NOTICE OF PROJECT CHANGE

SOUTH STATION AIR RIGHTS

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

Submitted by:
South Station Phase I Owner LLC
c/o Hines Interests Limited Partnership
One International Place, 11th Floor
Boston, MA 02110

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

In Association with:
Pelli Clarke Pelli Architects
Kendall/Heaton Associates, Inc.
Goulston & Storrs
Vanasse & Associates, Inc.
Howard Stein Hudson
Noresco

July 29, 2016

Epsilon
ASSOCIATES INC.

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Chapter 1.0

General Information / Project Description

1.0 GENERAL INFORMATION / PROJECT DESCRIPTION

1.1 Introduction

South Station Phase I Owner LLC (SSP1O or the Proponent), an affiliate of Hines Interests Limited Partnership and Gemdale Properties and Investment Corporation Limited, proposes to develop air rights located between the South Station Head House and the southern end of the Michael S. Dukakis Transportation Center at South Station (MSDTCSS). The South Station Air Rights Project includes an expansion of the bus terminal and creation of a more convenient passenger connection from the train platform area to the bus station and parking garage, as well as three major buildings: a Tower with office and residential space; a mid-rise building that will include either residential space, a hotel, or a mix of both; and a mid-rise office building (together, the Project). The Project will be targeting the Gold level of the Leadership in Energy and Environmental Design (LEED) rating system for Phase 1.

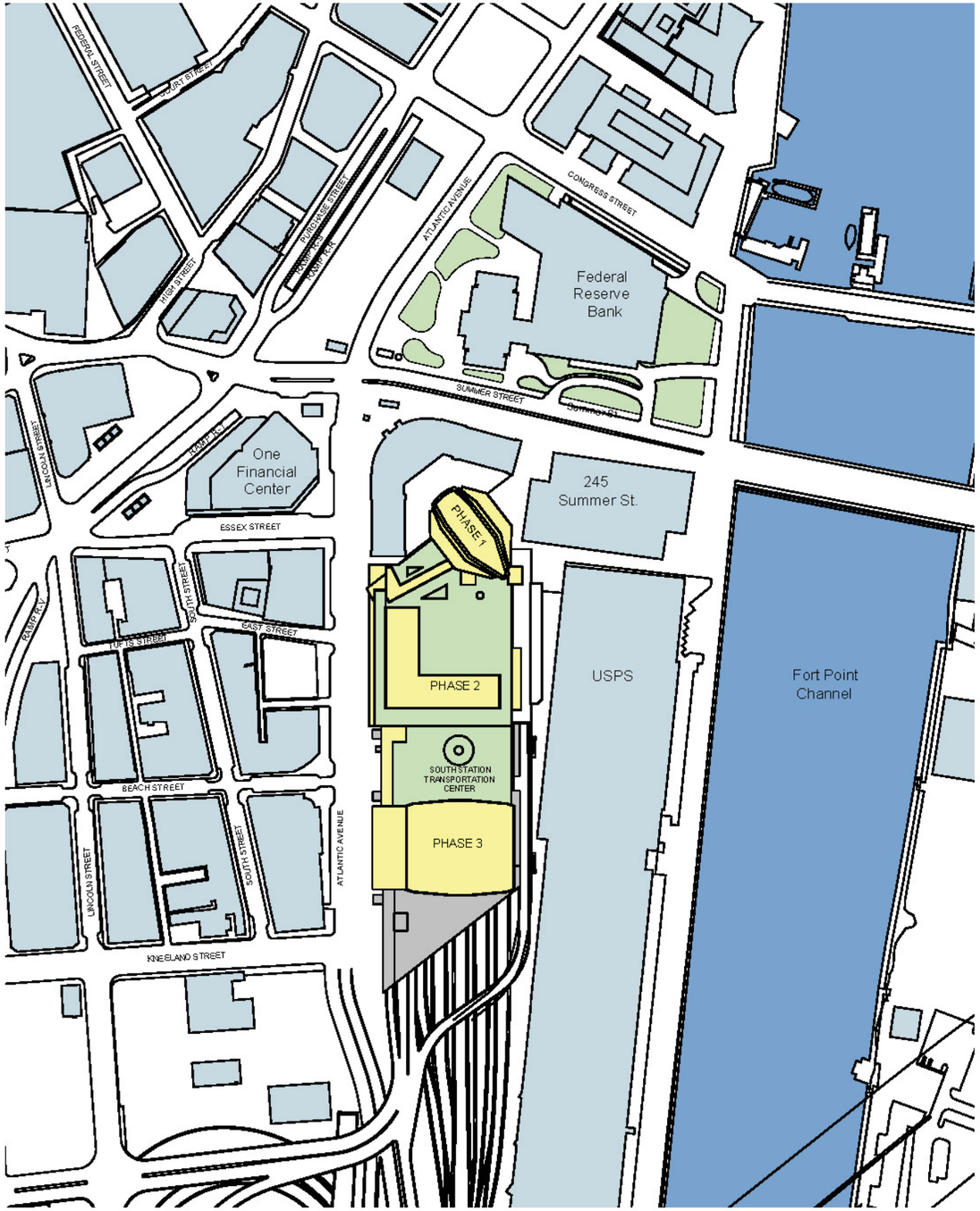
The Project will complete the inter-modal transportation and commercial center that was envisioned by the Boston Redevelopment Authority (BRA) and the Massachusetts Bay Transportation Authority (MBTA) in the course of planning for this site over the past four decades. The Project will reinforce South Station as a major public transportation entry and departure point for the City of Boston. The Project will be located above the ultimate intermodal transportation facility, connecting trains, subways, buses and automobiles, thereby offering office tenants, residents, and hotel guests access to public transit alternatives without leaving the site. By concentrating high density, commercial development above the transportation hub of the city, the convenience and utilization of public transportation is maximized in a transit oriented development that emphasizes smart growth. An aerial photograph and proposed site plan highlighting the Project location are shown on Figure 1-1.

The 2006 Project (as described below) was approved by the BRA through the issuance of a Final Adequacy Determination in 2006. This Notice of Project Change (NPC) is being submitted to the BRA under Article 80A Section 6 to provide information regarding changes to the 2006 Project.

1.2 Project History

A Request for Proposals for development of the air rights over South Station was issued by the BRA in 1989. In May, 1990, TUDC, an affiliate of Tufts University, was tentatively designated as the Redeveloper of the South Station Air Rights with final designation following in September 1991. At that time, the use, massing and design of the air rights project were determined by the BRA and TUDC, with the goal of completing Dewey Square and creating a gateway to the City from the south. The project was to include an office building of approximately 1.1 million square feet (sf), a hotel of approximately 650,000 sf, a research and development building of 350,000 sf, and 1,550 parking spaces.

EXISTING CONDITIONS - AERIAL PHOTO



FUTURE CONDITIONS - VICINITY PLAN

South Station Air Rights **Boston, Massachusetts**

Figure 1-1

Existing and Future Conditions

This design would have required significant track, platform and existing foundation modifications.

A Project Notification Form (PNF) was submitted to the BRA on December 11, 1992 in order to begin City review of the project under the then-applicable Article 31 of the Boston Zoning Code. The BRA issued a Scoping Determination on May 28, 1993, requiring the preparation of a Draft Project Impact Report (PIR).

Because the project was to be developed in three phases, the Draft PIR included an Overview Analysis of the entire project and a detailed Environmental Assessment of the first component scheduled to move forward. The Draft PIR was submitted on February 28, 1994. The BRA issued a Preliminary Adequacy Determination on May 5, 1994, which outlined issues to be addressed in a Final PIR.

As originally envisioned in the agreement between the BRA and TUDC, TUDC selected Hines as a development partner experienced in similar projects. TUDC and Hines entered into an agreement to develop the project in 1997, and in 1998 the BRA approved the final designation of the joint venture between TUDC and Hines.

TUDC/Hines submitted a Notice of Project Change (NPC)/PNF regarding the project on June 24, 1998. The purpose of the NPC/PNF was to provide the BRA, governmental agencies, and the general public with an update on the status of the project since the review process of 1994, and to recommence review of the project under the BRA Article 80 review process, the successor to Article 31 of the Boston Zoning Code.

The NPC/PNF was the first step in the process allowing the BRA to issue a new Scoping Determination detailing the issues to be addressed in a Draft PIR for the entire project. The NPC/PNF project included an office tower with approximately 1.25 million sf of office and retail space, a 1,150 space parking garage to be shared with the 400 to 600 room, 430,000 sf hotel, and a third building with 430,000 sf of office and/or research space, as well as 130,000 sf of expansion space for the bus terminal, and a parking garage of approximately 250 spaces.

The BRA issued a Scoping Determination on the NPC/PNF on August 10, 1998.

The Draft PIR was prepared as a single document for joint submission to the BRA and to MEPA under the MEPA review procedure, and was submitted to the BRA on October 2, 2000. On December 15, 2000, the BRA issued its Preliminary Adequacy Determination on the Draft PIR that outlined those items requiring further study in the Final PIR. The Final PIR was prepared as a single document for joint submission to the BRA and to MEPA, and was submitted to the BRA on February 28, 2006. The 2006 Project was approved by the BRA Board on June 6, 2006. A Development Plan for PDA no. 68 and a related Map Amendment were also approved on June 6, 2006 by the BRA Board, and the Development Plan and Map Amendment subsequently were approved by the Boston Zoning Commission

on June 28, 2006 and signed by the Mayor on June 29, 2006. The Final Adequacy Determination was issued by the BRA on July 19, 2006. Unfortunately, the economic crisis that ensued shortly thereafter put the 2006 Project on hold.

Since the 2006 approvals, the Proponent has continued to engage in its effort to market and secure financial backing for the 2006 Project. On May 12, 2016, the BRA Board and on May 17, 2016 the MBTA approved the transfer of interests from South Union Station LLC, the prior proponent, to the Proponent, in connection with the admission of a new investment partner. These efforts have also resulted in the changes being proposed in this NPC.

1.3 Project Description

1.3.1 Previously Proposed/Approved Project

The project previously approved under Article 80B[1] included the construction of three buildings: an approximately 920,000 sf office tower, an approximately 440,000 sf building with an approximately 200-room hotel and approximately 170,000 sf of residential space, and an approximately 440,000 sf office building. The previously approved project also included approximately 755 parking spaces and an expansion of the bus terminal, as well as new connections between the different travel modes served by South Station.

Although the previously approved project included only office space in the proposed Phase 1 tower, the Draft PIR and Final PIR studied two options: 1) all office as Option A, and 2) a mix of office and residential as Option B. The option with the highest environmental impact for each environmental review component was studied in the Draft PIR and Final PIR (e.g., wastewater impacts for the mixed office/residential tower were studied, while the transportation impacts were studied for the office only alternative). At the time of the 2006 BRA Board approval, only office space was chosen for the tower as the market conditions favored that use. However, the BRA Board Memorandum recognized that the Proponent might file an NPC seeking to implement the mixed office/residential tower option based on market conditions at a future date and recommended that, in the event market forces dictate that residential uses should be combined with office uses in the Phase 1 building, that the BRA, upon filing of a Notice of Project Change, "shall approve an amendment to the Development Plan incorporating the Phase 1 building Option B, without further Large Project Review under Article 80B."

[1] The 2006 Development Plan for PDA No. 68 allowed maximums greater than those set forth in the Article 80B filings in order to allow flexibility in developing the final design. The 2016 NPC compares the current proposal to the 2006 Article 80B filings.

1.3.2 Currently Proposed Project

The Project will be similar to the previously approved project, as it will continue to include three buildings with a mix of residential, office, retail, and/or hotel space.[2] The Project continues to include three phases, of which only Phases 1 and 2 are changing. Phase 3 will continue to be the same as proposed in the Final PIR.[3] A list of changes to the Project is included in Section 1.3.3. Figure 1-2 includes an axonometric plan showing the previously approved project, and Figures 1-3 and 1-4 show axonometric plans showing the currently proposed Project.

Tower (Phase 1) - A, 43-story[4] tower approximately 640-feet to the top of the highest occupiable floor, will include office space on the lower floors and residential units (rental or condominium) on the upper floors—approximately 711,000 sf of office use including amenity, retail, and conference facilities on floors 1 to 26, and approximately 321,000 sf of residential space containing approximately 175 residential units on floors 28 to 43. Although the height to the top of the architectural enclosure of the rooftop mechanical equipment has not changed, the zoning height has changed since zoning height under the Development Plan is measured to the top of the highest occupiable floor. The change in use from all office to mixed-use office and residential, as well as a change in structural design, has allowed for the addition of two floors to the building without increasing the overall height of the building. The office and residential ground floor entrance lobbies will be located on Atlantic Avenue. From the lobby area, office tenants and visitors will use an elevator to access the Sky Street level which will include connections to the elevators for the office portion of the tower, restaurant and accessory retail/amenity space, the parking garage, and the Phases 2 and 3 lobbies. Residents will take elevators from the Atlantic Avenue lobby to an upper level residential lobby with connections to gardens and terraces on the roof of the expanded parking garage, and to the elevators serving the residential condominiums. Mechanical levels will be below the office Sky Lobby level and between the top tower office floor and the bottom tower residential floor. Figure 1-5 shows a rendering of Phase 1.

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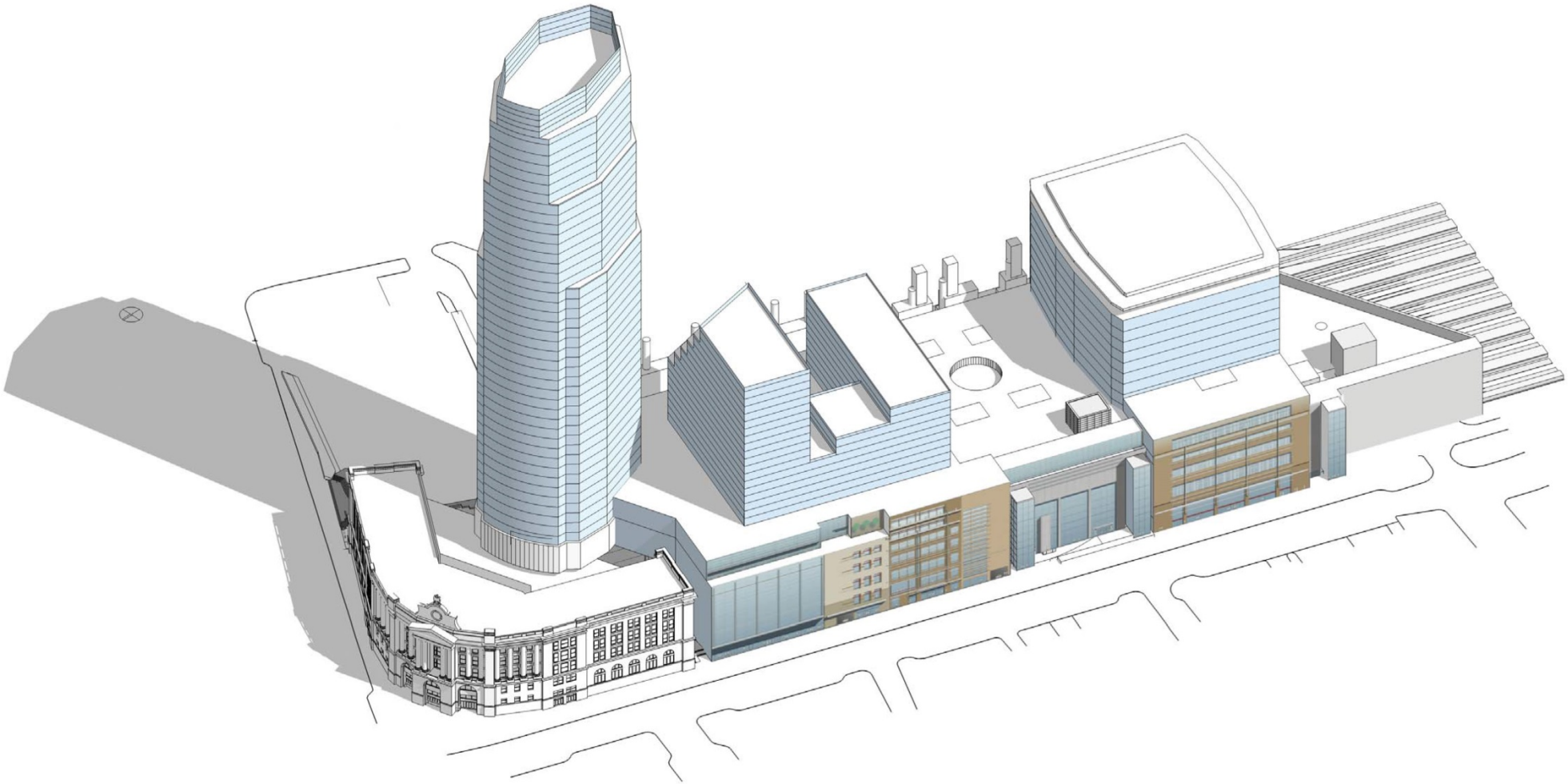
[2] Similar to the approach followed in 2006, the Amended and Restated Development Plan is also proposed to allow maximums greater than those set forth in this NPC in order to allow flexibility in developing the final design.

[3] Although only Phases 1 and 2 are changing, the calculation of GFA has changed for all Project components, including Phase 3 and the bus terminal expansion, due to a more refined approach to calculating GFA consistent with Article 2A of the Zoning Code.

[4] The first of the 43 stories is the Sky Lobby at the 9th floor.



