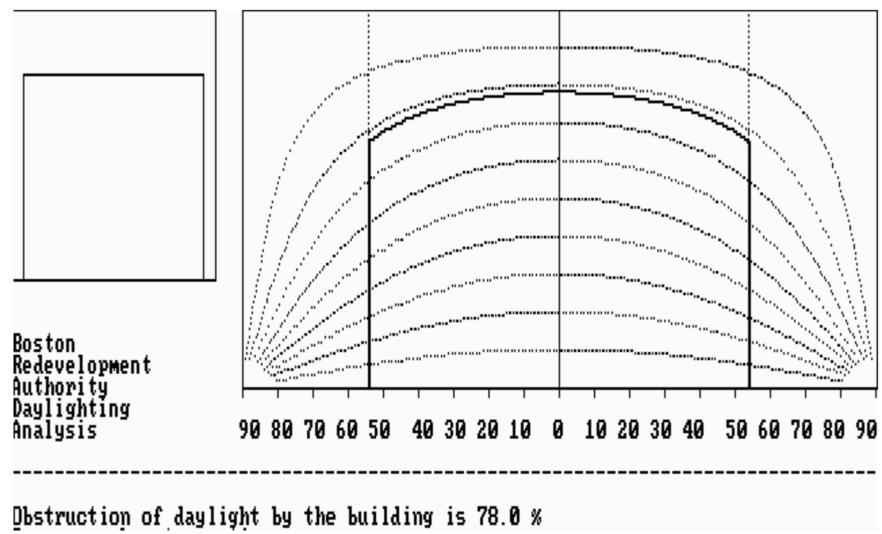


Viewpoint 2: View from Stuart Street facing south toward the Project site

AS-OF-RIGHT



Viewpoint 1: View from Trinity Place facing east toward the Project site

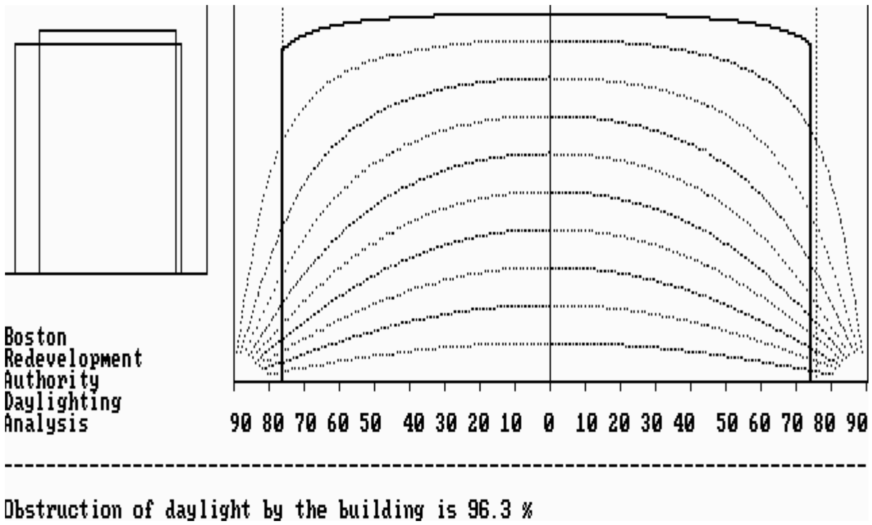


Viewpoint 2: View from Stuart Street facing south toward the Project site

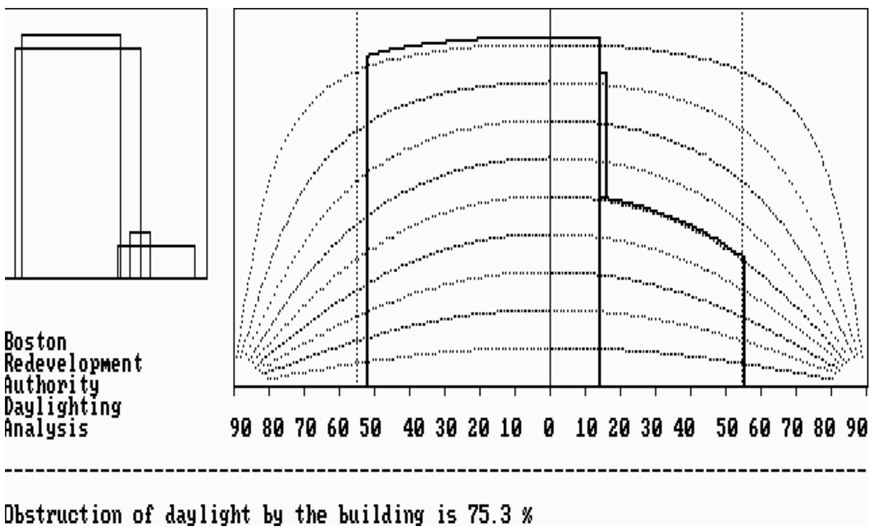
Figure 4.3-2

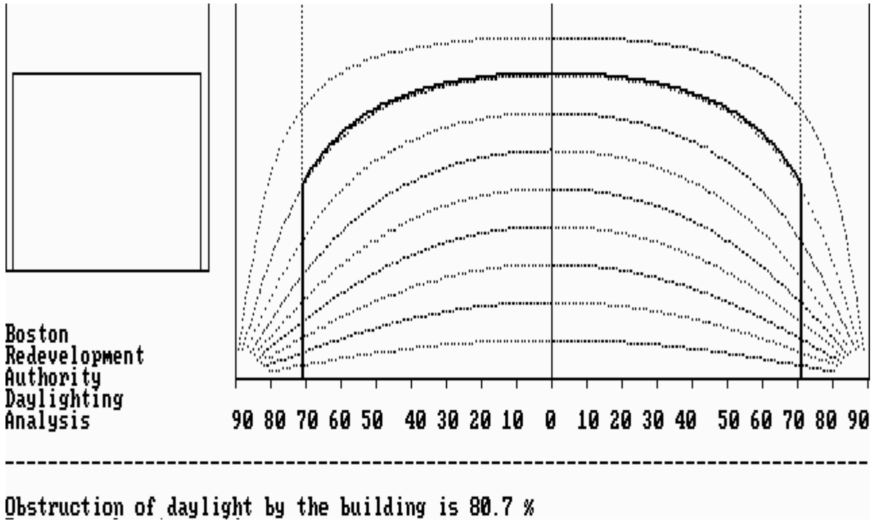
Daylight Analysis: Existing Viewpoints

Viewpoint 1: View from Trinity Place facing east toward the Project site

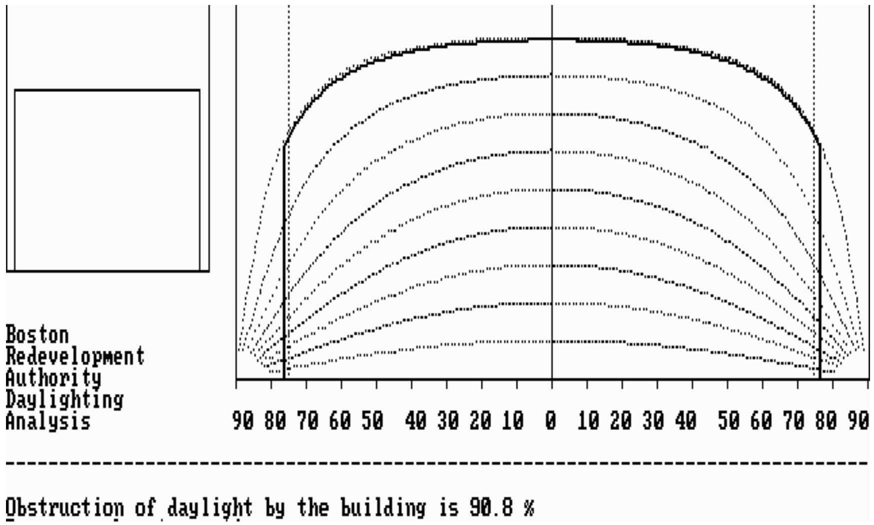


Viewpoint 2: View from Stuart Street facing south toward the Project site

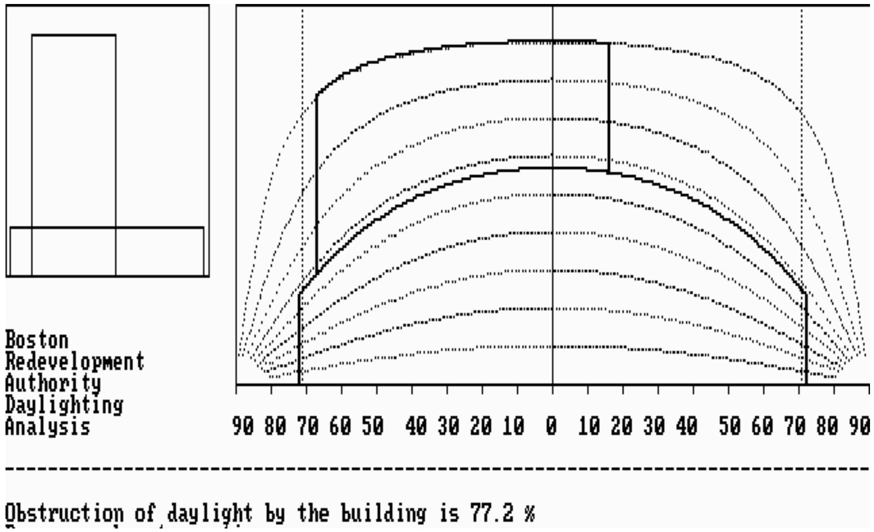




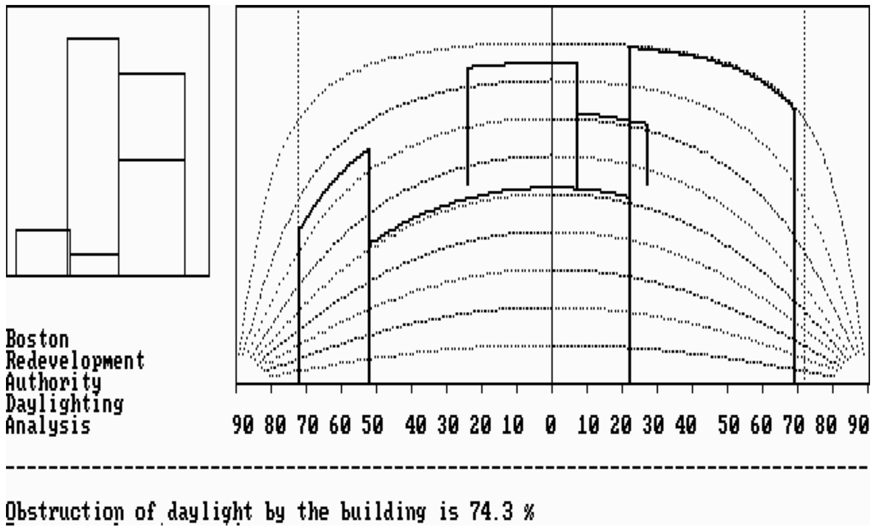
Area Context Viewpoint (AC1): View from Stuart Street facing north toward 441 Stuart Street



Area Context Viewpoint (AC3): View from Clarendon Street facing west toward 140 Clarendon Street



Area Context Viewpoint (AC2): View from Stuart Street facing north toward 10 Huntington Avenue



Area Context Viewpoint (AC4): View from Stuart Street facing south toward 400 Stuart Street

Trinity Place- Viewpoint 1

Trinity Place is a narrow roadway that runs along the western edge and around the back of the Project site. Viewpoint 1 was taken from the center of Trinity Place on the western side of the site, looking east at the Project site. Since Trinity Place is narrow and the existing, As-of-right Alternative and proposed Project buildings are located on the property line, the daylight obstruction from this viewpoint is high in every scenario. The existing daylight obstruction value is 89.3%. The development of the Project will increase the daylight obstruction value to 96.3%. While this is an increase over Existing Conditions, the daylight obstruction value for the Project is only slightly higher than the As-of-right Alternative, which would have a daylight obstruction value of 93.3%.

Stuart Street- Viewpoint 2

Stuart Street runs along the northern edge of the Project site. Viewpoint 2 was taken from the center of Stuart Street, looking south at the Project site. In its current use, the site has an existing daylight obstruction value of 63.5%. The As-of-right Alternative would create a daylight obstruction value of 78.0% since the mass of the building would take up the majority of the site and be located on the edge of the property line. The Project will have a daylight obstruction value of only 75.3%, which is lower than the As-of-right Alternative, because of the space between the Project and the adjacent YWCA building that allows for a greater view of the sky from this viewpoint.

Area Context Views

The Project area is primarily characterized by mixed-use buildings with commercial, hotel and residential uses, with some retail and restaurant uses on the ground floor. The Project is located in a dense urban area with a number of high-rises in the vicinity. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for the four area context viewpoints described above and shown on Figure 4.3-1. The daylight obstruction values range from 74.3% for AC4 to 90.8% for AC3. Daylight obstruction values for the Project are similar to the Area Context values.

4.3.4 Conclusions

The daylight analysis conducted for the Project describes Existing, Proposed and As-of-right Alternative daylight obstruction conditions at the Project site and in the surrounding area. The results of the BRADA analysis indicate that while the Project will result in a minor increased daylight obstruction over Existing Conditions for Viewpoint 1, the resulting conditions will be similar to the daylight obstruction values within the surrounding area. The increased daylight obstruction value is mainly due to the narrow street width. The daylight obstruction value on Stuart Street (Viewpoint 2) will be typical of the surrounding area, and less than the daylight obstruction value from the As-of-right Alternative, as the proposed Project includes space between the proposed building and the YWCA building, allowing for a greater view of the sky from Stuart Street.

4.4 Air Quality

4.4.1 Introduction

An air quality analysis was conducted to determine the impact from stationary sources (i.e., combustion source stacks, and garage vents). United States Environmental Protection Agency (EPA) approved air dispersion models are used to estimate project-generated ambient concentrations of nitrogen oxides (NOx), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO_2), in addition to CO from stationary sources. The air quality analysis shows that the Project will comply with the National Ambient Air Quality Standards for all criteria pollutants related to the operation of the Project's mechanical equipment.

4.4.2 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, EPA promulgated National Ambient Air Quality Standards (NAAQS) for these criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM-10 and PM-2.5), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in Table 4.4-1. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS.

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

A new one-hour NO_2 standard was promulgated on January 22, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly NO_2 NAAQS was published in the Federal Register on February 9, 2010 and became effective on April 12, 2010. The form of this standard is the three-year average of the 98th percentile of the daily maximum one-hour concentrations.

Similarly, a new one-hour SO_2 standard was promulgated on June 2, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly SO_2 NAAQS was published in the

Federal Register on June 22, 2010 and became effective on August 23, 2010. The form of this standard is the three-year average of the 99th percentile of the daily maximum one-hour concentrations.

Table 4.4-1 National Ambient Air Quality Standards

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

Notes:

[1] Not to be exceeded.

[2] Not to be exceeded more than once per year.

[3] Not to be exceeded more than an average of one day per year over three years.

[4] Not to be exceeded by the arithmetic average of the annual arithmetic averages from three successive years.

[5] Not to be exceeded based on the 98th percentile of data collection.

[6] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM-10 standard in 2006 (effective December 17, 2006). However, the annual standard remains codified in 310 CMR 6.00.

[7] Not to be exceeded. Based on the three year average of the 98th (NO_2) or 99th (SO_2) percentile of the daily maximum one-hour concentrations.

[8] The Annual and 24-hour SO_2 standards were revoked on June 2, 2010. However, these standards remain in effect until one year after an area is designated for the one-hour standard, unless currently in nonattainment.

Source: 40 CFR 50 and 310 CMR 6.00

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

The inhalable particulate (PM-10) NAAQS were promulgated on July 1, 1987 at the federal level with the intent of replacing the existing standards limiting ambient levels of Total Suspended Particulate (TSP). In 1998, EPA also promulgated a Fine Particulate (PM-2.5) NAAQS. It has been strengthened several times, currently with an annual standard of 12 micrograms per cubic meter ($\mu g/m^3$), and the 24-hour standard of 35 $\mu g/m^3$.

The impacts were added to monitored background values and compared to the NAAQS. The modeling methodology was developed in accordance with the latest Massachusetts Department of Environmental Protection (MassDEP) modeling policies and Federal modeling guidelines.[4]

4.4.3 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports was obtained for 2007 to 2011.

The Clean Air Act allows for one exceedance per year of the CO and SO_2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM-10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM-2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. For annual PM-2.5 averages, the average of the highest yearly observations was used as the background concentration. A new one-hour NO_2 standard was recently promulgated. To attain this standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$.

Background concentrations were determined from the closest available monitoring stations to the proposed development. All pollutants are not monitored at every station, so data from multiple locations are necessary. The closest monitor is at Kenmore Square in Boston. A summary of the background air quality concentrations are presented in Table 4.4-2.

4 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005.

Table 4.4-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

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

Notes:
From 2007-2011 MassDEP Annual Data Summaries
1 SO_2 reported in ppm or ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2600 $\mu g/m^3$.
2 CO reported in ppm or ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1140 $\mu g/m^3$.
3 NO_2 reported in ppm or ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1880 $\mu g/m^3$.
4 Background level for 24-hour PM-2.5 is the average concentration of the 98th percentile for three years.
5 Background level for annual PM-2.5 is the average for three years.
6 Maximum annual one-hour concentrations.
7 The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.
8 The 2010 and 2011 SO_2 three-hour value is not reported. Years 2007-2009 used instead.

4.4.4 Methodology

4.4.4.1 Microscale Analysis

The BRA Scoping Determination required an air quality analysis "for any intersection (including garage entrance/exits) where the level of service (LOS) is expected to deteriorate to D and the Proposed Project causes a 10 percent increase in traffic or where the level of service is E or F and the Proposed Project contributes to a reduction in LOS."

Since none of the intersections included in the transportation analysis meet the above criteria, the microscale analysis is not required.

4.4.4.2 Stationary Source Analysis

AERMOD Modeling Methodology

The most recent version of the U.S. EPA AERMOD refined dispersion model (Version 12345) was selected to predict concentrations from the stationary sources related to the Project. AERMOD is the U.S. EPA's preferred model for regulatory applications. The use of AERMOD provides the benefits of using the most current algorithms available for steady state dispersion modeling.

The AERMOD View graphical user interface (GUI) Version 8.0.5, created by Lakes Environmental, was used to facilitate model setup and post-processing of data. The AERMOD model was selected for this analysis because it:

- is the required U.S. EPA model for all refined regulatory analyses for receptors within 50 km of a source;
- is a refined model for facilities with multiple sources, source types, and building-induced downwash;
- uses actual representative hourly meteorological data;
- incorporates direction-specific building parameters which can be used to predict impacts within the wake region of nearby structures;
- allows the modeling of multiple sources together to predict cumulative downwind impacts;
- provides for variable emission rates;
- provides options to select multiple averaging periods between one-hour and one-year (scaling factors can be applied to adjust the one-hour impact to a peak impact less than one-hour); and,
- allows the use of large Cartesian and polar receptor grids, as well as discrete receptor locations.

Regulatory default options adopted for the model include:

- *Use stack-tip downwash (except for building downwash).* Stack-tip downwash is an adjustment of the actual stack release height for conditions when the gas exit velocity is less than 1.5 times the wind speed. For these conditions, the effective release height is reduced a bit, based on the diameter of the stack and the wind and gas exit velocity. This option applies to point sources only, such as emergency generators, cooling towers, boiler units and garage vents.
- *Use the missing data and calms processing routines.* The model treats missing meteorological data in the same way as the calms processing routine, i.e., it sets the concentration values to zero for that hour, and calculates the short term averages according to U.S. EPA's calms policy, as set forth in the Guideline[5]. Since only one-hour averages are being used, concentrations predicted with calm or missing data would not affect model results.

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5 Appendix W to 40 CFR Part 51, "Guideline on Air Quality Models", November 9, 2005.

The AERMOD model is able to assign sources to a rural or urban category to allow specified urban sources to use the effects of increased surface heating under stable atmospheric conditions. The urban dispersion classification was selected based on a visual inspection of the area within a three kilometer radius of the Project site. A population estimate of 4,591,112 for the Boston Metropolitan Statistical Area (MSA) was obtained from the U.S. Census website (www.census.gov) and is used in the AERMOD model to estimate the urban boundary layer height.

The regional meteorology in Boston is best approximated with meteorological data collected by the nearby Boston Logan International Airport in East Boston, MA. The station is located approximately 3.4 miles (5.5 km) to the east-northeast of the Project site at an elevation of 15 feet (4.57 m) above mean sea level. This station is the closest site for which extensive meteorological data are available which are representative of similar topographic influences that affect the proposed site. Five years (2007-2011) of hourly surface data collected at the station include wind speed and direction, temperature, cloud cover and ceiling height. Upper air data from Gray, Maine was processed along with the surface data. The processed meteorological files for use in AERMOD were provided by the MassDEP. These files have been used on other AERMOD applications in the area for review by MassDEP and are presumed to be of sufficient quality for regulatory applications.

A network of 2,784 receptors was used for the refined AERMOD modeling analysis. A nested grid of Cartesian receptors centered on the Project was used. The entire modeling domain encompassed 100 square kilometers. The spacing of the receptors was as follows:

- A 200 meter by 200 meter area bounding the Project site with receptors spaced every 10 meters.
- An area extending 200 meters from the 10 meter grid with receptors spaced every 20 meters.
- An area extending 300 meters from the 20 meter grid with receptors spaced every 50 meters.
- An area extending 500 meters from the 50 meter grid with receptors spaced every 100 meters.
- An area extending 1,000 meters from the 100 meter grid with receptors spaced every 200 meters.
- An area extending 3,000 meters from the 200 meter grid with receptors spaced every 500 meters.

Receptors falling on the Project's building footprint were removed from the analysis.

Terrain data were obtained from the U.S.G.S National Map Seamless Server (www.seamless.usgs.gov) according to guidance set forth by the EPA.[6] Source, building, and receptor elevations were processed using the AERMAP processor by way of the Lakes AERMOD View interface. Figure 4.4-1 presents the source and receptor locations, as well as the buildings used in the GEP stack height/downwash analysis described below.

Stationary Sources

Stationary sources of air pollution are typically units that combust fuel. In this case, these sources consist of heating units, electrical generating units, etc.

Boilers

The current plans include three small condensing boilers for heat and domestic hot water. All units will be natural gas-fired and located in a penthouse mechanical area on the roof of the building. The units are expected to be exhausted through individual stacks. It is anticipated that the Project will include three condensing boilers at two million British thermal units per hour (MMBtu/hr) each.

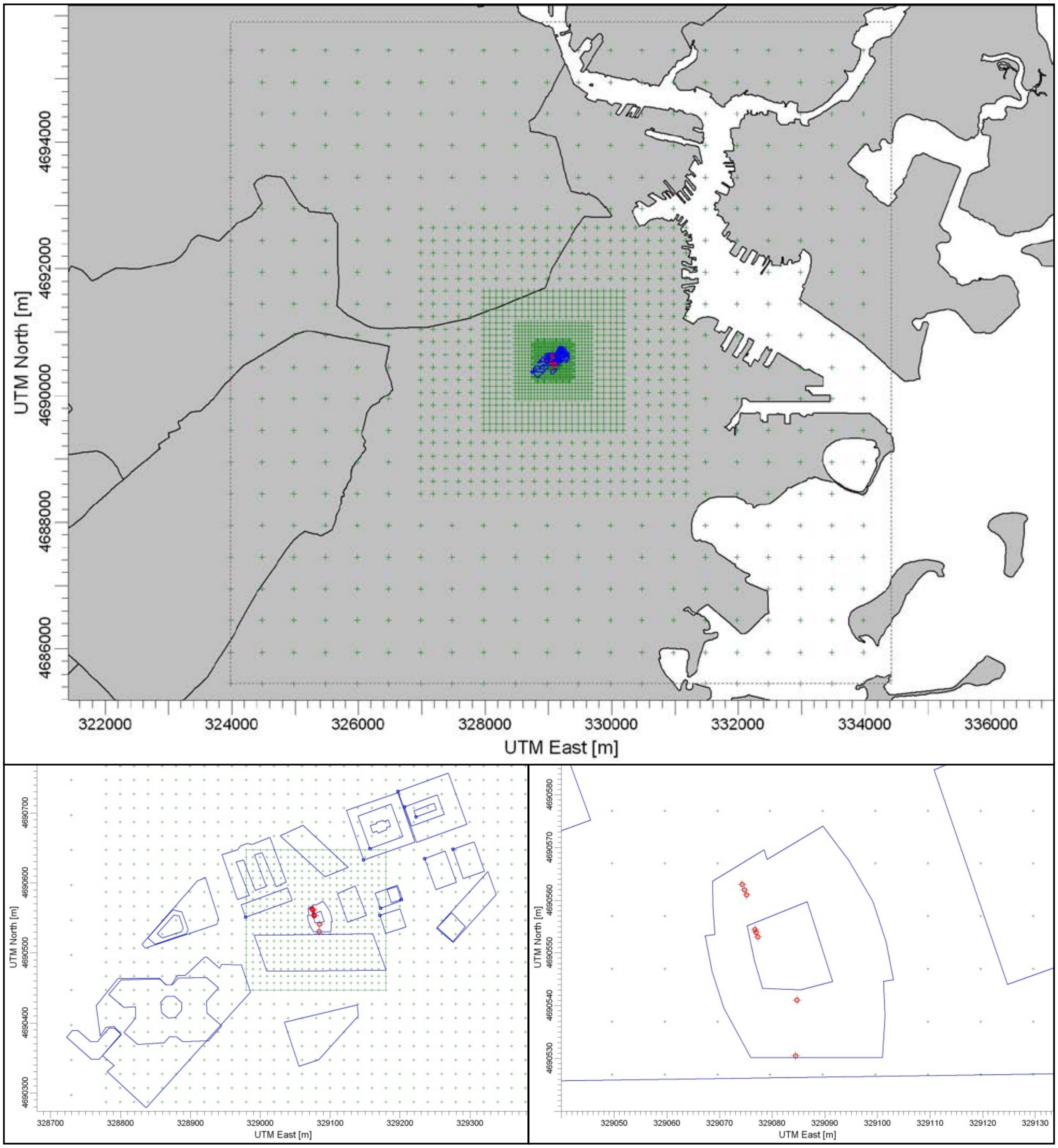
The boilers will be within the requirements of the MassDEP's Environmental Results Program (ERP) since individual estimated heat inputs are within or below the 10 to 40 MMBtu/hour ERP range. However, emissions were conservatively estimated for each boiler based on the MassDEP Boiler ERP program emission limits. Dispersion modeled impacts from the heating units were estimated from exhaust stacks 10 feet above the building roof heights above ground level. For all impacts, the heating equipment is assumed to be in operation 24 hours per day, seven days per week.

Since current plans show all boilers to be below the ERP limits of 10 MMBTU/hour, registration with MassDEP would not be required.

Emergency Generators

Current design plans include an emergency generator to be installed on the building. The unit will provide life safety and standby emergency power to the building. The unit will be diesel-fired and located in a mechanical area on the roof of the building. The generator is assumed to be designed such that its exhaust stack extends at least 10 feet above the individual building roof height above ground level. The emergency generator is anticipated to be a 1,000 kilowatt (kW) diesel fueled unit.

6 U.S. EPA, AERMOD Implementation Guide, March 19, 2009.



40 Trinity Place   Boston, Massachusetts

Figure 4.4-1

Source, Building & Receptor Locations for Stationary Source Analysis

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

Emissions were estimated for the emergency generator based on vendor supplied data. Comparable equipment was assumed where not provided by the architects or design engineers. The generator is assumed to operate 300 of 8,760 hours per year in the modeling for annual averaging times.

Cooling Towers

Current plans call for cooling towers to be installed on the building. These units will remove the excess heat in the building. All units will be located on the roof of the building. The Project is anticipated to include one 800-ton triple celled cooling tower.

Only emissions of particulate matter are assumed to be produced by the cooling tower cells. The cooling tower is assumed to operate at 100% capacity for 8,760 hours per year. Emissions of all other pollutants from the cooling tower are expected to be negligible.

Emissions and exhaust parameters were based on vendor supplied data and/or engineering judgment.

Parking Garage Exhausts

Two levels of parking are planned for the Project with a capacity of 100 total parking spaces. Carbon monoxide monitors and mechanical exhaust fans will be installed within the garage to ensure that levels of CO do not exceed health standards, and will be used to control abatement ventilation when necessary.

Emissions from the parking garage were calculated using MOBILE6.2 and an estimate of the total miles traveled within the garage during the a.m. and p.m. peak hours. Estimates of vehicle turnover by usage were provided by the transportation consultant. The total vehicle miles traveled (VMT) are calculated by multiplying the average distance a car would travel in the garage by the number of cars entering and leaving the garage.

To provide a conservative assumption for emissions from the garage, an emission rate from MOBILE6.2 of 10 miles per hour was assumed for the 2016 conditions. The higher of the summer or winter factors were used, depending on the pollutant. Additionally, emission factors were weighted such that only factors for light duty gasoline and diesel vehicle classes (MOBILE6.2 designations LDGV, LDGT, LDDV, and MCY) were used for garage emissions.

Therefore, the emission rates from the garage vents can be calculated as follows:

Mobile 6.2 emission factor in grams/mile
x garage VMT/hour
x 1 hour/3600 seconds
= grams/second

High velocity air intake louvers and the main garage entry will supply make-up air for the garage's ventilation systems. Total ventilation air requirements, as well as sizes, numbers, and locations of vents were provided by the mechanical design engineers. According to preliminary design, vents are assumed to be exiting horizontally at the fourth and fifth floor ceiling levels above grade along the southern façade of the building.

Detailed calculations, assumptions, and exhaust parameters for all stationary sources are presented in Appendix D.

GEP Stack Height Analysis

The Good Engineering Practice (GEP) stack height evaluation of the Project has been conducted in accordance with the EPA revised Guidelines for Determination of Good Engineering Practice Stack Height (EPA, 1985). A GEP stack is sufficiently high to avoid aerodynamic downwash effects from nearby buildings or structures. As defined by the EPA guidelines, the formula for computing GEP stack height is the greater of:

1. 65 meters, or
2. for stacks constructed after January 12, 1979,

$$H_{GEP} = H_b + 1.5L$$

where H_{GEP} = GEP stack height,

H_b = Height of adjacent or nearby structures,

L = Lesser of height or maximum projected width of adjacent or nearby building (i.e., the critical dimension), and nearby is within 5L of the stack from downwind (trailing edge) of the building.

The GEP formula was applied to the Project. Facility grade is approximately at mean sea level. The EPA's Building Profile Input Program Prime Version (BPIP-Prime) was run to confirm the GEP height and to calculate direction-specific building dimensions for use in AERMOD.

The point sources subject to building influences are the boiler stacks, dock vents, the cooling towers, the emergency generator stacks and the parking garage vents.

The proposed boiler stacks, the cooling towers, dock vents, emergency generator stacks and parking garage vents are all below GEP height; therefore, building downwash effects were considered in the air quality modeling. The AERMOD model determines when and if to include downwash in its calculations. In addition, if downwash applies, the AERMOD downwash algorithm will be used to estimate concentrations in the building cavity areas.

4.4.5 Results

A cumulative impact analysis was conducted for comparison to the NAAQS for CO, SO_2, NOx, PM-10, and PM-2.5. This analysis addresses emissions from the Project's heating boilers, emergency generators, cooling towers, and the parking garage vents.

Worst case maximum predicted impacts from these source groups were added to monitored background values obtained from MassDEP and compared to the NAAQS.

Table 4.4-3 presents the cumulative modeling results for the stationary sources plus monitored background values. The total impacts, when combined with the background, are below the NAAQS for all pollutants and averaging periods.

Table 4.4-3 Summary of NAAQS Stationary Source Modeling Analysis

Pollutant	Averaging Time	Max Modeled Conc. (μg/m³)	Modeled Year	Background Concentration (μg/m³)	Total Conc. (μg/m³)	Standard (μg/m³)	% Of Standard
SO_2	1 HR (1)	0.17	2007-2011	127.4	127.6	195	65%
	3 HR (2)	0.17	2007	88.4	88.6	1300	7%
	24 HR (2)	0.04	2008	31.5	31.5	365	9%
	ANN. (3)	0.00	2008/2011	6.5	6.5	80	8%
PM-10	24 HR (4)	0.43	2011	69.0	69.4	150	46%
	ANN. (3)	0.05	2011	20.6	20.7	50	41%
PM-2.5	24 HR (5)	0.45	2007-2011	20.7	21.2	35	61%
	ANN. (6)	0.05	2007-2011	9.2	9.3	15	62%
NO_2	1 HR (7)	5.53	2007-2011	140.8	146.3	188	78%
	ANN. (3)	0.51	2008	38.3	38.8	100	39%
CO	1 HR (2)	37.85	2007	2166.0	2203.8	40000	6%
	8 HR (2)	5.86	2010	1710.0	1715.9	10000	17%

Notes:
(1) Maximum 4th-Highest Maximum Daily One-hour Concentration Averaged Over 5 Years.
(2) Highest 2nd-High Concentration Over 5 Years.
(3) Highest Annual Concentration Over 5 Years.
(4) Highest 6th-High Concentration Over 5 Years.
(5) Maximum 1st-Highest 24-Hour Concentration Averaged Over 5 Years.
(6) Maximum Annual Concentration Averaged Over 5 Years.
(7) Maximum 8th Highest Maximum Daily One-hour Concentration Averaged Over 5 Years.

4.4.6 Conclusions

Using conservative estimates, the CO, SO_2, NOx, PM-10, and PM-2.5 concentrations at the nearest receptors including impacts from stationary sources and monitored background values, are well under the NAAQS thresholds.

4.4.7 Permitting

As mentioned above, it is currently anticipated that the emergency generator will be subject to the MassDEP ERP. Per the ERP, the generator owner will limit operation of the generator to less than 300 hours per year and submit a certification form to MassDEP within 60 days of installation. The boilers will likely be within the requirements of the ERP since individual estimated heat inputs would be within or below the 10 to 40 MMBtu/hour ERP range. If boilers are below the ERP limits of 10 MMBTU/hour, registration with MassDEP would not be required.

If at a later time the Project opts to integrate larger sources (such as combined heat and power), other air quality regulations may apply if total emissions exceed thresholds for other air pollution control requirements, including Massachusetts minor source preconstruction approvals (NMCPA), New Source Review (NSR), Operating Permits, and Prevention of Significant Deterioration (PSD).

Parking Garage Exhausts

According to local building codes and best construction practices, carbon monoxide monitors will be installed within the parking garage to ensure that levels of CO do not exceed health standards and to control abatement ventilation when necessary. Compliance will be certified by local inspection authorities.

4.5 Noise

4.5.1 Introduction

A noise analysis was conducted for the Project, including an estimate of future sound levels once the Project is in operation. The analysis was conducted in accordance with the BRA Scoping Determination to address potential impacts solely from the Project. .

Baseline noise levels were measured in the vicinity of the Project and were compared to predicted noise levels based on reference sound data for likely mechanical equipment identified by the Proponent for the Project. These predicted noise levels were compared to the City of Boston Zoning District Noise Standards (City Noise Standards) and the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy. The analysis indicates that predicted noise levels from Project-related mechanical equipment with appropriate noise mitigation will comply with the City Noise Standards, and will result in sound level increases that are below the limit established by the MassDEP Noise Policy.

4.5.2 Noise Terminology

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

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

Another property of decibels is that if one source of noise is 10 dB (or more) louder than another source, then the total sound level is simply the sound level of the higher source. For example, a source of sound at 60 dB plus another source of sound at 47 dB is 60 dB.

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

Because the sounds in our environment vary with time, they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment, A-weighted sound-level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n can have a value of 0 to 100 percent. Several sound-level metrics that are commonly reported in community noise studies are described below.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.

- L_{50} is the median sound level, the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.

- L_{max} is the maximum instantaneous sound level observed over a given period.

L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is also A-weighted.

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

The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud, intrusive noises.

By using various noise metrics, it is possible to separate prevailing, steady sounds (the L_{90}) from occasional, louder sounds (L_{10}) in the noise environment or combined average levels (L_{eq}). This analysis of sounds expected from the Project treats all noises as though they will be steady and continuous, and hence the L_{90} exceedance level was used. In the design of noise control treatments, it is essential to know something about the frequency spectrum of the noise of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design. The spectra of noises are usually stated in terms of octave-band sound pressure levels, in dB, with the octave frequency bands being those established by a generally-accepted standard. To facilitate the noise-control design process, the estimates of noise levels in this analysis are also presented in terms of octave-band sound pressure levels.

4.5.3 Noise Regulations and Criteria

The primary set of regulations relating to the potential increase in noise levels is the City Noise Standards (City of Boston Code – Ordinances: Section 16–26 Unreasonable Noise; and City of Boston Air Pollution Control Commission Regulations for the Control of Noise in the City of Boston). Separate regulations within the City Noise Standards provide criteria to control different types of noise. Regulation 2 is applicable to the effects of the proposed building, as completed, and was considered in the noise study for the Project. Table 4.5-1 includes the City Noise Standards.

Additionally, MassDEP regulates community noise by its Noise Policy (DAQC policy 90-001). The MassDEP Noise Policy limits source sound levels to a 10-dBA increase in the ambient measured noise level (L_{90}) at the Project property line and at the nearest residences. The property line evaluation is typically conducted at the property line of existing residences and/or at the property line of potential future sensitive receptors.[8] The policy further prohibits "pure tone" conditions—when any octave-band, center-frequency sound pressure level exceeds that of the two adjacent center-frequency sound pressure levels by three decibels or more.

8 *"Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation or a condition of air pollution under MassDEP regulations (see 310 CMR 7.10 U)."* MassDEP website (http://www.mass.gov/dep/air/laws/noisepol.htm), accessed April 2013.

Table 4.5-1 City Noise Standards, Maximum Allowable Sound Pressure Levels

Octave Band Center	Residential District		Residential Industrial Zoning District		Business Zoning District	Industrial Zoning District
Frequency (HZ)	Daytime (dB)	All Other Times (dB)	Daytime (dB)	All Other Times (dB)	Anytime (dB)	Anytime (dB)
32	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
A-Weighted (dBA)	**60**	**50**	**65**	**55**	**65**	**70**
Notes:	Noise standards are extracted from Regulation 2.5, City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976. All standards apply at the property line of the receiving property. dB and dBA based on a reference pressure of 20 micropascals. Daytime refers to the period between 7:00 a.m. and 6:00 p.m. daily except Sunday.					

4.5.4 Existing Conditions

4.5.4.1 Baseline Noise Environment

An ambient noise-level survey was conducted to characterize the "baseline" acoustical environment in the vicinity of the Project site. Existing noise sources consisted of: vehicular traffic (including trucks) on the local roadways, MBTA train and bus traffic, pedestrian traffic, nearby mechanical equipment located in and on surrounding buildings, and the general din of the city.

4.5.4.2 Noise Measurement Locations

The selection of the sound-monitoring locations was based upon a review of the current land uses in the Project area. Four noise-monitoring locations were selected as representative in obtaining a sampling of the ambient baseline noise environment. The measurement locations are depicted in Figure 4.5-1 and are described below.

- ♦ Location 1 is at the corner of Stuart Street and Clarendon Street, east of the Project site. This location is representative of the closest buildings to the site and the residential buildings east of the Project. Noise sources at this location include vehicular and pedestrian traffic, birds chirping (daytime only), mechanical ventilation (nighttime only), a flag flapping in the breeze (nighttime only) and emergency vehicle sirens.

- Location 2A and Location 2B are on Trinity Place, north of the Project site, which are adjacent to a residential building currently being renovated. Location 2A was the site for the daytime measurements, while Location 2B was the site for the nighttime measurements, which was moved from Location 2A to minimize the contribution from a ventilation fan associated with a parking garage. Noise sources at this location include vehicular (including trucks) and pedestrian traffic, noise associated with activities at a loading dock across the street, mechanical noise from surrounding buildings, distant sirens, a humming from equipment being used at the loading dock (nighttime only), noise from distant construction activity, and noise from a helicopter passing overhead (daytime only).

- Locations 3A and 3B are at a hotel at the corner of Dartmouth Street and Stuart Street, west of the Project site. Location 3A was the daytime noise measurement location, and Location 3B was the nighttime noise monitoring location to avoid news trucks present at the Location 3A during the nighttime measurement period. Noise sources include vehicular traffic (including trucks), pedestrian traffic, a mobile generator truck was operating (nighttime only), and emergency vehicle sirens (daytime only).

- Location 4 is at an apartment building on Dartmouth Street, southwest of the Project site. Noise sources include vehicular and pedestrian traffic, birds chirping (daytime only), a pedestrian crosswalk chime, leaf rustling (nighttime only) and noise associated with MBTA operations at Back Bay Station.

4.5.4.3 Noise Measurement Methodology

Sound-level measurements were taken for approximately 20 minutes per location during the daytime (11:30 a.m. to 1:45 p.m.) on April 10, 2013, and during nighttime hours (10:00 p.m. to 11:40 p.m.) on April 24, 2013. Since noise impacts are greatest at night when existing noise levels are lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to exclude peak traffic conditions.

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

4.5.4.4 Measurement Equipment

A Larson Davis model 831 Sound Level Analyzer, equipped with a Larson Davis model PRM831 Preamplifier, a PCB Piezotronics half-inch microphone, and a four-inch windscreen were used to collect broadband and octave band ambient sound pressure level data. The instrumentation meets the "Type 1 – Precision" requirements set forth in American National Standards Institute (ANSI) S1.4 for acoustical measuring devices. The meter was tripod-mounted at a height of five feet above ground level (AGL). The meter has data logging capability and was programmed to log statistical data for each 20-minute sampling period for the following parameters: L_{10}, L_{50}, L_{90}, L_{max}, L_{min}, and L_{eq}.

All measurement equipment was calibrated in the field before and after the surveys with a LD CAL200 acoustical calibrator, which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. The meters were calibrated and certified as accurate to standards set by the National Institute of Standards and Technology. These calibrations were conducted by an independent laboratory within the past 12 months.

4.5.4.5 Baseline Ambient Noise Levels

The existing ambient noise environment consists primarily of vehicular traffic on nearby roadways, building mechanical systems, and pedestrian activity. Baseline noise monitoring results are presented in Table 4.5-2, and summarized below.

- The daytime residual background (L_{90}) measurements ranged from 60 to 71 dBA;
- The nighttime residual background (L_{90}) measurements ranged from 57 to 64 dBA;
- The daytime equivalent level (L_{eq}) measurements ranged from 68 to 72 dBA; and
- The nighttime equivalent level (L_{eq}) measurements ranged from 62 to 69 dBA.

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Figure 4.5-1

Sound Level Measurement Locations

Table 4.5-2 Baseline Ambient Sound Level Measurements

Receptor I.D	Start Time	L_{10}	L_{50}	L_{eq}	L_{90}	L_{max}	L_{90} Sound Level (dB) per Octave Band Center Frequency (Hz)								
		(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	31.5	63	125	250	500	1000	2000	4000	8000
1-Day	12:45 p.m.	71	66	68	63	82	68	67	63	61	59	58	53	47	38
2A-Day	01:16 p.m.	72	71	72	71	81	68	70	65	68	69	66	62	55	48
3A-Day	11:35 a.m.	71	66	69	63	84	72	70	65	62	59	59	54	47	38
4-Day	12:08 p.m.	71	67	69	60	82	67	66	61	58	57	55	51	47	36
1-Night	11:19 p.m.	69	63	67	60	85	66	64	61	59	57	55	50	42	31
2B-Night	10:53 p.m.	71	67	69	64	80	68	68	62	62	61	59	55	48	34
3B-Night	10:26 p.m.	66	62	64	59	78	68	68	62	59	55	54	50	42	32
4-Night	10:00 p.m.	65	60	62	57	74	64	63	59	56	54	52	48	40	32

Notes:

1. Daytime weather: Temperature = 60.6° F, Relative Humidity = 49%, mostly cloudy skies, east winds 0-5 miles per hour.
   Nighttime weather: Temperature = 53.0° F, Relative Humidity = 74%, partly cloudy skies, south winds 0-5 miles per hour.
2. All road surfaces were dry during measurements.
3. Sampling periods were at least 20 minutes in duration.
4. Daytime measurements were collected on April 10, 2013.
   Nighttime measurements were collected on April 24, 2013.

4.5.5 Overview of Potential Project Noise Sources

The Project includes the demolition of the existing building and the construction of a mixed use building. The primary sources of continuous sound exterior to the Project will consist of ventilation, heating, cooling, and emergency power noise sources. Multiple noise sources will be located on the roof and there will be various exhaust/intakes along the façades of the building on several floors.

The major sources of sound exterior to the Project will be one 800-ton, triple celled cooling tower, two 6,000 cubic-feet-per-minute (CFM) energy-recovery ventilation units, four 9,000 CFM energy-recovery ventilation units, two 9,000 CFM garage exhaust fans, two 7,000 CFM grease exhaust systems, two 7,000 CFM make-up air units for kitchen exhaust, and one 1,000 kW standby generator. The proposed rooftop cooling tower for the building is a Marley NC8403NLN3 800-ton unit. It will be located on the roof at a height of approximately 400 feet above ground level (AGL). Each of the two Greenheck ERCH-55H-30 energy-recovery with cooling and heating units will be located on Level 6 with intakes and exhausts located in the southeast corner of the building. One of the four Greenheck ERCH-90H-30 energy-recovery with cooling and heating units will be located on Level 5 with intakes and exhausts located at the southeast corner of the building. One of the units will be located on Level 18M (eastern façade) and two units will be located on the roof at a height of approximately 400 feet AGL. Each of the garage exhaust fans will be Greenheck SBE-3H30-30 sidewall belt drive exhaust fans. One will be located on Level 4, and one will be located on Level 5. Each exhaust will be located on the southern façade of the building. The grease exhaust system will be a Greenheck 24-BISW-41-10-II-75 unit. One grease exhaust system will be located on the penthouse roof at a height of approximately 413 feet AGL. The second unit will be located on Level 2 with the intake along the eastern facade. AAON make-up air units for kitchen exhaust will be located on Level 18M and Level 2 with intakes along the eastern facade. The 1,000 kW Caterpillar standby generator will be located on the roof at a height of approximately 400 feet AGL.

A tabular summary of the modeled mechanical equipment proposed for the Project is presented below in Table 4.5-3a. Manufacturer specifications indicating the sound power for each piece of equipment—except for the emergency generator—are presented in Table 4.5-3b. The sound power of the mechanical and exhaust components of the emergency generator were calculated using the sound-pressure levels provided at a reference distance. These calculated values are presented in Table 4.5-3b.

The Project includes various noise-control measures that are necessary to achieve compliance with the applicable noise regulations. Mitigation will be installed to reduce the sound levels associated with the façade intakes and exhausts. The emergency generator will be controlled using an exhaust silencer and an acoustical enclosure. To further limit impacts from the standby generator, its required periodic, routine testing will be conducted during daytime hours, when background sound levels are highest. A summary of the noise mitigation proposed for the Project is presented below in Table 4.5-3c.

Table 4.5-3a Modeled Noise Sources

Noise Source	Quantity	Approximate Location	Size/Capacity
Cooling Tower	1	Roof at 400' AGL	800 Ton
Energy Recovery Ventilation Unit	2	Level 6, Façade intake and exhaust	6,000 CFM
Energy Recovery Ventilation Unit	4	Level 5 and Level 6, Roof	9,000 CFM
Garage Exhaust Fan	2	Level 4 and Level 5, Facade	9,000 CFM
Grease Exhaust System	2	Penthouse Roof, Level 2 - Facade	7,000 CFM
Make-up Air Unit	2	Level 2 and Level 18M, Façade intake	7,000 CFM
Generator	1	Roof at 400' AGL	1,000 kW

Table 4.5-3b Modeled Sound Power Levels per Noise Source

Noise Source	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Cooling Tower	96	96	99	98	97	92	91	86	83	77
Energy Recovery Ventilation Unit – Greenheck ERCH-55H-30 - Supply	93	99[1]	99	97	91	88	87	86	84	80
Energy Recovery Ventilation Unit – Greenheck ERCH-55H-30 - Exhaust	79	80[1]	80	81	76	74	73	73	70	63
Energy Recovery Ventilation Unit – Greenheck ERCH-90H-30 - Supply	99	103[1]	103	101	96	93	91	92	91	87
Energy Recovery Ventilation Unit – Greenheck ERCH-90H-30 - Exhaust	79	80[1]	80	79	73	72	73	74	71	63
Garage Exhaust Fan	92	89[1]	89	91	91	90	87	83	79	77
Grease Exhaust System	93	98[1]	98	96	97	88	86	81	77	75
Make-up Air Unit	86	85[1]	85	84	83	82	81	79	75	72
1,000 kW Generator – Mechanical – Caterpillar	120	109[1]	109	122	119	114	114	113	108	106
1,000 kW Generator – Exhaust – Caterpillar	128	112[1]	112	132	134	123	119	118	108	93

Notes:
Sound power levels do not include mitigation.
1. Sound level assumed to be equal to dB level in 63 Hz band.

Table 4.5-3c Attenuation Values Applied to Mitigate Each Noise Source

Noise Source	Form of Mitigation	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
All Intakes and Exhausts on the Façades of the Building	Mitigation	0	6	6	8	10	14	18	16	15
1,000 kW Generator – Mechanical – Caterpillar	Enclosure	4	7	13	25	25	25	25	25	25
1,000 kW Generator – Exhaust – Caterpillar	Silencer	0	18	33	32	31	21	21	21	21

4.5.6 Modeling Methodology

The noise impacts associated with the Project were predicted at the nearest receptors using the Cadna/A noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a more refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The Cadna/A software allows for octave band calculation of noise from multiple noise sources, as well as computation of diffraction around building edges.

4.5.6.1 Future Sound Levels – Nighttime

The analysis of sound levels at night considered all of the mechanical equipment without the emergency generators running, to simulate typical nighttime operating conditions at nearby receptors. Seven modeling locations were included in the analysis. These modeling receptors, which correspond to the closest residential and nearby commercial locations, are depicted in Figure 4.5-2. The predicted exterior Project-Only sound levels range from 32 to 54 dBA at nearby receptors. The range at residential modeling locations is 32 to 43 dBA. This analysis conservatively evaluates hotels as residential uses. According to data available through the Massachusetts Office of Geographic Information (MassGIS), the immediate area surrounding the Project site is zoned commercial. The current land use in the area indicates that there are several residential uses within this commercial zone. Therefore, the Residential limits have been applied to these locations. The remaining locations have been evaluated against the Business limits.

Predicted sound levels from Project-related equipment are within these broadband and octave-band nighttime limits under the City Noise Standards at the modeling locations. This evaluation is presented in Table 4.5-4a. In addition, the predicted future total sound levels (Project + Background) are below the MassDEP criteria of 10 dBA over the quietest nighttime sound levels (the L_{90} level) at sensitive receptors with nighttime use. This evaluation is presented in Table 4.5-4b. The Project's mechanical equipment is not expected to create any additional "pure-tone" conditions per the MassDEP Noise Policy when combined with existing middle of the night background sound levels at these locations as shown in Table 4.5-4c.

Table 4.5-4a Comparison of Future Predicted Project-Only Nighttime Sound Levels to the City of Boston Limits

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Residential	34	53	47	43	36	31	27	24	18	1
B	Residential	37	53	47	46	39	34	29	27	22	11
C	Residential	34	47	45	41	37	31	28	24	15	0
D	Residential	32	47	44	41	35	29	24	19	10	0
E	Residential	43	61	54	53	45	41	35	30	27	16
F	Business	54	71	64	63	56	51	46	41	40	34
G	Business	39	54	51	49	42	37	31	27	25	12
City of Boston Limits	Residential	50	68	67	61	52	46	40	33	28	26
	Business	65	79	78	73	68	62	56	51	47	44

Table 4.5-4b Comparison of Future Predicted Nighttime Sound Levels with Existing Background – MassDEP Noise Policy

Modeling Location ID	Zoning / Land Use	Project-Generated Sound Levels (dBA)	Existing L_{90} – Nighttime (dBA)	Future L_{90} – Nighttime Total (dBA)[1]	Increase (dBA)[1]
A	Residential	34	60[2]	60	0
B	Residential	37	64[2]	64	0
C	Residential	34	59[2]	59	0
D	Residential	32	57[2]	57	0
E	Residential	43	60[3]	60	0

Notes:

1. Calculation performed using existing and Project sound levels rounded to one decimal place.
2. Sound levels at Modeling ID's A through D correspond to measured sound levels at monitoring locations 1 through 4.
3. Ambient sound level assumed to be comparable to Location 1.

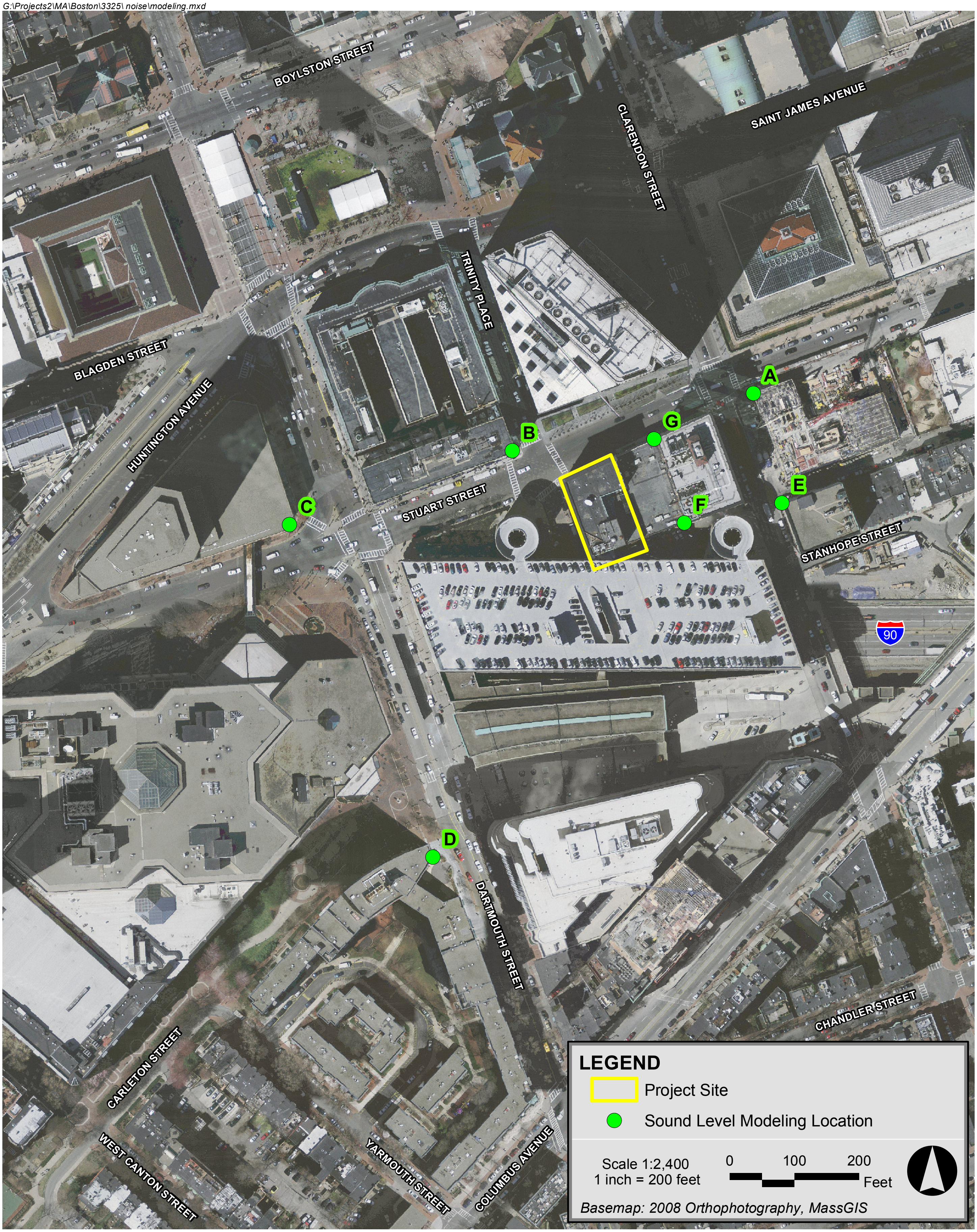

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Figure 4.5-2

Sound Level Modeling Locations

Table 4.5-4c MassDEP Noise Policy "Pure-Tone" Evaluation of Future Predicted Nighttime Sound Levels

Modeling Location ID	Zoning / Land Use	Sound Level (dB) per Octave Band Center Frequency (Hz)[1]								
		31.5	63	125	250	500	1k	2k	4k	8k
A	Residential	66	64	61	59	57	55	50	42	31
B	Residential	68	68	62	62	61	59	55	48	34
C	Residential	68	68	62	59	55	54	50	42	32
D	Residential	64	63	59	56	54	52	48	40	32
E	Residential	67	64	61	59	57	55	50	42	31

Notes:
1. Calculation performed using existing and Project sound levels rounded to one decimal place.

4.5.6.2 Future Sound Levels – Daytime

As noted above, the emergency generator will only operate during the day for brief, routine testing when the background sound levels are high, or during an interruption of power from the electrical grid. A second analysis combined noise from the Project's mechanical equipment and its emergency generator to reflect worst-case conditions. The sound levels were calculated at the same receptors as in the nighttime analysis, and then were evaluated against daytime limits. Daytime ambient sound levels were incorporated where applicable.

The predicted exterior Project-Only daytime sound levels range from 35 to 54 dBA at nearby receptors. The range at residential modeling locations is 35 to 48 dBA. Predicted sound levels from Project-related equipment are within the daytime broadband and octave-band limits under the City Noise Standards at each of the modeling locations. This evaluation is presented in Table 4.5-5a. In addition, the predicted future total sound levels (Project + Background) are below the MassDEP criteria of 10 dBA over the daytime ambient sound levels (the L_{90} level) at each of the residential locations. That evaluation is presented in Table 4.5-5b. The Project's mechanical equipment is not expected to create any additional "pure-tone" conditions as defined under the MassDEP Noise Policy when combined with existing midday background sound levels. The predicted total sound levels per octave band are shown in Table 4.5-5c.

Table 4.5-5a Comparison of Future Predicted Project-Only Daytime Sound Levels to City Noise Standards

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Residential	35	55	47	44	37	31	29	26	18	1
B	Residential	38	56	48	48	40	34	31	28	22	11
C	Residential	37	55	47	48	40	32	30	26	16	0
D	Residential	48	59	50	55	48	39	44	41	27	2
E	Residential	44	61	54	53	45	41	36	31	27	16
F	Business	54	71	64	63	56	51	46	41	40	34
G	Business	40	54	51	49	42	37	32	28	25	12
City of Boston Limits	Residential	60	76	75	69	62	56	50	45	40	38
	Business	65	79	78	73	68	62	56	51	47	44

Table 4.5-5b Comparison of Future Predicted Daytime Sound Levels with Existing Background – MassDEP Noise Policy

Modeling Location ID	Zoning / Land Use	Project-Generated Sound Levels (dBA)	Existing L_{90} – Nighttime (dBA)	Future L_{90} – Nighttime Total (dBA)[1]	Increase (dBA)[1]
A	Residential	35	63[2]	63	0
B	Residential	38	71[2]	71	0
C	Residential	37	63[2]	63	0
D	Residential	48	60[2]	60	0
E	Residential	44	63[3]	63	0

Notes:
1. Calculation performed using existing and Project sound levels rounded to one decimal place.
2. Sound levels at Modeling ID's A through D correspond to measured sound levels at monitoring locations 1 through 4.
3. Ambient sound level assumed to be comparable to Location 1.

Table 4.5-5c MassDEP Noise Policy "Pure-Tone" Evaluation of Future Predicted Daytime Sound Levels

Modeling Location ID	Zoning / Land Use	Sound Level (dB) per Octave Band Center Frequency (Hz)[1]								
		31.5	63	125	250	500	1k	2k	4k	8k
A	Residential	68	67	63	61	60	58	53	47	38
B	Residential	68	70	65	68	69	66	62	55	48
C	Residential	72	70	65	62	59	59	54	47	38
D	Residential	68	66	62	59	57	56	51	47	36
E	Residential	69	68	64	61	60	58	53	47	38

Notes:
1. Calculation performed using existing and Project sound levels rounded to one decimal place.

4.5.7 Conclusion

Baseline noise levels were measured in the vicinity of the Project during the day and at night. These levels were compared to modeled sound levels that were calculated based on information provided by the manufacturers of the expected mechanical equipment. Project-Only and future sound levels (Project + Background) were compared to applicable limits.

Predicted mechanical equipment noise levels from the Project at each receptor location, taking into account attenuation due to distance, structures, and noise-control measures, will be equal to or below the broadband requirements of City Noise Standards. When the aforementioned mitigation efforts are included, the predicted sound levels from Project-related equipment are expected to remain below 50 dBA, within the nighttime residential zoning limits for the City of Boston at the nearest residential receptors. The results indicate that the Project can operate without significant impact on the existing acoustical environment, and will result in a noise experience similar to that of a typical urban setting. In addition, the Project will comply with the MassDEP Noise Policy.

At this time, while the mechanical equipment and noise controls have been refined, they are still conceptual in nature. During the final design phase of the Project, mechanical equipment and noise controls will be specified and designed to meet the applicable broadband limit and the corresponding octave-band limits of the City Noise Standards, as well as the MassDEP Noise Policy. Additional mitigation may include the selection of quieter mechanical units, and/or the addition of acoustical louvers, screening walls, mufflers, or equipment enclosures, as needed.

4.6 Sustainable Design

4.6.1 Sustainable Practices

The Proponent has an extraordinary track record when it comes to operating sustainably, and this is a defining quality of Saunders Hotel Group's business. Its sustainability efforts have consistently been one step ahead of standard practices. For example, SHG began recycling white paper and phone books from the Boston Park Plaza in 1989, which was a significant effort at the time. SHG was also an innovator when it began requesting that travelers hang up their towels to reuse them a second day. This is a practice that is now implemented nationally at hotels, and has resulted in significant savings of energy and water.

The Proponent is committed to continuing its sustainability efforts, constantly seeking out new, innovative technologies that reduce its environmental impact. Through this practice, it has earned a reputation with vendors as predictors of what technologies will succeed in the industry. It has driven the development of better light-emitting diodes (LEDs) which meet the aesthetic appeal that many property owners seek, gone the extra mile to source the most sustainable options, and have embraced more efficient technologies. With this Project, the Proponent will continue to prove that sustainability makes a project more attractive and appealing to tourists and home buyers alike.

4.6.2 Compliance with Article 37

The Proponent has approached the Leadership in Energy and Environmental Design (LEED) checklist by bringing together the key stakeholders and determining what practices they have used in the past that should be considered standard, and then reconciled these practices with the checklist. Rather than trying to meet the bare minimum, they looked for opportunities to marry innovation with financial opportunity. The Proponent seeks to set the bar high for future developers, and to show that sustainability makes a project more attractive and more appealing.

The Project is anticipated to be certifiable at a minimum of the Gold level under the U.S. Green Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system, consistent with the Stuart Street Planning Study. The building will employ energy-efficient and water-conservation features for mechanical, electrical, architectural, and structural systems, assemblies, and materials where possible. Mechanical and HVAC systems will be installed to the current industry standards, and full cooperation with the local utility providers will be maintained during design and construction. In addition, the Proponent plans to incorporate carbon offset programs into the hotel portion of the Project, as well as provide the infrastructure necessary to allow for electric vehicle charging stations in the parking garage. The preliminary credits targeted are outlined below, including prerequisite credits under the various categories as outlined also in the LEED checklists provided in Appendix E. The assessment of achievable credits will be on-going as the design progresses.

Sustainable Sites (SS)

SS Prerequisite 1 - Construction Activity Pollution Prevention

This is "Standard Operating Procedure" for Suffolk Construction. An erosion and sedimentation control (ESC) plan has been drafted. Suffolk will ensure that all of the subcontractors adhere to the plan. Photographs and documentation will be collected as the Project progresses to ensure that all of the LEED requirements are met.

SS Credit 1 – Site Selection

The Project site is currently completely developed and is located in an urban area. This development does not violate any of the established criteria.

SS Credit 2 – Development Density/Community Connectivity

The ten basic services within ½ mile from the Project site include but are not limited to: bank, school, restaurant, community center, post office, library, place of worship, laundry, park, and pharmacy.

SS Credit 3 – Brownfield Redevelopment

An asbestos plan will be developed by a qualified environmental professional and documented according to EPA and state regulations. There will be asbestos abatement involved with this project. Suffolk will collect and submit all documentation regarding such work and regulatory compliance.

SS Credit 4.1 – Alternate Transportation, Public Transportation

The Project site is located directly adjacent to a MBTA commuter rail stop (Back Bay Station) as well as the Back Bay MBTA Orange Line station. The Copley Square Green Line station and several bus stops are also in the immediate area.

SS Credit 4.2 – Alternate Transportation - Bicycle Storage/Changing Room

Bicycle storage will be provided along with showers and a changing room for the full time hotel employees. Proponent is considering allowing staff access to gym showers for all FTE's within the building.

SS Credit 4.3 – Alternate Transportation – Low Emitting and Fuel Efficient Vehicles

The Project will provide electric vehicle charging stations for 3% of the total parking, or 3 spaces, and up to 5 spaces as demand mandates.

SS Credit 6.1 – Stormwater Design – Quantity Control

The Project will have a stormwater recharge system per the direction of the City of Boston. The recharge design will ensure that the amount of storm water entering the City infrastructure will be reduced by 25%.

SS Credit 7.1 – Heat Island Effect – Non-roof

The Project's parking is 100% covered.

SS Credit 7.2 – Heat Island Effect - Roof

The Project intends to use a white roof, Sarnafil G410 EnergySmart roof membrane for the roof areas that are not green roofs or otherwise covered. The SRI rating for this roof is 104.

Water Efficiency (WE)

WE Prerequisite 1 and Credit 3 – Water Use Reduction

The Proponent has committed to low flow water closets (1.28 gpf), low flow or waterless urinals (0.125 gpf or less), lavatories (0.5 gpm), and low flow shower heads (1.5 gpm). The Proponent anticipates a water savings greater than 37%.

Energy and Atmosphere (EA)

EA Prerequisite 1 – Fundamental Building Systems Commissioning

The Proponent has committed to perform the fundamental commissioning. The basis of design has been reviewed and the appropriate reports will be completed.

EA Prerequisite 2 – Minimum Energy Performance

The design will incorporate a highly efficient mechanical system design to comply with Massachusetts stretch code and at the same time will incorporate LEED principals. A cogeneration plant is being studied for inclusion into the Project. Cogeneration provides an efficient means of producing electricity while capturing the waste heat byproduct to heat the domestic water. The high demand for domestic hot water makes a cogeneration plant a possibility for this type of project.

EA Prerequisite 3 – CFC Reduction in HVAC & R Equipment

The design team for the Project will select HVAC equipment with refrigerants that meet the LEED prerequisite thresholds regarding refrigerant types.

EA Credit 1 – Optimize Energy Performance

The Project design will incorporate a highly efficient mechanical system design to comply with the Stretch Code provisions of the Massachusetts Building Code and at the same time will incorporate LEED principles.

EA Credit 3 – Enhanced Commissioning

The Proponent will perform the enhanced commissioning. The basis of design has been reviewed and the appropriate reports will be completed. The Proponent is seeking to design out the possibility of operator-error, using advanced continual commissioning to ensure that the building operates well from the beginning, and will continue to operate well in the future.

EA Credit 4 – Enhanced Refrigerant Management

The design team for the Project will select HVAC equipment with refrigerants that meet the LEED prerequisite thresholds regarding refrigerant types. Before any HVAC equipment that contains refrigerant is selected, the LEED administrator will perform the calculation comparing amount of Refrigerant to tonnage. The design team will be given ample time to discuss alternative selections to meet this requirement.

EA Credit 5 – Measurement and Verification

The Proponent has agreed to share energy consumption quantities.

EA Credit 6 – Green Power

The client anticipates purchasing 75% of the building's electricity from renewable sources for at least a two year contract.

Materials and Resources (MR)

MR Prerequisite 1 – Storage and Collection of Recyclables

The Project design team will dedicate a storage and collection room within the building. The room will be adequately sized based on the building square footage and usage and be readily accessible.

MR Credit 2 – Construction Waste Management

The general contractor has agreed to provide a construction waste management plan that will ensure that 75% of all waste and debris is directed to be recycled.

MR Credit 4 – Recycled Content

The Project architect will specify enough products with high recycled content to obtain the 10% threshold. The goal is to drive towards greater than 20% of the materials to contain recycled material.

MR Credit 5 – Regional Materials

The general contractor has generated a matrix of materials based on cost to determine which materials will allow the team to purchase and achieve this credit (10% based on cost of material). The goal is greater than 10%.

Indoor Environmental Air Quality (EQ)

EQ Prerequisite 1 – Minimum IAQ Performance

The HVAC design will meet ASHRAE 62.1-2007.

EQ Prerequisite 2 – Environmental Tobacco Smoke

The Project will be a no smoking facility.

EQ Credit 1 – Outdoor Air Delivery Monitoring

Demand control ventilation will be incorporated in the HVAC design. CO_2 sensors will be installed to monitor the outdoor air quality where required throughout the building.

EQ Credit 3.1 – Construction Indoor Air Quality (IAQ) Effectiveness During Construction

The Construction Manager has agreed to develop and implement an IAQ management plan for the construction phases of the Project. This will include the proper storage of absorptive materials to prevent moisture damage. Air handlers used during construction will have Minimum Efficiency Reporting Value (MERV) 8 filtration media that will be replaced before occupancy. The Sheet Metal and Air Condition Contractors' National Association (SMACNA) sheet metal guides concerning IAQ will be strictly adhered to.

EQ Credit 4 – Low Emitting Materials

The Project architect will specify all adhesives, sealants, paints, coatings, flooring systems, and composite wood in such a manner that the LEED requirements are met with regard to off-gassing, volatile organic compounds (VOC) contents, formaldehydes, etc.

EQ Credit 5 – Indoor Chemical and Pollutant Source Control

The following design elements are being incorporated to address this credit: 1) all trash/recycle rooms are anticipated to have exhaust. 2) All equipment supplying outdoor air will have MERV 13 filtration. 3) Walk-off mats will be installed at entry ways.

EQ Credit 6.1 – Controllability of Systems – Lighting

Due to the nature of the occupancy type, there will be lighting controls for each residential bedroom as well as multiple lighting controls on all multipurpose rooms.

EQ Credit 6.2 – Controllability of Systems – Thermal Comfort

Due to the nature of the occupancy type, there will be heating and air conditioning controls for each residential bedroom as well as controls in all multipurpose rooms.

EQ Credit 7.1 – Thermal Comfort - Design

The HVAC design will meet ASHRAE 55-2004.

EQ Credit 8.2 – Daylight and Views – Views of 90% of Spaces

The geometry of the building (narrow) allows for a majority of spaces to have a direct connection to the outdoors.

Innovation and Design Process (ID)

1. Construction Waste Management – Exemplary Performance, MRc2.1 (Innovation Credit 1.1)

As stated above, the Construction Manager will implement a waste management plan that will seek to divert at least 75% of construction and demolition waste material removed from the site from landfills through recycling and salvaging. This credit may be pursued aggressively in an opportunity to gain an exemplary performance credit of 95% construction waste recycling.

2. Alternate Transportation, SSc4.1 - Exemplary Performance (Innovation Credit 1.2)

The Project site is located adjacent to, and in the vicinity of, transit services with the required number of trips to achieve this credit.

3. Green Housekeeping (Innovation Credit 1.3)

The building owner intends on implementing a green housekeeping policy wherein all cleaners used in common areas shall comply with the Green Seal standard GS-37.

4. Bio Green food waste disposers (Innovation Credit 1.4)

Container that takes organic food waste and reduces it by 90% of its original waste; the end product is an environmentally friendly compost material.

5. Chemical-free Water Treatment (Innovation Credit 1.4) (LEED allows only 4 ID credits. This credit would be achieved if one of the above credits is not achievable.)

The use of chemical-free water treatment for cooling towers and boilers shall be evaluated as design progresses.

6. LEED Accredited Professional (Credit 2)

The Project team includes at least one LEED Accredited Professional.

Regional Priority Credits

Regional Priority Credits (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the Project. RPCs applicable to the Boston area include: SSc3, SSc6.1, SSc7.1, SSc7.2, EAc2 and MRc1.1. This Project anticipates two RPCs for the Project: SSc6.1-Stormwater Design, Quantity Control, SSc7.1-Heat Island Effect, Roof and SSc3-Brownfield Redevelopment.

4.7 Construction Impacts

4.7.1 Introduction

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

Proper pre-planning with the City and neighborhood will be essential to the successful construction of the Project. Construction methodologies, which ensure public safety and protect nearby residences and businesses, will be employed. Techniques such as barricades, walkways and signage will be used. The CMP will include routing plans for trucking and deliveries, plans for the protection of existing utilities, and control of noise and dust.

During the construction phase of the Project, the Proponent will provide the name, telephone number and address of a contact person to communicate with on issues related to the construction. The construction contact will be responsible for responding to the questions/comments/complaints of the residents of the neighborhood.

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

4.7.2 Construction Methodology/Public Safety

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

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

4.7.3 Construction Schedule

Construction of the Project is estimated to last approximately 28-30 months, with initial site work expected to begin in late 2013 or early 2014, and completion in the spring of 2016.

Typical construction hours will be from 7:00 a.m. to 6:00 p.m., Monday through Friday, with most shifts ordinarily ending at 3:30 p.m. No substantial sound-generating activity will occur before 7:00 a.m. If longer hours, additional shifts, or Saturday work is required, the construction manager will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. Notification should occur during normal business hours, Monday through Friday. It is noted that some activities such as finishing activities could run beyond 6:00 p.m. to ensure the structural integrity of the finished product; certain components must be completed in a single pour, and placement of concrete cannot be interrupted.

4.7.4 Construction Staging/Access

Access to the site and construction staging areas will be provided in the CMP.

Although specific construction and staging details have not been finalized, the Proponent and its construction management consultant will work to ensure that staging areas will be located to minimize impacts to pedestrian and vehicular flow. Secure fencing and barricades will be used to isolate construction areas from pedestrian traffic adjacent to the site. Construction procedures will be designed to meet all Occupational Safety and Health Administration (OSHA) safety standards for specific site construction activities.

4.7.5 Construction Mitigation

The Proponent will follow City and MassDEP guidelines which will direct the evaluation and mitigation of construction impacts. As part of this process, the Proponent and construction team will evaluate the Commonwealth's Clean Air Construction Initiative.

A CMP will be submitted to BTD for review and approval prior to issuance of a Building Permit. The CMP will include detailed information on specific construction mitigation measures and construction methodologies to minimize impacts to abutters and the local community. The CMP will also define truck routes which will help in minimizing the impact of trucks on City and neighborhood streets.

"Don't Dump - Drains to Charles River" plaques will be installed at storm drains that are replaced or installed as part of the Project.

4.7.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 700 construction jobs will be created over the length of construction. The Proponent will make reasonable good-faith efforts to have at least 50% of the total employee work hours be for Boston residents, at least 25% of total employee work hours be for minorities and at least 10% of the total employee work hours be for women. The Proponent will enter into a construction employment plan with the City of Boston.

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

4.7.7 Construction Truck Routes and Deliveries

Truck traffic will vary throughout the construction period depending on the activity. The construction team will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. Construction truck routes to and from the site for contractor personnel, supplies, materials, and removal of excavations required for the development will be coordinated with the

BTD. Traffic logistics and routing will be planned to minimize community impacts. Truck access during construction will be determined by the BTD as part of the CMP. These routes will be mandated as a part of all subcontractors' contracts for the development. The construction team will provide subcontractors and vendors with Construction Vehicle & Delivery Truck Route Brochures in advance of construction activity.

"No Idling" signs will be included at the loading, delivery, pick-up and drop-off areas.

4.7.8 Construction Air Quality

Plans for controlling fugitive dust during demolition, excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks. Short-term air quality impacts from fugitive dust may occur during demolition, excavation and the early phases of construction. The construction contract will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts. These measures are expected to include:

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Minimizing spoils on the construction site;
- Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Minimizing storage of debris on the site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.

4.7.9 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the Project. Increased community sound levels, however, are an inherent consequence of construction activities. Every reasonable effort will be made to minimize the noise impact of construction activities.

Mitigation measures are expected to include:

- Instituting a proactive program to ensure compliance with the City of Boston noise limitation policy;
- Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;

- Muffling enclosures on continuously running equipment, such as air compressors and welding generators;

- Replacing specific construction operations and techniques by less noisy ones where feasible;

- Selecting the quietest of alternative items of equipment where feasible;

- Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;

- Turning off idling equipment; and

- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

4.7.10 Construction Vibration

Means and methods for performing work at the site will be evaluated for potential vibration impacts on adjoining property, utilities, and adjacent existing structures. Acceptable vibration criteria will be established prior to construction, and vibration will be monitored, if required, during construction to ensure compliance with the agreed-upon standard.

4.7.11 Construction Waste

The Proponent will take an active role with regard to the reprocessing and recycling of construction waste. The disposal contract will include specific requirements that will ensure that construction procedures allow for the necessary segregation, reprocessing, reuse and recycling of materials when possible. For those materials that cannot be recycled, solid waste will be transported in covered trucks to an approved solid waste facility, per MassDEP Regulations for Solid Waste Facilities, 310 CMR 16.00. This requirement will be specified in the disposal contract.

4.7.12 Protection of Utilities

Existing public and private infrastructure located within the public right-of-way will be protected during construction. The installation of proposed utilities within the public way will be in accordance with the MWRA, BWSC, Boston Public Works, Dig Safe, and the governing utility company requirements. All necessary permits will be obtained before the commencement of the specific utility installation. Specific methods for constructing proposed utilities where they are near to, or connect with, existing water, sewer and drain facilities will be reviewed by BWSC as part of its site plan review process.

Section 5.0

Urban Design

5.0 URBAN DESIGN

The proposed Project will be a dramatic, exciting new addition to the Back Bay skyline. Being in close proximity to the iconic Hancock Tower, a worthy design is required, one that is notably distinct from the Hancock, but that at the same time is respectful of and reverent toward this signature structure. Accordingly, the design of the proposed Project responds to the sharp angularity of the neighboring Hancock Tower, as well as the rectilinear, box-like form of the nearby The Clarendon, and the fluid curvature of the approved Simon Tower at Copley Place, without attempting to mimic any of those buildings.

The curved forms of the Project tower distinguish it from its neighbors on the city skyline as the long axis rotates slightly and narrows to reduce shadow impact on Copley Square. The tower will be clad predominantly in glass curtainwall with a greater degree of transparency than the more reflective Hancock Tower.

The design takes advantage of a relatively modest building footprint to enhance its elegant and slender profile. The slender profile is accomplished by further dividing the façade vertically, simplifying its form so that it rises uninterrupted as a simple, coherent extrusion from the ground plane at the important Stuart Street and Trinity Place corner, a departure from earlier studies where the tower was set upon a six-story rectilinear base. This simplification also has the effect of improving its sense of scale over the more complicated earlier version presented in the PNF which tended to give the impression that the building is bigger than it actually iss. Careful study of various facade material options led to the conclusion that a single predominant material approach to the facades was the most effective strategy to effect simplification. However, the curtainwall will not be uniform; instead, it will be detailed in two similar, but subtly different approaches: one articulating horizontal banding to accentuate the curved surfaces, and one in which the horizontal spandrels are less apparent and to be used as a foil to the first. The façade treatment of the garage levels will be indistinguishable from adjacent areas of the façade, and will be entirely opaque so that automobile headlights will not be visible from the outside. Mechanical and louvered openings will be located to the south, towards the 100 Clarendon Street garage, and east, away from the most public faces of the buildings, with intake louvers only on the eastern face of the building.

The top of the building is rendered as a distinctive but natural extension and termination of the building shape below, a deceptively simple double spiral form that presents an enhanced and dramatic perspective and changes as viewed from each direction, from the view corridor from Arlington Street, Berkeley Street, and the Massachusetts Turnpike eastbound from Logan International Airport and South Boston to the Copley Square view corridor to the north, to the view emerging from the Massachusetts Turnpike Prudential exit onto Stuart Street to the west, to the South End view corridor to the south. See Figures 5-1 to 5-7 for perspectives of the Project from a variety of viewpoints. Figure 5-8 shows the elevation of the Project in its context.

Design Considerations

The elements that have been considered during the design process include:

- Proposed program of mixed use combining hotel and residential occupancies, and including related uses such as restaurants, conference and ballroom spaces, pool and fitness center and residential parking;
- Overall site dimensions, orientation and relationship to Stuart Street grid, existing block and adjacent University Club of Boston;
- Minimization of potential shadows cast on Copley Square;
- Visual relationship of the proposed building to other nearby existing and proposed high-rise developments;
- Responding to the "high spine" building urban design concept for this area of Boston; and
- Consistency with the intent of the Stuart Street Planning Study in regard to urban design. As the FAR is approximately 17.5, the Project maintains the prevailing streetwall along Stuart Street, the floor plates above 200 feet are only slightly above 12,000 sf, but are narrow, creating a slender building that minimizes shadow impacts, and the loading and parking garage entrances are placed toward the rear of the site, away from major thoroughfares. The Project will improve the surrounding sidewalks and invigorate the overall pedestrian experience.