South Station Air Rights Boston, Massachusetts

Figure 1-2

Project Axonometric – Previously Approved Project

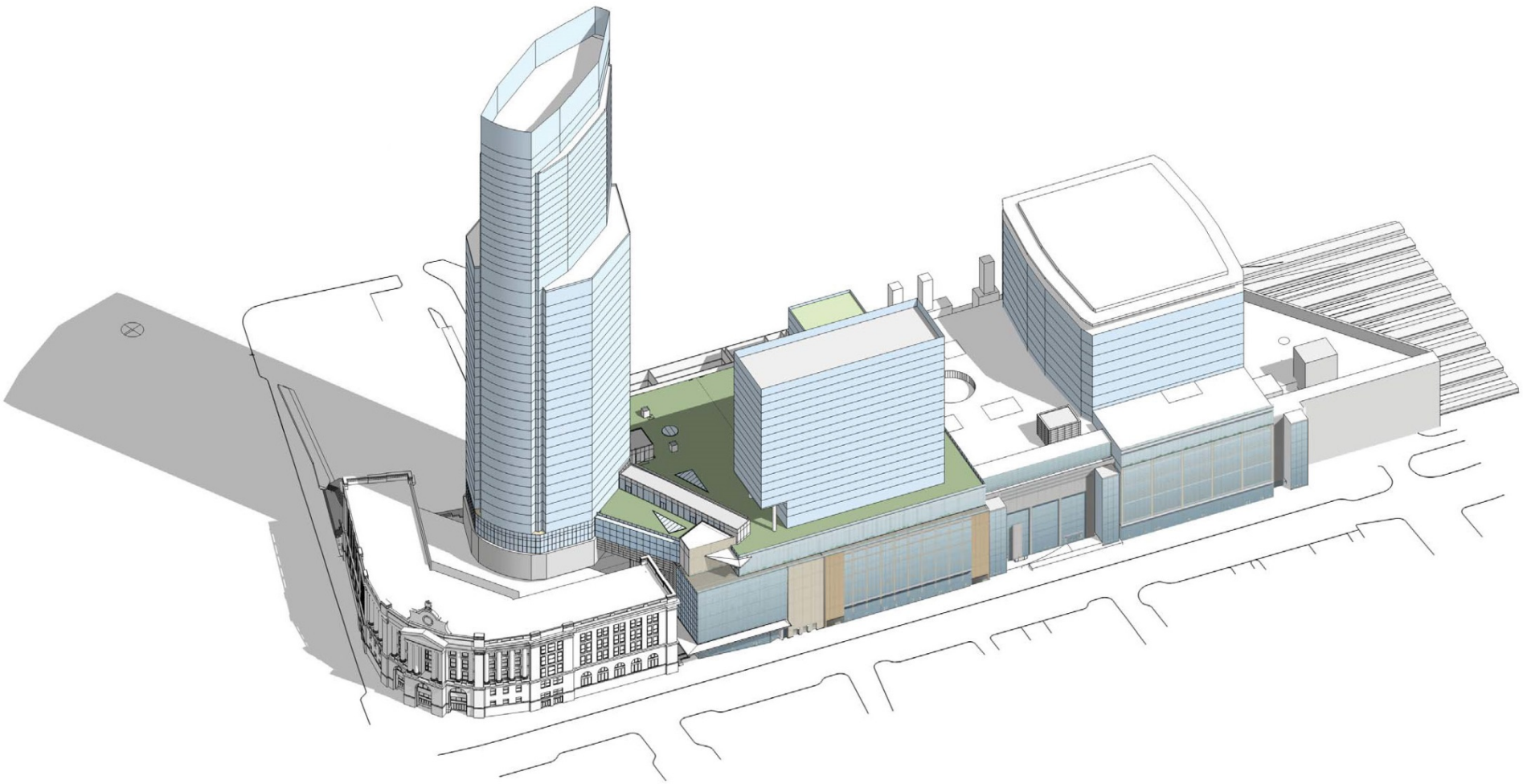


Figure 1-3

Project Axonometric (Looking East) – Current Project

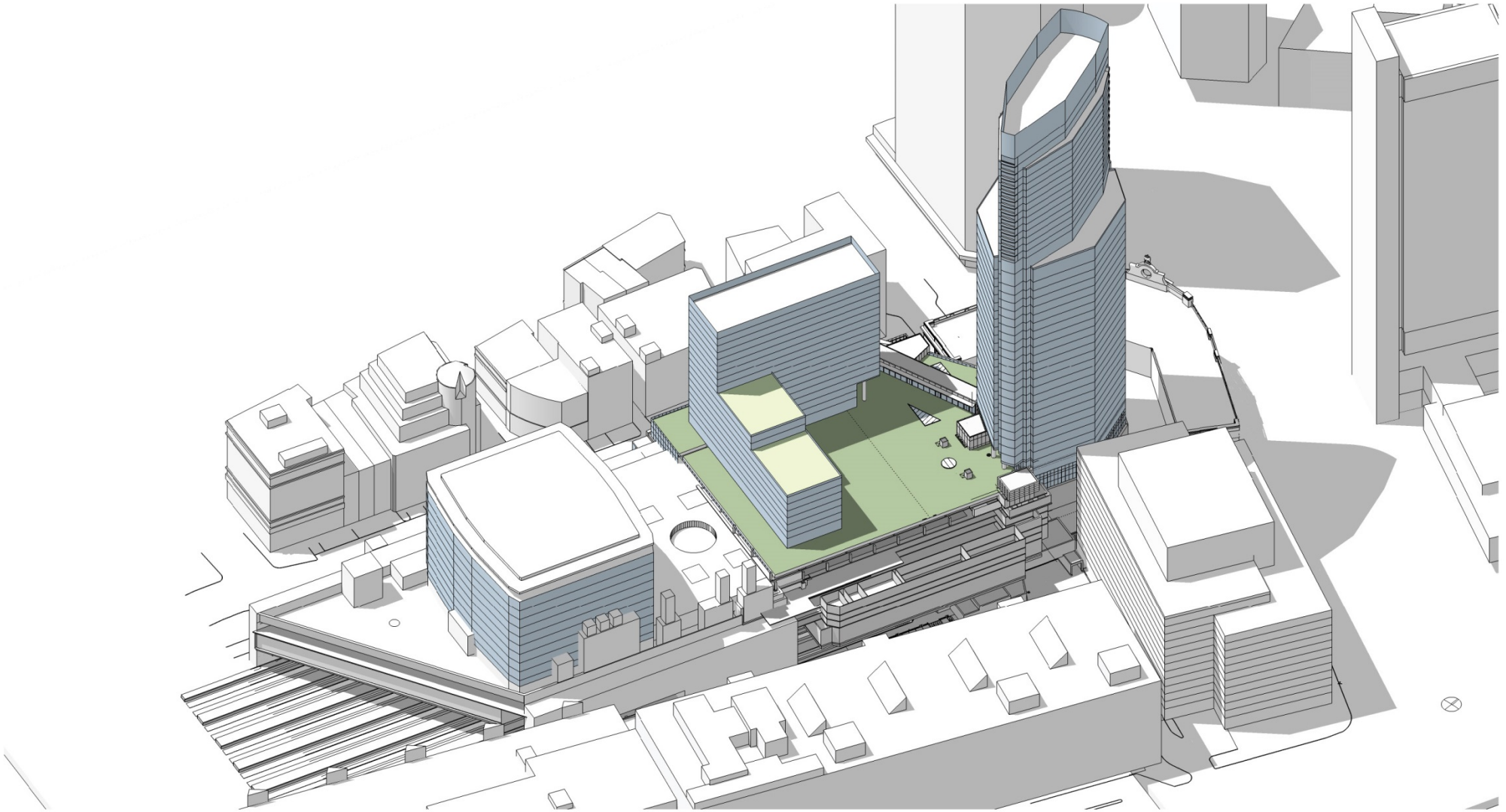


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Figure 1-4

Project Axonometric (Looking West) – Current Project

South Station Air Rights Boston, Massachusetts

Figure 1-5
Rendering of Phase 1 from the North

Hotel and/or Residential Building (Phase 2) - An approximately 314-foot tall, to the top of the highest occupiable floor, 17-story building will include approximately 438,000 sf. The building may include all residential units (rental or condominium), a hotel, or possibly a mix of hotel space and residential space (rental or condominium) with accessory retail. Phase 2 will be built above the expanded parking garage, and will have a lobby on Atlantic Avenue with elevators to the Sky Street level where the main lobby for the building will be located.

Mid-Rise Office Building (Phase 3) - An approximately 229-foot tall to the top of the highest occupiable floor, nine-story office building will be constructed on top of the existing parking garage. The approximately 511,000 sf office and accessory retail building will include an office lobby on Atlantic Avenue and elevator access to the Sky Street level.

All three buildings will include accessory retail space.

Bus Terminal Expansion and Pedestrian Connections – A new approximately 106,000 sf expansion of the existing bus terminal will be constructed in the current open space above the tracks between the existing South Station Head House and the existing bus terminal. New vertical connections between the bus station and train platforms will connect the two components. The Phase 1 building and the bus terminal expansion will create a weather-protected train shed between the South Station Head House and the bus terminal. This new space will accommodate a far more convenient pedestrian connection from the existing train station concourse and train platforms to the bus terminal.

Parking - The Project also provides for a five-level Parking Garage—two partial levels additional to that previously proposed to accommodate the additional residential space proposed to be constructed above the bus terminal, which will include a maximum of 895 parking spaces. After construction of the Parking Garage by the Proponent, it is anticipated that the Parking Garage and the MBTA Parking Garage will be operated by the Proponent as a single parking facility, containing a maximum of 1,083 parking spaces.

Ancillary Transportation Improvements - As part of the Project, the Proponent will improve the MBTA Transit Improvements by constructing modifications to the rotunda at the existing bus terminal, by relocating and modifying certain tracks and signals, by constructing a new electrical substation and by expanding the railyard ventilation system.

Table 1-1 provides a comparison between the project previously approved through the Article 80B process and the current Project, as well as details about the options for Phase 2. As noted above, although the previously approved project included only office space in Phase 1, two options were studied in the Draft PIR and Final PIR for Phase 1: 1) office only as Option A and 2) mix of office and residential space as Option B. The environmental impacts of the previously approved project were studied based on the worst case scenario for each environmental review component.

Table 1-1 Project Program Comparison

Project Element	Approximate Program FPIR (Option A)	Currently Proposed[1,2]
Phase 1		
Office/Retail	920,000 sf (including 8,000 sf retail)	711,000 sf (including 7,000 sf retail)
Residential	N/A	321,000 sf / 175 residential units
Phase 2 (All Residential Alternative)		
Residential/Retail	N/A	438,000 sf (including 8,000 sf retail) / 260 condominium units or 375 rental units[3]
Hotel	N/A	N/A
Phase 2 (Mixed Residential/Hotel Alternative)		
Residential/Retail	170,000 sf (including 8,000 sf retail) / 127 units	438,000 sf including 8,000 sf of retail (Potential mix of residential/hotel will depend on market conditions) [3]
Hotel	220,000 sf / 200 rooms	
Phase 2 (All Hotel Alternative)		
Residential	N/A	N/A
Hotel/Retail	N/A	438,000 sf (including 8,000 sf retail) / 360 rooms
Phase 3		
Office/Retail	455,000 sf (including 10,000 sf retail)	511,000 sf (including 12,000 sf retail)
Bus Terminal Expansion (Not included in total)		
Bus Terminal	70,000 sf	106,000 sf
TOTAL PROJECT		
Office/Retail	1,375,000 sf (including 18,000 sf retail)	1,222,000 sf (including 19,000 sf retail)
Residential/Retail	170,000 sf / (including 8,000 sf retail) (127 units)	Up to 759,000 sf (including 8,000 sf retail) (435-550 condo or rental units)[3]
Hotel	220,000 sf / 200 rooms	Up to 438,000 sf (including 8,000 sf retail) / 360 rooms
TOTAL SF w/o parking/loading with parking/loading	 1,765,000 sf 2,200,000 sf	 1,981,000 sf 2,522,000 sf
Parking	755 spaces	895 spaces

Table 1-1 Project Program Comparison (Continued)

Project Element	Approximate Program FPIR (Option A)		Currently Proposed[1,2]	
Height	To the top of the highest occupiable space[4]	To the top of the architectural feature enclosing the mechanical space measured from Grade	To the top of the highest occupiable space[4]	To the top of the architectural feature enclosing the mechanical space measured from Grade
Phase 1	621 feet	678 feet[5]	640.35 feet	677.1 feet
Phase 2	268 feet	308 feet	314 feet	334 feet
Phase 3	229 feet	249 feet	229 feet	249 feet

1 Based on Conceptual Plans and Zoning definition of GFA.

2 The calculations in this NPC represent a more refined calculation of GFA based on Article 2A of the Boston Zoning Code than was contained in the Final PIR, which may have inadvertently excluded some areas including mechanical areas which should not be properly considered GFA exclusions.

3 The Proponent plans to include condominium units in Phase 1, but depending on the economic conditions, rental units may be substituted.

4 In accordance with Article 40-8 and associated Appendix B measured from Grade.

5 The original FAA determinations specify a height limit of 691 feet above mean sea level based on NGVD 29 datum, consistent with the design of the previously approved project. FAA now requires the use of NAVD 88 datum. The 2016 FAA determinations, based on the new NAVD 88 datum, specified a height limit of 690 feet AMSL. The approximately one foot reduction in maximum height AMSL is attributable to the change in reference datum. The new limit reduces the height of the proposed tower as measured from above mean sea level by three inches. The original FAA determinations also included (for descriptive purposes only, not as a requirement) a height of 672 feet above ground level, and the 2016 FAA determination included a height of 677 feet above ground level.

The FPIR assumed that the average ground level elevation at the sidewalk along the Phase 1 building's frontage on Atlantic Avenue was 13.8 feet above mean sea level (AMSL) utilizing the NGVD 29 datum. The average ground level elevation at the sidewalk along the Phase 1 building's frontage on Atlantic Avenue is 12.9 feet above mean sea level (AMSL) utilizing the NAVD 88 datum. Thus, utilizing the current FAA height limit and zoning methodology for purposes of height measurement, the height above Grade is 677.1 feet (690 feet -12.9 feet =677.1 feet) based on NAVD 88 datum.

1.3.3 Project Changes Since BRA Approval

Changes to the Project are limited to Phases 1 and 2[5], parking and the bus terminal expansion, and include:

- Increase in site area to accommodate minor changes in Phase 1 building footprint (see Figure 1-6);

5 As noted in Footnote 3 above, although only Phases 1 and 2 are changing, the calculation of GFA has changed for all Project components, including Phase 3 and the bus terminal expansion, due to a more refined approach to calculating GFA consistent with Article 2A of the Zoning Code.

- Change in Phase 1 from all office alternative to mixed-use office and residential alternative, resulting in the creation of separate lobbies for residential and office space and the elimination of atrium space above the ground floor lobby, creation of four office/retail/amenity floors above the lobby and below the Sky Street as well as tower massing refinements to accommodate residential use, including two added floors within the previously approved overall building height to the top of the architectural enclosure of the rooftop mechanical equipment (achievable due to change in structural design and reduction in floor to floor height with residential use) (see Figure 1-7 and 1-8);

- Change of use of Phase 2 to add all-residential or all-hotel as alternatives to the approved mixed-use hotel and residential program, and the elimination of separate lobbies if a single use alternative is implemented;

- Change in massing of Phase 2 to create additional space between Phases 1 and 2, modifications to the layout to connect Phase 2 upper level lobby to Sky Street (previously it was located on the floor above) to provide more convenient access to shared amenities at office Sky Lobby, and the elimination of one ground floor lobby (unless both residential and hotel are included in Phase 2) and additional ground floor accessory retail space along Atlantic Avenue (see Figures 1-9 and 1-10, as well as Figures 1-3 and 1-4);

- Additional parking to accommodate changes in use (see Figures 1-11 and 1-12, as well as Figures 1-9 and 1-10);

- Modifications to the bus terminal expansion, including four fewer bus berths due to structural column requirements identified and reviewed with the MBTA in 2007, design changes requested by the MBTA (see Figures 1-13 and 1-14) including changes to the vertical circulation between the bus terminal and train platforms requested by the MBTA, which in turn necessitate minor modifications to the train track and platform layout (see Figures 1-15 and 1-16);

- Wider pathway between Atlantic Avenue and the train platforms, and change in overhead canopy eliminating the need for columns in the entry way and enhancing pedestrian flow;

- Minor changes to the layouts along Atlantic Avenue up to the Sky Street level to accommodate accessory retail, office and amenity space enlivening Atlantic Avenue, including restaurant space with outdoor seating at the Sky Street level, in addition to minor modifications of the lobby layouts at ground level and at the Sky Street level (see Figures 1-12, 1-14 and 1-16); and

- New outdoor terraces and gardens at the Phase 1 residential Sky Lobby level (see Figure 1-17).

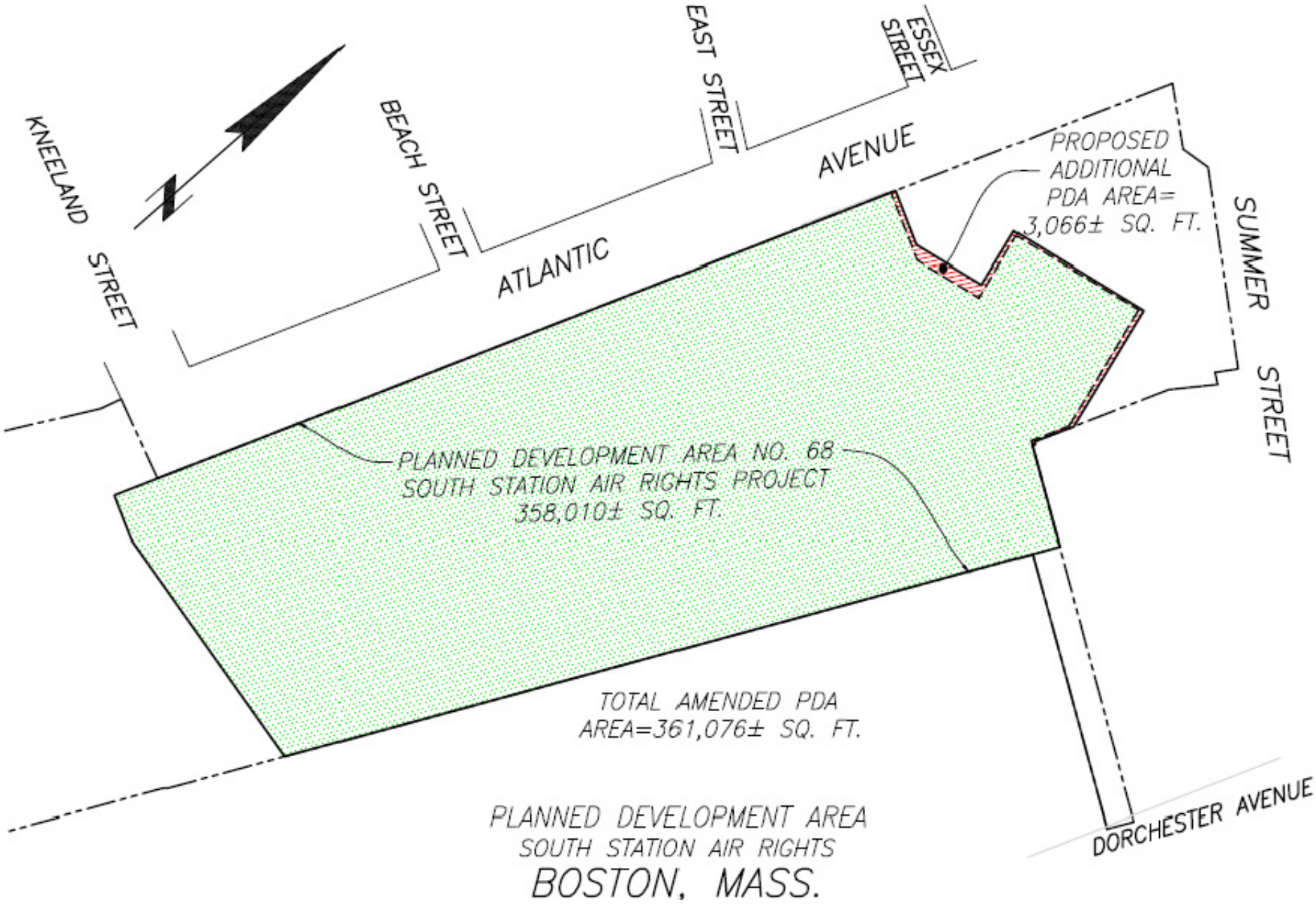

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Figure 1-6

Area to be Added to the Planned Development Area

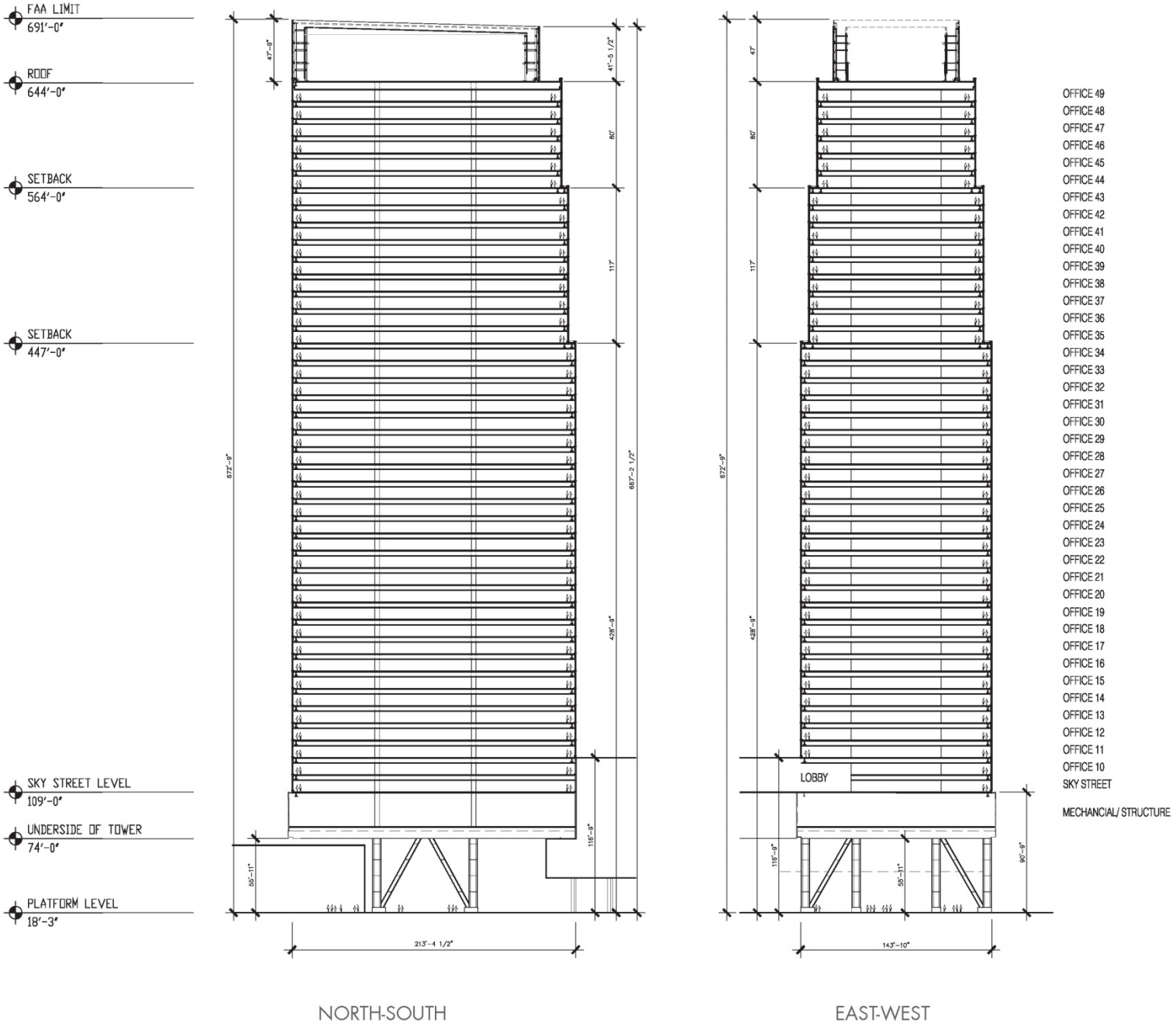

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Figure 1-7

Phase 1 Sections – Previously Approved Project

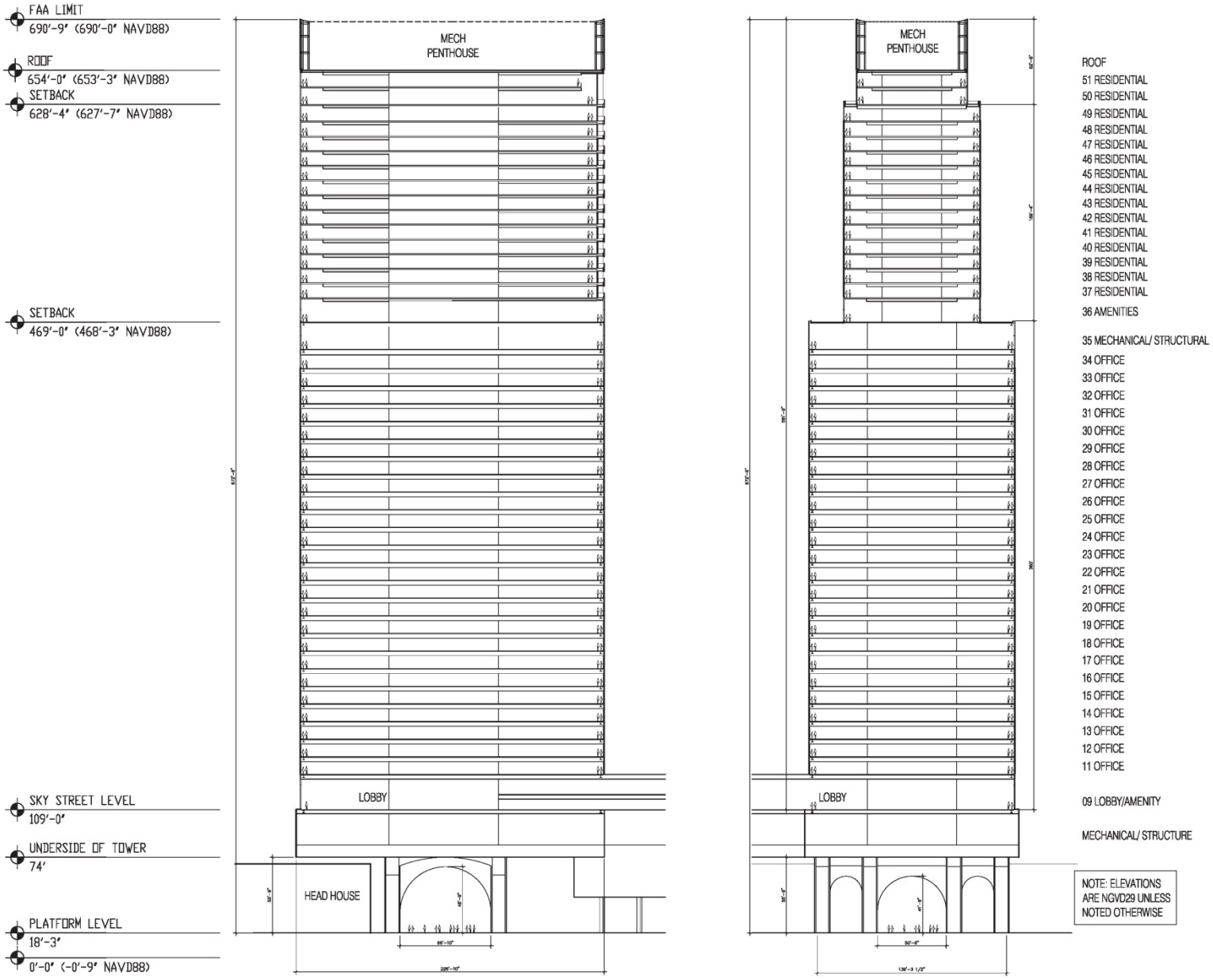

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Figure 1-8

Phase 1 Sections – Current Project

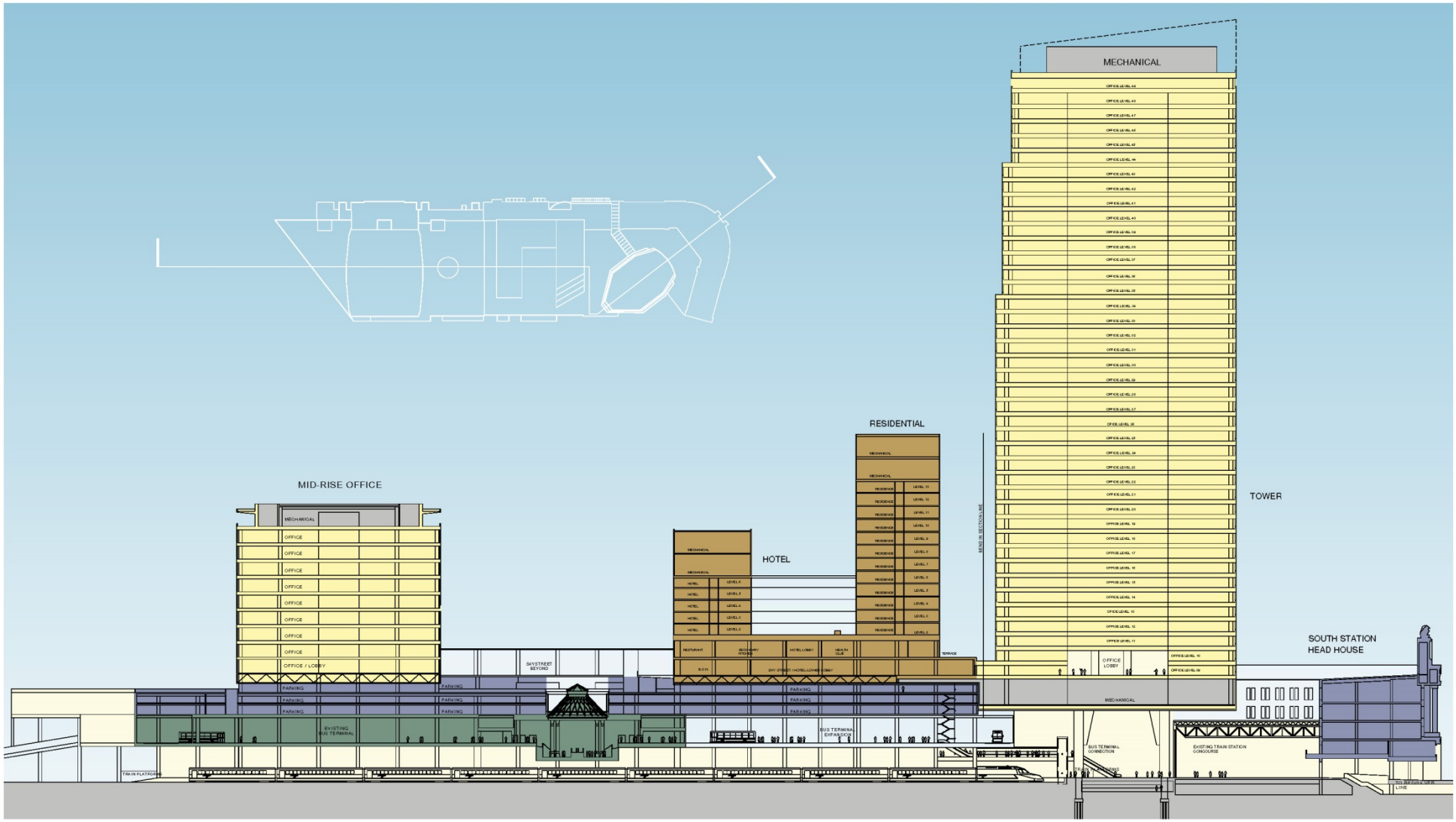

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Figure 1-9

Project Section – Previously Approved Project

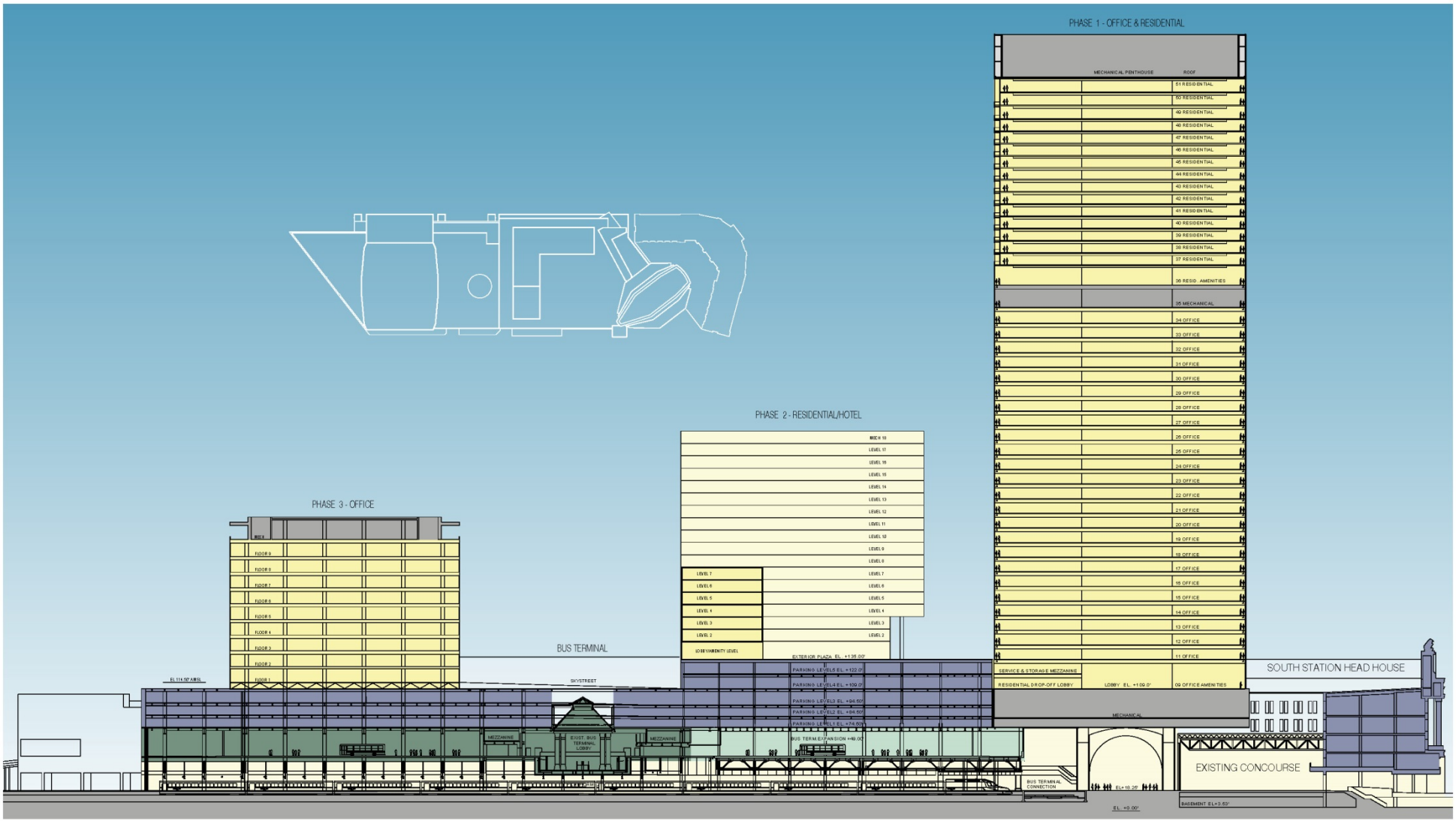

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Figure 1-10

Project Section – Current Project

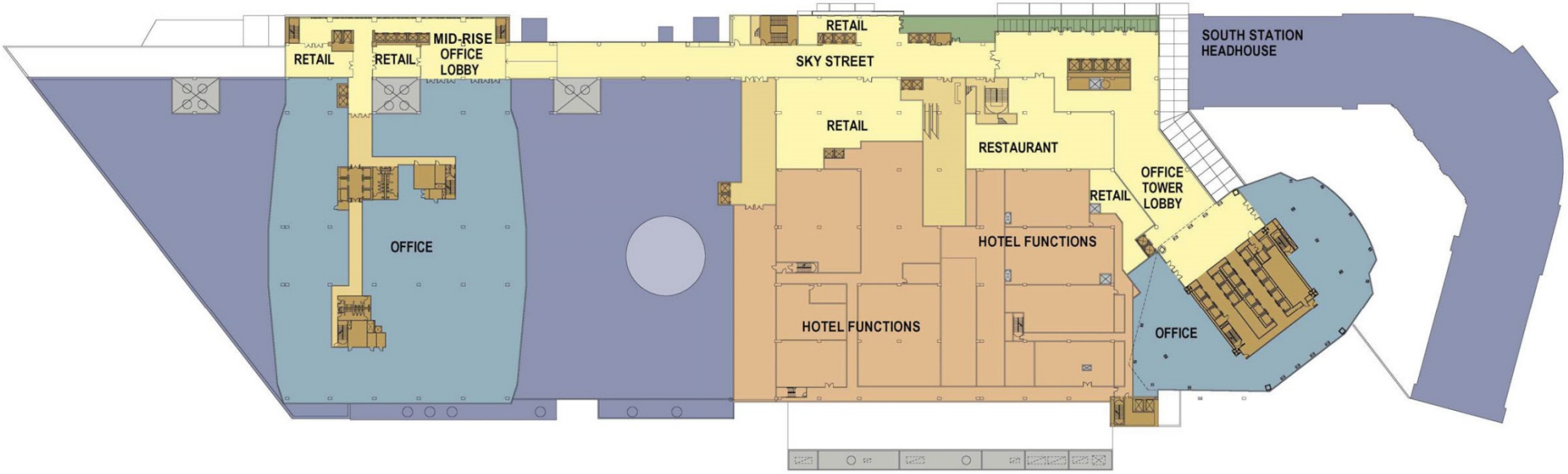

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Figure 1-11

Project Plan at Sky Street – Previously Approved Project

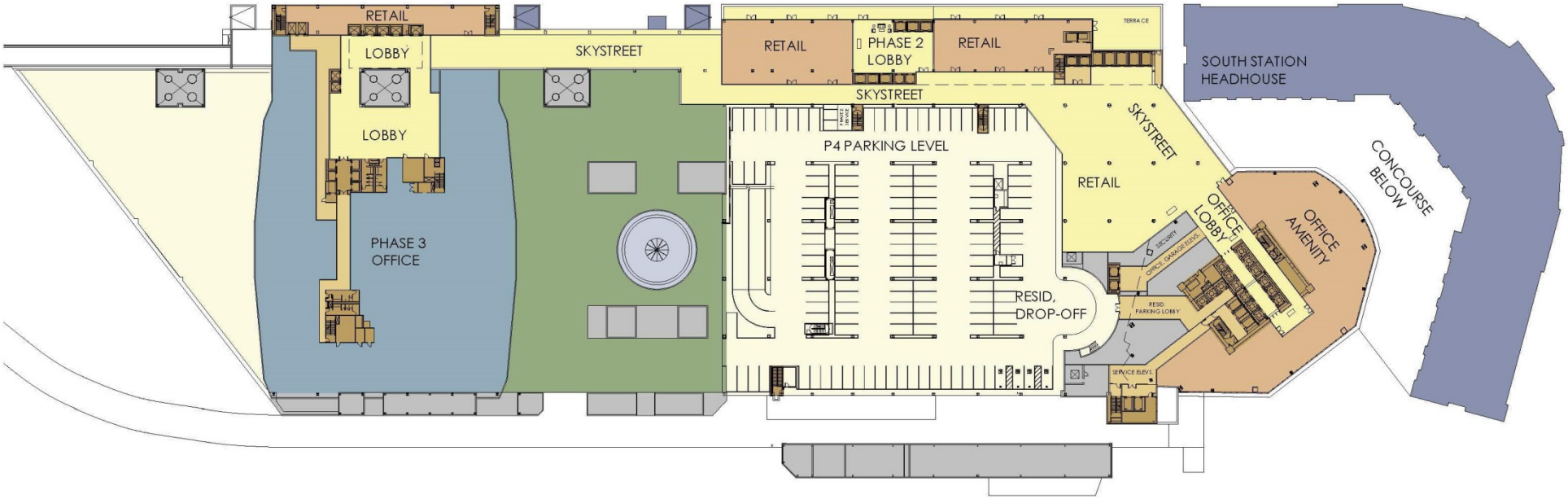

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Figure 1-12

Project Plan at Sky Street – Current Project

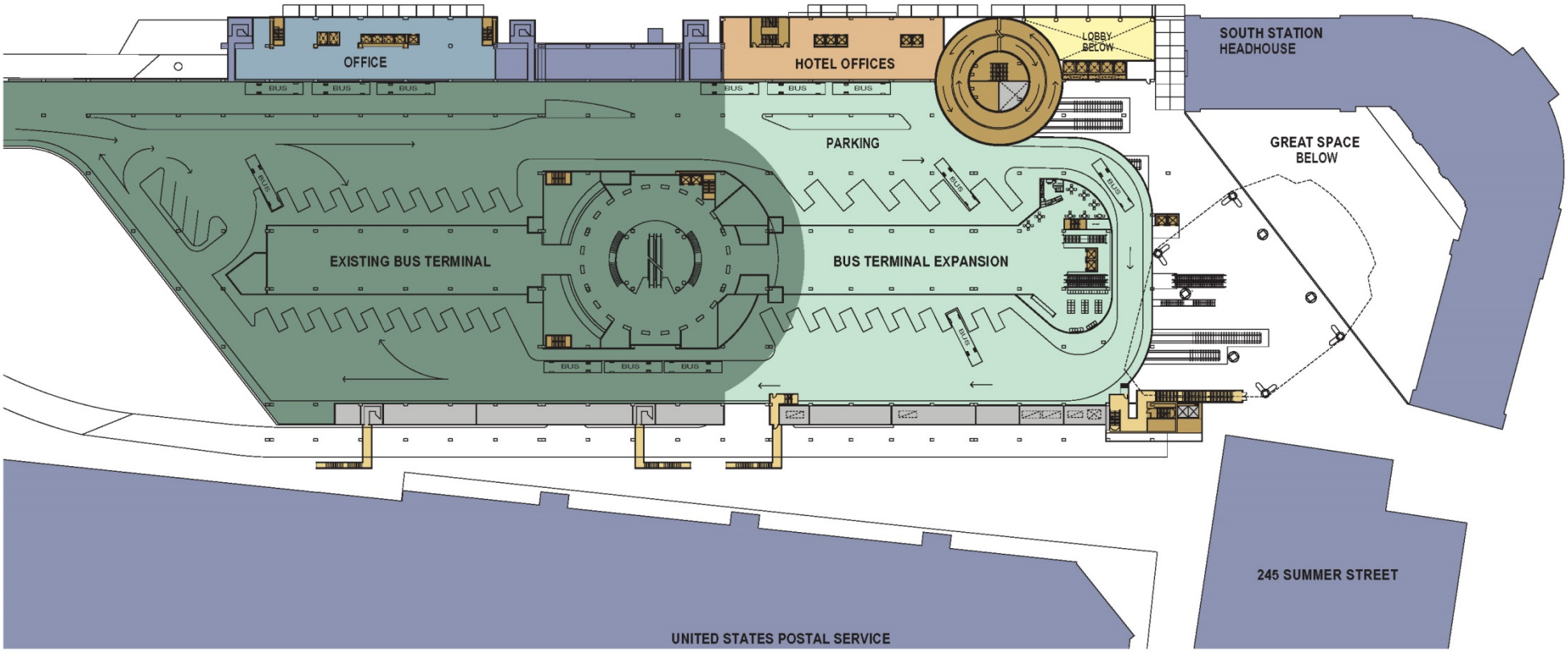

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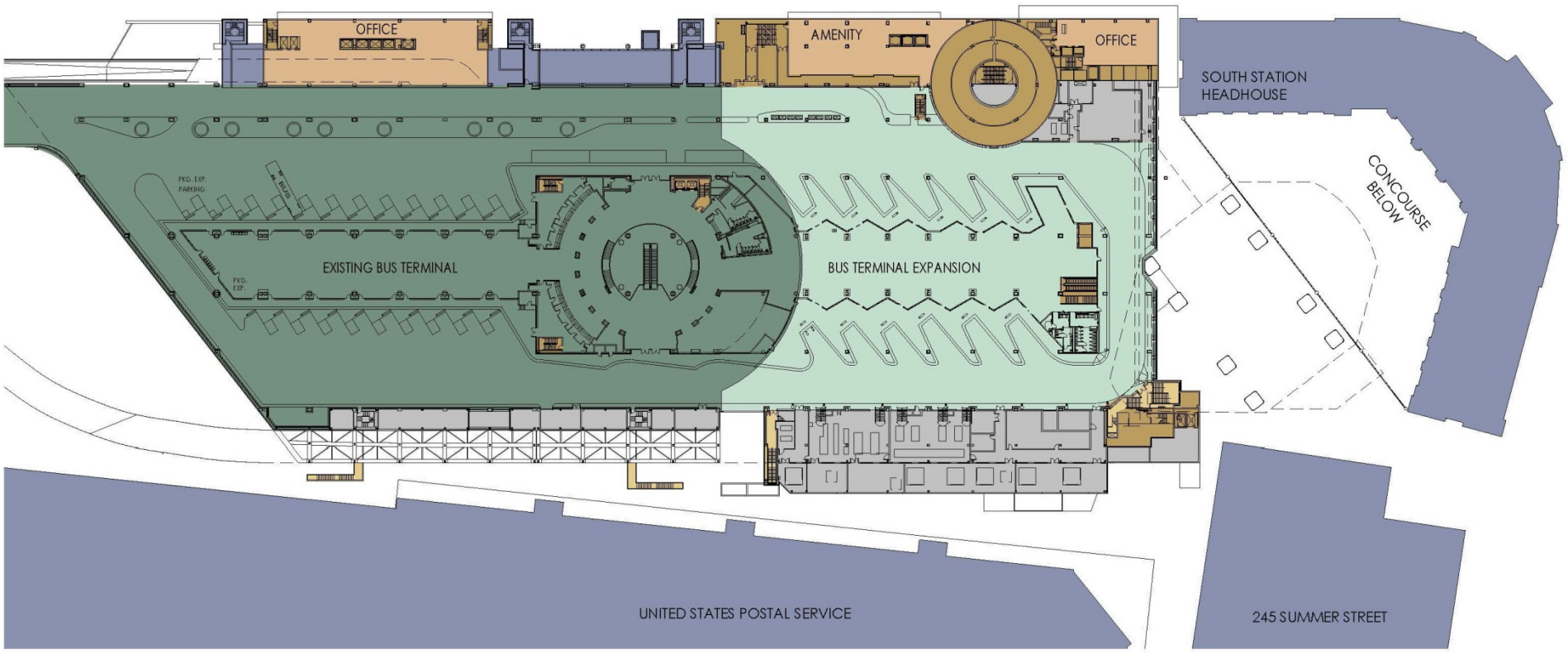
Figure 1-13

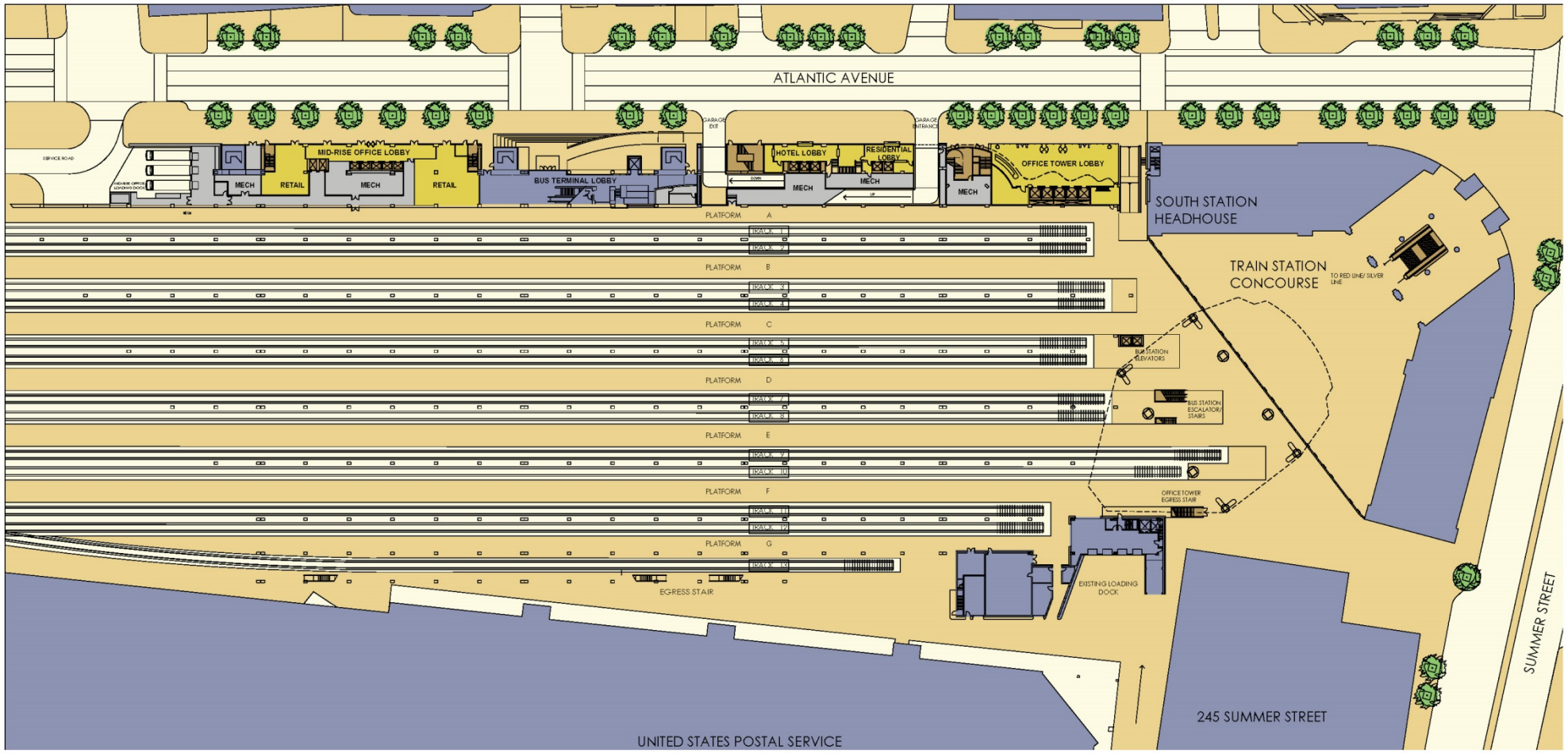
Project Plan at Bus Terminal – Previously Approved Project



South Station Air Rights **Boston, Massachusetts**

Figure 1-14

Project Plan at Bus Terminal – Current Project



South Station Air Rights Boston, Massachusetts

Figure 1-15

Project Plan at Grade – Previously Approved Project

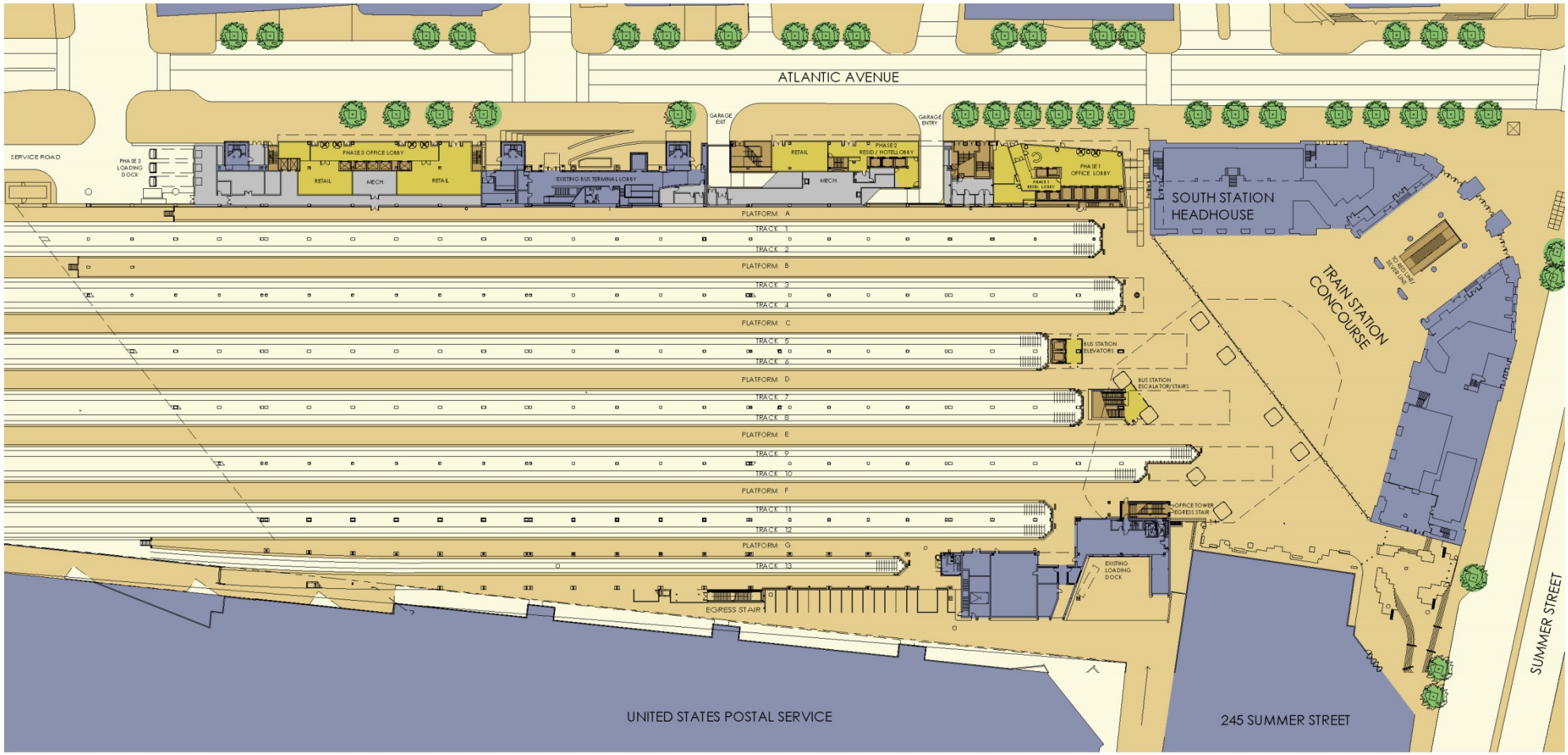


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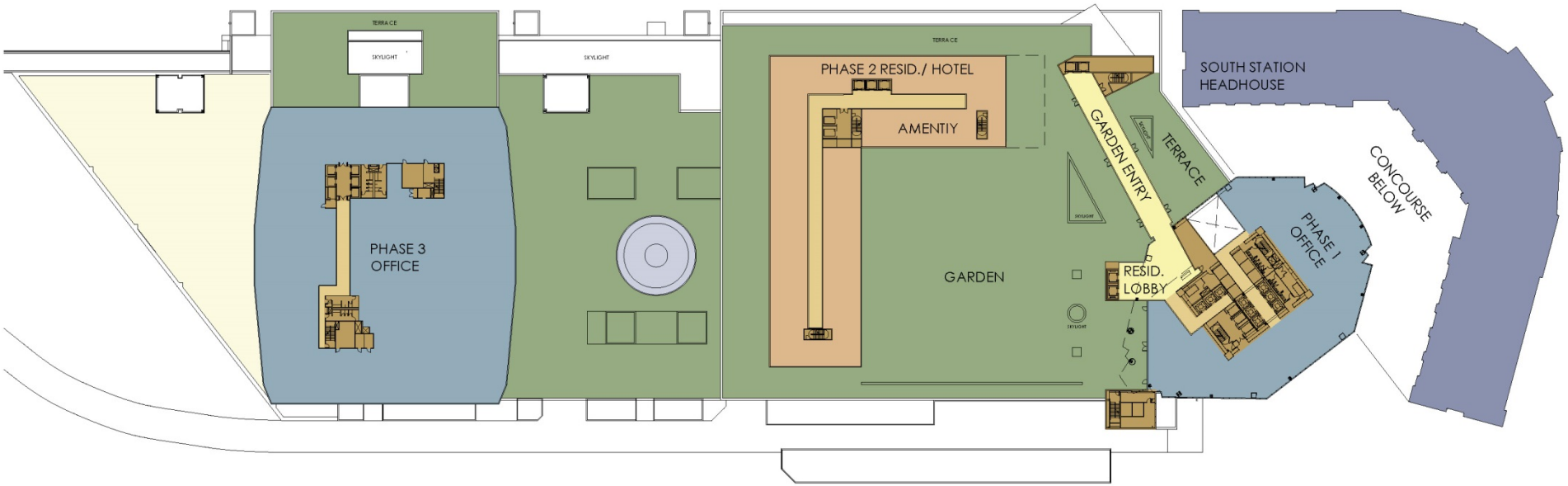
Figure 1-16

Project Plan at Grade – Current Project



South Station Air Rights Boston, Massachusetts

Figure 1-17

Project Plan at Phase 1 Residential Sky Lobby and Phase 2 Amenity Level – Current Project

1.3.4 Project Coordination with the South Station Expansion Project

The Proponent and MassDOT have been coordinating on the South Station Expansion project (SSX) and the proposed Project since 1998. The SSX DEIR submitted in October, 2014 and the SSX FEIR submitted June 30, 2016 included the proposed Project (referred to as the South Station Air Rights project [SSAR]) in its analyses as part of its No Build Alternative. Consistent with the SSX project, the Project proposes to improve interconnections between the different modes of transportation serviced by South Station. As stated in the SSX DEIR, "… the interrelationship between the two projects' design elements, such as platform lengths, column placement and passenger access, will be carefully reviewed to ensure consistency in planning and design." As described in the SSX FEIR, …."[p]rior to the expansion of South Station, MassDOT anticipates that the site would include the planned SSAR project…to be located directly above the railroad tracks at the existing South Station headhouse." The Proponent met with the South Station Expansion planning team in June 2016 to confirm that the Project and the SSX plans are coordinated and as described in the SSX FEIR, "…coordination between MassDOT and the SSAR project proponent will continue as design of each project advances." The plans proposed in the SSX FEIR filed on June 30, 2016 clearly identify the South Station Air Rights Project as part of the SSX Master Plan.