40 Trinity Place **Boston, Massachusetts**

tat | the architectural team

Figure 5-1

View from Berkeley Street Bridge

40 Trinity Place   Boston, Massachusetts

Figure 5-2

View from Copley Square

40 Trinity Place **Boston, Massachusetts**

Figure 5-3

View from Dartmouth and Stuart Street Intersection

40 Trinity Place   Boston, Massachusetts

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Figure 5-4

View from Southwest Corridor

40 Trinity Place Boston, Massachusetts

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Figure 5-5

View from Atelier Building (South End)

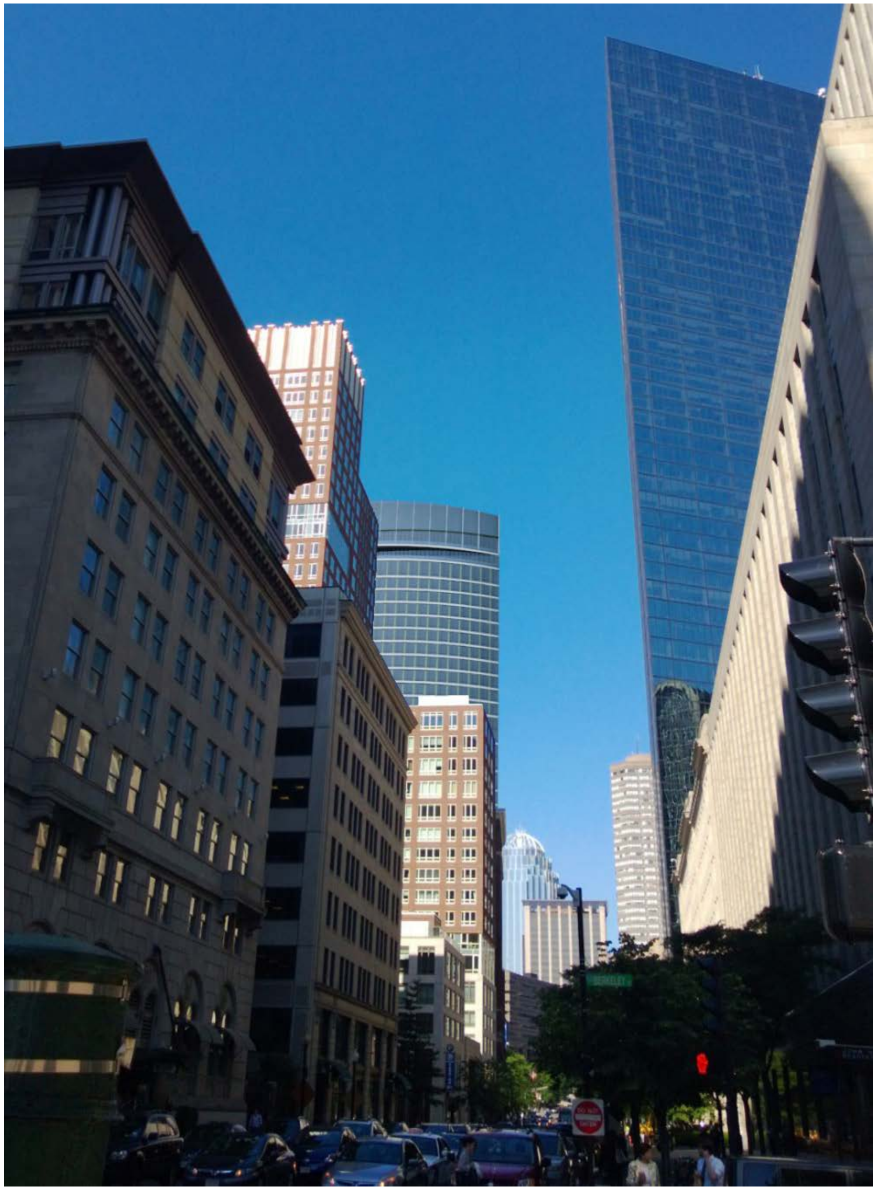

Figure 5-6

View from Berkeley and Stuart Street Intersection

40 Trinity Place **Boston, Massachusetts**

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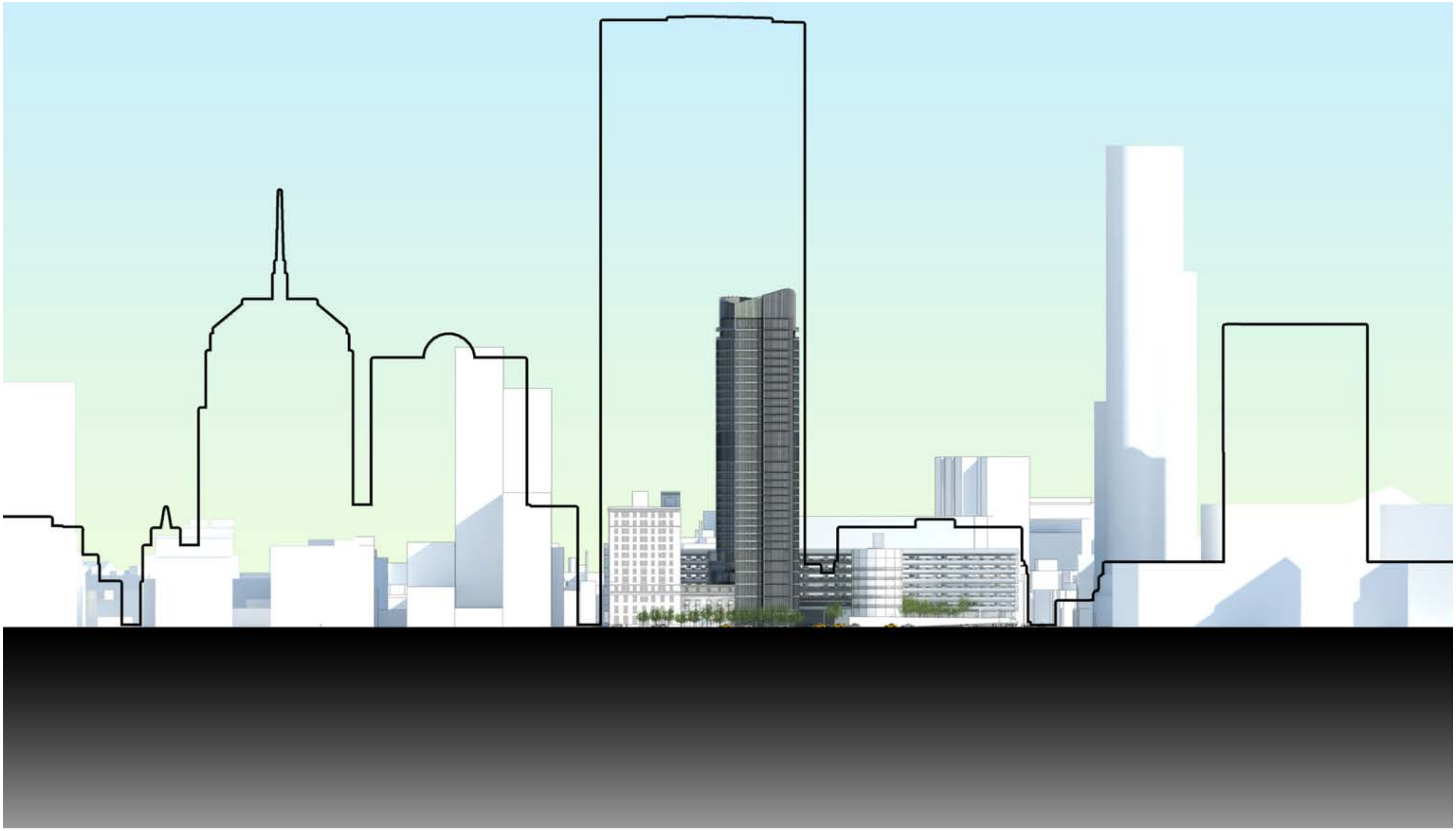
Figure 5-7

View from Memorial Drive



40 Trinity Place **Boston, Massachusetts**

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Figure 5-8

South Site Section

Section 6.0

Historic Resources

6.0 HISTORIC RESOURCES

6.1 Existing Conditions

6.1.1 Historic Resources within the Project Site

The Project site includes what was once a single building housing the Boston Common Hotel and Conference Center, at 40 Trinity Place, and the building housing the University Club at 426 Stuart Street. The combined building is included in the Inventory of Historic and Archaeological Assets of the Commonwealth (Inventory) (MHC No. 2395). The Georgian Revival building, designed by the Boston architecture partnership of Archibald G. Monks & Granville Johnson, has a brick and limestone eight-story main block with a three-story wing fronting Stuart Street. The three-story wing still houses the University Club, which is under separate ownership, and will be preserved as part of the Project. The Proponent will coordinate with MHC and BLC regarding the demolition of the 40 Trinity Place portion of the building.

Constructed in 1925, the building was originally built as the Club House for the University Club of Boston at 420-432 Stuart Street. The taller, Club House portion of the building was sold to the Chandler School for Women in 1962 and then to the John Hancock Mutual Life Insurance Company in 1971, which opened the John Hancock Institute in the building in 1972 to house and train new John Hancock insurance agents. The facility closed for nine months in 1986 for renovations, after which the John Hancock Conference Center was open to the public for meeting space and guest rooms.

The Project site is located at the southwest corner of the Park Square-Stuart Street historic area, which was determined eligible for listing in the National Register, although it failed to achieve listing (see further description below).

6.1.2 Historic Resources in the Vicinity of the Project Site

The Project site is in close proximity to properties individually listed in the State and National Registers of Historic Places, including the Young Women's Christian Association (YWCA) building at 140 Clarendon Street, which is located to the east of the Project site and is the only individually listed property within 500 feet of the Project site. Also located near the Project site are the Back Bay Historic District and Architectural District, to the north, and South End District and Landmark District, to the south. These and other State and National Register historic resources in the vicinity are described below.

Table 6-1 lists State and National Register-listed properties and historic districts located within a quarter-mile radius of the Project site. The individually listed properties are assigned numbers, which correspond to Figure 6-1. Figure 6-1 also identifies the locations of the State and National Register-listed historic districts within a quarter mile of the Project site.

Table 6-1 Historic Resources in the Vicinity of the Project Area

No.	Historic Resource	Address	Designation
1	New Old South Church	645 Boylston St.	NR, NRDIS, NHL, LHD
2	Boston Public Library	700 Boylston St.	NR, NRDIS, NHL, LL
3	Trinity Church	206 Clarendon St.	NR, NRDIS, NHL
4	Trinity Rectory	Clarendon St. and Newbury St.	NR, NRDIS, LHD
5	Street Clock	439 Boylston St.	NRDIS, LHD, LL
6	Berkeley Building	416-426 Boylston St.	NRDIS, LL
7	YWCA	140 Clarendon St.	NR
8	Youth's Companion Building	140-144 Berkeley St and 195-215 Columbus Ave.	NR
9	Armory of the First Corps of Cadets	97-105 Arlington St. and 130 Columbus Ave.	NR, LL
A	Back Bay Architectural District		LHD
B	Back Bay Historic District		NRDIS
C	Park Square-Stuart Street Historic District		NRDIS Eligible
D	Bay Village Historic District		LHD
E	South End District/ South End Landmark District		NRDIS, LHD
F	St. Botolph Street Area Architectural Conservation District		NRDOE, LHD

Designation Legend

NR	Individually listed on the National Register of Historic Places
NRDIS	National Register of Historic Places historic district
NRDOE	Determined eligible for inclusion in the National Register of Historic Places
NHL	National Historic Landmark
LHD	Local Historic District
LL	Local Landmark

The **Park Square – Stuart Street Historic Area** has been determined eligible for listing in the National Register by the MHC, although it failed to achieve listing. Roughly bounded by Trinity Place, St. James Avenue, Clarendon, Boylston, and Stuart streets, Columbus Avenue, and Park Plaza, and including the Project site, the Park Square – Stuart Street Historic Area is significant as an early twentieth-century extension of Boston's downtown business district, with numerous high-rise structures constructed on the site of the former sixteen-acre Boston & Providence Railroad yard. The area is included in the Inventory of Historic and Archaeological Assets of the Commonwealth.

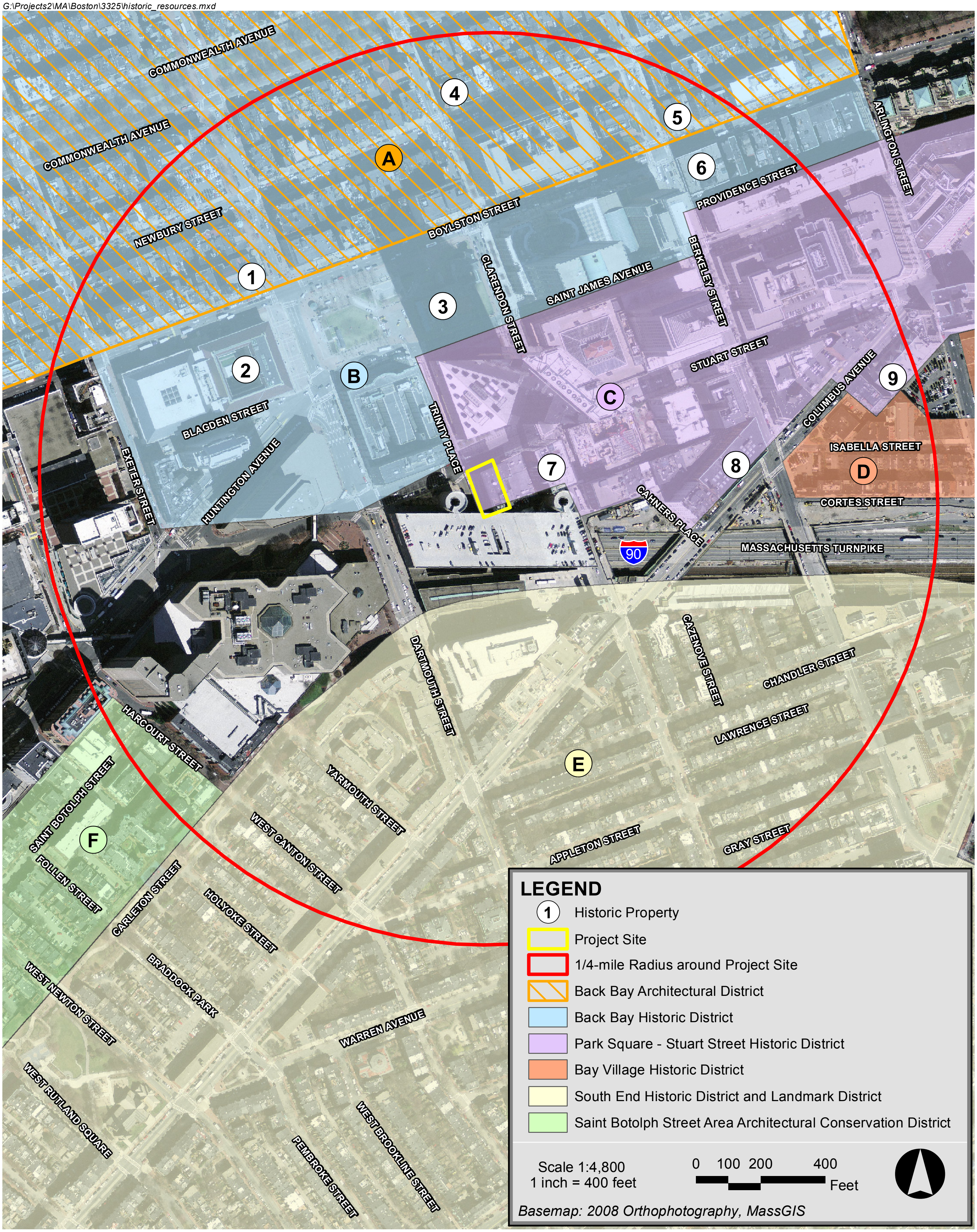


Figure 6-1
Historic Resources

The Project site is located north of the **South End District and Landmark District**. The South End of Boston was developed predominately between 1848 and 1930. Washington Street, which runs the length of the South End, was the original connector though the marshland between the City of Boston and the mainland area of Roxbury. The City of Boston eventually filled the marshland, and in 1848 began to auction off parcels to speculative developers. As a result of this initiative, the South End of Boston became one of the most fashionable residential neighborhoods in Boston in the nineteenth century. Despite the change in use and alterations to many of the buildings, the South End is the largest remaining urban Victorian residential neighborhood in the United States.

The Project site is located to the south of the **Back Bay Historic District and Architectural District,** which is bounded by Arlington Street to the east and Massachusetts Avenue to the west. Beginning in 1857 at Arlington Street, the area of land known as the Back Bay was created by filling in vast spans of tidal flats. By the late 1880s the marshy flats that once separated Boston and the neighboring town of Brookline had been completely filled in. The result was the creation of over four hundred and fifty acres of dry, developable land.

The Back Bay Historic District is listed in the National Register. The Back Bay Architectural District, a local historic district, has similar boundaries as the National Register district, but does not include the south side of Boylston Street.

Trinity Church in Copley Square is considered the greatest single piece of architecture designed by the acclaimed architect H.H. Richardson. The main body of the Richardson Romanesque church was constructed between 1872 and 1877. The porches were completed by Richardson's successor, Hugh Shepley between 1894 and 1897. Since the original Copley Square site was small, triangular, and isolated by surrounding streets, Richardson designed the church with a compact Greek cross plan and a large central tower. Romanesque features on the exterior are highlighted by the use of polychromatic stonework, while the interior space is illuminated with murals by John La Farge and Augustus Saint-Gaudens. The **Trinity Rectory** at the corner of Newbury and Clarendon streets, designed by H. H. Richardson and constructed in 1880, was built to serve as the residence of the pastor. The red brick and brownstone building is of a similar, though more modest expression of Richardson Romanesque design.

The **YWCA** at 140 Clarendon Street was completed in 1927 to the designs of Boston architects Shepard & Stearns. The Classical Revival style building, constructed of brick with limestone trim, originally housed a mix of residential, educational, recreational, and administrative spaces, including the first swimming pool and first public baths for women in Boston.

6.1.3 Archaeological Resources on the Project Site

There are no known archaeological resources listed in the State and National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth within the Project site. Prior to the construction of 40 Trinity Place, the Project site was filled land with a depth of 20-25 feet; therefore, it is unlikely that the Project will affect previously unidentified archaeological resources.

6.2 Potential Project Impacts on Historic Resources

The Project includes the demolition of the Boston Common Hotel and Conference Center at 40 Trinity Place. As noted above, the property is included in the Inventory.

The proposed demolition will be subject to review by the BLC under Article 85 of the Boston Zoning Code. An Article 85 Application for the property will be submitted to the BLC. In addition, a Massachusetts Historical Commission (MHC) PNF will be filed to initiate the State Register Review process. The Proponent anticipates entering into a Memorandum of Agreement with MHC concerning the demolition of the building on the Project site.

Indirect impacts to historic resources, including visual, shadow, and construction, were considered. Urban design and potential shadow and construction impacts are discussed in detail in Sections 5.0, 4.2, and 4.7 respectively. Potential shadow impacts specific to historic resources are summarized below.

The Project will include a dated cornerstone within the proposed new construction to identify the date of construction.

6.2.1 Shadow Impacts

As described in Section 4.2, two shadow impact analyses have been prepared in compliance with the BRA Scoping Determination, and show the anticipated impacts from the Project in comparison to the existing condition and As-of-right Alternative. The Proponent has completed a third analysis in response to comments on the Project that describe anticipated shadow impacts on the facades of nearby historic resources.

The first analysis describes the shadow study done for March 21, June 21, September 21, and December 21 at 9:00 a.m., 12:00 p.m. and 3:00 p.m., as well as 6:00 p.m. for June 21 and September 21. The second analysis looks at the Project's impacts on Copley Square in regard to the Stuart Street Planning Study, the Project's impacts on five locations within Copley Square, and the Project's impacts on surrounding open spaces in 15-minute increments. These two analyses are described in Section 4.2. The third analysis describes the shadow impacts on the facades of nearby historic resources and is included in this section.

The shadow figures included in Section 4.2 depict the shadow impacts of the Project on nearby properties, including historic resources. Net new shadow is limited in scope and duration and is typically cast across Stuart Street and rooftops of nearby buildings. New shadow impacts to historic resources are very limited, focused primarily on the Back Bay Historic District for limited periods.

In addition, shadow studies were undertaken to specifically assess shadow impacts of the Project and the As-of-right Alternative to the elevations of historic buildings in the vicinity of the Project, as identified in Table 6-1 and Figure 6-1. The results of the façade shadow studies are described below and depicted on Figures 6-2 to 6-9 at the end of this section.

Neither the Project nor the As-of-right Alternative will create new shadow on the Trinity Church and Rectory or the Armory of the First Corps of Cadets.

New Old South Church – Façade shadow studies of New Old South Church indicate no new shadow will be cast onto the facades of the building on March 21, June 21, or September 21 for the Project or the As-of-right Alternative. Limited new shadow will be cast on the uppermost story and roof of the building in the early morning hours on December 21 only (see Figures 6-2 and 6-3) for approximately one hour, 15 minutes. Additionally, a shadow will be cast on the Dartmouth Street elevation for only eight minutes. New façade shadow impacts for the As-of-right Alternative would be similar to the impacts from the Project; with shadows at the upper Boylston Street elevation for approximately one hour, 15 minutes.

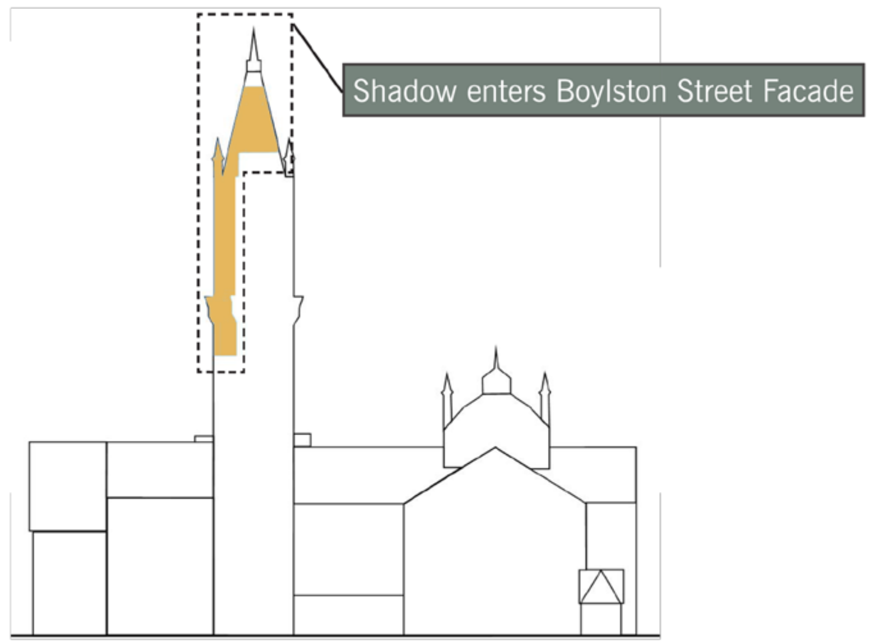
Boston Public Library – Façade shadow studies of the Boston Public Library indicate no new shadow will be cast onto the facades of the building on June 21 or December 21 for the Project. On March 21, there will be new shadow on portions of the Blagden Street elevation for approximately two hours, 20 minutes, starting at 7:23 a.m., and on portions of the Dartmouth Street elevation for approximately one hour starting at 8:43 a.m. (see Figure 6-4). On September 21, there will be new shadow on the Blagden Street elevation for approximately two hours, 20 minutes starting at 7:11 a.m., and on the Dartmouth Street elevation for approximately one hour starting at 8:31 a.m. (see Figure 6-5). The As-of-right Alternative would not create new shadow on the facades of the Boston Public Library.

Berkeley Building – Façade shadow studies of the Berkeley Building indicate no new shadow will be cast onto the facades of the building on March 21, June 21, or September 21 for the Project. On December 21, there will be minimal new shadow for approximately 20 minutes, starting at 1:50 p.m., limited to the rear parapet at the Berkeley Street elevation (see Figure 6-6). The As-of-right Alternative would not create new shadow on the facades of the Berkeley Building.

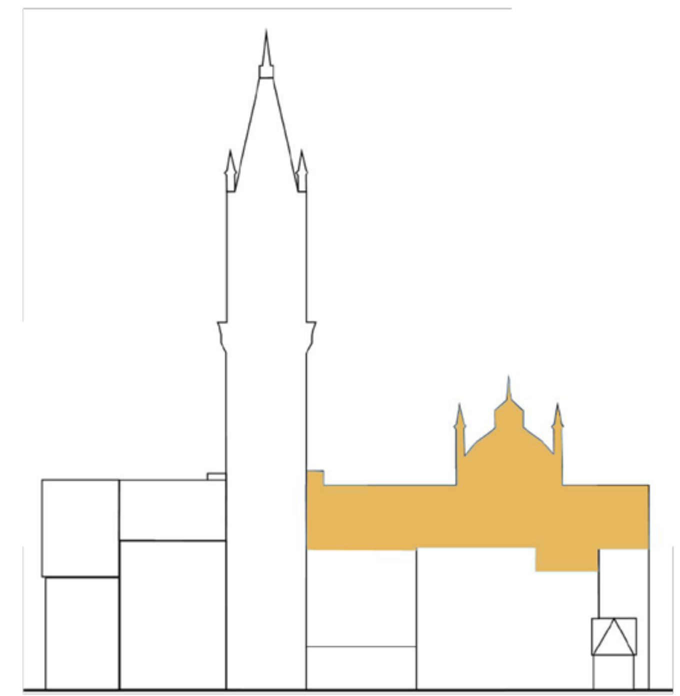
Youth's Companion Building – Façade shadow studies of the Youth's Companion Building indicate no new shadow will be cast onto the facades of the building on March 21, September 21, or December 21 for the Project. On June 21, there will be minimal new shadow for approximately 30 minutes, starting at 4:45 p.m., limited to the rear elevation at Stanhope Street (see Figure 6-7). The As-of-right Alternative would not create new shadow on the facades of the Youth's Companion Building.

Young Women's Christian Association (YWCA) – Façade shadow studies of the YWCA were prepared or June 21, the longest day of the year. The studies indicate there will be no new shadow on the street-facing elevations at Stuart Street or Clarendon Street with either the Project or with the As-of-right Alternative. The new shadow on the building's western-facing side elevation from the proposed Project and As-of-right Alternative are similar, and will be present in the afternoon hours. With the As-of-right Alternative, much of the western façade is completely blocked by the new building. The typical extent of new shadow on the YWCA building's western elevation is shown in Figure 6-8 for the Project, and Figure 6-9 for the As-of-right Alternative.

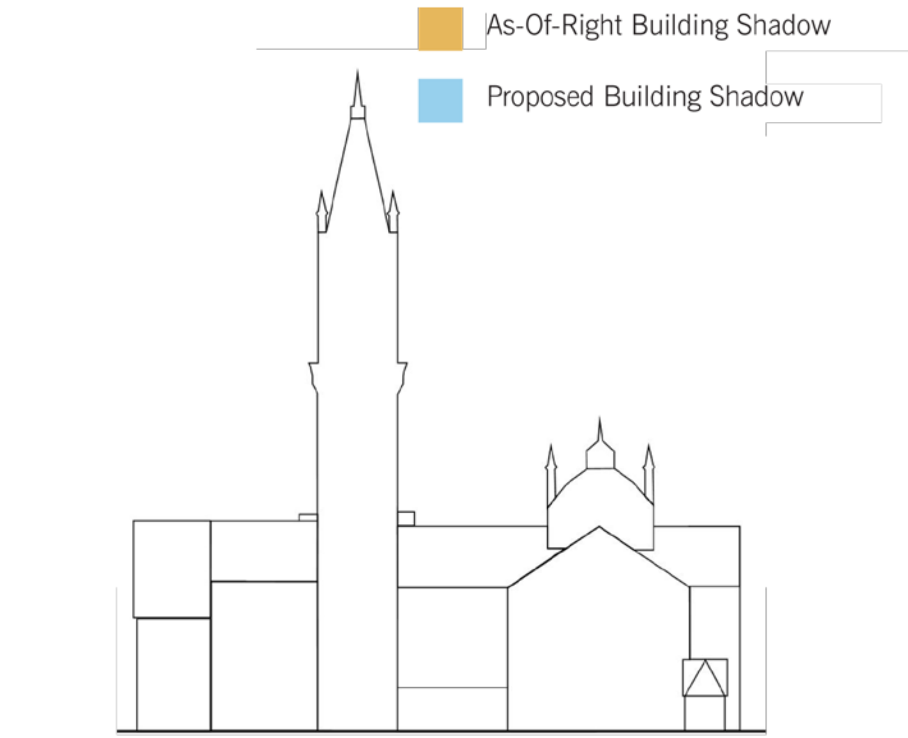
*March 21, June 21, September 21, October 21: Not Shown - No new shadow on subject area



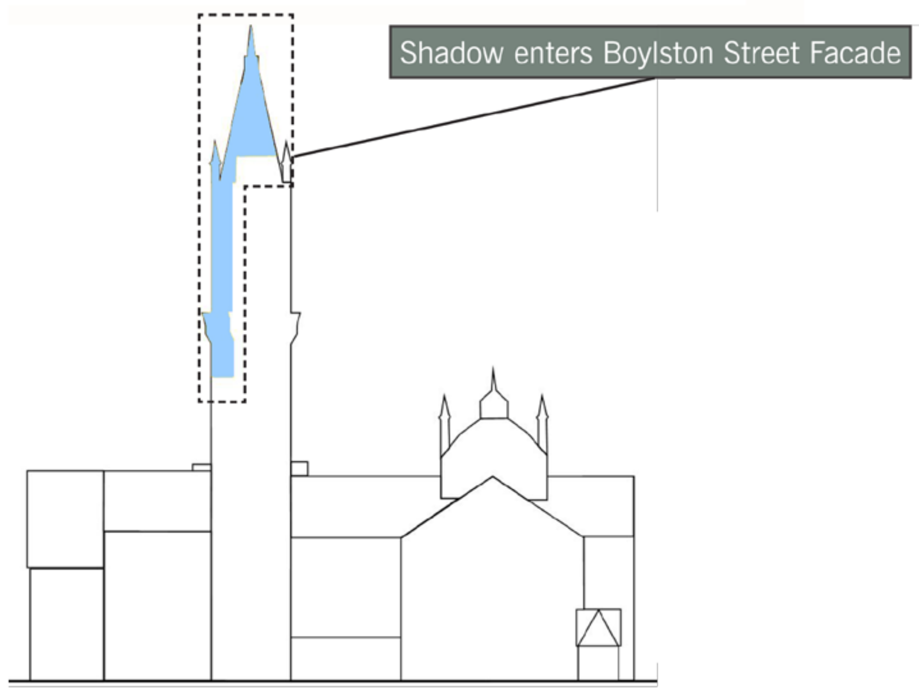
December 21; 7:15AM
New Old South Church - Boylston Street Facade



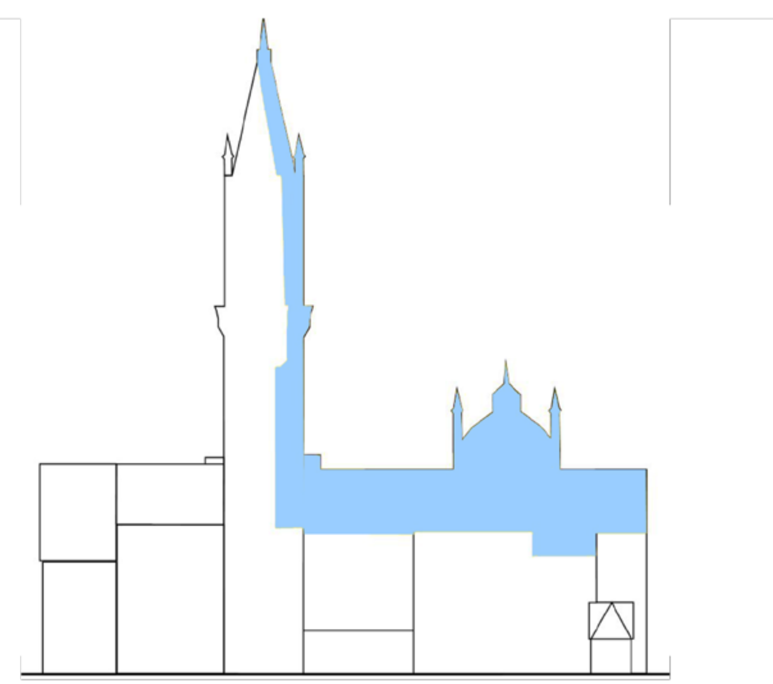
December 21; 7:55AM
New Old South Church - Boylston Street Facade



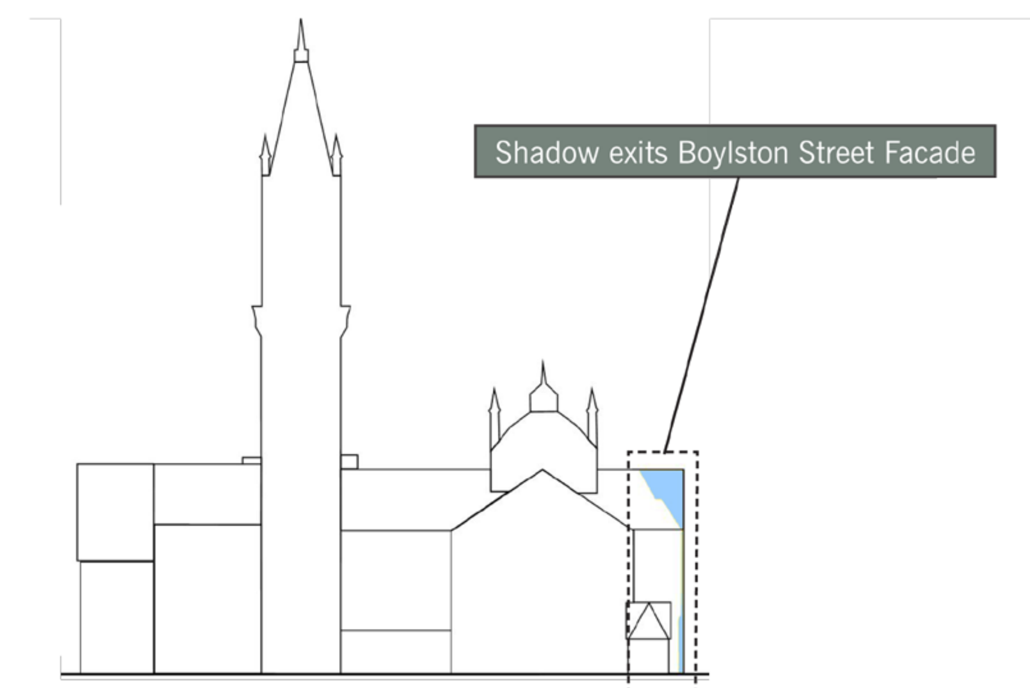
December 21; 8:29AM
New Old South Church - Boylston Street Facade



December 21; 7:15AM
New Old South Church - Boylston Street Facade



December 21; 7:55AM
New Old South Church - Boylston Street Facade

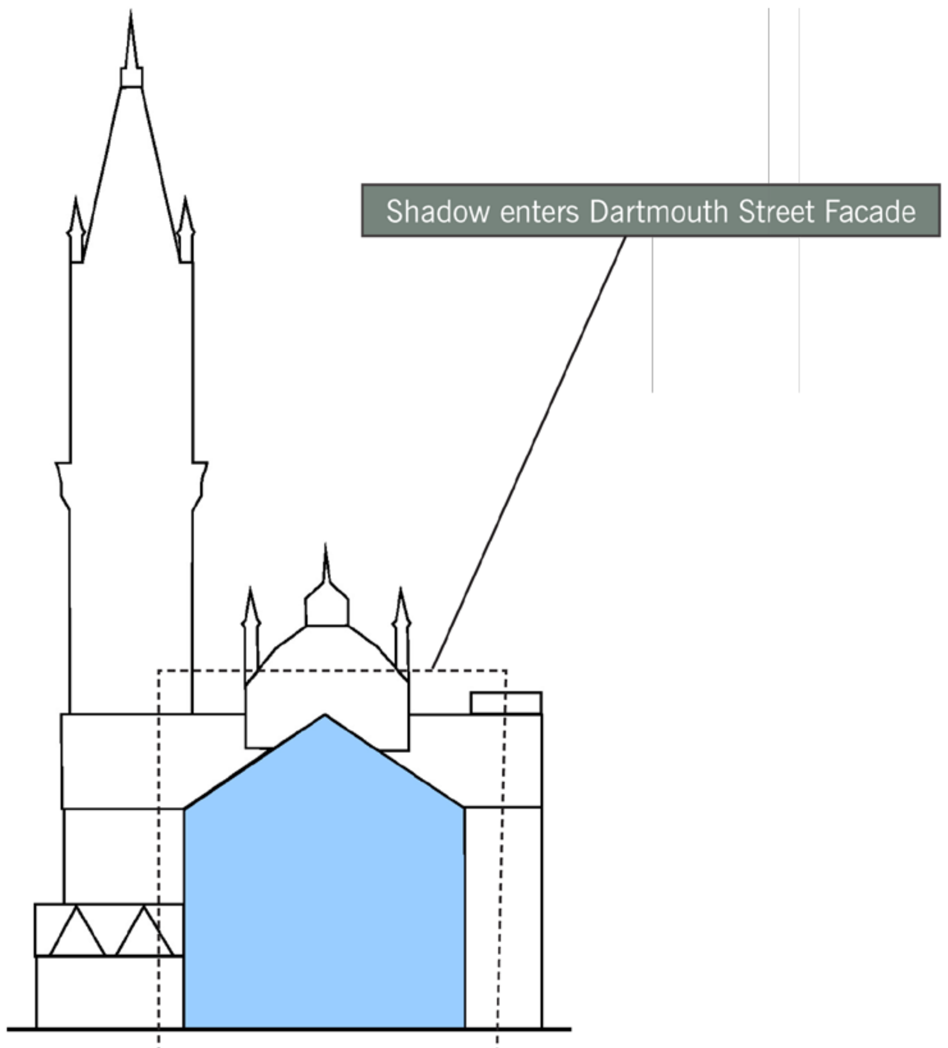


December 21; 8:29AM
New Old South Church - Boylston Street Facade

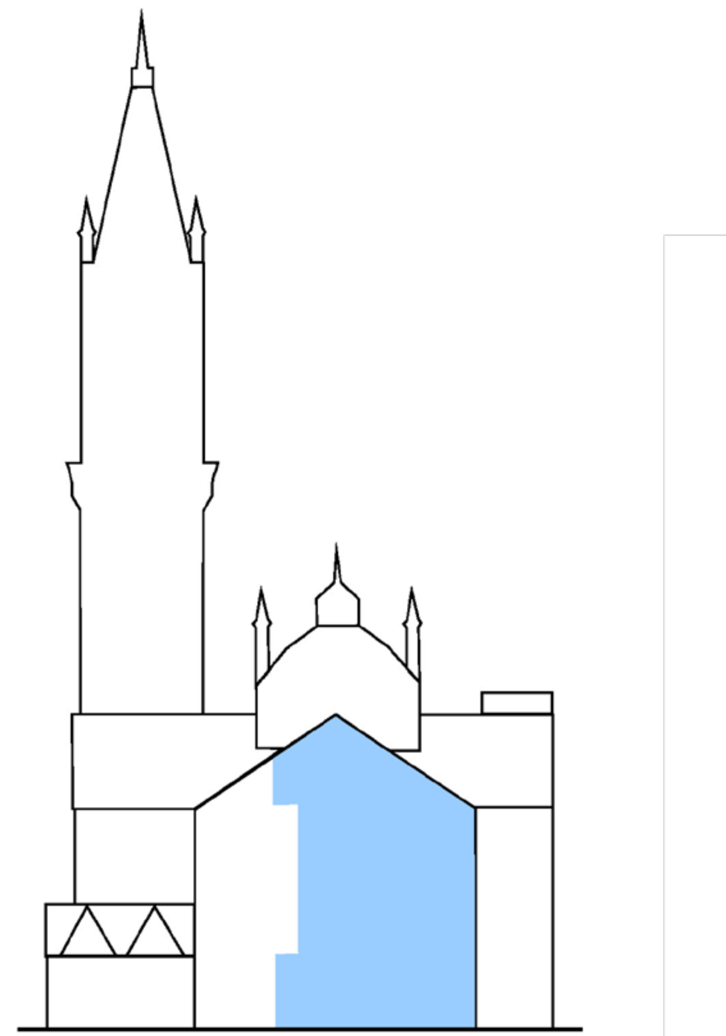
*March 21, June 21, September 21, October 21: Not Shown - No new shadow on subject area

As-Of-Right Building Shadow

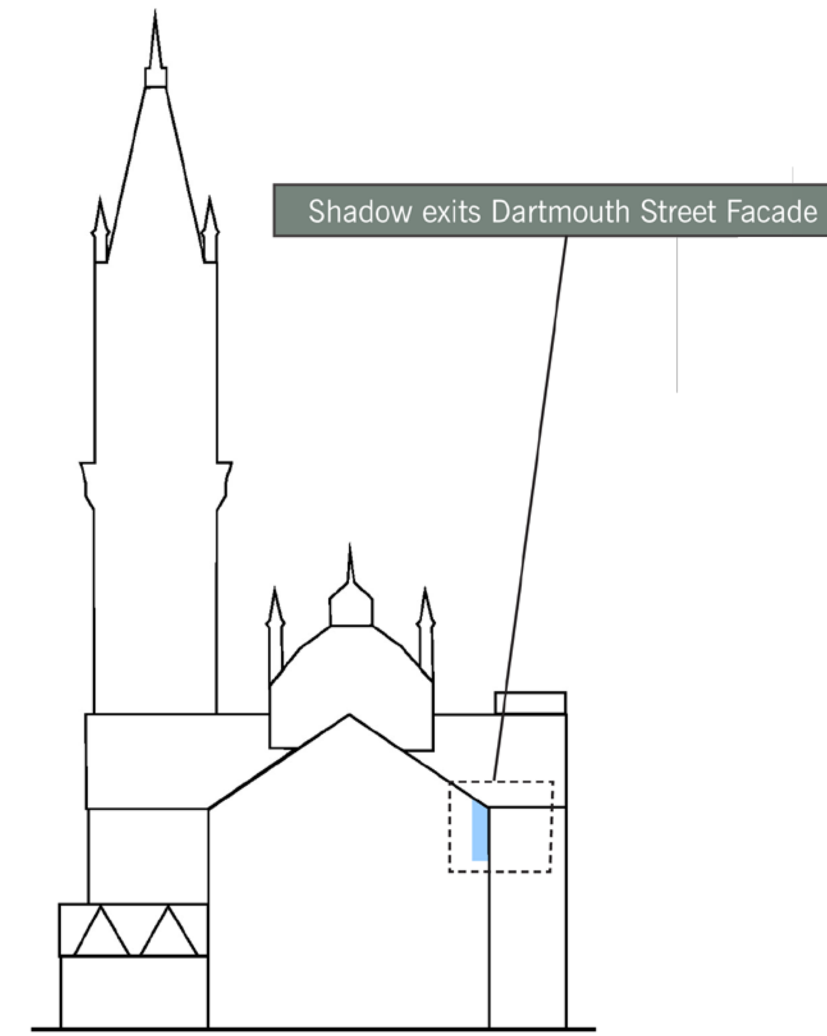
Proposed Building Shadow



December 21; 8:28AM
New Old South Church - Dartmouth Street Facade



December 21; 8:32AM
New Old South Church - Dartmouth Street Facade

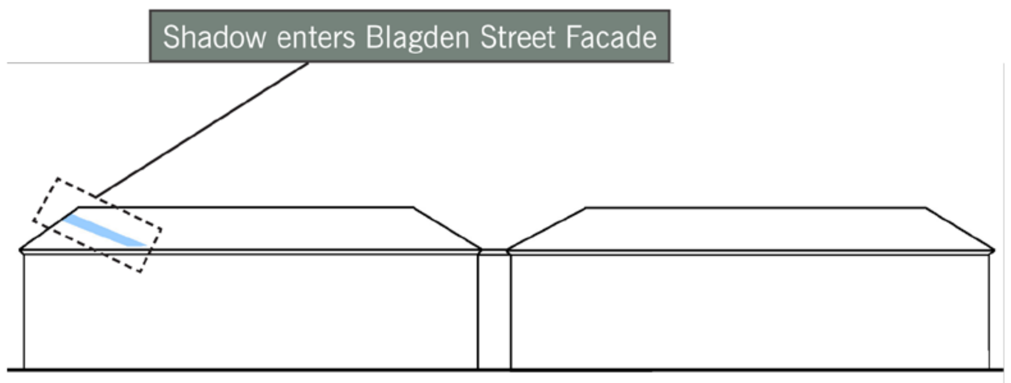


December 21; 8:36AM
New Old South Church - Dartmouth Street Facade

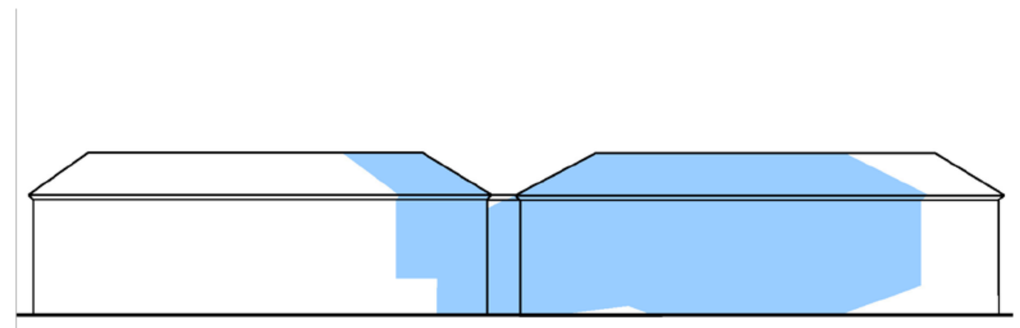
*June 21, October 21, December 21: Not Shown - No new shadow on subject area

As-Of-Right Building Shadow

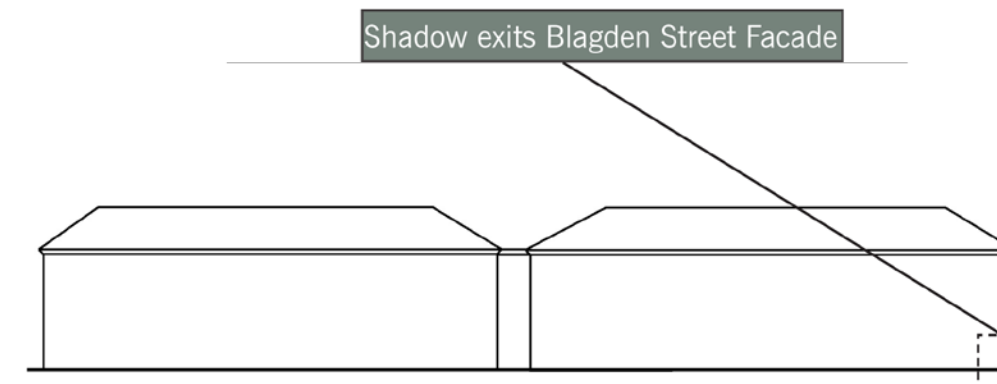
Proposed Building Shadow



March 21; 7:23AM
Boston Public Library - Blagden Street Facade

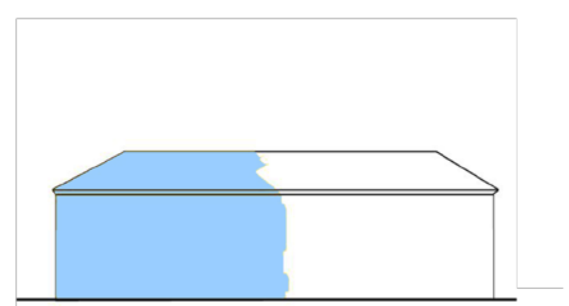


March 21; 8:31AM
Boston Public Library - Blagden Street Facade

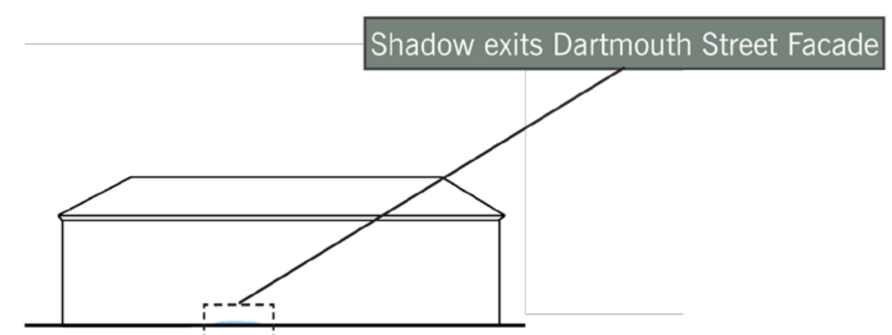


March 21; 9:41AM
Boston Public Library - Blagden Street Facade

March 21; 8:43AM
Boston Public Library - Dartmouth Street Facade

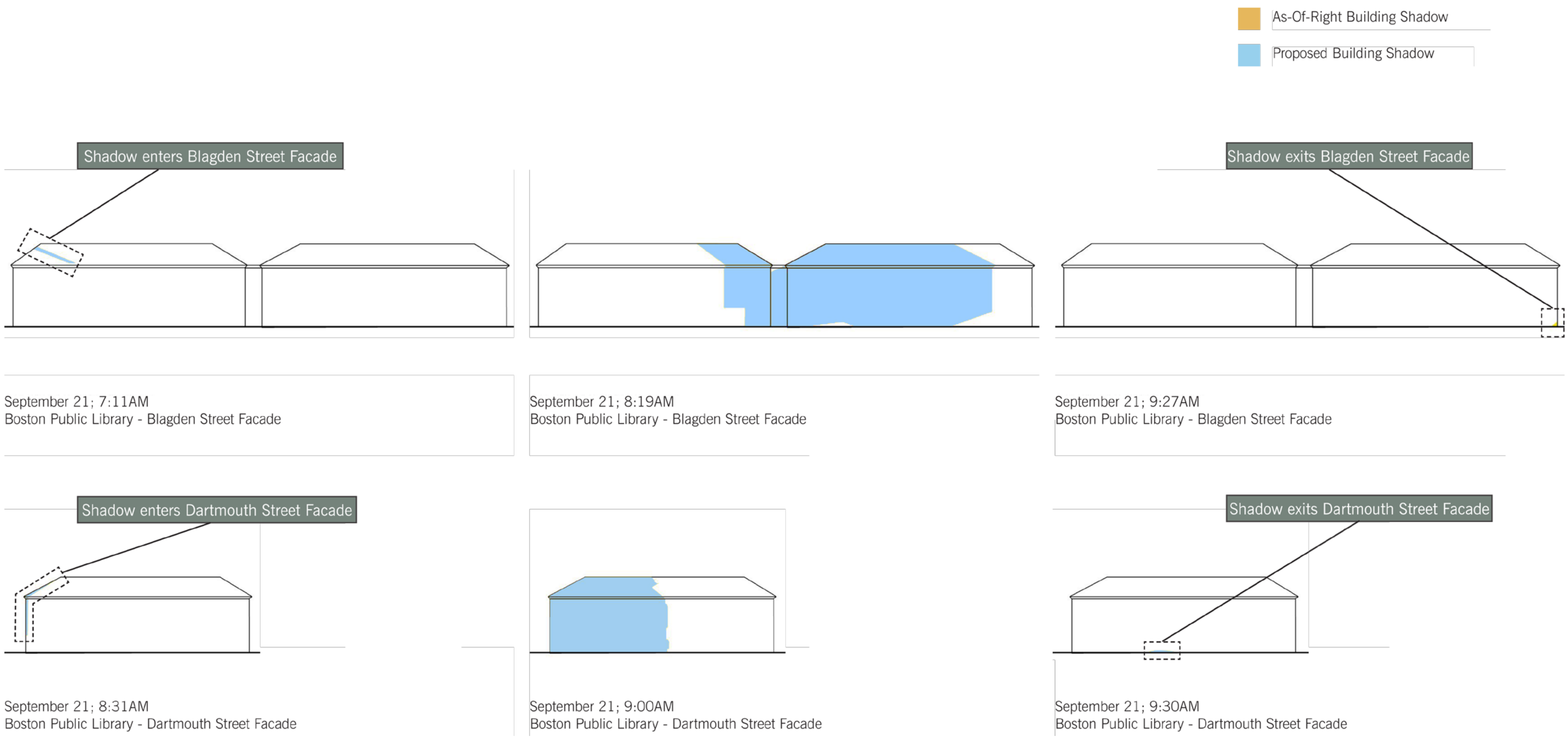


March 21; 9:14AM
Boston Public Library - Dartmouth Street Facade



March 21; 9:45AM
Boston Public Library - Dartmouth Street Facade

*June 21, October 21, December 21: Not Shown - No new shadow on subject area



*March 21, June 21, September 21, October 21: Not Shown - No new shadow on subject area

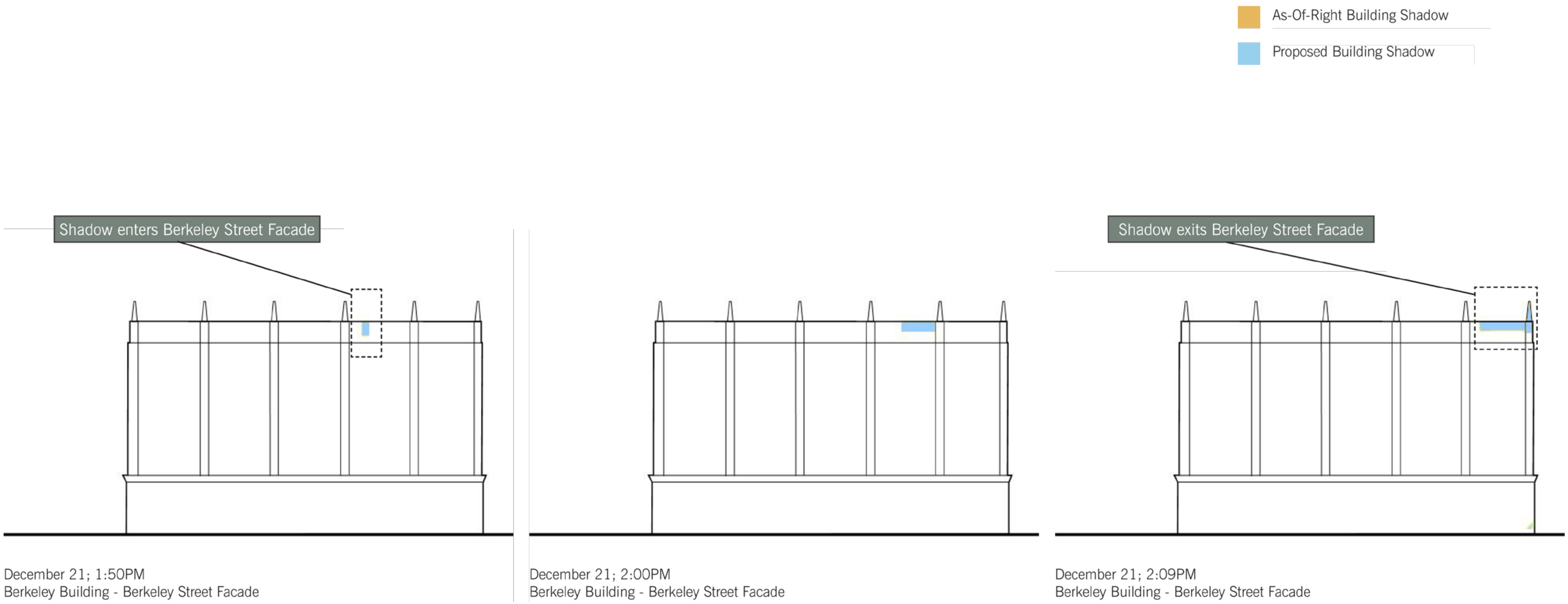
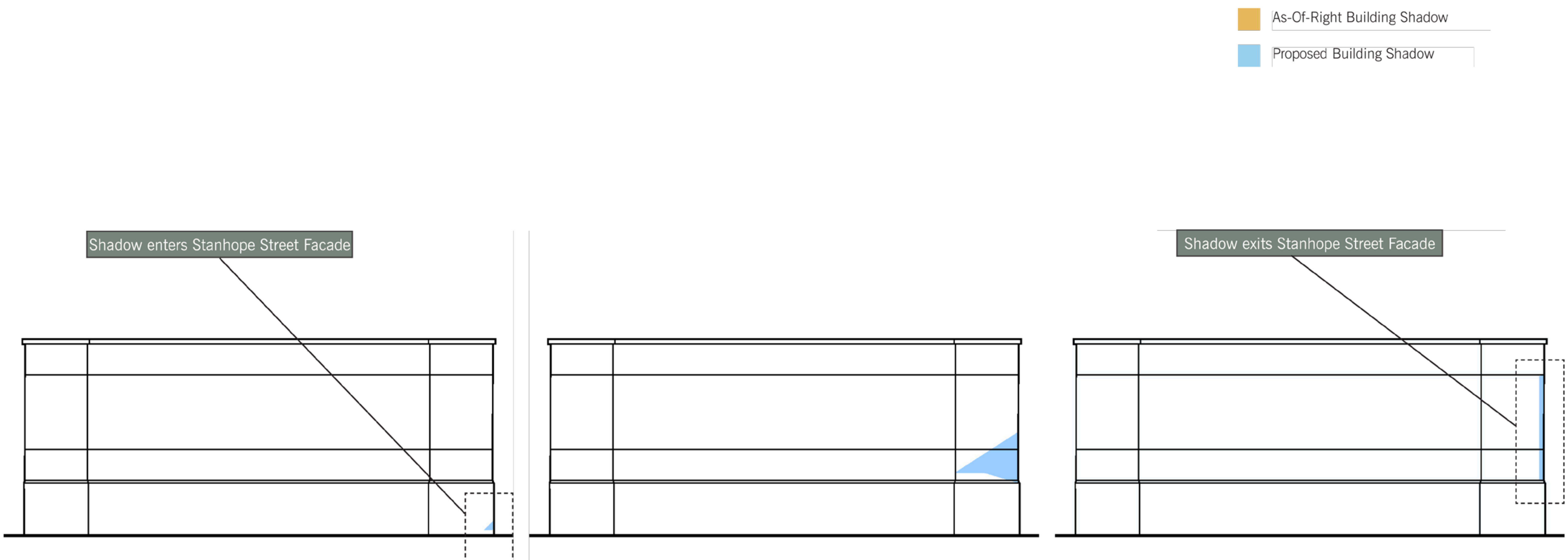


Figure 6-6

Berkeley Building – Façade Duration Study

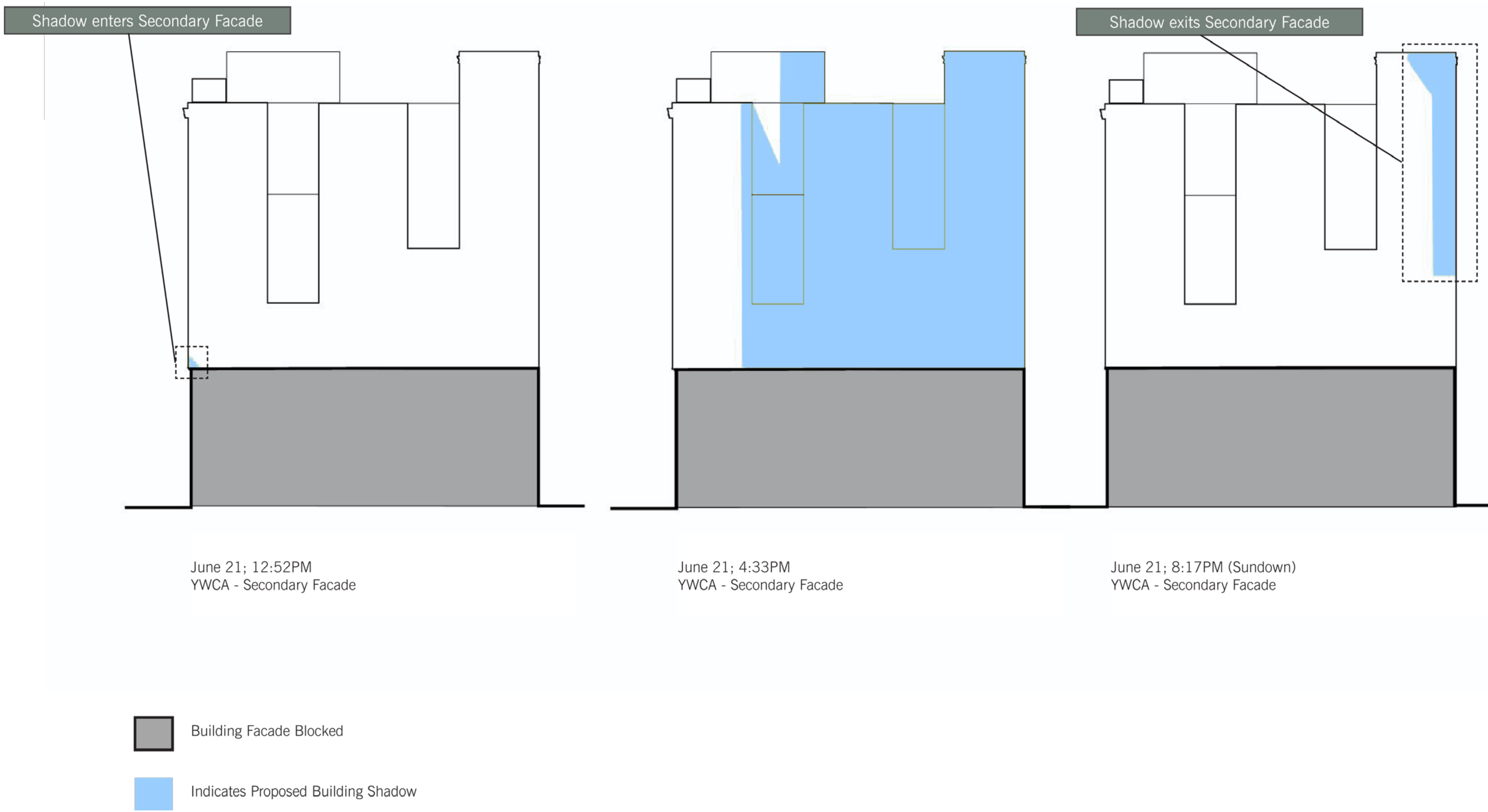
*March 21, September 21, October 21, December 21: Not Shown - No new shadow on subject area



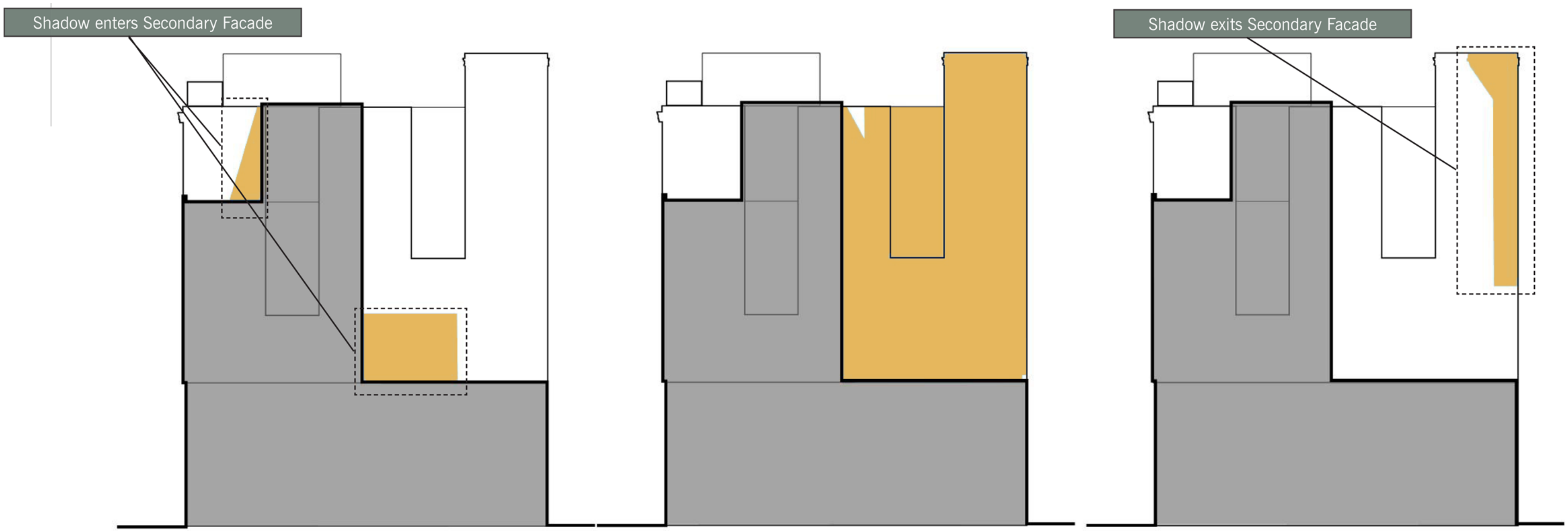
June 21; 4:45PM
Youth's Companion Building - Stanhope Street Facade

June 21; 5:00PM
Youth's Companion Building - Stanhope Street Facade

June 21; 5:14PM
Youth's Companion Building - Stanhope Street Facade



Shadow enters Secondary Facade
Shadow exits Secondary Facade
June 21; 12:52PM
YWCA - Secondary Facade
June 21; 4:33PM
YWCA - Secondary Facade
June 21; 8:17PM (Sundown)
YWCA - Secondary Facade
Building Facade Blocked
Indicates Proposed Building Shadow



June 21; 12:52PM
YWCA - Secondary Facade

June 21; 4:33PM
YWCA - Secondary Facade

June 21; 8:17PM (Sundown)
YWCA - Secondary Facade

Building Facade Blocked

Indicates As of Right Building Shadow

Figure 6-9

YWCA Building – Façade Duration Study

Section 7.0

Infrastructure

7.0 INFRASTRUCTURE

7.1 Introduction

The existing infrastructure surrounding the site of 40 Trinity Place is anticipated to be of adequate capacity to service the needs of the Project. The following sections describe the existing sanitary sewer, water, and storm drain systems surrounding the site, and explain how these systems will service the development. The analysis also discusses any anticipated Project-related impacts on area utilities, and identifies mitigation measures to address these potential impacts.

As the Project moves into the Design Development phase, a detailed infrastructure analysis will be performed. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the proposed new water, sanitary sewer, and storm drain connections.

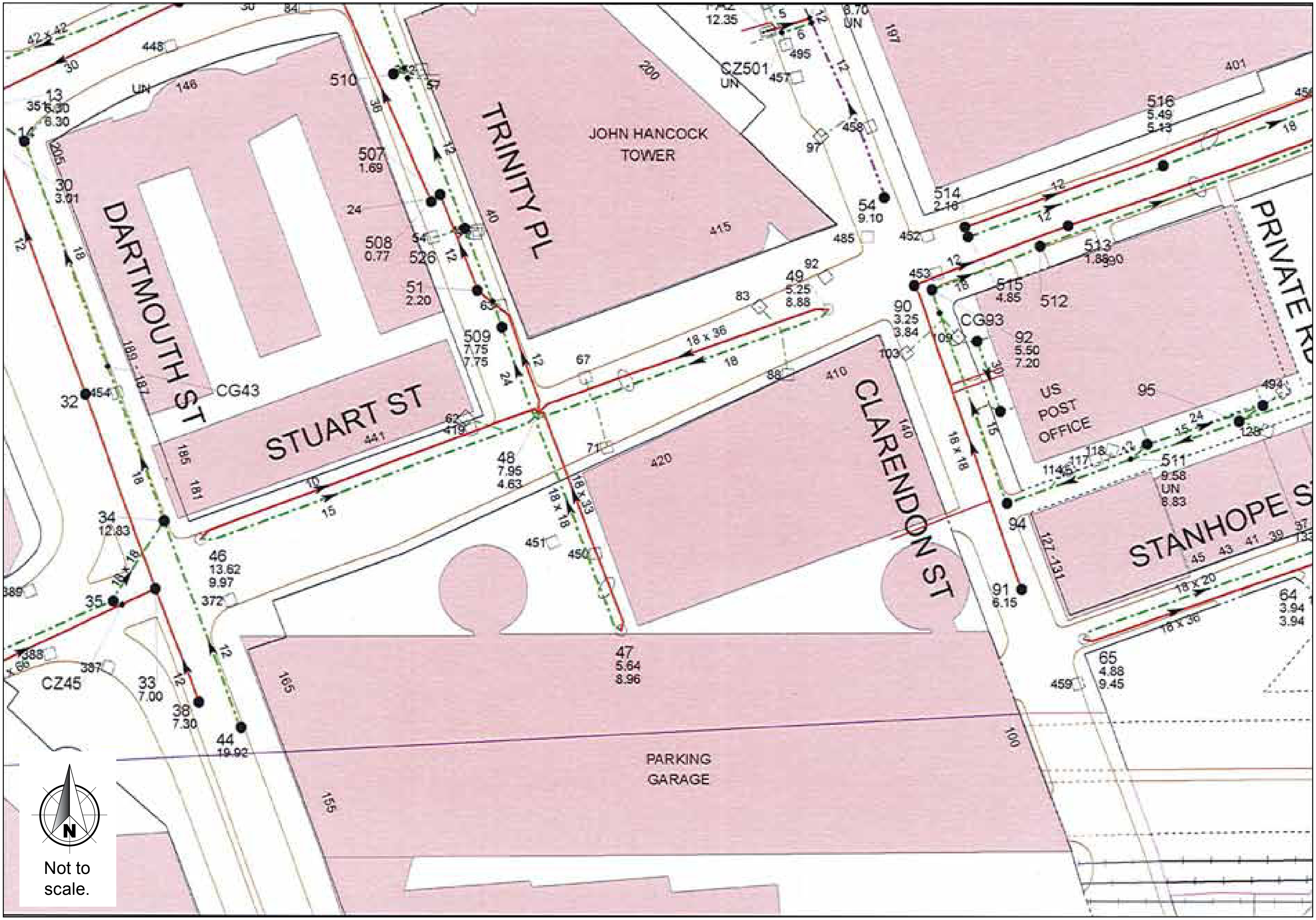
A Drainage Discharge Permit Application will be submitted to the BWSC for any required construction dewatering. The appropriate approvals from the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA) will also be sought.

7.2 Wastewater

7.2.1 Existing Sanitary Sewer System

The sanitary sewer system in the vicinity of the Project site is owned, operated, and maintained by BWSC (see Figure 7-1). There is an existing 18-inch by 36-inch sanitary sewer culvert located in Stuart Street to the north of the Project site. There is an existing 18-inch by 33-inch sanitary sewer culvert located in Trinity Place to the west of the Project site. Both lines eventually discharge into a 12-inch sanitary sewer pipe in Trinity Place near the northwest corner of the Project site.

The total sewer flow from the existing building is estimated at 9,329 gallons per day (gpd) based on the existing building uses and design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program as summarized in Table 7-1.



40 Trinity Place   Boston, Massachusetts

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Figure 7-1
BWSC Storm Drain and Sanitary Sewer System

Table 7-1 Existing Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Hotel	65 rooms	110 gpd/room	7,150 gpd
Coffee/Donut Shop	20 seats	20 gpd/seat	400 gpd
Office Space	10,000 sf	75 gpd/1,000 sf	750 gpd
Conference Center	343 seats	3 gpd/seat	1,029 gpd
Total			**9,329 gpd**

7.2.2 Project-Generated Sanitary Sewer Flow

The Project will generate an estimated 58,330 gallons per day (gpd) based on design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program as summarized in Table 7-2. This is a net increase of 49,001 gpd over the estimated flows from the existing buildings.

Table 7-2 Projected Sanitary Sewer Flows

Use	Approximate Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Hotel	227 rooms	110 gpd/room	24,970 gpd
Residential Units	201 beds	110 gpd/bed	22,110 gpd
Restaurant	300 seats	35 gpd/seat	10,500 gpd
University Club	30 members	25 gpd/member	750 gpd
Total			**58,330 gpd**

7.2.3 Sanitary Sewer Connection

It is anticipated that sanitary services for the Project will tie into the BWSC 18-inch by 33-inch sanitary sewer main in Trinity Place. All existing building services will be cut and capped at the main if the lines are not reused.

The flow full capacity of the 12-inch sanitary sewer located near the northwest corner of the Project site in Trinity Place is 2.94 cubic feet per second (cfs) (1.9 million gallons per day (MGD)). The projected maximum daily sewer flow for the Project is about 3.1% of this line's capacity.

The Proponent will submit a Site Plan to the BWSC for review and approval. Based on the proposed estimated sanitary flow, a Sewer Connection Permit will be required. This Permit will be submitted to BWSC for review and approval prior to submitting to MassDEP.

7.2.4 Effluent Quality

The Project is not expected to generate industrial wastes. The Project will file a sewer use discharge permit with the Massachusetts Water Resources Authority if a commercial laundry is provided.

An oil and grease separator will be installed to treat any flows that may reach the parking structure floor drains. The treated flow will be tied into the municipal sanitary sewer.

Grease traps will be provided on the kitchen waste lines servicing the proposed restaurants. The grease traps will be shown on the BWSC Site Plan and will be coordinated with BWSC's Sewer Operation Division/Enforcement Section.

7.2.5 Sewer System Mitigation

To help conserve water and reduce the amount of wastewater generated by the Project, and to meet Leadership in Energy and Environmental Design requirements, the Proponent will use water conservation devices such as low-flow toilets and flow-restricting faucets.

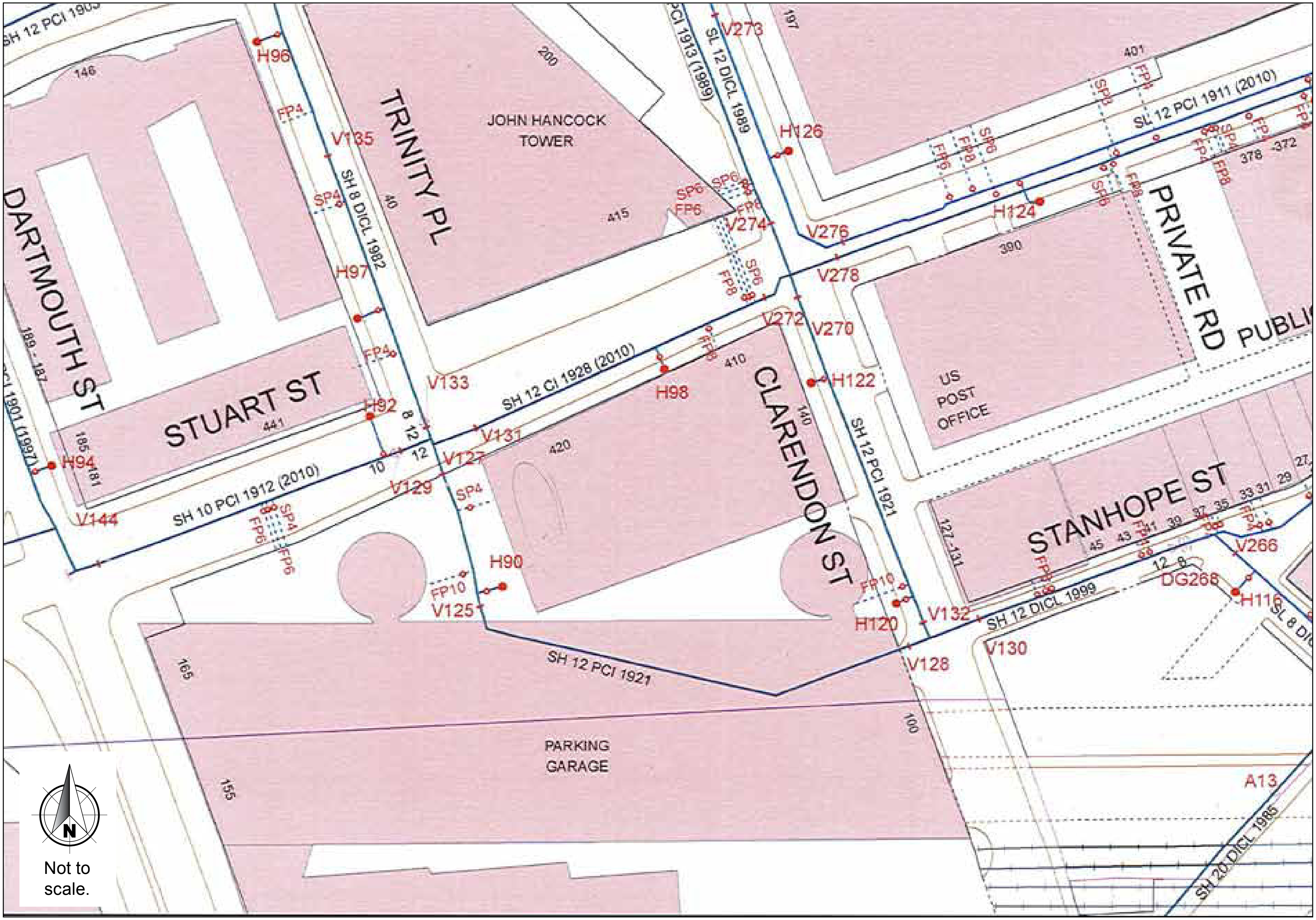
7.3 Water System

7.3.1 Existing Water Service

The water distribution system in the vicinity of the Project site is owned and maintained by BWSC (see Figure 7-2). There is a 12-inch cast iron (CI) distribution line located in Stuart Street that is part of BWSC's Southern High service network. Originally installed in 1928, it was cleaned and cement-lined in 2010. There is also a 12-inch pit cast iron (PCI) distribution line located in Trinity Place that is part of BWSC's Southern High service network and was installed in 1921.

According to BWSC records, the existing building has one existing water service, a 4-inch domestic water service located near the northwest corner of the Project site. This service connects to the 12-inch (Southern High) water main in Trinity Place. It appears that the existing building is serviced by an 8-inch fire protection line from the adjacent building (410 Stuart Street). This service connects to the 12-inch (Southern High) water main in Stuart Street. The location of the existing fire protection service will be confirmed as the Project moves to the Design Development phase.

There are several fire hydrants located in the vicinity of the Project site. There is a hydrant adjacent to the existing building on Trinity Place. There is also a hydrant in front of the University Club on Stuart Street and another hydrant across the street off the northwesterly corner of Stuart Street and Trinity Place. It appears that these hydrants will provide sufficient coverage for the Project. The Proponent will confirm this with BWSC and the Boston Fire Department (BFD) during the detailed design phase.



40 Trinity Place   Boston, Massachusetts

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Figure 7-2
BWSC Water Distribution System

7.3.2 Anticipated Water Consumption

The maximum daily water demand is estimated to be 64,163 gpd based on the sewage flow estimate and an added factor for system losses including the average requirements for the Project's cooling system. More detailed water use and meter sizing calculations will be submitted to BWSC as part of the Site Plan review process.

7.3.3 Proposed Water Service

Separate services will be provided for domestic use and fire protection. A domestic water line and two fire protection lines will serve the development and are expected to tie into the 12-inch water main (Southern High) on Trinity Place with tapping sleeve and valve connections. Water meters will be of a type approved by BWSC and tied into the BWSC's Automatic Meter Reading system.

Irrigation is currently not proposed for the Project. If it is added to the Project, the Proponent will provide BWSC an estimate of the water usage.

It is anticipated that the existing domestic water service will be abandoned and cut and capped at the main with the valve box, frame and cover removed. If a fire protection service needs to be removed, it will be coordinated with BWSC, BFD, and Inspectional Services Department. A Termination Verification Approval Form for Demolition will be submitted for approval by BWSC prior to demolition of any existing structures. The contractor will obtain a Hydrant Meter Permit from BWSC if hydrant use is required during construction.

7.3.4 Water Supply Conservation and Mitigation Measures

The Proponent will use low-flow plumbing fixtures in compliance with LEED requirements. It is expected that low-flow water closets and showers will be used. Lavatories are expected to have aerated faucets to reduce water usage.

7.4 Storm Drainage System

7.4.1 Existing Storm Drainage System

The storm drain system in the vicinity of the Project site is owned and maintained by BWSC (see Figure 7-1). There is an 18-inch storm drain in Stuart Street off the northerly side of the site. There is also an 18-inch by 18-inch storm drain in Trinity Place that runs along the westerly side of the site. Both lines eventually discharge into a 24-inch storm drain in Trinity Place near the northwest corner of the Project site.

Nearly the entire parcel is currently developed, with only a small parking area on the south side of the site, which is primarily impervious. There are no landscaped areas around the perimeter of the existing building.

Runoff from the Project site is currently collected and conveyed to the surrounding municipal storm drain systems. There are no stormwater management systems that would attenuate peak flows, and the Project site provides little opportunity for recharge. Runoff from paved surfaces around the property is generally captured in catch basins. Very little water quality treatment is realized before these areas are drained to the municipal storm drain system.

Rooftop runoff from the current site is collected and discharged to the 18-inch by 18-inch storm drain in Trinity Place through two building drain services. It appears that the runoff from the small parking area on the southerly side of the site drains overland and is captured by catch basins in Trinity Place that tie into the 18-inch by 18-inch storm drain.

7.4.2 Proposed Storm Water System

The proposed stormwater management system will be designed to improve existing conditions. It is anticipated that a stormwater infiltration system will be constructed near the loading area to promote groundwater recharge and help meet the requirements of Article 32 of the Boston Zoning Code, Groundwater Conservation Overlay District consistent with the Stuart Street Planning Study. It is expected that the infiltration system will have an overflow tied into BWSC's 18-inch by 18-inch storm drain in Trinity Place to alleviate the system during large rainfall events. Runoff from paved areas will be routed through a deep sump structure with an outlet trap to remove oil, sediment, and debris before discharge to the municipal storm drain system.

After construction, the Project site will continue to consist primarily of impervious surfaces, associated with building roofs and surface pavement. The existing drainage patterns will not change significantly as the rooftop runoff and pavement area will continue to drain to the 18-inch by 18-inch storm drain in Trinity Place, if necessary as an overflow from the new infiltration system.

All storm drain system improvements will be designed in accordance with BWSC's design standards and the BWSC "Requirements for Site Plans." A Site Plan will be submitted for BWSC approval, and a General Service Application will be completed prior to any off-site drain work. Any storm drain connections terminated as a result of construction will be cut and capped at the storm drain in the street in accordance with BWSC standards.

Erosion and sediment controls will be used during construction to protect adjacent properties and the municipal storm drain system. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

7.4.3 Groundwater Conservation Overlay District

As discussed above, the Project lies within the Groundwater Conservation Overlay District, established pursuant to Article 32 of the Boston Zoning Code. To meet the requirements of Article 32, the Project design proposes the construction of a recharge system. The recharge system will have the capacity to infiltrate a volume of rainfall equivalent to one inch over the impervious surfaces of the Project. An overflow pipe will be designed to convey runoff from larger storm events to the 18-inch by 18-inch storm drain pipe in Trinity Place.

It is expected that the rooftop runoff from the new building will be collected and directed to the proposed recharge system. No pretreatment is proposed since the rooftop runoff is normally considered clean. The Proponent will continue to meet with the Boston Groundwater Trust and BWSC to discuss compliance with Article 32 of the Boston Zoning Code.

7.5 Electrical Service

NSTAR owns and maintains the electrical transmission system located in Stuart Street and Trinity Place. The actual size and location of the proposed building services will be coordinated with NSTAR during the detailed design phase. It is anticipated that a transformer vault will be provided in the basement of the proposed building.

The Proponent is investigating energy conservation measures, including high efficiency lighting.

7.6 Telecommunications Systems

Verizon owns and maintains infrastructure in the vicinity of the Project site. It is anticipated that Verizon will supply telephone and high-speed internet service to the proposed building. The actual size and location of the proposed building services will be coordinated with Verizon during the detailed design phase.

7.7 Gas Systems

National Grid owns and maintains a 12-inch low pressure gas main in Stuart Street. The existing building is serviced by a 4-inch gas service coming from the 12-inch main. The Project is expected to use natural gas for heating and domestic hot water. The actual size and location of the building services will be coordinated with National Grid during the detailed design phase.

7.8 Steam Systems

Veolia Energy owns and maintains the steam transmission system located in Stuart Street and Trinity Place. There is a 12-inch steam main in Stuart Street off the northerly side of the site. Also, there is a 4-inch steam main in Trinity Place that runs along the westerly side of the site. The existing building is serviced by a 2.5-inch steam service coming from the 4-inch steam main in Trinity Place. The actual size and location of the proposed building services will be coordinated with Veolia Energy during the detailed design phase if Veolia steam will be utilized, or otherwise shown in the building plans if Veolia steam is not utilized.

7.9 Utility Protection during Construction

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

Section 8.0

Response to Comments

8.0 RESPONSE TO COMMENTS

8.1 Introduction

This chapter provides responses to the BRA Scoping Determination and the associated comment letters that were received on the PNF filed with the BRA on October 29, 2012. The letters have been reproduced and individual comments coded in the margins. Responses to the comments follow each individual letter and can be matched using the comment code numbers. Letters were received from the following City of Boston Departments, organizations, and individuals:

BRA Scoping Determination and Letters Received on the PNF
Boston Redevelopment Authority Scoping Determination
Katie Pederson (BRA)
Boston Transportation Department
David Carlson (BRA)
Representatives Walz, Rushing, and Michlewitz
Ellis South End Neighborhood Association
YWCA
Marvin Wool
Boston Preservation Alliance
Downtown Schools for Boston
Tent City Corporation
Neighborhood Association of the Back Bay
Susan Prindle
The Clarendon Condominium Trust Development Committee

8.2 Responses to BRA Scoping Determination and Responses to Comments

Responses to specific comments from the entities listed are provided following each of their letters.

BOSTON REDEVELOPMENT AUTHORITY
SCOPING DETERMINATION

FOR

40 TRINITY PLACE – BOSTON, PROJECT NOTIFICATION FORM

PREAMBLE

Trinity Stuart LLC (the "Developer") submitted to Boston Redevelopment Authority ("BRA") a Project Notification Form ("PNF") under Article 80 of the Boston Zoning Code on October 29, 2012 and noticed in the Boston Herald on the same day, for the redevelopment of the site at 40 Trinity Place located in the Back Bay neighborhood of Boston, together with air rights over a portion of the adjacent property at 426 Stuart Street that currently houses the University Club of Boston (together, the Proposed Project site). The proposed development includes the demolition of the existing Boston Common Hotel and Conference Center, and the construction of a 33-story, approximately 400 foot tall, mixed-use building totaling approximately 369,370 square feet (sf), with approximately 142 residential units, approximately 220-room hotel with accessory conference center space, two restaurants and approximately 100 above grade residential parking spots will be located on levels 4 and 5 (the "Proposed Project"). Written comments constitute an integral part of the Scoping Determination and should be responded to in the Draft Project Impact Report (the "DPIR").