1.4 Public Benefits

The Project is a mixed-use, transit-oriented development targeting LEED Gold for Phase 1 that develops an underutilized site of crucial importance to the revitalization of the surrounding area and achieves the objectives intended by the substantial investment of the federal and state governments in infrastructure and transit improvements of increasing commercial and residential development in the area. Below is a description of the Project's benefits.

Transportation Improvements

The Project includes numerous transportation-related improvements and benefits, including:

- Converts the value of the air rights above South Station into significant, privately-funded transportation infrastructure improvements.
- Significant private investment in transportation enhancements, including:
  - Construction of the approximately 106,000 sf bus terminal expansion;
  - Contribution to the renovation of the existing terminal;
  - Contribution to the MBTA for other transportation improvements; and

- Construction of an expanded train platform area which will accommodate pedestrian connections among the bus, train, and subway systems.

- Facilitates and reduces the MBTA's cost of the expansion of the railyard and platform areas onto the adjacent USPS property.

- Completes the vision of the BRA and MBTA to develop South Station into an intermodal transportation center that will concentrate development where it can be best served by the existing highway and public transportation infrastructure.

- Provides more convenient passenger connections between the bus station and the commuter rail, Amtrak and subway lines.

- Increases capacity of the bus terminal by 50%.

- Provides rail yard fire and life safety improvements.

- Improves railyard infrastructure to enhance the safety of patrons and reduce operating and maintenance costs of the MBTA.

- Provides wayfinding and safety enhancements for transit patrons with disabilities.

- Provides a weather-protected environment for patrons of South Station.

Economic Benefits

The Project includes a number of economic benefits for the City of Boston and Commonwealth, including:

- Provides significant, additional recurring income to the MBTA (bus gate fees and retail revenue).

- Meets or exceeds the affordable housing requirements as set forth in the 2007 Land Disposition Agreement between the BRA and the Developer.

- Creates approximately 6,600 direct construction jobs and $413,100,000 in wages from and salaries to construction workers.

- Results in approximately 5,300 permanent jobs, of which 1,300 are direct new permanent jobs resulting in approximately $98,700,000 in wages and salaries annually.

- Contributes to the Neighborhood Housing Trust and Neighborhood Jobs Trust in accordance with the Development Impact Project Agreement dated June 28, 2006.

- Over $26,000,000 in estimated property taxes annually.

- Increase in sales and wage tax revenues.
- Boston Residents Construction Plan.
- Boston Employment Opportunity Plan.