Specific concerns below are highlighted for additional emphasis and consideration:

- Height Many of the comments received highlight concerns regarding the height and massing of the Proposed Project. The Proposed Project will be surrounded by planned, approved, and existing buildings exceeding 400 feet, including the tallest building in Boston, the John Hancock tower. Nevertheless, comments from the community are not unanimous that the proposed height is appropriate in this location. While the Proposed Project conforms to the 2010 Stuart Street Planning Study Guidelines (the "Guidelines"), some comments suggest that a lower height limit in the Guidelines would have been more appropriate. Justification for a project of this size with respect to economic feasibility should be included in the DPIR. BRA.1

- Construction and Abutter Impacts Should approvals be granted after review of the DPIR, the BRA will seek to ensure that the construction of the

Proposed Project occurs with absolutely minimal disruption to the residents, businesses, and institutions of the surrounding neighborhood. The Developer should identify any encroachments upon abutters' rights or means of access and prepare a plan to mitigate any such encroachment. The Developer will be required to submit a Construction Management Plan to the Boston Transportation Department ("BTD") to ensure that proper measures are put in place to mitigate any and all potential negative impacts, especially for the closest abutters, the YWCA at 140 Clarendon Street. BRA.2

- Diverse Housing Stock Comments from the community and elected officials strongly suggest that the Developer satisfy the Inclusionary Development Policy by building the units on-site. Furthermore, there is a strong desire to provide both market rate and affordable housing appropriate for families wishing to live in the neighborhood. The Developer should evaluate the feasibility of placing all required affordable units on-site and maximizing housing appropriate for families in the Proposed Project. BRA.3

- No Build / As of Right For the purpose of meaningful analysis, the Developer should include in the DPIR a no build option andan as of right option. . BRA.4

- Pedestrian Level Uses Comments received indicate a strong desire to improve the pedestrian experience in this stretch of Stuart Street. The Developer should continue to refine the design for the ground floor of the Proposed Project with the community, the BRA, and the Boston Civic Design Commission ("BCDC"). BRA.5

- Wind and Shadow The Proposed Project will alter wind patterns and cast shadows, impacting the surrounding areas. Comments from the community suggest that past wind studies conducted for now-constructed buildings did not adequately or completely describe the wind impacts of the building. Therefore, the Developer should complete a wind study as according to BRA guidelines described later in this Scoping Determination. BRA.6

- Transportation Any large project will have traffic impacts. BTD requests that the Developer study six intersections: St. James Avenue / Trinity Place; St. James Avenue / Clarendon Street; Stuart Street / Trinity Place; Stuart Street / Clarendon Street; St. James Avenue / Dartmouth Street; and Stuart Street / Dartmouth Street. As is required in all Article 80 Reviews, traffic studies should incorporate projects approved by the BRA, but not yet completed. BRA.7

- <u>Educational Facility</u> Mayor Thomas M. Menino has asked the City of Boston and the BRA to collaborate and evaluate the demand for a new school that would serve the neighborhoods adjacent to the Proposed Project. Comments from elected officials and the community reflect the desire to locate a Boston Public School in near proximity to the Proposed Project. Since the Developer has a vested interested in the neighborhood we request a strong partnership moving forward. The BRA requests continued dialogue with the Developer to help achieve the goal of a new educational facility in the general vicinity of the Proposed Project. The Developer should also investigate the feasibility of locating a school within the current project site. BRA.8

- <u>Green</u> The Developer should strive to achieve the highest level of LEED certification possible. BRA.9 The Developer should encourage alternate modes of transportation by providing safe and secure bike storage, scooter parking and other facilities for residents and patrons to the site. BRA.10

SUBMISSION REQUIREMENTS

FOR

THE 40 TRINITY PLACE / 426 STUART STREET PROJECT, PROPOSAL CONSISTING OF APPROXIMATELY 369,370 SQUARE FEET OF DEVELOPMENT, APPROXIMATELY 142 RESIDENTIAL UNITS AND 220 ROOM HOTEL, INCLUDING 100 ABOVE-GRADE PARKING SPACES WITH RESTAURANT AND CONFERENCE SPACE - DRAFT PROJECT IMPACT REPORT

Written comments constitute an integral part of the Scoping Determination and should be responded to in the Draft Project Impact Report (the “DPIR”).

The Boston Redevelopment Authority ("BRA") is issuing this Scoping Determination (“Scope”) pursuant to Section 80B-5 of the Boston Zoning Code (the "Code"), in response to a Project Notification Form ("PNF") which Trinity Stuart LLC (the “Developer” or “Proponent”) submitted on October 29, 2012 proposing the redevelopment of the site at 40 Trinity Place located in the Back Bay neighborhood of Boston, together with air rights over a portion of the adjacent property at 426 Stuart Street that currently houses the University Club of Boston (together, the Proposed Project site). The proposed development includes the demolition of the existing Boston Common Hotel and Conference Center, and the construction of a 33-story, approximately 400 foot tall, mixed-use building totaling approximately 369,370 square feet (sf), with approximately 142 residential units, approximately 220-room hotel with accessory conference center space, two restaurants and approximately 100 above grade residential parking spots will be located on levels 4 and 5 (the “Proposed Project”). Notice of the receipt by the BRA of the PNF was published in the *Boston Herald* October 30, 2012 initiating the public comment period that initially was scheduled to end on November 30, 2012 but at the request of the Impact Advisory Group (“IAG”), local elected officials and members of the community it was extended to January 4, 2013. Pursuant to Section 80A-2 of the Code, the Notice and the PNF were sent to all public agencies of the City and other interested individuals and parties. Written comments in response to the Notice and the PNF that were received by the BRA prior to the end of the public comment period are included in the Appendices of this Scope. The Scope requests information that the BRA requires for its review of the Proposed Project in connection with the following:

(a) Certification of Compliance of the Proposed Project pursuant to Article 80, Section 80B-6 of the Code; and

(b) Preliminary Adequacy Determination pursuant to Article 80, Section 80B-5.4(c) of the Code; and

The BRA is reviewing the Proposed Project pursuant to Article 80, Section 80B, Large Project Review, which sets out comprehensive procedures for project review and requires the BRA to examine the urban design, transportation, environmental, and other impacts of proposed projects. The Developer is required to prepare and submit to the BRA a Draft Project Impact Report ("DPIR") that meets the requirements of the Scope by detailing the Proposed Project's expected impacts and proposing measures to mitigate, limit, or minimize such impacts. The DPIR shall contain the information necessary to meet the specifications of Section 80B-3 (Scope of Review; Content of Reports) and Section 80B-4 (Standards for Large Project Review Approval) as required by the Scope.

Subsequent to the end of the sixty (60) day public comment period for the DPIR, the BRA will issue a Preliminary Adequacy Determination ("PAD") that indicates the additional steps necessary for the Proponent to complete in order to satisfy the requirements of the Scope and all applicable sections of Article 80 of the Code. If the BRA finds that the PNF/DPIR adequately describe the Proposed Project's impacts and, if appropriate, proposes satisfactory measures to mitigate, limit or minimize such impacts, the PAD will announce such a determination and that the requirements for the filing and review of a Final Project Impact Report are waived pursuant to Section 80B-5.4(c)(iv) of the Code. Before reaching said findings, the BRA shall hold a public hearing pursuant to Article 80 of the Code. Section 80B-6 requires the Director of the BRA to issue a Certification of Compliance before the Commissioner of Inspectional Services can issue any building permit for the Proposed Project.

I. PROPOSED PROJECT DESCRIPTON

The project, as proposed, will be located 40 Trinity Place located in the Back Bay neighborhood of Boston, together with air rights over a portion of the adjacent property at 426 Stuart Street that currently houses the University Club of Boston (together, the “Project Site”).

The proposed development includes the demolition of the existing Boston Common Hotel and Conference Center, and the construction of a 33-story, approximately 400 foot tall, mixed-use building totaling approximately 369,370 square feet (sf), with approximately 142 residential units, approximately 220-room hotel with accessory conference center space, two restaurants and approximately 100 above grade residential parking spots will be located on levels 4 and 5 (the “Proposed Project”).

II. DEVELOPMENT REVIEW REQUIREMENTS - ARTICLE 80

SUBMISSION REQUIREMENTS

In addition to full-size scale drawings, sixty-five (65) copies of a bound report containing all submission materials reduced to size 8-1/2" x 11", except where otherwise specified, are required and one (1) CD with all materials. The report 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 Scope should be included in the report submitted for review.

A. GENERAL INFORMATION

1. Applicant Information
   - a. Development Team
     - (1) Names
       - (a) Developer (including description of development entity and type of corporation)
       - (b) Attorney
       - (c) Project consultants and architect BRA.11
     - (2) Business address and telephone number 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 the Applicant
     - (3) Evidence of site control over the project area, including current ownership and purchase options of 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. BRA.12
     - (4) Nature and extent of any and all public easements into, through, or surrounding the site.

2. Project Area

   - a. An area map identifying the location of the Proposed Project BRA.13

b. Description of metes and bounds of project area or certified survey of project area

3. Public Benefits

a. Anticipated employment levels including the following:
(1) Estimated number of construction jobs
(2) Estimated number of permanent jobs
The Proponent is expected to provide a workforce development plan and needs assessment for the Proposed Project. The Proponent should describe the efforts it will undertake to ensure that an appropriate share of new jobs and construction jobs will be filled by Boston residents. BRA.14

b. Current activities and programs 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.

4. Regulatory Controls and Permits

a. Existing zoning requirements, zoning computation forms, and any anticipated requests for zoning relief should be explained.

b. Anticipated permits required from other local, state, and federal entities with a proposed application schedule should be noted.

c. 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 BRA, including, but not limited to, copies of the Environmental Notification Form, decisions of the Secretary of Environmental Affairs, and the proposed schedule for coordination with BRA procedure. BRA.15

5. Community Groups

a. 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. BRA.16

b. A list of meetings held and proposed with interested parties, including public agencies, abutters, and community and business groups.

B. PROJECT DESCRIPTION AND ALTERNATIVES

1. Project Description

The DPIR 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 of the DPIR also shall present analysis of the development context of the Proposed Project. Appropriate site and building plans to illustrate clearly the Proposed Project shall be required. BRA.17

2. Project Alternatives

A description of alternatives to the Proposed Project that were considered shall be presented and the primary differences among the alternatives, particularly as they may affect environmental conditions, shall be discussed. In addition, any alternative development studies requested by the Boston Landmarks Commission should be discussed. BRA.18

C. TRANSPORTATION COMPONENT

Please refer the comments and information requested by the Boston Transportation Department ("BTD") included in Appendix 1. BRA.19

D. ENVIRONMENTAL PROTECTION COMPONENT

Please refer to the comments and information requested by the Boston Environment Department ("BED") and BRA environmental review included in Appendix 1. In addition, the Proponent is requested to provide information on the following:

- The Proponent should consider and document how it would use the Leadership in Energy and Environmental Design (LEED) standards. Integrating green building components into the planning and design of new projects improves energy efficiency and promotes responsible and sustainable building practices. BRA.20

E. URBAN DESIGN COMPONENT

The BCDC voted to review the Proposed Project on January 8, 2013 and saw a preliminary presentation. The Project was referred to Design Committee, which met on January 22 and further discussed concerns. When sufficient progress in preparation of a Preferred Alternative in the DPIR in response to the Scoping Document has been made pursuant to preliminary BCDC, IAG/public, and BRA staff comments, BCDC Design Committee meetings should be further scheduled by contacting David Carlson, Executive Director of the BCDC. Minutes from the 40 Trinity portion of the January BCDC meeting are attached.

It should be noted that a more advanced design should allow more in-depth comment at the DPIR stage. We reserve the right to comment at that stage toward the submission of an FPIR. In general, we will ask for studies related to all requested alternatives, with certain modifications, as well as comparisons to both existing conditions and an 'as-of-right' alternative. The 40 Trinity Place Project is at an interesting location in the Back Bay, and stands to make a significant difference on its block of Stuart Street. The proposed height places the Project in interesting company in the area; it should not try to compete directly but achieve its own form of expressed elegance. The following urban design objectives should be addressed in the DPIR submission.

1) Standard alternatives for study include no-build, and an 'as-of-right' build-out...in this case FAR 10, with a height of 155'. This alternative will conform to the density planned and anticipated in this area under current zoning, but not necessarily under the Stuart Street study. The Proponent has presumed a process allowing the flexibility in density and height pursuant to recommendations in the latter and so should conform to the preconditions contained therein. BRA.21

2) In general, the project should strive to minimize any incremental increase in environmental impacts as compared with either the full 'as-of-right' build-out or existing conditions. The specific building volume and massing should be designed such that with respect to criteria such as daylight, shadows, and wind, some elements or points may be worse, but analysis will prove that the whole is better as a Project. We will expect in fact that mitigations or positive urban benefits will result from this Project and in balance far outweigh any negative impact. Specific shadow and wind investigations will be requested - a separate category in this memorandum - to determine what the impacts are specifically regarding Copley Square. Height, tower shaping and setbacks should be adjusted to minimize any impacts. BRA.22

3) The highest building elements generally should be as diverse in height as possible, but orchestrated to be a natural completion to the idea of the building and not set in forced counterpoint. Where desirable to create an emphasis or entry, the higher facade elements could come straight down to the ground...but only if wind conditions (or effective mitigations of same) permit such. We ask that any infrastructure constraints in particular be studied to clarify any limitations for the Proposed Project. BRA.23 BRA.24

4) The most active ground floor program elements (entries to residential, hotel, and restaurant/skylobby function uses) should be not only retained but enhanced as a positive element of the Project, with entries possibly on both public sides, but adequate space and program planning along the sidewalk to avoid confusion or conflict. A hierarchy of such uses should be considered. Transparency and views into the uses must be maximized on each frontage. BRA.25

5) Multiple upper story uses as shown in the PNF are accordingly encouraged to enliven the streets with a diversity of activity throughout the day. Necessary service and access functions should not occur in areas where they will *directly* impact key points in the paths of residents and visitors. BRA.26

6) Above-grade garage floors should be covered, where possible, with program uses on all sides. Treatment of any directly visible portions of the garage should be of a high architectural character with robustly convincing detail. BRA.27

7) The Proposed Project is a layering of uses with at least one dramatically intended carving of the volume. Emphasize both aspects. And SIMPLIFY the chosen expression(s). Try to make the building appear slim in proportion. A strong, simple form may be best against the backdrop of the massive Hancock Garage structure. BRA.28

8) Study the choice of materials carefully. The nature of the curtainwall should be studied carefully - and understood as part of the composition. If the building is less a curtainwall and more metal, then the metal should have a special character or articulation - and not be just a flat metal panel system, which would diminish the potential appeal of the building. BRA.29

9) Street edges and new sidewalks created as a result of any version of the Proposed Project must conform to all applicable standards and be appropriately sized to bear pedestrian traffic peaks. Street trees or plantings should be included in site plans. Incorporate bicycle stations into the Project...both public and private. BRA.30

Among others, the refined design included in the DPIR must satisfactorily address all the above parameters. An accurate sense of scale of the Proposed Project in its context must be achieved. Focus on key distanced views, as well as key intermediate / user viewpoints, to guide the design composition of the Proposed Project. Utilize techniques that capture the context at each scale. Reinforce pedestrian pathways; develop a plan which shows the building program and how it supports such activity within the pedestrian / public access network. Active programming that will engage the public should be maximized. Take note of the fundamental contextual strengths of the site, including its connections to Back Bay Station, the MBTA, and Copley Square - and the other nearby towers in the present and future skyline - incorporate that sense into the overall design approach, tempered / enhanced by the proposed uses. BRA.31

The PNF Proposal includes parcels not currently under direct control of the redeveloper. Evidence of the team's ability to secure an arrangement for use of these parcels (and air rights) must be submitted. BRA.32

We reserve the right to add additional concerns during the course of the process of combined BRA staff, IAG, and BCDC review which may affect the responses detailed in the DPIR. The following urban design materials for the Proposed Project's schematic design must be submitted for the DPIR. BRA.33

1. Written description of program elements and space allocation (in square feet) for each element, as well as Project totals.
2. Neighborhood plan, elevations and sections at an appropriate scale (1"=100' or larger as determined by the BRA) showing relationships of the proposed project to the neighborhood context:
    a. massing
    b. building height
    c. scaling elements
    d. open space
    e major topographic features
    f. pedestrian and vehicular circulation
    g. land use
3. Color, or black and white 8"x10" photographs of the site and neighborhood.
4. Sketches and diagrams to clarify design issues and massing options.

5. Eye-level perspective (reproducible line or other approved drawings) showing the proposal (including main entries and public areas) in the context of the surrounding area. Views should display a particular emphasis on important viewing areas such as key intersections, pathways, or public parks/attractions. Some suggested viewpoints include (also see Copley Expansion Project views): north and south along Dartmouth and Clarendon, from Copley Square, east and west along Stuart, from the Southeast Expressway, from Memorial Drive (skyline), from adjacent residential neighborhoods (South End, Bay Village), et al. Long-ranged (distanced) views of the proposed project must also be studied (some are suggested above) to assess the impact on the skyline or other view lines. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) at least both the build and no-build conditions; any alternatives proposed should be compared as well. Planned context (projects approved) should also be included in build conditions. The BRA should approve the view locations before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.
6. Additional aerial or skyline views of the project, if and as requested.
7. Site sections at 1"=20' or larger (or other scale approved by the BRA) showing relationships to adjacent buildings and spaces.
8. Site plan(s) at an appropriate scale (1”=20’ or larger, or as approved by the BRA) showing:
    a. general relationships of proposed and existing adjacent buildings and open spaces
    b. open spaces defined by buildings on adjacent parcels and across streets
    c. general location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
    d. pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
    e. survey information, such as existing elevations, benchmarks, and utilities
    f. phasing possibilities, if applicable
    g. construction limits

9. Massing model (ultimately in basswood) at 1":40'0" for use in the Authority’s Downtown Model
10. Study model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration, facade composition, etc.
11. Drawings at an appropriate scale (e.g., 1":16'0", or as determined by BRA) describing architectural massing, facade design and proposed materials including:

a. building and site improvement plans
b. neighborhood elevations, sections, and / or plans showing the development in the context of the surrounding area
c. sections showing organization of functions and spaces, and relationships to adjacent spaces and structures
d. preliminary building plans showing ground floor and typical upper floor(s).
e. phasing, if any, of the Proposed Project

12. A written and / or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.
13. Electronic files describing the site and Proposed Project at Representation Levels one and two ("Streetscape" and "Massing") as described in the document *Boston "Smart Model": CAD & 3D Model Standard Guidelines*.
14. Full responses, which may be in the formats listed above, to any urban design-related issues raised in preliminary reviews or specifically included in the BRA scoping determination, preliminary adequacy determination, or other document requesting additional information leading up to BRA Board action, inclusive of material required for Boston Civic Design Commission review.
15. Proposed schedule for submission of all design or development-related materials.
16. True-scale three-dimensional graphic representations of the area indicated above either as aerial perspective or isometric views showing all buildings, streets, parks, and natural features.

SHADOW AND WIND COMMENTS

In addition to the comments and scoping by others, the Proponent is directed to conduct a specific shadow analysis for the specific time range of any new impacts on Copley Square Park....in other words defining rough extent and duration in terms of hours and time of year. Give particular attention to the period from March 21 to October 21; the Proposed Project should conform to the criteria suggested in the Stuart Street Zoning Study. Include duration studies for any other impacted open spaces in the area, including the Southwest Corridor, and the park on Stanhope Street. If overall duration is greater than one hour, provide an overlap study which defines any area impacted by shadows for a period greater than one hour. All net new shadows shall be defined as outlined elsewhere either by darker tone or color and shall be clearly shown to their full plan extent, whether on street, park, or rooftop. BRA.34 BRA.35

Regarding wind, *all wind tunnel test points shall be approved by BRA staff* before conduction of testing. Wind analysis may be requested at points within several blocks of the property in question; especially where contiguous to open space, analysis may extend to likely bounds of no impact. Analysis of results and effective mitigation shall be presented in the DPIR using diagram methodology so that the delta or changes manifested by the project relative to existing or as-of-right conditions...again, whichever provides the higher base impacts...are clearly understood. See Appendix 6 for required wind study points. BRA.36

DAYLIGHT COMPONENT

The BRADA program used for this analysis should look at views from Stuart and from Trinity Place. If a Proponent wishes to substitute a more contemporary computer program for the 1985 BRADA program, its equivalency must first be demonstrated to the satisfaction of BRA staff before it is utilized for inclusion in the DPIR, and it must be commonly available to Boston development team users. BRA.37

INFRASTRUCTURE SYSTEMS COMPONENT

An infrastructure impact analysis must be performed. BRA.38

The discussion of Proposed Project impacts on infrastructure systems should be organized system-by-system as suggested below. The applicant's submission must include an evaluation of the Proposed Project's impact on the capacity and adequacy of existing water, sewerage, energy (including gas and steam), and electrical communications (including telephone, fire alarm, computer, cable, etc.) utility systems, and the need reasonably attributable to the proposed project for additional systems facilities.

Any system upgrading or connection requiring a significant public or utility investment, creating a significant disruption in vehicular or pedestrian circulation, or affecting any public or neighborhood park or streetscape improvements, comprises an impact which must be mitigated. The DPIR must describe anticipated impacts in this regard, including specific mitigation measures, and must include nearby Proposed Project (i.e. the Copley Expansion tower, Columbus Center, Exeter Residences, 888 Boylston, et al.) build-out figures in the analysis. The standard scope for infrastructure analysis is given below:

1. Utility Systems and Water Quality

a. Estimated water consumption and sewage generation from the Proposed Project and the basis for each estimate. Include separate calculations for air conditioning system make-up water

b. Description of the capacity and adequacy of water and sewer systems and an evaluation of the impacts of the Proposed Project on those systems; sewer and storm drain systems should include a tributary flow analysis as part of this description

c. Identification of measures to conserve resources, including any provisions for recycling or 'green' strategies, including green roofs

d. Description of the Proposed Project's impacts on the water quality of Boston Harbor or other water bodies that could be affected by the Project, if applicable

e. Description of mitigation measures to reduce or eliminate impacts on water quality

f. Description of impact of on-site storm drainage on water quality

g. Information on how the Proposed Project will conform to requirements of the Ground Water Trust under Article 32, if applicable, by providing additional recharge opportunities

h. Detail methods of protection proposed for infrastructure conduits and other artifacts, including the MBTA tunnels and station structures, and BSWC sewer lines and water mains, during construction

i. Detail the energy source of the interior space heating; how obtained, and, if applicable, plans for reuse of condensate.

Thorough consultation with the planners and engineers of the utilities will be required, and should be referenced in the Infrastructure Component section.

2. Energy Systems BRA.39

a. Description of energy requirements of the project and evaluation of project impacts on resources and supply

b. Description of measures to conserve energy usage and consideration of the feasibility of including solar energy provisions or other on-site energy provisions, including wind, geothermal, and cogeneration.

Additional constraints or information required are described below. Any other system (emergency systems, gas, steam, optic fiber, cable, etc.) impacted by this development should also be described in brief. BRA.40

The location of transformer and other vaults required for electrical distribution or ventilation must be chosen to minimize disruption to pedestrian paths and public improvements both when operating normally and when being serviced, and must be described. Storm drain and sewage systems should be separated or separations provided for in the design of connections.

Excerpted from the unofficial minutes of the BCDC of January 8, 2013:

WR remained recused for the next item. The next item was a presentation of the **40 Trinity Place Project**. Gary Saunders stood and introduced himself and his brother Jeff. He noted Jordan Warshaw (JW) was their partner and would begin as Gary Kane (GK) of The Architectural Team (TAT) finished setting up. JW began by noting the locus. JW: This is the Hancock Conference Center site; we are taking air rights over the University Club. The YWCA is the third building on the (sub-)block. The building was originally built sequentially; the higher portion (the Conference Center) was built later. Windows are small in the existing building (shows picture) and the first floor is 8 steps up. It's an ADA nightmare - for those who know it's here to begin with, against the wall of the Hancock Garage. One of the keys of this Project is to reanimate the site - so even the Boston Preservation Alliance has supported something new. (Shows section diagram of program. Points...) This is for the expansion of the University Club, although they are undecided on their program. Above that, parking. It's too expensive below grade, but also gives a better footprint above, in the cantilevered zone. Then hotel, then the sky lobby / amenities levels, including a restaurant and conference center. Condos are above. The plan (shows) is formed in part by shadow limitations, since the community is sensitive to Copley Square. The shadows are okay in summer and in winter; the shoulder season (and time, roughly 9-11am is at issue) is the concern. JW then showed the ground floor plan, and a typical hotel floor plan. LW asked about the cantilever toward the garage, and JW noted a property overlap. JW showed the sky lobby floor for the hotel, with a stair up to the conference center. JW: There is an outside terrace with views toward the South End. There are bathrooms with City views.

Michael Liu (ML) of TAT noted that they would show the PNF images, but that the design has evolved further with BRA staff, and Gary would show that. ML: The base is regular, doing 'urban design work.' The building footprint should be about 13,000 SF, but constraints at the base force it to 11,000. We bump it out to 12,000 with the core, trying to maximize it. We are trying to develop a form that distinguishes itself, but doesn't blur the reading of the Hancock. The curve does some work to reduce the shadow impacts, and the building is turned 'sideways' for the same reason, as well as visual interest. It takes its sculptural form from the curve. But it's also orienting internal views. That results in the faceting, which is the distinguishing characteristic.

The YWCA and University Club both have punched windows; the Hancock is set back from the street. So there is a limited amount we can do for the street with our frontage. So there are lobbies, but light and activity in the restaurant, which is lively, and enlivening for the street. DS: Isn't the Simon tower blue glass? ML noted the graphics here are diagrammatic, showing curtainwall and metal-paneled areas. GK: The comment from BRA staff was to simplify. GK then went through a series of iterations, looking toward the (south)east from two altitudes. They had aligned edges, reduced fins, gone to two from three materials, and returned to a curve on both sides. GK then showed a quick fly-around 'just of the block, not of it in the City.' GK: We wanted to get the simplicity of the east and bring it to the west side.

DH: This is a really exciting project. The sky lobby could be great. The notion to simplify is good. I'm less concerned about the (SE) view down Stuart, versus other views (from the SE, from Copley). It looked bisected. The fly-around is good, but we really need to see a model in Committee. LE: Street-level views as well. It would help to understand the parameters. DC: The Hancock Building, and Dartmouth Street views. Trinity Place is like an alley, but think of it more as a connection. DH: Could that be cobbled? It would really transform it. JW: We have talked about that with Boston Properties, because it's also their garage entry. If they and the City are okay with it, we're in agreement. DS: Other projects should be shown in the model. It's confusing to have two roof forms going two directions, stronger to have one. KS: The faceting is a nice contrast to the angularity of the Hancock. Show views both day and night. We'll give lighting here more attention than we did at Nashua. On Stuart, think about how to make sense of that mishmash. On your ground plane, I don't quite understand how that works. MD: I'm not quite convinced by the ground floor yet, its faceting. Why not normalize it, and make the upper portion more interesting? You're losing what little space you have. Also - how it connects to the above program. You don't always have to hold the street edge, but I'm not sure why you're not.

JW: These are similar to the BRA comments; we have concentrated on floors 6-33. The top and the ground need work. DH: There are a lot of buildings that have *craft* in this area. I would be interested in discussing the curtainwall - how it makes its breaks, walls, angles. Especially with the Hancock as a simple, elegant backdrop. KS: Think about the entry procession into a big (tall) space, like the Langham in Hong Kong, for a relationship to the sky lobby. JW: We're thinking about that for the restaurant, 'hanging' that so that the spaces interact. Like the Dana in Chicago. The massing here is generally done in accord with the Stuart Street Planning Study. With no other comments, the 40 Trinity Place Project was sent to Design Committee.

Note: 40 Trinity was also seen in Design Committee (DH, AL, KS) on January 22.

F. HISTORIC RESOURCES COMPONENT

The Proposed Project site is located near a number of historic properties listed in the National and State Registers of Historic Places. The DPIR shall identify, map, and describe these historic resources and any other historic properties in the vicinity of the Proposed Project's site and shall evaluate the anticipated effects of the Proposed Project on these resources. Particular attention shall be given to the design, scale, height, massing, materials, and other architectural elements of the proposed buildings as these relate to the significant architectural and historic resources in the proposed project's vicinity. The DPIR must also include an assessment of the potential presence of archaeological resources that may be disturbed by the Proposed Project. The Proponents should also respond to the comments of the Boston Environment Department outlined in Appendix 1. BRA.41

G. DEVELOPMENT IMPACT PROJECT COMPONENT

If applicable, based on square footage and use the Proposed Project could be subject to and be required to enter into a Development Impact Project ("DIP or Linkage") agreement. A full analysis of square footage should be submitted in the DPIR. See below for a breakdown of payment if required. BRA.42

Housing Linkage:

DIP Uses	???????	square feet
Exclusion:	-100,000	
	??????	
	x $7.87	/square foot
	$??????????	

Jobs Linkage:

DIP Uses	?????????	square feet
Exclusion	-100,000	
	??????	
	x $1.57	/square foot
	$?????????	

H. 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 Draft Project Impact Report (DPIR) to the BRA as required by Section 80A-2. This Notice shall be published within five (5) days after the receipt of the DPIR by the BRA. Therefore, public comments shall be transmitted to the BRA within seventy-five (75) days of the publication of this Notice.

Sample forms of the Public Notices are attached as Appendix 4.

Following publication of the Public Notice, the Proponent shall submit to the BRA a copy of the published Notice together with the date of publication.

BRA.1 Height

Given the costs of construction, particularly with the constraints of a tight urban site, a certain critical mass must be built to achieve economic viability. It is not a coincidence that nearly all of the buildings built or approved in the past several decades within the vicinity of the Project site (other than those with very large lot areas) are of similar height and massing. The Clarendon, Liberty Mutual, the Westin, the Marriott, Simon residential building, Columbus Center building and others nearby the site are similar in massing. Additionally, the most recent economic cycles have been challenging for those seeking to develop economically successful new hotels that can be owned for the long term. The Project includes condominiums at a critical mass to enable the development group, members of which have owned and operated their Back Bay area hotels for an average of 50 years, to own this hotel for the long term.

BRA.2 Construction and abutter impacts

A Construction Management Plan will be submitted to the Boston Transportation Department. The Proponent will meet with abutters to discuss construction-related impacts.

BRA.3 Affordable housing

See Section 1.4.

BRA.4 No build and as-of-right

See Section 2.3.

BRA.5 Pedestrian level uses

See Section 2.2.1.

BRA.6 Wind and shadow

A wind study is included in Section 4.1. A shadow study is included in Section 4.2.

BRA.7 Transportation

The Proponent has expanded the study area to include the six intersections as requested by the BRA. See Figure 3-1 for a map showing the study area intersections. The transportation study presented in Chapter 3 incorporates impacts from eight planned development projects in the area that could impact study intersections. These are mapped in Figure 3-10 and described in Section 3.3.1.1.

BRA.8 Educational facility

The vertical circulation demands of a school in which large numbers of students would need to access multiple elevators in short periods of time make the building core unworkable. In addition, the size and shape of the building and required elevator cores for the Project's proposed program make it unfeasible to include a school within the building. The Project site also cannot accommodate the amount of outdoor activity space required for a school.

School bus pick-up/drop-off demands far exceed available curb space at the site along Stuart Street or Trinity Place. In addition, curb demands for the Project's hotel and residential uses, as well as the University Club, are not compatible with school bus usage of this curb.

The presence of a school would also increase vehicle trips to the site, thus impacting traffic flow in the area particularly during the morning commuter peak hour and the mid-afternoon.

BRA.9 LEED certification

The Proponent currently anticipates achieving the Gold level under the LEED rating system. See Section 4.6.

BRA.10 Alternate transportation modes

The Proponent will provide bicycle accommodation and amenities for the Project's residents, guests, tenants, and visitors to encourage bicycle use. See Section 3.5.2 for a description of bicycle accommodations.

BRA.11 Development team

See Section 1.2.

BRA.12 Legal information

See Section 1.6.

BRA.13 Project area

An exhibit plan is included in Appendix A.

BRA.14 Public benefits

See Section 1.4.

BRA.15 Regulatory controls and permits

See Section 1.5.

BRA.16 Community groups

See Section 1.7.

BRA.17 Project description

See Section 2.2.

BRA.18 Project alternatives

See Section 2.3.

BRA.19 Transportation component

See Chapter 3.

BRA.20 Environmental protection component

See Chapter 4.

BRA.21 Project alternatives

The No Build and As-of-right Alternatives are included in the environmental analyses as appropriate.

BRA.22 Environmental impacts

See Sections 4.1 and 4.2 for wind and shadow analyses, respectively.

BRA.23 Height

See Chapter 5. The top of the building is rendered as a distinctive but natural extension and termination of the building shape below, a deceptively simple double spiral form that presents an enhanced and dramatic perspective that changes as viewed from each direction from both the Copley Square view corridor to the north, to the view emerging from the Massachusetts Turnpike Prudential exit onto Stuart Street to the west, to the South End view corridor to the south, to the view corridor from Arlington Street, Berkeley Street, and the Massachusetts Turnpike eastbound from Logan International Airport and South Boston.

BRA.24 Infrastructure

It is anticipated that the surrounding infrastructure will have the capacity to service the Project. Chapter 7 includes a detailed infrastructure analysis.

BRA.25 Ground floor elements

See Section 2.2.1. The ground floor uses are laid out in a hierarchical form, from the most public spaces to the most private. The ground floor proposes a restaurant adjacent to Trinity Place with an entrance near the corner of Trinity Place and Stuart Street. Further up Stuart Street is the hotel entrance, which also faces the corner of Trinity Place and Stuart Street. On the eastern side of the site, the residential entrance is set back slightly from Stuart Street, reflecting its more private use.

BRA.26 Service and access functions

See Section 2.2.1. Service and access functions occur off of Trinity Place or the Massachusetts Turnpike Access Ramp at the southern portion of the Project site.

BRA.27 Garage

See Chapter 5. The façade treatment of the garage levels, located on the 4th and 5th floors, will be indistinguishable from adjacent areas of the façade and will be entirely opaque so that automobile headlights will not be visible from the outside.

BRA.28 Design

See Chapter 5. The design has been developed to take advantage of a relatively modest building footprint to enhance its elegant and slender profile. This is accomplished by further dividing the façade vertically, simplifying its form so that it rises uninterrupted as a simple, coherent extrusion from the ground plane at the important Stuart Street and Trinity Place corner, a departure from earlier studies where the tower was set upon a six-story rectilinear base. This simplification also has the effect of improving its sense of scale over more complicated earlier versions that tended to make the building look bigger than it actually was.

BRA.29 Materials

See Chapter 5.

BRA.30 Street edges and sidewalks

See Section 2.2.1.

BRA.31 Scale

See Section 2.2.1 and Chapter 5 which include a number of perspectives of the Project and information on pedestrian access and programming.

BRA.32 Property ownership

The Proponent's purchase of the air rights not currently owned is evidenced by private agreements with the abutting landowner.

BRA.33 Urban design materials

Materials not contained within the submission package at this stage will be submitted and or reviewed separately as the Design Review process continues with BRA staff, the IAG and the Boston Civic Design Commission.

BRA.34 Shadow analysis

See Section 4.2. Section 4.2.7 discusses the shadow impacts on nearby open spaces in regard to the Stuart Street Planning Study.

BRA.35 Shadow duration studies

See Section 4.2.7.

BRA.36 Wind

See Section 4.1.

BRA.37 Daylight component

See Section 4.3.

BRA.38 Infrastructure systems component

See Chapter 7.

BRA.39 Energy systems

The Project design will incorporate a highly efficient mechanical system design to comply with the Stretch Energy Code of the Massachusetts Building Code, and at the same time will incorporate LEED principals. A cogeneration plant is being considered in the current design. Cogeneration provides an efficient means of producing electricity while capturing the waste heat byproduct to heat the domestic water. The high demand for domestic hot water by the proposed uses makes this a possibility for the Project.

The Proponent has agreed to purchase 75% of the building's electricity from renewable sources for at least two years.

BRA.40 Energy system impacts

See Sections 7.5, 7.7 and 7.8.

BRA.41 Historic resources component

See Chapter 6.

BRA.42 Development impact project component

See Section 1.4.

BRA MEMORANDUM

TO: Geoff Lewis

FROM: Katie Pedersen

DATE: December 12, 2012

RE: 40 Trinity Place
Boston, Massachusetts
Project Notification Form

I have reviewed the Project Notification Form (PNF) dated October 29, 2012 and submit the following comments for the Environmental Protection Component. Trinity Stuart LLC (the Proponent) proposes the redevelopment of the site at 40 Trinity Place located in the Back Bay neighborhood of Boston, together with air rights over a portion of the adjacent property at 426 Stuart Street that currently houses the University Club of Boston (together, the Proposed Project site). The proposed development includes the demolition of the existing Boston Common Hotel and Conference Center, and the construction of a 33-story, approximately 400 foot tall, mixed-use building totaling approximately 369,370 square feet (sf), with approximately 142 residential units, approximately 220-room hotel with accessory conference center space, two restaurants and approximately 100 above grade residential parking spots will be located on levels 4 and 5 (the Proposed Project).

The Proposed Project will also include approximately 10,000 new square feet to be occupied by the existing University Club.

<u>Wind</u>

A quantitative wind tunnel analysis of the potential pedestrian level wind impacts shall be required. This analysis shall determine potential pedestrian level KP.1 winds adjacent to and in the vicinity of the Proposed Project site and shall identify the projected annual wind speeds for each season at each location. Expected wind levels should be reported using the amended Melbourne scale. The analysis shall identify any areas where wind velocities are expected to exceed acceptable levels, including the Boston Redevelopment Authority's (BRA) guideline of an effective gust velocity of 31 mph not to be exceeded more than 1% of the time.

Particular attention shall be given to areas of pedestrian use, including, but not limited to, the entrances to the Proposed Project and existing buildings in the vicinity of the Proposed Project, the sidewalks and walkways within and adjacent to the Proposed Project development and in the vicinity of the Proposed Project and the Copley Square Park. Specific locations to be evaluated shall be determined in consultation with the BRA and the City of Boston Environment Department.

For areas where wind speeds are projected to exceed acceptable levels, measures to reduce wind speeds and to mitigate potential adverse impact shall be identified and tested in the wind tunnel to quantify the expected benefit. Should the qualitative analysis indicate the possibility of excessive or unacceptable pedestrian level wind speeds, additional study may be required.

The wind tunnel testing shall be conducted in accordance with the following guidelines and criteria:

* Data shall be presented for both the existing (no-build) and for the future build Scenario.
*The analysis shall include the mean velocity exceeded 1% of the time and the effective gust velocity exceeded 1% of the time.
*Wind direction shall include the sixteen compass points. Data shall include the percent or probability of occurrence from each direction on seasonal and annual bases.
*Results of the wind tunnel testing shall be presented in miles per hour (mph).
*The model scale shall be such that it matches the simulated earth's boundary and shall include all buildings within at least 1,500 feet of the Proposed Project site. The model shall include all buildings recently completed, under construction, and planned within 1,500 feet of the Proposed Project site. Prior to testing, the model shall be reviewed by the BRA.
*The written report shall include an analysis which compares mean and effective gust velocities on annual and seasonal bases, for no-build and build conditions, and shall provide a descriptive analysis of the wind environment and impacts for each sensor point, including such items as the source of the winds, direction, seasonal variations, etc., as applicable. The report shall also include an analysis of the suitability of the locations for various activities (e.g., walking, sitting, standing, driving etc.) as appropriate, in accordance with Melbourne comfort categories.
*The pedestrian level wind impact analysis report shall include, at a minimum, the following maps and tables:

-Maps indicating the location of the wind impact sensors, for the existing (no-build) condition and future build scenario.
-Maps indicating mean and effective gust wind speeds at each sensor location, for the existing (no-build) condition and each future build scenario, on an annual basis and seasonally. Dangerous and unacceptable locations shall be highlighted.
-Maps indicating the suitability of each sensor location for various pedestrian related activities (comfort categories), for the existing (no-build) condition and future build scenario, on an annual basis and seasonally. To facilitate comparison, comfort categories may be distinguished through color coding or other appropriate means. In any case, dangerous and unacceptable conditions shall be highlighted.
-All maps should include a north arrow and be oriented and of the same scale as shadow diagrams.

Shadow

A shadow analysis shall be performed for existing and build conditions for the hours 9:00 a.m., 12:00 noon, and 3:00 p.m. for the vernal equinox, summer solstice, autumnal equinox, and winter solstice and for 6:00 p.m. during the summer and autumn, it should be noted that due to the time differences (daylight savings v. standard), the autumnal equinox shadows would not be the same as the vernal equinox shadows and therefore separate shadow studies are required for the vernal and autumnal equinoxes. KP.2

The shadow impact analysis shall include net shadow as well as existing shadow and must clearly show the incremental impact of the Proposed Project. For purposes of clarity, new shadow should be shown in a dark, contrasting tone distinguishable from existing shadow. The shadow impact study area shall include, at a minimum, the entire area to be encompassed by the maximum shadow expected to be produced by the Proposed Project. The build condition shall include all buildings under construction and any proposed buildings anticipated to be completed prior to the completion of the Proposed Project. Shadow from all existing buildings within the shadow impact study area shall be shown. A North Arrow shall be provided on all figures. Shadows shall be determined by using the applicable Boston Azimuth and Altitude data.

Particular attention shall be given to existing or proposed public open spaces and pedestrian areas, including, but not limited to, the existing sidewalks and pedestrian walkways within, adjacent to, and in the vicinity of the Proposed Project and the existing and proposed plazas, historic resources and open space areas within the vicinity of the Proposed Project.

The Proposed Project shall demonstrate conformance with the Stuart Street Planning Study Development Review Guidelines regarding the Copley Square Park (please see below). KP.3

> *"Each proposed project shall be arranged and designed in a way to assure that it does not cast shadows for more than two hours from 8:00 a.m. through 2:30 p.m., on any day from March 21 through October 21, in a calendar year, on any portion of Copley Square Park (bounded by Boylston Street, Clarendon Street, St James Ave. and Dartmouth St, excluding land occupied by Trinity Church.)"*

Daylight

(Please refer to Urban Design's comments)

Solar Glare

The Proponent has stated that the Proposed Project's design is not anticipated to include reflective glass or other reflective materials, thus, the Proponent does not anticipate the creation of either an adverse solar glare impact or a solar heat buildup in nearby buildings. However, should the design change and incorporate substantial glass-facades (reflective glass), a solar glare analysis shall be required.

The analysis shall measure potential reflective glare from the buildings onto potentially affected streets and public open spaces and sidewalk areas in order to determine the likelihood of visual impairment or discomfort due to reflective spot glare. Mitigation measures to eliminate any adverse reflective glare shall be identified.

Air Quality

The Proponent shall provide a description of the existing and projected future air quality in the Proposed Project vicinity and shall evaluate ambient levels to determine conformance with the National Ambient Air Quality Standards (NAAQS). Careful consideration shall be given to mitigation measures to ensure compliance with air quality standards.

A future air quality (carbon monoxide) analysis shall be required for any intersection (including garage entrance/exits) where the level of service (LOS) is expected to deteriorate to D and the Proposed Project causes a 10 percent increase in traffic or where the level of service is E or F and the Proposed Project contributes to a reduction in LOS. KP.4

The study shall analyze the existing conditions, future No-Build and future Build conditions. The methodology and parameters of the air quality analysis shall be approved in advance by the BRA and the Massachusetts Department of Environmental Protection (DEP). Mitigation measures to eliminate or avoid any violation of air quality standards shall be described.

There are currently two sets of National Ambient Air Quality Standards (NAAQS) for particle pollution: one for coarse particles (PM10) and the other for fine particles (PM2.5).

The health-based primary standard for PM10 is 150 micrograms per cubic meter (ug/m) averaged over a 24-hour period. The primary standards for PM2.5 are 15 ug/m averaged over an entire year and 35 ug/m averaged over a 24-hour period. The Proponent shall be required to demonstrate compliance.

A description of the Proposed Project's heating and mechanical systems including location of buildings/garage intake and exhaust vents and specifications, and an analysis of the impact on pedestrian level air quality and on any sensitive receptors from operation of the heating, mechanical and exhaust systems, including the building's emergency generator as well as the parking garage, shall be required. Measures to avoid any violation of air quality standards shall be described. KP.5

The Construction Management Plan (CMP) shall include mitigation measures to ensure the short-term air quality impacts from fugitive dust expected during the early phases of KP.6

construction from demolition of existing buildings and site preparation activities are minimal.

Noise

The Proponent shall be required to establish the existing noise levels at the Proposed Project site and vicinity based upon a noise-monitoring program and shall calculate future noise levels after the Proposed Project completion based on appropriate modeling and shall demonstrate compliance with the Design Noise Levels established by the U.S. Department of Housing and Urban Development for residential and other sensitive receptors and with all other applicable Federal, State and City of Boston noise criteria and regulations. The noise evaluation shall include the effect of noise generated by the area's traffic and other noise sources. Any required mitigation measures to minimize adverse noise impacts and to reduce interior noise levels of residential and other sensitive receptors to acceptable limits shall be described. KP.7

Analyses of the potential noise impacts from the Proposed Project's mechanical and exhaust systems and compliance with applicable regulations of the City of Boston shall be required. Descriptions of the Proposed Project's mechanical and exhaust systems and their location shall be included. Measures to minimize and eliminate adverse noise impacts on nearby sensitive receptors shall be described.

Groundwater

The Proponent has stated that the Proposed Project is located within the Groundwater Conservation Overlay District (GCOD) established under Article 32 of the Zoning Code. The Proponent has stated that the Proposed Project is located in an area where groundwater levels have traditionally been down below what is usual and below where wood pilings are regularly cut off, thus exposing the tops of the pilings to oxygen and potential rot, with groundwater elevations measured generally between EL 2.5 and 5.5 when measured against Boston City Base.

The Proponent has provided a comprehensive description of the Proposed Project's compliance with the GCOD, stating that the Proposed Project will not cause a reduction in area groundwater levels and will also include the installation of a recharge system.

The Proponent shall be required to consult with the Boston Groundwater Trust as well as the Boston Water and Sewer Commission. KP.8

Sustainable Design/Green Buildings

Any project subject to Article 37 shall contact the NSTAR Account Sales Executive in the pre- design stage and utilize the Comprehensive Design, Custom or Advanced Building Programs. The project will target at least a 25% combined electric and gas savings over the current Massachusetts Building Code. The Comprehensive Design Program is for commercial buildings over 100,000. The program is designed to incorporate an integrated approach to building design that may offer higher custom incentives based on the interactive building model required for the program. The Advanced Building program targets commercial building between 10,000 and 100,000 sf based on a prescriptive set of requirements with no modeling required and an incentive of $1.50 a sf is offered for this program.

The purpose of Article 37 of the Boston Zoning Code is to ensure that major buildings projects are planned, designed, constructed and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston. Any proposed project subject to the provisions of Article 37 shall be LEED Certifiable (U.S. Green Buildings Council) under the most appropriate LEED rating system. Proponents are encouraged to integrate sustainable building practices at the pre-design phase. Proposed Projects which are subject to comply with Section 80B of the Boston Zoning Code, Large Project Review, shall be subject to the requirements of Article 37.

As per the Draft Stuart Street Planning Study Development Review Guidelines the Proponent was encouraged to "incorporate advanced sustainability methods and/or accreditation that achieve certifiable status at LEED Silver level or equivalent, whichever meet or exceed environmental standards in effect." The Proponent has responded accordingly and has indicated that the Proposed Project is striving to achieve 53 points (silver certification) under the LEED 2009 for New Construction and Major Renovations rating system.

The Proponent is encouraged to strive to attain additional points, such as those indicated as "maybes" (15), as points may be dropped during the design and construction phases. The Proponent shall be required to continue to work with the Proposed Project team and research additional sustainable and energy-efficient measures to be incorporated into the Proposed Project design and as the building design develops, strive to achieve a higher level of LEED certification.

The Proponent has stated that a minimum of a 20% improvement over a baseline building performance rating has been targeted for the Proposed Project. The Proponent is reminded that the Proposed Project must demonstrate compliance with the Massachusetts Stretch Energy Code. The Proponent shall demonstrate that the designed energy use in the Proposed Project is at least 20% below the use expected based on the energy modeling standards contained in ASHRAE 90.1 2007.14, which is the latest version of the national model code for commercial buildings. The Proponent shall be required to explore methods to achieve an even greater percentage better than the Massachusetts Stretch Energy Code.

KP.9

The Proponent shall be required to revise and update the LEED checklist as the Proposed Project design advances. Prior to the Article 80B process completion the Proponent shall be required to submit a Final Article 37 Submission Package This package shall include the most current and accurate LEED Checklist, together with a comprehensive narrative, detailing how each of the points will be achieved. Please refer to the USGBC guidelines as to what is deemed necessary to demonstrate that the point has been achieved (or will be).

KP.10

KP.1 Wind

See Section 4.1.

KP.2 Shadow

See Section 4.2.

KP.3 Stuart Street Planning Study - Shadow

Section 4.2 includes a shadow analysis that confirms consistency with the Stuart Street Planning Study.

KP.4 Air quality

See Section 4.4.

KP.5 Heating and mechanical systems

See Section 4.4.

KP.6 Construction Management Plan

The Construction Management Plan will include mitigation measures regarding air quality.

KP.7 Noise

See Section 4.5.

KP.8 Groundwater

The Proponent will consult with the Boston Groundwater Trust and Boston Water and Sewer Commission regarding groundwater.

KP.9 Energy

When the design is in a more advanced stage, the Proponent will complete an energy model to confirm compliance with the Stretch Energy Code.

KP.10 LEED Checklist

See Section 4.6 and Appendix E. The Proponent currently anticipates achieving the Gold level under the LEED rating system.

December 14, 2012

Geoffrey Lewis, Senior Project Manger
Boston Redevelopment Authority
Boston City Hall, 9th Floor
Boston, MA 02201

RE: 40 Trinity Place ("PNF")

Dear Mr. Lewis:

Thank you for the opportunity to comment on 40 Trinity Place - (PNF) dated on November 7, 2012. Trinity Stuart LLC is proposing the construction of a new 33 story, 379,370 square foot mixed-use building with approximately 142 residential and 220 hotel rooms with accessory conference center, and two restaurants. The project is located at the corner of Stuart Street and Trinity Place, abutting 100 Clarendon Street Garage to the south and 426 Stuart Street (University Club) to the east, in Back Bay. The building will allow parking for residential parking for 100 vehicles on levels 4 & 5 via vehicle elevators with access/egress via Trinity Place. The project will request valet for hotel and restaurant on both Stuart St. and Trinity Place. The rear of the building will serve as the loading area- with both service and loading occurring on site.

The Boston Transportation Department (BTD) is required to comment on the combined impacts of all the components of the project. The proponent needs to address these comments and concerns when preparing future submissions as part of the Article 80 process as well as the Transportation Access Plan Agreement. Please note that upon BTD's final review and approval, a Transportation Access Plan Agreement codifying the transportation agreements and mitigation reached with BTD needs to be executed.

Parking

The proponent is proposing 100 on-site parking spots resulting in a .70 ratio of spaces per unit. The proponent is within a quarter mile of approximately 4,700 public off-street parking spaces. BTD.1 Current trends indicate that electric hybrids will soon be a significant percentage of all vehicles on the road. BTD is aggressively promoting the installation of a supporting infrastructure for these vehicles. We request a commitment to dedicate 5 percent of the total parking capacity to low-emitting and fuel efficient vehicle spaces for electric vehicle parking in addition to car-share to meet climate actions goals set forth by the City. The site will also utilized valet parking service to hotel and restaurant patrons at nearby facilities- looking at 4 spaces on Stuart Street and Trinity Place.

The area is thoroughly served by MBTA public transit lines including Heath Street Green line and 39 buses in the project radius is located one-half mile from the Brookline Village MBTA D-line stop as well as 4 other bus line stops. BTD would like to thank the proponent for accounting for bike parking accommodations (according to the City's Bike Parking Guidelines) of one in each unit as well as at spaces in front of the building. BTD requests a commitment to additional parking at the garage level for visitors and residents that can no accommodate the space at the apartment level. BTD.2

Traffic

To help evaluate both existing and future conditions, the study proposes four intersections: St. James/Trinity Place; St. James/Clarendon Street; Stuart St/ Trinity Place and Stuart St/Clarendon St. BTD requests that two intersections be added to the study to include St. James/Dartmouth and Stuart/Dartmouth St. This is in response to neighborhood concerns regarding traffic at peak hours and on weekends close to the site. BTD will require the proponent to study these intersections and make recommendations to improve vehicular and pedestrian flow. The proponent will need to coordinate with the anticipated Copley Place project in efforts to coordinate traffic study areas. BTD.3

Transportation Demand Management

BTD thanks the proponent for the described TDM measures listed in the PNF, including bike parking guideline ratios, car & bike share, transit information and a transportation coordinator position. BTD would suggest obtaining information on EV charging locations also at area garages. BTD.4

Service and Loading

We commend the proponents for providing off-street facilities for loading, garbage collection activity ; and particularly the appointment of a transportation coordinator to manage area activities and recommend posting "no idling" signage in loading and parking areas to assist BTD's efforts of reducing emissions & traffic congestion caused by off-street truck maneuvering and loading.

Site Plan

The proponent needs to submit an engineered site plan within the context of the surrounding roadways at 1:20 scale depicting: BTD.5

- Vehicular Access and Circulation	- Service and Loading*
- Parking Layout and Circulation	- Roadways and Sidewalks
- Pedestrian Access and Circulation	- Building Layout
- Bicycle Access and Circulation	- Bicycle Parking Locations and Types (covered, indoor, bike share, etc)
- Area Shuttle/Van Pool Pickup and Drop-off	- Transit Stops and Connections
- Parking Spaces for Car Sharing services	- Electric Vehicle Charging Stations

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

Construction Management Plan
As the projects in the PNF advance, 40 Trinity Place 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 stating, sidewalk relocations and hours of construction work. BTD acknowledges carpooling and transit subsidy commitments and will work with the proponent to execute the CMP. BTD.6

The issues raised above should be addressed in the TAPA to be provided for the projects in the IMP. BTD looks forward to working collaboratively with the Trinity Stuart LLC and the community in review of these projects and to address any outstanding concerns in the permitting process.

Sincerely,

Rachel Szakmary
Transportation Planner
Boston Transportation Department
Policy and Planning Division

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

BTD.1 Electric vehicle parking

As demand mandates, the Project will commit to providing up to 5% of total on-site parking supply (five spaces) with electric vehicle charging stations. Two nearby garages have electric vehicle charging stations, the John Hancock Tower (private) with three stations and the 100 Clarendon Street garage (public) with five stations. In addition, the Proponent installed the first street-accessible electric vehicle sharing station in Boston outside of the Lenox Hotel.

BTD.2 Bicycle parking

Secure, safe bicycle storage (longer-term parking) will be provided for residents and employees within the building. Short-term bicycle parking for visitors will be at street level on sidewalks conveniently located to Project entrances subject to receipt of necessary approvals. The Proponent will work with Boston Bikes and BTD to identify the appropriate number of bicycle racks for visitors given sidewalk constraints in the area. All bicycle parking will conform to BTD guidelines.

BTD.3 Traffic

The Proponent has expanded the study area to include the six intersections as requested by the BRA. See Figure 3-1 for a map showing study area intersections. The transportation study presented in Chapter 3 assesses the impacts under Year 2018 Build conditions. The proposed expansion at Copley Place, among several other planned development projects in the area, have been incorporated into the transportation study. See Section 3.3.1.1.

BTD.4 Electric vehicle charging stations in the area

Two nearby garages have electric vehicle charging stations, the John Hancock Tower (private) with three stations and the 100 Clarendon Street garage (public) with five stations.

BTD.5 Site plan

As part of the Transportation Access Plan Agreement with the City, the Proponent will submit an engineered site plan with the required information.

BTD.6 Construction Management Plan

As required by BTD, the Proponent will provide a detailed Construction Management Plan, which will include travel demand measures for construction workers, proposed street occupancies, equipment siting, sidewalk relocations, and hours of construction work.

Addressed by BRA.21 through BRA.40

MEMORANDUM

TO: Geoff Lewis
FROM: David Carlson
DATE: January 13, 2013 and as amended
SUBJECT: **40 Trinity Place PNF**
Scoping Comments

The 40 Trinity Place Project is a proposal by Trinity Stuart LLC (Jordan Warshaw, the Saunders Hotel Group) to demolish the existing 8-story Boston Common Hotel and Conference Center building and to redevelop the site as a tower containing about 142 residential units, a hotel of some 220 keys, and a restaurant at 40 Trinity Place at the SE corner of Stuart Street (and including air rights over 426 Stuart, the University Club) in the commercial area of the Back Bay neighborhood. This Project also includes on-site parking for the residential component and the potential for expansion of the adjacent University Club. Access remains from Stuart, Trinity, and the access driveway around this site, serving the University Club, and the YWCA adjacent to the Hancock Garage; details of this require further investigation. Agreements with the abutters will likely be required. The property in fact overlaps somewhat the Hancock Garage. The architect is The Architectural Team of Chelsea, with hotel interior spaces designed by Stonehill & Taylor Architects, P.C. of New York City.

The Proposed Project increases the FAR on its site (including the University Club parcel) to about 17.5, with a height of about 400'. Background zoning has an FAR of 8 with no height limit; IPOD zoning allows an enhanced (with Article 80 LPR) FAR of 10 and a height of 155'; the Stuart Street Zoning Study recommended an FAR of up to 17.5 and height of up to 400' for a project meeting certain criteria.

Comments are offered below related to a few environmental categories as well as Urban Design; please take these as modest augmentations of comments offered by others.

URBAN DESIGN COMPONENT

The BCDC voted to review the Proposed Project on January 8, 2013 and saw a preliminary presentation. The Project was referred to Design Committee, which met on January 22 and further discussed concerns. When sufficient progress in preparation of a Preferred Alternative in the DPIR in response to the Scoping Document has been made pursuant to preliminary BCDC, IAG/public, and BRA staff comments, BCDC Design Committee meetings should be further scheduled by contacting David Carlson, Executive Director of the BCDC. Minutes from the 40 Trinity portion of the January BCDC meeting are attached.

It should be noted that a more advanced design should allow more in-depth comment at the DPIR stage. We reserve the right to comment at that stage toward the submission of an FPIR. In general, we will ask for studies related to all requested alternatives, with certain modifications, as well as comparisons to both existing conditions and an 'as-of-right' alternative. The 40 Trinity Place Project is at an interesting location in the Back Bay, and stands to make a significant difference on its block of Stuart Street. The proposed height places the Project in interesting company in the area; it should not try to compete directly but achieve its own form of expressed elegance. The following urban design objectives should be addressed in the DPIR submission.

1) Standard alternatives for study include no-build, and an 'as-of-right' build-out...in this case FAR 10, with a height of 155'. This alternative will conform to the density planned and anticipated in this area under current zoning, but not necessarily under the Stuart Street study. The Proponent has presumed a process allowing the flexibility in density and height pursuant to recommendations in the latter and so should conform to the preconditions contained therein.

2) In general, the project should strive to minimize any incremental increase in environmental impacts as compared with either the full 'as-of-right' build-out or existing conditions. The specific building volume and massing should be designed such that with respect to criteria such as daylight, shadows, and wind, some elements or points may be worse, but analysis will prove that the whole is better as a Project. We will expect in fact that mitigations or positive urban benefits will result from this Project and in balance far outweigh any negative impact. Specific shadow and wind investigations will be requested - a separate category in this memorandum - to determine what the impacts are specifically regarding Copley Square. Height, tower shaping and setbacks should be adjusted to minimize any impacts.

3) The highest building elements generally should be as diverse in height as possible, but orchestrated to be a natural completion to the idea of the building and not set in forced counterpoint. Where desirable to create an emphasis or entry, the higher facade elements could come straight down to the ground...but only if wind conditions (or effective mitigations of same) permit such. We ask that any infrastructure constraints in particular be studied to clarify any limitations for the Proposed Project.

4) The most active ground floor program elements (entries to residential, hotel, and restaurant/skylobby function uses) should be not only retained but enhanced as a positive element of the Project, with entries possibly on both public sides, but adequate space and program planning along the sidewalk to avoid confusion or conflict. A hierarchy of such uses should be considered. Transparency and views into the uses must be maximized on each frontage.

5) Multiple upper story uses as shown in the PNF are accordingly encouraged to enliven the streets with a diversity of activity throughout the day. Necessary service and access functions should not occur in areas where they will *directly* impact key points in the paths of residents and visitors.

6) Above-grade garage floors should be covered, where possible, with program uses on all sides. Treatment of any directly visible portions of the garage should be of a high architectural character with robustly convincing detail.

7) The Proposed Project is a layering of uses with at least one dramatically intended carving of the volume. Emphasize both aspects. And SIMPLIFY the chosen expression(s). Try to make the building appear slim in proportion. A strong, simple form may be best against the backdrop of the massive Hancock Garage structure.

8) Study the choice of materials carefully. The nature of the curtainwall should be studied carefully - and understood as part of the composition. If the building is less a curtainwall and more metal, then the metal should have a special character or articulation - and not be just a flat metal panel system, which would diminish the potential appeal of the building.

9) Street edges and new sidewalks created as a result of any version of the Proposed Project must conform to all applicable standards and be appropriately sized to bear pedestrian traffic peaks. Street trees or plantings should be included in site plans. Incorporate bicycle stations into the Project...both public and private.

Among others, the refined design included in the DPIR must satisfactorily address all the above parameters. An accurate sense of scale of the Proposed Project in its context must be achieved. Focus on key distanced views, as well as key intermediate/user viewpoints, to guide the design composition of the Proposed Project. Utilize techniques that capture the context at each scale. Reinforce pedestrian pathways; develop a plan which shows the building program and how it supports such activity within the pedestrian/public access network. Active programming that will engage the public should be maximized. Take note of the fundamental contextual strengths of the site, including its connections to Back Bay Station, the MBTA, and Copley Square - and the other nearby towers in the present and future skyline - incorporate that sense into the overall design approach, tempered/enhanced by the proposed uses.

The PNF Proposal includes parcels not currently under direct control of the redeveloper. Evidence of the team’s ability to secure an arrangement for use of these parcels (and air rights) must be submitted.

We reserve the right to add additional concerns during the course of the process of combined BRA staff, IAG, and BCDC review which may affect the responses detailed in the DPIR. The following urban design materials for the Proposed Project's schematic design must be submitted for the DPIR.

1. Written description of program elements and space allocation (in square feet) for each element, as well as Project totals.
2. Neighborhood plan, elevations and sections at an appropriate scale (1"=100' or larger as determined by the BRA) showing relationships of the proposed project to the neighborhood context:
    - a. massing
    - b. building height
    - c. scaling elements
    - d. open space
    - e major topographic features
    - f. pedestrian and vehicular circulation
    - g. land use
3. Color, or black and white 8"x10" photographs of the site and neighborhood.
4. Sketches and diagrams to clarify design issues and massing options.
5. Eye-level perspective (reproducible line or other approved drawings) showing the proposal (including main entries and public areas) in the context of the surrounding area. Views should display a particular emphasis on important viewing areas such as key intersections, pathways, or public parks/attractions. Some suggested viewpoints include (also see Copley Expansion Project views): north and south along Dartmouth and Clarendon, from Copley Square, east and west along Stuart, from the Southeast Expressway, from Memorial Drive (skyline), from adjacent residential neighborhoods (South End, Bay Village), et al. Long-ranged (distanced) views of the proposed project must also be studied (some are suggested above) to assess the impact on the skyline or other view lines. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) at least both the build and no-build conditions; any alternatives proposed should be compared as well. Planned context (projects approved) should also be included in build conditions. The BRA should approve the view locations before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.
6. Additional aerial or skyline views of the project, if and as requested.
7. Site sections at 1"=20' or larger (or other scale approved by the BRA) showing relationships to adjacent buildings and spaces.
8. Site plan(s) at an appropriate scale (1"=20' or larger, or as approved by the BRA) showing:
    - a. general relationships of proposed and existing adjacent buildings and open spaces
    - b. open spaces defined by buildings on adjacent parcels and across streets
    - c. general location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features
    - d. pedestrian, handicapped, vehicular and service access and flow through the parcel and to adjacent areas
    - e. survey information, such as existing elevations, benchmarks, and utilities
    - f. phasing possibilities, if applicable
    - g. construction limits

9. Massing model (ultimately in basswood) at 1":40'0" for use in the Authority's Downtown Model
10. Study model at 1" = 16' or 1" = 20' showing preliminary concept of setbacks, cornice lines, fenestration, facade composition, etc.
11. Drawings at an appropriate scale (<u>e.g.</u>, 1":16'0", or as determined by BRA) describing architectural massing, facade design and proposed materials including:
    - a. building and site improvement plans
    - b. neighborhood elevations, sections, and/or plans showing the development in the context of the surrounding area
    - c. sections showing organization of functions and spaces, and relationships to adjacent spaces and structures

d. preliminary building plans showing ground floor and typical upper floor(s).
e. phasing, if any, of the Proposed Project

12. A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.
13. Electronic files describing the site and Proposed Project at Representation Levels one and two ("Streetscape" and "Massing") as described in the document *Boston "Smart Model": CAD & 3D Model Standard Guidelines*.
14. Full responses, which may be in the formats listed above, to any urban design-related issues raised in preliminary reviews or specifically included in the BRA scoping determination, preliminary adequacy determination, or other document requesting additional information leading up to BRA Board action, inclusive of material required for Boston Civic Design Commission review.
15. Proposed schedule for submission of all design or development-related materials.
16. True-scale three-dimensional graphic representations of the area indicated above either as aerial perspective or isometric views showing all buildings, streets, parks, and natural features.

SHADOW AND WIND COMMENTS

In addition to the comments and scoping by others, the Proponent is directed to conduct a specific shadow analysis for the specific time range of any new impacts on Copley Square Park....in other words defining rough extent and duration in terms of hours and time of year. Give particular attention to the period from March 21 to October 21; the Proposed Project should conform to the criteria suggested in the Stuart Street Zoning Study. Include duration studies for any other impacted open spaces in the area, including the Southwest Corridor, and the park on Stanhope Street. If overall duration is greater than one hour, provide an overlap study which defines any area impacted by shadows for a period greater than one hour. All net new shadows shall be defined as outlined elsewhere either by darker tone or color and shall be clearly shown to their full plan extent, whether on street, park, or rooftop.

Regarding wind, *all wind tunnel test points shall be approved by BRA staff* before conduction of testing. Wind analysis may be requested at points within several blocks of the property in question; especially where contiguous to open space, analysis may extend to likely bounds of no impact. Analysis of results and effective mitigation shall be presented in the DPIR using diagram methodology so that the delta or changes manifested by the project relative to existing or as-of-right conditions...again, whichever provides the higher base impacts...are clearly understood.

DAYLIGHT COMPONENT

The BRADA program used for this analysis should look at views from Stuart and from Trinity Place. If a Proponent wishes to substitute a more contemporary computer program for the 1985 BRADA program, its equivalency must first be demonstrated to the satisfaction of BRA staff before it is utilized for inclusion in the DPIR, and it must be commonly available to Boston development team users.

INFRASTRUCTURE SYSTEMS COMPONENT

An infrastructure impact analysis must be performed.

The discussion of Proposed Project impacts on infrastructure systems should be organized system-by-system as suggested below. The applicant's submission must include an evaluation of the Proposed Project's impact on the capacity and adequacy of existing water, sewerage, energy (including gas and steam), and electrical communications (including telephone, fire alarm, computer, cable, etc.) utility systems, and the need reasonably attributable to the proposed project for additional systems facilities.

Any system upgrading or connection requiring a significant public or utility investment, creating a significant disruption in vehicular or pedestrian circulation, or affecting any public or neighborhood park or streetscape improvements, comprises an impact which must be mitigated. The DPIR must describe anticipated impacts in this regard, including specific mitigation measures, and must include nearby Proposed Project (i.e. the Copley Expansion tower, Columbus Center, Exeter Residences, 888 Boylston, et al.) build-out figures in the analysis. The standard scope for infrastructure analysis is given below:

1. Utility Systems and Water Quality

a. Estimated water consumption and sewage generation from the Proposed Project and the basis for each estimate. Include separate calculations for air conditioning system make-up water

b. Description of the capacity and adequacy of water and sewer systems and an evaluation of the impacts of the Proposed Project on those systems; sewer and storm drain systems should include a tributary flow analysis as part of this description

c. Identification of measures to conserve resources, including any provisions for recycling or 'green' strategies, including green roofs

d. Description of the Proposed Project's impacts on the water quality of Boston Harbor or other water bodies that could be affected by the Project, if applicable

e. Description of mitigation measures to reduce or eliminate impacts on water quality

f. Description of impact of on-site storm drainage on water quality

g. Information on how the Proposed Project will conform to requirements of the Ground Water Trust under Article 32, if applicable, by providing additional recharge opportunities

h. Detail methods of protection proposed for infrastructure conduits and other artifacts, including the MBTA tunnels and station structures, and BSWC sewer lines and water mains, during construction

i. Detail the energy source of the interior space heating; how obtained, and, if applicable, plans for reuse of condensate.

Thorough consultation with the planners and engineers of the utilities will be required, and should be referenced in the Infrastructure Component section.

2. Energy Systems

a. Description of energy requirements of the project and evaluation of project impacts on resources and supply

b. Description of measures to conserve energy usage and consideration of the feasibility of including solar energy provisions or other on-site energy provisions, including wind, geothermal, and cogeneration.

Additional constraints or information required are described below. Any other system (emergency systems, gas, steam, optic fiber, cable, etc.) impacted by this development should also be described in brief.

The location of transformer and other vaults required for electrical distribution or ventilation must be chosen to minimize disruption to pedestrian paths and public improvements both when operating normally and when being serviced, and must be described. Storm drain and sewage systems should be separated or separations provided for in the design of connections.

Excerpted from the minutes of the BCDC of January 8, 2013:

WR remained recused for the next item. The next item was a presentation of the **40 Trinity Place Project**. Gary Saunders stood and introduced himself and his brother Jeff. He noted Jordan Warshaw (JW) was their partner and would begin as Gary Kane (GK) of The Architectural Team (TAT) finished setting up. JW began by noting the locus. JW: This is the Hancock Conference Center site; we are taking air rights over the University Club. The YWCA is the third building on the (sub-)block. The building was originally built sequentially; the higher portion (the Conference Center) was built later. Windows are small in the existing building (shows picture) and the first floor is 8 steps up. It's an ADA nightmare - for those who know it's here to begin with, against the wall of the Hancock Garage. One of the keys of this Project is to reanimate the site - so even the Boston Preservation Alliance has supported something new. (Shows section diagram of program. Points...) This is for the expansion of the University Club, although they are undecided on their program. Above that, parking. It's too expensive below grade, but also gives a better footprint above, in the cantilevered zone. Then hotel, then the sky lobby/amenities levels, including a restaurant and conference center. Condos are above. The plan (shows) is formed in part by shadow limitations, since the community is sensitive to Copley Square. The shadows are okay in summer and in winter; the shoulder season (and time, roughly 9-11am is at issue) is the concern. JW then showed the ground floor plan, and a typical hotel floor plan. LW asked about the cantilever toward the garage, and JW noted a property overlap. JW showed the sky lobby floor for the hotel, with a stair up to the conference center. JW: There is an outside terrace with views toward the South End. There are bathrooms with City views.

Michael Liu (ML) of TAT noted that they would show the PNF images, but that the design has evolved further with BRA staff, and Gary would show that. ML: The base is regular, doing 'urban design work.' The building footprint should be about 13,000 SF, but constraints at the base force it to 11,000. We bump it out to 12,000 with the core, trying to maximize it. We are trying to develop a form that distinguishes itself, but doesn't blur the reading of the Hancock. The curve does some work to reduce the shadow impacts, and the building is turned 'sideways' for the same reason, as well as visual interest. It takes its sculptural form from the curve. But it's also orienting internal views. That results in the faceting, which is the distinguishing characteristic. The YWCA and University Club both have punched windows; the Hancock is set back from the street. So there is a limited amount we can do for the street with our frontage. So there are lobbies, but light and activity in the restaurant, which is lively, and enlivening for the street. DS: Isn't the Simon tower blue glass? ML noted the graphics here are diagrammatic, showing curtainwall and metal-paneled areas. GK: The comment from BRA staff was to simplify. GK then went through a series of iterations, looking toward the (south)east from two altitudes. They had aligned edges, reduced fins, gone to two from three materials, and returned to a curve on both sides. GK then showed a quick fly-around 'just of the block, not of it in the City.' GK: We wanted to get the simplicity of the east and bring it to the west side.

DH: This is a really exciting project. The sky lobby could be great. The notion to simplify is good. I'm less concerned about the (SE) view down Stuart, versus other views (from the SE, from Copley). It looked bisected. The fly-around is good, but we really need to see a model in Committee. LE: Street-level views as well. It would help to understand the parameters. DC: The Hancock Building, and Dartmouth Street views. Trinity Place is like an alley, but think of it more as a connection. DH: Could that be cobbled? It would really transform it. JW: We have talked about that with Boston Properties, because it's also their garage entry. If they and the City are okay with it, we're in agreement. DS: Other projects should be shown in the model. It's confusing to have two roof forms going two directions, stronger to have one. KS: The faceting is a nice contrast to the angularity of the Hancock. Show views both day and night. We'll give lighting here more attention than we did at Nashua. On Stuart, think about how to make sense of that mishmash. On your ground plane, I don't quite understand how that works. MD: I'm not quite convinced by the ground floor yet, its faceting. Why not normalize it, and make the upper portion more interesting? You're losing what little space you have. Also - how it connects to the above program. You don't always have to hold the street edge, but I'm not sure why you're not.

JW: These are similar to the BRA comments; we have concentrated on floors 6-33. The top and the ground need work. DH: There are a lot of buildings that have *craft* in this area. I would be interested in discussing the curtainwall - how it makes its breaks, walls, angles. Especially with the Hancock as a simple, elegant backdrop. KS: Think about the entry procession into a big (tall) space, like the Langham in Hong Kong, for a relationship to the sky lobby. JW: We're thinking about that for the restaurant, 'hanging' that so that the spaces interact. Like the Dana in Chicago. The massing here is generally done in accord with the Stuart Street Planning Study. With no other comments, the 40 Trinity Place Project was sent to Design Committee.

Note: 40 Trinity was also seen in Design Committee (DH, AL, KS) on January 22.

The memorandum submitted by David Carlson was incorporated into the BRA Scoping Determination and comments have been addressed above in response to comments BRA.21 To BRA.40.

The Commonwealth of Massachusetts
House of Representatives
State House, Boston 02133-1054

January 3, 2013

Geoff Lewis
Boston Redevelopment Authority
One City Hall Square, 9th Floor
Boston, MA 02201

Re: 40 Trinity Place

Dear Mr. Lewis:

As State Representatives whose districts include the Back Bay and South End, we are writing with comments regarding the scope of review the Boston Redevelopment Authority should require Trinity Stuart LLC to undertake in connection with the building proposed for 40 Trinity Place. HR.1

<u>Wind Impacts</u>
At a recent meeting, the proponent's representative stated that the proponent's goal is to improve upon the existing wind conditions. We wholeheartedly support this goal and ask that scope of review require the proponent to evaluate wind mitigation measures that will improve the existing conditions, especially for pedestrians.

Given the extraordinary wind caused by the Hancock Tower, we ask that the wind analysis for this project use actual readings taken at each location to be studied. In this way, the on-the-ground reality is the baseline for all measurements. This area of the Back Bay is already uncomfortable for pedestrians, and local residents avoid it. We should forthrightly address the problem, and we can do so only with accurate data.

<u>Shadow Impacts</u>
Any building that limits the amount of sunshine on Copley Square is a serious concern. In addition to evaluating shadows cast by the proposed building, we ask that the scope of review require the proponent to evaluate alternative designs that (a) reduce the amount of new shadow that would be cast on Copley Square by the proposed building and (b) eliminate new shadow from being cast on the park between one hour after sunrise and one hour before sunset. HR.2

With the information gained from these alternative designs, we can make better informed judgments about the merits of the proposed building and the tradeoffs being sought by the proponent.

In addition, the shadow study should be required to show any new shadows cast on the courtyard of the Boston Public Library's McKim building and on the Commonwealth Avenue Mall.

<u>Traffic Analysis</u>
In addition to studying traffic and pedestrian counts for the four intersections proposed in the PNF, we ask that the proponent be required to analyze the traffic impacts on Dartmouth St. HR.3

between Newbury St. and Tremont St. and develop appropriate mitigation measures, if necessary.

We do not support a 0.7 parking ratio for the proposed residential units. We ask that the proponent be required to study traffic impacts using a more typical 0.5 parking ratio for residential units. This is a more appropriate ratio given the site's close proximity to public transportation and the ease of commuting by walking from the site to downtown or the nearby commercial areas. HR.4

Alternatives Analysis

We ask the BRA to require the proponent to evaluate an alternative proposal that includes an elementary school in the building. We note that the Massachusetts School Building Authority has a spreadsheet on its website that allows a person to calculate different amounts of square footage for a possible school based on a variety of assumptions. We would be pleased to work with the proponent on creating a set of assumptions that would be used to understand how a school could be included on site. HR.5

As the proponent considers what uses can be accommodated in the building, we propose that the developer evaluate a building that (1) includes use of the air rights over Trinity Place, (2) reduces the number of parking spaces so that the parking ratio for the residential units is 0.5 rather than 0.7 as proposed, and (3) uses space on a roof added to the Hancock Garage adjacent to the site (this could be appropriate for a school's outdoor recreation space). HR.6 HR.7 HR.8

University Club Air Rights and FAR Calculation

We request that the BRA require the proponent to explain in detail the arrangement it has with the University Club with regard to (1) the use of the University Club's air rights and (2) what space within the proposed building will be used by the Club. In addition, we ask that the proponent be required to identify what air rights the University Club will convey to the proponent and what air rights the Club will retain for possible future development. HR.9

We further request that the BRA require the proponent to calculate the project's FAR using only that portion of the University Club's air rights that will be used for the new building. The proponent's FAR calculation uses all of the University Club's air rights, even though it appears that not all of those air rights will be conveyed to the proponent. By doing so, the FAR is smaller than it would be if it is calculated based on the actual air rights used. HR.10

Draft Stuart Street Development Review Guidelines

The most recent draft of these guidelines specifies that for portions of new development that extend above the base level street wall height, the average residential floor plate above 200 feet high is 12,000. The DPIR should show whether or not this requirement is satisfied. HR.11

The draft guidelines also state that the maximum length is 200 feet for the portion of new development that extends above the base level street wall height. The DPIR should also show whether or not this requirement is satisfied. HR.12

The DPIR should also identify whether the revised FAR calculation requested above is more or less than the maximum allowed FAR of 17.5.

Affordable Housing
The proponent has committed to classifying 17.5% of the units as affordable housing in accordance with the most recent draft of the Stuart Street Planning Study Guidelines. We applaud that commitment.

The Project Notification Form does not state whether the affordable units will be located on-site and, if the units are on site, where they will be located in the building and the size of the units. We believe the affordable housing units should be located on-site or in the Back Bay or South End to ensure these neighborhoods have more housing that is affordable to people of all economic means. If some or all of the affordable housing will be located on site, the proponent should identify the number of units that will be on site, their size (e.g., how many will be 3 bedroom apartments), and where they will be located within the building. HR.13

Architectural Design
We know the influential role BRA staff members play in matters of exterior design. We urge the BRA to work with the proponent and its architects to take advantage of this opportunity to create a building that is architecturally bold and creative. A location outside of an architectural district provides a rare opportunity to build a tower that adds distinctive architecture to our city's built environment.

The addition of active, pedestrian friendly uses on the lower floors of 40 Trinity Place is especially important as the location is one of the few spots in Back Bay's business section that cries out for activity. As a result, the renderings included in the DPIR should pay particular attention to the design of the lower floors. HR.14

We urge the BRA to require the DPIR to include detailed renderings of the building as seen from the South End and how it will be reflected in the Hancock Tower when viewed from the south. HR.15

Impact on YWCA
At the recent community meeting, the President and CEO of the YWCA identified in general terms the concerns of her organization. We ask that the scope of review acknowledge the expressed concerns of the YWCA and that the DPIR include a plan of relief and mitigation for these concerns. HR.16

The Proponent's History of Large-Scale Development
We ask the BRA to require the proponent to explain in the DPIR its history of developing a building of the size and cost proposed here. HR.17

Please do not hesitate to contact us if you have any questions.

Sincerely,

Martha M. Walz
8th Suffolk District

Byron Rushing
9th Suffolk District

Aaron M. Michlewitz
3rd Suffolk District

HR.1 Wind

See Section 4.1.

HR.2 Shadow

See Section 4.2. The Proponent shaped the design of the Project to minimize the Project's shadow impacts on Copley Square.

HR.3 Traffic analysis

See Chapter 3.

HR.4 Parking ratio

The Project's proposed parking ratio is at 0.87 spaces per residential unit. Parking ratios for condominium uses are higher than those for rental apartment uses. The proposed parking ratio is within the 0.5 to 1.0 space per residential unit range of the maximum parking ratio guidelines recommended by BTD for residential parking in the Back Bay neighborhood. By comparison, a previous condominium development nearby in the South End by a principal of the Proponent provided 1.5 spaces per residential unit; the building's parking count is greatly reduced from that standard. The proposed parking ratios are consistent with the intent of the Stuart Street Planning Study.

HR.5 Elementary school

See response to comment BRA.8.

HR.6 Alternatives: Air rights

Trinity Place is owned by the City of Boston. The Proponent does not control the air rights above Trinity Place and therefore cannot construct its Project in such air rights.

HR.7 Alternatives: Parking ratio

See response to comment HR.4.

HR.8 Alternatives: Roof space

The Proponent does not have control over the roof of the adjacent garage, which is owned by another party, and which, the Proponent understands, will continue to be used for parking and/or redevelopment by its owner at some point in the future.

HR.9 Air rights

See response to comment BRA.32.

HR.10 FAR

See Section 1.5.1. The FAR has been calculated by using the site area of 40 Trinity Place and the adjacent University Club, and the proposed Project's building area, existing University Club building area, and area left available for a potential modest future addition by the University Club on its building. The Proponent's purchase of the air rights not currently owned is evidenced by a private, confidential agreement with the abutting landowner.

HR.11 Floor plate

The proposed design includes floor plates of just over 12,000 sf above 200 feet, which is consistent with the intent of the Stuart Street Planning Study.

HR.12 Maximum length

The proposed design has no horizontal dimension that exceeds 200 feet in length and is consistent with the intent of the Stuart Street Planning Study.

HR.13 Affordable housing

See response to comment BRA.3.

HR.14 Design of lower floors

See Chapter 5.

HR.15 Renderings

See Chapter 5.

HR.16 Impact on YWCA

The Proponent has responded to YW Boston's comments sent to the BRA. The Proponent continues to meet with representatives of YW Boston to listen to and address its concerns and intends to execute an abutter's agreement with the YW Boston.

HR.17 Proponent's history

Trinity Stuart LLC is comprised of Jordan Warshaw, Gary Saunders, and Jeffrey Saunders. Together their families have generations of roots in the South End and Back Bay as local developers and owner-operators of real estate including ownership of the Lenox Hotel, Copley Square Hotel, the Loews Back Bay Hotel and Park Plaza Hotel and managing the development of Atelier/505. They have proven themselves as owners, investors and managers of real estate development projects throughout Boston and especially the Back Bay that have created hundreds of permanent jobs, thousands of construction jobs, generated millions of dollars in property, hotel and meal tax revenues and energized Boston. Their long term ownership of many of these properties is indicative of their commitment to Boston's Back Bay neighborhood.

The Ellis South End Neighborhood Association

The Ellis South End Neighborhood Association, Inc.
Post Office Box 961
Boston, Massachusetts 02117
www.ellisneighborhood.org

January 4, 2013

Mr. Geoff Lewis
Boston Redevelopment Authority
One City Hall Plaza
Boston, MA 02201

Re: 40 Trinity Place Project

Dear Mr. Lewis:

The Ellis South End Neighborhood Association is writing to convey our comments and concerns regarding the proposed 40 Trinity Place project (the Project) as outlined in the October 29, 2012, Project Notification Form and further described by the development team at public meetings held on December 12 and 18, 2012. The planning and design of the Project is now at a schematic level and much refinement will be made as the design and review process continues. The following comments briefly summarize our neighborhood's concerns to date, and we encourage our further involvement as the Project continues through next stages of review and permitting.

The Ellis South End Neighborhood Association does not object to new development in the Stuart Street corridor, and welcomes projects which invigorate this area abutting the northern edge of the South End neighborhood. We are encouraged that the Project is proposed by Trinity Stuart LLC, with principals who have a deep background as developers and property owners in Boston. We anticipate as good neighbors, they will work with neighborhood groups and adjacent property owners to incorporate our concerns into the next stage of design.

Comments:

Height and Density: the Project has been presented as conforming with the maximum height and FAR density limits as outlined in the 2010 Stuart Street Planning Study. Zoning relief will be required to permit the project. A total height no taller than the recently built Clarendon condominium tower on Stuart Street, including all rooftop mechanical space and penthouses, is strongly preferred. The proposed tower height of 400 feet is not yet acceptable, and will be decided after the further development of floor plate changes, exterior design and wind studies. ESE.1

Traffic and Parking: the Project will increase traffic on Stuart Street and Dartmouth Street, the major cross street feeding into Stuart. These streets and nearby intersections are already over capacity at morning and evening rush hours, and we are concerned about the effect added vehicular traffic generated by the Project will create. ESE.2 A new signal light at the intersection of Stuart and Trinity Place, with pedestrian crossing signals, will be essential. ESE.3 The 100 private parking spaces proposed within the tower are accessed by two car lifts entered on Trinity Place. There is a strong likelihood that resident's waiting to park will backup Trinity Place and back onto Stuart Street at peak hours, creating further constriction of traffic flow on Stuart Street. ESE.4 Detailed traffic studies have not yet been presented. ESE.5

Wind and Shadow: We have deep concerns with wind problems, both at street level and at higher elevations this Project will create. ESE.6 High wind problems, created by taller buildings in the Stuart Street corridor, are real, unpleasant and dangerous. We will need to be convinced that rights above the University Club. We encourage the development team to study adding the air rights above Trinity Place to the floor plate, creating the potential for a larger floor plate, and a building of less overall height. Dedicating some lower level floors for public use, specifically a new Boston elementary school, should be a priority. We support and encourage this direction. ESE.7 ESE.8

Affordable Housing: affordable housing is noted in the developer's Project Notification Form, but doesn't state if residential units will be provided or a cash payment be made to an affordable housing fund. We support the location of affordable housing units linked to the Project, with a priority for multi-bedroom units for families, be located within the building and placed in equitable locations. Affordable housing is a key factor in maintaining the diversity of our urban neighborhoods. An affordable housing plan has not yet been presented. ESE.9

Exterior Design: the architect's drawings presented so far have focused on the Project's exterior as seen from Copley Square and the Back Bay neighborhood to the North of the Project. We stress the importance of how the tower will look facing the South End residents to the South and West. This visual, and the Project's relationship with the highly reflective John Hancock tower, as an dual ensemble, is the single most important visual aspect concerning the South End neighborhood. We will expect the tower to be richly detailed, and not give the South End neighborhood a back side view. We encourage the development team to be bold in terms of design in order to enliven the skyline while being equally sensitive to the surrounding buildings - some of which are historic as others are more contemporary. Both the design of the street level portion, the choice of materials, and glass are of high concern. Detailed exteriors, all sides, materials and glass choices have not yet been presented. ESE.10

Respectfully submitted:

Michael Hall

Michael Hall
President
The Ellis South End Neighborhood Association

Cc: Mayor Thomas M. Menino
BRA Director Peter Meade
Representative Aaron M. Michlewitz
Representative Marty Walz
Representative Byron Rushing
Councilor Bill Linehan

ESE.1 Height and density

See response to comment BRA.1. Also see Section 4.1 for the wind analysis and Chapter 5 for a discussion of design.

ESE.2 Traffic

The traffic study contains an evaluation of study area intersections under existing and future conditions. Given the mixed-used residential/hotel nature of the Project and the absence of typical commuter peak hour trip generators, such as office use, the Project is not expected to cause a change in level of service operations at study area intersections.

ESE.3 Signal light

The City will be installing a traffic signal at the currently unsignalized Stuart Street/Trinity Place intersection. Design of the associated roadway modifications and signal elements is nearly complete, and construction will likely start in 2013. The Stuart Street/Trinity Place traffic signal has been incorporated into the traffic study for Year 2018 No Build and Build conditions.

ESE.4 Traffic flow

See Sections 3.3.2.8 and 3.3.2.9 for a discussion of the residential parking valet operations and use of Trinity Place and Stuart Street.

ESE.5 Traffic studies

See Chapter 3.

ESE.6 Wind

See Section 4.1 for a wind study prepared in compliance with the BRA Scoping Determination.

ESE.7 Floor plate

See response to comment HR.6.

ESE.8 Elementary school

See response to comment BRA.8.

ESE.9 Affordable housing

See response to comment BRA.3.

ESE.10 Exterior design and views

See Chapter 5.

YWCA Boston
140 Clarendon Street, Suite 403
Boston, MA 02116
617-585-5400

January 4, 2013

By Hand

Mr. Peter Meade, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007

Re: **Proposed 40 Trinity Place Project**

Dear Mr. Meade:

This letter sets forth the comments of YWCA Boston ("YW Boston") on the Project Notification Form ("PNF") for the 40 Trinity Place project (the "Proposed Project") formally filed with the BRA as of October 29, 2012.

Based on our review of the Proposed Project and absence of any Proponent responsiveness to the concerns we have shared with them thus far in writing, in conversations, and at the BRA-sponsored community meeting, we have no choice but to strongly oppose the proposal in its current form based on its potential to severely impact the continued viability of YW Boston's operations and its ability to deliver essential services to Boston's most vulnerable communities.

As you know, YW Boston owns the building known as 140 Clarendon Street at the corner of Clarendon and Stuart Streets in the Back Bay neighborhood (the "YWCA Building"). The building is located just steps from the site of the Proposed Project and was recently renovated in 2005 with a combination of private and public financing sources, which include funds from the City's Department of Neighborhood Development and Neighborhood Housing Trust. The YWCA Building currently houses a range of uses, including budget hotel rooms at the "Hotel 140"; 79 affordable apartment units which are so restricted of record; 50 market rate apartment units, most the home of long-time residents; an annex of the Boston Public Schools' Snowden International High School; a 250 - seat theatre space in which the Lyric Stage of Boston is the resident theatre company; approximately 21,000 s.f. of office space (including the YW Boston's home offices); and ground floor retail space which the YW is currently in the process of re-tenanting.

The YWCA Building is YW Boston's only real estate asset and as you can see, it hosts a range of activities that contribute to Boston's vitality, including educational and cultural uses, affordable housing, reasonably priced hotel rooms that are located in the heart of the City, and reasonably priced apartments. The continued viability of the building, as well as its economic health, is critical to YW Boston's ability to operate its programs in the areas of building social, racial and gender equity with a focus on the priority areas of public health, education and safety.

We also note that the YWCA Building is listed on the National Register of Historic Places and is a "significant" building as determined by the Boston Landmarks Commission.

As a result, the YW Boston is very focused on and concerned about the plans for the Proposed Project, because the Proposed Project will have substantial impacts on YW Boston and the activities in the YWCA Building, potentially of sufficient magnitude to threaten the operational viability of YW Boston itself. As you know, the PNF filed is a "skinny" PNF and thus, does not include the detailed analysis that would make it possible for us to evaluate the Proposed Project's potential impacts, especially on matters such as wind, shadow, daylight, air quality, groundwater, traffic, etc. In addition, the conceptual plans presented in the PNF do not allow evaluation of the Proposed Project's design (by way of example, such basic dimensions as the distance between the YWCA Building and the Proposed Project are not provided) or its operation (e.g., the ground floor plans depict the project site but not within a larger context such as the city block on which the Proposed Project will be situated), so it is impossible for us to understand in any detail, the proposed traffic area in the service and access area.

In addition, we do not think that the PNF makes possible any evaluation of the Proposed Project against the Proposed Stuart Street Development Review Guidelines informally issued by the BRA in December of 2010 to ascertain whether the project (i) meets the standards set forth in those guidelines for the extra height and FAR being requested, and (ii) will provide the extraordinary public benefits called for in connection with such extra density. We assume (but ask you to confirm) that through the open public and public agency review process afforded by Article 80B Large Project Review, the BRA would discuss with the community these standards and the Proposed Project's satisfaction thereof, and whether the BRA would be prepared to make these determinations prior to any positive recommendation for the zoning relief the Proposed Project will require from the City's Board of Appeal.

We want to note in particular that YW Boston, our neighbor the University Club, and the 40 Trinity Place property all adjoin a shared access area at the back of the three properties, and the three properties share legal rights in such area. This area is of particular concern to YW Boston since its loading operations occur in this area. YW Boston also has parking and other property rights there which we believe would preclude the Proposed Project from being developed or operated as currently proposed, until and unless such rights are legally addressed by the Proponent by written agreement. While YW Boston and the University Club participated in a Proponent-requested meeting to discuss this shared area, there has been no proposal made by the Proponent to address any adjustment of the easement rights of the respective parties or indeed, how the Proposed Project will function in this shared area.

A. Impacts of the Proposed Project

Based upon the PNF and the presentation made by the Proponent at the BRA-sponsored community meeting on December 18, 2012, the preliminary concerns of YW Boston are focused primarily on the physical, environmental, and operational impacts on the YWCA Building. As a result, YW Boston has no choice but to oppose the Proposed Project at this time on the basis of its as-yet unexamined potential impacts on the surrounding environment, the public realm, and the physical integrity of the YWCA Building itself.

YW Boston believes that the Proposed Project may cause permanent and irreparable harm to its surrounding environment and on YW Boston due to the following categories of impacts, all of which must be definitively addressed by the Proponent in the DPIR, in the form of detailed environmental studies of the Proposed Project and a variety of smaller scenarios that the Proponent should be required to study:

1. Shadow Impacts on the following sensitive areas: YW.1

   a. Copley Square park

   b. Frieda Garcia park

   c. Southwest Corridor Park

   d. The YWCA Building's historic facades

   e. Trinity Church's historic roofs, facades, and grounds

2. Wind Impacts on the public realm in the following pedestrian-intensive areas: YW.2

   a. Stuart Street

   b. Clarendon Street

   c. Dartmouth Street

   d. Trinity Place

   e. The plaza surrounding the John Hancock building on both Stuart and Clarendon Streets

   f. Copley Square

3. <u>Wind Impacts on the adjacent YWCA Building itself, including:</u>

   a. Cladding pressure impacts (both positive and negative, on windows, doors, ornamental terra cotta elements, and other exterior elements)

   b. Enhanced structural stresses associated with wind gusts/vortices caused by the Proposed Project

   c. Enhanced geotechnical stresses (both compressive and uplift forces) caused by wind gusts/vortices caused by the Proposed Project's tower element

   d. Negative and positive pressure impacts on essential ventilation air intakes and exhausts, laundry intakes and exhausts, stairwell pressurization equipment, and other air-handling equipment located on or near the YWCA Building's exterior envelope

4. <u>Traffic & Transportation Impacts, including as follows:</u>

   a. Stuart Street – The Proposed Project will have multiple entrances for the hotel, residential component and restaurant, as well as valet service on Trinity Place and presumably a drop-off area on Stuart Street to serve both the residences and the restaurant. This will occur on a very short stretch of Stuart Street, a major inbound traffic artery for the city's downtown core that is already heavily congested.

   b. Trinity Place – It is not clear from the PNF what services and access will be provided from Trinity Place other than garage access; the use of this public street needs to be clarified and binding commitments made by the Proponent with respect to long-term operational limitations of the use of Trinity Place, to avoid further impacts on traffic conditions on Stuart Street. YW.3

   c. The shared access area – It is not clear from the PNF how the Proposed Project will be serviced, but we understand that the Proponent is proposing to use the shared access area in which YW Boston has property rights (and which runs along the rear of the University Club and the Proposed Project site), as a loading area to a degree far in excess of its originally contemplated and current usage. This overburdening of the existing YWCA easement rights is unacceptable to YW Boston and an alternate means of providing loading and service to the Proposed Project should be identified and committed to in the DPIR, and memorialized in one or more legally binding documents. Alternatively, YW Boston's easements rights will need to be adjusted in a YW.4

mutually agreeable manner among the University Club, YW Boston, and the Proponent.

5. Air Quality Impacts, including as follows: YW.5

a. Stuart Street/Trinity Place – The increased volume of vehicular traffic associated with the Proposed Project's garage, coupled with the conditions created by the introduction of a hotel porte-cochere, is likely to have a meaningful impact on the air quality along Stuart Street and Trinity Place. The Proponent must demonstrate that there will be no negative air quality impacts on the YWCA Building's ventilation air intakes.

6. Daylight Impacts. YW.6

a. Stuart Street

b. Trinity Place

c. The plaza surrounding the John Hancock building on both Stuart and Clarendon Streets

d. Copley Square

e. Hotel rooms and dwelling units within the YWCA Building, whose revenues are essential to the continued viability of the YW Boston. The Proponent and its development team have toured the YWCA Building multiple times and are well acquainted with the residential areas of the building.

7. Solar Glare/Lighting Impacts.

a. The YWCA Building's air conditioning systems were not designed to accommodate the types of solar loads that could result from direct solar glare from additional glass curtain wall facades; glare from the eastern elevation of the Proposed Project must be studied to evaluate these impacts, and appropriate mitigation measures proposed. YW.7

b. The impacts of the Proposed Project's lighting (both decorative and operational), considering the number and immediate proximity of residential dwelling units and hotel rooms at the YWCA Building that face the Proposed Project.

c. Impacts from garage lighting and vehicular lights within the garage must be studied; ideally the garage should be enclosed in an opaque enclosure material on all sides such that vehicle headlights would not be visible from outside the garage levels.

8. Noise Impacts.

a. Noise associated with the Proposed Project's mechanical equipment, including garage exhausts. The location and proposed enclosures for all roof top or other exterior mechanical equipment should be detailed in the DPIR, in plan and text. YW.8

b. Garage entry/exit sirens

c. Construction-related noise impacts

d. Other noise impacts related to the construction and/or operation of the Proposed Project.

9. Geotechnical impacts.

a. These include potential impacts (temporary and permanent) on the YWCA Building's foundations and adjacent public infrastructure facilities, as well as on historic structures in the vicinity of the site of the Proposed Project. YW.9

10. Construction Impacts. The Proponent should be required to demonstrate that the construction of the Proposed Project will not have any material impacts on the structure, building systems, or ongoing operation of the YWCA Building, including the hotel and residences. Any such impacts, if unmitigated, would threaten the viability of YW Boston as an organization. While YW Boston expects to enter into a private abutter's agreement with the Proponent prior to any BRA Board action on the Proposed Project (such agreement to include matters relating to construction-period impact modeling, monitoring, mitigation, as well as a variety of other areas of concern for YW Boston), the DPIR would be an appropriate forum in which to demonstrate how the Proponent will avoid construction-related impacts on our adjacent property and mitigate any impacts that do occur, including any financial costs to YW Boston associated with the Proposed Project's development. We also expect that various matters including pedestrian circulation and access to the YWCA Building, construction staging and equipment locations, noise, dust, vibration, and pest mitigation, and other related matters, would be detailed in a future Construction Management Plan for a more appropriately conceived project on the site. YW.10

11. Impacts to Existing Telecommunications Equipment. We are concerned about the Proposed Project's impacts on the YWCA's rooftop areas and the telecommunications equipment there that provides an essential revenue stream to the YW Boston. We are concerned YW.11

that the Proposed Project will cause interference with this equipment, both due to direct line-of-sight obstruction and also due to backscatter effects.

12. Impacts on the Value of the YWCA Building. We are concerned about the impacts of the Proposed Project on the value of the YWCA Building, which is YW Boston's single most significant physical asset. The value of this asset is derived in large part from the revenues generated by its programs, including its affordable housing, market-rate housing, hotel, and retail spaces. Any impacts to the revenue-generating potential of these spaces would have a direct and highly negative impact on the viability of the YW Boston as an organization and its mission-driven programs of eliminating racism and promoting gender equality in the City of Boston. YW.12

While YW Boston has not engaged engineers and technical experts to elaborate on these concerns at this time, it is our hope that the BRA and the various City of Boston agencies that comment on the PNF can elaborate on these general concerns in the Scoping Determination and require the Proponent to examine all of these impacts in detail so that we can be assured that the Proposed Project will not create significant and unacceptable impacts on our structure, operations, residents, and guests.

13. Loss of Business & Organizational Revenues. We are concerned that the construction of the Proposed Project in its current form, would lead to a significant interim and long-term loss of business from existing YW operations at the YWCA Building and resultant loss of revenue to YW Boston. Because YW Boston is a non-profit social-service organization, this loss of revenue would threaten the viability of the organization. We trust that the Proponent will seek ways to ensure that this loss of revenue to the organization, and its resultant direct impact on the neediest of Boston's citizens, would be appropriately mitigated. YW.13

B. Comments on Proposed Project Scoping Determination

YW.14

Notwithstanding YW Boston's opposition to the Proposed Project at this time, we recognize that the Proponent has commenced with the BRA, a public process for the Proposed Project. Without prejudicing our assertion that the Proponent does not have sufficient rights in the Proposed Project site to actually construct the project as proposed, we include our specific comments related to the content of the BRA's Scoping Determination. We hope that the BRA will incorporate the following comments into their Scoping Determination, and will require the Proponent to prepare the studies requested as part of the YW Boston's comments.

Specifically, the YW Boston requests that the Proponent conduct the following studies on the Proposed Project and a variety of other development scenarios and include their results in the DPIR:

1. Detailed shadow analysis demonstrating shadow impacts in each month of the year, not just the customary cardinal months; such shadow analysis should focus on the areas enumerated above. Cumulative shadow impacts with other development projects currently under review, proposed, or under construction (including the Simon/Copley Place expansion project and the development potential of the Dartmouth Street garage site) should also be examined closely to ensure that sensitive areas are not overburdened with excess aggregate shadow. A masonry porosity and moisture dissipation study of the YWCA Building's western elevation will be an essential component of these shadow studies in order to evaluate impacts on the historic masonry and terra cotta materials that comprise the YWCA Building's envelope due to our and our tax credit investors' major concerns about the inability of the YWCA Building's historic masonry to dry sufficiently if cast in too much shadow, leading to deterioration and accelerated weathering.

2. Comprehensive Pedestrian Level Wind (PLW) analyses of the areas outlined above and comprehensive analyses of wind impacts on the YWCA Building should be conducted – both Cladding Pressure and Force-Balance tests must be conducted to demonstrate no adverse impact on the YWCA Building, its windows and other envelope components, its structure and foundations, and other sensitive receptors such as fresh air intakes, laundry exhausts, stairwell pressurization system, etc. We request that the Proponent conduct a large-scale and fully instrumented wind tunnel test of the YWCA Building to demonstrate that the Proposed Project, set in its appropriate context, will have no negative impact on any of the structural, envelope, or mechanical components of the YWCA Building.

3. Comprehensive traffic analysis should be conducted, especially with respect to the extraordinary incremental volume of traffic that the Proposed Project contemplates for Trinity Place and the rear service area that is the subject of YW Boston easement rights. The location of both a restaurant and a residential entrance on Stuart Street, a major vehicular artery leading into the downtown core from the I-90 eastbound off-ramp, is very problematic, and will cause significant additional traffic congestion on Stuart Street. We would like further detail about the nature of proposed valet operations at the Proposed Project and the nature and volume of service deliveries to the proposed hotel.

4. Comprehensive air quality analyses should be conducted along key pedestrian corridors and at sensitive receptor areas such as the YWCA Building's fresh air intakes, which serve the hotel, residential, office, and community spaces within the building. Negative impacts to the air quality at the YWCA Building's intake locations could be disastrous to the organization. Mechanical equipment, garage exhaust locations, vehicular traffic-

related air quality impacts, and service vehicle idling air quality impacts, as well as other aspects of the Proposed Project must be studied to evaluate possible air quality impacts on the public realm and the indoor air quality at the YWCA Building.

5. Comprehensive noise impact analyses should be conducted to evaluate the noise impacts associated with the Proposed Project's garage entrances and operations, porte-cochere, mechanical equipment, wind effects, and other sources of noise associated with the Proposed Project on the surrounding residential and hotel uses.

6. Comprehensive daylight analyses should be conducted to evaluate the loss of daylight and skylight in the vicinity of the Proposed Project; special care and level of detail should be mandated with respect to conducting such studies from major pedestrian areas, parks and public open spaces, and within the dwelling units and hotel rooms of the YWCA Building.

7. The Proponent should complete a thorough analysis of potential geotechnical impacts of the Proposed Project's construction to evaluate whether the Proposed Project will have any impact on the adjacent historic YWCA Building. The Proponent should be required to make firm commitments with respect to the type of foundation construction contemplated, and instrumentation and analysis programs and standards for surrounding properties and facilities to be adopted as part of the Proposed Project's construction. It should be noted that impacts on the University Club's structure directly affect the YWCA Building pursuant to the so-called Row Building section of the Massachusetts State Building Code; the Proponent must demonstrate that the removal of a portion of the in-line diaphragm wall on the front and rear elevations of the contiguous block of buildings between Trinity Place and Clarendon Street will not have any negative effect on the shear or lateral load-bearing capacity of the University Club building's walls, and in turn, the YWCA's co-planar wall sections on these elevations.

8. The Proponent should be required to conduct studies of alternate tower design, shape, massing, setbacks, and orientation to evaluate whether such alternatives could reduce the environmental and visual impacts of the Proposed Project on the YWCA Building and the surrounding public realm. A special focus should be placed on setbacks, both with respect to adjacency to the YWCA Building and in terms of sky plane setback along an already extraordinarily narrow view corridor. The issues of setback and tower orientation require significant study by the Proponent, and we ask the BRA to require the Proponent to look at a variety of different massing, setback, and tower orientation alternatives to determine how impacts could be minimized, even within the bounds of the existing regulatory framework. Scenarios should also be examined that evaluate tower shapes and footprints that fit entirely within the Proponent's owned property, since certain portions of the project as currently proposed encroach into property encumbered with YW Boston

easement rights, and others encroach into property owned by a third party whose definitive consent has not yet been given for its use.

9. The Proponent should be required to provide numerous rendered views of the entire Proposed Project from various points in the Back Bay and South End neighborhoods, and other surrounding areas that show the oblique (not the narrow) sides of the Proposed Project, and that show the pedestrian-level view of the Proposed Project's entire height. Views from the Southwest Corridor Park, Stuart Street sidewalks, and from within the YWCA Building should be provided so that the public and the Proposed Project's most impacted neighbor can have a holistic view of the proposed construction.

10. The Proponent should be required to identify in detail the building materials and garage enclosure system proposed for the Proposed Project's eastern façade, which faces the YWCA Building. All materials facing the YWCA Building should be equal in quality as other elevations, and the garage should be fully enclosed with building materials that are of equal quality and consistency to those on other portions of the building. As proposed, the Proposed Project would leave many or our affordable housing residents and hotel guests facing a parking garage, whose envelope design is currently undefined. This is an unacceptable proposal and we request that the BRA require the Proponent to explore alternative approaches to accommodating parking on-site that do not negatively impact our residents and guests.

11. The Proponent should specify exactly how far from the YWCA Building's western façade the Proposed Project would be constructed, and provide view studies from within various components of the YWCA Building (i.e. affordable and market-rate housing, as well as hotel rooms) showing the visual, light and air, and shadow impacts that the Proposed Project would have on the YW Boston's program spaces.

12. The Proponent should be required to conduct structural analysis of the existing YWCA Building roofs to ensure that incremental wind loading and snow loading resulting from the development of the Proposed Project will not approach or exceed allowable stresses in our building's structural members.

13. The Proponent should be required to commit to providing the affordable housing for the Proposed Project on-site. As the Back Bay's largest affordable housing community, the YWCA Building plays an important role in ensuring the economic diversity of the Back Bay neighborhood. Consistent with the Simon/Copley Place expansion project's commitment to house all of its affordable housing on site, the Proponent should be required to do the same.

In addition to these specific studies, we request that the BRA require the Proponent to conduct all applicable environmental and other studies, including the above-referenced studies, for a series of alternative development projects. These analyses will help the BRA and other reviewing agencies to compare the Proposed Project as described in the PNF to alternative projects that reflect the Proponent's actual site ownership boundary and/or that may not have such significant impacts on the YW Boston's ongoing operations and programs:

- A project configuration that complies with existing zoning on the Proposed Project site;

- A project configuration that complies with the so-called "Base" provisions of the Proposed Stuart Street Development Review Guidelines;

- A "No-build" configuration.

- A configuration that adds value incrementally to the existing historic structure, rather than replaces the entire structure. The YW Boston, which recently invested nearly $50 million in a complete redevelopment of its own building, believes that this type of modest incremental approach could yield more public benefits than are currently proposed by the Proponent, while avoiding most of the environmental impacts that would be caused by the Proposed Project.

- A configuration that does not encroach into the YW Boston's easement area either at or above grade.

C. Zoning Clarifications

We also request that the Proponent clarify in the DPIR exactly what zoning envelope is being proposed for Article 80B review as part of the Proponent's current PNF, exactly how the Proposed Project is proposing to seek relief from the Boston Zoning Code, and whether the Proposed Project , as defined in the PNF, is intended to include any additional FAR or building envelope related to a hypothetical future vertical or horizontal expansion by the University Club of its existing building. We do not understand the reference to proposed expansion space of the University Club in the PNF, and have not been able to receive clarification as to the same from the Proponent's counsel. We would expect that any separate University Club proposed expansion would be reviewed under the Boston Zoning Code as a separate project. We would therefore object to any attempt by the Proponent to seek approvals or zoning relief for a hypothetical future expansion of the University Club building absent a full and complete public process and application for relief from the Board of Appeal related to and providing specific details about any such future expansion. We request that the BRA require the Proponent to provide specific confirmation of the project for which development review approval and zoning relief is being sought under the current public process. YW.15

D. Property Considerations

In addition to our concerns about the above-referenced physical and environmental impacts on the YWCA Building, we have previously noted the existing property rights benefitting YW Boston and affecting the site of the Proposed Project; those rights cannot be amended without YW Boston's express consent, and no such consent has been granted. Such rights are key to the developability of the Proposed Project. Hence, we request that the BRA follow past practice and include the following subsection in its Scoping Determination for the Proposed Project: YW.16

"***PROPERTY CONSIDERATIONS***

Consistent with the BRA's approach to other projects currently proposed to occupy adjacent land owned by parties other than the Proponent, the Proponent must identify and delineate any and all property currently owned by others, that it proposes to occupy temporarily or permanently as part of the Proposed Project's development.

The Proponent must also identify any and all private third party rights and/or interests in the Proposed Project site or other adjacent parcels that would be affected by the Proposed Project's development. These rights may include (but not be limited to): leases, easements, existing agreements, covenants, restrictions, and other encumbrances that may affect the Proponent's ability to construct the Proposed Project. The Proponent must specify exactly how these rights and/or interests will be maintained, modified, or extinguished in connection with the Proposed Project's development, and the Proponent must provide definitive evidence of authority to modify any third-party rights and/or interests in the Proposed Project site in the DPIR."

This section of the Scoping Determination would then help ensure that the review process for the Proposed Project is appropriately coordinated with resolutions to private property rights issues essential to the Proposed Project's ability to proceed.

E. Conclusion

As I stated at the December 18, 2012 community meeting , YW Boston is not opposed to development,. In fact, YW Boston embraces its urban context and our mission is focused on building the social fabric of our city, just as others focus on building its physical fabric. But, as a nonprofit organization whose focus is on achieving social justice in our community, we cannot afford to suffer the financial and physical impacts that the Proposed Project in its current form would have on our operations.

We look forward to a serious and thorough analysis and review of the Proposed Project's design and impacts, as well as a robust public discussion about the mitigation measures and community benefits to be legally committed to by the Proponent. We hope that the BRA incorporates this letter and the studies and analyses requested in this letter, into the Article 80B Scoping Determination and that the Proponent commits to preparing the analyses requested and thoughtfully and fully considering the impact issues set forth in this comment letter.

I cannot overemphasize that the future of YW Boston and the countless lives we touch with our social justice programming depends on our ability to continue our mission unaffected by the kinds of impacts that the Proposed Project would have on our organization and the YWCA Building.

In closing, based on our review of the PNF filing and absence of any Proponent response to our stated concerns to date, we must reiterate our opposition to the Proposed Project in its current form. We hope that the BRA will take our concerns seriously and help ensure the future success of one of Boston's oldest and largest community service organizations, which has dedicated its nearly 150-year life to eliminating racism, empowering women, and promoting peace, justice, freedom and dignity for all of Boston's citizens.

Thank you for your consideration.

Sincerely,

Sylvia Ferrell-Jones

Sylvia Ferrell-Jones
President and Chief Executive Officer

cc: Mayor Thomas M. Menino
Mayor's Office of Neighborhood Services
Geoffrey Lewis, BRA
Lawrence Seamans, YW Boston
Jack Tynan, YW Boston
Rebecca A. Lee, Esq.

YW.1 Shadow impacts

See Section 4.2 for a shadow analysis prepared in compliance with the BRA Scoping Determination. Façade shadow studies for nearby historic buildings are included in Section 6.2.

YW.2 Wind impacts on public realm

See Section 4.1 for a wind study prepared in compliance with the BRA Scoping Determination.

YW.3 Trinity Place service and access

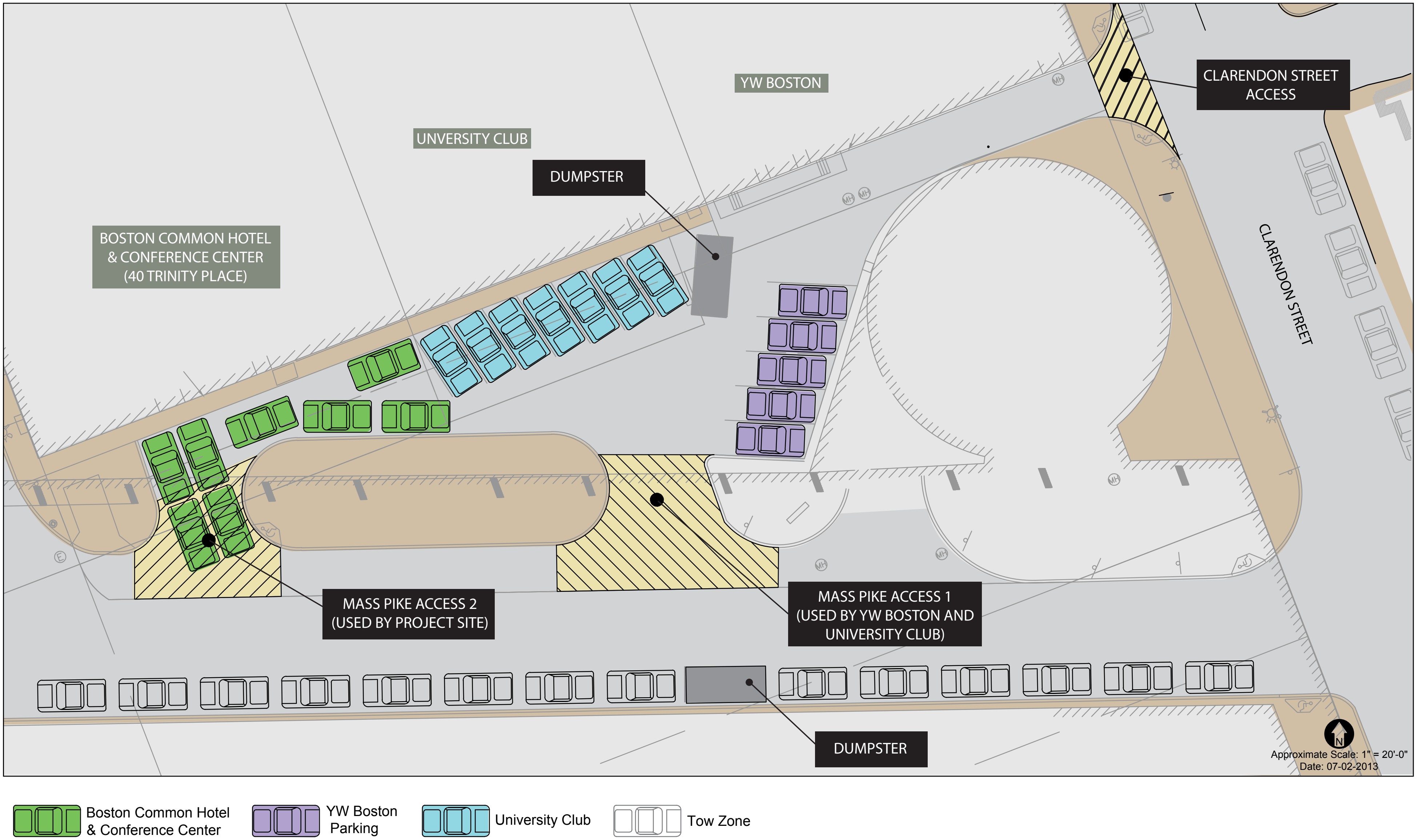
See Figure 3-13 for the planned curbside uses along Trinity Place and Stuart Street, as well as the Project's loading facilities. See Section 3.3.2.12 for a discussion of expected Project loading and service activity.

YW.4 Shared access area

YW Boston's property is benefited by a shared access easement over the area behind the YW Boston property, the University Club property, the Project Site and a parcel owned by the owner of the adjacent Garage at 100 Clarendon Street (Easement Area) to and from (i) the YW Boston property, (ii) a portion of the Easement Area used for parking for YW Boston vehicles, and (iii) the Massachusetts Turnpike access ramp. Currently, and for several decades, the portion of the Easement Area behind the Project has been solely used for loading and parking for the Project site and has not been used for access to the Massachusetts Turnpike access ramp by YW Boston vehicles. As such, the Proponent does not anticipate that the Easement Area will be overburdened by the Project.

As shown on Figure 8-1, the Easement Area is accessed from two curb cuts from the Massachusetts Turnpike access ramp and an alley extending from Clarendon Street behind the YW Boston building. YW Boston presently accesses, and for many decades has accessed, its parking spaces located in the Easement Area through a curb cut onto the Massachusetts Turnpike access ramp located closer to the YW Boston property, shown on Figure 8-1. YW Boston accesses its loading either from the alley extending from Clarendon Street or the same curb cut onto the Massachusetts Turnpike access ramp.

In contrast, the Project site does not use the same access points used by YW Boston. The Project site presently accesses, and for many decades has accessed, its parking and loading through a separate curb cut from the Massachusetts Turnpike access



40 Trinity Place Boston, Massachusetts

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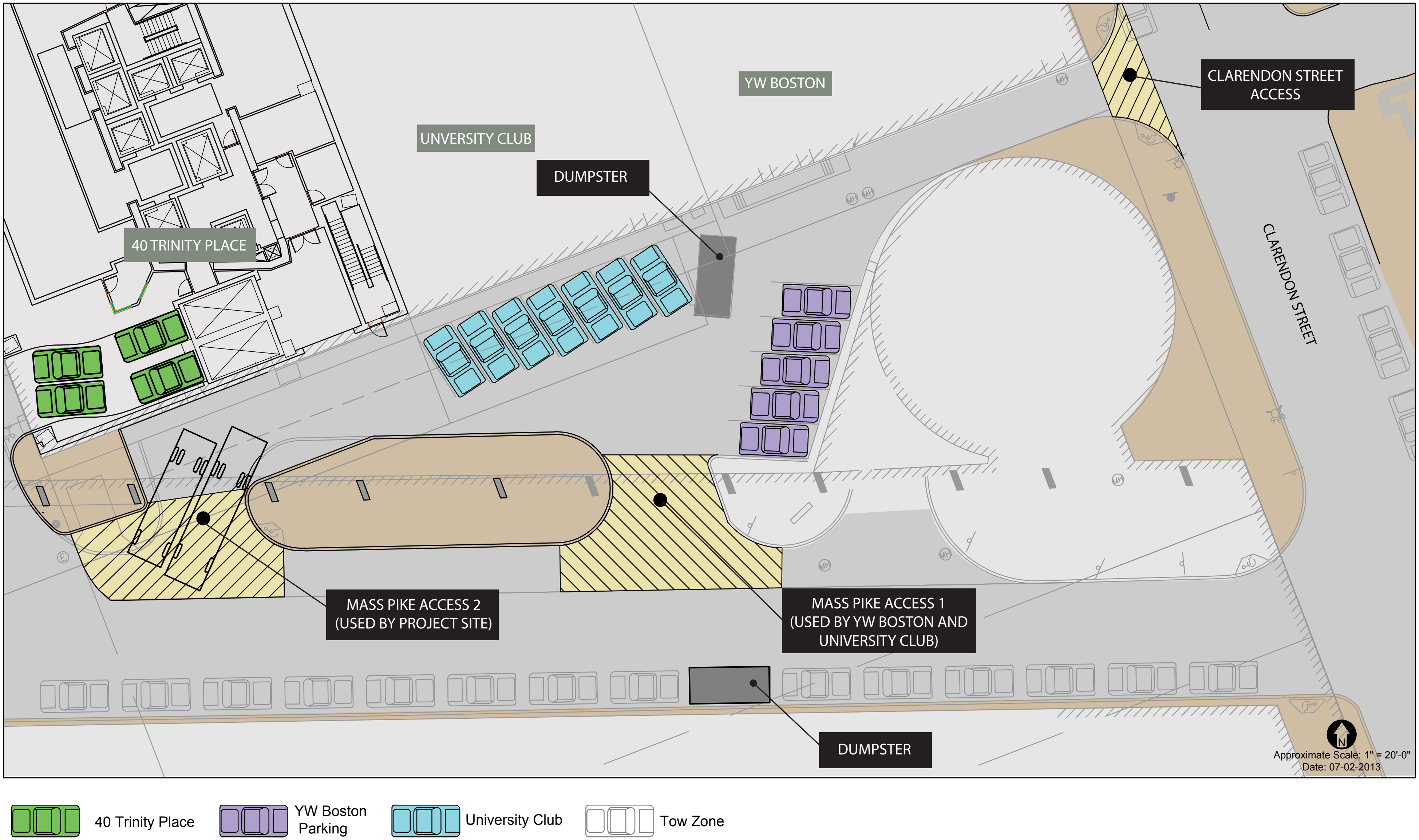
Figure 8-1
Existing Alley Parking and Easement Areas



40 Trinity Place Boston, Massachusetts

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Figure 8-2
Future Alley Parking and Easement Areas

ramp located farther from the YW Boston property shown on Figure 8-1. Because of current Project site and University Club parking uses, as are shown in Figure 8-2, there is no parking, service or loading pattern that utilizes both the portion of the Easement Area located near to the Project site and the portion located closer to the YW Boston property. Following construction of the Project, the Project site will continue to access its loading through the same curb cut as it does today, and its parking will be accessed from a driveway on Trinity Place, neither of which will conflict with the YW Boston's parking or access use, nor overburden the Easement Area.

YW.5 Air quality impacts

See Section 4.4 for an air quality analysis prepared in accordance with the BRA Scoping Determination.

YW.6 Daylight impacts

See Section 4.3 for a daylight analysis prepared in accordance with the BRA Scoping Determination. Please note that certain requested points cannot be measured due to the limitations of BRADA.

YW.7 Solar glare and lighting

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

The Project does not propose exterior lighting along the eastern façade of the building. The lights from within the building create a similar impact to those from other nearby buildings. The garage levels will be shielded so that headlights are not visible from the outside.

YW.8 Noise

See Section 4.5 for a noise study prepared in accordance with the BRA Scoping Determination. See Section 4.7.9 for a discussion of construction-related noise impacts.

The alarms related to garage entry and exit can be designed to minimize excessive noise to the surrounding area.

YW.9 Geotechnical impacts

The type of foundations being considered at this time are drilled-in small diameter grouted piles that are reinforced with an outer steel casing and inner core steel. The foundations consist of discrete concrete and steel elements that do not disturb the surrounding soils, create a groundwater barrier, impact groundwater flow, or create channels for groundwater flow or communication between the upper groundwater zone and deeper aquifers, since the result is a solid element with no surrounding voids.

The proposed construction methodology is very common in the Boston area and has been used for many projects in the Back Bay, including the Mandarin Oriental, Hynes Convention Center and numerous existing building renovations and modifications. The additional benefit of using drilled piles is to mitigate ground movement. Drilled piles do not generate vibration during installation and result in no impact to groundwater levels.

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

YW.10 Construction impacts

See Section 4.7 for a discussion of construction impacts and mitigation. The Construction Management Plan will outline measures to minimize the impacts to the surrounding area. The Proponent will continue to meet with YW Boston to discuss construction-related impacts.

YW.11 Impacts to existing telecommunications equipment

As the design progresses, the Proponent will continue to meet with the YW Boston regarding potential impacts to its building.

YW.12 Impacts on the value of the YWCA building

The Project is anticipated to positively impact the value of the YW building and its revenue generating potential. The Project will improve a stretch of Stuart Street that is currently underutilized and will bring new activity and vitality to the area. The invigoration of this portion of the street is anticipated to increase the value of the surrounding area, including the YWCA building, and will likely bring additional revenue to the YWCA building's retail tenants.

YW.13 Loss of business & organizational revenues

The construction of the Project is not anticipated to lead to a loss of business. In fact, the closure of the existing tourist hotel on the Project Site, which presently competes directly with YW Boston's hotel, will likely provide an increase in business to the YW building. The Proponent will continue to meet with YW Boston to discuss the Project's impacts.

YW.14 Scoping Determination

This DPIR has been prepared in response to the Scoping Determination issued by the BRA. The DPIR includes a study of the Project's impacts on wind, shadow, daylight, air quality, etc., as well as an analysis of the As-of-right Alternative.

YW.15 Zoning

See Section 1.5.1.

YW.16 Property rights

As discussed in YW.4, the Project has been designed to accommodate the YW Boston's non-exclusive access easement over a portion of the rear of the Project site and will not materially adversely impact such easement. The Proponent looks forward to continued dialogue with the YW Boston concerning its Project and potential impacts on this easement.

MARVIN S. WOOL, M.D.

780 Boylston St. – Suite 20-I ***Phone/FAX: 617-266-2275***
Boston, Massachusetts 02199 ***e-mail: mwool@massmed.org***

VIA: e-mail and FAX

Jan. 3, 2013

Dear Mr. Lewis and Mr. Meade,

As a resident of the Back Bay, I write to comment on the proposed 40 Trinity Place project.

The developers' failure to specifically commit to putting all required affordable housing on site is disappointing.

They acknowledge on page 2 of their Oct. 29th PNF that the inclusionary guidelines require that 17.5% of the market based units in the proposed building be devoted to affordable housing and that "consideration be given to the distribution of unit types and sizes." That 17.5% was recommended by the Stuart St. Planning Group with the declared intent to help remedy the severe dearth of affordable housing in the neighborhood.

Further, the 'typical floor' plan the developers have shown for each of the 16 residential floors in the Oct. 29th PNF was originally drawn in May and projected a total of 140-142 residences.

They have acknowledged that since that time they've realized that the basic floor plan was in error because it underestimated the core utility space required on each floor thereby significantly decreasing the net square footage available for residences.

Subsequently they have made two changes in their projections which will, in net, reduce the number of residences on each floor as well as increasing the average square footage of each residence, resulting in 110-120 total residences. That in turn would yield between 16 and 17 affordable units.

They should therefore promptly submit new ‘typical floor plans’ indicating the square footage of each unit as well as the unit’s designation (i.e. 3BR, 2BR, 1 BR, studio). Further, the mix of affordable units should precisely mirror the mix of the market priced units and the developers should indicate how they plan to place those 16-17 units among the 16 residential floors. To clarify: the neighborhood is one of families and therefore that should hold for residents in affordable units as well as those in market priced units. MW.1

Yours truly,

Marvin S. Wool

Cc: Representatives Byron Rushing and Marty Walz

Marvin S. Wool, M.D.

MW.1 Affordable housing

Please see response to comment BRA.3.

BOSTON PRESERVATION ALLIANCE

Old City Hall
45 School Street
Boston, MA 02108
617.367.2458
bostonpreservation.org

January 3, 2012

Mr. Geoffrey Lewis
Boston Redevelopment Authority
One City Hall Square, Floor 9
Boston, MA 02201

Re: 40 Trinity Place

Dear Mr. Lewis:

The Boston Preservation Alliance has reviewed the Project Notification Form prepared by Epsilon Associates and filed on behalf of Trinity Stuart LLC. This project includes demolition of an existing building and new construction at 40 Trinity Place in the Back Bay. The Alliance met with the project proponents' development team for a presentation on the plans in mid-December.

The Project site is located amidst a variety of historic resources at the southwest corner of the Park Square-Stuart Street historic area, which was determined eligible for listing in the National Register. The combined Boston Common Hotel and Conference Center/University Club Building itself is included in the Inventory of Historic and Archaeological Assets of the Commonwealth (MHC No. 2395). The Georgian Revival building, designed by the Boston architectural partnership of Archibald G. Monks & Granville Johnson, has a brick and limestone eight-story main block with a three-story wing fronting Stuart Street.

We recognize that demolition of this historic resource is being proposed by this project. While the Alliance desires historic buildings being given full consideration and review for adaptive use and preservation, the proponent appears to have given fair and reasonable consideration to utilizing the existing structure, and has demonstrated that such use is not viable due to structural limitations and restraints related to ADA access, among others. The Alliance supports the overall concept of bringing life to this block of Trinity Place with a mixed use project and is willing to sacrifice the historic building on this site in exchange for the project's many positive aspects, particularly because the proposed development meets the BRA's Draft Proposed Development Review Guidelines for Stuart Street.

The proponent has promised to coordinate with MHC and BLC regarding the proposed demolition of the Stuart Street portion of the building, and we would like the BRA to formally stipulate such coordination in its Article 80 scope. In addition, we request that the structure to be demolished be fully photo-documented both prior to being razed and during demolition, the later to document construction methods. Such photos should be approved by BLC, Alliance, and MHC staff before they are submitted to the City Archives and MHC as a permanent record. BPA.1

While we are willing to forgo opposition to the demolition for the overall benefits of the project, there are some concerns that we believe require further examination in the BRA Article 80 process, and request that the BRA include these items within its Article 80 scope. Items requiring further study by the proponent include:

<u>Street Level Elevations and Views</u>
While the birds-eye renderings presented by the developer are informative about the building itself, they provide limited information to aid our understanding of how the average person will experience the building from street level. We request that the proponent provide a full study of the proposed building from various areas of the neighborhood, and the city more broadly. We would like to see a wide variety of views from a pedestrian and/or automobile elevation. We are particular interested in views from several locations in Copley Square as well as views along Stuart Street itself. An understanding of the building's visual impact on approaches from the south is important as well. BPA.2

The drawings presented to us included a "base" section for the new building that is aligned parallel to the street and designed in a vocabulary conceptually consistent with the adjacent University Club. We do not suggest that the base of the new building mimic the adjacent historic buildings as it must work with the new tower, however, we feel that this lower level must coordinate with the adjacent buildings on the block, with all façades working together in one complimentary palette. In this regard we believe that a study of options for façade materials is in order. Such an analysis should look at these materials within the context of the entire block. We are most concerned about the materials at the lower elevations, with BPA.3

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the upper stories providing more opportunity for variation in material and orientation.

Impact on Neighboring Historic Resources

As you know, this site is nearby some of the city's most important architectural and historic resources, including Trinity Church, the Boston Public Library, the New Old South Church, and the new and old John Hancock Buildings as well as Copley Square itself. In addition, immediately adjacent are other historic buildings, perhaps of less significance as independent structures but as a whole contributing to the character-defining streetscape and pedestrian experience of the neighborhood. These latter buildings include the project building itself, the University Club, and The YWCA.

Although shadow studies are part of the normal requirements for a project of this size, we want to reiterate the importance of shadow analysis. New shadows introduced to historic buildings not only have negative aesthetic effects, but can adversely affect physical aspects of buildings – leading to accelerated deterioration of masonry, wood, and other historic components. Shadows are also known to change building dynamics, resulting in issues such as ice dams in places where they had never previously existed. We therefore insist on full shadow analysis for these impacts of the new building on the very important historic buildings in the area. We appreciate the developer's preemptory efforts in this regard, now presenting a building with some curved sides in an attempt to reduce shadow effects on Copley Plaza. BPA.4

In addition we ask that the impact of the new construction in relation to its very close proximity to existing structures and the proposed cantilever over the University Club be fully studied for potential negative impacts on these contiguous buildings. Water sheeting from the cantilever to the building below, for example, could create significant problems for the University Club. The new building's proximity to the YMCA should also be fully evaluated. BPA.5

Visual Impact on the Skyline

The proposed 33-story, 400-foot tall building will be conspicuous in the skyline, in particular as viewed when entering the city from the south and looking south from Copley Square. The upper floors of the building as proposed are quite "busy," particularly in contrast to the iconic sleekness of the adjacent Hancock Tower, and we feel it

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is important to have a full understanding of this contrast and the changes it will make to the well-known view of the Hancock Tower.

In order to fully evaluate the overall impact of the proposed project we request, in addition to a variety of views of an accurate computer-generated model, a physical model demonstrating the proposed building within its urban context. BPA.6

We anticipate that through the MEPA process this project will undergo review through the Massachusetts Historical Commission. We look forward to participating in that process and to continued discussion with the project proponent as the project evolves. If an MOA is determined necessary by MHC we request to be co-signatories on this document.

Sincerely,

Greg Galer
Executive Director

Susan Park
President

Cc:
Maureen Cavanaugh, Epsilon Associates
Gary Saunders, Jeffrey Saunders, and Jordan Warshaw, Trinity Stuart LLC
Matthew Kiefer, Goulston & Storrs
Ellen Lipsey, Boston Landmarks Commission
Howard Kassler, Neighborhood Association of the Back Bay

BPA.1 Demolition

The proposed demolition of the existing building on the Project site, 40 Trinity Place, will be subject to review by the BLC under Article 85 of the Boston Zoning Code. An Article 85 Application for the property will be submitted to the BLC.

A Massachusetts Historical Commission (MHC) PNF will be filed to initiate the State Register Review process. The Proponent anticipates entering into a Memorandum of Agreement with MHC concerning the demolition of the building on the Project site.

BPA.2 Elevation views

See Chapter 5.

BPA.3 Façade materials

See Chapter 5.

BPA.4 Shadow analysis

See Sections 4.2 and 6.2.

BPA.5 Construction impacts

See Section 4.7 for a discussion of construction impacts and mitigation. The Construction Management Plan to be filed with the City will outline measures to minimize the impacts to the surrounding area.

BPA.6 Model

The Proponent will coordinate with the BPA in regard to the requested model.

downtown schools for boston

January 4, 2013

Geoffrey Lewis
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Re: 40 Trinity Place Project Notification Form

Dear Mr. Lewis:

We are a group of several hundred Boston parents (and children), grandparents, and other local residents working to add public elementary schools in our city's downtown neighborhoods. We want to make it possible for more children to attend Boston Public Schools and help more families stay in downtown Boston. We are strong supporters of Boston Public Schools and the City of Boston. Indeed, many of us have children in BPS now, and many others hope to – or had hoped to.

We are writing in connection with the Project Notification Form filed for a building proposed for 40 Trinity Place. We ask the Boston Redevelopment Authority to include in the scope of review DS.1
an alternative that includes a public elementary school. Finding a location for a new school in Boston's downtown neighborhoods will require creativity and flexibility, and we are prepared to work with the BRA, BPS, and others within city government to meet the needs of our families and the families of Boston's future. We are also enthusiastic about the opportunity to work with Trinity Stuart LLC as it moves forward with the review of its proposed building. We believe it is possible for the company to achieve its goals while at the same time we, and the City of Boston, achieve our shared goal of educating the city's children close to home.

If you have any questions or would like more information about Downtown Schools for Boston Inc., please do not hesitate to contact me at ania.camargo@gmail.com.

For Downtown Schools For Boston Inc.

Ania Camargo
Temple Street
Boston

DS.1 Public elementary school

See response to comment BRA.8.

Tent City Corporation
130 Dartmouth Street
Boston, MA 02116

January 4, 2013

Geoffrey Lewis
BRA Project Planner
One City Hall Square – 9th floor
Boston, MA 02201

RE: Proposed development at 40 Trinity Place, Boston, MA

Dear Mr. Lewis:

On behalf of residents of Tent City, the large mixed income development at 130 Dartmouth Street, just across from the proposed residences and hotel at 40 Trinity Place, I would like to submit the following comments to you today, ahead of the close of the public comment period this afternoon.

We understand that in the project Notification Form the developers have commented on the required amount of affordable housing to be included in their project. However, they have not been specific as to how they will meet that requirement.

We could support this project if the developers would present a specific plan which includes placing all of the required 17.5 % of affordable units on site in their proposed new building and that the sizes of the affordable units (3 Br, 2Br, 1Br) match those of the market rate units. This would help to preserve the character of our common neighborhood as one that is favorable to residential properties and families as well as commercial spaces. We believe that a successful city plan is one that accommodates both in a mixed use setting versus favoring one type of development in isolation and to the exclusion of the other. TCC.1

Sincerely,

Susan Mills
Chair, Tent City Corporation Board of Directors

TCC.1 Affordable housing

See response to comment BRA.3.

January 3, 2013

Geoff Lewis
Boston Redevelopment Authority
One City Hall Square, 9th Floor
Boston, MA 02201
Fax: 617-742-7783
Email: geoffrey.lewis.bra@cityofboston.gov

Re: 40 Trinity Place/426 Stuart Street

Dear Mr. Lewis,

The Neighborhood Association of the Back Bay (NABB) is a volunteer organization whose mission is to halt deterioration of the neighborhood, maintain its architectural beauty, and further its historic residential character.

We are writing on behalf of NABB in connection with the 40 Trinity Place/426 Stuart Street Project Notification Form filed by Trinity Stuart LLC. The PNF presents a preliminary description of the proposed project. We support Trinity Stuart LLC' s approach to the Article 80 process and agree that a project of this importance requires and merits a two-stage review process, requiring both Draft Project Impact and Final Project Impact Reports (DPIR and FPIR).

Our comments are intended to respond to the request for recommendations for additional research and study that the development team will address in the next phase of the Article 80 process. We anticipate discussing other issues such as materials and fenestration in the next phase, when those items are presented by the development team in more detail.

Environmental Impacts

As density is increased, the importance of open space increases. Boston is and should remain a livable walking city. Copley Square has a place among the elite public squares in the world because of its unique charm and its historical significance. It is the City's prime gathering place for special events. Sunlight is key to the vitality that permeates this area. However, the excessive wind we all experience in the square makes it less than desirable at many times of this year. This is also true of the area near the John Hancock Tower, where the winds can be dangerous. In addition to their damage to the walking environment, the wind impacts upon existing buildings created by the proposed project may be an undesirable side effect.

At the BRA Scoping Session on November 20th, we emphasized the importance of thorough, high quality environmental impact studies for the preservation of sunlight, particularly in the public realm during winter months; comprehensive, reality based wind studies; comprehensive traffic studies of impacts on neighboring City streets, as well as the nearby Mass Pike on and off ramps; and preservation of groundwater.

Sunlight: We endorse the legislation proposed by Rep. Walz, which prohibits the casting of new shadows on Copley Square between the first hour after sunrise and the last hour before sunset, and urge the BRA to adopt that criterion.

The current BRA proposal would allow any new building to cast shadow on the square for two hours every day between March and October. Thus three or four projects, strategically placed, could eliminate the sun from the square entirely. There is no limitation on new shadow in the winter months, when sunlight is even more important. We feel strongly that following these criteria will negatively affect Copley Square, turning it into a darkened, windswept plaza for much of the year.

We request detailed sunlight studies that illustrate the path of travel of the proposed building (and alternatives) throughout the year. We request quantification of the areas of Copley Square and the Dartmouth Street Mall that are in shadow and the times they are in shadow. We also request a study that illustrates the movement of shadow on the faces of the key historic buildings facing Copley Square: the Boston Public Library and Courtyard, Old South, and Trinity Church. Spring and Fall studies should show hourly progression of the shadow on these areas. NABB.1 NABB.2

Wind: It is commonly acknowledged that the John Hancock Tower is responsible for a majority of the excessive and uncomfortable wind impacts on pedestrians in Copley Square and surrounding areas throughout the year. We cannot allow this situation to worsen.

The Clarendon project (circa 2004) requirements included requests for post-construction monitoring of wind conditions. However, we have not seen the requested real-time data on current wind conditions. If this information is available, it would be of great use at this time. If it is not available, we again urge that monitoring equipment be installed and the data mined to improve the accuracy of predicted wind study information, which is currently based on physical and mathematical models. We request the study area to extend along Dartmouth and Clarendon Streets to the River and an equal distance to the south, east and west. We request that the Wind Study Reports be translated into units and language lay people can relate to and understand. Further, we request a program of post construction monitoring for this project. NABB.3

It should be noted that the Landmarks Commission asked for a study of the wind effects on historic resources in the area near the Clarendon. This should be included in the next submission.

Traffic: We request a comprehensive traffic study for the area, including vehicular and pedestrian movements and their interactions. (These are particularly important during peak hours, when automobile and transit commuting is heavy.) Impacts on access routes to the area should be included, particularly those that pass through residential areas such as Dartmouth, Clarendon, and Berkeley Streets. Special attention should be given to parking and circulation in and near the project during Farmer's Market Days. Peak hour impacts on the Green and Orange Line should be quantified, and their capacity to absorb these impacts assessed. We request a study of Trinity Place and potentially closing it off. As with all of the impact studies, we request a traffic study that analyzes the situation with and without the improvements anticipated if the Simons project is built and if it is not built. NABB.4 NABB.5 NABB.6

The Green and Orange Lines appear to be close to or even over capacity at peak times now. We request current information about each line as well as the added projected impact related to the proposed project. NABB.7

Historic Preservation: We request that the study include impacts on protected buildings, such as Trinity Church, the Library, and Old South Church, as well as "eligible" or rated I-III buildings, such as John Hancock Clarendon Building, the Carriage Houses on Stanhope Street, the Publishers Building, the Salvation Army Building and the New England Power Building. NABB.8

Sustainability: Proposed development in the area should readily be able to attain LEED Silver, in part due to its proximity to public transportation. It also should respect the right to solar access of properties within the impact area. The precepts in the LEED certification program run in tandem with the objectives of the Mayor's Climate Action Plan. Consistent with the City's Climate Action objectives and its leadership as one of thirteen inaugural Solar America Cities under the Solar America Initiative of the U.S. Department of Energy, "As-of-Right" development should be required to achieve LEED Gold and "Enhanced" development should achieve LEED Platinum. NABB.9

Groundwater: Data reported by The Boston Groundwater Trust indicate that there is a significant groundwater drawdown nearby, along Stuart Street. There has been a history in this area of large basements with aging construction, leaking foundation walls and high volume sump pumping, all of which can contribute to groundwater depression. Of particular concern, in that regard, is the existing building at this location, which is understood to have an extensive basement and a deeper partial sub-basement. Both of these basements are proposed to be incorporated into the development and have potential for groundwater breaches.

We request that the project team further identify and study the existing basements and all utility connections for potential groundwater issues and recommend possible waterproofing mitigation measures as part of the DPIR and FPIR. NABB.10

Further, we request that the highly unusual methodology proposed for constructing supplemental new foundations be analyzed and explained because of the hazard it may introduce by penetration through the aquifer that currently preserves existing wood pile foundations. NABB.11

Other provisions of the study should include the following: NABB.12

- Identify wood pile-supported buildings nearby.
- Develop construction phase protocols, such as water level monitoring, stop work, notice to authorities & abutters and recharging in the event of lowered water levels.
- Detail specification of a permanent storm water recharge system from rooftop into the aquifer.
- A commitment to permanently manage groundwater protection measures by annual inspection and reporting to the City, following completion of the development.

Urban Design & Uses

Massing: The importance of limiting the height of buildings within proximity to the original Hancock building cannot be overlooked. The maximum height of the Clarendon project is below the shoulder of the Hancock building. The height limit is intended to reinforce and preserve the iconic skyline defined by the original Hancock building and should be no taller, including mechanicals, than the shoulder of that building, or 356 feet. NABB.13 NABB has consistently argued against the concept of the "High Spine", which would create a wall of high rise buildings walling off the South End from the Back Bay. Although it may seem attractive as viewed from surrounding expressways, it is extremely detrimental to the surrounding neighborhoods.

Enlivening the streetscape: The project site is located within a block that will benefit from new active uses to link the abutting neighborhoods--Ellis, Bay Village, and the Back Bay--by enlivening the streetscape and encouraging residential use and pedestrian activity in what is today a dead zone at night. Despite the proposed programming for the lower floor of the building, the link is broken by the street access from the Hancock Garage at Trinity Place.

Affordable Housing and Linkage: We strongly encourage the BRA and Trinity Stuart LLC to work creatively to forge a package for the project to NABB.14 provide all required Affordable Housing on-site, as well as expending any linkage funds for housing to develop uses particularly well-suited to this block in the Back Bay. NABB has consistently advocated that all the required affordable units be on-site and does so for this project as well.

Alternatives

We appreciate the deliberate pace of the planning and design for this site, which affords the exploration of options for building uses, massing, and NABB.15 design. Options, for example:

- A project design similar to the Old Police Headquarters, designed within the limitations of existing zoning should be included.
- An alternative massing at 356' should be included in the DPIR.
- Affordable Housing Options should be explored, especially to provide housing for families in three bedroom units. We believe the Affordable Housing Policy has the flexibility to provide much needed family housing.
- The Downtown Neighborhoods are severely hampered by the lack of a K-8 school within walking distance. Incorporation of an urban school should be studied, perhaps by using the air rights over Trinity Place or the parking Garage.

Conclusion

The Back Bay is not valuable as a consequence of the towers around it, but the other way around. The most dense, walkable, livable, vibrant, mixed-use, urbane and valuable areas of Boston are the small-scale, tightly packed ones, the historic neighborhoods. In Back Bay, the vibrant urban density is here, in the low-scale historic district; this is from whence the character and life of the Back Bay spring. This is what draws people--visitors, residents, shoppers, tourists, and businesses--from all over the world to Boston, not the towers around it. Putting it into the perpetual shadow of a "high spine" of towers will only maim that golden goose. Any high-rise development must be carefully designed to be respectful of its neighbors and its physical environment.

Sincerely,

Howard M. Kassler, Chair
Neighborhood Association of the Back Bay

Cc: Mayor Thomas M. Menino
BRA Director Peter Meade
Senator Will Brownsberger
Representatives Byron Rushing and Marty Walz

NABB.1 Sunlight/shadow

See Section 4.2 for a shadow analysis prepared in compliance with the BRA Scoping Determination.

NABB.2 Façade

See Section 6.2.

NABB.3 Wind study

See Section 4.1 for a wind analysis prepared in compliance with the BRA Scoping Determination.

NABB.4 Traffic study

See Chapter 3.

NABB.5 Trinity Place traffic

The City will be installing a traffic signal at the currently unsignalized Stuart Street/Trinity Place intersection, improving pedestrian safety and providing improved level of service for both vehicles and pedestrians. With the new signal, Trinity Place traffic will be able to proceed safely through the intersection on a green light, as opposed to waiting for a sufficient gap in three lanes of Stuart Street traffic as under existing conditions. See Tables 3-12 and 3-13 for intersection operational results under the Build Condition. Closing Trinity Place to vehicles was not considered in the traffic study.

NABB.6 Traffic study with or without Simons project

As directed by BTD, the transportation study incorporates the expansion of Copley Place, among other development projects proposed in the area. See Section 3.3.1.1 for a discussion of background projects.

NABB.7 Green Line and Orange Line capacity

See Section 3.2.6 for a discussion of existing transit service in the area, and see Table 3-11 for new trips generated by the Project. Overall, the Project will generate less than 40 transit trips per peak hour, per direction. Spread over the various transit options in the study area, the impact to any one service will be negligible.

NABB.8 Historic preservation

See Section 6.2 for an analysis of façade shadow impacts on nearby historic resources.

See Section 4.7 for a discussion of construction impacts and mitigation. The Construction Management Plan to be submitted to the City will outline measures to minimize the impacts to the surrounding area.

NABB.9 LEED certification

See response to comment BRA.9.

NABB.10 Groundwater

Area groundwater levels have been well documented by studies completed in the Project area and by the network of wells monitored and reported by the Boston Groundwater Trust (BGwT), all of which is available to the Project team. The available information, as well as specific conditions of the existing basement levels and proposed construction, will continue to be reviewed and evaluated by the team during Project design to understand conditions and potential impacts. The final design will be completed with a performance criteria established of no negative impact to area groundwater levels. This includes providing a completely waterproofed basement with no permanent groundwater pumping or leakage. It is anticipated that a stormwater infiltration system will be constructed near the loading area to promote groundwater recharge and help meet the requirements of Article 32 of the Boston Zoning Code.

NABB.11 Foundations

Foundation support requirements for the new tower structure are expected to include new deep foundations that extend to top of bedrock. The type of foundations being considered at this time are drilled-in small diameter grouted piles that are reinforced with an outer steel casing and inner core steel. The foundations consist of discrete concrete and steel elements that do not disturb the surrounding soils, create a groundwater barrier, impact groundwater flow, or create channels for groundwater flow or communication between the upper groundwater zone and deeper aquifers, since the result is a solid element with no surrounding voids.

The proposed construction methodology is very common in the Boston area and has been used for many projects in the Back Bay, including the Mandarin Oriental, Hynes Convention Center and numerous existing building renovations and modifications. The additional benefit of using drilled piles is to mitigate ground movement. Drilled piles do not generate vibration during installation and result in no impact to groundwater levels.

NABB.12 Other provisions

As discussed above, conditions in the area related to wood pile supported buildings and area groundwater levels are well understood and the information is readily available. The Project is committed to complying with provisions of Article 32 of the Zoning Code for construction in the Groundwater Conservation Overlay District (GCOD) which requires engineering evaluation and demonstration of no negative impacts. Provisions for protection of area groundwater levels will also be incorporated into the contract documents for the Project. It is anticipated that a stormwater infiltration system will be constructed near the loading area to promote groundwater recharge and help meet the requirements of Article 32.

NABB.13 Height limit

As mentioned previously, the Project's height, as conceived, allows for an economically viable Project. With its slender profile, the Project has been designed to minimize the Project's impacts in regard to shadow and wind. A project of 356 feet would result in a wider building in order to maintain sufficient floor area to make the Project economically viable. A wider building would create more of a "wall" between the Back Bay and South End and cast broader shadows on Copley Square. The Proponent believes that a building height of approximately 400 feet in a slender, well designed building will not detract from the original Hancock building's design and will significantly enhance the neighborhood.

NABB.14 Affordable housing

See response to comment BRA.3.

NABB.15 Alternatives

The Proponent has studied the alternatives requested by the BRA Scoping Determination.

Susan D. Prindle
140 Marlborough St.
Boston, MA 02116

Geoff Lewis, Project Coordinator
Boston Redevelopment Authority
One City Hall Square, 9th Floor
Boston, MA 02201

December 27, 2012

Re: 40 Trinity Place/426 Stuart Street

Dear Mr. Lewis,

I continue to be concerned about the pressure to build ever higher along the High Spine. Creating the Berlin Wall between the Back Bay and the South End is not and never has been a good idea, to my way of thinking. Pursuing that approach will sacrifice the livability of the abutting neighborhoods, cast critical historic resources in shadow, and exacerbate already unacceptable and dangerous wind levels. Despite this developers' good intentions, I doubt that the current proposal will be a net benefit to our area. As it will surely be cited as a precedent for future projects, it is doubly concerning to those of us who live here.

I was as disappointed as anyone that the Stuart Street study, which was, I believe, undertaken in good faith by all parties, failed to address the critical environmental and preservation issues in the Back Bay. After limping along for two years, it eventually foundered on, among other issues, neighborhood opposition to the proposed 400' height limit adjacent to Copley Square.

However, the residential groups which comprised the Stuart Street Study seemed willing to SP.1
support a building that respected the height of the shoulder of the old John Hancock tower (356', including mechanicals). I would urge that this lower height be studied in the DPIR to see if it would create less wind and shadow impact on the immediate area and on our neighborhoods. Having such a comparison would be useful not only for this project, but for future proposals.

In addition, I would like to see an as of right alternative studied. This could prove the most appropriate and cost-effective alternative for this site.

I would also like to reiterate a plea for actual, on-site wind studies of this area. My SP.2
understanding is that the current wind studies are based on readings at Logan Airport, rather than Clarendon Street. Given the importance of this issue to those of us who traverse this corridor, I would hope that the City would be willing to install anemometers at key locations (at minimum around the Hancock, at the entrance to Copley Place, at the YWCA and Trinity Church) to test the accuracy of their estimates.

Thank you for the opportunity to comment.

Sincerely,

Susan D. Prindle

SP.1 Height

The Proponent has studied the alternatives in compliance with the BRA Scoping Determination.

SP.2 Wind studies

See Section 4.1 for a wind analysis prepared in compliance with the BRA Scoping Determination.

The Clarendon
400 Stuart Street
Boston, MA 02116

February 28, 2013

Mr. Geoff Lewis
Boston Redevelopment Authority
One City Hall Square, 9th Floor
Boston, MA 02201

RE: 40 Trinity Place/426 Stuart Street

Dear Mr. Lewis:

Thank you for your responsiveness to our recent inquiries about the proposed development at 40 Trinity Place. Although we are supportive of a redevelopment of this property,we have serious concerns about the impact the proposed project would have on our neighborhood and our property as it has been presented.

A small new neighborhood was effectively created in 2009 with the opening of the residences at The Clarendon at 400 Stuart Street and One Back Bay at 135 Clarendon Street, now collectively housing approximately 600 residents. As new residents of this project, we are keenly interested in the ongoing evolution of our immediate neighborhood and are motivated to preserve the characteristics that attracted us to move here. However, as residents of this new neighborhood, we don't feel our concerns have been adequately addressed to date by those who have been involved in the early stages of the 40 Trinity Place permitting process. Thanks to your introduction, we were able to have our first meeting three weeks ago with the developers of the proposed Trinity project and are pleased to have initiated a dialogue.

We are still learning about this project and the permitting process but would like you to consider the following concerns as part of your scoping determination.

<u>Overall Project Size and Scope</u> CC.1

First and foremost, we ask that the BRA carefully evaluate the appropriateness of the very large degree of the zoning relief requested by developer. We believe the proposed mixed-use development as presented is far too large, far too tall, and too complex for the very small site it is proposed to be constructed upon.

We do not believe it would be proper to allow the developer use of the University Club's "air rights" in the determination of the acceptable Floor Area Ratio, particularly given that insufficient public benefits accrue from the resulting increase in allowable size and height. However, even with the square footage of the University Club property included, the proposed height and FAR of the project are grossly excessive. The height of the proposed building is 400 feet, or more than three times the maximum as-of-right height allowed in this B-8 zoning district. Even if the Board of Appeal were to grant an "enhanced" height of 155 feet, the proposed building would be more than two and one half times higher than the maximum enhanced height allowed in Subdistrict K of the Downtown IPOD. The proposed FAR is similarly excessive, with a proposed FAR of 17.5, or more than twice the maximum as-of-right FAR of 8.0, and greatly in excess of the maximum "enhanced" FAR of 10.0.

No exterior changes are proposed to the existing private University Club so the desired streetscape improvements and other such public benefits that would presumably be necessary to qualify for the requested zoning relief for this portion of the project are clearly lacking.

The proposed design does not provide sufficient streetscape improvements on Stuart Street. We request that the developer consider alternate configurations for the base of the building. The proposed design introduces an additional private entry on Stuart Street, adjacent to the existing private entry to the University Club, and eliminates a current active public retail space. In addition, the balance of the streetscape plan on Stuart Street eliminates another retail space and replaces it with a hotel entry. The only retail space being added is on the side street (Trinity Place) which will be less desirable to the restaurateurs targeted to occupy the space. In addition, the depths of the proposed sidewalks are much too narrow for the size of the project and its proposed uses. CC.2

The developer's Project Notification Form (PNF) cites a draft summary of the Stuart Street Planning Study Proposed Development Review Guidelines (the "Study"), as its primary justification for the significant zoning relief requested, despite the fact that the Study was never adopted or incorporated into the Boston zoning code in any way. We understand that significant differences remain among the organizations that participated in the Study, including differences that would preclude a project anywhere near the height proposed. Also, our property represents the largest group of homeowners living within the Study area and also those in closest proximity to the project yet we had absolutely no input into the Study. In addition, the Study did not contemplate the recently approved, 47 story, 600+ foot high tower at Copley Place located less than 400 feet from the proposed project on the border of the Study area. The impact of this major project that will become the 3rd tallest building in Back Bay was not considered in the Study. Accordingly, we ask the BRA to review the proposed 40 Trinity project on its own merits in accordance with the Article 80 process and reject any use of the draft recommendations included in Stuart Street Planning Study. CC.3

<u>Traffic and Congestion</u>
We have enormous concerns about increased traffic and congestion that would result from this massive project. The proposed usage of essentially the entire footprint of the site for the building leaves no private space available to deal with the parking and circulation challenges presented by the project. Given the large number of visitors, employees and residents that can be expected to go in and out daily, we do not believe the developer's plan to rely primarily upon valet service will be practically workable. The developer's PNF makes a remarkable claim that peak period vehicle trips will decrease with the proposed development. We ask that the BRA challenge the developer's Trip Generation study given that it would seem very unlikely that the development, which is four times the size of the current underutilized hotel and conference center, would generate less vehicular traffic, as claimed. Even the hotel and conference portion of the project, which will be twice the size of the current facility, is projected to generate fewer trips, which also seems highly suspect.

Trinity Place is effectively a one way street given that the only outlets heading South are a parking garage entrance, a Mass Turnpike entrance and the tight parking and loading area behind the building shared with abutting properties. The developer anticipates using Trinity Place to help deal with the traffic challenges but there is no ability to reverse direction without making a U turn. In addition, the hotel entry on Stuart Street lacks any private off-street space to accommodate guests and visitors coming to the hotel by car. The three or four public parking spaces in front of the building are several magnitudes lower than would be necessary to address adequately the hotel, residential and restaurant valet parking needs in addition to drop off/pick – up and taxi service usage. We ask the BRA seriously consider whether the traffic, parking and circulation challenges can ever be adequately overcome on this small site. A further traffic and circulation challenge exists with respect to loading. No provision for daily loading is evident in the plan for the building's residents and the specified loading area for the entire 379,000 square foot building is located behind the property in a spot that would prohibit drive through circulation.

We ask that the BRA carefully study the project's ability, or inability, to deal with the expected CC.4
additional traffic given the many site constraints. We also request that the developers add the intersection of Stuart Street and Dartmouth Street to the list of to-be-studied intersections for their traffic analysis. Virtually all vehicular traffic to the site will come on Stuart from the Dartmouth Street direction and this intersection is critical to circulation in and around the neighborhood, as well as for access to Back Bay from the Mass Turnpike. We ask that the study consider the traffic impact with and without the already approved Copley Place Expansion.

Specific to our building, we face daily challenges today dealing with gridlocked street traffic combined with steady pedestrian traffic in the AM period which often makes it difficult to exit our garage onto Stuart Street. We also frequently walk past the proposed project site in our daily excursions, along with a sidewalk full of commuters during peak periods, and regularly witness the gridlock on Stuart Street created by the growing level of pedestrian traffic crossing the street. We ask that the scoping determination also study the increased pedestrian and vehicular traffic that the project will generate that would likely exacerbate these existing and potentially dangerous problems.

Shadows and Loss of Daylight

The developer's PNF did little to address shadow and daylight impacts from the proposed project. The visual presentation in the PNF was focused on views from Copley Square, the Charles River and the Southwest Corridor with little attention paid to Stuart Street other than in the immediate block of the proposed development. Figure 2-6 in the developer's PNF presentation gives evidence of the significant adverse shadow and daylight impact on and around our residences as well as upon the prominent historic buildings and parks that surround us. Given that the proposed 400 foot tall tower is located less than 200 feet from our homes, we request that
shadow and daylight studies be completed by the developer to specifically address the magnitude CC.5
and timeframe of lost sunlight and new shadows throughout the year that will be imposed upon our building and the buildings and public areas surrounding it.

Skyline Perspective

A review of the publicly available documents for the approved Copley Expansion, the unadopted Stuart Street Planning Study and the proposed 40 Trinity Place PNF all failed to study the impact to the Back Bay skyline looking from the east and from our neighborhood. We request that the
skyline perspective be considered looking West from the East. CC.6

Wind

The intersection of Stuart Street and Clarendon Street is among the windiest in all of Boston. The wind study completed to help secure approval of the Copley Place Expansion showed Unacceptable levels of wind gusts at this intersection, where we enter and exit our residences. Wind levels deemed "Dangerous" were found a block away. Clearly, wind is serious problem in the area around the proposed development and we request that wind speeds not be allowed to increase at all in this area as a result of the proposed new building. Given the less than precise science of predicting wind levels, we ask that actual baseline studies be performed to compare actual wind speeds at key points in and around our property to the projected wind speeds from wind tunnel modeling using the wind study data that was the basis for approval for the Copley Expansion. Such a study will help provide an understanding of the precision and reliability of the wind studies in a known problematic location that can't safely sustain any higher wind levels. CC.7

Construction

By any measure, constructing a 33 story, 400 foot tower is a complicated endeavor that would present a variety of challenges. Trying to build one with virtually no setbacks on a parcel of only 13,361 square feet would appear to be exceedingly daunting. Given the property's location, fronting on a very busy commuting artery which also serves as the front door to our homes, we question how such a tower can be built without subsuming an unacceptable amount of public roadway. For one, there doesn't appear to be any viable staging area for this large tower. It would seem that all staging, construction equipment, vehicles, deliveries, etc. would have to make use of the public roadways surrounding the building. This would create too great a burden for too long for area residents and businesses who have just endured many years of construction-related delays. Will the proposed plan close one or more lanes of Stuart Street for the duration of the project? Will a relocated pedestrian sidewalk take away more of Stuart Street, or will we need to cross the street for the three year duration of the project to walk past the development back and forth on Stuart Street? Accordingly, we ask that the developer present a very detailed and credible construction plan (and schedule) that addresses the myriad of challenges that this project presents. And given that the PNF made no reference to the nearby residences, including ours, we ask that the developer address how noise and other environmental concerns will be handled to minimize their effects upon our homes. CC.8

Developer Experience and Financial Commitment

The 40 Trinity Place project proposes incorporating a hotel, residential units, an upper level garage, restaurant space and the expansion of the adjacent University Club, with the upper levels cantilevering over the existing University Club. Even if it were to be built on a far larger site, it would still be a complex project that would demand an experienced and proven development team to execute. We ask that the agency review closely the developer's experience executing similar complicated high-rise mixed-use projects. CC.9

A large, complex project as proposed will require a very large financial commitment to it see it through its multi-year development cycle. Accordingly, we request that the developer be able to demonstrate its financial capacity for the project including sufficient contingency funding to account for the project's inherent complexity.

Design Issues
Studies on the BRA website detail desired tower design configurations, including appropriate setbacks above a tower's base as the building rises. The proposed tower lacks such setbacks and instead proposes an undesirable, walled-off effect on Stuart Street and as viewed from the East and West. Given the degree of zoning relief being requested, we believe the tower design should at the very least be in keeping with your tower design guidelines. We also find the aesthetic design as depicted in the renderings to not be in keeping with the proposed project's location directly across the street from the iconic John Hancock tower. We presume that many opinions will be weighed on this subjective perspective as the project advances in the permitting process and ask that our input be considered along with others'.

We believe the proposed project has many serious flaws that will be difficult if not impossible to address in acceptable manner. We ask that our opinions be heard and that we be included in the process going forward.

Thank you for your consideration of our requests. We look forward to continuing our dialogue with you and the developer on this important project. If you would like to connect with us, please feel free to call Rosemary Austin, property manager of The Clarendon at (617) 284-5111 or Tom Iannotti, the chairman of our committee at (617)-638-0054.

Sincerely,

The Clarendon Condominium Trust Development Committee

Thomas Iannotti, Committee Chairman
Elliot Katzman, Board Member, The Clarendon Condominium Trust
Lisa Pedicini, Board Member, The Clarendon Condominium Trust
William Beckeman, Committee Member

Cc:

Senator William N. Brownsberger
Councilor Bill Linehan
Peter Meade, Director Boston Redevelopment Authority
Hilani Morales Neighborhood Coordinator
Representative Byron Rushing
Howard P. Speicher
Jay Walsh, Director ONS Neighborhood Coordinators

CC.1 Project size

The Project has been designed to be generally consistent with the goals and requirements of the Stuart Street Planning Study and with the height and massing of other projects studied and approved in the area, such as Liberty Mutual, The Clarendon, the Simon residential building, and the Columbus Center project, as well as other buildings in the area, including The Boston Marriott Copley Place and Westin Hotel at Copley Place.

CC.2 Streetscape improvements

See Chapter 5.

CC.3 Stuart Street Planning Study

Comment noted.

CC.4 Traffic impacts

See Chapter 3.

CC.5 Shadow and daylight

See Sections 4.2 and 4.3.

CC.6 Skyline perspective

See Chapter 5.

CC.7 Wind

See Section 4.1 for a wind analysis prepared in compliance with the BRA Scoping Determination.

CC.8 Construction

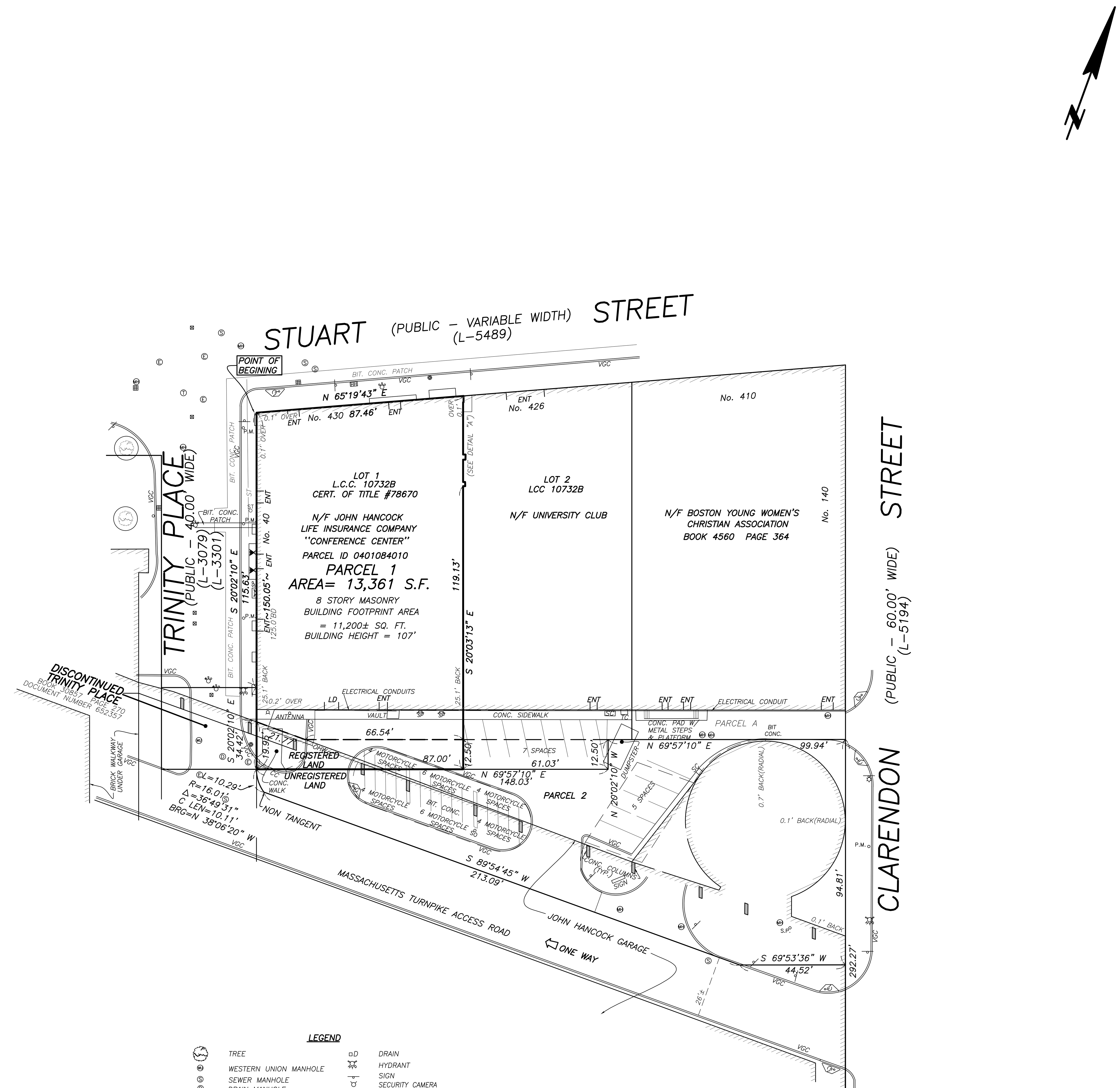
See Section 4.7 for a discussion of construction-related impacts and mitigation. A Construction Management Plan will be submitted to the Boston Transportation Department prior to commencement of work on the Project site. The CMP will address staging, deliveries, use of public ways, traffic control during construction, mitigation of noise and air quality impacts, etc.

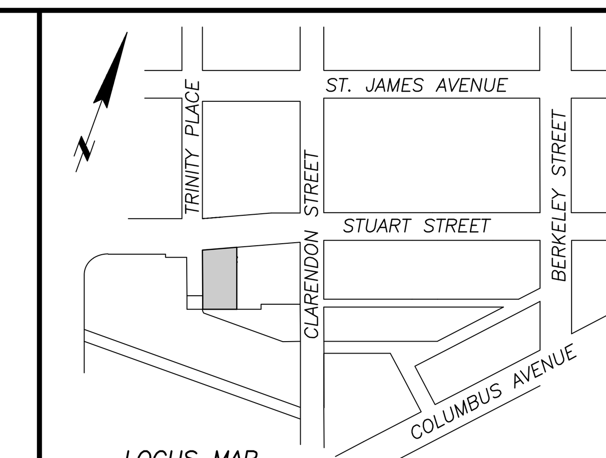
CC.9 Developer experience and financial commitment

See response to comment HR.17.