Public Realm/ Pedestrian Activity

The Project also includes a number of benefits to its immediate surroundings, including:

- Respectfully complements the axis, geometry and visual strength of the train station building.
- Completes Dewey Square as a gateway and public space.
- Improves streetscape and pedestrian experience along Atlantic Avenue with new retail spaces and lobbies to the proposed buildings activating the street and enhancing compatibility with the Leather District.
- Facilitates the future creation of a direct pedestrian link among the train station concourse, the adjacent USPS property, and the waterfront along Fort Point Channel.
- Creates a vibrant street life during off-peak hours, resulting in safer and more pleasant travel by public transportation in evenings and on weekends.
- Improves streetscape with new sidewalks, granite curbs, streetlights, street trees and street furniture.

1.5 Zoning

In connection with this NPC, the site area is being increased by map amendment by 3,066 sf. The zoning calculations for the NPC Project set forth in Table 1-2. Consistent with the Amended and Restated Development Plan, the Site Area within the Planned Development Area (PDA) consists of MBTA fee area over which the Project is being constructed. The South Station Head House itself is not included in the site area.

Note that the Project numbers used in the NPC analysis exclude the square foot measurement of the parking garages (the Project Parking Garage and the MBTA Garage) and the loading areas. For purposes of calculation of FAR, however, such above-grade areas are considered Gross Floor Area under the Boston Zoning Code and are used in calculation of FAR under the Amended and Restated Development Plan.

Consistent with Article 40-8 and Appendix B of the Boston Zoning Code as applicable within a PDA for the purposes of determining height, height of the proposed Project is measured from grade level (as defined in the Boston Zoning Code) to the top of the

structure of the last occupied floor. For reference, however, height is also presented below as measured to the top of the highest architectural enclosure of the rooftop mechanical equipment. For zoning purposes, height is measured above grade level (agl).

Table 1-2 Zoning Calculations

Height Phase 1	640.35 feet to the top of the highest occupiable floor and 677.1 feet to the top of the architectural enclosure of the rooftop mechanical equipment
Height of Phase 2	314 feet to the top of the highest occupiable floor and 334 feet to the top of the architectural enclosure of the rooftop mechanical equipment
Height of Phase 3	229 feet to the top of the highest occupiable floor and 249 feet to the top of the architectural enclosure of the rooftop mechanical equipment
Gross Square Feet (less project parking and loading)	1,981,000 sf
Gross Square Feet (incl. project parking and loading and MBTA parking)	2,522,000 sf
Approximate Land Area (includes air rights)	361,076 sf
FAR[6] (incl. parking and loading)	6.98
FAR (less parking and loading)	5.49
FAR (maximum allowed under Article 40 in PDA in New Economy Development Area)	10.0

The Project will require the zoning approval of the BRA and the Boston Zoning Commission for approval of an Amended and Restated Development Plan and a map amendment adding 3,066 sf to PDA No. 68. The proposed Amended and Restated

[6] Although the site is air rights, FAR for the proposed Project has been calculated based on the land area of the underlying MBTA fee area. Under the Boston Zoning Code, the MBTA improvements on the fee area do not constitute Gross Floor Area (and, therefore, are not counted in FAR calculations) as long as they are used for transit-related purposes.

Development Plan for Planned Development Area No. 68 has been submitted under separate cover.

1.6 Regulatory Controls and Permits

In connection with the 2006 Project, the following permits or approvals as listed in the Final Project Impact Report have been previously issued: FEDERAL: Federal Aviation Administration—Determination of No Hazard; STATE: Executive Office of Environmental Affairs (MEPA Unit)—Secretary's Certificate Adequacy of Final EIR; Executive Office of Transportation—Approval of Issuance of Building Permit; Massachusetts Bay Transportation Authority—Permits, Approvals, Easements, Operating Agreements and Other Arrangements; Massachusetts Highway Department—Highway Access Permit; Massachusetts Historical Commission—Memorandum of Agreement; Department of Public Safety Board of Building Code Regulations and Standards-- Variance; LOCAL: Boston Air Pollution Control Commission—Permit; Boston Civic Design Commission—Approval; Boston Redevelopment Authority—Article 80 Review; Article 80B Adequacy Determination; Amendment of Article 40; Creation of PDA No. 68; Approval of Development Plan; Land Disposition (Air Rights) Agreement; Boston Zoning Commission/Mayor-- Amendment of Article 40; Creation of PDA No. 68; Approval of Development Plan; City of Boston Committee on Licenses—Approval of Erection of Parking Garage and Storage of Inflammables; Public Improvement Commission—Specific Repair Plan, Earth Retention Order; Discontinuance of Air Rights; License for Marquee.

In connection with the Project, no additional permits or approvals beyond those listed in the FPIR and above are anticipated, except that modifications or supplements to permits or approvals previously issued may be required to reflect the changes proposed from the 2006 Project and the following additional permits or approvals have been identified: STATE: Department of Public Safety—Building Permit; Massachusetts Department of Transportation—Alteration of State Highway Layout; Approval to Build within Limits of State Highway Layout.

1.7 Lapse of Time

The 2006 previously approved project has been included as a background "existing" condition in impact studies of more recent projects in the surrounding area, including the South Station Expansion currently being reviewed under the Massachusetts Environmental Policy Act. It is not anticipated that any lapse of time has resulted in additional impacts from the Project itself.

1.8 Schedule

The redevelopment of the site will proceed generally from the north end of the site to the south end. The Project phases may be constructed during different periods of time. The Proponent currently estimates that construction of the bus terminal expansion, the ancillary

transportation improvements, the next phase of the parking garage and the Phase 1 building will commence in 2017, and will be completed approximately four years after commencement of construction. Construction of the Phase 2 building is expected to commence within one year after completion of the Phase 1 building, and will be completed approximately two years after commencement of construction. Construction of the Phase 3 building is expected to commence within one year after completion of the Phase 2 building, and will be completed approximately two years after commencement of construction. However, the schedule may be expedited or extended depending on market forces.

Chapter 2.0

Transportation Component

2.0 TRANSPORTATION COMPONENT

2.1 Introduction

Vanasse & Associates, Inc. (VAI) has completed a detailed assessment of the changes to the development program for the South Station Air-Rights Project as these changes relate to trip-generation and the associated impacts on the transportation infrastructure. The scope of work was developed in consultation with the BRA and the Boston Transportation Department (BTD), and consisted of the following specific elements:

- Assessing existing operating conditions and pedestrian and vehicle accommodations along Atlantic Avenue, Purchase Street and Surface Road using the BTD traffic model (2014 base-year);
- Providing updated transit ridership and capacity information for South Station;
- Evaluating motor vehicle, pedestrian and bicycle safety within the study area;
- Reviewing future operating conditions and transit use with and without the Project consistent with the horizon year (2025) and future conditions that were defined in the Traffic Analysis that was submitted in support of the South Station Expansion project;[1,2]
- Comparing impacts associated with the proposed Project to those of the previously approved development program; and
- Refining and expanding the elements of the transportation improvement program to reflect the transportation resources and opportunities that are available to the Project site and within the study area.

Based on this assessment, the impacts on the transportation infrastructure that are associated with the Project are generally consistent with, or reduced from, the conditions that were assessed in the Transportation Component of the February 28, 2006 Final PIR, which concluded that the transportation infrastructure afforded sufficient capacity to accommodate the 2006 Final PIR Project.

As noted in the February 28, 2006 Final PIR, the planning and design of the Central Artery/Tunnel (CA/T) project contemplated the construction of the 2006 Project and, as such, the associated transportation infrastructure, including the I-90/I-93 interchange, the ramps serving the South Station Bus Terminal and the surface street system proximate to the Project site, were constructed in a manner to support the development of the Project.

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[1] Traffic Analysis Technical Report, South Station Expansion; MassDOT; October 2014.

[2] Note that the South Station Expansion project FEIR and the associated improvements to South Station reflect a larger South Station Air Rights project than is being proposed.

2.1.1 Project Impact Summary

Several potential development scenarios have been considered for the Project, all of which include the same program for Phases 1 and 3, but reflect alternatives for Phase 2. The option with the anticipated highest overall number of trips (375 Phase 2 residential units) was used for the analysis as the associated trips and the impacts on the transportation infrastructure would be less for the other scenarios considered. Depending on market conditions and other factors, Phase 2 may ultimately be a mix of residential and hotel, but it is anticipated that the impacts will be similar or less as those described in the transportation analysis.

2.1.1.1 Trip-Generation

Prior to dissemination of Project-related trips to the various modes of travel that are available to the Project site, the Project is projected to result in 11,830 unadjusted vehicle trips on an average weekday (again, two-way, 24-hour volume), with 1,616 unadjusted vehicle trips expected during the weekday morning peak-hour and 1,682 unadjusted vehicle trips expected during the weekday evening peak-hour.

After dissemination of Project-related trips to the available modes of transportation, the Project is projected to result in 3,144 automobile trips on an average weekday, with 5,242 transit trips and 4,572 pedestrian/bicycle trips. During the weekday morning peak hour, the Project is projected to generate 558 automobile trips, with 951 transit trips and 244 pedestrian/bicycle trips. During the weekday evening peak hour, the Project is projected to generate 601 automobile trips, with 959 transit trips and 262 pedestrian/bicycle trips.

NPC Project Trip Comparison

A comparison of the trips (all modes) was made between the 2016 NPC option that will result in the most trips (office space in Phases 1 and 3 and up to 550 residential units in Phases 1 and 2) and the option described in the Final PIR that resulted in the most trips (all office Phase 1). This comparison indicates that the 2016 NPC Project will result in 26 fewer automobile trips on an average weekday when compared to the approved Final PIR Option A, with 1,634 fewer transit trips and 882 fewer pedestrian/bicycle trips. During the weekday morning peak-hour, the 2016 NPC Project was shown to result in 12 additional automobile trips, with 400 fewer transit trips and 39 additional pedestrian/bicycle trips. During the weekday evening peak-hour, the 2016 NPC Project was shown to result in 14 additional vehicle trips, with 478 fewer transit trips and 31 additional pedestrian/bicycle trips.

Traffic Operations

The addition of the 2016 NPC Project traffic to the 17 signalized study area intersections is predicted to result in a change in the overall level of service (LOS) at only two of the intersections studied between the 2025 No Build and 2025 Build condition. Eleven of the 17 signalized intersections were found to be generally operating at LOS D or better during the peak hours under all analysis conditions.

All movements at the two unsignalized study area intersections (the access points to the Project site from Atlantic Avenue) are predicted to operate at LOS A during both the weekday morning and evening peak hours, with vehicle queues of no more than one vehicle.

Pedestrian and Bicycle Conditions

The Project is expected to result in up to 4,572 pedestrian/bicycle trips on an average weekday, and between 200 and 260 pedestrian/bicycle trips during the weekday peak commuter hours. The Project site is served by an interconnected sidewalk infrastructure that links the Project to Downtown Boston and the South Boston Waterfront, with the signalized intersections within the study area providing marked crosswalks, pedestrian traffic signal equipment and phasing. A Hubway bicycle sharing station is provided at South Station, and bicycle accommodations are provided along Atlantic Avenue, Surface Road, Purchase Street and Seaport Boulevard, which link the Project site to other bicycle facilities in the City and the region.

Planned improvements to these accommodations in conjunction with the Project (discussion follows) and as a part of the South Station Expansion project will improve and expand pedestrian and bicycle access to the Project site, and ensure that sufficient capacity is provided to accommodate the increased pedestrian and bicycle activity associated with the Project. It is important to note that the capacity analyses and the associated pedestrian and bicycle improvements that have been defined for the South Station Expansion project reflect a larger development proposal for the Project than is currently proposed.

Public Transportation

The additional weekday peak-hour transit trips expected to be generated by the Project were distributed to each of the public transportation modes operated by the MBTA and the private bus lines that serve the South Station Bus Terminal based on ridership information provided by the Central Transportation Planning Staff (CTPS). Based on the peak period transit capacity and ridership information provided by the CTPS, the majority of the transit trips associated with the Project are expected to use the subway system, with a projected increase in peak-hour ridership of up to 117 passengers on any one subway line (including the Silver Line). Peak-hour ridership on the Commuter Rail system is expected to increase by up to 41 passengers on any individual train. Increases in bus and commuter boat

ridership associated with the Project are expected to be relatively modest and a similar increase to that indicated in the FPIR. As indicated previously, the South Station Expansion project and the associated improvements to South Station reflect a larger South Station Air Rights project and associated increase in transit ridership for the Project than is currently proposed.

2.1.1.2 Transportation Improvement Program

As a result of the analyses presented herein, a comprehensive transportation improvement program has been developed for the Project that is consistent with the improvements that were outlined in the Transportation Access Plan Agreement (TAPA) that was executed between the Proponent and BTD for the 2006 Final PIR Project that was to occupy the Project site. These improvements are designed to: i) address the potential impact of the Project on the transportation infrastructure; ii) encourage the use of alternative modes of transportation for those accessing the Project; and iii) address transportation infrastructure deficiencies identified as a part of this study or by the City.

The planned improvements encompass the following general elements:

- Sidewalk and streetscape improvements along the Project site frontage on Atlantic Avenue;
- Pedestrian and bicycle access and safety improvements, including providing funds and data for a South Station/Leather District Pedestrian Access Study;
- Advancement of a comprehensive Transportation Demand Management (TDM) program to include specific elements designed to encourage the use of public transportation services, car and vanpooling, and pedestrian and bicycle use;
- Implementation of a detailed Construction Management Plan (CMP) that is designed to reduce impacts during the construction phase of the Project; and
- Integration of a traffic monitoring and reporting program that will be used to document the trip characteristics of the Project under operating conditions, and allow for adjustments to the elements of the TDM program or associated aspects of the transportation improvement program as necessary.

The implementation of the identified improvements will serve to provide additional capacity and enhancements to the transportation system to accommodate the Project, and to facilitate access to the Project site in a safe and efficient manner.

2.1.2 Project Description

As currently proposed, the Project will entail the construction of a mixed-use, transit oriented development that will encompass a mix of office, residential/hotel and accessory retail space located on the air rights between the South Station Head House and the southern end of the Michael S. Dukakis Transportation Center at South Station including the MBTA's South Station Bus Terminal and the railroad tracks for the MBTA commuter rail and Amtrak. The site is generally bounded by Atlantic Avenue to the west, the South Station Head House to the north and the U.S. Postal Service to the east, and is depicted on Figure 2-1 in the context of the existing transportation infrastructure.

As previously described, several potential development programs are under consideration for the Project, all of which will include the same program in Phases 1 and 3, as well as the accessory retail in Phase 2 (1,147,347 sf of office[3] including approximately 19, 350± sf of conference center space and 27,000± sf of accessory retail space, as well as 175 residential units) but may include different use alternatives for Phase 2. One Phase 2 alternative includes all residential/retail space with up to 375 residential units (either 260 condominiums or 375 rental units) and another Phase 2 alternative includes an all hotel alternative with 360 keys/rooms. The option with the highest overall number of trips (375 Phase 2 residential units) was used for the analysis as the associated trips and the impacts on the transportation infrastructure would be less for the other scenarios considered. Depending on market conditions and other factors, Phase 2 may ultimately be a mix of residential and hotel, but it is anticipated that the impacts will be similar or less as those described in the transportation analysis.

In conjunction with the Project, the South Station Bus Terminal will be expanded by approximately 106,000 sf on property owned by the MBTA and a new parking garage will be constructed above the bus terminal which will include approximately 895 spaces in addition to the existing MBTA parking garage. After construction of the new garage, the combined parking garages (new garage and MBTA garage) will provide 1,083 parking spaces.

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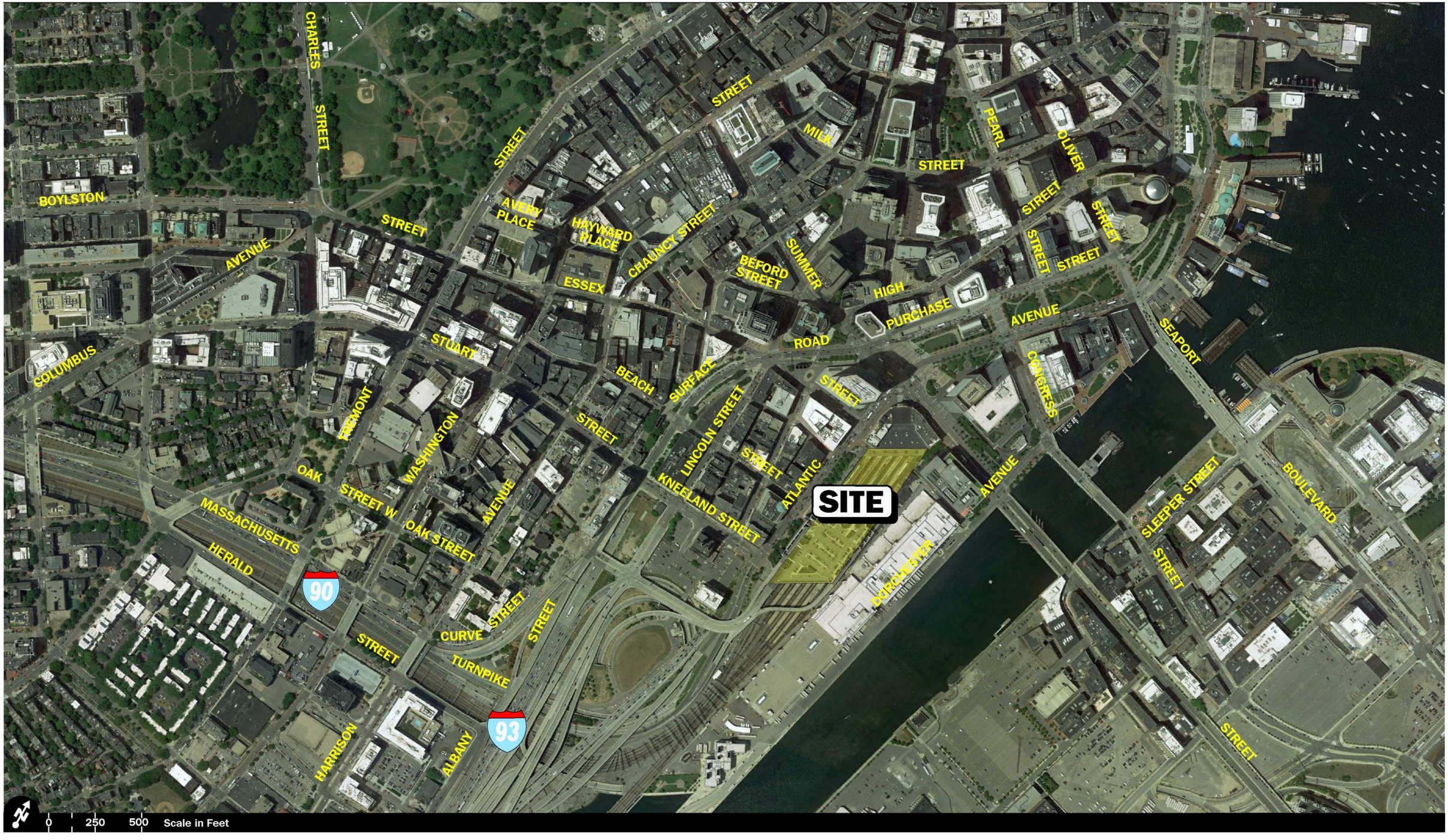
[3] The floor area of the office component, inclusive of mechanical, podium, service and circulating space within the podium, is 1,222,000 sf as described in Chapter 1.



South Station Air Rights Boston, Massachusetts

Figure 2-1
Site Location Map

The approved development program for the Project site as defined in the Transportation component of the February 28, 2006 Final PIR also included two potential development programs which were defined as follows:

Option A - 1.375 million sf of office space; a 220,000 sf, 200-room hotel; and 127 residential units encompassing approximately 170,000 sf.