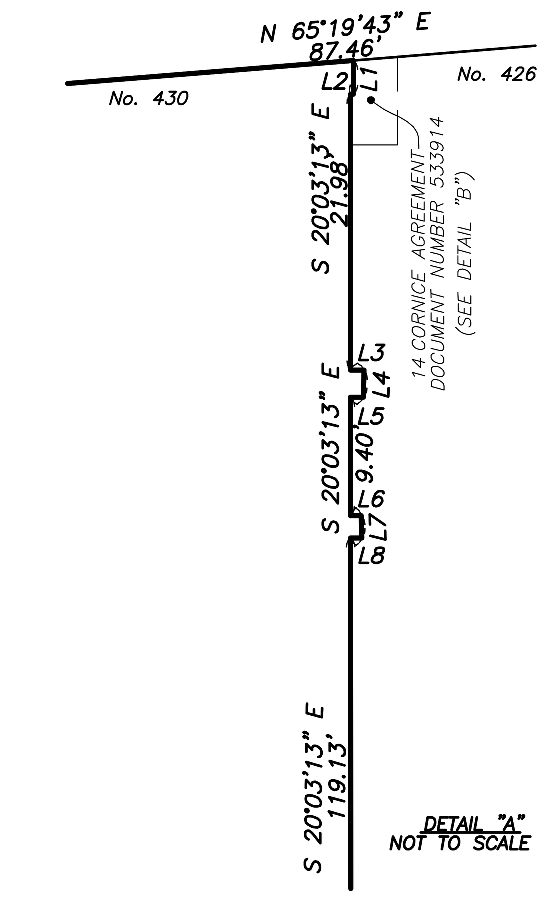
Appendix A

Exhibit Plan





LOCUS MAP
NOT TO SCALE



DETAIL "A"
NOT TO SCALE

LINE	BEARING	DISTANCE
L1	S 20°03'13" E	2.68'
L2	S 69°56'47" W	0.22'
L3	N 69°56'47" E	1.07'
L4	S 18°27'15" E	2.15'
L5	S 69°56'47" W	1.01'
L6	N 69°56'47" E	0.84'
L7	S 21°40'54" E	1.76'
L8	S 69°56'47" W	0.89'

NOTE:

1) THE PURPOSE OF THIS PLAN IS TO SHOW THE BUILDING AND MAJORE IMPROVEMENTS. FOR CLARITY, NOTES AND EASEMENT INFORMATION NOT SHOWN.

BOUNDARY DESCRIPTION – PARCEL 1

THAT CERTAIN PARCEL OF LAND WITH THE BUILDINGS THEREON SITUATED AT 40 TRINITY PLACE AND 430 STUART STREET, IN THE CITY OF BOSTON, COUNTY OF SUFFOLK, COMMONWEALTH OF MASSACHUSETTS, SHOWN AS LOT ONE (1) ON A SUBDIVISION PLAN DRAWN BY GUNTHER ENGINEERING, INC., SURVEYORS, DATED FEBRUARY 6, 1995, AS MODIFIED AND APPROVED BY THE COURT, FILED IN THE LAND REGISTRATION OFFICE AS PLAN NO. 10732–B, A COPY OF A PORTION OF WHICH IS FILED WITH CERTIFICATE OF TITLE 110296 AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE SOUTHERLY SIDELINE OF STUART STREET AND THE EASTERLY SIDELINE OF TRINITY PLACE;

THENCE RUNNING N 65°19'43" E ALONG THE SAID SOUTHERLY SIDELINE OF STUART STREET, A DISTANCE OF 87.46 FEET;

THENCE TURNING AND RUNNING S 20°03'13" E, A DISTANCE OF 2.68 FEET;

THENCE TURNING AND RUNNING S 69°56'47" W, A DISTANCE OF 0.22 FEET;

THENCE TURNING AND RUNNING S 20°03'13" E, A DISTANCE OF 21.98 FEET;

THENCE TURNING AND RUNNING N 69°56'47" E, A DISTANCE OF 1.07 FEET;

THENCE TURNING AND RUNNING S 18°27'15" E, A DISTANCE OF 2.15 FEET;

THENCE TURNING AND RUNNING S 69°56'47" W, A DISTANCE OF 1.01 FEET;

THENCE TURNING AND RUNNING S 20°03'13" E, A DISTANCE OF 9.40 FEET;

THENCE TURNING AND RUNNING N 69°56'47" E, A DISTANCE OF 0.84 FEET;

THENCE TURNING AND RUNNING S 21°40'54" E, A DISTANCE OF 1.76 FEET;

THENCE TURNING AND RUNNING S 69°56'47" W, A DISTANCE OF 0.89 FEET;

THENCE TURNING AND RUNNING S 20°03'13" E, A DISTANCE OF 119.13 FEET;

THENCE TURNING AND RUNNING S 69°57'10" W, A DISTANCE OF 87.00 FEET;

THENCE TURNING AND RUNNING N 20°02'10" W IN PART BY THE EASTERLY SIDELINE OF TRINITY PLACE, A DISTANCE OF 150.05 FEET TO THE POINT OF BEGINNING;

CONTAINING AN AREA OF 13,361 SQUARE FEET.

LEGEND

- TREE
- WESTERN UNION MANHOLE
- SEWER MANHOLE
- DRAIN MANHOLE
- MANHOLE
- HANDICAP RAMP
- GAS SHUT OFF
- WATER SHUT OFF
- BOSTON WATER METER
- CATCH BASIN
- CATCH BASIN–ROUND
- LIGHT POLE
- EXCEPTION NO. IN TITLE COMMITMENT
- DRAIN
- HYDRANT
- SIGN
- SECURITY CAMERA
- P.M. PARKING METER
- PARKING METER POST
- S.P. STAND PIPE
- STG STEAM GATE
- ELECTRIC HANDHOLE
- VGC VERTICAL GRANITE CURB
- BD BUILDING DIMENSION
- TC TRASH COMPACTOR
- SC STORAGE CONTAINTER
- ENT ENTRANCE
- LD LOADING DOCK

EXHIBIT PLAN
40 TRINITY PLACE
A.K.A. 430 STUART STREET
JOHN HANCOCK CONFERENCE CENTER
JOHN HANCOCK LIFE INSURANCE COMPANY
BOSTON, MASS.

SCALE: 1"=20' JULY 12, 2013
HARRY R. FELDMAN, INC. LAND SURVEYORS
112 SHAWMUT AVENUE PHONE: (617)357–9740
BOSTON, MASS. 02118 www.harryrfeldman.com

FELDMAN
Professional Land Surveyors

20 0 10 20 40 80
GRAPHIC SCALE

RESEARCH JLC	FIELD CHIEF JM	PROJ MGR RGA	APPROVED	SHEET NO. 1 OF 1
CALC PHB II	CADD PHB II	FIELD CHECKED	CRD FILE 13243	JOB NO. 13303

FILENAME: S:\PROJECTS\13300s\13303\13303–EXHIBIT.dwg

Appendix B

Transportation

Traffic Counts

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

N/S: Dartmouth Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 C
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dartmouth Street From North			Stuart Street From East			Dartmouth Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	10	89	0	93	159	131	482
07:15 AM	0	0	0	0	0	0	33	89	0	96	180	143	541
07:30 AM	0	0	0	0	0	0	21	95	0	106	211	178	611
07:45 AM	0	0	0	0	0	0	19	123	0	108	179	190	619
Total	0	0	0	0	0	0	83	396	0	403	729	642	2253
08:00 AM	0	0	0	0	0	0	20	122	0	128	224	216	710
08:15 AM	0	0	0	0	0	0	25	96	0	99	223	198	641
08:30 AM	0	0	0	0	0	0	3	93	0	122	248	182	648
08:45 AM	0	0	0	0	0	0	17	62	0	101	210	180	570
Total	0	0	0	0	0	0	65	373	0	450	905	776	2569
Grand Total	0	0	0	0	0	0	148	769	0	853	1634	1418	4822
Apprch %	0	0	0	0	0	0	16.1	83.9	0	21.8	41.8	36.3	
Total %	0	0	0	0	0	0	3.1	15.9	0	17.7	33.9	29.4	
Cars	0	0	0	0	0	0	138	726	0	816	1559	1373	4612
% Cars	0	0	0	0	0	0	93.2	94.4	0	95.7	95.4	96.8	95.6
Heavy Vehicles	0	0	0	0	0	0	10	43	0	37	75	45	210
% Heavy Vehicles	0	0	0	0	0	0	6.8	5.6	0	4.3	4.6	3.2	4.4

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	19	**123**	0	**142**	108	179	190	477	619
08:00 AM	0	0	0	0	0	0	0	0	20	122	0	142	**128**	224	**216**	**568**	**710**
08:15 AM	0	0	0	0	0	0	0	0	**25**	96	0	121	99	223	198	520	641
08:30 AM	0	0	0	0	0	0	0	0	3	93	0	96	122	**248**	182	552	648
Total Volume	0	0	0	0	0	0	0	0	67	434	0	501	457	874	786	2117	2618
% App. Total	0	0	0		0	0	0		13.4	86.6	0		21.6	41.3	37.1		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.670	.882	.000	.882	.893	.881	.910	.932	.922
Cars	0	0	0	0	0	0	0	0	62	417	0	479	439	837	763	2039	2518
% Cars	0	0	0	0	0	0	0	0	92.5	96.1	0	95.6	96.1	95.8	97.1	96.3	96.2
Heavy Vehicles	0	0	0	0	0	0	0	0	5	17	0	22	18	37	23	78	100
% Heavy Vehicles	0	0	0	0	0	0	0	0	7.5	3.9	0	4.4	3.9	4.2	2.9	3.7	3.8

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

N/S: Dartmouth Street
E/W: Stuart Street
City, State: Boston, MA
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Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	10	83	0	88	148	128	457
07:15 AM	0	0	0	0	0	0	31	82	0	92	172	133	510
07:30 AM	0	0	0	0	0	0	20	86	0	101	205	173	585
07:45 AM	0	0	0	0	0	0	16	118	0	106	171	184	595
Total	0	0	0	0	0	0	77	369	0	387	696	618	2147
08:00 AM	0	0	0	0	0	0	20	118	0	123	217	213	691
08:15 AM	0	0	0	0	0	0	23	93	0	94	212	188	610
08:30 AM	0	0	0	0	0	0	3	88	0	116	237	178	622
08:45 AM	0	0	0	0	0	0	15	58	0	96	197	176	542
Total	0	0	0	0	0	0	61	357	0	429	863	755	2465
Grand Total	0	0	0	0	0	0	138	726	0	816	1559	1373	4612
Apprch %	0	0	0	0	0	0	16	84	0	21.8	41.6	36.6	
Total %	0	0	0	0	0	0	3	15.7	0	17.7	33.8	29.8	

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	16	**118**	0	134	106	171	184	461	595
08:00 AM	0	0	0	0	0	0	0	0	20	118	0	**138**	**123**	217	**213**	**553**	**691**
08:15 AM	0	0	0	0	0	0	0	0	**23**	93	0	116	94	212	188	494	610
08:30 AM	0	0	0	0	0	0	0	0	3	88	0	91	116	**237**	178	531	622
Total Volume	0	0	0	0	0	0	0	0	62	417	0	479	439	837	763	2039	2518
% App. Total	0	0	0		0	0	0		12.9	87.1	0		21.5	41	37.4		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.674	.883	.000	.868	.892	.883	.896	.922	.911

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Page No : 1

Groups Printed- Heavy Vehicles

	Dartmouth Street From North			Stuart Street From East			Dartmouth Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	0	0	0	0	6	0	5	11	3	25
07:15 AM	0	0	0	0	0	0	2	7	0	4	8	10	31
07:30 AM	0	0	0	0	0	0	1	9	0	5	6	5	26
07:45 AM	0	0	0	0	0	0	3	5	0	2	8	6	24
Total	0	0	0	0	0	0	6	27	0	16	33	24	106
08:00 AM	0	0	0	0	0	0	0	4	0	5	7	3	19
08:15 AM	0	0	0	0	0	0	2	3	0	5	11	10	31
08:30 AM	0	0	0	0	0	0	0	5	0	6	11	4	26
08:45 AM	0	0	0	0	0	0	2	4	0	5	13	4	28
Total	0	0	0	0	0	0	4	16	0	21	42	21	104
Grand Total	0	0	0	0	0	0	10	43	0	37	75	45	210
Apprch %	0	0	0	0	0	0	18.9	81.1	0	23.6	47.8	28.7	
Total %	0	0	0	0	0	0	4.8	20.5	0	17.6	35.7	21.4	

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	6	0	6	**5**	**11**	3	19	25
07:15 AM	0	0	0	0	0	0	0	0	2	7	0	9	4	8	**10**	**22**	**31**
07:30 AM	0	0	0	0	0	0	0	0	1	**9**	0	**10**	5	6	5	16	26
07:45 AM	0	0	0	0	0	0	0	0	**3**	5	0	8	2	8	6	16	24
Total Volume	0	0	0	0	0	0	0	0	6	27	0	33	16	33	24	73	106
% App. Total	0	0	0		0	0	0		18.2	81.8	0		21.9	45.2	32.9		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.750	.000	.825	.800	.750	.600	.830	.855

PRECISION DATA INDUSTRIES, LLC

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

N/S: Dartmouth Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 C
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Peds and Bicycles

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	11	0	0	0	253	1	1	0	18	0	0	0	24	308
07:15 AM	0	0	0	15	0	0	0	187	0	1	0	20	0	2	0	26	251
07:30 AM	0	0	0	40	0	0	0	330	0	0	0	25	1	0	0	51	447
07:45 AM	0	0	0	40	0	0	0	289	0	1	0	38	0	0	1	53	422
Total	0	0	0	106	0	0	0	1059	1	3	0	101	1	2	1	154	1428
08:00 AM	0	0	0	36	0	0	0	309	0	2	0	49	0	0	0	41	437
08:15 AM	0	3	0	51	0	0	0	400	0	2	0	31	0	0	1	43	531
08:30 AM	0	1	0	38	0	0	0	342	0	2	0	64	0	0	1	39	487
08:45 AM	0	0	0	42	0	1	0	233	0	4	0	52	0	0	0	52	384
Total	0	4	0	167	0	1	0	1284	0	10	0	196	0	0	2	175	1839
Grand Total	0	4	0	273	0	1	0	2343	1	13	0	297	1	2	3	329	3267
Apprch %	0	1.4	0	98.6	0	0	0	100	0.3	4.2	0	95.5	0.3	0.6	0.9	98.2	
Total %	0	0.1	0	8.4	0	0	0	71.7	0	0.4	0	9.1	0	0.1	0.1	10.1	

	Dartmouth Street From North					Stuart Street From East					Dartmouth Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	40	40	0	0	0	289	289	0	1	0	38	39	0	0	**1**	**53**	**54**	422
08:00 AM	0	0	0	36	36	0	0	0	309	309	0	**2**									
08:15 AM	**0**	**3**	0	**51**	**54**	0	0	0	**400**	**400**	0	2	0	31	33	0	0	1	43	44	**531**
08:30 AM	0	1	0	38	39	0	0	0	342	342	0	2	0	**64**	**66**	0	0	1	39	40	487
Total Volume	0	4	0	165	169	0	0	0	1340	1340	0	7	0	182	189	0	0	3	176	179	1877
% App. Total	0	2.4	0	97.6		0	0	0	100		0	3.7	0	96.3		0	0	1.7	98.3		
PHF	.000	.333	.000	.809	.782	.000	.000	.000	.838	.838	.000	.875	.000	.711	.716	.000	.000	.750	.830	.829	.884

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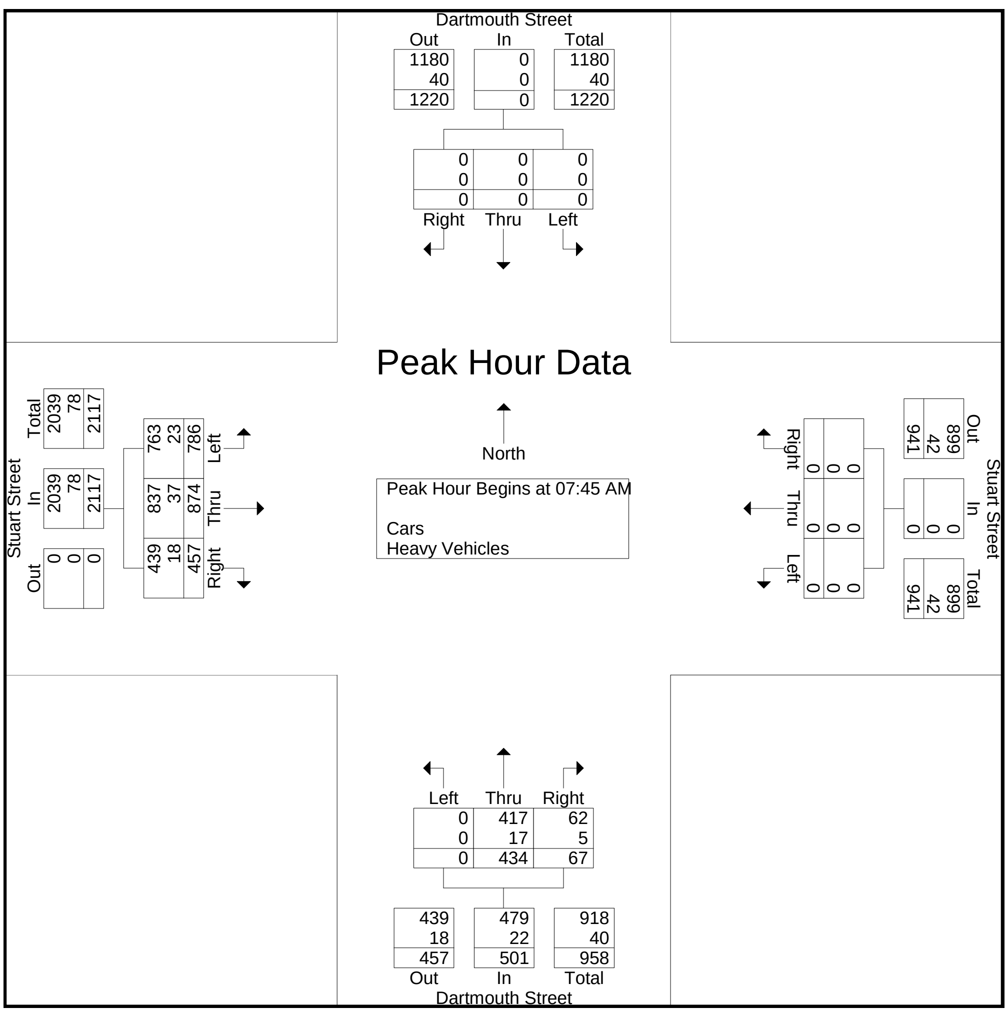
N/S: Dartmouth Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 C
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	19	**123**	0	**142**	108	179	190	477	619
08:00 AM	0	0	0	0	0	0	0	0	20	122	0	142	**128**	224	**216**	**568**	**710**
08:15 AM	0	0	0	0	0	0	0	0	**25**	96	0	121	99	223	198	520	641
08:30 AM	0	0	0	0	0	0	0	0	3	93	0	96	122	**248**	182	552	648
Total Volume	0	0	0	0	0	0	0	0	67	434	0	501	457	874	786	2117	2618
% App. Total	0	0	0		0	0	0		13.4	86.6	0		21.6	41.3	37.1		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.670	.882	.000	.882	.893	.881	.910	.932	.922
Cars	0	0	0	0	0	0	0	0	62	417	0	479	439	837	763	2039	2518
% Cars	0	0	0	0	0	0	0	0	92.5	96.1	0	95.6	96.1	95.8	97.1	96.3	96.2
Heavy Vehicles	0	0	0	0	0	0	0	0	5	17	0	22	18	37	23	78	100
% Heavy Vehicles	0	0	0	0	0	0	0	0	7.5	3.9	0	4.4	3.9	4.2	2.9	3.7	3.8



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N/S: Dartmouth Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 CC
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars - Heavy Vehicles

	Dartmouth Street From North			Stuart Street From East			Dartmouth Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	19	117	0	104	153	157	550
04:15 PM	0	0	0	0	0	0	25	94	0	101	153	136	509
04:30 PM	0	0	0	0	0	0	33	96	0	111	157	172	569
04:45 PM	0	0	0	0	0	0	25	114	0	107	158	186	590
Total	0	0	0	0	0	0	102	421	0	423	621	651	2218
05:00 PM	0	0	0	0	0	0	28	112	0	111	189	210	650
05:15 PM	0	0	0	0	0	0	18	137	0	130	181	220	686
05:30 PM	0	0	0	0	0	0	22	130	0	106	211	222	691
05:45 PM	0	0	0	0	0	0	19	127	0	110	186	209	651
Total	0	0	0	0	0	0	87	506	0	457	767	861	2678
Grand Total	0	0	0	0	0	0	189	927	0	880	1388	1512	4896
Apprch %	0	0	0	0	0	0	16.9	83.1	0	23.3	36.7	40	
Total %	0	0	0	0	0	0	3.9	18.9	0	18	28.3	30.9	
Cars	0	0	0	0	0	0	182	908	0	849	1349	1496	4784
% Cars	0	0	0	0	0	0	96.3	98	0	96.5	97.2	98.9	97.7
Heavy Vehicles	0	0	0	0	0	0	7	19	0	31	39	16	112
% Heavy Vehicles	0	0	0	0	0	0	3.7	2	0	3.5	2.8	1.1	2.3

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

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
05:00 PM	0	0	0	0	0	0	0	0	**28**	112	0	140	111	189	210	510	650
05:15 PM	0	0	0	0	0	0	0	0	18	**137**	0	**155**	**130**	181	220	531	686
05:30 PM	0	0	0	0	0	0	0	0	22	130	0	152	106	**211**	**222**	**539**	**691**
05:45 PM	0	0	0	0	0	0	0	0	19	127	0	146	110	186	209	505	651
Total Volume	0	0	0	0	0	0	0	0	87	506	0	593	457	767	861	2085	2678
% App. Total	0	0	0		0	0	0		14.7	85.3	0		21.9	36.8	41.3		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.777	.923	.000	.956	.879	.909	.970	.967	.969
Cars	0	0	0	0	0	0	0	0	84	501	0	585	447	752	855	2054	2639
% Cars	0	0	0	0	0	0	0	0	96.6	99.0	0	98.7	97.8	98.0	99.3	98.5	98.5
Heavy Vehicles	0	0	0	0	0	0	0	0	3	5	0	8	10	15	6	31	39
% Heavy Vehicles	0	0	0	0	0	0	0	0	3.4	1.0	0	1.3	2.2	2.0	0.7	1.5	1.5

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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 CC
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars

	Dartmouth Street From North			Stuart Street From East			Dartmouth Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	18	113	0	98	147	152	528
04:15 PM	0	0	0	0	0	0	23	92	0	97	146	134	492
04:30 PM	0	0	0	0	0	0	32	94	0	105	151	170	552
04:45 PM	0	0	0	0	0	0	25	108	0	102	153	185	573
Total	0	0	0	0	0	0	98	407	0	402	597	641	2145
05:00 PM	0	0	0	0	0	0	27	109	0	109	186	208	639
05:15 PM	0	0	0	0	0	0	18	137	0	128	177	219	679
05:30 PM	0	0	0	0	0	0	22	128	0	103	207	221	681
05:45 PM	0	0	0	0	0	0	17	127	0	107	182	207	640
Total	0	0	0	0	0	0	84	501	0	447	752	855	2639
Grand Total	0	0	0	0	0	0	182	908	0	849	1349	1496	4784
Apprch %	0	0	0	0	0	0	16.7	83.3	0	23	36.5	40.5	
Total %	0	0	0	0	0	0	3.8	19	0	17.7	28.2	31.3	

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	0	0	**27**	109	0	136	109	186	208	503	639
05:15 PM	0	0	0	0	0	0	0	0	18	**137**	0	**155**	**128**	177	219	524	679
05:30 PM	0	0	0	0	0	0	0	0	22	128	0	150	103	**207**	**221**	**531**	**681**
05:45 PM	0	0	0	0	0	0	0	0	17	127	0	144	107	182	207	496	640
Total Volume	0	0	0	0	0	0	0	0	84	501	0	585	447	752	855	2054	2639
% App. Total	0	0	0		0	0	0		14.4	85.6	0		21.8	36.6	41.6		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.778	.914	.000	.944	.873	.908	.967	.967	.969

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N/S: Dartmouth Street
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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 CC
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Heavy Vehicles

	Dartmouth Street From North			Stuart Street From East			Dartmouth Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	0	0	1	4	0	6	6	5	22
04:15 PM	0	0	0	0	0	0	2	2	0	4	7	2	17
04:30 PM	0	0	0	0	0	0	1	2	0	6	6	2	17
04:45 PM	0	0	0	0	0	0	0	6	0	5	5	1	17
Total	0	0	0	0	0	0	4	14	0	21	24	10	73
05:00 PM	0	0	0	0	0	0	1	3	0	2	3	2	11
05:15 PM	0	0	0	0	0	0	0	0	0	2	4	1	7
05:30 PM	0	0	0	0	0	0	0	2	0	3	4	1	10
05:45 PM	0	0	0	0	0	0	2	0	0	3	4	2	11
Total	0	0	0	0	0	0	3	5	0	10	15	6	39
Grand Total	0	0	0	0	0	0	7	19	0	31	39	16	112
Apprch %	0	0	0	0	0	0	26.9	73.1	0	36	45.3	18.6	
Total %	0	0	0	0	0	0	6.2	17	0	27.7	34.8	14.3	

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	1	4	0	5	**6**	6	**5**	**17**	**22**
04:15 PM	0	0	0	0	0	0	0	0	**2**	2	0	4	4	**7**	2	13	17
04:30 PM	0	0	0	0	0	0	0	0	1	2	0	3	6	6	2	14	17
04:45 PM	0	0	0	0	0	0	0	0	0	**6**	0	**6**	5	5	1	11	17
Total Volume	0	0	0	0	0	0	0	0	4	14	0	18	21	24	10	55	73
% App. Total	0	0	0		0	0	0		22.2	77.8	0		38.2	43.6	18.2		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.583	.000	.750	.875	.857	.500	.809	.830

PRECISION
DATA
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File Name : 112458 CC
Site Code : 05188.01
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Groups Printed- Peds and Bicycles

	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	26	0	0	0	162	0	3	0	36	0	0	1	48	276
04:15 PM	0	0	0	14	0	0	0	185	0	1	0	46	0	0	0	56	302
04:30 PM	0	0	0	20	0	0	0	193	0	3	0	49	0	0	0	47	312
04:45 PM	0	0	0	37	0	0	0	198	0	4	0	56	1	4	1	57	358
Total	0	0	0	97	0	0	0	738	0	11	0	187	1	4	2	208	1248
05:00 PM	0	0	0	45	0	0	0	348	0	2	0	47	0	1	0	47	490
05:15 PM	0	3	0	54	0	0	0	291	2	3	0	57	0	0	0	64	474
05:30 PM	0	1	0	41	0	0	0	364	1	3	0	56	0	1	0	61	528
05:45 PM	0	0	0	57	0	1	0	252	0	0	0	64	0	1	0	72	447
Total	0	4	0	197	0	1	0	1255	3	8	0	224	0	3	0	244	1939
Grand Total	0	4	0	294	0	1	0	1993	3	19	0	411	1	7	2	452	3187
Apprch %	0	1.3	0	98.7	0	0.1	0	99.9	0.7	4.4	0	94.9	0.2	1.5	0.4	97.8	
Total %	0	0.1	0	9.2	0	0	0	62.5	0.1	0.6	0	12.9	0	0.2	0.1	14.2	

	Dartmouth Street From North					Stuart Street From East					Dartmouth Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	45	45	0	0	0	348	348	0	2	0	47	49	0	**1**	0	47	48	490
05:15 PM	0	**3**	0	54	**57**	0	0	0	291	291	**2**	**3**									
05:30 PM	**0**	**1**	**0**	**41**	**42**	**0**	**0**	**0**	**364**	**364**	1	3	0	56	60	0	1	0	61	62	**528**
05:45 PM	0	0	0	**57**			**1**							**64**	**64**	0	1	0	**72**	**73**	447
Total Volume	0	4	0	197	201	0	1	0	1255	1256	3	8	0	224	235	0	3	0	244	247	1939
% App. Total	0	2	0	98		0	0.1	0	99.9		1.3	3.4	0	95.3		0	1.2	0	98.8		
PHF	.000	.333	.000	.864	.882	.000	.250	.000	.862	.863	.375	.667	.000	.875	.918	.000	.750	.000	.847	.846	.918

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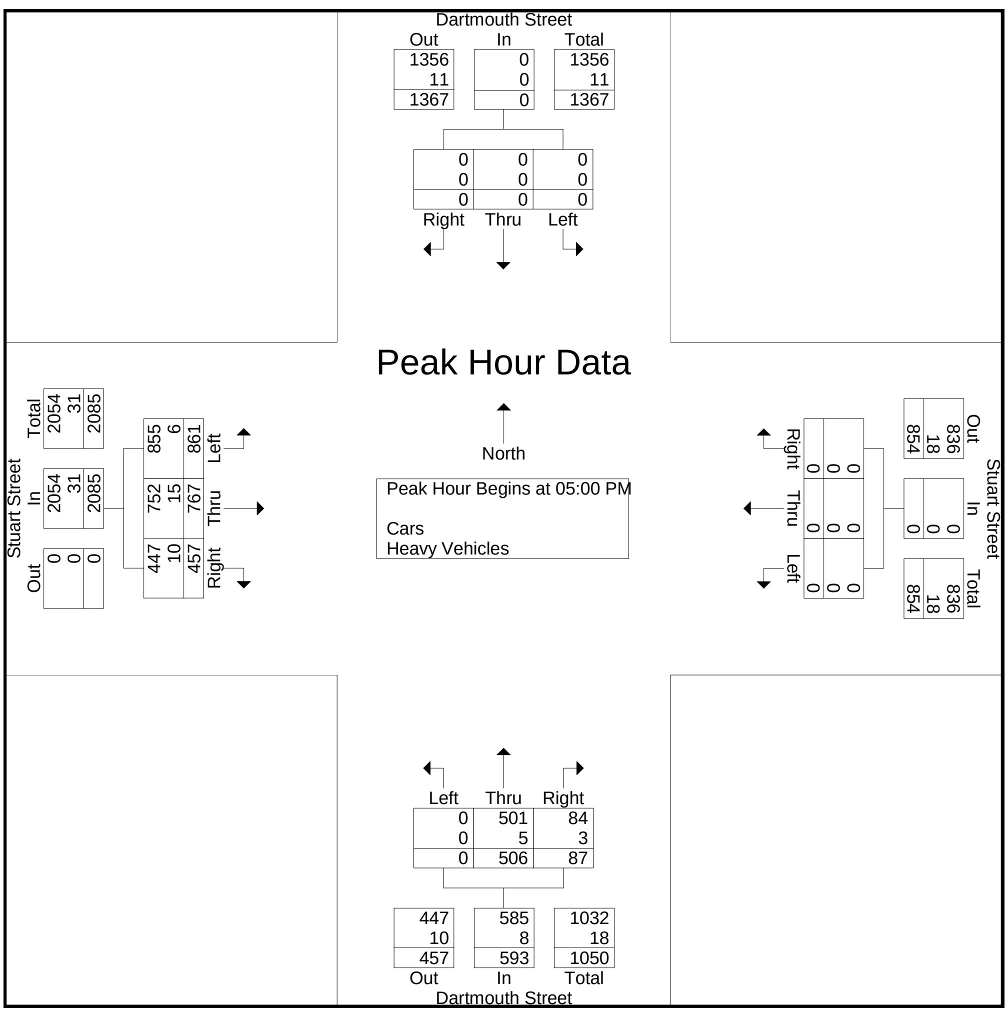
	Dartmouth Street From North				Stuart Street From East				Dartmouth Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	**28**	112	0	140	111	189	210	510	650
05:15 PM	0	0	0	0	0	0	0	0	18	**137**	0	**155**	**130**	181	220	531	686
05:30 PM	0	0	0	0	0	0	0	0	22	130	0	152	106	**211**	**222**	**539**	**691**
05:45 PM	0	0	0	0	0	0	0	0	19	127	0	146	110	186	209	505	651
Total Volume	0	0	0	0	0	0	0	0	87	506	0	593	457	767	861	2085	2678
% App. Total	0	0	0		0	0	0		14.7	85.3	0		21.9	36.8	41.3		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.777	.923	.000	.956	.879	.909	.970	.967	.969
Cars	0	0	0	0	0	0	0	0	84	501	0	585	447	752	855	2054	2639
% Cars	0	0	0	0	0	0	0	0	96.6	99.0	0	98.7	97.8	98.0	99.3	98.5	98.5
Heavy Vehicles	0	0	0	0	0	0	0	0	3	5	0	8	10	15	6	31	39
% Heavy Vehicles	0	0	0	0	0	0	0	0	3.4	1.0	0	1.3	2.2	2.0	0.7	1.5	1.5



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N/S: Clarendon Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 A
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars - Heavy Vehicles

	Clarendon Street From North			Stuart Street From East			Clarendon Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	74	32	0	0	0	0	0	0	27	126	0	259
07:15 AM	0	97	33	0	0	0	0	0	0	25	159	0	314
07:30 AM	0	103	38	0	0	0	0	0	0	45	168	0	354
07:45 AM	0	119	51	0	0	0	0	0	0	41	141	0	352
Total	0	393	154	0	0	0	0	0	0	138	594	0	1279
08:00 AM	0	131	45	0	0	0	0	0	0	46	164	0	386
08:15 AM	0	142	32	0	0	0	0	0	0	44	173	0	391
08:30 AM	0	135	38	0	0	0	0	0	0	36	209	0	418
08:45 AM	0	151	31	0	0	0	0	0	0	40	194	0	416
Total	0	559	146	0	0	0	0	0	0	166	740	0	1611
Grand Total	0	952	300	0	0	0	0	0	0	304	1334	0	2890
Apprch %	0	76	24	0	0	0	0	0	0	18.6	81.4	0	
Total %	0	32.9	10.4	0	0	0	0	0	0	10.5	46.2	0	
Cars	0	914	291	0	0	0	0	0	0	284	1275	0	2764
% Cars	0	96	97	0	0	0	0	0	0	93.4	95.6	0	95.6
Heavy Vehicles	0	38	9	0	0	0	0	0	0	20	59	0	126
% Heavy Vehicles	0	4	3	0	0	0	0	0	0	6.6	4.4	0	4.4

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	131	**45**	176	0	0	0	0	0	0	0	0	**46**	164	0	210	386
08:15 AM	0	142	32	174	0	0	0	0	0	0	0	0	44	173	0	217	391
08:30 AM	0	135	38	173	0	0	0	0	0	0	0	0	36	**209**	0	**245**	**418**
08:45 AM	0	**151**	31	**182**	0	0	0	0	0	0	0	0	40	194	0	234	416
Total Volume	0	559	146	705	0	0	0	0	0	0	0	0	166	740	0	906	1611
% App. Total	0	79.3	20.7		0	0	0		0	0	0		18.3	81.7	0		
PHF	.000	.925	.811	.968	.000	.000	.000	.000	.000	.000	.000	.000	.902	.885	.000	.924	.964
Cars	0	542	139	681	0	0	0	0	0	0	0	0	156	706	0	862	1543
% Cars	0	97.0	95.2	96.6	0	0	0	0	0	0	0	0	94.0	95.4	0	95.1	95.8
Heavy Vehicles	0	17	7	24	0	0	0	0	0	0	0	0	10	34	0	44	68
% Heavy Vehicles	0	3.0	4.8	3.4	0	0	0	0	0	0	0	0	6.0	4.6	0	4.9	4.2

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N/S: Clarendon Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 A
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Cars

	Clarendon Street From North			Stuart Street From East			Clarendon Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	71	31	0	0	0	0	0	0	26	118	0	246
07:15 AM	0	92	33	0	0	0	0	0	0	22	153	0	300
07:30 AM	0	96	37	0	0	0	0	0	0	43	163	0	339
07:45 AM	0	113	51	0	0	0	0	0	0	37	135	0	336
Total	0	372	152	0	0	0	0	0	0	128	569	0	1221
08:00 AM	0	127	44	0	0	0	0	0	0	43	159	0	373
08:15 AM	0	139	32	0	0	0	0	0	0	41	163	0	375
08:30 AM	0	131	34	0	0	0	0	0	0	34	200	0	399
08:45 AM	0	145	29	0	0	0	0	0	0	38	184	0	396
Total	0	542	139	0	0	0	0	0	0	156	706	0	1543
Grand Total	0	914	291	0	0	0	0	0	0	284	1275	0	2764
Apprch %	0	75.9	24.1	0	0	0	0	0	0	18.2	81.8	0	
Total %	0	33.1	10.5	0	0	0	0	0	0	10.3	46.1	0	

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	127	**44**	171	0	0	0	0	0	0	0	0	**43**	159	0	202	373
08:15 AM	0	139	32	171	0	0	0	0	0	0	0	0	41	163	0	204	375
08:30 AM	0	131	34	165	0	0	0	0	0	0	0	0	34	**200**	0	**234**	**399**
08:45 AM	0	**145**	29	**174**	0	0	0	0	0	0	0	0	38	184	0	222	396
Total Volume	0	542	139	681	0	0	0	0	0	0	0	0	156	706	0	862	1543
% App. Total	0	79.6	20.4		0	0	0		0	0	0		18.1	81.9	0		
PHF	.000	.934	.790	.978	.000	.000	.000	.000	.000	.000	.000	.000	.907	.883	.000	.921	.967

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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 A
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Heavy Vehicles

	Clarendon Street From North			Stuart Street From East			Clarendon Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	3	1	0	0	0	0	0	0	1	8	0	13
07:15 AM	0	5	0	0	0	0	0	0	0	3	6	0	14
07:30 AM	0	7	1	0	0	0	0	0	0	2	5	0	15
07:45 AM	0	6	0	0	0	0	0	0	0	4	6	0	16
Total	0	21	2	0	0	0	0	0	0	10	25	0	58
08:00 AM	0	4	1	0	0	0	0	0	0	3	5	0	13
08:15 AM	0	3	0	0	0	0	0	0	0	3	10	0	16
08:30 AM	0	4	4	0	0	0	0	0	0	2	9	0	19
08:45 AM	0	6	2	0	0	0	0	0	0	2	10	0	20
Total	0	17	7	0	0	0	0	0	0	10	34	0	68
Grand Total	0	38	9	0	0	0	0	0	0	20	59	0	126
Apprch %	0	80.9	19.1	0	0	0	0	0	0	25.3	74.7	0	
Total %	0	30.2	7.1	0	0	0	0	0	0	15.9	46.8	0	

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	4	1	5	0	0	0	0	0	0	0	0	**3**	5	0	8	13
08:15 AM	0	3	0	3	0	0	0	0	0	0	0	0	3	**10**	0	**13**	16
08:30 AM	0	4	**4**	**8**	0	0	0	0	0	0	0	0	2	9	0	11	19
08:45 AM	0	**6**	2	8	0	0	0	0	0	0	0	0	2	10	0	12	**20**
Total Volume	0	17	7	24	0	0	0	0	0	0	0	0	10	34	0	44	68
% App. Total	0	70.8	29.2		0	0	0		0	0	0		22.7	77.3	0		
PHF	.000	.708	.438	.750	.000	.000	.000	.000	.000	.000	.000	.000	.833	.850	.000	.846	.850

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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 A
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Peds and Bicycles

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	43	0	0	0	99	0	0	0	27	0	0	0	58	227
07:15 AM	0	0	0	24	0	0	0	64	0	0	0	41	0	2	0	76	207
07:30 AM	0	1	1	51	0	0	0	131	0	0	0	52	0	0	0	119	355
07:45 AM	0	1	1	52	0	0	0	156	0	0	0	66	0	0	0	96	372
Total	0	2	2	170	0	0	0	450	0	0	0	186	0	2	0	349	1161
08:00 AM	0	0	0	92	0	0	0	271	0	0	0	102	0	2	0	149	616
08:15 AM	0	2	1	57	0	0	0	198	0	0	0	52	0	0	0	127	437
08:30 AM	0	1	0	66	0	0	0	172	0	0	0	59	0	0	0	125	423
08:45 AM	0	2	0	45	0	0	0	133	0	0	0	60	0	0	0	168	408
Total	0	5	1	260	0	0	0	774	0	0	0	273	0	2	0	569	1884
Grand Total	0	7	3	430	0	0	0	1224	0	0	0	459	0	4	0	918	3045
Apprch %	0	1.6	0.7	97.7	0	0	0	100	0	0	0	100	0	0.4	0	99.6	
Total %	0	0.2	0.1	14.1	0	0	0	40.2	0	0	0	15.1	0	0.1	0	30.1	

	Clarendon Street From North					Stuart Street From East					Clarendon Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	**92**	**92**	0	0	0	**271**	**271**	0	0	0	**102**	**102**	0	**2**	0	149	151	**616**
08:15 AM	0	**2**	**1**																		
08:30 AM	**0**	**1**	**0**	**66**	**67**	**0**	**0**	**0**	**172**	**172**	**0**	**0**	**0**	**59**	**59**	**0**	**0**	**0**	**125**	**125**	**423**
08:45 AM	**0**	**2**	**0**	**45**	**47**	**0**	**0**	**0**	**133**	**133**	**0**	**0**	**0**	**60**	**60**	**0**	**0**	**0**	**168**	**168**	408
Total Volume	0	5	1	260	266	0	0	0	774	774	0	0	0	273	273	0	2	0	569	571	1884
% App. Total	0	1.9	0.4	97.7		0	0	0	100		0	0	0	100		0	0.4	0	99.6		
PHF	.000	.625	.250	.707	.723	.000	.000	.000	.714	.714	.000	.000	.000	.669	.669	.000	.250	.000	.847	.850	.765

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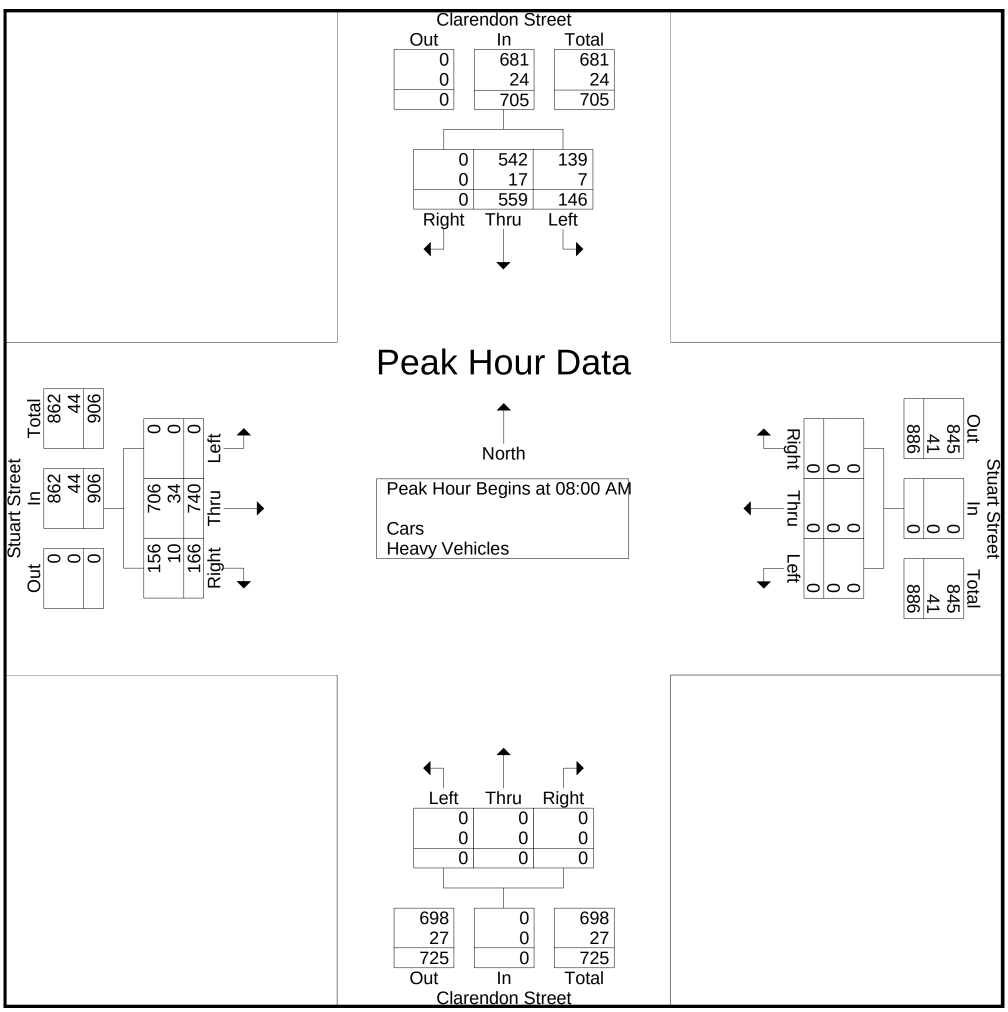
Start Date : 3/9/2011
Page No : 1

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	131	**45**	176	0	0	0	0	0	0	0	0	**46**	164	0	210	386
08:15 AM	0	142	32	174	0	0	0	0	0	0	0	0	44	173	0	217	391
08:30 AM	0	135	38	173	0	0	0	0	0	0	0	0	36	**209**	0	**245**	**418**
08:45 AM	0	**151**	31	**182**	0	0	0	0	0	0	0	0	40	194	0	234	416
Total Volume	0	559	146	705	0	0	0	0	0	0	0	0	166	740	0	906	1611
% App. Total	0	79.3	20.7		0	0	0		0	0	0		18.3	81.7	0		
PHF	.000	.925	.811	.968	.000	.000	.000	.000	.000	.000	.000	.000	.902	.885	.000	.924	.964
Cars	0	542	139	681	0	0	0	0	0	0	0	0	156	706	0	862	1543
% Cars	0	97.0	95.2	96.6	0	0	0	0	0	0	0	0	94.0	95.4	0	95.1	95.8
Heavy Vehicles	0	17	7	24	0	0	0	0	0	0	0	0	10	34	0	44	68
% Heavy Vehicles	0	3.0	4.8	3.4	0	0	0	0	0	0	0	0	6.0	4.6	0	4.9	4.2



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File Name : 112458 AA
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Clarendon Street From North			Stuart Street From East			Clarendon Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	100	36	0	0	0	0	0	0	31	142	0	309
04:15 PM	0	76	32	0	0	0	0	0	0	40	126	0	274
04:30 PM	0	97	45	0	0	0	0	0	0	42	165	0	349
04:45 PM	0	126	50	0	0	0	0	0	0	46	159	0	381
Total	0	399	163	0	0	0	0	0	0	159	592	0	1313
05:00 PM	0	167	68	0	0	0	0	0	0	64	167	0	466
05:15 PM	0	147	56	0	0	0	0	0	0	62	176	0	441
05:30 PM	0	120	46	0	0	0	0	0	0	34	135	0	335
05:45 PM	0	130	50	0	0	0	0	0	0	82	153	0	415
Total	0	564	220	0	0	0	0	0	0	242	631	0	1657
Grand Total	0	963	383	0	0	0	0	0	0	401	1223	0	2970
Apprch %	0	71.5	28.5	0	0	0	0	0	0	24.7	75.3	0	
Total %	0	32.4	12.9	0	0	0	0	0	0	13.5	41.2	0	
Cars	0	936	374	0	0	0	0	0	0	397	1202	0	2909
% Cars	0	97.2	97.7	0	0	0	0	0	0	99	98.3	0	97.9
Heavy Vehicles	0	27	9	0	0	0	0	0	0	4	21	0	61
% Heavy Vehicles	0	2.8	2.3	0	0	0	0	0	0	1	1.7	0	2.1

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	**167**	**68**	**235**	0	0	0	0	0	0	0	0	64	167	0	231	**466**
05:15 PM	0	147	56	203	0	0	0	0	0	0	0	0	62	**176**	0	**238**	441
05:30 PM	0	120	46	166	0	0	0	0	0	0	0	0	34	135	0	169	335
05:45 PM	0	130	50	180	0	0	0	0	0	0	0	0	**82**	153	0	235	415
Total Volume	0	564	220	784	0	0	0	0	0	0	0	0	242	631	0	873	1657
% App. Total	0	71.9	28.1		0	0	0		0	0	0		27.7	72.3	0		
PHF	.000	.844	.809	.834	.000	.000	.000	.000	.000	.000	.000	.000	.738	.896	.000	.917	.889
Cars	0	550	215	765	0	0	0	0	0	0	0	0	241	622	0	863	1628
% Cars	0	97.5	97.7	97.6	0	0	0	0	0	0	0	0	99.6	98.6	0	98.9	98.2
Heavy Vehicles	0	14	5	19	0	0	0	0	0	0	0	0	1	9	0	10	29
% Heavy Vehicles	0	2.5	2.3	2.4	0	0	0	0	0	0	0	0	0.4	1.4	0	1.1	1.8

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File Name : 112458 AA
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars

	Clarendon Street From North			Stuart Street From East			Clarendon Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	96	35	0	0	0	0	0	0	31	141	0	303
04:15 PM	0	74	32	0	0	0	0	0	0	39	122	0	267
04:30 PM	0	95	43	0	0	0	0	0	0	41	160	0	339
04:45 PM	0	121	49	0	0	0	0	0	0	45	157	0	372
Total	0	386	159	0	0	0	0	0	0	156	580	0	1281
05:00 PM	0	162	68	0	0	0	0	0	0	64	164	0	458
05:15 PM	0	144	56	0	0	0	0	0	0	62	175	0	437
05:30 PM	0	118	46	0	0	0	0	0	0	33	133	0	330
05:45 PM	0	126	45	0	0	0	0	0	0	82	150	0	403
Total	0	550	215	0	0	0	0	0	0	241	622	0	1628
Grand Total	0	936	374	0	0	0	0	0	0	397	1202	0	2909
Apprch %	0	71.5	28.5	0	0	0	0	0	0	24.8	75.2	0	
Total %	0	32.2	12.9	0	0	0	0	0	0	13.6	41.3	0	

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	**162**	**68**	**230**	0	0	0	0	0	0	0	0	64	164	0	228	**458**
05:15 PM	0	144	56	200	0	0	0	0	0	0	0	0	62	**175**	0	**237**	437
05:30 PM	0	118	46	164	0	0	0	0	0	0	0	0	33	133	0	166	330
05:45 PM	0	126	45	171	0	0	0	0	0	0	0	0	**82**	150	0	232	403
Total Volume	0	550	215	765	0	0	0	0	0	0	0	0	241	622	0	863	1628
% App. Total	0	71.9	28.1		0	0	0		0	0	0		27.9	72.1	0		
PHF	.000	.849	.790	.832	.000	.000	.000	.000	.000	.000	.000	.000	.735	.889	.000	.910	.889

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N/S: Clarendon Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 AA
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Heavy Vehicles

	Clarendon Street From North			Stuart Street From East			Clarendon Street From South			Stuart Street From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	4	1	0	0	0	0	0	0	0	1	0	6
04:15 PM	0	2	0	0	0	0	0	0	0	1	4	0	7
04:30 PM	0	2	2	0	0	0	0	0	0	1	5	0	10
04:45 PM	0	5	1	0	0	0	0	0	0	1	2	0	9
Total	0	13	4	0	0	0	0	0	0	3	12	0	32
05:00 PM	0	5	0	0	0	0	0	0	0	0	3	0	8
05:15 PM	0	3	0	0	0	0	0	0	0	0	1	0	4
05:30 PM	0	2	0	0	0	0	0	0	0	1	2	0	5
05:45 PM	0	4	5	0	0	0	0	0	0	0	3	0	12
Total	0	14	5	0	0	0	0	0	0	1	9	0	29
Grand Total	0	27	9	0	0	0	0	0	0	4	21	0	61
Apprch %	0	75	25	0	0	0	0	0	0	16	84	0	
Total %	0	44.3	14.8	0	0	0	0	0	0	6.6	34.4	0	

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	2	0	2	0	0	0	0	0	0	0	0	**1**	4	0	5	7
04:30 PM	0	2	**2**	4	0	0	0	0	0	0	0	0	1	**5**	0	**6**	**10**
04:45 PM	0	**5**	1	**6**	0	0	0	0	0	0	0	0	1	2	0	3	9
05:00 PM	0	5	0	5	0	0	0	0	0	0	0	0	0	3	0	3	8
Total Volume	0	14	3	17	0	0	0	0	0	0	0	0	3	14	0	17	34
% App. Total	0	82.4	17.6		0	0	0		0	0	0		17.6	82.4	0		
PHF	.000	.700	.375	.708	.000	.000	.000	.000	.000	.000	.000	.000	.750	.700	.000	.708	.850

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N/S: Clarendon Street
E/W: Stuart Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 AA
Site Code : 05188.01
Start Date : 3/9/2011
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Groups Printed- Peds and Bicycles

	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	24	0	0	0	47	0	0	0	63	1	0	0	193	328
04:15 PM	0	2	0	27	0	0	0	50	0	0	0	52	0	0	0	152	283
04:30 PM	0	0	1	34	0	0	0	37	0	0	0	114	0	0	0	214	400
04:45 PM	0	1	0	31	0	0	0	77	0	0	0	58	0	4	0	182	353
Total	0	3	1	116	0	0	0	211	0	0	0	287	1	4	0	741	1364
05:00 PM	0	0	0	48	0	0	0	130	0	1	0	126	0	1	0	353	659
05:15 PM	0	1	0	19	0	1	0	65	0	0	0	76	0	1	0	247	410
05:30 PM	0	1	0	28	0	0	0	39	0	0	0	54	0	1	0	161	284
05:45 PM	0	2	1	23	0	0	0	39	0	0	0	57	1	1	0	112	236
Total	0	4	1	118	0	1	0	273	0	1	0	313	1	4	0	873	1589
Grand Total	0	7	2	234	0	1	0	484	0	1	0	600	2	8	0	1614	2953
Apprch %	0	2.9	0.8	96.3	0	0.2	0	99.8	0	0.2	0	99.8	0.1	0.5	0	99.4	
Total %	0	0.2	0.1	7.9	0	0	0	16.4	0	0	0	20.3	0.1	0.3	0	54.7	

	Clarendon Street From North					Stuart Street From East					Clarendon Street From South					Stuart Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	**1**	**34**	**35**	**0**	**0**	**0**	**37**	**37**	**0**	**0**	**0**	**114**	**114**	**0**	**0**	**0**	**214**	**214**	**400**
04:45 PM	**0**	**1**	0	31	32	0	0	0	77	77	0	0	0	58	58	0	**4**	0	182	186	353
05:00 PM	0	0	0	**48**	**48**	0	0	0	**130**	**130**	0	**1**		**126**	**127**	0	1	0	**353**	**354**	**659**
05:15 PM	0	1	0	19	20	0	**1**														
Total Volume	0	2	1	132	135	0	1	0	309	310	0	1	0	374	375	0	6	0	996	1002	1822
% App. Total	0	1.5	0.7	97.8		0	0.3	0	99.7		0	0.3	0	99.7		0	0.6	0	99.4		
PHF	.000	.500	.250	.688	.703	.000	.250	.000	.594	.596	.000	.250	.000	.742	.738	.000	.375	.000	.705	.708	.691

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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 AA
Site Code : 05188.01
Start Date : 3/9/2011
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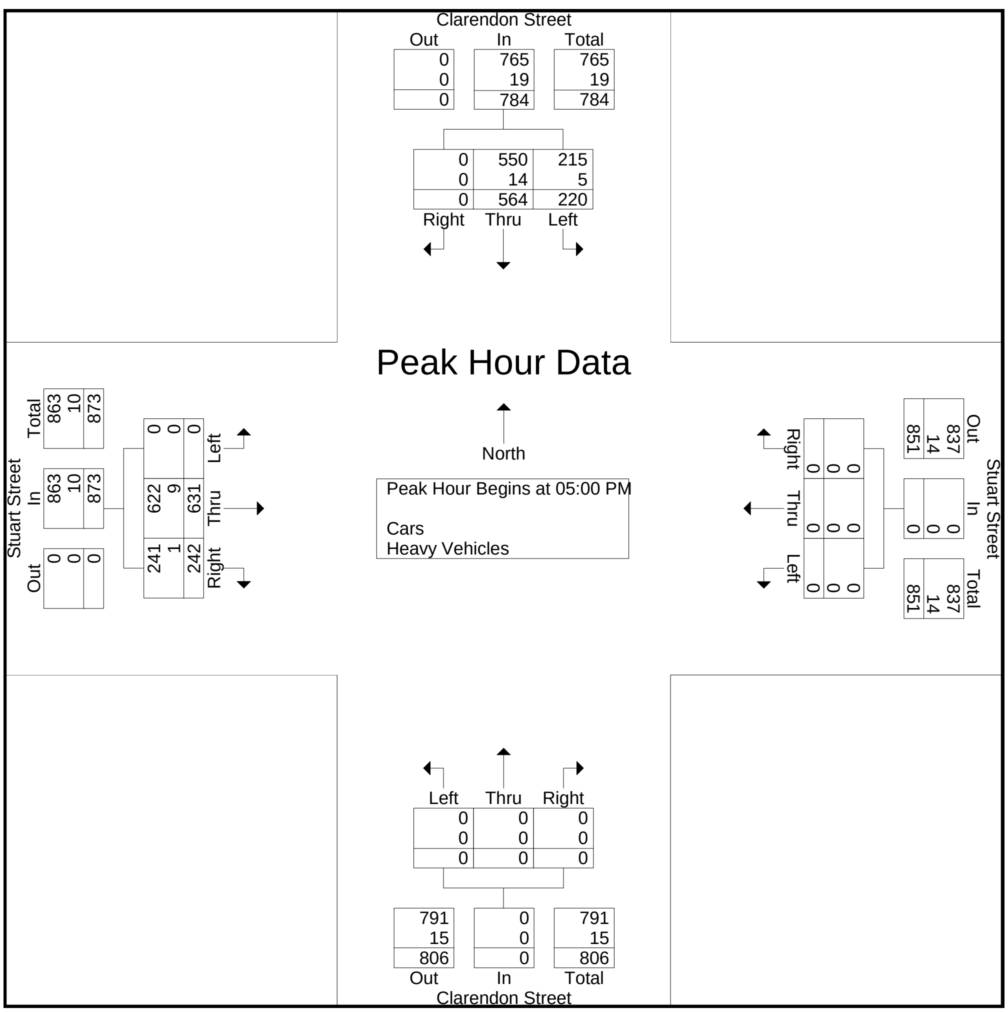
	Clarendon Street From North				Stuart Street From East				Clarendon Street From South				Stuart Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	**167**	**68**	**235**	0	0	0	0	0	0	0	0	64	167	0	231	**466**
05:15 PM	0	147	56	203	0	0	0	0	0	0	0	0	62	**176**	0	**238**	441
05:30 PM	0	120	46	166	0	0	0	0	0	0	0	0	34	135	0	169	335
05:45 PM	0	130	50	180	0	0	0	0	0	0	0	0	**82**	153	0	235	415
Total Volume	0	564	220	784	0	0	0	0	0	0	0	0	242	631	0	873	1657
% App. Total	0	71.9	28.1		0	0	0		0	0	0		27.7	72.3	0		
PHF	.000	.844	.809	.834	.000	.000	.000	.000	.000	.000	.000	.000	.738	.896	.000	.917	.889
Cars	0	550	215	765	0	0	0	0	0	0	0	0	241	622	0	863	1628
% Cars	0	97.5	97.7	97.6	0	0	0	0	0	0	0	0	99.6	98.6	0	98.9	98.2
Heavy Vehicles	0	14	5	19	0	0	0	0	0	0	0	0	1	9	0	10	29
% Heavy Vehicles	0	2.5	2.3	2.4	0	0	0	0	0	0	0	0	0.4	1.4	0	1.1	1.8



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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 D
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Clarendon Street From North			St. James Avenue From East			Clarendon Street From South			St. James Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	27	77	0	0	83	28	0	0	0	0	0	0	215
07:15 AM	32	87	0	0	100	38	0	0	0	0	0	0	257
07:30 AM	32	103	0	0	111	30	0	0	0	0	0	0	276
07:45 AM	37	121	0	0	105	29	0	0	0	0	0	0	292
Total	128	388	0	0	399	125	0	0	0	0	0	0	1040
08:00 AM	42	129	0	0	119	47	0	0	0	0	0	0	337
08:15 AM	35	110	0	0	148	46	0	0	0	0	0	0	339
08:30 AM	51	131	0	0	102	38	0	0	0	0	0	0	322
08:45 AM	37	128	0	0	110	36	0	0	0	0	0	0	311
Total	165	498	0	0	479	167	0	0	0	0	0	0	1309
Grand Total	293	886	0	0	878	292	0	0	0	0	0	0	2349
Apprch %	24.9	75.1	0	0	75	25	0	0	0	0	0	0	
Total %	12.5	37.7	0	0	37.4	12.4	0	0	0	0	0	0	
Cars	283	856	0	0	739	280	0	0	0	0	0	0	2158
% Cars	96.6	96.6	0	0	84.2	95.9	0	0	0	0	0	0	91.9
Heavy Vehicles	10	30	0	0	139	12	0	0	0	0	0	0	191
% Heavy Vehicles	3.4	3.4	0	0	15.8	4.1	0	0	0	0	0	0	8.1

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

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
08:00 AM	42	129	0	171	0	119	**47**	166	0	0	0	0	0	0	0	0	337
08:15 AM	35	110	0	145	0	**148**	46	**194**	0	0	0	0	0	0	0	0	**339**
08:30 AM	**51**	**131**	0	**182**	0	102	38	140	0	0	0	0	0	0	0	0	322
08:45 AM	37	128	0	165	0	110	36	146	0	0	0	0	0	0	0	0	311
Total Volume	165	498	0	663	0	479	167	646	0	0	0	0	0	0	0	0	1309
% App. Total	24.9	75.1	0		0	74.1	25.9		0	0	0		0	0	0		
PHF	.809	.950	.000	.911	.000	.809	.888	.832	.000	.000	.000	.000	.000	.000	.000	.000	.965
Cars	159	485	0	644	0	410	160	570	0	0	0	0	0	0	0	0	1214
% Cars	96.4	97.4	0	97.1	0	85.6	95.8	88.2	0	0	0	0	0	0	0	0	92.7
Heavy Vehicles	6	13	0	19	0	69	7	76	0	0	0	0	0	0	0	0	95
% Heavy Vehicles	3.6	2.6	0	2.9	0	14.4	4.2	11.8	0	0	0	0	0	0	0	0	7.3

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Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 D
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars

	Clarendon Street From North			St. James Avenue From East			Clarendon Street From South			St. James Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	25	74	0	0	65	27	0	0	0	0	0	0	191
07:15 AM	31	84	0	0	87	36	0	0	0	0	0	0	238
07:30 AM	31	96	0	0	92	30	0	0	0	0	0	0	249
07:45 AM	37	117	0	0	85	27	0	0	0	0	0	0	266
Total	124	371	0	0	329	120	0	0	0	0	0	0	944
08:00 AM	41	126	0	0	108	45	0	0	0	0	0	0	320
08:15 AM	35	108	0	0	123	46	0	0	0	0	0	0	312
08:30 AM	47	127	0	0	86	36	0	0	0	0	0	0	296
08:45 AM	36	124	0	0	93	33	0	0	0	0	0	0	286
Total	159	485	0	0	410	160	0	0	0	0	0	0	1214
Grand Total	283	856	0	0	739	280	0	0	0	0	0	0	2158
Apprch %	24.8	75.2	0	0	72.5	27.5	0	0	0	0	0	0	
Total %	13.1	39.7	0	0	34.2	13	0	0	0	0	0	0	

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	41	126	0	167	0	108	45	153	0	0	0	0	0	0	0	0	**320**
08:15 AM	35	108	0	143	0	**123**	**46**	**169**	0	0	0	0	0	0	0	0	312
08:30 AM	**47**	**127**	0	**174**	0	86	36	122	0	0	0	0	0	0	0	0	296
08:45 AM	36	124	0	160	0	93	33	126	0	0	0	0	0	0	0	0	286
Total Volume	159	485	0	644	0	410	160	570	0	0	0	0	0	0	0	0	1214
% App. Total	24.7	75.3	0		0	71.9	28.1		0	0	0		0	0	0		
PHF	.846	.955	.000	.925	.000	.833	.870	.843	.000	.000	.000	.000	.000	.000	.000	.000	.948

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File Name : 112458 D
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Heavy Vehicles

	Clarendon Street From North			St. James Avenue From East			Clarendon Street From South			St. James Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	2	3	0	0	18	1	0	0	0	0	0	0	24
07:15 AM	1	3	0	0	13	2	0	0	0	0	0	0	19
07:30 AM	1	7	0	0	19	0	0	0	0	0	0	0	27
07:45 AM	0	4	0	0	20	2	0	0	0	0	0	0	26
Total	4	17	0	0	70	5	0	0	0	0	0	0	96
08:00 AM	1	3	0	0	11	2	0	0	0	0	0	0	17
08:15 AM	0	2	0	0	25	0	0	0	0	0	0	0	27
08:30 AM	4	4	0	0	16	2	0	0	0	0	0	0	26
08:45 AM	1	4	0	0	17	3	0	0	0	0	0	0	25
Total	6	13	0	0	69	7	0	0	0	0	0	0	95
Grand Total	10	30	0	0	139	12	0	0	0	0	0	0	191
Apprch %	25	75	0	0	92.1	7.9	0	0	0	0	0	0	
Total %	5.2	15.7	0	0	72.8	6.3	0	0	0	0	0	0	

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	**7**	0	**8**	0	19	0	19	0	0	0	0	0	0	0	0	**27**
07:45 AM	0	4	0	4	0	20	**2**	22	0	0	0	0	0	0	0	0	26
08:00 AM	1	3	0	4	0	11	2	13	0	0	0	0	0	0	0	0	17
08:15 AM	0	2	0	2	0	**25**	0	**25**	0	0	0	0	0	0	0	0	27
Total Volume	2	16	0	18	0	75	4	79	0	0	0	0	0	0	0	0	97
% App. Total	11.1	88.9	0		0	94.9	5.1		0	0	0		0	0	0		
PHF	.500	.571	.000	.563	.000	.750	.500	.790	.000	.000	.000	.000	.000	.000	.000	.000	.898

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File Name : 112458 D
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Groups Printed- Peds and Bicycles

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	20	0	1	0	70	0	0	0	14	0	0	0	18	123
07:15 AM	0	0	0	16	0	0	0	40	0	0	0	14	0	0	0	13	83
07:30 AM	0	2	0	21	0	0	0	83	0	0	0	27	0	0	0	27	160
07:45 AM	0	2	0	28	0	0	0	109	0	0	0	27	0	0	0	34	200
Total	0	4	0	85	0	1	0	302	0	0	0	82	0	0	0	92	566
08:00 AM	0	3	0	48	0	0	0	129	0	0	0	34	0	0	0	38	252
08:15 AM	0	3	0	52	0	0	0	137	0	0	0	44	0	0	0	52	288
08:30 AM	1	2	0	45	0	0	0	156	0	0	0	45	0	0	0	31	280
08:45 AM	0	2	0	40	0	1	1	132	0	0	0	67	0	0	0	35	278
Total	1	10	0	185	0	1	1	554	0	0	0	190	0	0	0	156	1098
Grand Total	1	14	0	270	0	2	1	856	0	0	0	272	0	0	0	248	1664
Apprch %	0.4	4.9	0	94.7	0	0.2	0.1	99.7	0	0	0	100	0	0	0	100	
Total %	0.1	0.8	0	16.2	0	0.1	0.1	51.4	0	0	0	16.3	0	0	0	14.9	

	Clarendon Street From North					St. James Avenue From East					Clarendon Street From South					St. James Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	**3**	0	48	51	0	0	0	129	129	0	0	0	34	34	0	0	0	38	38	252
08:15 AM	0	3	0	**52**	**55**	0	0	0	137	137	0	0	0	44	44	0	0	0	**52**	**52**	**288**
08:30 AM	**1**								**156**	**156**	0	0	0	45	45	0	0	0	31	31	280
08:45 AM	0	2	0	40	42	0	**1**	**1**						**67**	**67**	0	0	0	35	35	278
Total Volume	1	10	0	185	196	0	1	1	554	556	0	0	0	190	190	0	0	0	156	156	1098
% App. Total	0.5	5.1	0	94.4		0	0.2	0.2	99.6		0	0	0	100		0	0	0	100		
PHF	.250	.833	.000	.889	.891	.000	.250	.250	.888	.891	.000	.000	.000	.709	.709	.000	.000	.000	.750	.750	.953

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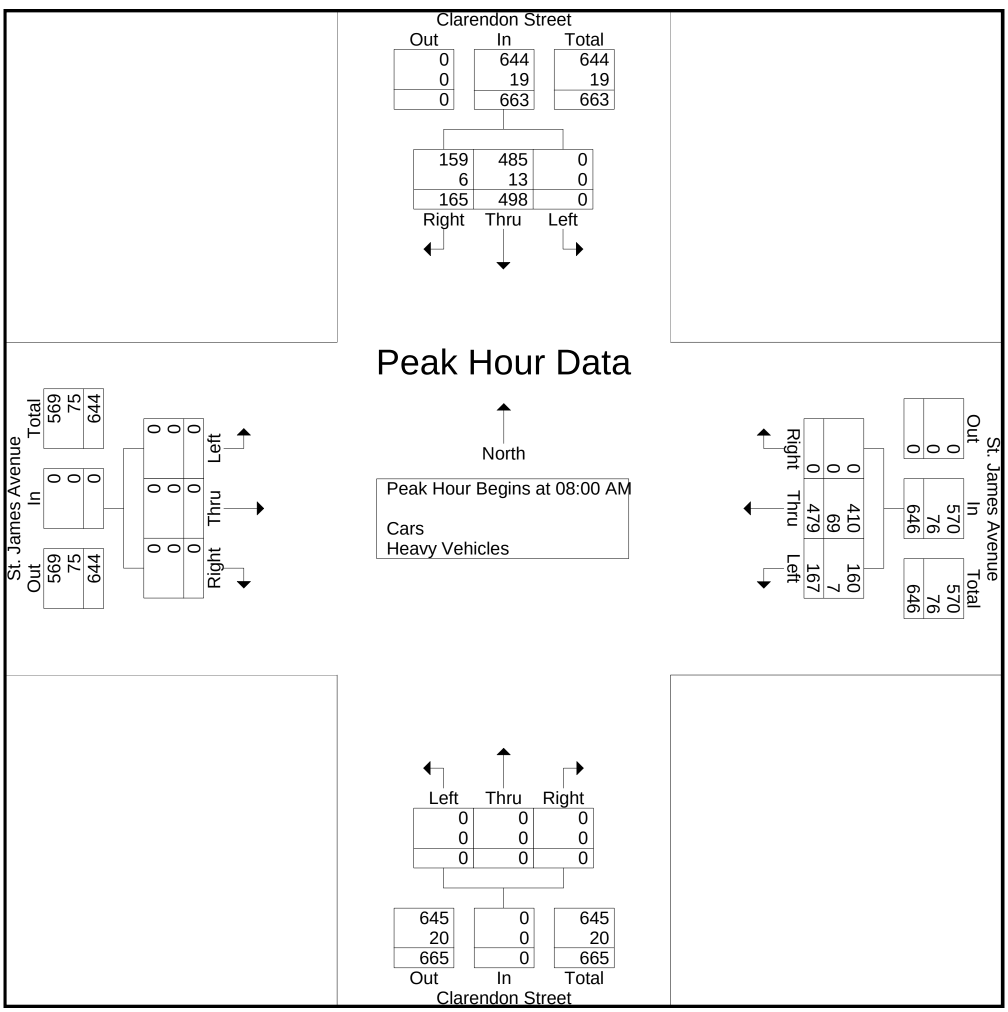
N/S: Clarendon Street
E/W: St. James Avenue
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 112458 D
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	42	129	0	171	0	119	**47**	166	0	0	0	0	0	0	0	0	337
08:15 AM	35	110	0	145	0	**148**	46	**194**	0	0	0	0	0	0	0	0	**339**
08:30 AM	**51**	**131**	0	**182**	0	102	38	140	0	0	0	0	0	0	0	0	322
08:45 AM	37	128	0	165	0	110	36	146	0	0	0	0	0	0	0	0	311
Total Volume	165	498	0	663	0	479	167	646	0	0	0	0	0	0	0	0	1309
% App. Total	24.9	75.1	0		0	74.1	25.9		0	0	0		0	0	0		
PHF	.809	.950	.000	.911	.000	.809	.888	.832	.000	.000	.000	.000	.000	.000	.000	.000	.965
Cars	159	485	0	644	0	410	160	570	0	0	0	0	0	0	0	0	1214
% Cars	96.4	97.4	0	97.1	0	85.6	95.8	88.2	0	0	0	0	0	0	0	0	92.7
Heavy Vehicles	6	13	0	19	0	69	7	76	0	0	0	0	0	0	0	0	95
% Heavy Vehicles	3.6	2.6	0	2.9	0	14.4	4.2	11.8	0	0	0	0	0	0	0	0	7.3



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N/S: Clarendon Street
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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kupriel

File Name : 112458 DD
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars - Heavy Vehicles

	Clarendon Street From North			St. James Avenue From East			Clarendon Street From South			St. James Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	28	83	0	0	112	42	0	0	0	0	0	0	265
04:15 PM	45	76	0	0	114	31	0	0	0	0	0	0	266
04:30 PM	34	88	0	0	117	35	0	0	0	0	0	0	274
04:45 PM	31	117	0	0	153	52	0	0	0	0	0	0	353
Total	138	364	0	0	496	160	0	0	0	0	0	0	1158
05:00 PM	39	116	0	0	139	56	0	0	0	0	0	0	350
05:15 PM	47	124	0	0	158	42	0	0	0	0	0	0	371
05:30 PM	41	119	0	0	142	51	0	0	0	0	0	0	353
05:45 PM	34	113	0	0	141	62	0	0	0	0	0	0	350
Total	161	472	0	0	580	211	0	0	0	0	0	0	1424
Grand Total	299	836	0	0	1076	371	0	0	0	0	0	0	2582
Apprch %	26.3	73.7	0	0	74.4	25.6	0	0	0	0	0	0	
Total %	11.6	32.4	0	0	41.7	14.4	0	0	0	0	0	0	
Cars	295	810	0	0	1010	358	0	0	0	0	0	0	2473
% Cars	98.7	96.9	0	0	93.9	96.5	0	0	0	0	0	0	95.8
Heavy Vehicles	4	26	0	0	66	13	0	0	0	0	0	0	109
% Heavy Vehicles	1.3	3.1	0	0	6.1	3.5	0	0	0	0	0	0	4.2

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	31	117	0	148	0	153	52	**205**	0	0	0	0	0	0	0	0	353
05:00 PM	39	116	0	155	0	139	**56**	195	0	0	0	0	0	0	0	0	350
05:15 PM	**47**	**124**	0	**171**	0	**158**	42	200	0	0	0	0	0	0	0	0	**371**
05:30 PM	41	119	0	160	0	142	51	193	0	0	0	0	0	0	0	0	353
Total Volume	158	476	0	634	0	592	201	793	0	0	0	0	0	0	0	0	1427
% App. Total	24.9	75.1	0		0	74.7	25.3		0	0	0		0	0	0		
PHF	.840	.960	.000	.927	.000	.937	.897	.967	.000	.000	.000	.000	.000	.000	.000	.000	.962
Cars	157	460	0	617	0	560	197	757	0	0	0	0	0	0	0	0	1374
% Cars	99.4	96.6	0	97.3	0	94.6	98.0	95.5	0	0	0	0	0	0	0	0	96.3
Heavy Vehicles	1	16	0	17	0	32	4	36	0	0	0	0	0	0	0	0	53
% Heavy Vehicles	0.6	3.4	0	2.7	0	5.4	2.0	4.5	0	0	0	0	0	0	0	0	3.7

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E/W: St. James Avenue
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kupriel

File Name : 112458 DD
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars

	Clarendon Street From North			St. James Avenue From East			Clarendon Street From South			St. James Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	28	81	0	0	100	40	0	0	0	0	0	0	249
04:15 PM	43	74	0	0	106	30	0	0	0	0	0	0	253
04:30 PM	33	87	0	0	108	34	0	0	0	0	0	0	262
04:45 PM	31	111	0	0	148	49	0	0	0	0	0	0	339
Total	135	353	0	0	462	153	0	0	0	0	0	0	1103
05:00 PM	38	112	0	0	130	56	0	0	0	0	0	0	336
05:15 PM	47	121	0	0	148	41	0	0	0	0	0	0	357
05:30 PM	41	116	0	0	134	51	0	0	0	0	0	0	342
05:45 PM	34	108	0	0	136	57	0	0	0	0	0	0	335
Total	160	457	0	0	548	205	0	0	0	0	0	0	1370
Grand Total	295	810	0	0	1010	358	0	0	0	0	0	0	2473
Apprch %	26.7	73.3	0	0	73.8	26.2	0	0	0	0	0	0	
Total %	11.9	32.8	0	0	40.8	14.5	0	0	0	0	0	0	

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	31	111	0	142	0	**148**	49	**197**	0	0	0	0	0	0	0	0	339
05:00 PM	38	112	0	150	0	130	**56**	186	0	0	0	0	0	0	0	0	336
05:15 PM	**47**	**121**	0	**168**	0	148	41	189	0	0	0	0	0	0	0	0	**357**
05:30 PM	41	116	0	157	0	134	51	185	0	0	0	0	0	0	0	0	342
Total Volume	157	460	0	617	0	560	197	757	0	0	0	0	0	0	0	0	1374
% App. Total	25.4	74.6	0		0	74	26		0	0	0		0	0	0		
PHF	.835	.950	.000	.918	.000	.946	.879	.961	.000	.000	.000	.000	.000	.000	.000	.000	.962

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N/S: Clarendon Street
E/W: St. James Avenue
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kupriel

File Name : 112458 DD
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Heavy Vehicles

	Clarendon Street From North			St. James Avenue From East			Clarendon Street From South			St. James Avenue From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	2	0	0	12	2	0	0	0	0	0	0	16
04:15 PM	2	2	0	0	8	1	0	0	0	0	0	0	13
04:30 PM	1	1	0	0	9	1	0	0	0	0	0	0	12
04:45 PM	0	6	0	0	5	3	0	0	0	0	0	0	14
Total	3	11	0	0	34	7	0	0	0	0	0	0	55
05:00 PM	1	4	0	0	9	0	0	0	0	0	0	0	14
05:15 PM	0	3	0	0	10	1	0	0	0	0	0	0	14
05:30 PM	0	3	0	0	8	0	0	0	0	0	0	0	11
05:45 PM	0	5	0	0	5	5	0	0	0	0	0	0	15
Total	1	15	0	0	32	6	0	0	0	0	0	0	54
Grand Total	4	26	0	0	66	13	0	0	0	0	0	0	109
Apprch %	13.3	86.7	0	0	83.5	16.5	0	0	0	0	0	0	
Total %	3.7	23.9	0	0	60.6	11.9	0	0	0	0	0	0	

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

Peak Hour for Entire Intersection Begins at 04:00 PM

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	0	2	0	2	0	**12**	2	**14**	0	0	0	0	0	0	0	0	**16**
04:15 PM	**2**	2	0	4	0	8	1	9	0	0	0	0	0	0	0	0	13
04:30 PM	1	1	0	2	0	9	1	10	0	0	0	0	0	0	0	0	12
04:45 PM	0	**6**	0	**6**	0	5	**3**	8	0	0	0	0	0	0	0	0	14
Total Volume	3	11	0	14	0	34	7	41	0	0	0	0	0	0	0	0	55
% App. Total	21.4	78.6	0		0	82.9	17.1		0	0	0		0	0	0		
PHF	.375	.458	.000	.583	.000	.708	.583	.732	.000	.000	.000	.000	.000	.000	.000	.000	.859

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N/S: Clarendon Street
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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kupriel

File Name : 112458 DD
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Peds and Bicycles

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	46	0	6	0	58	0	0	0	26	0	0	0	37	173
04:15 PM	0	3	0	61	0	3	0	46	0	0	0	23	0	0	0	52	188
04:30 PM	1	1	0	61	0	2	0	56	0	0	0	26	0	0	0	42	189
04:45 PM	0	3	0	77	0	4	0	81	0	0	0	53	0	0	0	72	290
Total	1	7	0	245	0	15	0	241	0	0	0	128	0	0	0	203	840
05:00 PM	0	1	0	97	0	4	0	156	0	0	0	75	0	0	0	87	420
05:15 PM	0	1	1	85	0	9	1	105	0	0	0	54	0	0	0	72	328
05:30 PM	0	1	0	108	0	8	1	99	0	0	0	44	0	0	0	77	338
05:45 PM	0	2	1	60	0	3	0	58	0	0	0	29	0	0	0	50	203
Total	0	5	2	350	0	24	2	418	0	0	0	202	0	0	0	286	1289
Grand Total	1	12	2	595	0	39	2	659	0	0	0	330	0	0	0	489	2129
Apprch %	0.2	2	0.3	97.5	0	5.6	0.3	94.1	0	0	0	100	0	0	0	100	
Total %	0	0.6	0.1	27.9	0	1.8	0.1	31	0	0	0	15.5	0	0	0	23	

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

	Clarendon Street From North					St. James Avenue From East					Clarendon Street From South					St. James Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:45 PM	0	**3**	0	77	80	0	4	0	81	85	0	0	0	53	53	0	0	0	72	72	290
05:00 PM	0	1	0	97	98	0	4	0	**156**	**160**	0	0	0	**75**	**75**	0	0	0	**87**	**87**	**420**
05:15 PM	0	1	**1**				**9**	**1**													
05:30 PM	**0**	**1**	**0**	**108**	**109**	0	8	1	99	108	0	0	0	44	44	0	0	0	77	77	338
Total Volume	0	6	1	367	374	0	25	2	441	468	0	0	0	226	226	0	0	0	308	308	1376
% App. Total	0	1.6	0.3	98.1		0	5.3	0.4	94.2		0	0	0	100		0	0	0	100		
PHF	.000	.500	.250	.850	.858	.000	.694	.500	.707	.731	.000	.000	.000	.753	.753	.000	.000	.000	.885	.885	.819

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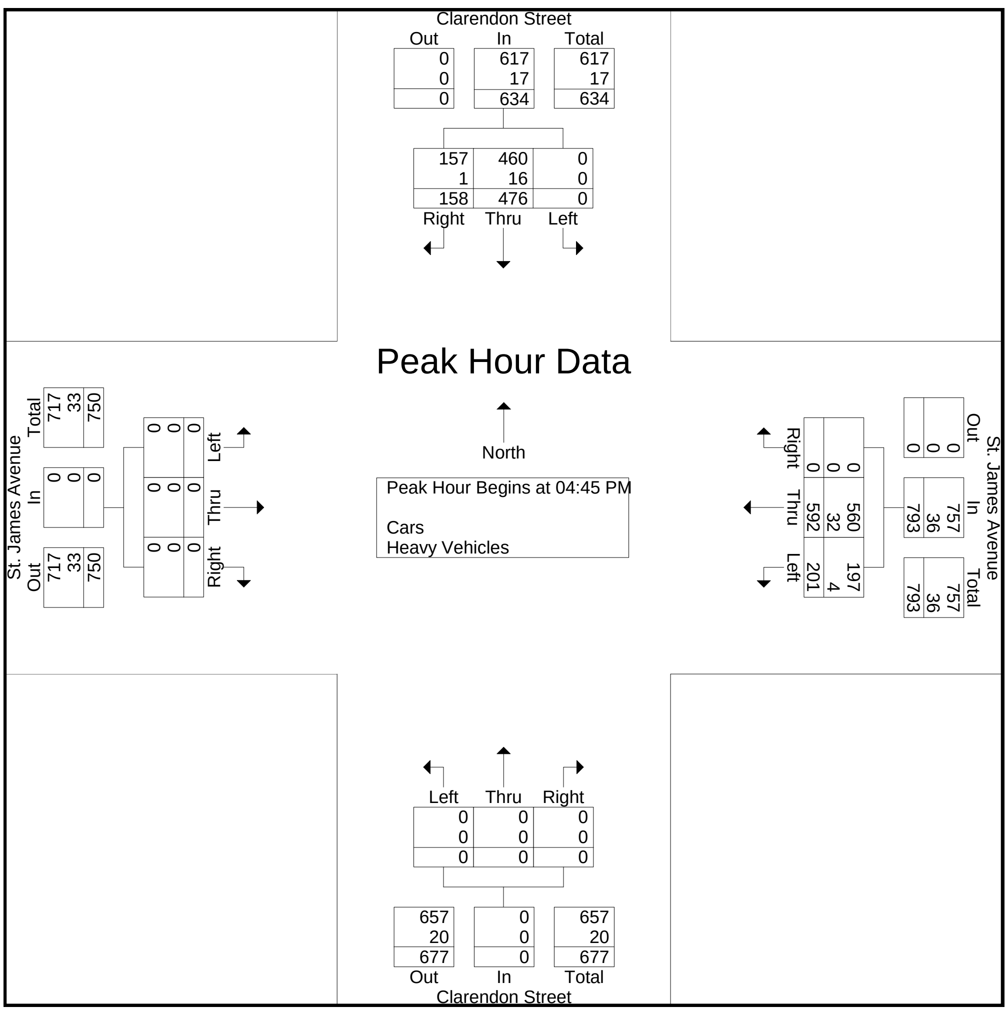
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kupriel