Option B - 1.075 million sf of office space; a 225,000 sf, 200-room hotel; and 329 residential units encompassing approximately 450,000 sf.[4]

Under both Final PIR development options, the South Station Bus Terminal was to be expanded by approximately 90,000 sf on property owned by the MBTA, and a new parking garage was to be constructed above the bus terminal which would include 755 spaces in addition to the MBTA parking garage. After construction of the new garage, the combined parking garages (new garage and MBTA garage) were to provide 905 parking spaces.

The South Station Air Rights Project was reflected in the traffic volume projections and planning that formed the basis of the constructed elements of the Central Artery/Tunnel (CA/T) project and the South Station Bus Terminal. As such, the planned and constructed elements of the transportation system that serves the South Station area incorporate the infrastructure required to support this transit-oriented development.

Consistent with the 2006 Final PIR Project, access to the parking garage of the Project will be provided by the South Station Connector and the ramp system that serves the South Station Bus Terminal, as well as by way of vehicle entrances (one entering drive and one exiting drive) located off Atlantic Avenue.

2.1.3 Study Methodology

This study is responsive to the scope of work that was identified in consultation with the BRA and BTD, and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; public transportation services; on-street parking; observations of traffic flow; and peak period pedestrian, bicycle and vehicle counts, which were provided by BTD for an established 2014 baseline condition.

In the second stage of the study, future conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future demands due to expected growth independent of the Project. Pursuant to the scope of work identified by

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[4] Similar to the current Project, the Final PIR development programs included approximately 27,000 sf of accessory retail space in the office space totals.

the BRA and BTD for the Project, a 2025 future condition horizon year was established consistent with the Traffic Analysis that was conducted in support of the South Station Expansion project.[5] The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address the projected impact of the Project on the transportation infrastructure as identified in stage two of the study, and to facilitate safe and efficient access to the Project site.

2.2 Existing Conditions

A comprehensive field inventory of the study area roadways and intersections was conducted in June 2016. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; on and off-street parking; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area.

2.2.1 Study Area

The study area assessed for the Project was developed in consultation with the BRA and BTD, and was selected to contain the major roadways providing access to the Project site including: Atlantic Avenue, Purchase Street and Surface Road; as well as 17 major intersections located along these roadways, through which Project-related traffic will travel. The 17 study intersections, as shown in Figure 2-2, are:

1. Surface Road at Kneeland Street
2. Kneeland Street at Lincoln Street
3. Atlantic Avenue at Kneeland Street, Frontage Road and the I-90 Eastbound Off-Ramp
4. Atlantic Avenue at Beach Street
5. Atlantic Avenue at Essex Street
6. Atlantic Avenue at Summer Street
7. Summer Street at Dorchester Avenue
8. Congress Street at Dorchester Avenue
9. Atlantic Avenue at Congress Street

[5] Ibid.

10. Atlantic Avenue at Pearl Street

11. Atlantic Avenue at Oliver Street, Seaport Boulevard and the I-93 Northbound On-Ramp

12. Purchase Street at Oliver Street

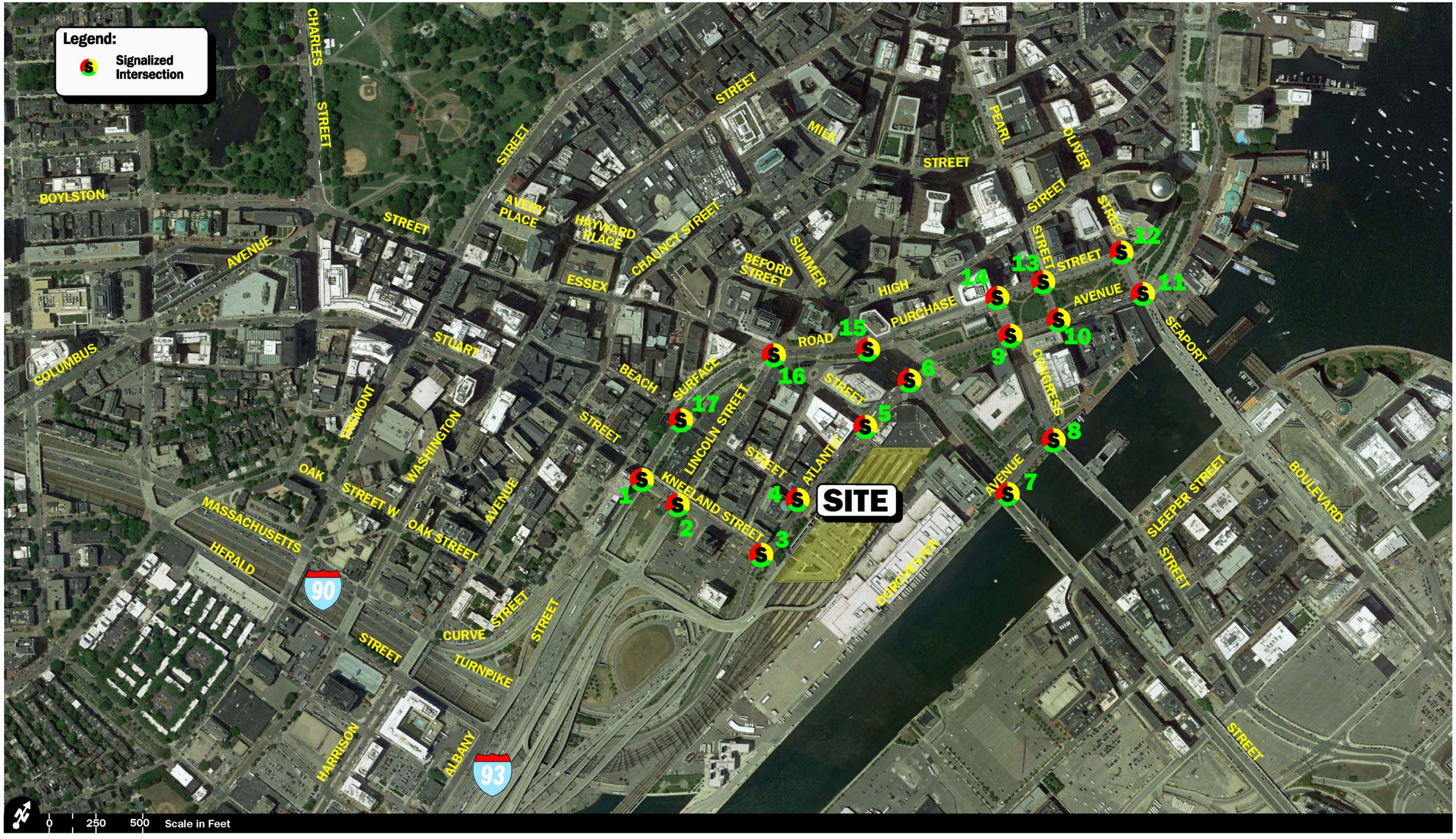
13. Purchase Street at Pearl Street

14. Purchase Street at Congress Street

15. Purchase Street and the I-93 Southbound Off-Ramp at Summer Street

16. Surface Road at Essex Street, Lincoln Street and the I-93 Ramps

17. Surface Road at Beach Street



South Station Air Rights Boston, Massachusetts

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Figure 2-2
Study Area Map

2.2.2 Geometry

A field inventory of the study area roadways, intersection geometrics, pedestrian accommodations and bicycle facilities was conducted in June 2016 and is summarized in the following sections.

2.2.2.1 Roadways

Atlantic Avenue – Within the study area, Atlantic Avenue is a three-lane urban principal arterial roadway (MassDOT Function Classification) that is under City jurisdiction and traverses a general one-way northbound alignment between Kneeland Street and Mercantile Street. Sidewalks are generally provided along both sides of Atlantic Avenue with on-street parking accommodated in designated areas, and a marked bicycle lane provided along the east side. Within the study area, MBTA bus stops are provided at Congress Street, Summer Street and Seaport Boulevard, as well as at the South Station Bus Terminal and South Station. Land use along Atlantic Avenue consists of the Project site, South Station, the South Station Bus Terminal, the Rose Kennedy Greenway, residential and commercial properties, the New England Aquarium, and areas of open space.

Purchase Street – Purchase Street is a three-lane, urban principal arterial roadway that is under City jurisdiction and traverses a general one-way southbound alignment between High Street and Summer Street, linking the north and south sections of Surface Road. Sidewalks are provided along both sides of Purchase Street with a marked bicycle lane provided along the west side. An MBTA bus stop is provided at Pearl Street. Land use along Purchase Street consists of residential and commercial properties, and areas of open space as a part of the Rose Kennedy Greenway.

Surface Road – Surface Road is a three-lane, urban principal arterial roadway that is under City jurisdiction and traverses a general one-way southbound alignment between New Chardon Street and High Street in the north, and between Summer Street and Kneeland Street in the south, with Purchase Street linking the two segments. Sidewalks are generally provided along both sides of Surface Road with a marked bicycle lane provided along the west side. MBTA bus stops are provided at Kneeland Street, State Street and at Haymarket Square. Land use along Surface Road consists of residential and commercial properties, and areas of open space as a part of the Rose Kennedy Greenway.

2.2.2.2 Intersections

Table 2-1 and Figure 2-3 summarize lane use, traffic control, pedestrian and bicycle accommodations and other existing features at the study area intersections as observed in June 2016.

Table 2-1 Study Area Intersection Description

Intersection	Traffic Control Type[a]	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/ Description)	Bus Stop? (Yes/No and Location)	On-Street Parking? (Yes/No/ Location)	Loading Zone? (Yes/No/ Location)	Other Defining Feature
Surface Rd/Kneeland St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes - bicycle lane on Surface Rd	Yes – northwest corner	No	No	Surface Rd. is one-way southbound
Kneeland St/Lincoln St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	No	No	Yes – both sides of Lincoln St	No	Lincoln Street is one-way northbound
Atlantic Ave/Kneeland St/Frontage Rd/I-90 Eastbound Off-Ramp	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	No	No	Yes – both sides of Atlantic Ave	No	Atlantic Ave is one-way northbound
Atlantic Ave/Beach St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	No	South Station Bus Terminal is located opposite Beach Street	Yes – both sides of Atlantic Ave and Beach St (Leather District resident permit parking)	Yes- both sides of Beach St	Atlantic Ave is one-way northbound; Beach St is one-way westbound
Atlantic Ave/Essex St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Essex St and Atlantic Ave north of intersection	Yes- southwest corner; South Station is located opposite Essex Street	Yes – both sides of Atlantic Ave south of intersection and north side of Essex St	Yes – north side of Essex St	Atlantic Ave is one-way northbound; "Do Not Block Intersection" signs and markings provided
Atlantic Ave/Summer St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Atlantic Ave	South Station located in southeast corner of intersection	No	No	Atlantic Ave is one-way northbound; "Do Not Block Intersection" signs and markings provided; MBTA headhouses for the Red Line and Silver Line located on corners

[a] See notes at end of table.

Table 2-1 Study Area Intersection Description (Continued)

Intersection	Traffic Control Type[a]	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/ Description)	Bus Stop? (Yes/No and Location)	On-Street Parking? (Yes/No/ Location)	Loading Zone? (Yes/No/ Location)	Other Defining Feature
Summer St/Dorchester Ave	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	No	Yes – northwest corner	Yes – south side of Summer St west of intersection; east side of Dorchester Ave	No	15-min USPS parking on Dorchester Ave south of intersection
Congress St/Dorchester Ave	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	No	No	Yes – north side of Congress St west of intersection; east side of Dorchester Ave	Yes – north side of Congress St west of intersection	
Atlantic Ave/Congress St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Atlantic Ave; "sharrow" markings on Congress St west leg	No	Yes – north and east legs of intersection	Yes – north side of Congress St east of intersection	Atlantic Ave is one-way northbound; Congress St west leg is one-way eastbound; "Do Not Block Intersection" signs and markings provided
Atlantic Ave/Pearl St	NC	Yes –sidewalks and crosswalks provided	Yes – bicycle lane on Atlantic Ave; "sharrow" markings on Pearl St	No	No	Yes – east side of Atlantic Ave north of intersection	Atlantic Ave is one-way northbound; Pear St is one-way eastbound
Atlantic Ave/Oliver St/ Seaport Blvd/ I-93 Northbound On-Ramp	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Atlantic Ave and Seaport Blvd east leg; "sharrow" markings on Seaport Blvd west leg	Yes – northeast corner	No	Yes – east side of Atlantic Ave south of intersection	Atlantic Ave is one-way northbound

[a] See notes at end of table.

Table 2-1 Study Area Intersection Description (Continued)

Intersection	Traffic Control Type[a]	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/ Description)	Bus Stop? (Yes/No and Location)	On-Street Parking? (Yes/No/ Location)	Loading Zone? (Yes/No/ Location)	Other Defining Feature
Purchase St/Oliver St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Purchase St; "sharrow" markings on Seaport Blvd and Oliver St	No	No	Yes – both sides of Oliver St	Purchase St is one-way southbound; Oliver St is one-way westbound
Purchase St/Pearl St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Purchase St and Pearl St west leg; "sharrow" markings on Purchase St east leg	Yes – northwest corner	Yes – both sides of Pearl St west of intersection	Yes – north side of Pearl St west of intersection	Purchase St is one-way southbound; Pearl St is one-way westbound
Purchase St/Congress St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Purchase St and "sharrow" markings on Congress St	No	No	No	Purchase St is one-way southbound; Congress St is one-way eastbound
Purchase St/I-93 Southbound Off-Ramp/Summer St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Purchase St and "sharrow" markings on Congress St	No	No	No	Purchase St is one-way southbound
Surface Rd/Essex St/Lincoln St/I-93 Ramps	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Surface Rd and "sharrow" markings on Essex St	No	Yes – west side of Surface Road and east side of Lincoln St south of intersection	No	Surface Rd is one-way southbound; Lincoln St is one-way northbound; Essex St is one-way eastbound
Surface Rd/Beach St	TS	Yes – sidewalks, crosswalks, and traffic signal equipment/phasing provided	Yes – bicycle lane on Surface Rd	No	Yes – west side of Surface Road and both sides of Beach St	No	Surface Rd is one-way southbound; Beach St is one-way westbound

[a] TS = traffic signal; F = flashing beacon; P = pedestrian signal; S = STOP-sign control; Y = Yield-sign control; R = rotary/roundabout; NC = no control present.

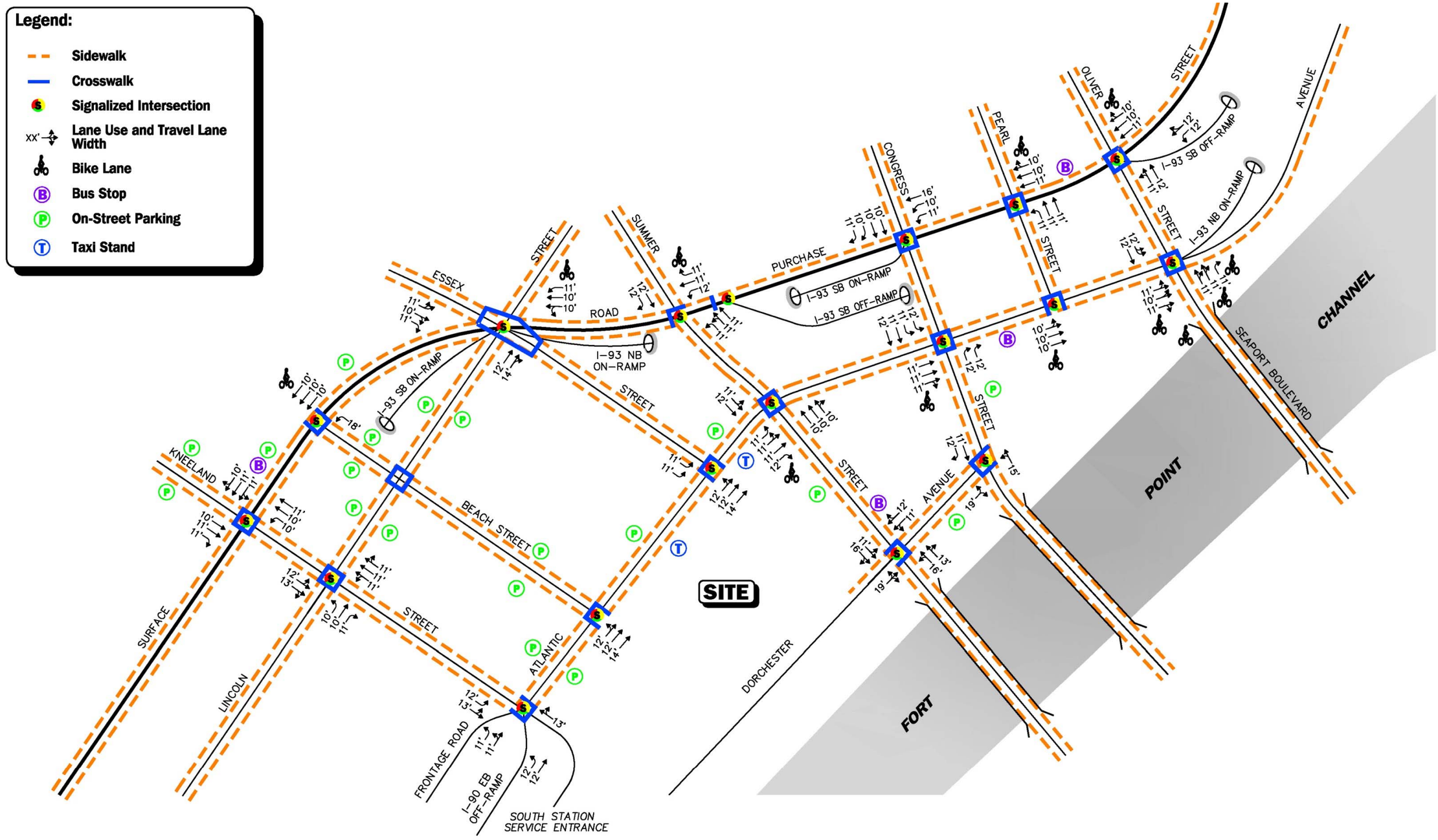


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Figure 2-3

Existing Intersection Lane Use, Travel Lane Width and Pedestrian Facilities

2.2.3 Traffic Volumes

To determine existing traffic-volume demands and flow patterns within the study area, manual turning movement counts (TMCs) and vehicle classification counts were provided by BTD for a 2014 base year for use in completing this assessment. The TMCs were conducted at the study intersections during the weekday morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods, the peak traffic volume hours for both the Project and the adjacent roadways. The 2014 Existing weekday morning and evening peak-hour traffic volumes are depicted on Figures 2-4 and 2-5, respectively.

A review of the peak period traffic counts indicates that the weekday morning peak-hour generally occurs between 8:00 a.m. and 9:00 a.m. and the weekday evening peak-hour generally occurs between 5:00 p.m. and 6:00 p.m.

2.2.4 Pedestrian and Bicycle Facilities

A comprehensive field inventory of pedestrian and bicycle facilities was performed in June 2016. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. Pedestrian and bicycle counts were also provided by BTD for the study area and were collected in conjunction with the TMCs. A description of pedestrian and bicycle facilities within the study area is provided in Table 2-2 and on Figure 2-3. Figures 2-6 and 2-7 depict the 2014 pedestrian crossing volumes within the study area during the weekday morning and evening peak hours, respectively, with Figures 2-8 and 2-9 depicting the corresponding weekday peak-hour bicycle volumes.

A Hubway bicycle sharing station is located at South Station, which recorded up to 8,200 bicycle trips (combined origin and destination) in 2013.[6]

Planned future pedestrian and bicycle improvements were identified in conjunction with the South Station Expansion project that would include the following measures:

- Extending the Harborwalk along the entire Fort Point Channel in conjunction with the reopening of Dorchester Avenue as a public street to Summer Street.
- Constructing a separated bikeway (cycle track) along the reopened Dorchester Avenue to connect to the South Bay Harbor Trail, the Summer Street Corridor cycle track and bicycle lanes on Atlantic Avenue and Surface Road/Purchase Street.
- Implementing concurrent pedestrian phasing where appropriate.
- Adding and realigning crosswalks to improve pedestrian access and circulation.

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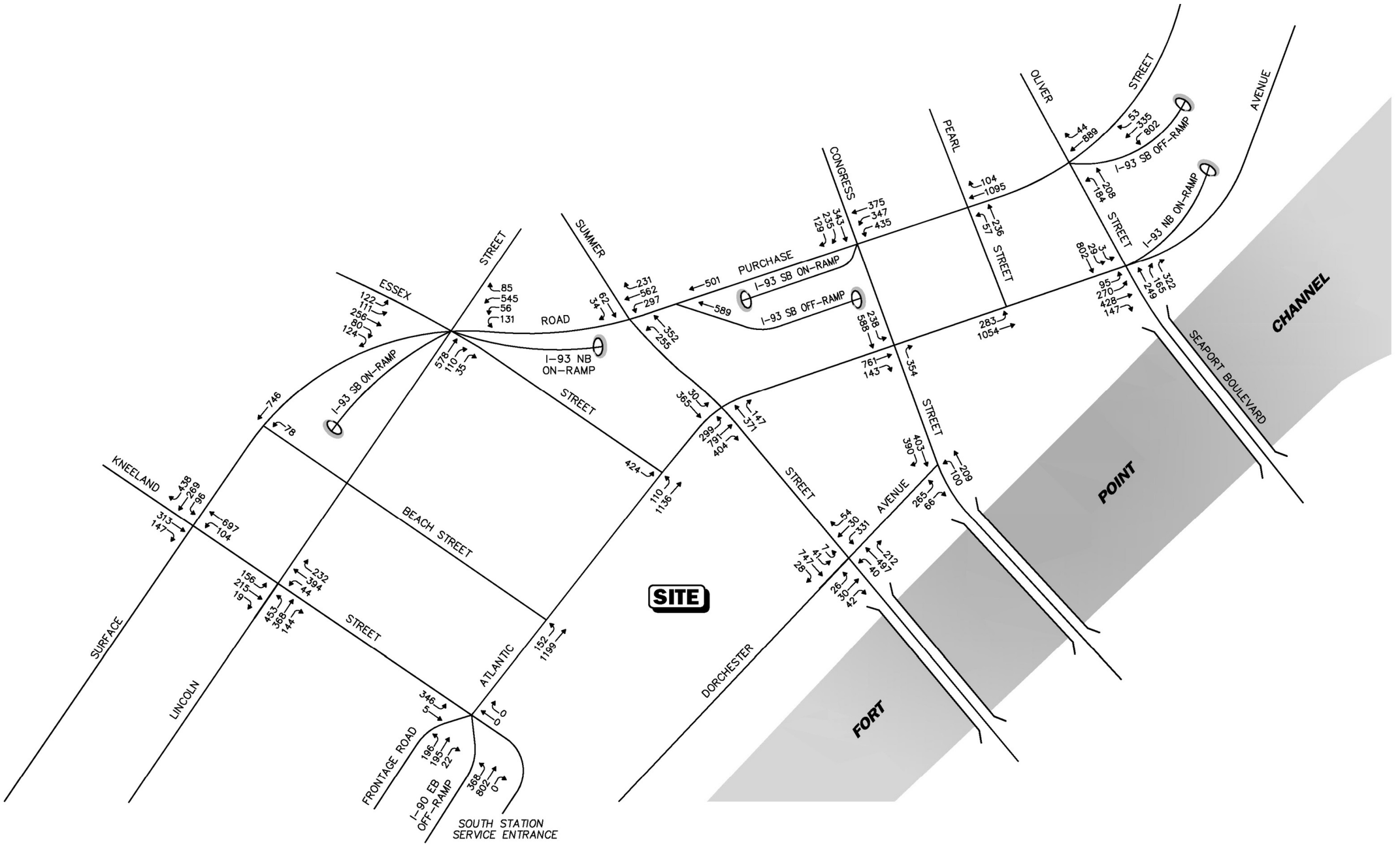
[6] Ibid 1.



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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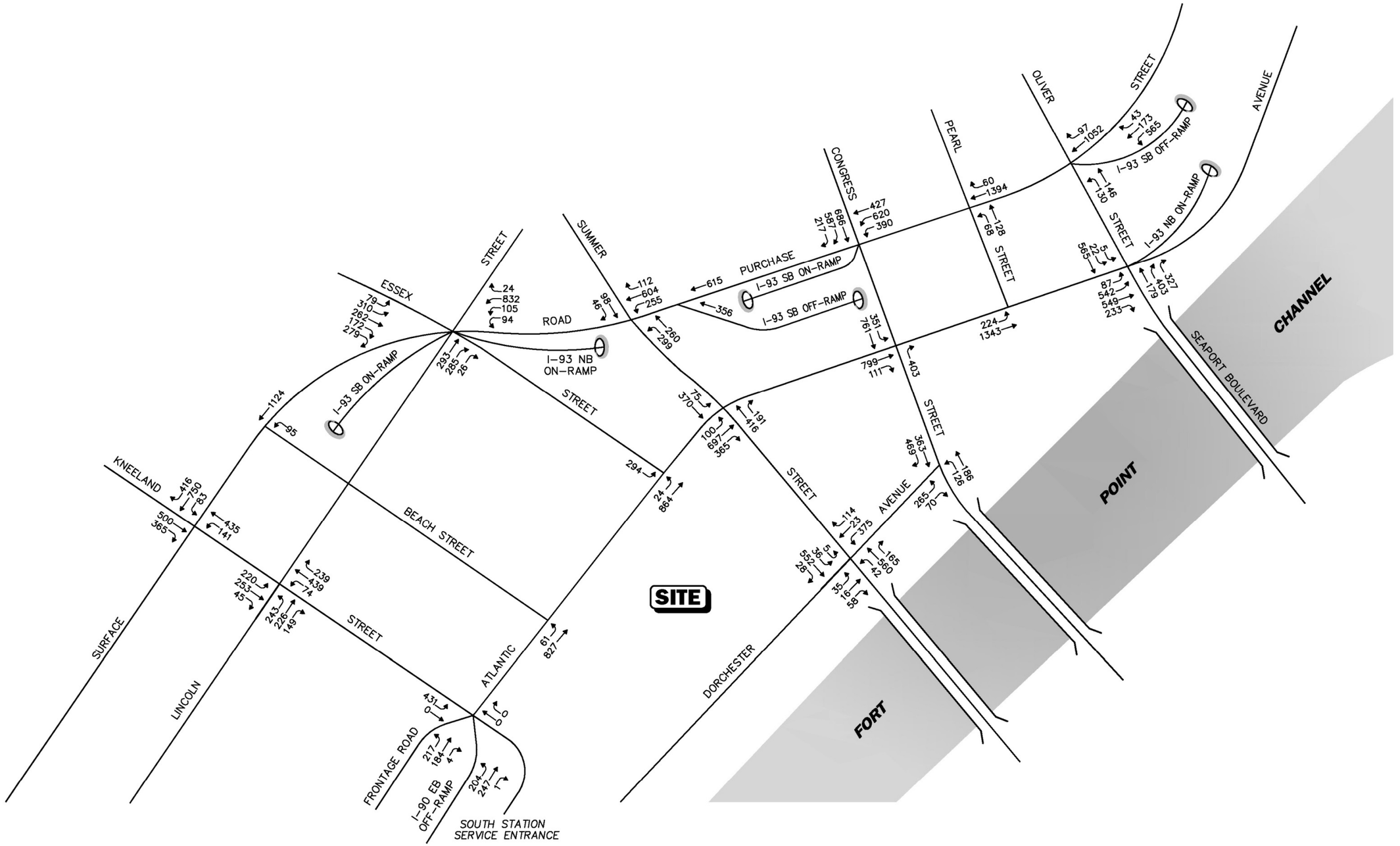
Figure 2-4

2014 Existing Weekday Morning Peak Hour Traffic Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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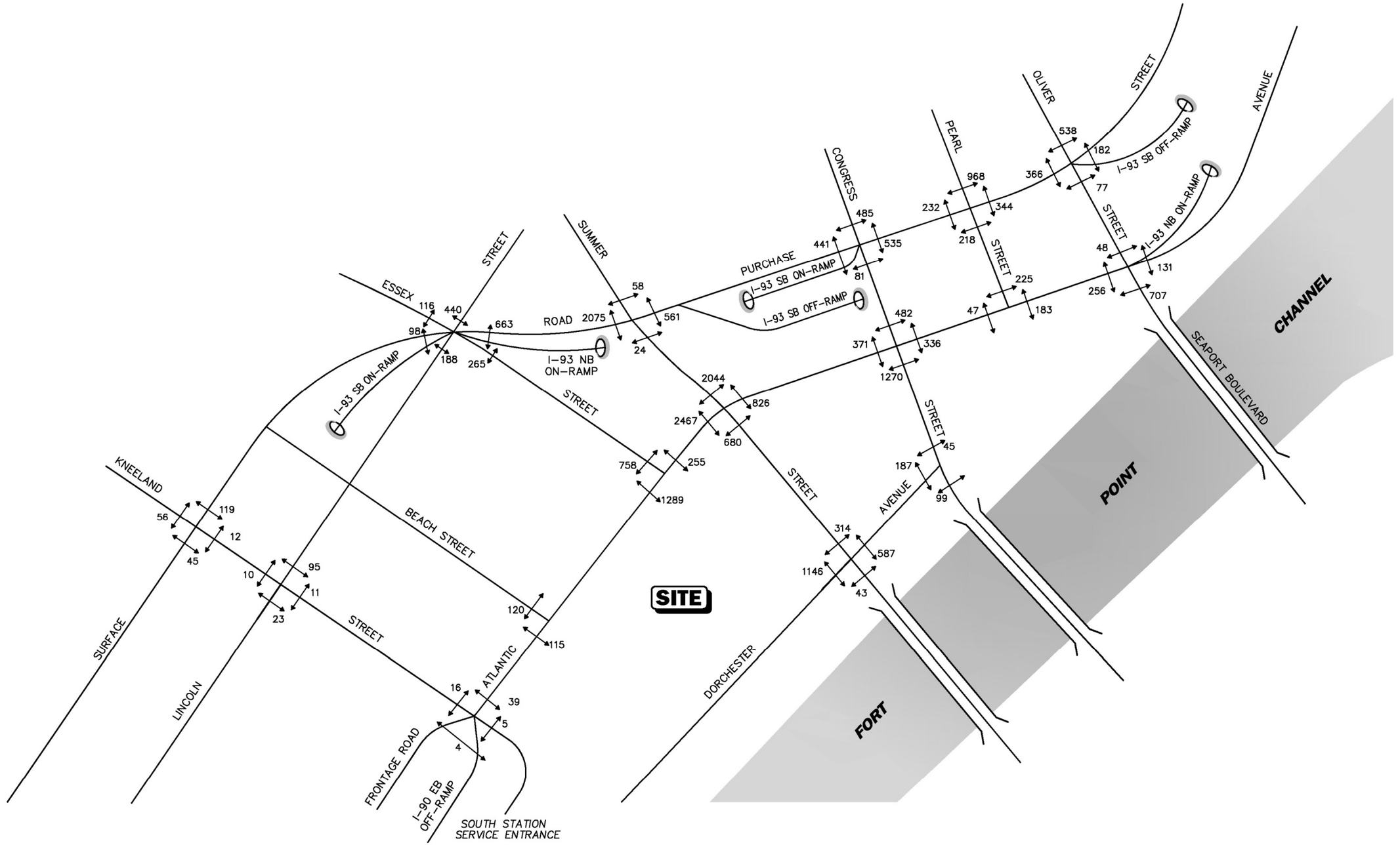
Figure 2-5

2014 Existing Weekday Evening Peak Hour Traffic Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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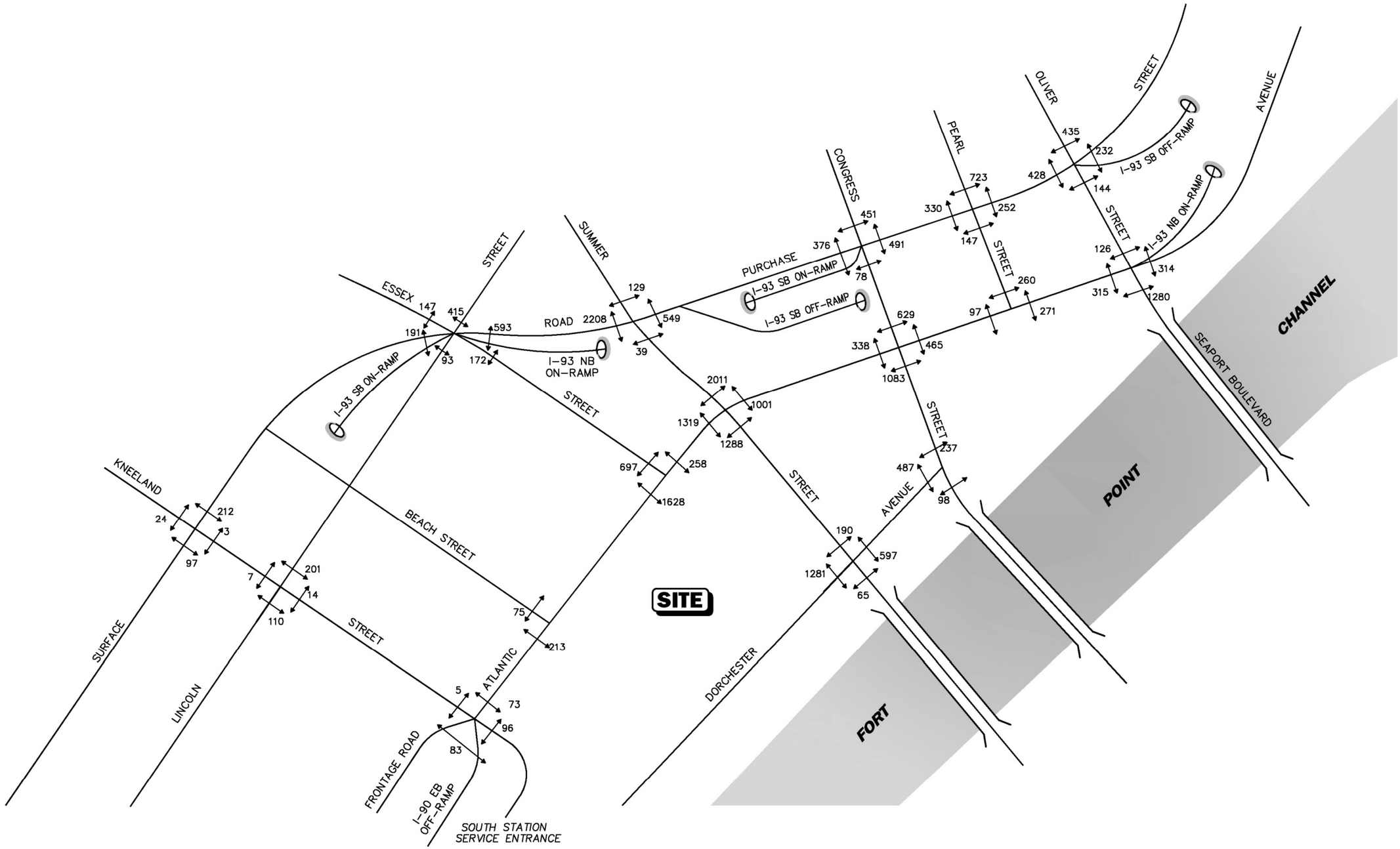
Figure 2-6

2014 Existing Weekday Morning Peak Hour Pedestrian Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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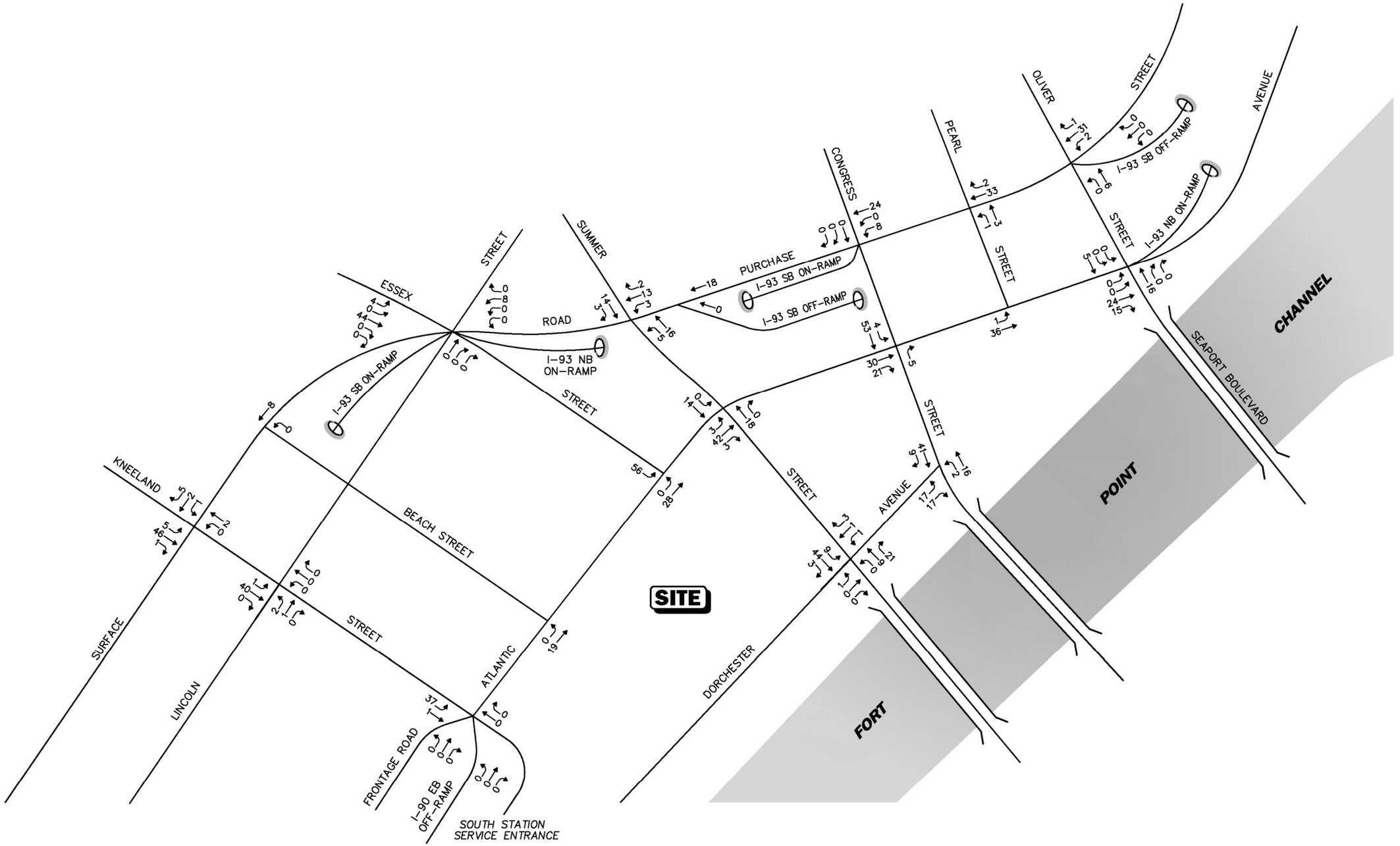
Figure 2-7