File Name : 112458 DD
Site Code : 05188.01
Start Date : 3/9/2011

	Clarendon Street From North				St. James Avenue From East				Clarendon Street From South				St. James Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	31	117	0	148	0	153	52	**205**	0	0	0	0	0	0	0	0	353
05:00 PM	39	116	0	155	0	139	**56**	195	0	0	0	0	0	0	0	0	350
05:15 PM	**47**	**124**	0	**171**	0	**158**	42	200	0	0	0	0	0	0	0	0	**371**
05:30 PM	41	119	0	160	0	142	51	193	0	0	0	0	0	0	0	0	353
Total Volume	158	476	0	634	0	592	201	793	0	0	0	0	0	0	0	0	1427
% App. Total	24.9	75.1	0		0	74.7	25.3		0	0	0		0	0	0		
PHF	.840	.960	.000	.927	.000	.937	.897	.967	.000	.000	.000	.000	.000	.000	.000	.000	.962
Cars	157	460	0	617	0	560	197	757	0	0	0	0	0	0	0	0	1374
% Cars	99.4	96.6	0	97.3	0	94.6	98.0	95.5	0	0	0	0	0	0	0	0	96.3
Heavy Vehicles	1	16	0	17	0	32	4	36	0	0	0	0	0	0	0	0	53
% Heavy Vehicles	0.6	3.4	0	2.7	0	5.4	2.0	4.5	0	0	0	0	0	0	0	0	3.7



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E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard Stein-Hudson / S. Kurpiel

File Name : 112458 F
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dartmouth Street From North			St. James Avenue From East						Dartmouth Street From South						Huntington Ave/Mass Pike/Blagden St From West			
Start Time	Right	Thru	Left	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	9	2	3	14	80	0	0	92	10	2	49	53	0	0	0	314
07:15 AM	0	0	0	6	3	0	13	98	0	0	115	2	1	54	31	0	0	0	323
07:30 AM	0	0	0	16	1	3	9	109	0	0	114	9	5	65	41	0	0	0	372
07:45 AM	0	0	0	6	5	3	11	112	0	0	168	3	1	66	51	0	0	0	426
Total	0	0	0	37	11	9	47	399	0	0	489	24	9	234	176	0	0	0	1435
08:00 AM	0	0	0	12	4	5	34	100	0	0	183	6	2	70	45	0	0	0	461
08:15 AM	0	0	0	13	9	2	25	140	0	0	148	3	0	52	50	0	0	0	442
08:30 AM	0	0	0	17	9	2	10	117	0	0	174	6	1	56	28	0	0	0	420
08:45 AM	0	0	0	14	6	5	12	101	0	0	165	5	2	42	47	0	0	0	399
Total	0	0	0	56	28	14	81	458	0	0	670	20	5	220	170	0	0	0	1722
Grand Total	0	0	0	93	39	23	128	857	0	0	1159	44	14	454	346	0	0	0	3157
Apprch %	0	0	0	8.2	3.4	2	11.2	75.2	0	0	57.5	2.2	0.7	22.5	17.2	0	0	0	
Total %	0	0	0	2.9	1.2	0.7	4.1	27.1	0	0	36.7	1.4	0.4	14.4	11	0	0	0	
Cars	0	0	0	69	34	23	105	740	0	0	1121	39	13	437	329	0	0	0	2910
% Cars	0	0	0	74.2	87.2	100	82	86.3	0	0	96.7	88.6	92.9	96.3	95.1	0	0	0	92.2
Heavy Vehicles	0	0	0	24	5	0	23	117	0	0	38	5	1	17	17	0	0	0	247
% Heavy Vehicles	0	0	0	25.8	12.8	0	18	13.7	0	0	3.3	11.4	7.1	3.7	4.9	0	0	0	7.8

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	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	6	5	3	11	112	0	137	0	168	3	1	66	**51**	289	0	0	0	0	426
08:00 AM	0	0	0	0	12	4	**5**	**34**	100	0	155	0	**183**	**6**	**2**	**70**		**306**					**461**
08:15 AM	0	0	0	0	13	**9**			**140**		**189**	0	148	3	0	52	50	253	0	0	0	0	442
08:30 AM	0	0	0	0	**17**	9	2	10	117	0	155	0	174	6	1	56	28	265	0	0	0	0	420
Total Volume	0	0	0	0	48	27	12	80	469	0	636	0	673	18	4	244	174	1113	0	0	0	0	1749
% App. Total	0	0	0		7.5	4.2	1.9	12.6	73.7	0		0	60.5	1.6	0.4	21.9	15.6		0	0	0		
PHF	.000	.000	.000	.000	.706	.750	.600	.588	.838	.000	.841	.000	.919	.750	.500	.871	.853	.909	.000	.000	.000	.000	.948
Cars	0	0	0	0	41	24	12	68	405	0	550	0	656	17	3	238	166	1080	0	0	0	0	1630
% Cars	0	0	0	0	85.4	88.9	100	85.0	86.4	0	86.5	0	97.5	94.4	75.0	97.5	95.4						
Heavy Vehicles	0	0	0	0	7	3	0	12	64	0	86	0	17	1	1	6	8	33	0	0	0	0	119
% Heavy Vehicles	0	0	0	0	14.6	11.1	0	15.0	13.6	0	13.5	0	2.5	5.6	25.0	2.5	4.6	3.0	0	0	0	0	6.8

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

N/S: Dartmouth Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard Stein-Hudson / S. Kurpiel

File Name : 112458 F
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Cars

	Dartmouth Street From North			St. James Avenue From East						Dartmouth Street From South						Huntington Ave/Mass Pike/Blagden St From West			
Start Time	Right	Thru	Left	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	2	2	3	9	67	0	0	89	9	2	47	50	0	0	0	280
07:15 AM	0	0	0	2	3	0	11	91	0	0	106	1	1	50	30	0	0	0	295
07:30 AM	0	0	0	15	1	3	7	87	0	0	107	8	5	62	39	0	0	0	334
07:45 AM	0	0	0	4	5	3	10	90	0	0	165	3	1	64	47	0	0	0	392
Total	0	0	0	23	11	9	37	335	0	0	467	21	9	223	166	0	0	0	1301
08:00 AM	0	0	0	11	4	5	27	91	0	0	179	6	1	69	43	0	0	0	436
08:15 AM	0	0	0	11	7	2	22	123	0	0	142	2	0	51	49	0	0	0	409
08:30 AM	0	0	0	15	8	2	9	101	0	0	170	6	1	54	27	0	0	0	393
08:45 AM	0	0	0	9	4	5	10	90	0	0	163	4	2	40	44	0	0	0	371
Total	0	0	0	46	23	14	68	405	0	0	654	18	4	214	163	0	0	0	1609
Grand Total	0	0	0	69	34	23	105	740	0	0	1121	39	13	437	329	0	0	0	2910
Apprch %	0	0	0	7.1	3.5	2.4	10.8	76.2	0	0	57.8	2	0.7	22.5	17	0	0	0	
Total %	0	0	0	2.4	1.2	0.8	3.6	25.4	0	0	38.5	1.3	0.4	15	11.3	0	0	0	

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	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	4	5	3	10	90	0	112	0	165	3	**1**	**64**	**47**	**280**	**0**	**0**	**0**	**0**	**392**
08:00 AM	**0**	**0**	**0**	**0**	**11**	**4**	**5**	**27**	91	0	138	0	**179**	**6**	1	**69**	43	**298**	**0**	**0**	**0**	**0**	**436**
08:15 AM	0	0	0	0	11	7	2	22	**123**		**165**	0	142	2	0	51	**49**	244	0	0	0	0	409
08:30 AM	0	0	0	0	**15**	**8**																	
Total Volume	0	0	0	0	41	24	12	68	405	0	550	0	656	17	3	238	166	1080	0	0	0	0	1630
% App. Total	0	0	0		7.5	4.4	2.2	12.4	73.6	0		0	60.7	1.6	0.3	22	15.4		0	0	0		
PHF	.000	.000	.000	.000	.683	.750	.600	.630	.823	.000	.833	.000	.916	.708	.750	.862	.847	.906	.000	.000	.000	.000	.935

PRECISION
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N/S: Dartmouth Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard Stein-Hudson / S. Kurpiel

File Name : 112458 F
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Heavy Vehicles

	Dartmouth Street From North			St. James Avenue From East						Dartmouth Street From South						Huntington Ave/Mass Pike/Blagden St From West			
Start Time	Right	Thru	Left	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Right	Thru	Left	Int. Total
07:00 AM	0	0	0	7	0	0	5	13	0	0	3	1	0	2	3	0	0	0	34
07:15 AM	0	0	0	4	0	0	2	7	0	0	9	1	0	4	1	0	0	0	28
07:30 AM	0	0	0	1	0	0	2	22	0	0	7	1	0	3	2	0	0	0	38
07:45 AM	0	0	0	2	0	0	1	22	0	0	3	0	0	2	4	0	0	0	34
Total	0	0	0	14	0	0	10	64	0	0	22	3	0	11	10	0	0	0	134
08:00 AM	0	0	0	1	0	0	7	9	0	0	4	0	1	1	2	0	0	0	25
08:15 AM	0	0	0	2	2	0	3	17	0	0	6	1	0	1	1	0	0	0	33
08:30 AM	0	0	0	2	1	0	1	16	0	0	4	0	0	2	1	0	0	0	27
08:45 AM	0	0	0	5	2	0	2	11	0	0	2	1	0	2	3	0	0	0	28
Total	0	0	0	10	5	0	13	53	0	0	16	2	1	6	7	0	0	0	113
Grand Total	0	0	0	24	5	0	23	117	0	0	38	5	1	17	17	0	0	0	247
Apprch %	0	0	0	14.2	3	0	13.6	69.2	0	0	48.7	6.4	1.3	21.8	21.8	0	0	0	
Total %	0	0	0	9.7	2	0	9.3	47.4	0	0	15.4	2	0.4	6.9	6.9	0	0	0	

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	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	**7**	0	0	**5**	13	0	**25**	0	3	**1**	0	2	3	9	0	0	0	0	34
07:15 AM	0	0	0	0	4	0	0	2	7	0	13	0	**9**			**4**		**15**					
07:30 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**22**	**0**	**25**	**0**	**7**	**1**	**0**	**3**	**2**	**13**	**0**	**0**	**0**	**0**	**38**
07:45 AM	0	0	0	0	2	0	0	1	22	0	25	0	3	0	0	2	**4**	9	0	0	0	0	34
Total Volume	0	0	0	0	14	0	0	10	64	0	88	0	22	3	0	11	10	46	0	0	0	0	134
% App. Total	0	0	0		15.9	0	0	11.4	72.7	0		0	47.8	6.5	0	23.9	21.7		0	0	0		
PHF	.000	.000	.000	.000	.500	.000	.000	.500	.727	.000	.880	.000	.611	.750	.000	.688	.625	.767	.000	.000	.000	.000	.882

N/S: Dartmouth Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard Stein-Hudson / S. Kurpiel

PRECISION DATA INDUSTRIES, LLC
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File Name : 112458 F
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Peds and Bicycles

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South								Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	Peds	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Peds	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Peds (Left Turn Lane)	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	21	0	0	1	0	1	0	147	0	1	0	1	0	0	34	19	0	0	0	29	254
07:15 AM	0	1	0	2	0	0	0	0	0	0	149	0	1	0	0	0	0	39	34	0	0	0	25	251
07:30 AM	0	0	0	14	0	0	0	0	1	0	214	0	0	0	0	0	0	37	46	0	0	0	35	347
07:45 AM	0	0	0	20	0	0	0	0	0	0	220	0	2	0	0	0	0	78	53	0	0	0	66	439
Total	0	1	0	57	0	0	1	0	2	0	730	0	4	0	1	0	0	188	152	0	0	0	155	1291
08:00 AM	0	0	0	37	0	0	0	0	1	0	239	0	2	0	0	0	0	51	73	0	0	0	52	455
08:15 AM	0	0	0	21	0	0	0	0	0	0	275	0	2	0	0	0	0	59	58	0	0	0	67	482
08:30 AM	0	0	0	21	0	0	0	0	0	0	169	0	2	0	0	1	0	52	61	0	0	0	39	345
08:45 AM	0	0	0	32	0	0	1	0	0	0	183	0	3	0	0	0	0	76	75	0	0	0	79	449
Total	0	0	0	111	0	0	1	0	1	0	866	0	9	0	0	1	0	238	267	0	0	0	237	1731
Grand Total	0	1	0	168	0	0	2	0	3	0	1596	0	13	0	1	1	0	426	419	0	0	0	392	3022
Apprch %	0	0.6	0	99.4	0	0	0.1	0	0.2	0	99.7	0	1.5	0	0.1	0.1	0	49.5	48.7	0	0	0	100	
Total %	0	0	0	5.6	0	0	0.1	0	0.1	0	52.8	0	0.4	0	0	0	0	14.1	13.9	0	0	0	13	

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

	Dartmouth Street From North					St. James Avenue From East								Dartmouth Street From South									Huntington Ave/Mass Pike/Blagden St From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Peds	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Peds (Left Turn Lane)	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
08:00 AM	0	0	0	**37**	**37**	0	0	0	0	**1**	0	239	240	0	2	0	0	0	0	51	73	126	0	0	0	52	52	455
08:15 AM	0	0	0	21	21	0	0	0	0	0	0	**275**	**275**	0	2	0	0	0	0	59	58	119	0	0	0	67	67	**482**
08:30 AM	0	0	0	21	21	0	0	0	0	0	0	169	169	0	2	0	0	**1**	0	52	61	116	0	0	0	39	39	345
08:45 AM	0	0	0	32	32	0	0	**1**				183	184	0	**3**	0	0	0	0	**76**	**75**	**154**	0	0	0	**79**	**79**	449
Total Volume	0	0	0	111	111	0	0	1	0	1	0	866	868	0	9	0	0	1	0	238	267	515	0	0	0	237	237	1731
% App. Total	0	0	0	100		0	0	0.1	0	0.1	0	99.8		0	1.7	0	0	0.2	0	46.2	51.8		0	0	0	100		
PHF	.000	.000	.000	.750	.750	.000	.000	.250	.000	.250	.000	.787	.789	.000	.750	.000	.000	.250	.000	.783	.890	.836	.000	.000	.000	.750	.750	.898

N/S: Dartmouth Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard Stein-Hudson / S. Kurpiel

PRECISION DATA INDUSTRIES, LLC
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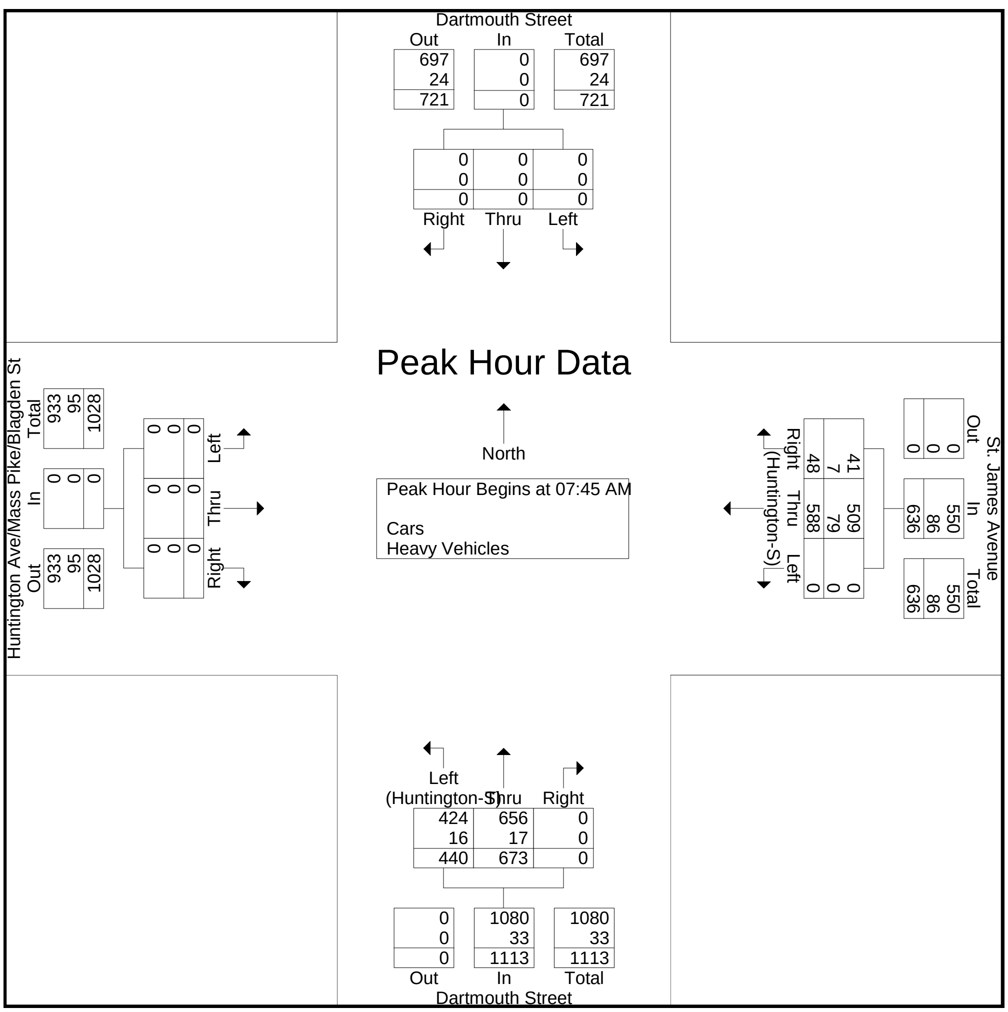
	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden	Thru (Huntingt	Thru (Mass	Thru (Huntingt	Left	App. Total	Right	Thru	Left (Blagden	Left (Huntingt	Left (Mass	Left (Huntingt	App. Total	Right	Thru	Left	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	6	5	3	11	112	0	137	0	168	3	1	66	**51**	289	0	0	0	0	426
08:00 AM	0	0	0	0	12	4	**5**	**34**	100	0	155	0	**183**	**6**	**2**	**70**		**306**					**461**
08:15 AM	0	0	0	0	13	**9**			**140**		**189**	0	148	3	0	52	50	253	0	0	0	0	442
08:30 AM	0	0	0	0	**17**	9	2	10	117	0	155	0	174	6	1	56	28	265	0	0	0	0	420
Total Volume	0	0	0	0	48	27	12	80	469	0	636	0	673	18	4	244	174	1113	0	0	0	0	1749
% App. Total	0	0	0		7.5	4.2	1.9	12.6	73.7	0		0	60.5	1.6	0.4	21.9	15.6		0	0	0		
PHF	.000	.000	.000	.000	.706	.750	.600	.588	.838	.000	.841	.000	.919	.750	.500	.871	.853	.909	.000	.000	.000	.000	.948
Cars	0	0	0	0	41	24	12	68	405	0	550	0	656	17	3	238	166	1080	0	0	0	0	1630
% Cars	0	0	0	0	85.4	88.9	100	85.0	86.4	0	86.5	0	97.5	94.4	75.0	97.5	95.4						
Heavy Vehicles	0	0	0	0	7	3	0	12	64	0	86	0	17	1	1	6	8	33	0	0	0	0	119
% Heavy Vehicles	0	0	0	0	14.6	11.1	0	15.0	13.6	0	13.5	0	2.5	5.6	25.0	2.5	4.6	3.0	0	0	0	0	6.8



N/S: Clarendon Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard/Stein-Hudson / S. Kurpiel

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File Name : 112458 FF
Site Code : 05188.01
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Groups Printed- Cars - Heavy Vehicles

	Dartmouth Street From North			St. James Avenue From East						Dartmouth Street From South						Huntington Ave/Mass Pike/Blagden St From West			
Start Time	Right	Thru	Left	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	19	6	2	33	79	0	0	141	6	8	85	27	0	0	0	406
04:15 PM	0	0	0	25	4	3	34	83	0	0	120	4	4	65	24	0	0	0	366
04:30 PM	0	0	0	18	7	7	20	90	0	0	135	8	4	92	24	0	0	0	405
04:45 PM	0	0	0	25	7	2	26	106	0	0	144	7	2	94	41	0	0	0	454
Total	0	0	0	87	24	14	113	358	0	0	540	25	18	336	116	0	0	0	1631
05:00 PM	0	0	0	21	7	3	44	79	0	0	157	11	1	101	42	0	0	0	466
05:15 PM	0	0	0	30	9	3	33	106	0	0	210	3	4	106	36	0	0	0	540
05:30 PM	0	0	0	24	9	9	32	110	0	0	233	6	5	87	26	0	0	0	541
05:45 PM	0	0	0	26	8	5	30	91	0	0	218	6	0	73	27	0	0	0	484
Total	0	0	0	101	33	20	139	386	0	0	818	26	10	367	131	0	0	0	2031
Grand Total	0	0	0	188	57	34	252	744	0	0	1358	51	28	703	247	0	0	0	3662
Apprch %	0	0	0	14.7	4.5	2.7	19.8	58.4	0	0	56.9	2.1	1.2	29.5	10.3	0	0	0	
Total %	0	0	0	5.1	1.6	0.9	6.9	20.3	0	0	37.1	1.4	0.8	19.2	6.7	0	0	0	
Cars	0	0	0	184	57	34	235	687	0	0	1345	48	28	689	241	0	0	0	3548
% Cars	0	0	0	97.9	100	100	93.3	92.3	0	0	99	94.1	100	98	97.6	0	0	0	96.9
Heavy Vehicles	0	0	0	4	0	0	17	57	0	0	13	3	0	14	6	0	0	0	114
% Heavy Vehicles	0	0	0	2.1	0	0	6.7	7.7	0	0	1	5.9	0	2	2.4	0	0	0	3.1

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	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

Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	App. Total	Int. Total
05:00 PM	0	0	0	0	21	7	3	**44**	79	0	154	0	157	**11**	1	101	**42**	312	0	0	0	0	466
05:15 PM	0	0	0	0	**30**	**9**										**106**		**359**					
05:30 PM	**0**	**0**	**0**	**0**	**24**	**9**	**9**	**32**	**110**	**0**	**184**	0	**233**	**6**	**5**	**87**	**26**	**357**	**0**	**0**	**0**	**0**	**541**
05:45 PM	0	0	0	0	26	8	5	30	91	0	160	0	218	6	0	73	27	324	0	0	0	0	484
Total Volume	0	0	0	0	101	33	20	139	386	0	679	0	818	26	10	367	131	1352	0	0	0	0	2031
% App. Total	0	0	0		14.9	4.9	2.9	20.5	56.8	0		0	60.5	1.9	0.7	27.1	9.7		0	0	0		
PHF	.000	.000	.000	.000	.842	.917	.556	.790	.877	.000	.923	.000	.878	.591	.500	.866	.780		.000	.000	.000	.000	.939
Cars	0	0	0	0	99	33	20	128	359	0	639	0	810	26	10	363	128	1337	0	0	0	0	1976
% Cars	0	0	0	0	98.0			92.1	93.0	0	94.1	0	99.0	100	100	98.9	97.7						
Heavy Vehicles	0	0	0	0	2	0	0	11	27	0	40	0	8	0	0	4	3	15	0	0	0	0	55
% Heavy Vehicles	0	0	0	0	2.0	0	0	7.9	7.0	0	5.9	0	1.0	0	0	1.1	2.3	1.1	0	0	0	0	2.7

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Clarendon Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard/Stein-Hudson / S. Kurpiel

File Name : 112458 FF
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Cars

	Dartmouth Street From North			St. James Avenue From East						Dartmouth Street From South						Huntington Ave/Mass Pike/Blagden St From West			
Start Time	Right	Thru	Left	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	18	6	2	32	69	0	0	138	4	8	81	27	0	0	0	385
04:15 PM	0	0	0	25	4	3	32	75	0	0	119	4	4	63	23	0	0	0	352
04:30 PM	0	0	0	17	7	7	19	83	0	0	135	7	4	91	24	0	0	0	394
04:45 PM	0	0	0	25	7	2	24	101	0	0	143	7	2	91	39	0	0	0	441
Total	0	0	0	85	24	14	107	328	0	0	535	22	18	326	113	0	0	0	1572
05:00 PM	0	0	0	21	7	3	42	71	0	0	154	11	1	99	41	0	0	0	450
05:15 PM	0	0	0	28	9	3	29	102	0	0	210	3	4	104	35	0	0	0	527
05:30 PM	0	0	0	24	9	9	29	100	0	0	233	6	5	87	25	0	0	0	527
05:45 PM	0	0	0	26	8	5	28	86	0	0	213	6	0	73	27	0	0	0	472
Total	0	0	0	99	33	20	128	359	0	0	810	26	10	363	128	0	0	0	1976
Grand Total	0	0	0	184	57	34	235	687	0	0	1345	48	28	689	241	0	0	0	3548
Apprch %	0	0	0	15.4	4.8	2.8	19.6	57.4	0	0	57.2	2	1.2	29.3	10.3	0	0	0	
Total %	0	0	0	5.2	1.6	1	6.6	19.4	0	0	37.9	1.4	0.8	19.4	6.8	0	0	0	

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	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	21	7	3	**42**	71	0	144	0	154	**11**	1	99	**41**	306	0	0	0	0	450
05:15 PM	0	0	0	0	**28**	**9**			**102**		**171**	0	210	3	4	**104**		**356**					**527**
05:30 PM	0	0	0	0	24	9	**9**						**233**		**5**								
05:45 PM	**0**	**0**	**0**	**0**	**26**	**8**	**5**	**28**	**86**	**0**	**153**	**0**	**213**	**6**	**0**	**73**	**27**	**319**	**0**	**0**	**0**	**0**	**472**
Total Volume	0	0	0	0	99	33	20	128	359	0	639	0	810	26	10	363	128	1337	0	0	0	0	1976
% App. Total	0	0	0		15.5	5.2	3.1	20	56.2	0		0	60.6	1.9	0.7	27.2	9.6		0	0	0		
PHF	.000	.000	.000	.000	.884	.917	.556	.762	.880	.000	.934	.000	.869	.591	.500	.873	.780		.000	.000	.000	.000	.937

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N/S: Clarendon Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard/Stein-Hudson / S. Kurpiel

File Name : 112458 FF
Site Code : 05188.01
Start Date : 3/9/2011
Page No : 1

Groups Printed- Heavy Vehicles

	Dartmouth Street From North			St. James Avenue From East						Dartmouth Street From South						Huntington Ave/Mass Pike/Blagden St From West			
Start Time	Right	Thru	Left	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	1	0	0	1	10	0	0	3	2	0	4	0	0	0	0	21
04:15 PM	0	0	0	0	0	0	2	8	0	0	1	0	0	2	1	0	0	0	14
04:30 PM	0	0	0	1	0	0	1	7	0	0	0	1	0	1	0	0	0	0	11
04:45 PM	0	0	0	0	0	0	2	5	0	0	1	0	0	3	2	0	0	0	13
Total	0	0	0	2	0	0	6	30	0	0	5	3	0	10	3	0	0	0	59
05:00 PM	0	0	0	0	0	0	2	8	0	0	3	0	0	2	1	0	0	0	16
05:15 PM	0	0	0	2	0	0	4	4	0	0	0	0	0	2	1	0	0	0	13
05:30 PM	0	0	0	0	0	0	3	10	0	0	0	0	0	0	1	0	0	0	14
05:45 PM	0	0	0	0	0	0	2	5	0	0	5	0	0	0	0	0	0	0	12
Total	0	0	0	2	0	0	11	27	0	0	8	0	0	4	3	0	0	0	55
Grand Total	0	0	0	4	0	0	17	57	0	0	13	3	0	14	6	0	0	0	114
Apprch %	0	0	0	5.1	0	0	21.8	73.1	0	0	36.1	8.3	0	38.9	16.7	0	0	0	
Total %	0	0	0	3.5	0	0	14.9	50	0	0	11.4	2.6	0	12.3	5.3	0	0	0	

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	App. Total	Right	Thru	Left	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	**1**	0	0	1	**10**	**0**	**12**	0	**3**	**2**	0	**4**	**0**	**9**	**0**	**0**	**0**	**0**	**21**
04:15 PM	0	0	0	0	0	0	0	**2**	8	0	10	0	1	0	0	2	1	4	0	0	0	0	14
04:30 PM	0	0	0	0	1	0	0	1	7	0	9	0	0	1	0	1	0	2	0	0	0	0	11
04:45 PM	0	0	0	0	0	0	0	2	5	0	7	0	1	0	0	3	**2**	6	0	0	0	0	13
Total Volume	0	0	0	0	2	0	0	6	30	0	38	0	5	3	0	10	3	21	0	0	0	0	59
% App. Total	0	0	0		5.3	0	0	15.8	78.9	0		0	23.8	14.3	0	47.6	14.3		0	0	0		
PHF	.000	.000	.000	.000	.500	.000	.000	.750	.750	.000	.792	.000	.417	.375	.000	.625	.375	.583	.000	.000	.000	.000	.702

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N/S: Clarendon Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard/Stein-Hudson / S. Kurpiel

File Name : 112458 FF
Site Code : 05188.01
Start Date : 3/9/2011

Groups Printed- Peds and Bicycles

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South								Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	Peds	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Peds	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Peds (Left Turn Lane)	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	35	0	1	0	0	1	0	146	0	1	0	0	0	1	73	55	0	0	0	78	391
04:15 PM	0	0	0	32	1	0	4	0	0	0	198	0	2	0	0	0	0	74	59	0	0	0	100	470
04:30 PM	0	1	0	26	1	0	2	0	0	0	167	0	0	0	0	0	0	114	68	0	0	0	125	504
04:45 PM	0	1	0	22	0	1	2	0	0	0	177	1	2	0	0	0	0	69	58	0	0	0	77	410
Total	0	2	0	115	2	2	8	0	1	0	688	1	5	0	0	0	1	330	240	0	0	0	380	1775
05:00 PM	0	0	0	13	1	0	2	1	0	0	223	0	4	0	0	0	0	82	70	0	0	0	135	531
05:15 PM	0	0	0	16	0	1	4	0	0	0	204	0	4	0	0	0	0	85	73	0	0	0	97	484
05:30 PM	0	0	0	38	1	1	3	0	0	0	254	0	4	0	0	0	0	74	72	0	0	0	138	585
05:45 PM	0	0	0	34	0	0	1	0	0	0	242	0	0	0	0	0	0	94	94	0	0	0	99	564
Total	0	0	0	101	2	2	10	1	0	0	923	0	12	0	0	0	0	335	309	0	0	0	469	2164
Grand Total	0	2	0	216	4	4	18	1	1	0	1611	1	17	0	0	0	1	665	549	0	0	0	849	3939
Apprch %	0	0.9	0	99.1	0.2	0.2	1.1	0.1	0.1	0	98.3	0.1	1.4	0	0	0	0.1	53.9	44.5	0	0	0	100	
Total %	0	0.1	0	5.5	0.1	0.1	0.5	0	0	0	40.9	0	0.4	0	0	0	0	16.9	13.9	0	0	0	21.6	

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

	Dartmouth Street From North					St. James Avenue From East								Dartmouth Street From South									Huntington Ave/Mass Pike/Blagden St From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru (Blagden)	Thru (Huntington-N)	Thru (Mass Pike)	Thru (Huntington-S)	Left	Peds	App. Total	Right	Thru	Left (Blagden)	Left (Huntington-N)	Left (Mass Pike)	Left (Huntington-S)	Peds (Left Turn Lane)	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
05:00 PM	0	0	0	13	13	**1**	0	2	**1**	0	0	223	227	0	**4**	0	0	0	0	82	70	156	0	0	0	135	135	531
05:15 PM	0	0	0	16	16	0	**1**	**4**				204	209	0	4	0	0	0	0	85	73	162	0	0	0	97	97	484
05:30 PM	0	0	0	**38**	**38**	1	1	3	0	0	0	**254**	**259**	0	4	0	0	0	0	74	72	150	0	0	0	**138**	**138**	**585**
05:45 PM	0	0	0	34	34	0	0	1	0	0	0	242	243	0	0	0	0	0	0	**94**	**94**	**188**	0	0	0	99	99	564
Total Volume	0	0	0	101	101	2	2	10	1	0	0	923	938	0	12	0	0	0	0	335	309	656	0	0	0	469	469	2164
% App. Total	0	0	0	100		0.2	0.2	1.1	0.1	0	0	98.4		0	1.8	0	0	0	0	51.1	47.1		0	0	0	100		
PHF	.000	.000	.000	.664	.664	.500	.500	.625	.250	.000	.000	.908	.905	.000	.750	.000	.000	.000	.000	.891	.822	.872	.000	.000	.000	.850	.850	.925

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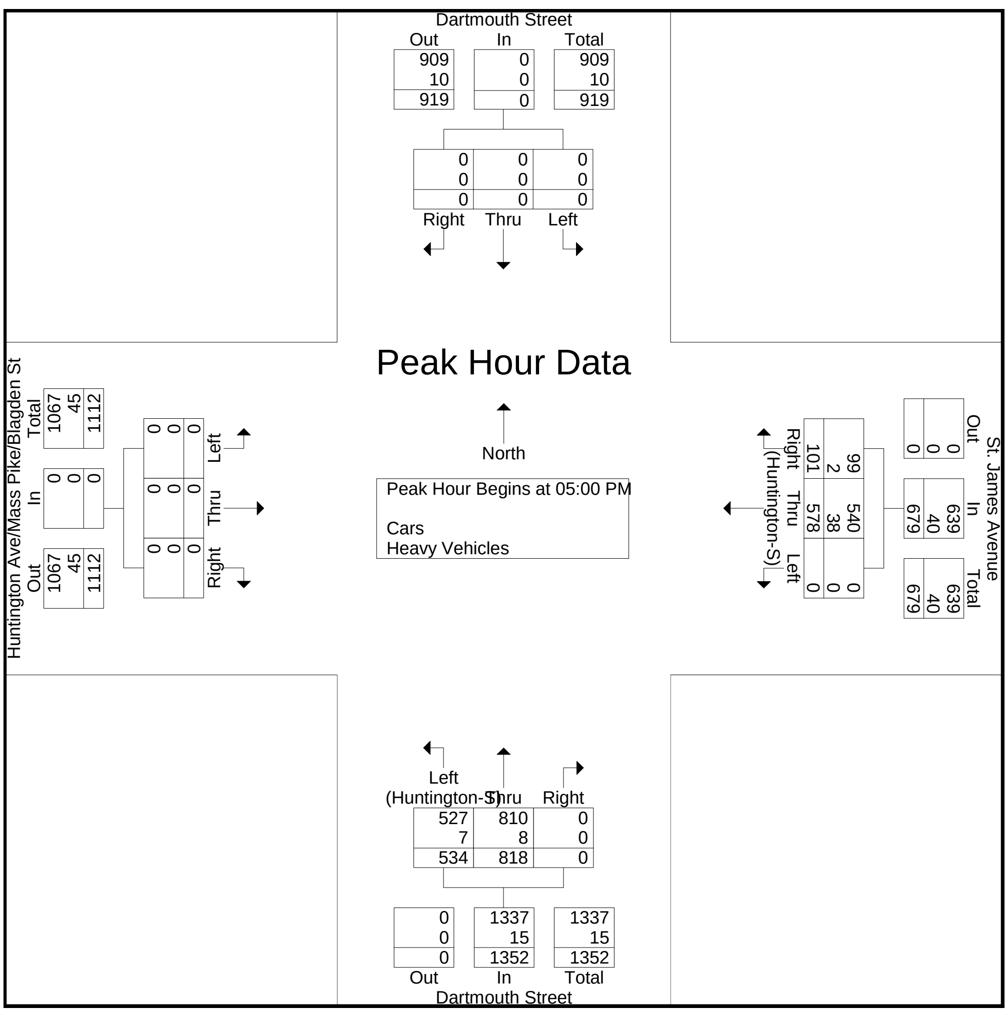
N/S: Clarendon Street
E/W: St.James/Huntington,I-90,Blagden
City, State: Boston, MA
Client: Howard/Stein-Hudson / S. Kurpiel

File Name : 112458 FF
Site Code : 05188.01
Start Date : 3/9/2011

	Dartmouth Street From North				St. James Avenue From East							Dartmouth Street From South							Huntington Ave/Mass Pike/Blagden St From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru (Blagden	Thru (Huntingt	Thru (Mass	Thru (Huntingt	Left	App. Total	Right	Thru	Left (Blagden	Left (Huntingt	Left (Mass	Left (Huntingt	App. Total	Right	Thru	Left	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	21	7	3	**44**	79	0	154	0	157	**11**	1	101	**42**	312	0	0	0	0	466
05:15 PM	0	0	0	0	**30**	**9**										**106**		**359**					
05:30 PM	**0**	**0**	**0**	**0**	**24**	**9**	**9**	**32**	**110**	**0**	**184**	0	**233**	**6**	**5**	**87**	**26**	**357**	**0**	**0**	**0**	**0**	**541**
05:45 PM	0	0	0	0	26	8	5	30	91	0	160	0	218	6	0	73	27	324	0	0	0	0	484
Total Volume	0	0	0	0	101	33	20	139	386	0	679	0	818	26	10	367	131	1352	0	0	0	0	2031
% App. Total	0	0	0		14.9	4.9	2.9	20.5	56.8	0		0	60.5	1.9	0.7	27.1	9.7		0	0	0		
PHF	.000	.000	.000	.000	.842	.917	.556	.790	.877	.000	.923	.000	.878	.591	.500	.866	.780		.000	.000	.000	.000	.939
Cars	0	0	0	0	99	33	20	128	359	0	639	0	810	26	10	363	128	1337	0	0	0	0	1976
% Cars	0	0	0	0	98.0			92.1	93.0	0	94.1	0	99.0	100	100	98.9	97.7						
Heavy Vehicles	0	0	0	0	2	0	0	11	27	0	40	0	8	0	0	4	3	15	0	0	0	0	55
% Heavy Vehicles	0	0	0	0	2.0	0	0	7.9	7.0	0	5.9	0	1.0	0	0	1.1	2.3	1.1	0	0	0	0	2.7



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N/S: Trinity Place
E/W: Stuart Street (Route 9)
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 A
Site Code : 08030.01
Start Date : 2/9/2010
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Trinity Place From North			Stuart Street (Route 9) From East			Trinity Place From South			Stuart Street (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	4	0	0	0	3	1	0	22	149	4	183
07:15 AM	0	2	3	0	0	0	4	2	0	30	147	13	201
07:30 AM	0	1	2	0	0	0	5	3	0	33	168	7	219
07:45 AM	0	1	1	0	0	0	4	2	0	22	180	6	216
Total	0	4	10	0	0	0	16	8	0	107	644	30	819
08:00 AM	0	2	1	0	0	0	3	4	0	43	166	9	228
08:15 AM	0	3	2	0	0	0	3	2	0	42	200	9	261
08:30 AM	0	4	4	0	0	0	3	1	0	39	230	6	287
08:45 AM	0	3	2	0	0	0	8	7	0	41	179	10	250
Total	0	12	9	0	0	0	17	14	0	165	775	34	1026
Grand Total	0	16	19	0	0	0	33	22	0	272	1419	64	1845
Apprch %	0	45.7	54.3	0	0	0	60	40	0	15.5	80.9	3.6	
Total %	0	0.9	1	0	0	0	1.8	1.2	0	14.7	76.9	3.5	
Cars	0	16	14	0	0	0	29	22	0	271	1358	34	1744
% Cars	0	100	73.7	0	0	0	87.9	100	0	99.6	95.7	53.1	94.5
Heavy Vehicles	0	0	5	0	0	0	4	0	0	1	61	30	101
% Heavy Vehicles	0	0	26.3	0	0	0	12.1	0	0	0.4	4.3	46.9	5.5

	Trinity Place From North				Stuart Street (Route 9) From East				Trinity Place From South				Stuart Street (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	2	1	3	0	0	0	0	3	4	0	7	**43**	166	9	218	228
08:15 AM	0	3	2	5	0	0	0	0	3	2	0	5	42	200	9	251	261
08:30 AM	0	**4**	**4**	**8**	0	0	0	0	3	1	0	4	39	**230**	6	**275**	**287**
08:45 AM	0	3	2	5	0	0	0	0	**8**	**7**	0	**15**	41	179	**10**	230	250
Total Volume	0	12	9	21	0	0	0	0	17	14	0	31	165	775	34	974	1026
% App. Total	0	57.1	42.9		0	0	0		54.8	45.2	0		16.9	79.6	3.5		
PHF	.000	.750	.563	.656	.000	.000	.000	.000	.531	.500	.000	.517	.959	.842	.850	.885	.894
Cars	0	12	6	18	0	0	0	0	14	14	0	28	164	746	17	927	973
% Cars	0	100	66.7	85.7	0	0	0	0	82.4	100	0	90.3	99.4	96.3	50.0	95.2	94.8
Heavy Vehicles	0	0	3	3	0	0	0	0	3	0	0	3	1	29	17	47	53
% Heavy Vehicles	0	0	33.3	14.3	0	0	0	0	17.6	0	0	9.7	0.6	3.7	50.0	4.8	5.2

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N/S: Trinity Place
E/W: Stuart Street (Route 9)
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 A
Site Code : 08030.01
Start Date : 2/9/2010

Groups Printed- Cars

	Trinity Place From North			Stuart Street (Route 9) From East			Trinity Place From South			Stuart Street (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	2	0	0	0	3	1	0	22	138	3	169
07:15 AM	0	2	3	0	0	0	3	2	0	30	139	8	187
07:30 AM	0	1	2	0	0	0	5	3	0	33	162	4	210
07:45 AM	0	1	1	0	0	0	4	2	0	22	173	2	205
Total	0	4	8	0	0	0	15	8	0	107	612	17	771
08:00 AM	0	2	1	0	0	0	3	4	0	42	157	4	213
08:15 AM	0	3	1	0	0	0	2	2	0	42	194	5	249
08:30 AM	0	4	3	0	0	0	3	1	0	39	220	3	273
08:45 AM	0	3	1	0	0	0	6	7	0	41	175	5	238
Total	0	12	6	0	0	0	14	14	0	164	746	17	973
Grand Total	0	16	14	0	0	0	29	22	0	271	1358	34	1744
Apprch %	0	53.3	46.7	0	0	0	56.9	43.1	0	16.3	81.7	2	
Total %	0	0.9	0.8	0	0	0	1.7	1.3	0	15.5	77.9	1.9	

	Trinity Place From North				Stuart Street (Route 9) From East				Trinity Place From South				Stuart Street (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	2	1	3	0	0	0	0	3	4	0	7	**42**	157	4	203	213
08:15 AM	0	3	1	4	0	0	0	0	2	2	0	4	42	194	**5**	241	249
08:30 AM	0	**4**	**3**	**7**	0	0	0	0	3	1	0	4	39	**220**	3	**262**	**273**
08:45 AM	0	3	1	4	0	0	0	0	**6**	**7**	0	**13**	41	175	5	221	238
Total Volume	0	12	6	18	0	0	0	0	14	14	0	28	164	746	17	927	973
% App. Total	0	66.7	33.3		0	0	0		50	50	0		17.7	80.5	1.8		
PHF	.000	.750	.500	.643	.000	.000	.000	.000	.583	.500	.000	.538	.976	.848	.850	.885	.891

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E/W: Stuart Street (Route 9)
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 A
Site Code : 08030.01
Start Date : 2/9/2010
Page No : 1

Groups Printed- Heavy Vehicles

	Trinity Place From North			Stuart Street (Route 9) From East			Trinity Place From South			Stuart Street (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:00 AM	0	0	2	0	0	0	0	0	0	0	11	1	14
07:15 AM	0	0	0	0	0	0	1	0	0	0	8	5	14
07:30 AM	0	0	0	0	0	0	0	0	0	0	6	3	9
07:45 AM	0	0	0	0	0	0	0	0	0	0	7	4	11
Total	0	0	2	0	0	0	1	0	0	0	32	13	48
08:00 AM	0	0	0	0	0	0	0	0	0	1	9	5	15
08:15 AM	0	0	1	0	0	0	1	0	0	0	6	4	12
08:30 AM	0	0	1	0	0	0	0	0	0	0	10	3	14
08:45 AM	0	0	1	0	0	0	2	0	0	0	4	5	12
Total	0	0	3	0	0	0	3	0	0	1	29	17	53
Grand Total	0	0	5	0	0	0	4	0	0	1	61	30	101
Apprch %	0	0	100	0	0	0	100	0	0	1.1	66.3	32.6	
Total %	0	0	5	0	0	0	4	0	0	1	60.4	29.7	

	Trinity Place From North				Stuart Street (Route 9) From East				Trinity Place From South				Stuart Street (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	**1**	9	**5**	**15**	**15**
08:15 AM	0	0	**1**	**1**	0	0	0	0	1	0	0	1	0	6	4	10	12
08:30 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	**10**	3	13	14
08:45 AM	0	0	1	1	0	0	0	0	**2**	0	0	**2**	0	4	5	9	12
Total Volume	0	0	3	3	0	0	0	0	3	0	0	3	1	29	17	47	53
% App. Total	0	0	100		0	0	0		100	0	0		2.1	61.7	36.2		
PHF	.000	.000	.750	.750	.000	.000	.000	.000	.375	.000	.000	.375	.250	.725	.850	.783	.883

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E/W: Stuart Street (Route 9)
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 A
Site Code : 08030.01
Start Date : 2/9/2010

Groups Printed- Peds and Bicycles

	Trinity Place From North				Stuart Street (Route 9) From East				Trinity Place From South				Stuart Street (Route 9) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	61	0	0	0	12	0	0	0	41	0	0	0	73	187
07:15 AM	0	0	0	77	0	0	0	23	0	0	0	66	0	2	0	85	253
07:30 AM	0	0	0	89	0	0	0	28	0	0	0	134	0	0	0	110	361
07:45 AM	0	0	0	112	0	0	0	41	0	0	0	92	0	0	0	111	356
Total	0	0	0	339	0	0	0	104	0	0	0	333	0	2	0	379	1157
08:00 AM	0	0	0	179	0	0	0	40	0	0	0	132	0	2	0	212	565
08:15 AM	0	0	0	231	0	0	0	50	0	0	0	159	0	1	0	272	713
08:30 AM	0	0	0	161	0	2	0	40	0	0	0	125	0	2	0	164	494
08:45 AM	0	0	0	200	0	0	0	49	0	0	0	168	0	1	1	271	690
Total	0	0	0	771	0	2	0	179	0	0	0	584	0	6	1	919	2462
Grand Total	0	0	0	1110	0	2	0	283	0	0	0	917	0	8	1	1298	3619
Apprch %	0	0	0	100	0	0.7	0	99.3	0	0	0	100	0	0.6	0.1	99.3	
Total %	0	0	0	30.7	0	0.1	0	7.8	0	0	0	25.3	0	0.2	0	35.9	

	Trinity Place From North					Stuart Street (Route 9) From East					Trinity Place From South					Stuart Street (Route 9) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	179	179	0	0	0	40	40	0	0	0	132	132	0	**2**	0	212	214	565
08:15 AM	0	0	0	**231**	**231**	0	0	0	**50**	**50**	0	0	0	159	159	0	1	0	**272**	**273**	**713**
08:30 AM	0	0	0	161	161	0	**2**														
08:45 AM	**0**	**0**	**0**	**200**	**200**	**0**	**0**	**0**	**49**	**49**	**0**	**0**	**0**	**168**	**168**	0	1	**1**	**271**	**273**	**690**
Total Volume	0	0	0	771	771	0	2	0	179	181	0	0	0	584	584	0	6	1	919	926	2462
% App. Total	0	0	0	100		0	1.1	0	98.9		0	0	0	100		0	0.6	0.1	99.2		
PHF	.000	.000	.000	.834	.834	.000	.250	.000	.895	.905	.000	.000	.000	.869	.869	.000	.750	.250	.845	.848	.863

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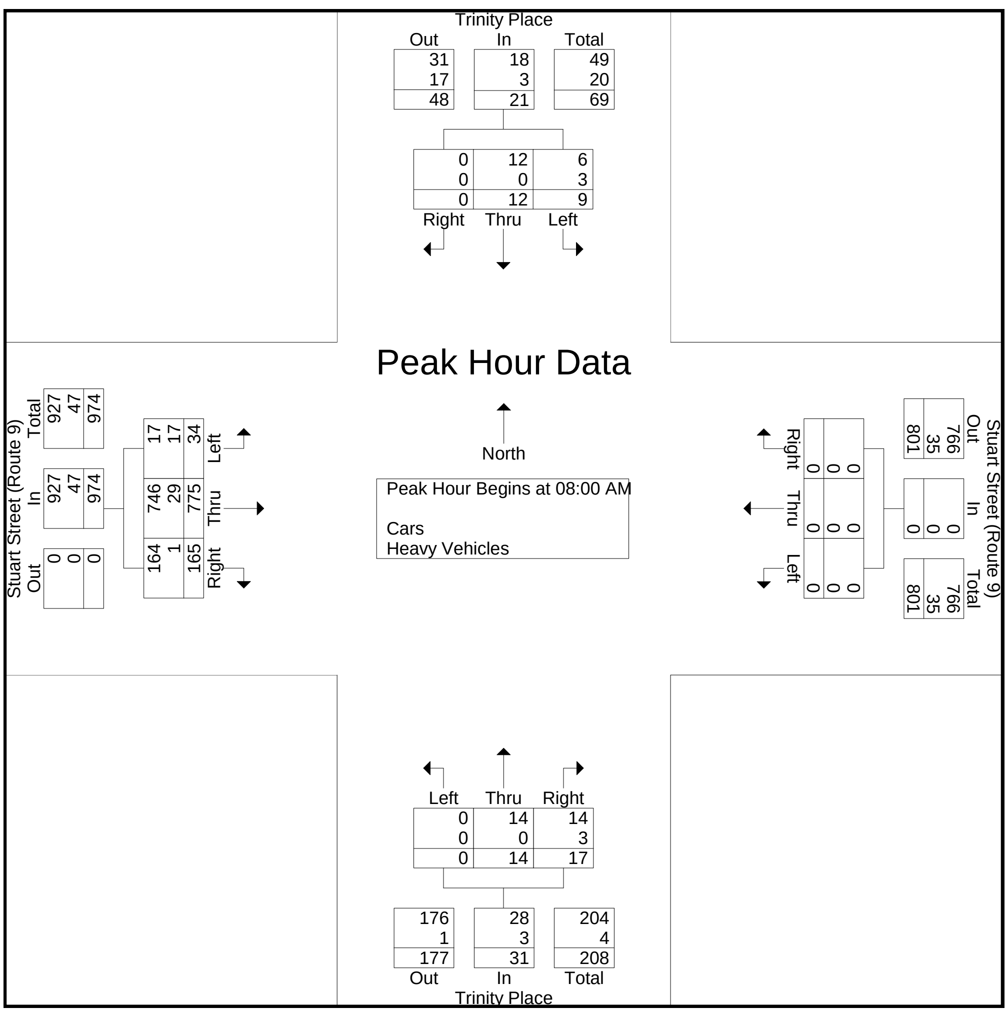
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 A
Site Code : 08030.01
Start Date : 2/9/2010
Page No : 1

	Trinity Place From North				Stuart Street (Route 9) From East				Trinity Place From South				Stuart Street (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	2	1	3	0	0	0	0	3	4	0	7	**43**	166	9	218	228
08:15 AM	0	3	2	5	0	0	0	0	3	2	0	5	42	200	9	251	261
08:30 AM	0	**4**	**4**	**8**	0	0	0	0	3	1	0	4	39	**230**	6	**275**	**287**
08:45 AM	0	3	2	5	0	0	0	0	**8**	**7**	0	**15**	41	179	**10**	230	250
Total Volume	0	12	9	21	0	0	0	0	17	14	0	31	165	775	34	974	1026
% App. Total	0	57.1	42.9		0	0	0		54.8	45.2	0		16.9	79.6	3.5		
PHF	.000	.750	.563	.656	.000	.000	.000	.000	.531	.500	.000	.517	.959	.842	.850	.885	.894
Cars	0	12	6	18	0	0	0	0	14	14	0	28	164	746	17	927	973
% Cars	0	100	66.7	85.7	0	0	0	0	82.4	100	0	90.3	99.4	96.3	50.0	95.2	94.8
Heavy Vehicles	0	0	3	3	0	0	0	0	3	0	0	3	1	29	17	47	53
% Heavy Vehicles	0	0	33.3	14.3	0	0	0	0	17.6	0	0	9.7	0.6	3.7	50.0	4.8	5.2



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N/S: Trinity Church/ Trinity Place
E/W: St. James Avenue (Route 9)
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 B
Site Code : 08030.01
Start Date : 2/9/2010
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Trinity Church From North			St. James Avenue (Route 9) From East			Trinity Place From South			St. James Avenue (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:15 AM	0	0	0	0	102	5	0	0	12	0	0	0	119
07:30 AM	0	0	0	0	119	4	0	0	11	0	0	0	134
07:45 AM	0	0	0	0	132	3	0	0	10	0	0	0	145
Total	0	0	0	0	353	12	0	0	33	0	0	0	398
08:00 AM	0	0	0	0	133	4	0	0	11	0	0	0	148
08:15 AM	0	0	0	0	158	5	0	0	9	0	0	0	172
08:30 AM	0	0	0	0	153	7	0	0	6	0	0	0	166
08:45 AM	0	0	0	0	132	2	0	0	14	0	0	0	148
Total	0	0	0	0	576	18	0	0	40	0	0	0	634
Grand Total	0	0	0	0	929	30	0	0	73	0	0	0	1032
Apprch %	0	0	0	0	96.9	3.1	0	0	100	0	0	0	
Total %	0	0	0	0	90	2.9	0	0	7.1	0	0	0	
Cars	0	0	0	0	826	26	0	0	48	0	0	0	900
% Cars	0	0	0	0	88.9	86.7	0	0	65.8	0	0	0	87.2
Heavy Vehicles	0	0	0	0	103	4	0	0	25	0	0	0	132
% Heavy Vehicles	0	0	0	0	11.1	13.3	0	0	34.2	0	0	0	12.8

Peak Hour Analysis From 07:15 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
08:00 AM	0	0	0	0	0	133	4	137	0	0	11	11	0	0	0	0	148
08:15 AM	0	0	0	0	0	**158**	5	**163**	0	0	9	9	0	0	0	0	**172**
08:30 AM	0	0	0	0	0	153	**7**	160	0	0	6	6	0	0	0	0	166
08:45 AM	0	0	0	0	0	132	2	134	0	0	**14**	**14**	0	0	0	0	148
Total Volume	0	0	0	0	0	576	18	594	0	0	40	40	0	0	0	0	634
% App. Total	0	0	0		0	97	3		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.911	.643	.911	.000	.000	.714	.714	.000	.000	.000	.000	.922
Cars	0	0	0	0	0	519	17	536	0	0	27	27	0	0	0	0	563
% Cars	0	0	0	0	0	90.1	94.4	90.2	0	0	67.5	67.5	0	0	0	0	88.8
Heavy Vehicles	0	0	0	0	0	57	1	58	0	0	13	13	0	0	0	0	71
% Heavy Vehicles	0	0	0	0	0	9.9	5.6	9.8	0	0	32.5	32.5	0	0	0	0	11.2

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City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 B
Site Code : 08030.01
Start Date : 2/9/2010

Groups Printed- Cars

	Trinity Church From North			St. James Avenue (Route 9) From East			Trinity Place From South			St. James Avenue (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:15 AM	0	0	0	0	87	4	0	0	8	0	0	0	99
07:30 AM	0	0	0	0	104	2	0	0	7	0	0	0	113
07:45 AM	0	0	0	0	116	3	0	0	6	0	0	0	125
Total	0	0	0	0	307	9	0	0	21	0	0	0	337
08:00 AM	0	0	0	0	118	4	0	0	7	0	0	0	129
08:15 AM	0	0	0	0	141	5	0	0	6	0	0	0	152
08:30 AM	0	0	0	0	141	7	0	0	5	0	0	0	153
08:45 AM	0	0	0	0	119	1	0	0	9	0	0	0	129
Total	0	0	0	0	519	17	0	0	27	0	0	0	563
Grand Total	0	0	0	0	826	26	0	0	48	0	0	0	900
Apprch %	0	0	0	0	96.9	3.1	0	0	100	0	0	0	
Total %	0	0	0	0	91.8	2.9	0	0	5.3	0	0	0	

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:15 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	118	4	122	0	0	7	7	0	0	0	0	129
08:15 AM	0	0	0	0	0	**141**	5	146	0	0	6	6	0	0	0	0	152
08:30 AM	0	0	0	0	0	141	**7**	**148**	0	0	5	5	0	0	0	0	**153**
08:45 AM	0	0	0	0	0	119	1	120	0	0	**9**	**9**	0	0	0	0	129
Total Volume	0	0	0	0	0	519	17	536	0	0	27	27	0	0	0	0	563
% App. Total	0	0	0		0	96.8	3.2		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.920	.607	.905	.000	.000	.750	.750	.000	.000	.000	.000	.920

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File Name : 102108 B
Site Code : 08030.01
Start Date : 2/9/2010

Groups Printed- Heavy Vehicles

	Trinity Church From North			St. James Avenue (Route 9) From East			Trinity Place From South			St. James Avenue (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
07:15 AM	0	0	0	0	15	1	0	0	4	0	0	0	20
07:30 AM	0	0	0	0	15	2	0	0	4	0	0	0	21
07:45 AM	0	0	0	0	16	0	0	0	4	0	0	0	20
Total	0	0	0	0	46	3	0	0	12	0	0	0	61
08:00 AM	0	0	0	0	15	0	0	0	4	0	0	0	19
08:15 AM	0	0	0	0	17	0	0	0	3	0	0	0	20
08:30 AM	0	0	0	0	12	0	0	0	1	0	0	0	13
08:45 AM	0	0	0	0	13	1	0	0	5	0	0	0	19
Total	0	0	0	0	57	1	0	0	13	0	0	0	71
Grand Total	0	0	0	0	103	4	0	0	25	0	0	0	132
Apprch %	0	0	0	0	96.3	3.7	0	0	100	0	0	0	
Total %	0	0	0	0	78	3	0	0	18.9	0	0	0	

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	15	1	16	0	0	**4**	**4**	0	0	0	0	20
07:30 AM	0	0	0	0	0	15	**2**	**17**	0	0	4	4	0	0	0	0	**21**
07:45 AM	0	0	0	0	0	**16**	0	16	0	0	4	4	0	0	0	0	20
08:00 AM	0	0	0	0	0	15	0	15	0	0	4	4	0	0	0	0	19
Total Volume	0	0	0	0	0	61	3	64	0	0	16	16	0	0	0	0	80
% App. Total	0	0	0		0	95.3	4.7		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.953	.375	.941	.000	.000	1.000	1.000	.000	.000	.000	.000	.952

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N/S: Trinity Church/ Trinity Place
E/W: St. James Avenue (Route 9)
City, State: Boston, MA
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 B
Site Code : 08030.01
Start Date : 2/9/2010

Groups Printed- Peds and Bicycles

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:15 AM	0	0	0	8	0	0	0	39	0	0	0	14	0	0	0	4	65
07:30 AM	0	0	0	13	0	1	0	59	0	0	0	22	0	0	0	14	109
07:45 AM	0	0	0	9	0	0	0	91	0	0	0	28	0	0	0	16	144
Total	0	0	0	30	0	1	0	189	0	0	0	64	0	0	0	34	318
08:00 AM	0	0	0	13	0	0	0	100	0	0	0	24	0	0	0	12	149
08:15 AM	0	0	0	9	0	2	0	104	0	0	0	28	0	0	0	19	162
08:30 AM	0	0	0	21	0	0	0	158	0	0	0	27	0	0	0	9	215
08:45 AM	0	0	0	22	0	3	0	278	0	1	1	21	0	0	0	21	347
Total	0	0	0	65	0	5	0	640	0	1	1	100	0	0	0	61	873
Grand Total	0	0	0	95	0	6	0	829	0	1	1	164	0	0	0	95	1191
Apprch %	0	0	0	100	0	0.7	0	99.3	0	0.6	0.6	98.8	0	0	0	100	
Total %	0	0	0	8	0	0.5	0	69.6	0	0.1	0.1	13.8	0	0	0	8	

Peak Hour Analysis From 07:15 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

	Trinity Church From North					St. James Avenue (Route 9) From East					Trinity Place From South					St. James Avenue (Route 9) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
08:00 AM	0	0	0	13	13	0	0	0	100	100	0	0	0	24	24	0	0	0	12	12	149
08:15 AM	0	0	0	9	9	0	2	0	104	106	0	0	0	**28**	**28**	0	0	0	19	19	162
08:30 AM	0	0	0	21	21	0	0	0	158	158	0	0	0	27	27	0	0	0	9	9	215
08:45 AM	0	0	0	**22**	**22**	0	**3**		**278**	**281**	0	**1**	**1**	21	23	0	0	0	**21**	**21**	**347**
Total Volume	0	0	0	65	65	0	5	0	640	645	0	1	1	100	102	0	0	0	61	61	873
% App. Total	0	0	0	100		0	0.8	0	99.2		0	1	1	98		0	0	0	100		
PHF	.000	.000	.000	.739	.739	.000	.417	.000	.576	.574	.000	.250	.250	.893	.911	.000	.000	.000	.726	.726	.629

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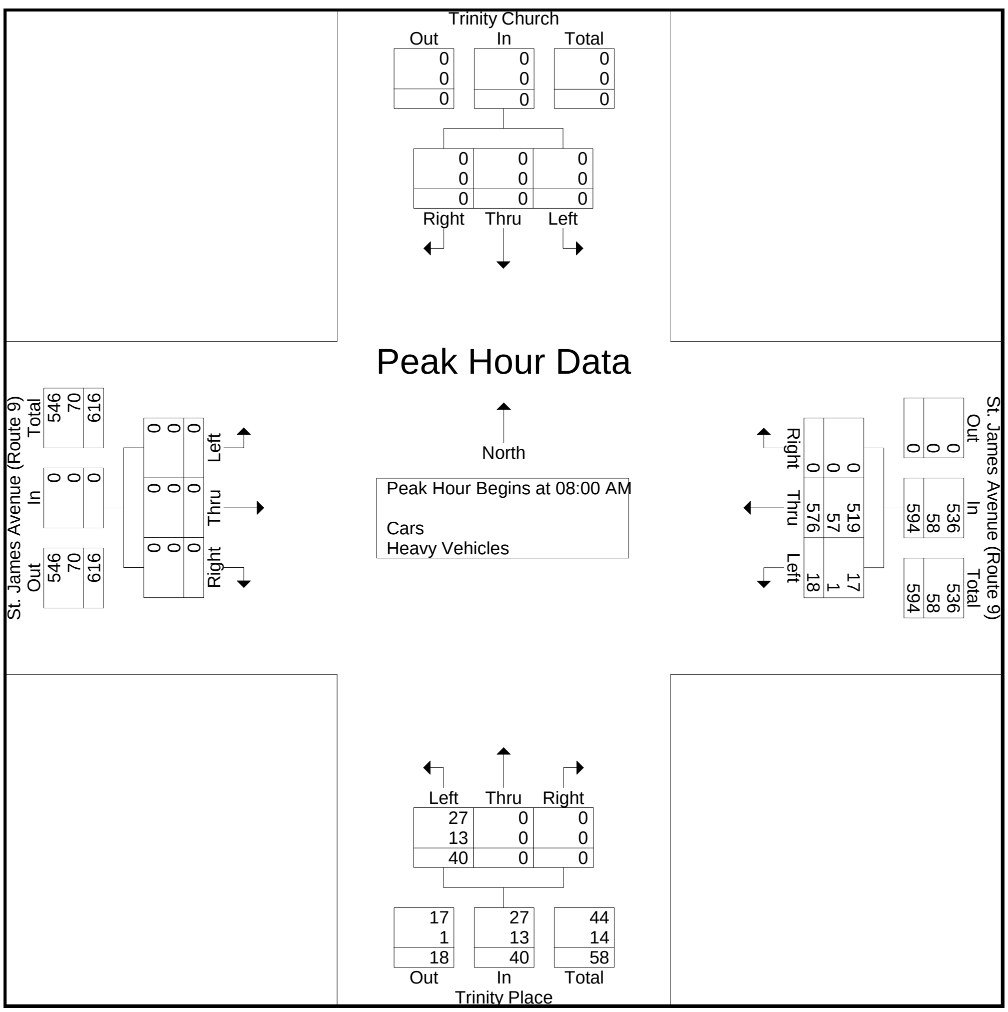
Client: Howard Stein-Hudson/ S. Kurpiel

File Name : 102108 B
Site Code : 08030.01
Start Date : 2/9/2010

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:15 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	133	4	137	0	0	11	11	0	0	0	0	148
08:15 AM	0	0	0	0	0	**158**	5	**163**	0	0	9	9	0	0	0	0	**172**
08:30 AM	0	0	0	0	0	153	**7**	160	0	0	6	6	0	0	0	0	166
08:45 AM	0	0	0	0	0	132	2	134	0	0	**14**	**14**	0	0	0	0	148
Total Volume	0	0	0	0	0	576	18	594	0	0	40	40	0	0	0	0	634
% App. Total	0	0	0		0	97	3		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.911	.643	.911	.000	.000	.714	.714	.000	.000	.000	.000	.922
Cars	0	0	0	0	0	519	17	536	0	0	27	27	0	0	0	0	563
% Cars	0	0	0	0	0	90.1	94.4	90.2	0	0	67.5	67.5	0	0	0	0	88.8
Heavy Vehicles	0	0	0	0	0	57	1	58	0	0	13	13	0	0	0	0	71
% Heavy Vehicles	0	0	0	0	0	9.9	5.6	9.8	0	0	32.5	32.5	0	0	0	0	11.2



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File Name : 102108 BB
Site Code : 08030.01
Start Date : 2/9/2010
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Trinity Church From North			St. James Avenue (Route 9) From East			Trinity Place From South			St. James Avenue (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	176	5	0	0	11	0	0	0	192
04:15 PM	0	0	0	0	169	4	0	0	15	0	0	0	188
04:30 PM	0	0	0	0	147	9	0	0	13	0	0	0	169
04:45 PM	0	0	0	0	155	2	0	0	20	0	0	0	177
Total	0	0	0	0	647	20	0	0	59	0	0	0	726
05:00 PM	0	0	0	0	146	2	0	0	18	0	0	0	166
05:15 PM	0	0	0	0	206	4	0	0	23	0	0	0	233
05:30 PM	0	0	0	0	183	4	0	0	14	0	0	0	201
05:45 PM	0	0	0	0	196	5	0	0	17	0	0	0	218
Total	0	0	0	0	731	15	0	0	72	0	0	0	818
Grand Total	0	0	0	0	1378	35	0	0	131	0	0	0	1544
Apprch %	0	0	0	0	97.5	2.5	0	0	100	0	0	0	
Total %	0	0	0	0	89.2	2.3	0	0	8.5	0	0	0	
Cars	0	0	0	0	1306	34	0	0	113	0	0	0	1453
% Cars	0	0	0	0	94.8	97.1	0	0	86.3	0	0	0	94.1
Heavy Vehicles	0	0	0	0	72	1	0	0	18	0	0	0	91
% Heavy Vehicles	0	0	0	0	5.2	2.9	0	0	13.7	0	0	0	5.9

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	146	2	148	0	0	18	18	0	0	0	0	166
05:15 PM	0	0	0	0	0	**206**	4	**210**	0	0	**23**	**23**	0	0	0	0	**233**
05:30 PM	0	0	0	0	0	183	4	187	0	0	14	14	0	0	0	0	201
05:45 PM	0	0	0	0	0	196	**5**	201	0	0	17	17	0	0	0	0	218
Total Volume	0	0	0	0	0	731	15	746	0	0	72	72	0	0	0	0	818
% App. Total	0	0	0		0	98	2		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.887	.750	.888	.000	.000	.783	.783	.000	.000	.000	.000	.878
Cars	0	0	0	0	0	701	15	716	0	0	62	62	0	0	0	0	778
% Cars	0	0	0	0	0	95.9	100	96.0	0	0	86.1	86.1	0	0	0	0	95.1
Heavy Vehicles	0	0	0	0	0	30	0	30	0	0	10	10	0	0	0	0	40
% Heavy Vehicles	0	0	0	0	0	4.1	0	4.0	0	0	13.9	13.9	0	0	0	0	4.9

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File Name : 102108 BB
Site Code : 08030.01
Start Date : 2/9/2010
Page No : 1

Groups Printed- Cars

	Trinity Church From North			St. James Avenue (Route 9) From East			Trinity Place From South			St. James Avenue (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	166	5	0	0	10	0	0	0	181
04:15 PM	0	0	0	0	160	3	0	0	13	0	0	0	176
04:30 PM	0	0	0	0	135	9	0	0	13	0	0	0	157
04:45 PM	0	0	0	0	144	2	0	0	15	0	0	0	161
Total	0	0	0	0	605	19	0	0	51	0	0	0	675
05:00 PM	0	0	0	0	140	2	0	0	16	0	0	0	158
05:15 PM	0	0	0	0	195	4	0	0	20	0	0	0	219
05:30 PM	0	0	0	0	178	4	0	0	12	0	0	0	194
05:45 PM	0	0	0	0	188	5	0	0	14	0	0	0	207
Total	0	0	0	0	701	15	0	0	62	0	0	0	778
Grand Total	0	0	0	0	1306	34	0	0	113	0	0	0	1453
Apprch %	0	0	0	0	97.5	2.5	0	0	100	0	0	0	
Total %	0	0	0	0	89.9	2.3	0	0	7.8	0	0	0	

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	140	2	142	0	0	16	16	0	0	0	0	158
05:15 PM	0	0	0	0	0	**195**	4	**199**	0	0	**20**	**20**	0	0	0	0	**219**
05:30 PM	0	0	0	0	0	178	4	182	0	0	12	12	0	0	0	0	194
05:45 PM	0	0	0	0	0	188	**5**	193	0	0	14	14	0	0	0	0	207
Total Volume	0	0	0	0	0	701	15	716	0	0	62	62	0	0	0	0	778
% App. Total	0	0	0		0	97.9	2.1		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.899	.750	.899	.000	.000	.775	.775	.000	.000	.000	.000	.888

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Groups Printed- Heavy Vehicles

	Trinity Church From North			St. James Avenue (Route 9) From East			Trinity Place From South			St. James Avenue (Route 9) From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
04:00 PM	0	0	0	0	10	0	0	0	1	0	0	0	11
04:15 PM	0	0	0	0	9	1	0	0	2	0	0	0	12
04:30 PM	0	0	0	0	12	0	0	0	0	0	0	0	12
04:45 PM	0	0	0	0	11	0	0	0	5	0	0	0	16
Total	0	0	0	0	42	1	0	0	8	0	0	0	51
05:00 PM	0	0	0	0	6	0	0	0	2	0	0	0	8
05:15 PM	0	0	0	0	11	0	0	0	3	0	0	0	14
05:30 PM	0	0	0	0	5	0	0	0	2	0	0	0	7
05:45 PM	0	0	0	0	8	0	0	0	3	0	0	0	11
Total	0	0	0	0	30	0	0	0	10	0	0	0	40
Grand Total	0	0	0	0	72	1	0	0	18	0	0	0	91
Apprch %	0	0	0	0	98.6	1.4	0	0	100	0	0	0	
Total %	0	0	0	0	79.1	1.1	0	0	19.8	0	0	0	

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	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	10	0	10	0	0	1	1	0	0	0	0	11
04:15 PM	0	0	0	0	0	9	**1**	10	0	0	2	2	0	0	0	0	12
04:30 PM	0	0	0	0	0	**12**	0	**12**	0	0	0	0	0	0	0	0	12
04:45 PM	0	0	0	0	0	11	0	11	0	0	**5**	**5**	0	0	0	0	**16**
Total Volume	0	0	0	0	0	42	1	43	0	0	8	8	0	0	0	0	51
% App. Total	0	0	0		0	97.7	2.3		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.875	.250	.896	.000	.000	.400	.400	.000	.000	.000	.000	.797

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Start Date : 2/9/2010

Groups Printed- Peds and Bicycles

	Trinity Church From North				St. James Avenue (Route 9) From East				Trinity Place From South				St. James Avenue (Route 9) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	16	0	4	0	76	0	0	0	21	0	0	0	13	130
04:15 PM	0	0	0	28	0	5	0	61	0	0	0	25	0	0	0	21	140
04:30 PM	0	0	0	50	0	4	0	55	1	1	0	26	0	0	0	15	152
04:45 PM	0	0	0	32	1	5	0	76	0	0	0	42	0	0	0	9	165
Total	0	0	0	126	1	18	0	268	1	1	0	114	0	0	0	58	587
05:00 PM	0	0	0	51	0	5	1	150	0	1	0	31	0	0	0	21	260
05:15 PM	0	1	0	29	1	7	0	121	0	0	1	32	0	0	0	26	218
05:30 PM	0	0	0	29	0	3	0	124	0	0	0	41	0	0	0	32	229
05:45 PM	0	0	1	25	0	8	0	127	0	0	0	37	0	0	0	19	217
Total	0	1	1	134	1	23	1	522	0	1	1	141	0	0	0	98	924
Grand Total	0	1	1	260	2	41	1	790	1	2	1	255	0	0	0	156	1511
Apprch %	0	0.4	0.4	99.2	0.2	4.9	0.1	94.7	0.4	0.8	0.4	98.5	0	0	0	100	
Total %	0	0.1	0.1	17.2	0.1	2.7	0.1	52.3	0.1	0.1	0.1	16.9	0	0	0	10.3	

	Trinity Church From North					St. James Avenue (Route 9) From East					Trinity Place From South					St. James Avenue (Route 9) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	**51**	**51**	0	5	**1**	**150**	**156**	0	**1**	**0**	**31**	**32**	**0**	**0**	**0**	**21**	**21**	**260**
05:15 PM	0	**1**	0	29	30	**1**	7	0	121	129	0	0	**1**	32	33	0	0	0	26	26	218
05:30 PM	0	0	0	29	29	0	3	0	124	127	0	0	0	**41**	**41**	0	0	0	**32**	**32**	229
05:45 PM	0	0	**1**				**8**														
Total Volume	0	1	1	134	136	1	23	1	522	547	0	1	1	141	143	0	0	0	98	98	924
% App. Total	0	0.7	0.7	98.5		0.2	4.2	0.2	95.4		0	0.7	0.7	98.6		0	0	0	100		
PHF	.000	.250	.250	.657	.667	.250	.719	.250	.870	.877	.000	.250	.250	.860	.872	.000	.000	.000	.766	.766	.888

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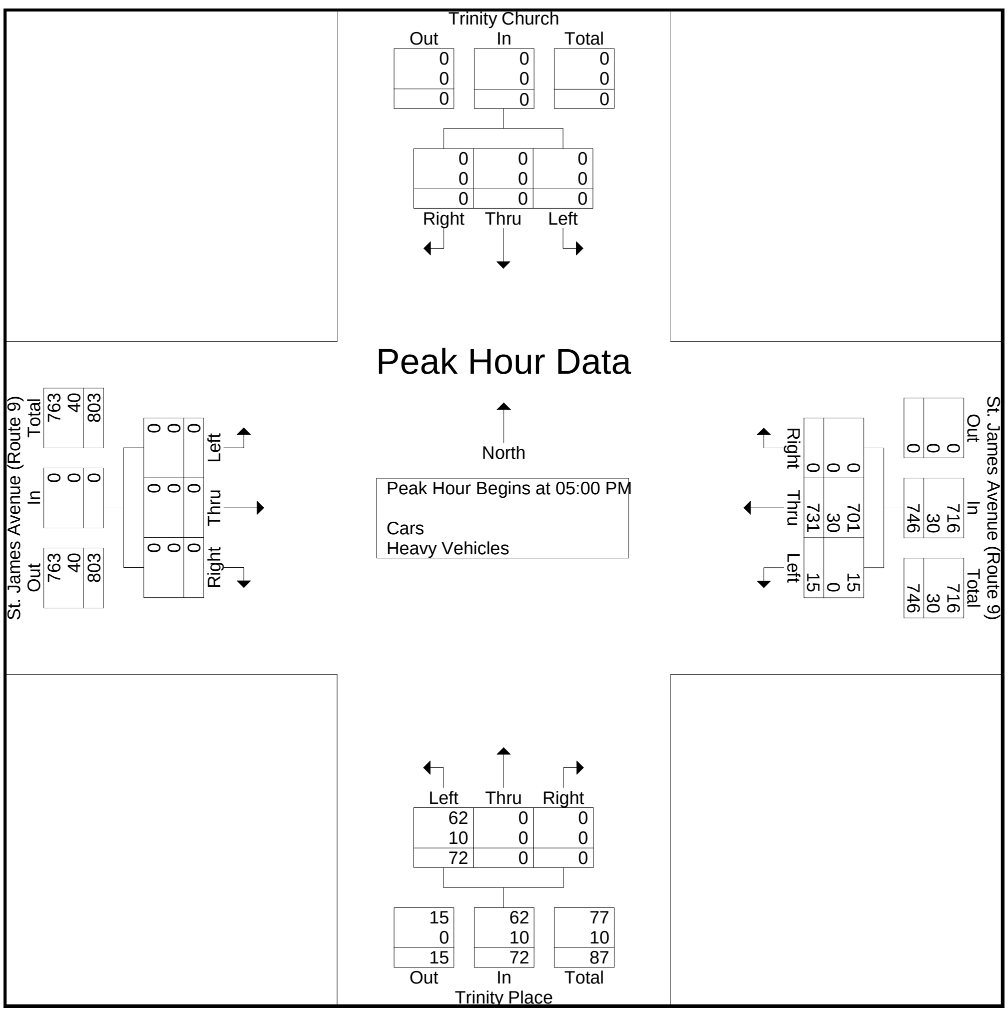
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	146	2	148	0	0	18	18	0	0	0	0	166
05:15 PM	0	0	0	0	0	**206**	4	**210**	0	0	**23**	**23**	0	0	0	0	**233**
05:30 PM	0	0	0	0	0	183	4	187	0	0	14	14	0	0	0	0	201
05:45 PM	0	0	0	0	0	196	**5**	201	0	0	17	17	0	0	0	0	218
Total Volume	0	0	0	0	0	731	15	746	0	0	72	72	0	0	0	0	818
% App. Total	0	0	0		0	98	2		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.887	.750	.888	.000	.000	.783	.783	.000	.000	.000	.000	.878
Cars	0	0	0	0	0	701	15	716	0	0	62	62	0	0	0	0	778
% Cars	0	0	0	0	0	95.9	100	96.0	0	0	86.1	86.1	0	0	0	0	95.1
Heavy Vehicles	0	0	0	0	0	30	0	30	0	0	10	10	0	0	0	0	40
% Heavy Vehicles	0	0	0	0	0	4.1	0	4.0	0	0	13.9	13.9	0	0	0	0	4.9



Synchro Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	12	12	12	12	11	11	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50	50			
Trailing Detector (ft)	0	0	0					0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.70								0.49			
Frt			0.850						0.850			
Flt Protected	0.950											
Satd. Flow (prot)	3468	4834	1584	0	0	0	0	2935	1289	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2412	4834	1584	0	0	0	0	2935	629	0	0	0
Right Turn on Red	No		No			Yes			Yes			Yes
Satd. Flow (RTOR)									9			
Headway Factor	0.97	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.19	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		317			295			208			395	
Travel Time (s)		8.6			8.0			5.7			10.8	
Volume (vph)	762	985	455	0	0	0	0	366	71	0	0	0
Confl. Peds. (#/hr)	167		184						500			
Confl. Bikes (#/hr)									7			
Peak Hour Factor	0.91	0.93	0.81	0.92	0.92	0.92	0.92	0.90	0.69	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	4%	0%	0%	0%	0%	7%	9%	0%	0%	0%
Adj. Flow (vph)	837	1059	562	0	0	0	0	407	103	0	0	0
Lane Group Flow (vph)	837	1059	562	0	0	0	0	407	103	0	0	0
Turn Type	custom		Prot						custom			
Protected Phases		1	1					2				
Permitted Phases	1 5							5	2 5			
Detector Phases		1	1					2	2 5			
Minimum Initial (s)		8.0	8.0					8.0				
Minimum Split (s)		18.0	18.0					14.0				
Total Split (s)	76.0	41.0	41.0	0.0	0.0	0.0	0.0	14.0	49.0	0.0	0.0	0.0
Total Split (%)	84.4%	45.6%	45.6%	0.0%	0.0%	0.0%	0.0%	15.6%	54.4%	0.0%	0.0%	0.0%
Maximum Green (s)		37.0	37.0					10.0				
Yellow Time (s)		3.0	3.0					3.0				
All-Red Time (s)		1.0	1.0					1.0				
Lead/Lag		Lead	Lead					Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0					2.0				
Recall Mode		C-Max	C-Max					Max				
Walk Time (s)		7.0	7.0					7.0				
Flash Dont Walk (s)		7.0	7.0					3.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	72.0	37.0	37.0					45.0	45.0			
Actuated g/C Ratio	0.80	0.41	0.41					0.50	0.50			
v/c Ratio	0.43	0.53	0.86					0.28	0.32			
Control Delay	3.5	21.2	39.9					13.7	15.7			

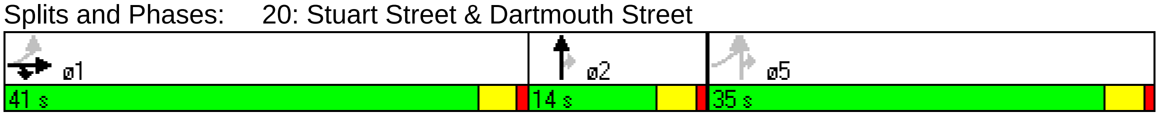
Lane Group	ø5
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	16.0
Total Split (s)	35.0
Total Split (%)	39%
Maximum Green (s)	31.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Max
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0					0.0	0.0			
Total Delay	3.5	21.2	39.9					13.7	15.7			
LOS	A	C	D					B	B			
Approach Delay		19.5						14.1				
Approach LOS		B						B				
90th %ile Green (s)		37.0	37.0					10.0				
90th %ile Term Code		Coord	Coord					MaxR				
70th %ile Green (s)		37.0	37.0					10.0				
70th %ile Term Code		Coord	Coord					MaxR				
50th %ile Green (s)		37.0	37.0					10.0				
50th %ile Term Code		Coord	Coord					MaxR				
30th %ile Green (s)		37.0	37.0					10.0				
30th %ile Term Code		Coord	Coord					MaxR				
10th %ile Green (s)		37.0	37.0					10.0				
10th %ile Term Code		Coord	Coord					MaxR				
Stops (vph)	202	711	385					201	38			
Fuel Used(gal)	3	10	6					2	0			
CO Emissions (g/hr)	236	674	447					171	35			
NOx Emissions (g/hr)	46	131	87					33	7			
VOC Emissions (g/hr)	55	156	104					40	8			
Dilemma Vehicles (#)	0	0	0					0	0			
Queue Length 50th (ft)	55	162	285					67	30			
Queue Length 95th (ft)	76	203	#369					97	47			
Internal Link Dist (ft)		237			215			128			315	
Turn Bay Length (ft)												
Base Capacity (vph)	1930	1987	651					1468	319			
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	0.43	0.53	0.86					0.28	0.32			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 6 (7%), Referenced to phase 1:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 18.5	Intersection LOS: B
Intersection Capacity Utilization 45.6%	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: 20: Stuart Street & Dartmouth Street



Lane Group	ø5
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	31.0
90th %ile Term Code	MaxR
70th %ile Green (s)	31.0
70th %ile Term Code	MaxR
50th %ile Green (s)	31.0
50th %ile Term Code	MaxR
30th %ile Green (s)	31.0
30th %ile Term Code	MaxR
10th %ile Green (s)	31.0
10th %ile Term Code	MaxR
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

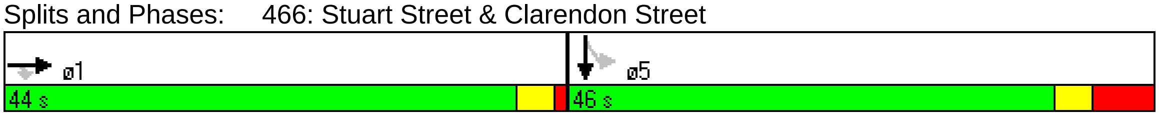
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	10	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50							50	50	
Trailing Detector (ft)		0	0							0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.65								0.90	
Frt			0.850									
Flt Protected											0.990	
Satd. Flow (prot)	0	2940	1234	0	0	0	0	0	0	0	2758	0
Flt Permitted											0.990	
Satd. Flow (perm)	0	2940	800	0	0	0	0	0	0	0	2471	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)			168								49	
Headway Factor	1.14	1.22	1.30	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.33	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		295			822			322			378	
Travel Time (s)		8.0			22.4			8.8			10.3	
Volume (vph)	0	702	158	0	0	0	0	0	0	143	549	0
Confl. Peds. (#/hr)			276							782		
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92
Heavy Vehicles (%)	0%	5%	6%	0%	0%	0%	0%	0%	0%	5%	3%	0%
Parking (#/hr)		0	0							0	0	
Adj. Flow (vph)	0	747	168	0	0	0	0	0	0	152	584	0
Lane Group Flow (vph)	0	747	168	0	0	0	0	0	0	0	736	0
Turn Type			Perm							Perm		
Protected Phases		1									5	
Permitted Phases			1							5		
Detector Phases		1	1							5	5	
Minimum Initial (s)		8.0	8.0							8.0	8.0	
Minimum Split (s)		18.0	18.0							24.0	24.0	
Total Split (s)	0.0	44.0	44.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	0.0
Total Split (%)	0.0%	48.9%	48.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.1%	51.1%	0.0%
Maximum Green (s)		40.0	40.0							38.0	38.0	
Yellow Time (s)		3.0	3.0							3.0	3.0	
All-Red Time (s)		1.0	1.0							5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0							2.0	2.0	
Recall Mode		C-Max	C-Max							Max	Max	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		7.0	7.0							9.0	9.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		40.0	40.0								42.0	
Actuated g/C Ratio		0.44	0.44								0.47	
v/c Ratio		0.57	0.37								0.62	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		8.5	3.6								14.6	
Queue Delay		0.0	0.0								0.1	
Total Delay		8.5	3.6								14.6	
LOS		A	A								B	
Approach Delay		7.6									14.6	
Approach LOS		A									B	
90th %ile Green (s)		40.0	40.0							38.0	38.0	
90th %ile Term Code		Coord	Coord							MaxR	MaxR	
70th %ile Green (s)		40.0	40.0							38.0	38.0	
70th %ile Term Code		Coord	Coord							MaxR	MaxR	
50th %ile Green (s)		40.0	40.0							38.0	38.0	
50th %ile Term Code		Coord	Coord							MaxR	MaxR	
30th %ile Green (s)		40.0	40.0							38.0	38.0	
30th %ile Term Code		Coord	Coord							MaxR	MaxR	
10th %ile Green (s)		40.0	40.0							38.0	38.0	
10th %ile Term Code		Coord	Coord							MaxR	MaxR	
Stops (vph)		500	28								505	
Fuel Used(gal)		5	1								6	
CO Emissions (g/hr)		343	43								435	
NOx Emissions (g/hr)		67	8								85	
VOC Emissions (g/hr)		79	10								101	
Dilemma Vehicles (#)		0	0								0	
Queue Length 50th (ft)		22	0								173	
Queue Length 95th (ft)		250	24								236	
Internal Link Dist (ft)		215			742			242			298	
Turn Bay Length (ft)												
Base Capacity (vph)		1307	449								1179	
Starvation Cap Reductn		0	0								31	
Spillback Cap Reductn		0	0								0	
Storage Cap Reductn		0	0								0	
Reduced v/c Ratio		0.57	0.37								0.64	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 1:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 49.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 466: Stuart Street & Clarendon Street

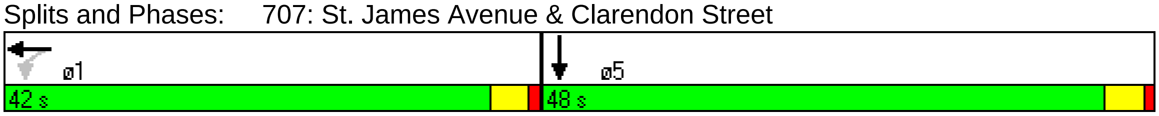


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	15	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)				50	50						50	
Trailing Detector (ft)				0	0						0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					0.92						0.92	
Frt											0.961	
Flt Protected					0.987							
Satd. Flow (prot)	0	0	0	0	3232	0	0	0	0	0	3086	0
Flt Permitted					0.987							
Satd. Flow (perm)	0	0	0	0	2974	0	0	0	0	0	3086	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					65						75	
Headway Factor	1.14	1.14	1.14	1.14	0.97	1.14	1.14	1.14	1.14	1.14	1.01	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		313			654			378			312	
Travel Time (s)		8.5			17.8			10.3			8.5	
Volume (vph)	0	0	0	174	511	0	0	0	0	0	518	180
Confl. Peds. (#/hr)				192								158
Peak Hour Factor	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	16%	0%	0%	0%	0%	0%	3%	1%
Parking (#/hr)												0
Adj. Flow (vph)	0	0	0	181	532	0	0	0	0	0	540	188
Lane Group Flow (vph)	0	0	0	0	713	0	0	0	0	0	728	0
Turn Type				Perm								
Protected Phases					1						5	
Permitted Phases				1								
Detector Phases				1	1						5	
Minimum Initial (s)				8.0	8.0						8.0	
Minimum Split (s)				18.0	18.0						18.0	
Total Split (s)	0.0	0.0	0.0	42.0	42.0	0.0	0.0	0.0	0.0	0.0	48.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	0.0%	53.3%	0.0%
Maximum Green (s)				38.0	38.0						44.0	
Yellow Time (s)				3.0	3.0						3.0	
All-Red Time (s)				1.0	1.0						1.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				2.0	2.0						2.0	
Recall Mode				C-Max	C-Max						Max	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				7.0	7.0						7.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)					38.0						44.0	
Actuated g/C Ratio					0.42						0.49	
v/c Ratio					0.55						0.47	
Control Delay					19.6						14.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay					0.0						0.0	
Total Delay					19.6						14.7	
LOS					B						B	
Approach Delay					19.6						14.7	
Approach LOS					B						B	
90th %ile Green (s)				38.0	38.0						44.0	
90th %ile Term Code				Coord	Coord						MaxR	
70th %ile Green (s)				38.0	38.0						44.0	
70th %ile Term Code				Coord	Coord						MaxR	
50th %ile Green (s)				38.0	38.0						44.0	
50th %ile Term Code				Coord	Coord						MaxR	
30th %ile Green (s)				38.0	38.0						44.0	
30th %ile Term Code				Coord	Coord						MaxR	
10th %ile Green (s)				38.0	38.0						44.0	
10th %ile Term Code				Coord	Coord						MaxR	
Stops (vph)					454						397	
Fuel Used(gal)					8						5	
CO Emissions (g/hr)					579						383	
NOx Emissions (g/hr)					113						74	
VOC Emissions (g/hr)					134						89	
Dilemma Vehicles (#)					0						0	
Queue Length 50th (ft)					141						123	
Queue Length 95th (ft)					196						170	
Internal Link Dist (ft)		233			574			298			232	
Turn Bay Length (ft)												
Base Capacity (vph)					1293						1547	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.55						0.47	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 17 (19%), Referenced to phase 1:WBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 52.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 707: St. James Avenue & Clarendon Street



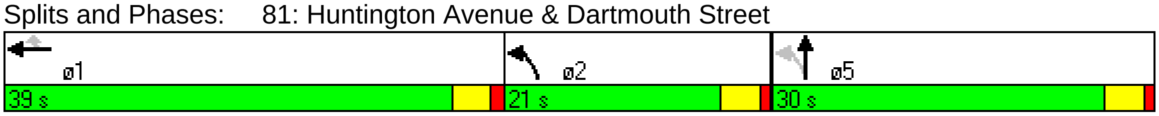
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)					50	50	50	50				
Trailing Detector (ft)					0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94	0.44					
Frt						0.850						
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	2640	1124	2973	4381	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	2640	1055	1323	4381	0	0	0	0
Right Turn on Red			Yes			No	No		Yes			Yes
Satd. Flow (RTOR)												
Headway Factor	1.14	1.14	1.14	1.19	1.27	1.19	1.14	1.19	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1222			294			395			468	
Travel Time (s)		33.3			8.0			10.8			12.8	
Volume (vph)	0	0	0	0	592	58	431	697	0	0	0	0
Confl. Peds. (#/hr)						37	293					
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.93	0.90	0.89	0.91	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	13%	25%	6%	3%	0%	0%	0%	0%
Parking (#/hr)					0			0				
Adj. Flow (vph)	0	0	0	0	637	64	484	766	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	637	64	484	766	0	0	0	0
Turn Type						Perm	pm+pt					
Protected Phases					1		2	5				
Permitted Phases						1	5					
Detector Phases					1	1	2	5				
Minimum Initial (s)					8.0	8.0	8.0	8.0				
Minimum Split (s)					24.0	24.0	21.0	25.0				
Total Split (s)	0.0	0.0	0.0	0.0	39.0	39.0	21.0	30.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	43.3%	43.3%	23.3%	33.3%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)					35.0	35.0	17.0	26.0				
Yellow Time (s)					3.0	3.0	3.0	3.0				
All-Red Time (s)					1.0	1.0	1.0	1.0				
Lead/Lag					Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)					2.0	2.0	2.0	2.0				
Recall Mode					C-Max	C-Max	Ped	Max				
Walk Time (s)					8.0	8.0	8.0	8.0				
Flash Dont Walk (s)					12.0	12.0	9.0	13.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)					35.0	35.0	43.0	26.0				
Actuated g/C Ratio					0.39	0.39	0.48	0.29				
v/c Ratio					0.62	0.16	0.51	0.61				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					40.8	32.4	12.7	24.9				
Queue Delay					0.0	0.0	0.0	0.0				
Total Delay					40.8	32.4	12.7	24.9				
LOS					D	C	B	C				
Approach Delay					40.0			20.2				
Approach LOS					D			C				
90th %ile Green (s)					35.0	35.0	17.0	26.0				
90th %ile Term Code					Coord	Coord	Ped	MaxR				
70th %ile Green (s)					35.0	35.0	17.0	26.0				
70th %ile Term Code					Coord	Coord	Ped	MaxR				
50th %ile Green (s)					35.0	35.0	17.0	26.0				
50th %ile Term Code					Coord	Coord	Ped	MaxR				
30th %ile Green (s)					35.0	35.0	17.0	26.0				
30th %ile Term Code					Coord	Coord	Ped	MaxR				
10th %ile Green (s)					35.0	35.0	17.0	26.0				
10th %ile Term Code					Coord	Coord	Ped	MaxR				
Stops (vph)					553	51	183	490				
Fuel Used(gal)					9	1	3	8				
CO Emissions (g/hr)					595	51	229	543				
NOx Emissions (g/hr)					116	10	44	106				
VOC Emissions (g/hr)					138	12	53	126				
Dilemma Vehicles (#)					0	0	0	0				
Queue Length 50th (ft)					191	33	60	109				
Queue Length 95th (ft)					251	m64	87	146				
Internal Link Dist (ft)		1142			214			315			388	
Turn Bay Length (ft)												
Base Capacity (vph)					1027	410	944	1266				
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					0.62	0.16	0.51	0.61				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 27.3 Intersection LOS: C
Intersection Capacity Utilization 45.6% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Huntington Avenue & Dartmouth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	65	826	165	0	0	0	0	14	17	17	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	898	179	0	0	0	0	15	18	18	13	0
Pedestrians					182			593			783	
Lane Width (ft)					0.0			14.0			14.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			58			76	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		295			295							
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	783			1670			1728	2505	1164	1432	2594	783
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	783			1430			1499	2415	833	1149	2521	783
tC, single (s)	5.1			4.1			7.5	6.5	7.3	8.2	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.7			2.2			3.5	4.0	3.5	3.8	4.0	3.3
p0 queue free %	49			100			0	0	82	0	0	100
cM capacity (veh/h)	140			173			0	1	101	0	1	81

Direction, Lane #	EB 1	EB 2	EB 3	NB 1	SB 1
Volume Total	295	449	404	34	32
Volume Left	71	0	0	0	18
Volume Right	0	0	179	18	0
cSH	140	1700	1700	3	0
Volume to Capacity	0.51	0.26	0.24	11.04	Err
Queue Length 95th (ft)	60	0	0	Err	Err
Control Delay (s)	37.2	0.0	0.0	Err	Err
Lane LOS	E			F	F
Approach Delay (s)	9.6			Err	Err
Approach LOS				F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	88	603	47	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	96	655	51	0
Pedestrians	62				102	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				9	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	294			313		
pX, platoon unblocked					0.89	
vC, conflicting volume			102		683	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			102		525	102
tC, single (s)			4.4		7.6	6.9
tC, 2 stage (s)						
tF (s)			2.4		3.9	3.3
p0 queue free %			92		83	100
cM capacity (veh/h)			1267		303	860

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	314	437	51
Volume Left	96	0	51
Volume Right	0	0	0
cSH	1267	1700	303
Volume to Capacity	0.08	0.26	0.17
Queue Length 95th (ft)	6	0	15
Control Delay (s)	2.9	0.0	19.3
Lane LOS	A		C
Approach Delay (s)	1.2		19.3
Approach LOS			C

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	12	12	12	12	11	11	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50	50			
Trailing Detector (ft)	0	0	0					0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.68								0.49			
Frt			0.850						0.850			
Flt Protected	0.950											
Satd. Flow (prot)	3536	4834	1569	0	0	0	0	3049	1338	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2416	4834	1569	0	0	0	0	3049	652	0	0	0
Right Turn on Red	No		No			Yes			Yes			Yes
Satd. Flow (RTOR)									31			
Headway Factor	0.97	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.19	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		317			316			208			395	
Travel Time (s)		8.6			8.6			5.7			10.8	
Volume (vph)	865	743	462	0	0	0	0	508	85	0	0	0
Confl. Peds. (#/hr)	199		226						500			
Confl. Bikes (#/hr)			3						8			
Peak Hour Factor	0.94	0.83	0.83	0.92	0.92	0.92	0.92	0.92	0.45	0.92	0.92	0.92
Heavy Vehicles (%)	1%	3%	5%	0%	0%	0%	0%	3%	5%	0%	0%	0%
Adj. Flow (vph)	920	895	557	0	0	0	0	552	189	0	0	0
Lane Group Flow (vph)	920	895	557	0	0	0	0	552	189	0	0	0
Turn Type	custom		Prot						custom			
Protected Phases		1	1					2				
Permitted Phases	1 5							5	2 5			
Detector Phases		1	1					2	2 5			
Minimum Initial (s)		8.0	8.0					8.0				
Minimum Split (s)		18.0	18.0					14.0				
Total Split (s)	76.0	50.0	50.0	0.0	0.0	0.0	0.0	14.0	40.0	0.0	0.0	0.0
Total Split (%)	84.4%	55.6%	55.6%	0.0%	0.0%	0.0%	0.0%	15.6%	44.4%	0.0%	0.0%	0.0%
Maximum Green (s)		46.0	46.0					10.0				
Yellow Time (s)		3.0	3.0					3.0				
All-Red Time (s)		1.0	1.0					1.0				
Lead/Lag		Lead	Lead					Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0					2.0				
Recall Mode		C-Max	C-Max					Max				
Walk Time (s)		7.0	7.0					7.0				
Flash Dont Walk (s)		7.0	7.0					3.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	72.0	46.0	46.0					36.0	36.0			
Actuated g/C Ratio	0.80	0.51	0.51					0.40	0.40			
v/c Ratio	0.48	0.36	0.69					0.45	0.68			
Control Delay	3.8	13.7	22.4					21.3	32.9			

Lane Group	ø5
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	16.0
Total Split (s)	26.0
Total Split (%)	29%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Max
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0					0.0	0.0			
Total Delay	3.8	13.7	22.4					21.3	32.9			
LOS	A	B	C					C	C			
Approach Delay		11.9						24.2				
Approach LOS		B						C				
90th %ile Green (s)		46.0	46.0					10.0				
90th %ile Term Code		Coord	Coord					MaxR				
70th %ile Green (s)		46.0	46.0					10.0				
70th %ile Term Code		Coord	Coord					MaxR				
50th %ile Green (s)		46.0	46.0					10.0				
50th %ile Term Code		Coord	Coord					MaxR				
30th %ile Green (s)		46.0	46.0					10.0				
30th %ile Term Code		Coord	Coord					MaxR				
10th %ile Green (s)		46.0	46.0					10.0				
10th %ile Term Code		Coord	Coord					MaxR				
Stops (vph)	242	420	343					358	60			
Fuel Used(gal)	4	6	5					4	1			
CO Emissions (g/hr)	275	398	326					313	66			
NOx Emissions (g/hr)	54	77	64					61	13			
VOC Emissions (g/hr)	64	92	76					72	15			
Dilemma Vehicles (#)	0	0	0					0	0			
Queue Length 50th (ft)	63	106	228					118	72			
Queue Length 95th (ft)	89	121	306					164	49			
Internal Link Dist (ft)		237			236			128			315	
Turn Bay Length (ft)												
Base Capacity (vph)	1933	2471	802					1220	279			
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	0.48	0.36	0.69					0.45	0.68			

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 86 (96%), Referenced to phase 1:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

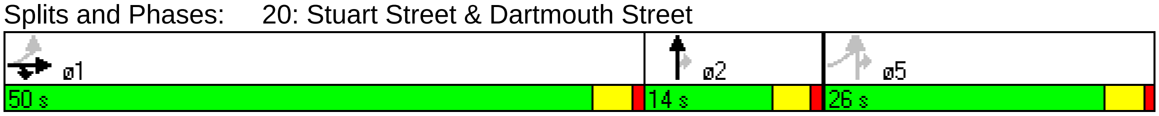
Maximum v/c Ratio: 0.69

Intersection Signal Delay: 14.9 Intersection LOS: B

Intersection Capacity Utilization 49.8% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 20: Stuart Street & Dartmouth Street



Lane Group	ø5
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	22.0
90th %ile Term Code	MaxR
70th %ile Green (s)	22.0
70th %ile Term Code	MaxR
50th %ile Green (s)	22.0
50th %ile Term Code	MaxR
30th %ile Green (s)	22.0
30th %ile Term Code	MaxR
10th %ile Green (s)	22.0
10th %ile Term Code	MaxR
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

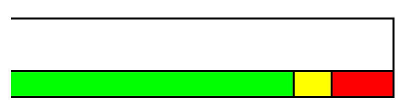
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	10	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50							50	50	
Trailing Detector (ft)		0	0							0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.61								0.90	
Frt			0.850									
Flt Protected											0.986	
Satd. Flow (prot)	0	3026	1295	0	0	0	0	0	0	0	2773	0
Flt Permitted											0.986	
Satd. Flow (perm)	0	3026	789	0	0	0	0	0	0	0	2504	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)			203								84	
Headway Factor	1.14	1.22	1.30	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.33	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		274			822			322			378	
Travel Time (s)		7.5			22.4			8.8			10.3	
Volume (vph)	0	657	243	0	0	0	0	0	0	208	533	0
Confl. Peds. (#/hr)			378							312		
Confl. Bikes (#/hr)			6									
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Parking (#/hr)		0	0							0	0	
Adj. Flow (vph)	0	722	267	0	0	0	0	0	0	229	586	0
Lane Group Flow (vph)	0	722	267	0	0	0	0	0	0	0	815	0
Turn Type			Perm							Perm		
Protected Phases		1									5	
Permitted Phases			1							5		
Detector Phases		1	1							5	5	
Minimum Initial (s)		8.0	8.0							8.0	8.0	
Minimum Split (s)		18.0	18.0							24.0	24.0	
Total Split (s)	0.0	45.0	45.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	0.0
Total Split (%)	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	50.0%	0.0%
Maximum Green (s)		41.0	41.0							37.0	37.0	
Yellow Time (s)		3.0	3.0							3.0	3.0	
All-Red Time (s)		1.0	1.0							5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0							2.0	2.0	
Recall Mode		C-Max	C-Max							Max	Max	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		7.0	7.0							9.0	9.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		41.0	41.0								41.0	
Actuated g/C Ratio		0.46	0.46								0.46	
v/c Ratio		0.52	0.57								0.69	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		12.0	6.2								14.6	
Queue Delay		0.0	0.0								0.0	
Total Delay		12.0	6.2								14.7	
LOS		B	A								B	
Approach Delay		10.4									14.7	
Approach LOS		B									B	
90th %ile Green (s)		41.0	41.0							37.0	37.0	
90th %ile Term Code		Coord	Coord							MaxR	MaxR	
70th %ile Green (s)		41.0	41.0							37.0	37.0	
70th %ile Term Code		Coord	Coord							MaxR	MaxR	
50th %ile Green (s)		41.0	41.0							37.0	37.0	
50th %ile Term Code		Coord	Coord							MaxR	MaxR	
30th %ile Green (s)		41.0	41.0							37.0	37.0	
30th %ile Term Code		Coord	Coord							MaxR	MaxR	
10th %ile Green (s)		41.0	41.0							37.0	37.0	
10th %ile Term Code		Coord	Coord							MaxR	MaxR	
Stops (vph)		376	39								402	
Fuel Used(gal)		5	1								6	
CO Emissions (g/hr)		320	72								429	
NOx Emissions (g/hr)		62	14								84	
VOC Emissions (g/hr)		74	17								99	
Dilemma Vehicles (#)		0	0								0	
Queue Length 50th (ft)		69	10								90	
Queue Length 95th (ft)		88	44								114	
Internal Link Dist (ft)		194			742			242			298	
Turn Bay Length (ft)												
Base Capacity (vph)		1379	470								1186	
Starvation Cap Reductn		0	0								12	
Spillback Cap Reductn		0	0								0	
Storage Cap Reductn		0	0								0	
Reduced v/c Ratio		0.52	0.57								0.69	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 1:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 12.4 Intersection LOS: B
Intersection Capacity Utilization 55.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 466: Stuart Street & Clarendon Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	15	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)				50	50						50	
Trailing Detector (ft)				0	0						0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					0.91						0.91	
Frt											0.964	
Flt Protected					0.986							
Satd. Flow (prot)	0	0	0	0	3453	0	0	0	0	0	3080	0
Flt Permitted					0.986							
Satd. Flow (perm)	0	0	0	0	3131	0	0	0	0	0	3080	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					88						60	
Headway Factor	1.14	1.14	1.14	1.14	0.97	1.14	1.14	1.14	1.14	1.14	1.01	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		290			654			378			157	
Travel Time (s)		7.9			17.8			10.3			4.3	
Volume (vph)	0	0	0	229	575	0	0	0	0	0	512	162
Confl. Peds. (#/hr)				228								311
Confl. Bikes (#/hr)												9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	6%	0%	0%	0%	0%	0%	2%	2%
Parking (#/hr)												0
Adj. Flow (vph)	0	0	0	236	593	0	0	0	0	0	528	167
Lane Group Flow (vph)	0	0	0	0	829	0	0	0	0	0	695	0
Turn Type				Perm								
Protected Phases					1						5	
Permitted Phases				1								
Detector Phases				1	1						5	
Minimum Initial (s)				8.0	8.0						8.0	
Minimum Split (s)				18.0	18.0						18.0	
Total Split (s)	0.0	0.0	0.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	44.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	51.1%	51.1%	0.0%	0.0%	0.0%	0.0%	0.0%	48.9%	0.0%
Maximum Green (s)				42.0	42.0						40.0	
Yellow Time (s)				3.0	3.0						3.0	
All-Red Time (s)				1.0	1.0						1.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				2.0	2.0						2.0	
Recall Mode				C-Max	C-Max						Max	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				7.0	7.0						7.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)					42.0						40.0	
Actuated g/C Ratio					0.47						0.44	
v/c Ratio					0.55						0.50	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					16.9						17.6	
Queue Delay					0.0						0.0	
Total Delay					16.9						17.6	
LOS					B						B	
Approach Delay					16.9						17.6	
Approach LOS					B						B	
90th %ile Green (s)				42.0	42.0						40.0	
90th %ile Term Code				Coord	Coord						MaxR	
70th %ile Green (s)				42.0	42.0						40.0	
70th %ile Term Code				Coord	Coord						MaxR	
50th %ile Green (s)				42.0	42.0						40.0	
50th %ile Term Code				Coord	Coord						MaxR	
30th %ile Green (s)				42.0	42.0						40.0	
30th %ile Term Code				Coord	Coord						MaxR	
10th %ile Green (s)				42.0	42.0						40.0	
10th %ile Term Code				Coord	Coord						MaxR	
Stops (vph)					497						421	
Fuel Used(gal)					9						5	
CO Emissions (g/hr)					639						345	
NOx Emissions (g/hr)					124						67	
VOC Emissions (g/hr)					148						80	
Dilemma Vehicles (#)					0						0	
Queue Length 50th (ft)					152						130	
Queue Length 95th (ft)					208						180	
Internal Link Dist (ft)		210			574			298			77	
Turn Bay Length (ft)												
Base Capacity (vph)					1508						1402	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						46	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.55						0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 6 (7%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 17.2 Intersection LOS: B
Intersection Capacity Utilization 55.3% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 707: St. James Avenue & Clarendon Street

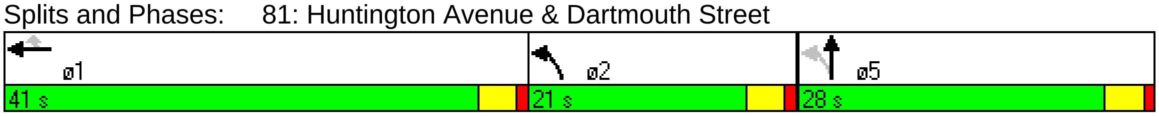
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)					50	50	50	50				
Trailing Detector (ft)					0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94	0.35					
Frt						0.850						
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	2842	1377	3060	4468	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	2842	1290	1068	4468	0	0	0	0
Right Turn on Red			Yes			No	No		Yes			Yes
Satd. Flow (RTOR)												
Headway Factor	1.14	1.14	1.14	1.19	1.27	1.19	1.14	1.19	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1222			317			395			468	
Travel Time (s)		33.3			8.6			10.8			12.8	
Volume (vph)	0	0	0	0	697	121	542	831	0	0	0	0
Confl. Peds. (#/hr)						34	474					
Confl. Bikes (#/hr)						13						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.88	0.81	0.91	0.95	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	5%	2%	3%	1%	0%	0%	0%	0%
Parking (#/hr)					0			0				
Adj. Flow (vph)	0	0	0	0	792	149	596	875	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	792	149	596	875	0	0	0	0
Turn Type						Perm	pm+pt					
Protected Phases					1		2	5				
Permitted Phases						1	5					
Detector Phases					1	1	2	5				
Minimum Initial (s)					8.0	8.0	8.0	8.0				
Minimum Split (s)					24.0	24.0	21.0	24.0				
Total Split (s)	0.0	0.0	0.0	0.0	41.0	41.0	21.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	45.6%	45.6%	23.3%	31.1%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)					37.0	37.0	17.0	24.0				
Yellow Time (s)					3.0	3.0	3.0	3.0				
All-Red Time (s)					1.0	1.0	1.0	1.0				
Lead/Lag					Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)					2.0	2.0	2.0	2.0				
Recall Mode					C-Max	C-Max	Ped	Max				
Walk Time (s)					8.0	8.0	8.0	8.0				
Flash Dont Walk (s)					12.0	12.0	9.0	12.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)					37.0	37.0	41.0	24.0				
Actuated g/C Ratio					0.41	0.41	0.46	0.27				
v/c Ratio					0.68	0.28	0.69	0.73				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					18.6	15.2	17.2	24.8				
Queue Delay					0.0	0.0	0.0	0.0				
Total Delay					18.6	15.2	17.2	24.8				
LOS					B	B	B	C				
Approach Delay					18.1			21.7				
Approach LOS					B			C				
90th %ile Green (s)					37.0	37.0	17.0	24.0				
90th %ile Term Code					Coord	Coord	Max	MaxR				
70th %ile Green (s)					37.0	37.0	17.0	24.0				
70th %ile Term Code					Coord	Coord	Ped	MaxR				
50th %ile Green (s)					37.0	37.0	17.0	24.0				
50th %ile Term Code					Coord	Coord	Ped	MaxR				
30th %ile Green (s)					37.0	37.0	17.0	24.0				
30th %ile Term Code					Coord	Coord	Ped	MaxR				
10th %ile Green (s)					37.0	37.0	17.0	24.0				
10th %ile Term Code					Coord	Coord	Ped	MaxR				
Stops (vph)					344	54	315	716				
Fuel Used(gal)					6	1	5	10				
CO Emissions (g/hr)					408	64	344	680				
NOx Emissions (g/hr)					79	12	67	132				
VOC Emissions (g/hr)					95	15	80	158				
Dilemma Vehicles (#)					0	0	0	0				
Queue Length 50th (ft)					121	40	59	150				
Queue Length 95th (ft)					154	63	120	196				
Internal Link Dist (ft)		1142			237			315			388	
Turn Bay Length (ft)												
Base Capacity (vph)					1168	530	863	1191				
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					0.68	0.28	0.69	0.73				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 7 (8%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 20.3 Intersection LOS: C
Intersection Capacity Utilization 49.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 81: Huntington Avenue & Dartmouth Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	44	743	41	0	0	0	0	33	88	69	4	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	808	45	0	0	0	0	36	96	75	4	0
Pedestrians					169			609			402	
Lane Width (ft)					0.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			51			34	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		316			274							
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	402			1461			1537	1937	1069	1049	1959	402
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	402			1343			1424	1855	921	899	1879	402
tC, single (s)	4.7			4.1			7.5	6.5	6.9	7.9	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.7	4.0	3.3
p0 queue free %	93			100			100	0	24	0	79	100
cM capacity (veh/h)	653			238			17	21	126	0	20	401

Direction, Lane #	EB 1	EB 2	EB 3	NB 1	SB 1
Volume Total	250	404	246	132	79
Volume Left	48	0	0	0	75
Volume Right	0	0	45	96	0
cSH	653	1700	1700	53	0
Volume to Capacity	0.07	0.24	0.14	2.46	Err
Queue Length 95th (ft)	6	0	0	336	Err
Control Delay (s)	2.8	0.0	0.0	828.4	Err
Lane LOS	A			F	F
Approach Delay (s)	0.8			828.4	Err
Approach LOS				F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	28	709	109	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	30	771	118	0
Pedestrians	99				143	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				12	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	317			290		
pX, platoon unblocked					0.88	
vC, conflicting volume			143		688	143
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			143		508	143
tC, single (s)			4.2		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.3
p0 queue free %			98		67	100
cM capacity (veh/h)			1234		357	779

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	287	514	118
Volume Left	30	0	118
Volume Right	0	0	0
cSH	1234	1700	357
Volume to Capacity	0.02	0.30	0.33
Queue Length 95th (ft)	2	0	36
Control Delay (s)	1.1	0.0	20.0
Lane LOS	A		C
Approach Delay (s)	0.4		20.0
Approach LOS			C

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	12	12	12	12	11	11	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50	50			
Trailing Detector (ft)	0	0	0					0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.70								0.49			
Frt			0.850						0.850			
Flt Protected	0.950											
Satd. Flow (prot)	3468	4834	1584	0	0	0	0	2935	1289	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2412	4834	1584	0	0	0	0	2935	629	0	0	0
Right Turn on Red	No		No			Yes			Yes			Yes
Satd. Flow (RTOR)									6			
Headway Factor	0.97	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.19	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		317			295			208			395	
Travel Time (s)		8.6			8.0			5.7			10.8	
Volume (vph)	807	1077	470	0	0	0	0	377	74	0	0	0
Confl. Peds. (#/hr)	167		184						500			
Confl. Bikes (#/hr)									7			
Peak Hour Factor	0.91	0.93	0.81	0.92	0.92	0.92	0.92	0.90	0.69	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	4%	0%	0%	0%	0%	7%	9%	0%	0%	0%
Adj. Flow (vph)	887	1158	580	0	0	0	0	419	107	0	0	0
Lane Group Flow (vph)	887	1158	580	0	0	0	0	419	107	0	0	0
Turn Type	custom		Prot						custom			
Protected Phases		1	1					2				
Permitted Phases	1 5							5	2 5			
Detector Phases		1	1					2	2 5			
Minimum Initial (s)		8.0	8.0					8.0				
Minimum Split (s)		18.0	18.0					14.0				
Total Split (s)	76.0	41.0	41.0	0.0	0.0	0.0	0.0	14.0	49.0	0.0	0.0	0.0
Total Split (%)	84.4%	45.6%	45.6%	0.0%	0.0%	0.0%	0.0%	15.6%	54.4%	0.0%	0.0%	0.0%
Maximum Green (s)		37.0	37.0					10.0				
Yellow Time (s)		3.0	3.0					3.0				
All-Red Time (s)		1.0	1.0					1.0				
Lead/Lag		Lead	Lead					Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0					2.0				
Recall Mode		C-Max	C-Max					Max				
Walk Time (s)		7.0	7.0					7.0				
Flash Dont Walk (s)		7.0	7.0					3.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	72.0	37.0	37.0					45.0	45.0			
Actuated g/C Ratio	0.80	0.41	0.41					0.50	0.50			
v/c Ratio	0.46	0.58	0.89					0.29	0.34			
Control Delay	3.7	22.0	43.0					13.8	16.5			

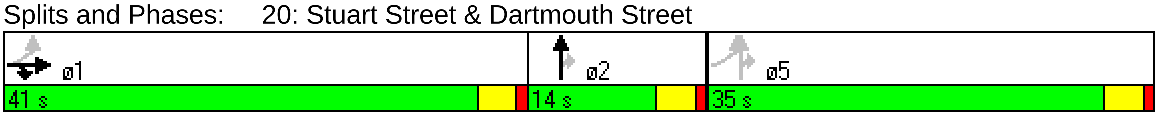
Lane Group	ø5
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	16.0
Total Split (s)	35.0
Total Split (%)	39%
Maximum Green (s)	31.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Max
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0					0.0	0.0			
Total Delay	3.7	22.0	43.0					13.8	16.5			
LOS	A	C	D					B	B			
Approach Delay		20.5						14.3				
Approach LOS		C						B				
90th %ile Green (s)		37.0	37.0					10.0				
90th %ile Term Code		Coord	Coord					MaxR				
70th %ile Green (s)		37.0	37.0					10.0				
70th %ile Term Code		Coord	Coord					MaxR				
50th %ile Green (s)		37.0	37.0					10.0				
50th %ile Term Code		Coord	Coord					MaxR				
30th %ile Green (s)		37.0	37.0					10.0				
30th %ile Term Code		Coord	Coord					MaxR				
10th %ile Green (s)		37.0	37.0					10.0				
10th %ile Term Code		Coord	Coord					MaxR				
Stops (vph)	221	797	398					209	42			
Fuel Used(gal)	4	11	7					3	1			
CO Emissions (g/hr)	254	754	483					177	38			
NOx Emissions (g/hr)	49	147	94					34	7			
VOC Emissions (g/hr)	59	175	112					41	9			
Dilemma Vehicles (#)	0	0	0					0	0			
Queue Length 50th (ft)	60	182	299					69	33			
Queue Length 95th (ft)	84	226	#415					100	50			
Internal Link Dist (ft)		237			215			128			315	
Turn Bay Length (ft)												
Base Capacity (vph)	1930	1987	651					1468	318			
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	0.46	0.58	0.89					0.29	0.34			

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 6 (7%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 19.4 Intersection LOS: B
Intersection Capacity Utilization 47.2% 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: 20: Stuart Street & Dartmouth Street



Lane Group	ø5
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	31.0
90th %ile Term Code	MaxR
70th %ile Green (s)	31.0
70th %ile Term Code	MaxR
50th %ile Green (s)	31.0
50th %ile Term Code	MaxR
30th %ile Green (s)	31.0
30th %ile Term Code	MaxR
10th %ile Green (s)	31.0
10th %ile Term Code	MaxR
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

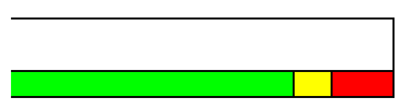
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱								↰↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	10	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50							50	50	
Trailing Detector (ft)		0	0							0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.65								0.88	
Frt			0.850									
Flt Protected											0.988	
Satd. Flow (prot)	0	2940	1234	0	0	0	0	0	0	0	2750	0
Flt Permitted											0.988	
Satd. Flow (perm)	0	2940	800	0	0	0	0	0	0	0	2413	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)			172								65	
Headway Factor	1.14	1.22	1.30	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.33	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		295			822			322			378	
Travel Time (s)		8.0			22.4			8.8			10.3	
Volume (vph)	0	790	162	0	0	0	0	0	0	181	563	0
Confl. Peds. (#/hr)			276							782		
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92
Heavy Vehicles (%)	0%	5%	6%	0%	0%	0%	0%	0%	0%	5%	3%	0%
Parking (#/hr)		0	0							0	0	
Adj. Flow (vph)	0	840	172	0	0	0	0	0	0	193	599	0
Lane Group Flow (vph)	0	840	172	0	0	0	0	0	0	0	792	0
Turn Type			Perm							Perm		
Protected Phases		1									5	
Permitted Phases			1							5		
Detector Phases		1	1							5	5	
Minimum Initial (s)		8.0	8.0							8.0	8.0	
Minimum Split (s)		18.0	18.0							24.0	24.0	
Total Split (s)	0.0	44.0	44.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	0.0
Total Split (%)	0.0%	48.9%	48.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.1%	51.1%	0.0%
Maximum Green (s)		40.0	40.0							38.0	38.0	
Yellow Time (s)		3.0	3.0							3.0	3.0	
All-Red Time (s)		1.0	1.0							5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0							2.0	2.0	
Recall Mode		C-Max	C-Max							Max	Max	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		7.0	7.0							9.0	9.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		40.0	40.0								42.0	
Actuated g/C Ratio		0.44	0.44								0.47	
v/c Ratio		0.64	0.38								0.68	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.2	4.1								14.9	
Queue Delay		0.8	0.0								0.0	
Total Delay		12.0	4.1								14.9	
LOS		B	A								B	
Approach Delay		10.7									14.9	
Approach LOS		B									B	
90th %ile Green (s)		40.0	40.0							38.0	38.0	
90th %ile Term Code		Coord	Coord							MaxR	MaxR	
70th %ile Green (s)		40.0	40.0							38.0	38.0	
70th %ile Term Code		Coord	Coord							MaxR	MaxR	
50th %ile Green (s)		40.0	40.0							38.0	38.0	
50th %ile Term Code		Coord	Coord							MaxR	MaxR	
30th %ile Green (s)		40.0	40.0							38.0	38.0	
30th %ile Term Code		Coord	Coord							MaxR	MaxR	
10th %ile Green (s)		40.0	40.0							38.0	38.0	
10th %ile Term Code		Coord	Coord							MaxR	MaxR	
Stops (vph)		579	33								550	
Fuel Used(gal)		6	1								7	
CO Emissions (g/hr)		420	47								472	
NOx Emissions (g/hr)		82	9								92	
VOC Emissions (g/hr)		97	11								109	
Dilemma Vehicles (#)		0	0								0	
Queue Length 50th (ft)		221	0								188	
Queue Length 95th (ft)		298	22								257	
Internal Link Dist (ft)		215			742			242			298	
Turn Bay Length (ft)												
Base Capacity (vph)		1307	451								1161	
Starvation Cap Reductn		204	0								4	
Spillback Cap Reductn		0	0								0	
Storage Cap Reductn		0	0								0	
Reduced v/c Ratio		0.76	0.38								0.68	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 1:EBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 12.5 Intersection LOS: B
Intersection Capacity Utilization 54.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 466: Stuart Street & Clarendon Street



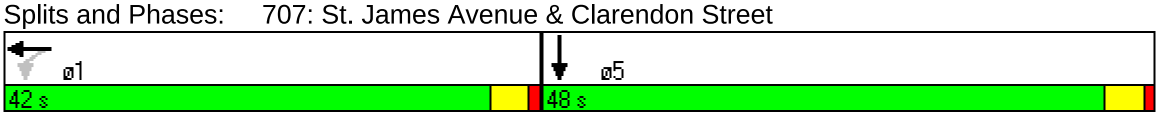
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	15	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)				50	50						50	
Trailing Detector (ft)				0	0						0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					0.92						0.92	
Frt											0.963	
Flt Protected					0.988							
Satd. Flow (prot)	0	0	0	0	3234	0	0	0	0	0	3103	0
Flt Permitted					0.988							
Satd. Flow (perm)	0	0	0	0	2979	0	0	0	0	0	3103	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					63						69	
Headway Factor	1.14	1.14	1.14	1.14	0.97	1.14	1.14	1.14	1.14	1.14	1.01	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		313			654			378			312	
Travel Time (s)		8.5			17.8			10.3			8.5	
Volume (vph)	0	0	0	178	530	0	0	0	0	0	565	185
Confl. Peds. (#/hr)				192								158
Peak Hour Factor	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	16%	0%	0%	0%	0%	0%	3%	1%
Parking (#/hr)												0
Adj. Flow (vph)	0	0	0	185	552	0	0	0	0	0	589	193
Lane Group Flow (vph)	0	0	0	0	737	0	0	0	0	0	782	0
Turn Type				Perm								
Protected Phases					1						5	
Permitted Phases				1								
Detector Phases				1	1						5	
Minimum Initial (s)				8.0	8.0						8.0	
Minimum Split (s)				18.0	18.0						18.0	
Total Split (s)	0.0	0.0	0.0	42.0	42.0	0.0	0.0	0.0	0.0	0.0	48.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	0.0%	53.3%	0.0%
Maximum Green (s)				38.0	38.0						44.0	
Yellow Time (s)				3.0	3.0						3.0	
All-Red Time (s)				1.0	1.0						1.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				2.0	2.0						2.0	
Recall Mode				C-Max	C-Max						Max	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				7.0	7.0						7.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)					38.0						44.0	
Actuated g/C Ratio					0.42						0.49	
v/c Ratio					0.57						0.50	
Control Delay					20.0						15.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay					0.0						0.0	
Total Delay					20.0						15.5	
LOS					C						B	
Approach Delay					20.0						15.5	
Approach LOS					C						B	
90th %ile Green (s)				38.0	38.0						44.0	
90th %ile Term Code				Coord	Coord						MaxR	
70th %ile Green (s)				38.0	38.0						44.0	
70th %ile Term Code				Coord	Coord						MaxR	
50th %ile Green (s)				38.0	38.0						44.0	
50th %ile Term Code				Coord	Coord						MaxR	
30th %ile Green (s)				38.0	38.0						44.0	
30th %ile Term Code				Coord	Coord						MaxR	
10th %ile Green (s)				38.0	38.0						44.0	
10th %ile Term Code				Coord	Coord						MaxR	
Stops (vph)					476						445	
Fuel Used(gal)					9						6	
CO Emissions (g/hr)					605						424	
NOx Emissions (g/hr)					118						82	
VOC Emissions (g/hr)					140						98	
Dilemma Vehicles (#)					0						0	
Queue Length 50th (ft)					148						137	
Queue Length 95th (ft)					205						188	
Internal Link Dist (ft)		233			574			298			232	
Turn Bay Length (ft)												
Base Capacity (vph)					1294						1552	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						30	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.57						0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 17.7 Intersection LOS: B
Intersection Capacity Utilization 54.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 707: St. James Avenue & Clarendon Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)					50	50	50	50				
Trailing Detector (ft)					0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94	0.44					
Frt						0.850						
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	2640	1124	2973	4381	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	2640	1055	1323	4381	0	0	0	0
Right Turn on Red			Yes			No	No		Yes			Yes
Satd. Flow (RTOR)												
Headway Factor	1.14	1.14	1.14	1.19	1.27	1.19	1.14	1.19	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1222			294			395			468	
Travel Time (s)		33.3			8.0			10.8			12.8	
Volume (vph)	0	0	0	0	616	59	466	719	0	0	0	0
Confl. Peds. (#/hr)						37	293					
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.93	0.90	0.89	0.91	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	13%	25%	6%	3%	0%	0%	0%	0%
Parking (#/hr)					0			0				
Adj. Flow (vph)	0	0	0	0	662	66	524	790	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	662	66	524	790	0	0	0	0
Turn Type						Perm	pm+pt					
Protected Phases					1		2	5				
Permitted Phases						1	5					
Detector Phases					1	1	2	5				
Minimum Initial (s)					8.0	8.0	8.0	8.0				
Minimum Split (s)					24.0	24.0	21.0	25.0				
Total Split (s)	0.0	0.0	0.0	0.0	39.0	39.0	21.0	30.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	43.3%	43.3%	23.3%	33.3%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)					35.0	35.0	17.0	26.0				
Yellow Time (s)					3.0	3.0	3.0	3.0				
All-Red Time (s)					1.0	1.0	1.0	1.0				
Lead/Lag					Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)					2.0	2.0	2.0	2.0				
Recall Mode					C-Max	C-Max	Ped	Max				
Walk Time (s)					8.0	8.0	8.0	8.0				
Flash Dont Walk (s)					12.0	12.0	9.0	13.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)					35.0	35.0	43.0	26.0				
Actuated g/C Ratio					0.39	0.39	0.48	0.29				
v/c Ratio					0.64	0.16	0.56	0.62				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					41.3	32.4	13.4	25.5				
Queue Delay					0.0	0.0	0.0	0.0				
Total Delay					41.3	32.4	13.4	25.5				
LOS					D	C	B	C				
Approach Delay					40.5			20.7				
Approach LOS					D			C				
90th %ile Green (s)					35.0	35.0	17.0	26.0				
90th %ile Term Code					Coord	Coord	Ped	MaxR				
70th %ile Green (s)					35.0	35.0	17.0	26.0				
70th %ile Term Code					Coord	Coord	Ped	MaxR				
50th %ile Green (s)					35.0	35.0	17.0	26.0				
50th %ile Term Code					Coord	Coord	Ped	MaxR				
30th %ile Green (s)					35.0	35.0	17.0	26.0				
30th %ile Term Code					Coord	Coord	Ped	MaxR				
10th %ile Green (s)					35.0	35.0	17.0	26.0				
10th %ile Term Code					Coord	Coord	Ped	MaxR				
Stops (vph)					580	51	204	511				
Fuel Used(gal)					9	1	4	8				
CO Emissions (g/hr)					626	51	253	567				
NOx Emissions (g/hr)					122	10	49	110				
VOC Emissions (g/hr)					145	12	59	131				
Dilemma Vehicles (#)					0	0	0	0				
Queue Length 50th (ft)					200	34	66	114				
Queue Length 95th (ft)					261	m64	97	154				
Internal Link Dist (ft)		1142			214			315			388	
Turn Bay Length (ft)												
Base Capacity (vph)					1027	410	944	1266				
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					0.64	0.16	0.56	0.62				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 27.7 Intersection LOS: C
Intersection Capacity Utilization 47.2% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Huntington Avenue & Dartmouth Street

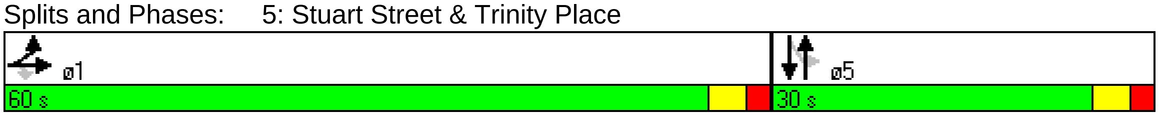
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12	12	11	12	12	11	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50		50	50	
Trailing Detector (ft)	0	0	0					0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95	0.31					0.83			0.82	
Frt			0.850					0.927				
Flt Protected		0.997									0.971	
Satd. Flow (prot)	0	4637	1439	0	0	0	0	1158	0	0	1338	0
Flt Permitted		0.997									0.875	
Satd. Flow (perm)	0	4392	450	0	0	0	0	1158	0	0	990	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184					8				
Headway Factor	1.14	1.05	1.14	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.19	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		295			295			320			387	
Travel Time (s)		6.7			6.7			7.3			8.8	
Volume (vph)	67	915	169	0	0	0	0	16	18	18	12	0
Confl. Peds. (#/hr)	783		593						182	182		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	49%	4%	1%	0%	0%	0%	0%	0%	18%	33%	0%	0%
Adj. Flow (vph)	73	995	184	0	0	0	0	17	20	20	13	0
Lane Group Flow (vph)	0	1068	184	0	0	0	0	37	0	0	33	0
Turn Type	Split		Perm							Perm		
Protected Phases	1	1						5			5	
Permitted Phases			1							5		
Detector Phases	1	1	1					5		5	5	
Minimum Initial (s)	10.0	10.0	10.0					8.0		8.0	8.0	
Minimum Split (s)	24.0	24.0	24.0					19.0		19.0	19.0	
Total Split (s)	60.0	60.0	60.0	0.0	0.0	0.0	0.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	66.7%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	55.0	55.0	55.0					25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0	3.0					3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max					None		None	None	
Walk Time (s)	7.0	7.0	7.0					7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0					7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)		79.2	79.2					9.6			9.6	
Actuated g/C Ratio		0.88	0.88					0.11			0.11	
v/c Ratio		0.26	0.44					0.28			0.31	
Control Delay		0.4	9.7					36.3			39.7	
Queue Delay		0.0	0.6					0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		0.4	10.3					36.3			39.7	
LOS		A	B					D			D	
Approach Delay		1.9						36.3			39.7	
Approach LOS		A						D			D	
90th %ile Green (s)	69.2	69.2	69.2					10.8		10.8	10.8	
90th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
70th %ile Green (s)	71.6	71.6	71.6					8.4		8.4	8.4	
70th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
50th %ile Green (s)	72.0	72.0	72.0					8.0		8.0	8.0	
50th %ile Term Code	Coord	Coord	Coord					Min		Min	Min	
30th %ile Green (s)	85.0	85.0	85.0					0.0		0.0	0.0	
30th %ile Term Code	Coord	Coord	Coord					Skip		Skip	Skip	
10th %ile Green (s)	85.0	85.0	85.0					0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord	Coord					Skip		Skip	Skip	
Stops (vph)		17	69					28			28	
Fuel Used(gal)		2	1					0			0	
CO Emissions (g/hr)		170	77					34			34	
NOx Emissions (g/hr)		33	15					7			7	
VOC Emissions (g/hr)		39	18					8			8	
Dilemma Vehicles (#)		0	0					0			0	
Queue Length 50th (ft)		2	36					16			19	
Queue Length 95th (ft)		10	103					44			m34	
Internal Link Dist (ft)		215			215			240			307	
Turn Bay Length (ft)												
Base Capacity (vph)		4079	418					340			286	
Starvation Cap Reductn		1037	59					0			0	
Spillback Cap Reductn		280	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.35	0.51					0.11			0.12	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 7 (8%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 3.8 Intersection LOS: A
Intersection Capacity Utilization 39.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Stuart Street & Trinity Place



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	90	624	49	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	98	678	53	0
Pedestrians	62				102	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				9	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	294			313		
pX, platoon unblocked					0.88	
vC, conflicting volume			102		699	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			102		529	102
tC, single (s)			4.4		7.6	6.9
tC, 2 stage (s)						
tF (s)			2.4		3.9	3.3
p0 queue free %			92		82	100
cM capacity (veh/h)			1267		298	860

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	324	452	53
Volume Left	98	0	53
Volume Right	0	0	0
cSH	1267	1700	298
Volume to Capacity	0.08	0.27	0.18
Queue Length 95th (ft)	6	0	16
Control Delay (s)	2.9	0.0	19.7
Lane LOS	A		C
Approach Delay (s)	1.2		19.7
Approach LOS			C

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	12	12	12	12	11	11	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50	50			
Trailing Detector (ft)	0	0	0					0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.68								0.49			
Frt			0.850						0.850			
Flt Protected	0.950											
Satd. Flow (prot)	3536	4834	1569	0	0	0	0	3049	1338	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2416	4834	1569	0	0	0	0	3049	652	0	0	0
Right Turn on Red	No		No			Yes			Yes			Yes
Satd. Flow (RTOR)									26			
Headway Factor	0.97	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.19	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		317			316			208			395	
Travel Time (s)		8.6			8.6			5.7			10.8	
Volume (vph)	923	797	478	0	0	0	0	528	87	0	0	0
Confl. Peds. (#/hr)	199		226						500			
Confl. Bikes (#/hr)			3						8			
Peak Hour Factor	0.94	0.83	0.83	0.92	0.92	0.92	0.92	0.92	0.45	0.92	0.92	0.92
Heavy Vehicles (%)	1%	3%	5%	0%	0%	0%	0%	3%	5%	0%	0%	0%
Adj. Flow (vph)	982	960	576	0	0	0	0	574	193	0	0	0
Lane Group Flow (vph)	982	960	576	0	0	0	0	574	193	0	0	0
Turn Type	custom		Prot						custom			
Protected Phases		1	1					2				
Permitted Phases	1 5							5	2 5			
Detector Phases		1	1					2	2 5			
Minimum Initial (s)		8.0	8.0					8.0				
Minimum Split (s)		18.0	18.0					14.0				
Total Split (s)	76.0	50.0	50.0	0.0	0.0	0.0	0.0	14.0	40.0	0.0	0.0	0.0
Total Split (%)	84.4%	55.6%	55.6%	0.0%	0.0%	0.0%	0.0%	15.6%	44.4%	0.0%	0.0%	0.0%
Maximum Green (s)		46.0	46.0					10.0				
Yellow Time (s)		3.0	3.0					3.0				
All-Red Time (s)		1.0	1.0					1.0				
Lead/Lag		Lead	Lead					Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0					2.0				
Recall Mode		C-Max	C-Max					Max				
Walk Time (s)		7.0	7.0					7.0				
Flash Dont Walk (s)		7.0	7.0					3.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	72.0	46.0	46.0					36.0	36.0			
Actuated g/C Ratio	0.80	0.51	0.51					0.40	0.40			
v/c Ratio	0.51	0.39	0.72					0.47	0.70			
Control Delay	4.1	14.0	23.3					21.6	35.4			

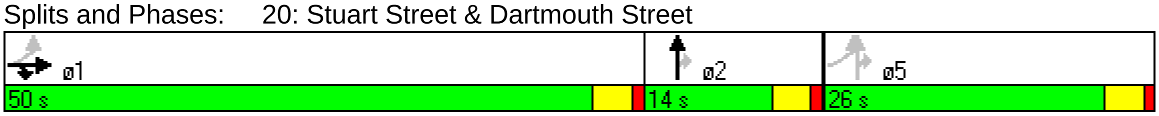
Lane Group	ø5
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	16.0
Total Split (s)	26.0
Total Split (%)	29%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Max
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0					0.0	0.0			
Total Delay	4.1	14.0	23.3					21.6	35.4			
LOS	A	B	C					C	D			
Approach Delay		12.3						25.0				
Approach LOS		B						C				
90th %ile Green (s)		46.0	46.0					10.0				
90th %ile Term Code		Coord	Coord					MaxR				
70th %ile Green (s)		46.0	46.0					10.0				
70th %ile Term Code		Coord	Coord					MaxR				
50th %ile Green (s)		46.0	46.0					10.0				
50th %ile Term Code		Coord	Coord					MaxR				
30th %ile Green (s)		46.0	46.0					10.0				
30th %ile Term Code		Coord	Coord					MaxR				
10th %ile Green (s)		46.0	46.0					10.0				
10th %ile Term Code		Coord	Coord					MaxR				
Stops (vph)	271	458	363					373	63			
Fuel Used(gal)	4	6	5					5	1			
CO Emissions (g/hr)	301	432	346					327	71			
NOx Emissions (g/hr)	59	84	67					64	14			
VOC Emissions (g/hr)	70	100	80					76	17			
Dilemma Vehicles (#)	0	0	0					0	0			
Queue Length 50th (ft)	71	115	241					124	78			
Queue Length 95th (ft)	98	131	322					172	53			
Internal Link Dist (ft)		237			236			128			315	
Turn Bay Length (ft)												
Base Capacity (vph)	1933	2471	802					1220	276			
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	0.51	0.39	0.72					0.47	0.70			

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 55 (61%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 72.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 20: Stuart Street & Dartmouth Street



Lane Group	ø5
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	22.0
90th %ile Term Code	MaxR
70th %ile Green (s)	22.0
70th %ile Term Code	MaxR
50th %ile Green (s)	22.0
50th %ile Term Code	MaxR
30th %ile Green (s)	22.0
30th %ile Term Code	MaxR
10th %ile Green (s)	22.0
10th %ile Term Code	MaxR
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

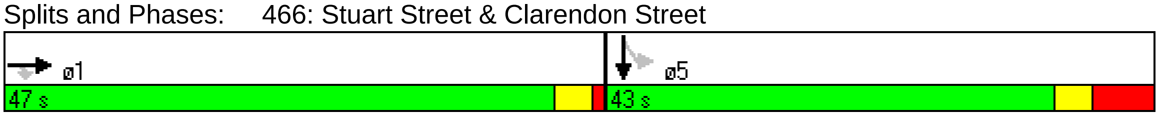
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	10	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50							50	50	
Trailing Detector (ft)		0	0							0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.61								0.90	
Frt			0.850									
Flt Protected											0.986	
Satd. Flow (prot)	0	3026	1295	0	0	0	0	0	0	0	2773	0
Flt Permitted											0.986	
Satd. Flow (perm)	0	3026	789	0	0	0	0	0	0	0	2500	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)			176								83	
Headway Factor	1.14	1.22	1.30	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.33	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		274			822			322			378	
Travel Time (s)		7.5			22.4			8.8			10.3	
Volume (vph)	0	708	249	0	0	0	0	0	0	218	548	0
Confl. Peds. (#/hr)			378							312		
Confl. Bikes (#/hr)			6									
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Parking (#/hr)		0	0							0	0	
Adj. Flow (vph)	0	778	274	0	0	0	0	0	0	240	602	0
Lane Group Flow (vph)	0	778	274	0	0	0	0	0	0	0	842	0
Turn Type			Perm							Perm		
Protected Phases		1									5	
Permitted Phases			1							5		
Detector Phases		1	1							5	5	
Minimum Initial (s)		8.0	8.0							8.0	8.0	
Minimum Split (s)		18.0	18.0							24.0	24.0	
Total Split (s)	0.0	47.0	47.0	0.0	0.0	0.0	0.0	0.0	0.0	43.0	43.0	0.0
Total Split (%)	0.0%	52.2%	52.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.8%	47.8%	0.0%
Maximum Green (s)		43.0	43.0							35.0	35.0	
Yellow Time (s)		3.0	3.0							3.0	3.0	
All-Red Time (s)		1.0	1.0							5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0							2.0	2.0	
Recall Mode		C-Max	C-Max							Max	Max	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		7.0	7.0							9.0	9.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		43.0	43.0								39.0	
Actuated g/C Ratio		0.48	0.48								0.43	
v/c Ratio		0.54	0.58								0.75	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.5	8.1								26.9	
Queue Delay		0.8	0.3								1.3	
Total Delay		12.3	8.4								28.2	
LOS		B	A								C	
Approach Delay		11.2									28.2	
Approach LOS		B									C	
90th %ile Green (s)		43.0	43.0							35.0	35.0	
90th %ile Term Code		Coord	Coord							MaxR	MaxR	
70th %ile Green (s)		43.0	43.0							35.0	35.0	
70th %ile Term Code		Coord	Coord							MaxR	MaxR	
50th %ile Green (s)		43.0	43.0							35.0	35.0	
50th %ile Term Code		Coord	Coord							MaxR	MaxR	
30th %ile Green (s)		43.0	43.0							35.0	35.0	
30th %ile Term Code		Coord	Coord							MaxR	MaxR	
10th %ile Green (s)		43.0	43.0							35.0	35.0	
10th %ile Term Code		Coord	Coord							MaxR	MaxR	
Stops (vph)		293	75								635	
Fuel Used(gal)		4	1								9	
CO Emissions (g/hr)		310	89								636	
NOx Emissions (g/hr)		60	17								124	
VOC Emissions (g/hr)		72	21								148	
Dilemma Vehicles (#)		0	0								0	
Queue Length 50th (ft)		93	9								210	
Queue Length 95th (ft)		109	m32								282	
Internal Link Dist (ft)		194			742			242			298	
Turn Bay Length (ft)												
Base Capacity (vph)		1446	469								1130	
Starvation Cap Reductn		350	22								124	
Spillback Cap Reductn		0	0								0	
Storage Cap Reductn		0	0								0	
Reduced v/c Ratio		0.71	0.61								0.84	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 1:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 18.8 | Intersection LOS: B
Intersection Capacity Utilization 56.8% | ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 466: Stuart Street & Clarendon Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	15	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)				50	50						50	
Trailing Detector (ft)				0	0						0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					0.91						0.91	
Frt											0.964	
Flt Protected					0.986							
Satd. Flow (prot)	0	0	0	0	3452	0	0	0	0	0	3082	0
Flt Permitted					0.986							
Satd. Flow (perm)	0	0	0	0	3141	0	0	0	0	0	3082	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					82						60	
Headway Factor	1.14	1.14	1.14	1.14	0.97	1.14	1.14	1.14	1.14	1.14	1.01	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		290			654			378			157	
Travel Time (s)		7.9			17.8			10.3			4.3	
Volume (vph)	0	0	0	237	626	0	0	0	0	0	530	166
Confl. Peds. (#/hr)				228								311
Confl. Bikes (#/hr)												9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	6%	0%	0%	0%	0%	0%	2%	2%
Parking (#/hr)												0
Adj. Flow (vph)	0	0	0	244	645	0	0	0	0	0	546	171
Lane Group Flow (vph)	0	0	0	0	889	0	0	0	0	0	717	0
Turn Type				Perm								
Protected Phases					1						5	
Permitted Phases				1								
Detector Phases				1	1						5	
Minimum Initial (s)				8.0	8.0						8.0	
Minimum Split (s)				18.0	18.0						18.0	
Total Split (s)	0.0	0.0	0.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	44.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	51.1%	51.1%	0.0%	0.0%	0.0%	0.0%	0.0%	48.9%	0.0%
Maximum Green (s)				42.0	42.0						40.0	
Yellow Time (s)				3.0	3.0						3.0	
All-Red Time (s)				1.0	1.0						1.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				2.0	2.0						2.0	
Recall Mode				C-Max	C-Max						Max	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				7.0	7.0						7.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)					42.0						40.0	
Actuated g/C Ratio					0.47						0.44	
v/c Ratio					0.59						0.51	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					17.8						17.9	
Queue Delay					0.1						0.0	
Total Delay					17.9						17.9	
LOS					B						B	
Approach Delay					17.9						17.9	
Approach LOS					B						B	
90th %ile Green (s)				42.0	42.0						40.0	
90th %ile Term Code				Coord	Coord						MaxR	
70th %ile Green (s)				42.0	42.0						40.0	
70th %ile Term Code				Coord	Coord						MaxR	
50th %ile Green (s)				42.0	42.0						40.0	
50th %ile Term Code				Coord	Coord						MaxR	
30th %ile Green (s)				42.0	42.0						40.0	
30th %ile Term Code				Coord	Coord						MaxR	
10th %ile Green (s)				42.0	42.0						40.0	
10th %ile Term Code				Coord	Coord						MaxR	
Stops (vph)					556						440	
Fuel Used(gal)					10						5	
CO Emissions (g/hr)					703						360	
NOx Emissions (g/hr)					137						70	
VOC Emissions (g/hr)					163						83	
Dilemma Vehicles (#)					0						0	
Queue Length 50th (ft)					170						135	
Queue Length 95th (ft)					230						187	
Internal Link Dist (ft)		210			574			298			77	
Turn Bay Length (ft)												
Base Capacity (vph)					1510						1403	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					50						2	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.61						0.51	

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 6 (7%), Referenced to phase 1:WBTL, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

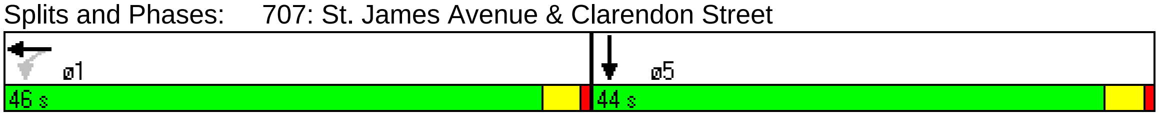
Maximum v/c Ratio: 0.59

Intersection Signal Delay: 17.9 Intersection LOS: B

Intersection Capacity Utilization 57.8% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 707: St. James Avenue & Clarendon Street



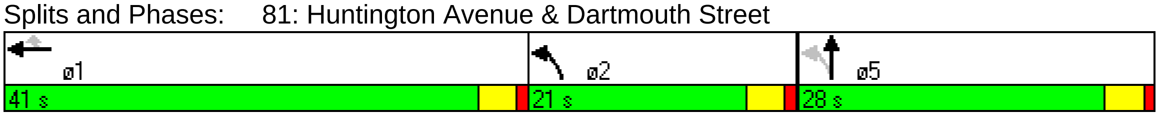
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)					50	50	50	50				
Trailing Detector (ft)					0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94	0.35					
Frt						0.850						
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	2842	1377	3060	4468	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	2842	1290	1068	4468	0	0	0	0
Right Turn on Red			Yes			No	No		Yes			Yes
Satd. Flow (RTOR)												
Headway Factor	1.14	1.14	1.14	1.19	1.27	1.19	1.14	1.19	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1222			317			395			468	
Travel Time (s)		33.3			8.6			10.8			12.8	
Volume (vph)	0	0	0	0	746	124	593	858	0	0	0	0
Confl. Peds. (#/hr)						34	474					
Confl. Bikes (#/hr)						13						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.88	0.81	0.91	0.95	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	5%	2%	3%	1%	0%	0%	0%	0%
Parking (#/hr)					0			0				
Adj. Flow (vph)	0	0	0	0	848	153	652	903	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	848	153	652	903	0	0	0	0
Turn Type						Perm	pm+pt					
Protected Phases					1		2	5				
Permitted Phases						1	5					
Detector Phases					1	1	2	5				
Minimum Initial (s)					8.0	8.0	8.0	8.0				
Minimum Split (s)					24.0	24.0	21.0	24.0				
Total Split (s)	0.0	0.0	0.0	0.0	41.0	41.0	21.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	45.6%	45.6%	23.3%	31.1%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)					37.0	37.0	17.0	24.0				
Yellow Time (s)					3.0	3.0	3.0	3.0				
All-Red Time (s)					1.0	1.0	1.0	1.0				
Lead/Lag					Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)					2.0	2.0	2.0	2.0				
Recall Mode					C-Max	C-Max	Ped	Max				
Walk Time (s)					8.0	8.0	8.0	8.0				
Flash Dont Walk (s)					12.0	12.0	9.0	12.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)					37.0	37.0	41.0	24.0				
Actuated g/C Ratio					0.41	0.41	0.46	0.27				
v/c Ratio					0.73	0.29	0.76	0.76				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					19.8	15.8	20.8	36.6				
Queue Delay					0.0	0.0	0.0	0.0				
Total Delay					19.8	15.8	20.8	36.6				
LOS					B	B	C	D				
Approach Delay					19.2			30.0				
Approach LOS					B			C				
90th %ile Green (s)					37.0	37.0	17.0	24.0				
90th %ile Term Code					Coord	Coord	Max	MaxR				
70th %ile Green (s)					37.0	37.0	17.0	24.0				
70th %ile Term Code					Coord	Coord	Max	MaxR				
50th %ile Green (s)					37.0	37.0	17.0	24.0				
50th %ile Term Code					Coord	Coord	Max	MaxR				
30th %ile Green (s)					37.0	37.0	17.0	24.0				
30th %ile Term Code					Coord	Coord	Max	MaxR				
10th %ile Green (s)					37.0	37.0	17.0	24.0				
10th %ile Term Code					Coord	Coord	Ped	MaxR				
Stops (vph)					380	57	472	805				
Fuel Used(gal)					6	1	6	12				
CO Emissions (g/hr)					453	66	441	865				
NOx Emissions (g/hr)					88	13	86	168				
VOC Emissions (g/hr)					105	15	102	200				
Dilemma Vehicles (#)					0	0	0	0				
Queue Length 50th (ft)					128	41	149	187				
Queue Length 95th (ft)					173	68	204	234				
Internal Link Dist (ft)		1142			237			315			388	
Turn Bay Length (ft)												
Base Capacity (vph)					1168	530	863	1191				
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					0.73	0.29	0.76	0.76				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 7 (8%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 25.8 Intersection LOS: C
Intersection Capacity Utilization 90.1% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 81: Huntington Avenue & Dartmouth Street



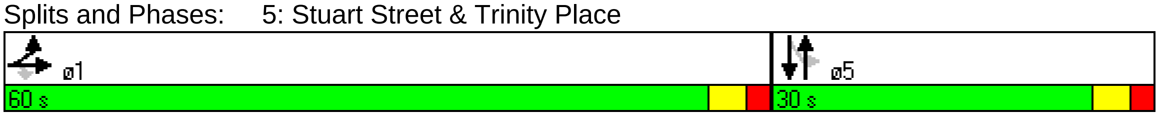
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12	12	11	12	12	11	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50		50	50	
Trailing Detector (ft)	0	0	0					0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97	0.30					0.77			0.77	
Frt			0.850					0.902				
Flt Protected		0.997									0.955	
Satd. Flow (prot)	0	4799	1454	0	0	0	0	1154	0	0	1316	0
Flt Permitted		0.997									0.677	
Satd. Flow (perm)	0	4647	443	0	0	0	0	1154	0	0	717	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47					10				
Headway Factor	1.14	1.05	1.14	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.19	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		316			274			278			387	
Travel Time (s)		7.2			6.2			6.3			8.8	
Volume (vph)	45	796	43	0	0	0	0	34	90	74	4	0
Confl. Peds. (#/hr)	402		609						169	169		
Confl. Bikes (#/hr)			4									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	29%	2%	0%	0%	0%	0%	0%	0%	0%	21%	0%	0%
Adj. Flow (vph)	49	865	47	0	0	0	0	37	98	80	4	0
Lane Group Flow (vph)	0	914	47	0	0	0	0	135	0	0	84	0
Turn Type	Split		Perm							Perm		
Protected Phases	1	1						5			5	
Permitted Phases			1							5		
Detector Phases	1	1	1					5		5	5	
Minimum Initial (s)	10.0	10.0	10.0					8.0		8.0	8.0	
Minimum Split (s)	24.0	24.0	24.0					19.0		19.0	19.0	
Total Split (s)	60.0	60.0	60.0	0.0	0.0	0.0	0.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	66.7%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	55.0	55.0	55.0					25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0	3.0					3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max					None		None	None	
Walk Time (s)	7.0	7.0	7.0					7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0					7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)		66.7	66.7					15.3			15.3	
Actuated g/C Ratio		0.74	0.74					0.17			0.17	
v/c Ratio		0.26	0.14					0.66			0.69	
Control Delay		1.9	0.8					46.2			55.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.1	0.0					0.0			0.0	
Total Delay		2.0	0.8					46.2			55.7	
LOS		A	A					D			E	
Approach Delay		2.0						46.2			55.7	
Approach LOS		A						D			E	
90th %ile Green (s)	56.5	56.5	56.5					23.5		23.5	23.5	
90th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
70th %ile Green (s)	63.0	63.0	63.0					17.0		17.0	17.0	
70th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
50th %ile Green (s)	66.7	66.7	66.7					13.3		13.3	13.3	
50th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
30th %ile Green (s)	70.1	70.1	70.1					9.9		9.9	9.9	
30th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
10th %ile Green (s)	72.0	72.0	72.0					8.0		8.0	8.0	
10th %ile Term Code	Coord	Coord	Coord					Min		Min	Min	
Stops (vph)		99	0					105			68	
Fuel Used(gal)		3	0					2			1	
CO Emissions (g/hr)		206	8					141			104	
NOx Emissions (g/hr)		40	2					27			20	
VOC Emissions (g/hr)		48	2					33			24	
Dilemma Vehicles (#)		0	0					0			0	
Queue Length 50th (ft)		23	0					68			42	
Queue Length 95th (ft)		32	m0					113			m75	
Internal Link Dist (ft)		236			194			198			307	
Turn Bay Length (ft)												
Base Capacity (vph)		3555	340					340			207	
Starvation Cap Reductn		1061	0					0			0	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.37	0.14					0.40			0.41	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 58 (64%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 48.3% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Stuart Street & Trinity Place



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	34	758	112	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	37	824	122	0
Pedestrians	99				143	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				12	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	317			290		
pX, platoon unblocked					0.86	
vC, conflicting volume			143		728	143
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			143		520	143
tC, single (s)			4.2		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.3
p0 queue free %			97		64	100
cM capacity (veh/h)			1234		341	779

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	312	549	122
Volume Left	37	0	122
Volume Right	0	0	0
cSH	1234	1700	341
Volume to Capacity	0.03	0.32	0.36
Queue Length 95th (ft)	2	0	39
Control Delay (s)	1.2	0.0	21.3
Lane LOS	A		C
Approach Delay (s)	0.4		21.3
Approach LOS			C

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	12	12	12	12	11	11	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50	50			
Trailing Detector (ft)	0	0	0					0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.70								0.49			
Frt			0.850						0.850			
Flt Protected	0.950											
Satd. Flow (prot)	3468	4834	1584	0	0	0	0	2935	1289	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2412	4834	1584	0	0	0	0	2935	629	0	0	0
Right Turn on Red	No		No			Yes			Yes			Yes
Satd. Flow (RTOR)									6			
Headway Factor	0.97	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.19	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		317			295			208			395	
Travel Time (s)		8.6			8.0			5.7			10.8	
Volume (vph)	807	1090	470	0	0	0	0	377	74	0	0	0
Confl. Peds. (#/hr)	167		184						500			
Confl. Bikes (#/hr)									7			
Peak Hour Factor	0.91	0.93	0.81	0.92	0.92	0.92	0.92	0.90	0.69	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	4%	0%	0%	0%	0%	7%	9%	0%	0%	0%
Adj. Flow (vph)	887	1172	580	0	0	0	0	419	107	0	0	0
Lane Group Flow (vph)	887	1172	580	0	0	0	0	419	107	0	0	0
Turn Type	custom		Prot						custom			
Protected Phases		1	1					2				
Permitted Phases	1 5							5	2 5			
Detector Phases		1	1					2	2 5			
Minimum Initial (s)		8.0	8.0					8.0				
Minimum Split (s)		18.0	18.0					14.0				
Total Split (s)	76.0	41.0	41.0	0.0	0.0	0.0	0.0	14.0	49.0	0.0	0.0	0.0
Total Split (%)	84.4%	45.6%	45.6%	0.0%	0.0%	0.0%	0.0%	15.6%	54.4%	0.0%	0.0%	0.0%
Maximum Green (s)		37.0	37.0					10.0				
Yellow Time (s)		3.0	3.0					3.0				
All-Red Time (s)		1.0	1.0					1.0				
Lead/Lag		Lead	Lead					Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0					2.0				
Recall Mode		C-Max	C-Max					Max				
Walk Time (s)		7.0	7.0					7.0				
Flash Dont Walk (s)		7.0	7.0					3.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	72.0	37.0	37.0					45.0	45.0			
Actuated g/C Ratio	0.80	0.41	0.41					0.50	0.50			
v/c Ratio	0.46	0.59	0.89					0.29	0.34			
Control Delay	3.7	22.1	43.0					13.8	16.5			

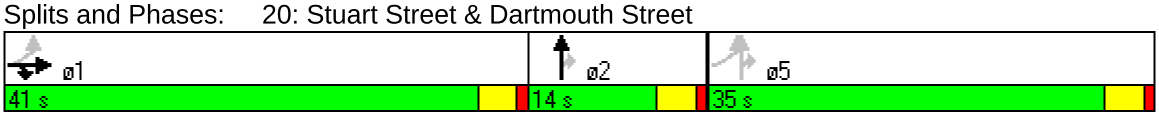
Lane Group	ø5
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	16.0
Total Split (s)	35.0
Total Split (%)	39%
Maximum Green (s)	31.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Max
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0					0.0	0.0			
Total Delay	3.7	22.1	43.0					13.8	16.5			
LOS	A	C	D					B	B			
Approach Delay		20.5						14.3				
Approach LOS		C						B				
90th %ile Green (s)		37.0	37.0					10.0				
90th %ile Term Code		Coord	Coord					MaxR				
70th %ile Green (s)		37.0	37.0					10.0				
70th %ile Term Code		Coord	Coord					MaxR				
50th %ile Green (s)		37.0	37.0					10.0				
50th %ile Term Code		Coord	Coord					MaxR				
30th %ile Green (s)		37.0	37.0					10.0				
30th %ile Term Code		Coord	Coord					MaxR				
10th %ile Green (s)		37.0	37.0					10.0				
10th %ile Term Code		Coord	Coord					MaxR				
Stops (vph)	221	811	398					209	42			
Fuel Used(gal)	4	11	7					3	1			
CO Emissions (g/hr)	254	766	483					177	38			
NOx Emissions (g/hr)	49	149	94					34	7			
VOC Emissions (g/hr)	59	178	112					41	9			
Dilemma Vehicles (#)	0	0	0					0	0			
Queue Length 50th (ft)	60	184	299					69	33			
Queue Length 95th (ft)	84	229	#415					100	50			
Internal Link Dist (ft)		237			215			128			315	
Turn Bay Length (ft)												
Base Capacity (vph)	1930	1987	651					1468	318			
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	0.46	0.59	0.89					0.29	0.34			

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 6 (7%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 19.5 Intersection LOS: B
Intersection Capacity Utilization 47.2% 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: 20: Stuart Street & Dartmouth Street



Lane Group	ø5
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	31.0
90th %ile Term Code	MaxR
70th %ile Green (s)	31.0
70th %ile Term Code	MaxR
50th %ile Green (s)	31.0
50th %ile Term Code	MaxR
30th %ile Green (s)	31.0
30th %ile Term Code	MaxR
10th %ile Green (s)	31.0
10th %ile Term Code	MaxR
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	12	12	12	12	12	12	12	10	12
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50							50	50	
Trailing Detector (ft)		0	0							0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.65								0.88	
Frt			0.850									
Flt Protected											0.988	
Satd. Flow (prot)	0	2744	1152	0	0	0	0	0	0	0	2750	0
Flt Permitted											0.988	
Satd. Flow (perm)	0	2744	746	0	0	0	0	0	0	0	2413	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)			135								65	
Headway Factor	1.14	1.33	1.42	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.33	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		295			822			322			378	
Travel Time (s)		8.0			22.4			8.8			10.3	
Volume (vph)	0	794	170	0	0	0	0	0	0	181	563	0
Confl. Peds. (#/hr)			276							782		
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.92	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.92
Heavy Vehicles (%)	0%	5%	6%	0%	0%	0%	0%	0%	0%	5%	3%	0%
Parking (#/hr)		0	0							0	0	
Adj. Flow (vph)	0	845	181	0	0	0	0	0	0	193	599	0
Lane Group Flow (vph)	0	845	181	0	0	0	0	0	0	0	792	0
Turn Type			Perm							Perm		
Protected Phases		1									5	
Permitted Phases			1							5		
Detector Phases		1	1							5	5	
Minimum Initial (s)		8.0	8.0							8.0	8.0	
Minimum Split (s)		18.0	18.0							24.0	24.0	
Total Split (s)	0.0	44.0	44.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	46.0	0.0
Total Split (%)	0.0%	48.9%	48.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	51.1%	51.1%	0.0%
Maximum Green (s)		40.0	40.0							38.0	38.0	
Yellow Time (s)		3.0	3.0							3.0	3.0	
All-Red Time (s)		1.0	1.0							5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0							2.0	2.0	
Recall Mode		C-Max	C-Max							Max	Max	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		7.0	7.0							9.0	9.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		40.0	40.0								42.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.44	0.44								0.47	
v/c Ratio		0.69	0.44								0.68	
Control Delay		13.2	5.9								14.9	
Queue Delay		0.9	0.1								0.0	
Total Delay		14.0	6.0								14.9	
LOS		B	A								B	
Approach Delay		12.6									14.9	
Approach LOS		B									B	
90th %ile Green (s)		40.0	40.0							38.0	38.0	
90th %ile Term Code		Coord	Coord							MaxR	MaxR	
70th %ile Green (s)		40.0	40.0							38.0	38.0	
70th %ile Term Code		Coord	Coord							MaxR	MaxR	
50th %ile Green (s)		40.0	40.0							38.0	38.0	
50th %ile Term Code		Coord	Coord							MaxR	MaxR	
30th %ile Green (s)		40.0	40.0							38.0	38.0	
30th %ile Term Code		Coord	Coord							MaxR	MaxR	
10th %ile Green (s)		40.0	40.0							38.0	38.0	
10th %ile Term Code		Coord	Coord							MaxR	MaxR	
Stops (vph)		677	53								550	
Fuel Used(gal)		7	1								7	
CO Emissions (g/hr)		470	58								472	
NOx Emissions (g/hr)		91	11								92	
VOC Emissions (g/hr)		109	14								109	
Dilemma Vehicles (#)		0	0								0	
Queue Length 50th (ft)		230	0								188	
Queue Length 95th (ft)		311	35								257	
Internal Link Dist (ft)		215			742			242			298	
Turn Bay Length (ft)			90									
Base Capacity (vph)		1220	407								1161	
Starvation Cap Reductn		149	18								4	
Spillback Cap Reductn		0	0								0	
Storage Cap Reductn		0	0								0	
Reduced v/c Ratio		0.79	0.47								0.68	

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 25 (28%), Referenced to phase 1:EBT, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

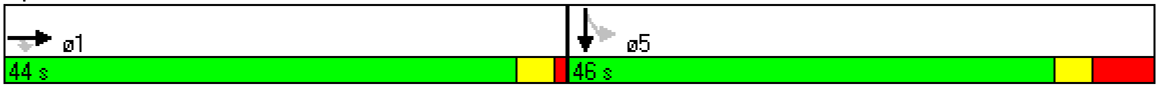
Maximum v/c Ratio: 0.69

Intersection Signal Delay: 13.6 Intersection LOS: B

Intersection Capacity Utilization 54.2% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 466: Stuart Street & Clarendon Street



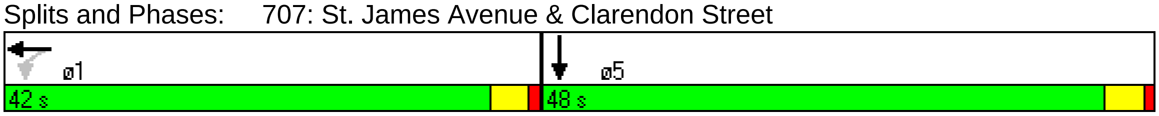
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑						↑↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	15	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)				50	50						50	
Trailing Detector (ft)				0	0						0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					0.92						0.92	
Frt											0.963	
Flt Protected					0.988							
Satd. Flow (prot)	0	0	0	0	3234	0	0	0	0	0	3103	0
Flt Permitted					0.988							
Satd. Flow (perm)	0	0	0	0	2980	0	0	0	0	0	3103	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					62						69	
Headway Factor	1.14	1.14	1.14	1.14	0.97	1.14	1.14	1.14	1.14	1.14	1.01	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		313			654			378			312	
Travel Time (s)		8.5			17.8			10.3			8.5	
Volume (vph)	0	0	0	178	535	0	0	0	0	0	565	185
Confl. Peds. (#/hr)				192								158
Peak Hour Factor	0.92	0.92	0.92	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	2%	16%	0%	0%	0%	0%	0%	3%	1%
Parking (#/hr)												0
Adj. Flow (vph)	0	0	0	185	557	0	0	0	0	0	589	193
Lane Group Flow (vph)	0	0	0	0	742	0	0	0	0	0	782	0
Turn Type				Perm								
Protected Phases					1						5	
Permitted Phases				1								
Detector Phases				1	1						5	
Minimum Initial (s)				8.0	8.0						8.0	
Minimum Split (s)				18.0	18.0						18.0	
Total Split (s)	0.0	0.0	0.0	42.0	42.0	0.0	0.0	0.0	0.0	0.0	48.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	0.0%	0.0%	0.0%	0.0%	0.0%	53.3%	0.0%
Maximum Green (s)				38.0	38.0						44.0	
Yellow Time (s)				3.0	3.0						3.0	
All-Red Time (s)				1.0	1.0						1.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				2.0	2.0						2.0	
Recall Mode				C-Max	C-Max						Max	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				7.0	7.0						7.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)					38.0						44.0	
Actuated g/C Ratio					0.42						0.49	
v/c Ratio					0.57						0.50	
Control Delay					20.1						15.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay					0.0						0.0	
Total Delay					20.1						15.5	
LOS					C						B	
Approach Delay					20.1						15.5	
Approach LOS					C						B	
90th %ile Green (s)				38.0	38.0						44.0	
90th %ile Term Code				Coord	Coord						MaxR	
70th %ile Green (s)				38.0	38.0						44.0	
70th %ile Term Code				Coord	Coord						MaxR	
50th %ile Green (s)				38.0	38.0						44.0	
50th %ile Term Code				Coord	Coord						MaxR	
30th %ile Green (s)				38.0	38.0						44.0	
30th %ile Term Code				Coord	Coord						MaxR	
10th %ile Green (s)				38.0	38.0						44.0	
10th %ile Term Code				Coord	Coord						MaxR	
Stops (vph)					482						445	
Fuel Used(gal)					9						6	
CO Emissions (g/hr)					611						424	
NOx Emissions (g/hr)					119						82	
VOC Emissions (g/hr)					142						98	
Dilemma Vehicles (#)					0						0	
Queue Length 50th (ft)					150						137	
Queue Length 95th (ft)					207						188	
Internal Link Dist (ft)		233			574			298			232	
Turn Bay Length (ft)												
Base Capacity (vph)					1294						1552	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						30	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.57						0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 17 (19%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 17.7 Intersection LOS: B
Intersection Capacity Utilization 54.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 707: St. James Avenue & Clarendon Street



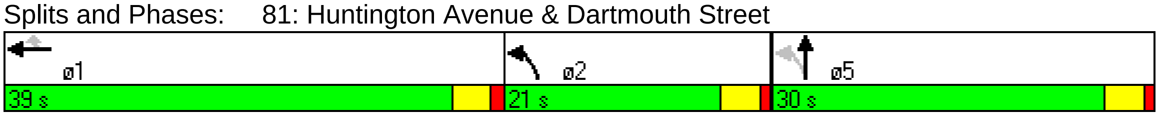
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)					50	50	50	50				
Trailing Detector (ft)					0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94	0.44					
Frt						0.850						
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	2640	1124	2973	4381	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	2640	1055	1323	4381	0	0	0	0
Right Turn on Red			Yes			No	No		Yes			Yes
Satd. Flow (RTOR)												
Headway Factor	1.14	1.14	1.14	1.19	1.27	1.19	1.14	1.19	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1222			294			395			468	
Travel Time (s)		33.3			8.0			10.8			12.8	
Volume (vph)	0	0	0	0	624	61	466	719	0	0	0	0
Confl. Peds. (#/hr)						37	293					
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.93	0.90	0.89	0.91	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	13%	25%	6%	3%	0%	0%	0%	0%
Parking (#/hr)					0			0				
Adj. Flow (vph)	0	0	0	0	671	68	524	790	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	671	68	524	790	0	0	0	0
Turn Type						Perm	pm+pt					
Protected Phases					1		2	5				
Permitted Phases						1	5					
Detector Phases					1	1	2	5				
Minimum Initial (s)					8.0	8.0	8.0	8.0				
Minimum Split (s)					24.0	24.0	21.0	25.0				
Total Split (s)	0.0	0.0	0.0	0.0	39.0	39.0	21.0	30.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	43.3%	43.3%	23.3%	33.3%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)					35.0	35.0	17.0	26.0				
Yellow Time (s)					3.0	3.0	3.0	3.0				
All-Red Time (s)					1.0	1.0	1.0	1.0				
Lead/Lag					Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)					2.0	2.0	2.0	2.0				
Recall Mode					C-Max	C-Max	Ped	Max				
Walk Time (s)					8.0	8.0	8.0	8.0				
Flash Dont Walk (s)					12.0	12.0	9.0	13.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)					35.0	35.0	43.0	26.0				
Actuated g/C Ratio					0.39	0.39	0.48	0.29				
v/c Ratio					0.65	0.17	0.56	0.62				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					41.4	32.3	13.4	25.5				
Queue Delay					0.0	0.0	0.0	0.0				
Total Delay					41.4	32.3	13.4	25.5				
LOS					D	C	B	C				
Approach Delay					40.6			20.7				
Approach LOS					D			C				
90th %ile Green (s)					35.0	35.0	17.0	26.0				
90th %ile Term Code					Coord	Coord	Ped	MaxR				
70th %ile Green (s)					35.0	35.0	17.0	26.0				
70th %ile Term Code					Coord	Coord	Ped	MaxR				
50th %ile Green (s)					35.0	35.0	17.0	26.0				
50th %ile Term Code					Coord	Coord	Ped	MaxR				
30th %ile Green (s)					35.0	35.0	17.0	26.0				
30th %ile Term Code					Coord	Coord	Ped	MaxR				
10th %ile Green (s)					35.0	35.0	17.0	26.0				
10th %ile Term Code					Coord	Coord	Ped	MaxR				
Stops (vph)					586	54	204	511				
Fuel Used(gal)					9	1	4	8				
CO Emissions (g/hr)					634	53	253	567				
NOx Emissions (g/hr)					123	10	49	110				
VOC Emissions (g/hr)					147	12	59	131				
Dilemma Vehicles (#)					0	0	0	0				
Queue Length 50th (ft)					202	35	66	114				
Queue Length 95th (ft)					264	m65	97	154				
Internal Link Dist (ft)		1142			214			315			388	
Turn Bay Length (ft)												
Base Capacity (vph)					1027	410	944	1266				
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					0.65	0.17	0.56	0.62				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 27.8 Intersection LOS: C
Intersection Capacity Utilization 47.2% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 81: Huntington Avenue & Dartmouth Street



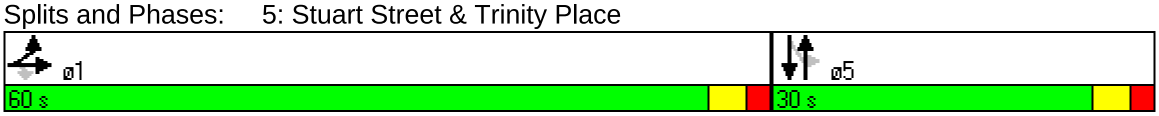
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12	12	11	12	12	11	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50		50	50	
Trailing Detector (ft)	0	0	0					0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95	0.31					0.83			0.85	
Frt			0.850					0.927				
Flt Protected		0.997									0.974	
Satd. Flow (prot)	0	4637	1439	0	0	0	0	1158	0	0	1372	0
Flt Permitted		0.997									0.881	
Satd. Flow (perm)	0	4392	450	0	0	0	0	1158	0	0	1055	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198					8				
Headway Factor	1.14	1.05	1.14	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.19	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		295			295			320			387	
Travel Time (s)		6.7			6.7			7.3			8.8	
Volume (vph)	67	915	182	0	0	0	0	26	30	18	17	0
Confl. Peds. (#/hr)	783		593						182	182		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	49%	4%	1%	0%	0%	0%	0%	0%	18%	33%	0%	0%
Adj. Flow (vph)	73	995	198	0	0	0	0	28	33	20	18	0
Lane Group Flow (vph)	0	1068	198	0	0	0	0	61	0	0	38	0
Turn Type	Split		Perm							Perm		
Protected Phases	1	1						5			5	
Permitted Phases			1							5		
Detector Phases	1	1	1					5		5	5	
Minimum Initial (s)	10.0	10.0	10.0					8.0		8.0	8.0	
Minimum Split (s)	24.0	24.0	24.0					19.0		19.0	19.0	
Total Split (s)	60.0	60.0	60.0	0.0	0.0	0.0	0.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	66.7%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	55.0	55.0	55.0					25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0	3.0					3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max					None		None	None	
Walk Time (s)	7.0	7.0	7.0					7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0					7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)		75.3	75.3					10.1			10.1	
Actuated g/C Ratio		0.84	0.84					0.11			0.11	
v/c Ratio		0.28	0.48					0.45			0.32	
Control Delay		0.4	11.5					43.6			38.7	
Queue Delay		0.1	0.8					0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		0.5	12.3					43.6			38.7	
LOS		A	B					D			D	
Approach Delay		2.3						43.6			38.7	
Approach LOS		A						D			D	
90th %ile Green (s)	68.0	68.0	68.0					12.0		12.0	12.0	
90th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
70th %ile Green (s)	70.6	70.6	70.6					9.4		9.4	9.4	
70th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
50th %ile Green (s)	72.0	72.0	72.0					8.0		8.0	8.0	
50th %ile Term Code	Coord	Coord	Coord					Min		Min	Min	
30th %ile Green (s)	72.0	72.0	72.0					8.0		8.0	8.0	
30th %ile Term Code	Coord	Coord	Coord					Min		Min	Min	
10th %ile Green (s)	85.0	85.0	85.0					0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord	Coord					Skip		Skip	Skip	
Stops (vph)		20	81					46			32	
Fuel Used(gal)		2	1					1			1	
CO Emissions (g/hr)		172	90					62			39	
NOx Emissions (g/hr)		33	18					12			8	
VOC Emissions (g/hr)		40	21					14			9	
Dilemma Vehicles (#)		0	0					0			0	
Queue Length 50th (ft)		2	47					29			22	
Queue Length 95th (ft)		10	114					66			m40	
Internal Link Dist (ft)		215			215			240			307	
Turn Bay Length (ft)												
Base Capacity (vph)		3881	409					340			305	
Starvation Cap Reductn		1035	60					0			0	
Spillback Cap Reductn		489	0					1			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.38	0.57					0.18			0.12	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 7 (8%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 5.2 Intersection LOS: A
Intersection Capacity Utilization 39.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Stuart Street & Trinity Place



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	95	624	59	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	103	678	64	0
Pedestrians	62				102	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				9	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	294			313		
pX, platoon unblocked					0.88	
vC, conflicting volume			102		710	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			102		538	102
tC, single (s)			4.4		7.6	6.9
tC, 2 stage (s)						
tF (s)			2.4		3.9	3.3
p0 queue free %			92		78	100
cM capacity (veh/h)			1267		292	860

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	329	452	64
Volume Left	103	0	64
Volume Right	0	0	0
cSH	1267	1700	292
Volume to Capacity	0.08	0.27	0.22
Queue Length 95th (ft)	7	0	21
Control Delay (s)	3.1	0.0	20.8
Lane LOS	A		C
Approach Delay (s)	1.3		20.8
Approach LOS			C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	14	16	12	12	12	12	11	11	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50	50			
Trailing Detector (ft)	0	0	0					0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.68								0.49			
Frt			0.850						0.850			
Flt Protected	0.950											
Satd. Flow (prot)	3536	4834	1569	0	0	0	0	3049	1338	0	0	0
Flt Permitted	0.950											
Satd. Flow (perm)	2416	4834	1569	0	0	0	0	3049	652	0	0	0
Right Turn on Red	No		No			Yes			Yes			Yes
Satd. Flow (RTOR)									23			
Headway Factor	0.97	1.05	0.97	1.14	1.14	1.14	1.14	1.19	1.19	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		317			316			208			395	
Travel Time (s)		8.6			8.6			5.7			10.8	
Volume (vph)	923	825	478	0	0	0	0	528	87	0	0	0
Confl. Peds. (#/hr)	199		226						500			
Confl. Bikes (#/hr)			3						8			
Peak Hour Factor	0.94	0.83	0.83	0.92	0.92	0.92	0.92	0.92	0.45	0.92	0.92	0.92
Heavy Vehicles (%)	1%	3%	5%	0%	0%	0%	0%	3%	5%	0%	0%	0%
Adj. Flow (vph)	982	994	576	0	0	0	0	574	193	0	0	0
Lane Group Flow (vph)	982	994	576	0	0	0	0	574	193	0	0	0
Turn Type	custom		Prot						custom			
Protected Phases		1	1					2				
Permitted Phases	1 5							5	2 5			
Detector Phases		1	1					2	2 5			
Minimum Initial (s)		8.0	8.0					8.0				
Minimum Split (s)		18.0	18.0					14.0				
Total Split (s)	76.0	50.0	50.0	0.0	0.0	0.0	0.0	14.0	40.0	0.0	0.0	0.0
Total Split (%)	84.4%	55.6%	55.6%	0.0%	0.0%	0.0%	0.0%	15.6%	44.4%	0.0%	0.0%	0.0%
Maximum Green (s)		46.0	46.0					10.0				
Yellow Time (s)		3.0	3.0					3.0				
All-Red Time (s)		1.0	1.0					1.0				
Lead/Lag		Lead	Lead					Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0					2.0				
Recall Mode		C-Max	C-Max					Max				
Walk Time (s)		7.0	7.0					7.0				
Flash Dont Walk (s)		7.0	7.0					3.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	72.0	46.0	46.0					36.0	36.0			
Actuated g/C Ratio	0.80	0.51	0.51					0.40	0.40			
v/c Ratio	0.51	0.40	0.72					0.47	0.70			
Control Delay	4.1	14.2	23.3					21.6	36.0			

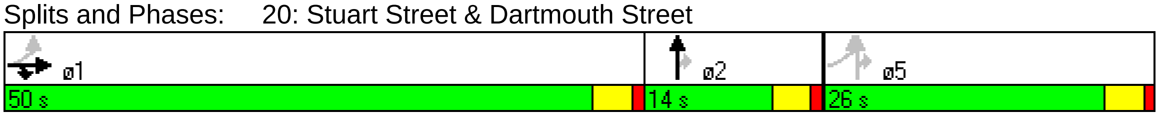
Lane Group	ø5
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	5
Permitted Phases	
Detector Phases	
Minimum Initial (s)	8.0
Minimum Split (s)	16.0
Total Split (s)	26.0
Total Split (%)	29%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Max
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0					0.0	0.0			
Total Delay	4.1	14.2	23.3					21.6	36.0			
LOS	A	B	C					C	D			
Approach Delay		12.4						25.2				
Approach LOS		B						C				
90th %ile Green (s)		46.0	46.0					10.0				
90th %ile Term Code		Coord	Coord					MaxR				
70th %ile Green (s)		46.0	46.0					10.0				
70th %ile Term Code		Coord	Coord					MaxR				
50th %ile Green (s)		46.0	46.0					10.0				
50th %ile Term Code		Coord	Coord					MaxR				
30th %ile Green (s)		46.0	46.0					10.0				
30th %ile Term Code		Coord	Coord					MaxR				
10th %ile Green (s)		46.0	46.0					10.0				
10th %ile Term Code		Coord	Coord					MaxR				
Stops (vph)	271	479	363					373	63			
Fuel Used(gal)	4	6	5					5	1			
CO Emissions (g/hr)	301	450	346					327	72			
NOx Emissions (g/hr)	59	88	67					64	14			
VOC Emissions (g/hr)	70	104	80					76	17			
Dilemma Vehicles (#)	0	0	0					0	0			
Queue Length 50th (ft)	71	120	241					124	79			
Queue Length 95th (ft)	98	137	322					172	55			
Internal Link Dist (ft)		237			236			128			315	
Turn Bay Length (ft)												
Base Capacity (vph)	1933	2471	802					1220	275			
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	0.51	0.40	0.72					0.47	0.70			

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 55 (61%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 72.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 20: Stuart Street & Dartmouth Street



Lane Group	ø5
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
90th %ile Green (s)	22.0
90th %ile Term Code	MaxR
70th %ile Green (s)	22.0
70th %ile Term Code	MaxR
50th %ile Green (s)	22.0
50th %ile Term Code	MaxR
30th %ile Green (s)	22.0
30th %ile Term Code	MaxR
10th %ile Green (s)	22.0
10th %ile Term Code	MaxR
Stops (vph)	
Fuel Used(gal)	
CO Emissions (g/hr)	
NOx Emissions (g/hr)	
VOC Emissions (g/hr)	
Dilemma Vehicles (#)	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	12	12	12	12	12	12	12	10	12
Storage Length (ft)	0		90	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50							50	50	
Trailing Detector (ft)		0	0							0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.61								0.90	
Frt			0.850									
Flt Protected											0.986	
Satd. Flow (prot)	0	2824	1209	0	0	0	0	0	0	0	2773	0
Flt Permitted											0.986	
Satd. Flow (perm)	0	2824	736	0	0	0	0	0	0	0	2500	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)			176								83	
Headway Factor	1.14	1.33	1.42	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.33	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		274			822			322			378	
Travel Time (s)		7.5			22.4			8.8			10.3	
Volume (vph)	0	713	258	0	0	0	0	0	0	218	548	0
Confl. Peds. (#/hr)			378							312		
Confl. Bikes (#/hr)			6									
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	1%	0%	0%	0%	0%	0%	0%	1%	3%	0%
Parking (#/hr)		0	0							0	0	
Adj. Flow (vph)	0	784	284	0	0	0	0	0	0	240	602	0
Lane Group Flow (vph)	0	784	284	0	0	0	0	0	0	0	842	0
Turn Type			Perm							Perm		
Protected Phases		1									5	
Permitted Phases			1							5		
Detector Phases		1	1							5	5	
Minimum Initial (s)		8.0	8.0							8.0	8.0	
Minimum Split (s)		18.0	18.0							24.0	24.0	
Total Split (s)	0.0	47.0	47.0	0.0	0.0	0.0	0.0	0.0	0.0	43.0	43.0	0.0
Total Split (%)	0.0%	52.2%	52.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	47.8%	47.8%	0.0%
Maximum Green (s)		43.0	43.0							35.0	35.0	
Yellow Time (s)		3.0	3.0							3.0	3.0	
All-Red Time (s)		1.0	1.0							5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		2.0	2.0							2.0	2.0	
Recall Mode		C-Max	C-Max							Max	Max	
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		7.0	7.0							9.0	9.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effct Green (s)		43.0	43.0								39.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.48	0.48								0.43	
v/c Ratio		0.58	0.64								0.75	
Control Delay		12.0	11.0								26.9	
Queue Delay		0.8	0.3								1.3	
Total Delay		12.8	11.2								28.2	
LOS		B	B								C	
Approach Delay		12.4									28.2	
Approach LOS		B									C	
90th %ile Green (s)		43.0	43.0							35.0	35.0	
90th %ile Term Code		Coord	Coord							MaxR	MaxR	
70th %ile Green (s)		43.0	43.0							35.0	35.0	
70th %ile Term Code		Coord	Coord							MaxR	MaxR	
50th %ile Green (s)		43.0	43.0							35.0	35.0	
50th %ile Term Code		Coord	Coord							MaxR	MaxR	
30th %ile Green (s)		43.0	43.0							35.0	35.0	
30th %ile Term Code		Coord	Coord							MaxR	MaxR	
10th %ile Green (s)		43.0	43.0							35.0	35.0	
10th %ile Term Code		Coord	Coord							MaxR	MaxR	
Stops (vph)		302	101								632	
Fuel Used(gal)		5	2								9	
CO Emissions (g/hr)		319	109								635	
NOx Emissions (g/hr)		62	21								124	
VOC Emissions (g/hr)		74	25								147	
Dilemma Vehicles (#)		0	0								0	
Queue Length 50th (ft)		96	11								210	
Queue Length 95th (ft)		115	m136								281	
Internal Link Dist (ft)		194			742			242			298	
Turn Bay Length (ft)			90									
Base Capacity (vph)		1349	444								1130	
Starvation Cap Reductn		276	14								125	
Spillback Cap Reductn		0	0								0	
Storage Cap Reductn		0	0								0	
Reduced v/c Ratio		0.73	0.66								0.84	

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 49 (54%), Referenced to phase 1:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

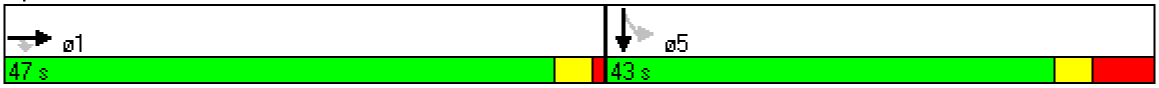
Intersection Signal Delay: 19.3 Intersection LOS: B

Intersection Capacity Utilization 57.5% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 466: Stuart Street & Clarendon Street



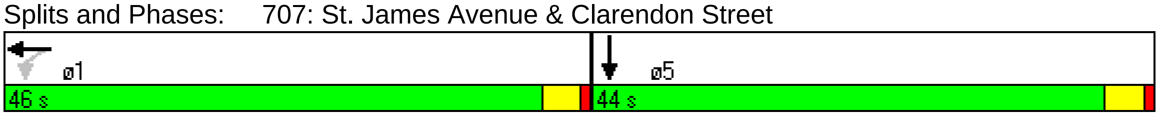
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	16	12	12	12	12	12	15	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)				50	50						50	
Trailing Detector (ft)				0	0						0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					0.91						0.91	
Frt											0.964	
Flt Protected					0.987							
Satd. Flow (prot)	0	0	0	0	3455	0	0	0	0	0	3082	0
Flt Permitted					0.987							
Satd. Flow (perm)	0	0	0	0	3149	0	0	0	0	0	3082	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					79						60	
Headway Factor	1.14	1.14	1.14	1.14	0.97	1.14	1.14	1.14	1.14	1.14	1.01	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		290			654			378			157	
Travel Time (s)		7.9			17.8			10.3			4.3	
Volume (vph)	0	0	0	237	638	0	0	0	0	0	530	166
Confl. Peds. (#/hr)				228								311
Confl. Bikes (#/hr)												9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	6%	0%	0%	0%	0%	0%	2%	2%
Parking (#/hr)												0
Adj. Flow (vph)	0	0	0	244	658	0	0	0	0	0	546	171
Lane Group Flow (vph)	0	0	0	0	902	0	0	0	0	0	717	0
Turn Type				Perm								
Protected Phases					1						5	
Permitted Phases				1								
Detector Phases				1	1						5	
Minimum Initial (s)				8.0	8.0						8.0	
Minimum Split (s)				18.0	18.0						18.0	
Total Split (s)	0.0	0.0	0.0	46.0	46.0	0.0	0.0	0.0	0.0	0.0	44.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	51.1%	51.1%	0.0%	0.0%	0.0%	0.0%	0.0%	48.9%	0.0%
Maximum Green (s)				42.0	42.0						40.0	
Yellow Time (s)				3.0	3.0						3.0	
All-Red Time (s)				1.0	1.0						1.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				2.0	2.0						2.0	
Recall Mode				C-Max	C-Max						Max	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				7.0	7.0						7.0	
Pedestrian Calls (#/hr)				0	0						0	
Act Effct Green (s)					42.0						40.0	
Actuated g/C Ratio					0.47						0.44	
v/c Ratio					0.60						0.51	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					18.0						17.9	
Queue Delay					0.1						0.0	
Total Delay					18.1						17.9	
LOS					B						B	
Approach Delay					18.1						17.9	
Approach LOS					B						B	
90th %ile Green (s)				42.0	42.0						40.0	
90th %ile Term Code				Coord	Coord						MaxR	
70th %ile Green (s)				42.0	42.0						40.0	
70th %ile Term Code				Coord	Coord						MaxR	
50th %ile Green (s)				42.0	42.0						40.0	
50th %ile Term Code				Coord	Coord						MaxR	
30th %ile Green (s)				42.0	42.0						40.0	
30th %ile Term Code				Coord	Coord						MaxR	
10th %ile Green (s)				42.0	42.0						40.0	
10th %ile Term Code				Coord	Coord						MaxR	
Stops (vph)					569						440	
Fuel Used(gal)					10						5	
CO Emissions (g/hr)					718						360	
NOx Emissions (g/hr)					140						70	
VOC Emissions (g/hr)					166						83	
Dilemma Vehicles (#)					0						0	
Queue Length 50th (ft)					174						135	
Queue Length 95th (ft)					235						187	
Internal Link Dist (ft)		210			574			298			77	
Turn Bay Length (ft)												
Base Capacity (vph)					1512						1403	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					49						2	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.62						0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 6 (7%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 58.2% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 707: St. James Avenue & Clarendon Street



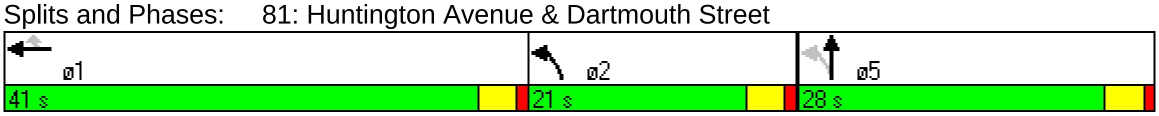
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱	↰↰	↑↑↑				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	12	12	12	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)					50	50	50	50				
Trailing Detector (ft)					0	0	0	0				
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94	0.35					
Frt						0.850						
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	2842	1377	3060	4468	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	2842	1290	1068	4468	0	0	0	0
Right Turn on Red			Yes			No	No		Yes			Yes
Satd. Flow (RTOR)												
Headway Factor	1.14	1.14	1.14	1.19	1.27	1.19	1.14	1.19	1.14	1.14	1.14	1.14
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1222			317			395			468	
Travel Time (s)		33.3			8.6			10.8			12.8	
Volume (vph)	0	0	0	0	755	127	593	858	0	0	0	0
Confl. Peds. (#/hr)						34	474					
Confl. Bikes (#/hr)						13						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.88	0.81	0.91	0.95	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	5%	2%	3%	1%	0%	0%	0%	0%
Parking (#/hr)					0			0				
Adj. Flow (vph)	0	0	0	0	858	157	652	903	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	858	157	652	903	0	0	0	0
Turn Type						Perm	pm+pt					
Protected Phases					1		2	5				
Permitted Phases						1	5					
Detector Phases					1	1	2	5				
Minimum Initial (s)					8.0	8.0	8.0	8.0				
Minimum Split (s)					24.0	24.0	21.0	24.0				
Total Split (s)	0.0	0.0	0.0	0.0	41.0	41.0	21.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	45.6%	45.6%	23.3%	31.1%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)					37.0	37.0	17.0	24.0				
Yellow Time (s)					3.0	3.0	3.0	3.0				
All-Red Time (s)					1.0	1.0	1.0	1.0				
Lead/Lag					Lead	Lead	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)					2.0	2.0	2.0	2.0				
Recall Mode					C-Max	C-Max	Ped	Max				
Walk Time (s)					8.0	8.0	8.0	8.0				
Flash Dont Walk (s)					12.0	12.0	9.0	12.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)					37.0	37.0	41.0	24.0				
Actuated g/C Ratio					0.41	0.41	0.46	0.27				
v/c Ratio					0.73	0.30	0.76	0.76				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					20.1	15.9	20.8	36.6				
Queue Delay					0.0	0.0	0.0	0.0				
Total Delay					20.1	15.9	20.8	36.6				
LOS					C	B	C	D				
Approach Delay					19.5			30.0				
Approach LOS					B			C				
90th %ile Green (s)					37.0	37.0	17.0	24.0				
90th %ile Term Code					Coord	Coord	Max	MaxR				
70th %ile Green (s)					37.0	37.0	17.0	24.0				
70th %ile Term Code					Coord	Coord	Max	MaxR				
50th %ile Green (s)					37.0	37.0	17.0	24.0				
50th %ile Term Code					Coord	Coord	Max	MaxR				
30th %ile Green (s)					37.0	37.0	17.0	24.0				
30th %ile Term Code					Coord	Coord	Max	MaxR				
10th %ile Green (s)					37.0	37.0	17.0	24.0				
10th %ile Term Code					Coord	Coord	Ped	MaxR				
Stops (vph)					390	59	472	805				
Fuel Used(gal)					7	1	6	12				
CO Emissions (g/hr)					463	69	441	865				
NOx Emissions (g/hr)					90	13	86	168				
VOC Emissions (g/hr)					107	16	102	200				
Dilemma Vehicles (#)					0	0	0	0				
Queue Length 50th (ft)					130	41	149	187				
Queue Length 95th (ft)					176	70	204	234				
Internal Link Dist (ft)		1142			237			315			388	
Turn Bay Length (ft)												
Base Capacity (vph)					1168	530	863	1191				
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					0.73	0.30	0.76	0.76				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 7 (8%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 25.8 Intersection LOS: C
Intersection Capacity Utilization 90.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 81: Huntington Avenue & Dartmouth Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12	12	11	12	12	11	12
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50					50		50	50	
Trailing Detector (ft)	0	0	0					0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97	0.30					0.78			0.82	
Frt			0.850					0.906				
Flt Protected		0.997									0.960	
Satd. Flow (prot)	0	4799	1454	0	0	0	0	1175	0	0	1353	0
Flt Permitted		0.997									0.691	
Satd. Flow (perm)	0	4647	443	0	0	0	0	1175	0	0	795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77					10				
Headway Factor	1.14	1.05	1.14	1.14	1.14	1.14	1.14	1.19	1.14	1.14	1.19	1.14
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		316			274			278			387	
Travel Time (s)		7.2			6.2			6.3			8.8	
Volume (vph)	45	796	71	0	0	0	0	46	104	74	16	0
Confl. Peds. (#/hr)	402		609						169	169		
Confl. Bikes (#/hr)			4									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	29%	2%	0%	0%	0%	0%	0%	0%	0%	21%	0%	0%
Adj. Flow (vph)	49	865	77	0	0	0	0	50	113	80	17	0
Lane Group Flow (vph)	0	914	77	0	0	0	0	163	0	0	97	0
Turn Type	Split		Perm							Perm		
Protected Phases	1	1						5			5	
Permitted Phases			1							5		
Detector Phases	1	1	1					5		5	5	
Minimum Initial (s)	10.0	10.0	10.0					8.0		8.0	8.0	
Minimum Split (s)	24.0	24.0	24.0					19.0		19.0	19.0	
Total Split (s)	60.0	60.0	60.0	0.0	0.0	0.0	0.0	30.0	0.0	30.0	30.0	0.0
Total Split (%)	66.7%	66.7%	66.7%	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	33.3%	33.3%	0.0%
Maximum Green (s)	55.0	55.0	55.0					25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0	3.0					3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0					2.0		2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max					None		None	None	
Walk Time (s)	7.0	7.0	7.0					7.0		7.0	7.0	
Flash Dont Walk (s)	12.0	12.0	12.0					7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0					0		0	0	
Act Effct Green (s)		65.8	65.8					16.2			16.2	
Actuated g/C Ratio		0.73	0.73					0.18			0.18	
v/c Ratio		0.26	0.22					0.74			0.68	
Control Delay		2.0	1.5					51.8			49.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.1	0.0					0.0			0.0	
Total Delay		2.1	1.5					51.8			49.9	
LOS		A	A					D			D	
Approach Delay		2.0						51.8			49.9	
Approach LOS		A						D			D	
90th %ile Green (s)	56.4	56.4	56.4					23.6		23.6	23.6	
90th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
70th %ile Green (s)	62.0	62.0	62.0					18.0		18.0	18.0	
70th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
50th %ile Green (s)	65.3	65.3	65.3					14.7		14.7	14.7	
50th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
30th %ile Green (s)	68.4	68.4	68.4					11.6		11.6	11.6	
30th %ile Term Code	Coord	Coord	Coord					Gap		Gap	Gap	
10th %ile Green (s)	72.0	72.0	72.0					8.0		8.0	8.0	
10th %ile Term Code	Coord	Coord	Coord					Min		Min	Min	
Stops (vph)		98	1					130			76	
Fuel Used(gal)		3	0					3			2	
CO Emissions (g/hr)		207	14					183			111	
NOx Emissions (g/hr)		40	3					36			22	
VOC Emissions (g/hr)		48	3					43			26	
Dilemma Vehicles (#)		0	0					0			0	
Queue Length 50th (ft)		23	0					84			46	
Queue Length 95th (ft)		31	m2					136			m81	
Internal Link Dist (ft)		236			194			198			307	
Turn Bay Length (ft)												
Base Capacity (vph)		3510	345					347			230	
Starvation Cap Reductn		1035	0					0			0	
Spillback Cap Reductn		0	0					0			0	
Storage Cap Reductn		0	0					0			0	
Reduced v/c Ratio		0.37	0.22					0.47			0.42	

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 58 (64%), Referenced to phase 1:EBTL, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

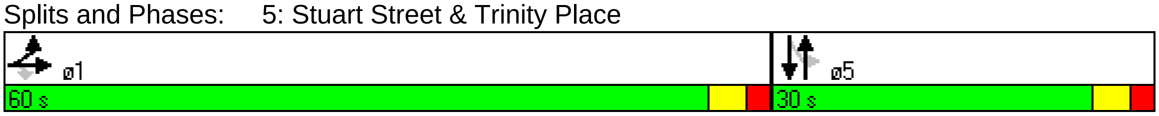
Intersection Signal Delay: 12.2 Intersection LOS: B

Intersection Capacity Utilization 49.7% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 5: Stuart Street & Trinity Place



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	46	758	124	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	50	824	135	0
Pedestrians	99				143	
Lane Width (ft)	0.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				12	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	317			290		
pX, platoon unblocked					0.85	
vC, conflicting volume			143		754	143
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			143		542	143
tC, single (s)			4.2		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.3
p0 queue free %			96		58	100
cM capacity (veh/h)			1234		324	779

Direction, Lane #	WB 1	WB 2	NB 1
Volume Total	325	549	135
Volume Left	50	0	135
Volume Right	0	0	0
cSH	1234	1700	324
Volume to Capacity	0.04	0.32	0.42
Queue Length 95th (ft)	3	0	49
Control Delay (s)	1.6	0.0	23.8
Lane LOS	A		C
Approach Delay (s)	0.6		23.8
Approach LOS			C

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Trip Generation

40 Trinity Place

March 25, 2013

Trip Generation Estimation (Proposed Program)

Howard/Stein-Hudson Associates

Component	Size	Category	Trip Rates (Trips/ksf or unit)	Unadjusted Vehicle Trips	Internal trips	Capture Rate	Less Internal Trips	Assumed national vehicle occupancy rate[9]	**Converted to Person trips**	Transit Share[10]	**Transit Trips**	Walk/Bike/ Other Share[10]	**Walk/ Bike/ Other Trips**	Vehicle Share[10]	Vehicle Person Trips	Assumed national vehicle occupancy rate[9]	**Total Adjusted Vehicle Trips**
								Daily Trip Generation									
Hotel [1]																	
	227	Total	8.17	1855			1,855	1.1	**2,040**	19%	**388**	57%	**1,163**	24%	490	1.1	**445**
	units	In	4.09	927			927	1.1	**1,020**	19%	**194**	57%	**581**	24%	245	1.1	**223**
		Out	4.09	927			927	1.1	**1,020**	19%	**194**	57%	**581**	24%	245	1.1	**223**
Condominiums [2]																	
	115	Total	5.71	657			657	1.1	**723**	19%	**137**	57%	**412**	24%	174	1.1	**158**
	units	In	2.86	329			329	1.1	**361**	19%	**69**	57%	**206**	24%	87	1.1	**79**
		Out	2.86	329			329	1.1	**361**	19%	**69**	57%	**206**	24%	87	1.1	**79**
Restaurant [3]																	
	11.3	Total	89.95	1,016			1,016	2.2	**2,236**	16%	**358**	55%	**1,230**	29%	648	2.2	**295**
	KSF	In	44.98	508			508	2.2	**1,118**	16%	**179**	55%	**615**	29%	324	2.2	**147**
		Out	44.98	508			508	2.2	**1,118**	16%	**179**	55%	**615**	29%	324	2.2	**147**
Health/Fitness Club [4]																	
	5.5	Total	32.93	181			181	2.2	**398**	16%	**64**	55%	**219**	29%	116	2.2	**53**
	KSF	In	16.47	91			91	2.2	**199**	16%	**32**	55%	**110**	29%	58	2.2	**26**
		Out	16.47	91			91	2.2	**199**	16%	**32**	55%	**110**	29%	58	2.2	**26**
Total		Total		**3,709**			**1,855**		**5,398**		**947**		**3,024**		1,427		**950**
		In		**1,855**			**1,855**		**2,699**		**473**		**1,512**		714		**475**
		Out		**1,855**			**1,855**		**2,699**		**473**		**1,512**		714		**475**
								AM Peak Hour Trip Generation									
Hotel [1]																	
	227	Total	0.53	120			120	1.1	**132**		**25**		**81**		26	1.1	**24**
	units	In	0.31	71			71	1.1	**78**	22%	**17**	59%	**46**	19%	15	1.1	**13**
		Out	0.22	49			49	1.1	**54**	15%	**8**	64%	**35**	21%	11	1.1	**10**
Condominiums [2]																	
	115	Total	0.54	62			62	1.1	**68**		**11**		**43**		14	1.1	**13**
	units	In	0.10	12			12	1.1	**13**	22%	**3**	59%	**8**	19%	2	1.1	**2**
		Out	0.44	50			50	1.1	**55**	15%	**8**	64%	**35**	21%	12	1.1	**11**
Restaurant [3]																	
	11.3	Total	0.81	9			9	2.2	**20**		**4**		**12**		5	2.2	**2**
	KSF	In	0.66	8			8	2.2	**17**	19%	**3**	57%	**9**	24%	4	2.2	**2**
		Out	0.15	2			2	2.2	**4**	13%	**0**	61%	**2**	26%	1	2.2	**0**
Health/Fitness Club [4]																	
	5.5	Total	1.41	8			8	2.2	**17**		**3**		**10**		4	2.2	**2**
	KSF	In	0.71	4			4	2.2	**9**	19%	**2**	57%	**5**	24%	2	2.2	**1**
		Out	0.71	4			4	2.2	**9**	13%	**1**	61%	**5**	26%	2	2.2	**1**
Total		Total		**199**			**199**		**238**		**43**		**146**		50		**41**
		In		**94**			**94**		**116**		**25**		**68**		23		**18**
		Out		**105**			**105**		**122**		**18**		**78**		26		**22**
								PM Peak Hour Trip Generation									
Hotel [1]																	
	227	Total	0.60	136			136	1.1	**150**		**28**		**92**		30	1.1	**27**
	units	In	0.31	69			69	1.1	**76**	15%	**11**	64%	**49**	21%	16	1.1	**15**
		Out	0.29	67			67	1.1	**73**	22%	**16**	59%	**43**	19%	14	1.1	**13**
Condominiums [2]																	
	115	Total	0.47	55			55	1.1	**60**		**11**		**37**		12	1.1	**11**
	units	In	0.29	34			34	1.1	**37**	15%	**6**	64%	**24**	21%	8	1.1	**7**
		Out	0.18	21			21	1.1	**23**	22%	**5**	59%	**13**	19%	4	1.1	**4**
Restaurant [3]																	
	11.3	Total	7.49	85			85	2.2	**186**		**28**		**111**		47	2.2	**21**
	KSF	In	5.02	57			57	2.2	**125**	13%	**16**	61%	**76**	26%	32	2.2	**15**
		Out	2.47	28			28	2.2	**61**	19%	**12**	57%	**35**	24%	15	2.2	**7**
Health/Fitness Club [4]																	
	5.5	Total	3.84	21			21	2.2	**46**		**7**		**28**		12	2.2	**5**
	KSF	In	2.19	12			12	2.2	**26**	13%	**3**	61%	**16**	26%	7	2.2	**3**
		Out	1.65	9			9	2.2	**20**	19%	**4**	57%	**11**	24%	5	2.2	**2**
Total		Total		**297**			**297**		**442**		**73**		**268**		101		**65**
		In		**172**			**172**		**265**		**37**		**165**		63		**40**
		Out		**124**			**124**		**178**		**37**		**103**		38		**26**

Notes:

1. ITE Trip Generation, 9th Edition, LUC 310 (Hotel), average rate.
2. ITE Trip Generation, 9th Edition, LUC 232 (High-Rise Residential Condominium/Townhouse), fitted curve equation
3. ITE Trip Generation, 9th Edition, LUC 931 (Quality Restaurant), average rate.
4. ITE Trip Generation 9th Edition, LUC 492 (Health/Fitness Club), average rate for daily and a.m.. peak: fitted curve for p.m.
5. Mode shares based on BTD Data for Area 4

Appendix B Transportation is available upon request

Appendix C

Wind

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
1	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	16	-24%	Walking	24	-17%	Acceptable
		Summer	13	-19%	Standing	19	-14%	Acceptable
		Fall	15	-21%	Standing	22	-15%	Acceptable
		Winter	17	-26%	Walking	25	-19%	Acceptable
		Annual	16	-20%	Walking	23	-18%	Acceptable
2	A			DATA NOT AVAILABLE				
				DATA NOT AVAILABLE				
				DATA NOT AVAILABLE				
				DATA NOT AVAILABLE				
				DATA NOT AVAILABLE				
	B	Spring	6		Sitting	10		Acceptable
		Summer	5		Sitting	8		Acceptable
		Fall	6		Sitting	10		Acceptable
		Winter	6		Sitting	11		Acceptable
		Annual	6		Sitting	10		Acceptable
3	A	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
4	A				DATA NOT AVAILABLE			
					DATA NOT AVAILABLE			
					DATA NOT AVAILABLE			
					DATA NOT AVAILABLE			
	B	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
5	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
6	A	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	20		Uncomfortable	29		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	28		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
7	A	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
	B	Spring	18		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	22		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable
8	A	Spring	20		Uncomfortable	28		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
	B	Spring	20		Uncomfortable	28		Acceptable
		Summer	17		Walking	22		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
9	A	Spring	23		Uncomfortable	30		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	24		Uncomfortable	31		Acceptable
		Annual	22		Uncomfortable	29		Acceptable
	B	Spring	23		Uncomfortable	30		Acceptable
		Summer	18		Walking	24		Acceptable
		Fall	21		Uncomfortable	28		Acceptable
		Winter	24		Uncomfortable	31		Acceptable
		Annual	22		Uncomfortable	29		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
10	A	Spring	26		Uncomfortable	34		Unacceptabl
		Summer	20		Uncomfortable	27		Acceptable
		Fall	23		Uncomfortable	31		Acceptable
		Winter	26		Uncomfortable	35		Unacceptabl
		Annual	24		Uncomfortable	32		Unacceptabl
	B	Spring	26		Uncomfortable	34		Unacceptabl
		Summer	20		Uncomfortable	27		Acceptable
		Fall	24		Uncomfortable	32		Unacceptabl
		Winter	27		Uncomfortable	35		Unacceptabl
		Annual	24		Uncomfortable	33		Unacceptabl
11	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
12	A	Spring	26		Uncomfortable	32		Unacceptabl
		Summer	21		Uncomfortable	26		Acceptable
		Fall	22		Uncomfortable	28		Acceptable
		Winter	25		Uncomfortable	32		Unacceptabl
		Annual	23		Uncomfortable	30		Acceptable
	B	Spring	26		Uncomfortable	32		Unacceptabl
		Summer	21		Uncomfortable	26		Acceptable
		Fall	23		Uncomfortable	29		Acceptable
		Winter	25		Uncomfortable	32		Unacceptabl
		Annual	24		Uncomfortable	30		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
13	A	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	15		Standing	22		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
14	A	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	25		Acceptable
	B	Spring	19		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	25		Acceptable
15	A	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	15		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	16		Walking	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
16	A	Spring	17		Walking	26		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	18		Walking	28		Acceptable
		Annual	16		Walking	25		Acceptable
	B	Spring	17		Walking	27		Acceptable
		Summer	13		Standing	21		Acceptable
		Fall	16		Walking	25		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	17		Walking	27		Acceptable
17	A	Spring	23		Uncomfortable	32		Unacceptabl
		Summer	19		Walking	26		Acceptable
		Fall	22		Uncomfortable	30		Acceptable
		Winter	26		Uncomfortable	35		Unacceptabl
		Annual	23		Uncomfortable	32		Unacceptabl
	B	Spring	20	-13%	Uncomfortable	30		Acceptable
		Summer	16	-16%	Walking	24		Acceptable
		Fall	19	-14%	Walking	28		Acceptable
		Winter	22	-15%	Uncomfortable	32		Unacceptabl
		Annual	20	-13%	Uncomfortable	30		Acceptable
18	A	Spring	19		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	26		Acceptable
	B	Spring	20		Uncomfortable	28		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	22		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	28		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
19	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	32		Unacceptabl
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	23		Uncomfortable	32		Unacceptabl
		Summer	19	12%	Walking	26		Acceptable
		Fall	22		Uncomfortable	30		Acceptable
		Winter	25		Uncomfortable	34		Unacceptabl
		Annual	22		Uncomfortable	31		Acceptable
20	A	Spring	31		Dangerous	39		Unacceptabl
		Summer	24		Uncomfortable	30		Acceptable
		Fall	28		Dangerous	36		Unacceptabl
		Winter	31		Dangerous	39		Unacceptabl
		Annual	29		Dangerous	37		Unacceptabl
	B	Spring	31		Dangerous	40		Unacceptabl
		Summer	24		Uncomfortable	31		Acceptable
		Fall	28		Dangerous	36		Unacceptabl
		Winter	32		Dangerous	40		Unacceptabl
		Annual	29		Dangerous	37		Unacceptabl
21	A	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	18	12%	Walking	26	13%	Acceptable
		Summer	16	14%	Walking	22		Acceptable
		Fall	18	12%	Walking	25		Acceptable
		Winter	20	18%	Uncomfortable	27		Acceptable
		Annual	18	12%	Walking	25		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
22	A	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	20		Uncomfortable	29		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21	11%	Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
23	A	Spring	23		Uncomfortable	31		Acceptable
		Summer	18		Walking	25		Acceptable
		Fall	21		Uncomfortable	29		Acceptable
		Winter	24		Uncomfortable	33		Unacceptabl
		Annual	22		Uncomfortable	30		Acceptable
	B	Spring	23		Uncomfortable	32		Unacceptabl
		Summer	18		Walking	25		Acceptable
		Fall	22		Uncomfortable	30		Acceptable
		Winter	25		Uncomfortable	33		Unacceptabl
		Annual	23		Uncomfortable	31		Acceptable
24	A	Spring	17		Walking	25		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	17		Walking	26		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17		Walking	25		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
25	A	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	24		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	21		Uncomfortable	32		Unacceptabl
		Annual	19		Walking	29		Acceptable
	B	Spring	21		Uncomfortable	30		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	19		Walking	29		Acceptable
		Winter	22		Uncomfortable	32		Unacceptabl
		Annual	20		Uncomfortable	30		Acceptable
26	A	Spring	15		Standing	23		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	24		Acceptable
		Summer	14		Standing	21	11%	Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
27	A	Spring	16		Walking	25		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	15		Standing	24		Acceptable
	B	Spring	17		Walking	26		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	17		Walking	27		Acceptable
		Annual	16		Walking	24		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
28	A	Spring	13		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
29	A	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	15		Standing	21		Acceptable
30	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	13		Standing	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
31	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable
32	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	14		Standing	20		Acceptable
33	A	Spring	11		Sitting	18		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	8	-11%	Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	15		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
34	A	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	13		Standing	20		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
35	A	Spring	19		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	24		Acceptable
		Winter	20		Uncomfortable	28		Acceptable
		Annual	18		Walking	25		Acceptable
36	A	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	12		Sitting	20		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	18		Acceptable
		Winter	13		Standing	20		Acceptable
		Annual	12		Sitting	18		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
37	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	24		Acceptable
		Annual	14		Standing	22		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
38	A	Spring	14		Standing	23		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	22		Acceptable
		Winter	15		Standing	25		Acceptable
		Annual	14		Standing	23		Acceptable
	B	Spring	14		Standing	23		Acceptable
		Summer	10		Sitting	17		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	25		Acceptable
		Annual	13		Standing	22		Acceptable
39	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	33		Unacceptabl
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	20		Uncomfortable	29		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	18		Walking	27		Acceptable
		Winter	22		Uncomfortable	32		Unacceptabl
		Annual	19		Walking	28		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
40	A	Spring	16		Walking	26		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	18		Walking	28		Acceptable
		Annual	16		Walking	26		Acceptable
	B	Spring	16		Walking	26		Acceptable
		Summer	12		Sitting	20		Acceptable
		Fall	15		Standing	24		Acceptable
		Winter	17		Walking	28		Acceptable
		Annual	15		Standing	25		Acceptable
41	A	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
42	A	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
43	A	Spring	15		Standing	24		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	15		Standing	23		Acceptable
	B	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	16		Walking	25		Acceptable
44	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	26		Acceptable
		Winter	23		Uncomfortable	30		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	27		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
45	A	Spring	25		Uncomfortable	33		Unacceptabl
		Summer	20		Uncomfortable	26		Acceptable
		Fall	23		Uncomfortable	31		Acceptable
		Winter	26		Uncomfortable	35		Unacceptabl
		Annual	24		Uncomfortable	32		Unacceptabl
	B	Spring	29	16%	Dangerous	40	21%	Unacceptabl
		Summer	23	15%	Uncomfortable	31	19%	Acceptable
		Fall	27	17%	Uncomfortable	37	19%	Unacceptabl
		Winter	32	23%	Dangerous	43	23%	Unacceptabl
		Annual	29	21%	Dangerous	39	22%	Unacceptabl

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
46	A	Spring	22		Uncomfortable	30		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	29		Acceptable
	B	Spring	22		Uncomfortable	29		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	23		Uncomfortable	31		Acceptable
		Annual	21		Uncomfortable	28		Acceptable
47	A	Spring	27		Uncomfortable	35		Unacceptabl
		Summer	24		Uncomfortable	30		Acceptable
		Fall	25		Uncomfortable	32		Unacceptabl
		Winter	25		Uncomfortable	33		Unacceptabl
		Annual	25		Uncomfortable	33		Unacceptabl
	B	Spring	27		Uncomfortable	35		Unacceptabl
		Summer	24		Uncomfortable	30		Acceptable
		Fall	24		Uncomfortable	32		Unacceptabl
		Winter	25		Uncomfortable	33		Unacceptabl
		Annual	25		Uncomfortable	33		Unacceptabl
48	A	Spring	21		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable
	B	Spring	21		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	20		Uncomfortable	28		Acceptable
		Winter	21		Uncomfortable	30		Acceptable
		Annual	20		Uncomfortable	28		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
49	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
	B	Spring	20		Uncomfortable	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	19		Walking	27		Acceptable
50	A	Spring	18		Walking	26		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	18		Walking	26		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	24		Acceptable
		Winter	18		Walking	26		Acceptable
		Annual	17		Walking	24		Acceptable
51	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	24		Acceptable
	B	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	25		Acceptable
		Annual	15		Standing	24		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
52	A	Spring	13		Standing	20		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	12		Sitting	19		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	19		Acceptable
53	A	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	29		Acceptable
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	21		Uncomfortable	31		Acceptable
		Annual	20		Uncomfortable	29		Acceptable
54	A	Spring	27		Uncomfortable	37		Unacceptabl
		Summer	20		Uncomfortable	27		Acceptable
		Fall	25		Uncomfortable	34		Unacceptabl
		Winter	25		Uncomfortable	36		Unacceptabl
		Annual	25		Uncomfortable	34		Unacceptabl
	B	Spring	27		Uncomfortable	37		Unacceptabl
		Summer	20		Uncomfortable	27		Acceptable
		Fall	24		Uncomfortable	34		Unacceptabl
		Winter	26		Uncomfortable	36		Unacceptabl
		Annual	25		Uncomfortable	34		Unacceptabl

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
55	A	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	17		Walking	26		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	16		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	15		Standing	23		Acceptable
		Winter	16		Walking	26		Acceptable
		Annual	15		Standing	24		Acceptable
56	A	Spring	28		Dangerous	39		Unacceptabl
		Summer	22		Uncomfortable	31		Acceptable
		Fall	27		Uncomfortable	37		Unacceptabl
		Winter	31		Dangerous	42		Unacceptabl
		Annual	28		Dangerous	39		Unacceptabl
	B	Spring	28		Dangerous	39		Unacceptabl
		Summer	22		Uncomfortable	31		Acceptable
		Fall	27		Uncomfortable	37		Unacceptabl
		Winter	31		Dangerous	42		Unacceptabl
		Annual	28		Dangerous	39		Unacceptabl
57	A	Spring	32		Dangerous	41		Unacceptabl
		Summer	29		Dangerous	36		Unacceptabl
		Fall	31		Dangerous	39		Unacceptabl
		Winter	33		Dangerous	42		Unacceptabl
		Annual	31		Dangerous	40		Unacceptabl
	B	Spring	32		Dangerous	41		Unacceptabl
		Summer	29		Dangerous	36		Unacceptabl
		Fall	31		Dangerous	40		Unacceptabl
		Winter	33		Dangerous	43		Unacceptabl
		Annual	31		Dangerous	40		Unacceptabl

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
58	A	Spring	20		Uncomfortable	29		Acceptable
		Summer	17		Walking	24		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
	B	Spring	20		Uncomfortable	30		Acceptable
		Summer	17		Walking	25		Acceptable
		Fall	19		Walking	28		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	19		Walking	28		Acceptable
59	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
60	A	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	19		Walking	29		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	27		Acceptable
		Annual	18		Walking	26		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
61	A	Spring	21		Uncomfortable	29		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	26		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
	B	Spring	21		Uncomfortable	29		Acceptable
		Summer	16		Walking	23		Acceptable
		Fall	19		Walking	27		Acceptable
		Winter	21		Uncomfortable	29		Acceptable
		Annual	20		Uncomfortable	27		Acceptable
62	A	Spring	15		Standing	22		Acceptable
		Summer	13		Standing	19		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	16		Walking	23		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	22		Acceptable
63	A	Spring	20		Uncomfortable	27		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	18		Walking	25		Acceptable
	B	Spring	20		Uncomfortable	27		Acceptable
		Summer	17		Walking	23		Acceptable
		Fall	18		Walking	25		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	18		Walking	25		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
64	A	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
65	A	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
66	A	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	17		Acceptable
		Annual	11		Sitting	16		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
67	A	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
	B	Spring	13		Standing	19		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	12		Sitting	18		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	12		Sitting	18		Acceptable
68	A	Spring	11		Sitting	17		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	11		Sitting	17		Acceptable
		Summer	8		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
69	A	Spring	19		Walking	25		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	19		Walking	25		Acceptable
		Annual	17		Walking	24		Acceptable
	B	Spring	18		Walking	25		Acceptable
		Summer	15		Standing	20		Acceptable
		Fall	17		Walking	23		Acceptable
		Winter	18		Walking	25		Acceptable
		Annual	17		Walking	23		Acceptable

Notes:
1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

CONSULTING ENGINEERS & SCIENTISTS

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
70	A	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	13		Standing	21		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	11		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	23		Acceptable
		Annual	13		Standing	21		Acceptable
71	A	Spring	26		Uncomfortable	37		Unacceptabl
		Summer	20		Uncomfortable	28		Acceptable
		Fall	25		Uncomfortable	34		Unacceptabl
		Winter	29		Dangerous	40		Unacceptabl
		Annual	26		Uncomfortable	36		Unacceptabl
	B	Spring	26		Uncomfortable	37		Unacceptabl
		Summer	20		Uncomfortable	28		Acceptable
		Fall	25		Uncomfortable	34		Unacceptabl
		Winter	29		Dangerous	40		Unacceptabl
		Annual	26		Uncomfortable	36		Unacceptabl
72	A	Spring	25		Uncomfortable	34		Unacceptabl
		Summer	19		Walking	26		Acceptable
		Fall	23		Uncomfortable	32		Unacceptabl
		Winter	28		Dangerous	37		Unacceptabl
		Annual	25		Uncomfortable	34		Unacceptabl
	B	Spring	25		Uncomfortable	34		Unacceptabl
		Summer	19		Walking	26		Acceptable
		Fall	23		Uncomfortable	32		Unacceptabl
		Winter	28		Dangerous	37		Unacceptabl
		Annual	25		Uncomfortable	33		Unacceptabl

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
73	A	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
	B	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	18		Walking	26		Acceptable
		Winter	20		Uncomfortable	29		Acceptable
		Annual	18		Walking	27		Acceptable
74	A	Spring	18		Walking	27		Acceptable
		Summer	16		Walking	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	18		Walking	26		Acceptable
	B	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	18		Walking	27		Acceptable
75	A	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	18		Walking	27		Acceptable
	B	Spring	19		Walking	28		Acceptable
		Summer	15		Standing	22		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	20		Uncomfortable	30		Acceptable
		Annual	18		Walking	28		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
76	A	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	14		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	19		Acceptable
		Annual	11		Sitting	18		Acceptable
77	A	Spring	14		Standing	20		Acceptable
		Summer	11		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	19		Acceptable
	B	Spring	14		Standing	20		Acceptable
		Summer	12		Sitting	16		Acceptable
		Fall	13		Standing	19		Acceptable
		Winter	14		Standing	21		Acceptable
		Annual	13		Standing	20		Acceptable
78	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	23		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
79	A	Spring	25		Uncomfortable	34		Unacceptabl
		Summer	19		Walking	25		Acceptable
		Fall	23		Uncomfortable	30		Acceptable
		Winter	25		Uncomfortable	34		Unacceptabl
		Annual	23		Uncomfortable	31		Acceptable
	B	Spring	25		Uncomfortable	34		Unacceptabl
		Summer	19		Walking	26		Acceptable
		Fall	23		Uncomfortable	31		Acceptable
		Winter	25		Uncomfortable	34		Unacceptabl
		Annual	23		Uncomfortable	32		Unacceptabl
80	A	Spring	17		Walking	25		Acceptable
		Summer	13		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	16		Walking	24		Acceptable
	B	Spring	17		Walking	25		Acceptable
		Summer	14		Standing	20		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	18		Walking	27		Acceptable
		Annual	17		Walking	24		Acceptable
81	A	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable
	B	Spring	15		Standing	23		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	22		Acceptable
		Winter	16		Walking	24		Acceptable
		Annual	15		Standing	22		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

<u>Configurations</u>

A - No Build
B - Build

<u>Mean Wind Speed Criteria</u>

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

<u>Effective Gust Criteria</u>

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
82	A	Spring	14		Standing	22		Acceptable
		Summer	11		Sitting	18		Acceptable
		Fall	13		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	15		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	21		Acceptable
		Winter	15		Standing	23		Acceptable
		Annual	14		Standing	21		Acceptable
83	A	Spring	18		Walking	27		Acceptable
		Summer	14		Standing	21		Acceptable
		Fall	17		Walking	25		Acceptable
		Winter	19		Walking	28		Acceptable
		Annual	17		Walking	26		Acceptable
	B	Spring	18		Walking	27		Acceptable
		Summer	15		Standing	21		Acceptable
		Fall	17		Walking	26		Acceptable
		Winter	19		Walking	29		Acceptable
		Annual	18		Walking	26		Acceptable
84	A	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	12		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
85	A	Spring	9		Sitting	15		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	9		Sitting	15		Acceptable
	B	Spring	9		Sitting	15		Acceptable
		Summer	8		Sitting	12		Acceptable
		Fall	9		Sitting	14		Acceptable
		Winter	9		Sitting	15		Acceptable
		Annual	9		Sitting	14		Acceptable
86	A	Spring	14		Standing	21		Acceptable
		Summer	12		Sitting	17		Acceptable
		Fall	13		Standing	20		Acceptable
		Winter	14		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
	B	Spring	14		Standing	22		Acceptable
		Summer	12		Sitting	18		Acceptable
		Fall	14		Standing	20		Acceptable
		Winter	15		Standing	22		Acceptable
		Annual	14		Standing	21		Acceptable
87	A	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable
	B	Spring	17		Walking	24		Acceptable
		Summer	14		Standing	19		Acceptable
		Fall	16		Walking	23		Acceptable
		Winter	17		Walking	25		Acceptable
		Annual	16		Walking	23		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			**Mean Wind Speed**			**Effective Gust Wind Speed**		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
88	A	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
	B	Spring	12		Sitting	18		Acceptable
		Summer	10		Sitting	15		Acceptable
		Fall	11		Sitting	17		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	11		Sitting	17		Acceptable
89	A	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	22		Acceptable
		Annual	13		Standing	20		Acceptable
	B	Spring	13		Standing	21		Acceptable
		Summer	10		Sitting	16		Acceptable
		Fall	12		Sitting	19		Acceptable
		Winter	13		Standing	21		Acceptable
		Annual	12		Sitting	20		Acceptable
90	A	Spring	10		Sitting	16		Acceptable
		Summer	8		Sitting	13		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	17		Acceptable
		Annual	10		Sitting	15		Acceptable
	B	Spring	10		Sitting	16		Acceptable
		Summer	7	-12%	Sitting	12		Acceptable
		Fall	9		Sitting	15		Acceptable
		Winter	10		Sitting	16		Acceptable
		Annual	9		Sitting	15		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

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

BRA Criteria			Mean Wind Speed			Effective Gust Wind Speed		
Loc.	Config.	Season	Speed (mph)	%Change	RATING	Speed (mph)	%Change	RATING
91	A	Spring	10		Sitting	15		Acceptable
		Summer	9		Sitting	13		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	16		Acceptable
		Annual	10		Sitting	15		Acceptable
	B	Spring	10		Sitting	15		Acceptable
		Summer	8	-11%	Sitting	12		Acceptable
		Fall	10		Sitting	15		Acceptable
		Winter	11		Sitting	16		Acceptable
		Annual	10		Sitting	15		Acceptable
92	A	Spring	10		Sitting	16		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	16		Acceptable
	B	Spring	10		Sitting	17		Acceptable
		Summer	9		Sitting	14		Acceptable
		Fall	10		Sitting	16		Acceptable
		Winter	11		Sitting	18		Acceptable
		Annual	10		Sitting	17		Acceptable

Notes: 1) Wind speeds are for a 1% probability of exceedance; and,
2) % Change is based on comparison with Configuration A and only those that are greater than 10% are listed.

Configurations

A - No Build
B - Build

Mean Wind Speed Criteria

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

Effective Gust Criteria

Acceptable:	≤ 31 mph
Unacceptable:	> 31 mph

Appendix D

Air Quality

APPENDIX D AIR QUALITY

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 4.4 of the DPIR. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale and stationary source air quality analyses.

Stationary Source Analysis

Emissions

Emissions for the heating combustion units were calculated using the latest MassDEP emission limits for boilers based on the Boiler Environmental Results Program (ERP). Emissions for the emergency generators and cooling towers were obtained from vendor information for a similar size unit. The resulting hourly emission rate in pounds per hour were converted to grams per second and input to the AERMOD model. For the NAAQS analysis, a similar approach was conducted for CO, SO_2, NOx, PM-10, and PM-2.5. The emergency generator emissions were calculated based on a g/bhp-hr emission factor provided by vendor information for typical size units.

All assumptions and data used in the stationary source emissions and stack parameter calculations are provided herein.

AERMOD

The EPA AERMOD model was used to calculate air quality impacts due to the installation of heating combustion boilers, emergency generators, parking garage vents, loading dock vents and cooling towers. For non-combustion sources, ambient temperature releases were assumed; otherwise temperatures from the exhaust gas were used. Urban dispersion coefficients were used. Building downwash was accounted for in the modeling based on the building heights and projected widths of the buildings. The maximum modeled impacts from the garage vents and the stack sources were conservatively added to monitored background values for comparison to the NAAQS.

Microscale Analysis

For projects in Boston, the BRA requires the analysis of the effect on air quality of the increase in traffic generated by a project. This “microscale” analysis is required for projects in which: 1) project traffic would impact intersections or roadway links currently operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D, E, or F; 2) project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) the project will generate 3,000 or more new average daily trips on roadways providing access to a single location. The microscale analysis involves modeling of carbon monoxide (CO) emissions from vehicles idling at and traveling through signalized intersections.

Analysis of the intersection LOS and volumes show none meet the aforementioned criteria.

Boiler, Cooling Tower, Emergency Generator, Garage Vent, and Loading Dock Exhaust Vent Emissions Calculations

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Heating Boilers

			Notes
Source Name		BLR1-3	
Make		Lochinvar	mfg sheets sent on 4/3/13
Model		FB-2000	mfg sheets sent on 4/3/13
Qty.		3	Plans sent on 4/3/13
Boiler Heat Input	MMBTU/hr (ea.):	2.000	
Boiler Emission Rates	lb/MMBTU	g/s	
NOx	0.035	0.00882	ERP limits
CO	0.080	0.02016	ERP limits
VOC	0.030	0.00756	ERP limits
PM-2.5	0.010	0.00252	ERP limits Assume PM10=PM2.5
PM-10	0.010	0.00252	ERP limits Assume PM10=PM2.5
SO2	0.0006	0.00015	AP42 Table 1.4-2 (assuming 1040 Btu/scf)
CO2	115.385	29.07628	AP42 Table 1.4-2 (assuming 1040 Btu/scf)
Gas Exit Temp	°F	170	assumed
Gas Exit Temp	°K	349.8	calculated
Exhaust air (CFM)	CFM	838.60	
Gas Exit Velocity	fps	40.00	calculated
Gas Exit Velocity	mps	12.19	calculated
Roof Height	feet	413.00	from site plans
Stack height	feet above roofline	10	
Stack height	feet	423	calculated
Stack height	meters	128.930	calculated
Stack Diameter	feet	0.667	mfg sheets sent on 4/3/13
Stack Diameter	meters	0.203	calculated

Cooling Towers

			Notes
Designation		CT1	Plans sent on 4/3/13
Make		Marley	mfg sheets sent on 4/3/13
Model		NC8403NLN3	mfg sheets sent on 4/3/13
Cooling Tower Rate	tons	800	assumed 3gpm/ton cooling
Tower Overall Dimensions	feet	18.17x8.4x11.939	mfg sheets sent on 4/3/13
CT Stack Height (above roofline)	feet	11.94	mfg sheets sent on 4/3/13
Primary Building Height (ft)	feet	400.00	from site plans
CT Stack Height	feet	411.9	calculated
CT Stack Height	meters	125.56	calculated
Number of cells (per tower)	#	3	mfg sheets sent on 4/3/13
Cooling Tower Specs			
Cooling Tower Exhaust Flow	CFM	218890	mfg sheets sent on 4/3/13
Cooling Tower Cell Exhaust Flow	CFM	72960	mfg sheets sent on 4/3/13
Cooling Tower Cell Exhaust Flow	kg/s	38.4	calculated
Cooling Tower Exhaust Temp	°F	78	mfg sheets sent on 4/3/13
Cooling Tower Exhaust Temp	K	298.7	calculated
Cooling Tower Cell Diameter	feet	7	mfg sheets sent on 4/3/13
Cooling Tower Cell Diameter	meters	2.13	calculated
Cooling Tower Stack Velocity	fps	31.60	calculated
Cooling Tower Stack Velocity	mps	9.63	calculated
Cooling Tower Drift			
Drift Rate	% of circ water	0.001	assumed
Circulating Water Rate	gpm	2,400	mfg sheets sent on 4/3/13
Circulating Water Rate	gph	144,000	calculated
TDS+TSS concentration in drift	mg/L	1,500	assumed
PM emission rate in drift (per cell)	lb/hr	0.006	calculated
PM emission rate in drift (per cell)	g/s	0.00076	calculated

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Emergency Generators

				Notes
Designation			EG1	
Number			1	Plans sent on 4/3/13
Electrical output		kilowatts	1000	Plans sent on 4/3/13
Make		Caterpillar	Caterpillar	sheets sent on 4/3/13
model	C32		C32	sheets sent on 4/3/13
Engine Horsepower		BHP	1502.00	Mfg data
Engine power		kilowatts	1120.04	calculated
Fuel consumption @full load		gph	74.34	Mfg data
Heat Input		MMBTU/hr:	10.18458	calculated
Stack Parameters				
Exhaust Temperature		°F	964.94	Mfg data
Exhaust Temperature		°K	791.5	calculated
Total Exhaust Flow		ACFM	8387.24	Mfg data
Flange Diameter		in.	8	sheets sent on 4/3/13
Maximum Backpressure		in. H2O	40.2	sheets sent on 4/3/13
Maximum velocity		fpm	20316.61	calculated
Flow area required		sq. ft	0.413	calculated
Number of exhausts (typ. 1 or 2)		#	1	sheets sent on 4/3/13
Selected silencer diameter		in	12	sheets sent on 4/3/13
Actual silencer opening area		sq. ft each	0.785	calculated
Actual velocity		fpm each	10678.966	calculated
Actual velocity		fps each	177.983	calculated
Single Stack Effective Diameter		ft	1.000	calculated
Single Stack Effective Diameter		m	0.305	calculated
Single Stack Effective Velocity		fps	177.983	calculated
Single Stack Effective Velocity		mps	54.249	calculated
Primary Building Height		ft	400.00	from site plans
Stack Height (10' above roofline)		ft	*410.00*	From 11/27/12 email from S. Carroll to C. Emil
Stack Height		m	*124.97*	calculated

Pollutant	Emission factor unit	Emission factor	
NOx	g/BHP-hr	5.84	EF from mfg data (Not to exceed)
CO	g/BHP-hr	0.36	EF from mfg data (Not to exceed)
VOC	g/BHP-hr	0.02	EF from mfg data (Not to exceed)
PM10	g/BHP-hr	0.05	EF from mfg data (Not to exceed)
PM2.5	g/BHP-hr	0.05	EF from mfg data (Not to exceed)
SO2	g/BHP-hr	0.004766301	15 ppm S mass conserved
HAPs	lb/MMBTU	0.00149	AP42 Table 3.4-4 & 3.3-2
CO2	lb/MMBTU	165	AP42 Table 3.4-1 & 3.3-1

Short Term Emission Rate			
NOx	g/s	0.0834	uses EPA 'intermittent" factor (300 hrs/yr)
CO	g/s	0.1487	calculated
VOC	g/s	0.0101	calculated
PM10	g/s	0.0189	calculated
PM2.5	g/s	0.0189	calculated
SO2	g/s	0.0020	calculated

Long Term (300 hr/yr) Emission Rate			
NOx	g/s	0.0834	calculated
CO	g/s	0.0051	calculated
VOC	g/s	0.0003	calculated
PM10	g/s	0.0006	calculated
PM2.5	g/s	0.0006	calculated
SO2	g/s	0.00007	calculated

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Garage Exhaust Vents]

Description	Fifth Floor	Sixth Floor	58.6% of total garage area X 592 total spaces
Total spaces	50	50	
Residential spaces	50	50	
Retail/commercial spaces	0	0	
# vehicles entering garage/hr	9.75	9.75	assume peak turnover of 75% of total spaces
Levels	1	1	Plans sent on 4/3/13
Below Grade Garage Area (sq ft)	15500	15500	from project description
Number of vents	1	1	Plans sent on 4/3/13
Stack Exhaust Flow (acfm)	9000	9000	sheets sent on 4/3/13
Stack Exhaust Temperature (°F)	*70*	*70*	Assumed temp remains consistent
Stack Exhaust Temperature (K)	294.3	294.3	calculated
outlet area per vent (sqft)	5.1	5.1	Assumed
effective diameter (ft)	*2.552*	*2.552*	sheets sent on 4/3/13
effective diameter (m)	*0.778*	*0.778*	calculated
Stack Velocity (fpm)	1759.39	1759.39	calculated
Stack Velocity (fps)	29.32	29.32	calculated
Stack Velocity (m/s)	8.94	8.94	calculated
Stack height (ft)	70.58	83.58	Plans sent on 4/3/13
Stack height (m)	21.51	25.48	calculated
Garage Distance Traveled (ft)	150	150	calculated
Hourly garage mileage (VMT)	0.277	0.277	calculated

Total Emissions			2016 10mph Emission Factors
	Per Vent Emission Rates	Per Vent Emission Ra	M6.2 g/mile
Composite VOC (g/s):	3.0E-05	3.0E-05	0.396
Composite CO (g/s):	7.8E-04	7.8E-04	10.177
Composite NOX (g/s):	2.1E-05	2.1E-05	0.277
Composite CO2 (g/s):	3.3E-02	3.3E-02	434.061
Total PM2.5 (g/s):	8.7E-07	8.7E-07	0.011
Total PM10 (g/s):	1.9E-06	1.9E-06	0.025
SO2 (g/s):	6.0E-07	6.0E-07	0.008

Example Emissions Assumption.

Example Emissions Assumption: 4 levels underground, 1000 spaces

Of the 1000 spaces, assume 750 residential, 250 commercial. It is assumed that the garage is on average 75% full. Residential spaces are assumed to turn over 25% per hour, while commercial spaces turn over hourly.

(750 x 0.25) + (250 x 1.0) x 0.75 = 328 vehicles per hour

It is assumed that the vehicles travel halfway, on average, into the garage at any time (travel to midpoint of mid level). Some travel through all 4 levels. Some find parking on the uppermost level. In this example, the distance to the center of the garage is assumed to be approximately 500 feet.

Using this assumption, a total VMT of 31.1 miles is traveled (500 feet/level x 328 cars / 5,280 feet per mile).

Emission factor is assumed to be weighted average of 10 mph LDGV, LDGT<6000gvw, LDDV, and MC. Higher of summer/winter values.

Since traffic in/out of garage will not be at peak hour for all 24 hrs per day, the following factors were assumed to account for fluctuating usage

Hour	Factor
1 AM to 5 AM	0.25
6 AM to 8 AM	1.00
9 AM to 5 PM	0.50
6 PM to 7 PM	1.00
8 PM to 12 AM	0.25

summer 2016 10 mph

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.2778	0.4263	0.1677		0.037	0.0001	0.0015	0.0858	0.0037	1
Fuel Economy (mpg):	24.1	18.5	14.2	17	9.9	32.4	18.4	7.3	50	16.1

Composite Emission										
Composite VOC :	0.391	0.356	0.42	0.374	0.589	0.335	0.188	0.588	5.38	0.423
Composite CO :	4.77	4.85	5.08	4.91	15.24	2.807	0.69	1.511	36.41	5.073
Composite NOX :	0.291	0.262	0.371	0.293	0.412	0.507	0.135	3.005	1	0.532
Composite CO2 :	368.1	479.3	624.3	520.2	894.6	314.1	552.7	1398.8	177.4	565.98
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0213	0.0957	0.0205	0.0599	0.0207	0.0159
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0362	0.1166	0.0349	0.0898	0.0372	0.0308
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.013	0.0033	0.0092

Winter 2016 10 mph

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
	------	------	------	------	------	------	------	------	------	------
VMT Distribution:	0.2812	0.4248	0.1669		0.0366	0.0001	0.0015	0.0852	0.0037	1
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50	16.1

Composite Emission										
Composite VOC :	0.396	0.35	0.446	0.377	0.676	0.329	0.192	0.596	4.93	0.428
Composite CO :	10.66	9.67	9.8	9.7	18.65	2.766	0.693	1.601	31.83	9.677
Composite NOX :	0.259	0.276	0.409	0.314	0.471	0.503	0.142	3.232	1.32	0.556
Composite CO2 :	368.1	479.3	624.3	520.2	894.6	314.1	552.6	1399.8	177.4	564.84
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0219	0.0957	0.021	0.0625	0.0207	0.0161
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0368	0.1166	0.0353	0.0927	0.0372	0.0311
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.013	0.0033	0.0092

Summer garage vehicles :	LDGV	LDGT12	LDDV	MC	SUM
actual fraction	0.2778	0.4263	0.0001	0.0037	0.7079
garage fraction	0.3924	0.6022	0.0001	0.0052	1
					Composite EF
Composite VOC :	0.391	0.356	0.335	5.38	0.396
Composite CO :	4.77	4.85	2.807	36.41	4.983
Composite NOX :	0.291	0.262	0.507	1	0.277
Composite CO2 :	368.1	479.3	314.1	177.4	434.061
Total PM2.5:	0.0113	0.0113	0.0957	0.0207	0.011
Total PM10:	0.0248	0.0248	0.1166	0.0372	0.025
SO2:	0.0066	0.0087	0.0029	0.0033	0.008

Winter garage vehicles :	LDGV	LDGT12	LDDV	MC	SUM
actual fraction	0.2812	0.4248	0.0001	0.0037	0.7098
garage fraction	0.3962	0.5985	0.0001	0.0052	1
					Composite EF
Composite VOC :	0.396	0.35	0.329	4.93	0.392
Composite CO :	10.66	9.67	2.766	31.83	10.177
Composite NOX :	0.259	0.276	0.503	1.32	0.275
Composite CO2 :	368.1	479.3	314.1	177.4	433.649
Total PM2.5:	0.0113	0.0113	0.0957	0.0207	0.011
Total PM10:	0.0248	0.0248	0.1166	0.0372	0.025
SO2:	0.0066	0.0087	0.0029	0.0033	0.008

summer 2016 2.5 mph

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2778	0.4263	0.1677		0.037	0.0001	0.0015	0.0858	0.0037	1
Fuel Economy (mpg):	24.1	18.5	14.2	17	9.9	32.4	18.4	7.3	50	16.1
Composite Emission										
Composite VOC :	1.875	1.511	1.633	1.545	2.075	0.45	0.257	0.853	11.93	1.634
Composite CO :	11.52	10.43	10.95	10.58	28.66	4.418	1.135	2.685	119.9	11.221
Composite NOX :	0.452	0.374	0.529	0.418	0.382	0.673	0.179	3.946	1.12	0.731
Composite CO2 :	368.1	479.3	624.3	520.2	894.6	314.1	552.7	1398.8	177.4	565.98
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0213	0.0957	0.0205	0.0599	0.0207	0.0159
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0362	0.1166	0.0349	0.0898	0.0372	0.0308
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.013	0.0033	0.0092

Winter 2016 2.5 mph

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2812	0.4248	0.1669		0.0366	0.0001	0.0015	0.0852	0.0037	1
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50	16.1
Composite Emission										
Composite VOC :	1.904	1.49	1.673	1.542	2.328	0.442	0.263	0.865	11.25	1.648
Composite CO :	19.1	17.48	18.31	17.72	35.08	4.365	1.141	2.844	100.99	17.752
Composite NOX :	0.357	0.381	0.565	0.433	0.437	0.667	0.189	4.242	1.48	0.74
Composite CO2 :	368.1	479.3	624.3	520.2	894.6	314.1	552.6	1399.8	177.4	564.84
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0219	0.0957	0.021	0.0625	0.0207	0.0161
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0368	0.1166	0.0353	0.0927	0.0372	0.0311
SO2:	0.0066	0.0087	0.0115	0.0095	0.0163	0.0029	0.0052	0.013	0.0033	0.0092

Summer Loading Dock vehicles :	HDGV	HDDV	SUM
actual fraction	0.037	0.0858	0.1228
garage fraction	0.3013	0.6987	1
			Composite EF
Composite VOC :	2.075	0.853	1.221
Composite CO :	28.66	2.685	10.511
Composite NOX :	0.382	3.946	2.872
Composite CO2 :	894.6	1398.8	1246.883
Total PM2.5:	0.0213	0.0599	0.048
Total PM10:	0.0362	0.0898	0.074
SO2:	0.0163	0.013	0.014

Winter Loading Dock vehicles :	HDGV	HDDV	SUM
actual fraction	0.0366	0.0852	0.1218
garage fraction	0.3005	0.6995	1
			Composite EF
Composite VOC :	2.328	0.865	1.305
Composite CO :	35.08	2.844	12.531
Composite NOX :	0.437	4.242	3.099
Composite CO2 :	894.6	1399.8	1247.991
Total PM2.5:	0.0219	0.0625	0.050
Total PM10:	0.0368	0.0927	0.076
SO2:	0.0163	0.013	0.014

40 Trinity Place	2013 Existing AM Peak			2013 Existing PM Peak		
Intersections (Signalized and *Unsignalized*)	LOS	Delay (Sec)	Traffic Volume	LOS	Delay (Sec)	Traffic Volume
Stuart Street & Dartmouth Street	B	18.5	2639	B	14.9	2663
Stuart Street & Clarendon Street	B	10.7	1552	B	12.3	1641
St. James Avenue & Clarendon Street	B	17.1	1383	B	17.2	1478
St. James Avenue & Dartmouth Street	C	27.3	1778	C	20.3	2191
Stuart Street & Trinity Place (Signalized in 2018)						
Stuart Street & Trinity Place (unsignalized in 2013)	A	10.0	1116	A	10.0	1022
St. James Avenue & Trinity Place	A	2.4	738	A	2.9	846

LOS is HCM value for signalized intersections and ICU value for unsignalized intersections.
Color Code:
Red = Signalized intersections at LOS D or worse.
Green = Top 3 signalized intersections based on volume.
Dark Blue = Volume increase >20%
Light Blue = Volume increase > 10%
Yellow = Unsignalized intersection with delay > 150s. Capped at 150s
Gold = Unsignalized intersection with missing delay. Assigned value based on HCM LOS
A = 10s
B = 15s
C = 25s
D = 35s
E = 50 s
F or worse = 80s
Pink = Not analyzed or calculated.. Assumed same as No Action.

40 Trinity Place

Intersections (Signalized and *Unsignalized*)	2018 No Build AM Peak LOS	2018 No Build AM Peak Delay (Sec)	2018 No Build AM Peak Traffic Volume	2018 No Build PM Peak LOS	2018 No Build PM Peak Delay (Sec)	2018 No Build PM Peak Traffic Volume
Stuart Street & Dartmouth Street	B	19.4	2805	B	15.3	2813
Stuart Street & Clarendon Street	B	12.5	1696	B	18.8	1723
St. James Avenue & Clarendon Street	B	17.7	1458	B	17.9	1559
St. James Avenue & Dartmouth Street	C	27.7	1860	C	25.8	2321
Stuart Street & Trinity Place (Signalized in 2018)	A	3.8	1215	B	10.8	1086
Stuart Street & Trinity Place (unsignalized in 2013)						
St. James Avenue & Trinity Place	A	2.4	763	A	3.0	904

LOS is HCM value for signalized intersections and ICU value for unsignalized intersections.
Color Code:
Red = Signalized intersections at LOS D or worse.
Green = Top 3 signalized intersections based on volume.
Dark Blue = Volume increase >20%
Light Blue = Volume increase > 10%
Yellow = Unsignalized intersection with delay > 150s. Capped at 150s
Gold = Unsignalized intersection with missing delay. Assigned value based on HCM LOS
A = 10s
B = 15s
C = 25s
D = 35s
E = 50 s
F or worse = 80s
Pink = Not analyzed or calculated.. Assumed same as No Action.

40 Trinity Place	2018 Build AM Peak				2018 Build PM Peak			
Intersections (Signalized and *Unsignalized*)	LOS	Delay (Sec)	Traffic Volume	No-Build to Build Volume % Increase	LOS	Delay (Sec)	Traffic Volume	No-Build to Build Volume % Increase
Stuart Street & Dartmouth Street	B	19.5	2818	0%	B	15.3	2841	1%
Stuart Street & Clarendon Street	B	13.6	1708	1%	B	19.3	1737	1%
St. James Avenue & Clarendon Street	B	17.7	1463	0%	B	18.0	1571	1%
St. James Avenue & Dartmouth Street	C	27.8	1870	1%	C	25.8	2333	1%
Stuart Street & Trinity Place (Signalized in 2018)	B	5.2	1255	3%	B	12.2	1152	6%
Stuart Street & Trinity Place (unsignalized in 2013)								
St. James Avenue & Trinity Place	A	2.8	778	2%	A	3.7	928	3%

LOS is HCM value for signalized intersections and ICU value for unsignalized intersections.
Color Code:
Red = Signalized intersections at LOS D or worse.
Green = Top 3 signalized intersections based on volume.
Dark Blue = Volume increase >20%
Light Blue = Volume increase > 10%
Yellow = Unsignalized intersection with delay > 150s. Capped at 150s
Gold = Unsignalized intersection with missing delay. Assigned value based on HCM LOS
A = 10s
B = 15s
C = 25s
D = 35s
E = 50 s
F or worse = 80s
Pink = Not analyzed or calculated.. Assumed same as No Action.

Due to excessive size AERMOD, CAL3QHC, and MOBILE6.2 input and output files are available on digital media upon request.

Appendix E

LEED Checklist

LEED 2009 for New Construction and Major Renovations

Project Checklist

40 Trinity

05/09/2013

Sustainable Sites — Possible Points: 26

Y	?	N			
20	2	4		**Sustainable Sites**	**26**
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
1			Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
		2	Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
		1	Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
	1		Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y	?	N			
3		7		**Water Efficiency**	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
		4	Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
3		1	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y	?	N			
14	3	18		**Energy and Atmosphere**	**35**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
7	3	9	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
1		2	Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y	?	N			
5	1	8		**Materials and Resources**	**14**
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

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

Indoor Environmental Quality — Possible Points: 15

Y	?	N			
11	2	2		**Indoor Environmental Quality**	**15**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
	1		Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
		1	Credit 7.2	Thermal Comfort—Verification	1
	1		Credit 8.1	Daylight and Views—Daylight	1
1			Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

Y	?	N			
5		1		**Innovation and Design Process**	**6**
1			Credit 1.1	Innovation in Design: MR 2.1 - Exemplary Performance	1
1			Credit 1.2	Innovation in Design: SS 4.1 - Exemplary Performance	1
1			Credit 1.3	Innovation in Design: Green Housekeeping	1
1			Credit 1.4	Innovation in Design: Bio Green Food Waste Disposer	1
		1	Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

Y	?	N			
3		1		**Regional Priority Credits**	**4**
1			Credit 1.1	Regional Priority: SS Credit 3	1
1			Credit 1.2	Regional Priority: SS Credit 6.1	1
1			Credit 1.3	Regional Priority: SS Credit 7.1	1
		1	Credit 1.4	Regional Priority:	1

Total — Possible Points: 110

Y	?	N		Possible Points
61	8	41	**Total**	**110**

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