2014 Existing Weekday Evening Peak Hour Pedestrian Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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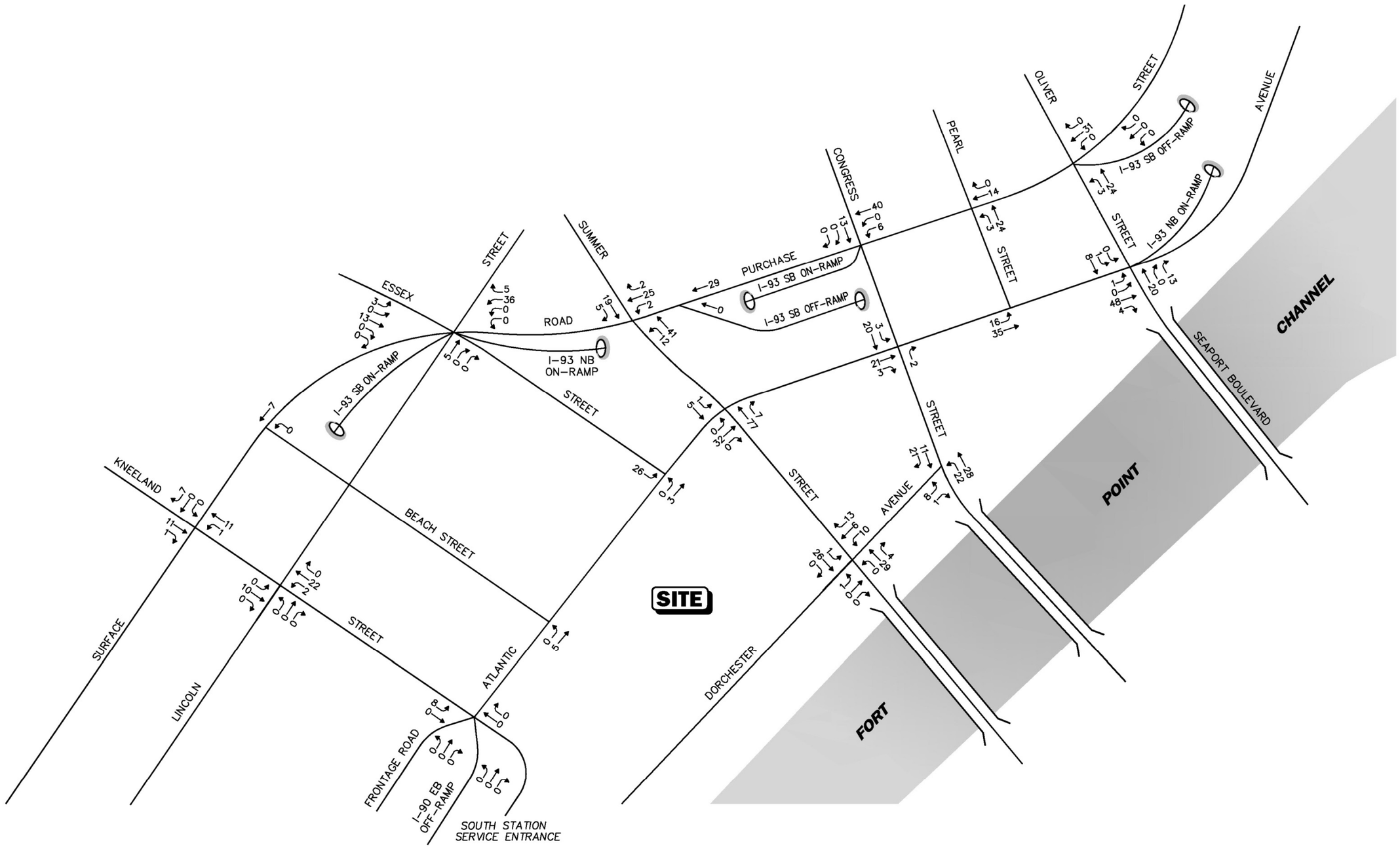
Figure 2-8

2014 Existing Weekday Morning Peak Hour Bicycle Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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Figure 2-9

2014 Existing Weekday Evening Peak Hour Bicycle Volumes

2.2.5 Public Transportation

The Project site affords superior access to public transportation given its location at the southern hub of the MBTA Commuter Rail system at South Station and the South Station Bus Terminal. In addition to the MBTA Commuter Rail system, these important transportation nodes afford connections to intercity and interstate bus lines, MBTA bus services, Amtrak train services, and MBTA subway service via the Silver Line and Red Line. Headhouses for the Silver Line and Red Line are located on the corners of the Atlantic Avenue/Summer Street intersection and immediately adjacent to the Project site. Figure 2-10 depicts the available public transportation services in the area. The following sections describe the available public transportation services within the study area that serve the Project site, with detailed system maps, schedules and fare information provided in Appendix A.

2.2.5.1 Bus Service

The MBTA operates the following six public bus routes within the study area:

- **Route 4: North Station - World Trade Center** via Federal Courthouse & South Station.
- **Route 7: City Point - Otis & Summer Streets** via Summer Street & South Station.
- **Route 11: City Point - Downtown BayView Route**.
- **Route 448: Marblehead - Downtown Crossing** via Paradise Road or Humphrey Street, Lynnway, & Airport.
- **Route 449: Marblehead - Downtown Crossing** via Paradise Road or Humphrey Street, Lynnway, & Airport.
- **Route 459**: **Salem Depot - Downtown Crossing** via Logan Airport & Central Square, Lynn.

Table 2-2 summarizes the MBTA bus service capacity and ridership information as provided by the CTPS for the six public buses serving the study area.

South Station Air Rights Boston, Massachusetts

Figure 2-10
Public Transportation Map

Table 2-2 MBTA Bus Service and Capacity

Bus Route Number	Bus Route	Weekday Morning Peak Period			Weekday Evening Peak Period		
		Peak Period Headway (minutes)	Ridership[a] (Inbound and Outbound Total)	Maximum Load Capacity[b] (Inbound and Outbound Total)	Peak Period Headway (minutes)	Ridership[a] (Inbound and Outbound Total)	Maximum Load Capacity[b] (Inbound and Outbound Total)
4	North Station – World Trade Center	12-16	278	1,140	19-22	154	912
7	City Point – Otis & Summer Streets	3-10	1,901	4,104	7-8	1,037	2,584
11	City Point – Downtown Bayview Route	6-12	1,026	2,204	12-25	504	1,520
448	Marblehead – Downtown Crossing	60	150	304	--	--	--
449	Marblehead – Downtown Crossing	60	48	152	60	100	152
459	Salem Depot – Downtown Crossing	70-75	194	300	70	167	300

Source: MBTA/CTPS; 2014 data.

[a]Ridership for a two-hour peak period (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.).

[b]Passenger capacity for a two-hour peak period (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.). Maximum load capacity is equal to 76 passengers.

2.2.5.2 Subway Service

The Project site and the immediate study area are served by MBTA subway service provided by way of the Silver Line and Red Line. Headhouses for the Silver Line and Red Line are located on the corners of the Atlantic Avenue/Summer Street intersection and immediately adjacent to the Project site. Connections to the MBTA Orange Line can be made from the Red Line at Downtown Crossing Station and to the Green Line at Park Street Station.

Table 2-3 summarizes the service capacity and ridership information for the Silver Line and Red Line at South Station.

Table 2-3 MBTA South Station Subway Service and Capacity

Subway Line	Peak Period Headway (Minutes)	Policy Load Capacity (Passengers)[a]	Crush Load Capacity (Passengers)[b]	Weekday Daily Ridership (Passengers)
Silver Line	8-10	65	96	12,700
Red Line	9 (each branch)	1,002	1,602	54,000

Source: MBTA/CTPS; 2012

[a]Ridership for a two-hour peak period (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.).

[b]Passenger capacity for a two-hour peak period (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.).

2.2.5.3 Commuter Rail Service

The Project site is located at the southern hub of the MBTA Commuter Rail system at South Station, which is served by eight MBTA Commuter Rail lines:

- Fairmount
- Framingham/Worcester
- Franklin
- Greenbush
- Kingston/Plymouth
- Middleborough/Lakeville
- Needham
- Providence/Stoughton

Table 2-4 summarizes the service capacity and ridership information for the Commuter Rail lines that serve South Station.

Table 2-4 MBTA South Station Commuter Rail Service and Capacity

Commuter Rail Line	Weekday Morning Peak Period Ridership[a]	Weekday Morning Peak Period Maximum Load Capacity[b]	Weekday Evening Peak Period Ridership[a]	Weekday Evening Peak Period Maximum Load Capacity[b]
Fairmount:				
Inbound	254	1,710	22	1,710
Outbound	6	1,710	169	1,710
Total	260	3,420	291	3,420
Framingham/Worcester:				
Inbound	1,258	4,080	153	2,316
Outbound	105	2,316	2,139	4,872
Total	1,363	6,396	2,292	7,188
Franklin:				
Inbound	1,246	4,284	100	1,896
Outbound	38	948	1,804	5,232
Total	1,284	5,232	1,904	7,128
Greenbush:				
Inbound	1,176	2,106	13	702
Outbound	7	702	1,392	2,808
Total	1,183	2,808	1,405	3,510
Kingston/Plymouth:				
Inbound	1,565	2,502	22	834
Outbound	29	1,602	1,710	2,502
Total	1,594	4,104	1,732	3,336
Middleborough/Lakeville:				
Inbound	757	1,602	9	834
Outbound	26	768	1,437	2,370
Total	783	2,370	1,446	3,204
Needham:				
Inbound	982	2,184	53	1,368
Outbound	147	2,184	1,206	2,184
Total	1,129	4,368	1,259	3,552
Providence/Stoughton:				
Inbound	1,871	5,700	117	2,736
Outbound	221	2,052	3,338	5,700
Total	2,092	7,752	3,455	8,436

Source: CTPS counts, Spring 2012.

[a]Ridership for a two-hour peak period (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.).

[b]Passenger capacity for a two-hour peak period (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.).

2.2.5.4 Regional Train Service

In addition, to the MBTA Commuter Rail service at South Station, Amtrak operates the Acela Express, Northeast Regional and Lake Shore Limited train services. Both Northeast Regional and Acela Express provide train service between South Station in Boston and Union Station in Washington, D.C., with stops in Providence, RI; New London and New Haven, CT; New York City; New Jersey; Baltimore, MD; and Philadelphia, PA. Connections to other regional train routes are provided at Back Bay Station in Boston; New Haven Station in New Haven, CT; Penn Station in New York City; 30th Street Station in Philadelphia, PA; and at Union Station in Washington, D.C. The Lake Shore Limited provides train service between South Station and Chicago, IL, with stops in Albany and Buffalo, NY, and Cleveland and Toledo, OH.

2.2.5.5 Regional Bus Service

The South Station Bus Terminal provides access to intercity and interstate bus lines that serve the New England/New York region with connections to destinations throughout the United States, Canada and Mexico. Regional bus lines that serve the South Station Bus Terminal include: Greyhound, Peter Pan, Plymouth & Brockton, C&J, Dattco, Concord Coach, Boston Express, Lucky Star, Bolt Bus, and Megabus.

2.2.6 Motor Vehicle Crash Data

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent three-year period available (2011 through 2013, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, and severity, and presented in Table 2-5.

As can be seen in Table 2-5, the study area intersections were found to have experienced an average of approximately four or fewer reported motor vehicle crashes per year over the three-year review period, and all of the intersections were found to have a motor vehicle crash rate below both the MassDOT statewide and District 6 averages for a signalized or unsignalized intersection, as appropriate. No fatal motor vehicle crashes were reported to have occurred at the study area intersections over the three-year review period. The detailed MassDOT Crash Rate Worksheets are provided in Appendix A.

A review of the MassDOT statewide Highway Safety Improvement Program (HSIP) listing indicates that the Atlantic Avenue and Surface Road corridors extending from just south of Congress Street to and including Kneeland Street are eligible for HSIP funding as "high pedestrian crash cluster" locations, with portions of Atlantic Avenue between and including East Street and Summer Street and proximate to the Federal Reserve listed as HSIP eligible "high crash cluster" locations. MassDOT defines a HSIP eligible cluster as: *"...a cluster in which the total number of 'equivalent property damage only' crashes is within the top 5*

percent of all clusters in that region. 'Equivalent property damage only' is a method of combining the number of crashes with the severity of crashes based on a weighted scale where a fatal crash is worth 10, an injury crash is worth 5 and a property damage only crash is worth 1." The improvements that have been identified in conjunction with the South Station Expansion project (discussion follows) will serve to enhance pedestrian and bicycle safety within the study area and at the high crash cluster locations.

Table 2-5 Motor Vehicle Crash Data Summary[a]

	Surface Road/ Kneeland Street	Kneeland Street/ Lincoln Street	Kneeland Street/ Atlantic Avenue/ Frontage Road/ I-90 Eastbound Off-Ramp	Atlantic Avenue/ Beach Street	Atlantic Avenue/ Essex Street	Atlantic Avenue/ Summer Street	Summer Street/ Dorchester Avenue	Congress Street/ Dorchester Avenue	Atlantic Avenue/ Congress Street	Atlantic Avenue/ Pearl Street	Atlantic Avenue/ Seaport Boulevard/ Oliver Street	Purchase Street/ Oliver Street/ I-93 Southbound Off-Ramp	Purchase Street/ Pearl Street
Traffic Control Type:[b]	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
Year:													
2011	2	2	4	2	3	1	2	0	1	0	3	1	0
2012	3	4	3	1	4	4	2	0	2	0	1	0	0
2013	2	0	0	1	0	0	0	0	0	0	8	0	0
Total	7	6	7	4	7	5	4	0	3	0	12	1	0
Average	2.33	2.00	2.33	1.33	2.33	1.67	1.33	0.00	1.00	0.00	4.00	0.33	0.00
Rate[c]	0.21	0.27	0.45	0.37	0.49	0.19	0.17	0.00	0.12	0.00	0.34	0.04	0.00
Significant?[d]	No	No	No	No	No	No	No	No	No	No	No	No	No
Type:													
Angle	3	1	0	1	0	1	0	0	0	0	0	1	0
Rear-End	1	1	3	1	2	0	1	0	1	0	4	0	0
Head-On	0	1	0	0	1	0	0	0	1	0	0	0	0
Sideswipe	1	1	2	1	1	3	0	0	1	0	2	0	0
Fixed Object	0	0	0	0	0	0	1	0	0	0	0	0	0
Pedestrian/Bicycle	0	0	0	1	0	0	1	0	0	0	1	0	0
Unknown/Other	2	2	2	0	3	1	1	0	0	0	5	0	0
Total	7	6	7	4	7	5	4	0	3	0	12	1	0
Severity:													
Property Damage Only	7	4	2	4	5	4	1	0	3	0	7	0	0
Personal Injury	0	2	5	0	2	1	3	0	0	0	5	1	0
Fatality	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	6	7	4	7	5	4	0	3	0	12	1	0
Day of Week:													
Monday through Friday	5	3	6	3	5	3	3	0	1	0	9	1	0
Saturday	0	1	0	1	2	2	0	0	1	0	1	0	0
Sunday	2	2	1	0	0	0	1	0	1	0	2	0	0
Total	7	6	7	4	7	5	4	0	3	0	12	1	0

See notes at end of table.

Table 2-5 Motor Vehicle Crash Data Summary[a] (Continued)

	Congress Street/ Purchase Street	Summer Street/ Purchase Street/ I-93 Southbound Off-Ramp	Surface Road/ Essex Street/ Lincoln Street	Surface Road/ Beach Street
Traffic Control Type:[b]	TS	TS	TS	TS
Year:				
2011	4	1	2	1
2012	4	8	3	1
2013	2	0	1	1
Total	10	9	6	3
Average	3.33	3.00	2.00	1.00
Rate[c]	0.28	0.41	0.21	0.20
Significant?[d]	No	No	No	No
Type:				
Angle	7	0	1	2
Rear-End	1	5	3	0
Head-On	0	0	0	0
Sideswipe	0	1	1	1
Fixed Object	0	0	0	0
Pedestrian/Bicycle	0	1	0	0
Unknown/Other	2	2	1	0
Total	10	9	6	3
Severity:				
Property Damage Only	6	6	6	2
Personal Injury	4	3	0	1
Fatality	0	0	0	0
Total	10	9	6	3
Day of Week:				
Monday through Friday	7	7	3	2
Saturday	1	1	1	0
Sunday	2	1	2	1
Total	10	9	6	3

NOTES:

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2011 through 2013.

[b]Traffic Control Type: U = unsignalized; TS = traffic signal; R = rotary/roundabout.

[c]Crash rate per million vehicles entering the intersection.

[d]The intersection crash rate is significant if it is found to exceed 0.53 crashes per million vehicles entering an intersection for an unsignalized intersection, and 0.70 crashes per million vehicles entering an intersection for a signalized intersection as defined by MassDOT for the MassDOT District (District 6) in which the Project is located, or 0.58 crashes per million vehicles entering an intersection for an unsignalized intersections and 0.77 crashes per million vehicles entering an intersection for a signalized intersection based on MassDOT statewide crash data.

2.3 Future Conditions

Pursuant to the scope of work identified by the BRA and BTD for the Project, existing (2014) conditions in the study area were projected to the year 2025, consistent with the Traffic Analysis that was conducted in support of the South Station Expansion project.[7] Independent of the Project, conditions on the transportation system in the year 2025 under No Build conditions are influenced by changes in the transportation system resulting from: i) specific development projects by others; ii) population and demographic shifts; and iii) capital investments made by the local, state and/or federal government or private interests. Anticipated Project-generated trips superimposed upon the 2025 No Build condition transportation network reflect 2025 Build conditions with the Project.

2.3.1 Future Growth

Future growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all volumes (traffic, pedestrian and bicycle) under study. The drawback to such a procedure is that some volumes may actually grow at either a higher or a lower rate at particular intersections.

An alternative procedure identifies the location and type of planned development, estimates the trips that are to be generated, and assigns the resultant values to the area transportation network. This procedure produces a more realistic estimate of growth for local conditions; however, the drawback of this procedure is that potential growth in population and development external to the study area would not be accounted for in the projections.

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

2.3.1.1 Specific Development by Others

As requested by the BRA and consistent with the traffic volume projections developed for the South Station Expansion project, the following specific development projects by others were identified for inclusion in this study:

[7] Ibid 1.

- *Millennium Tower and Burnham Building (former Filene's site).* This project consists of the construction of a mixed-use development that includes approximately 450 residential units, approximately 127,000 sf of office space, and approximately 220,000 sf of retail space to include a health club and restaurant. The project also includes the construction of approximately 550 parking spaces, including 250 spaces available to the public. Construction is complete.
- *Millennium Place.* This project consists of the construction of a mixed-use development that includes approximately 256 residential units and 12,000 sf of retail space. Construction is complete.
- *45 Stuart Street.* This project consists of the construction of a 384,000 sf residential development. Construction is complete.
- *Kensington Place.* This project consists of the construction of a mixed-use residential, retail and office development encompassing 405,200 sf of space. Construction is complete.
- *120 Kingston Street.* This project consists of the construction of a 228,900 sf residential development with ground flood retail. Construction is complete.
- *Hong Lok House.* This project consists of the construction of a 62,218 sf residential development. Construction is complete.
- *Oxford Ping Affordable Housing.* This project consists of the construction of a 56,400 sf residential development. Construction is complete.
- *Fan Pier – Vertex.* This project consists of the construction of a 1.1 million sf office development. Construction is complete.
- *381 Congress Street.* This project consists of the construction of a 43,700 sf residential development. Construction is complete.
- *One Greenway.* This project consists of the construction of a mixed-use development encompassing 325 residential units, 5,500 sf of retail space and 6,000 sf of community space. Construction is complete.
- *Ink Block.* This project consists of the construction of a mixed-use residential, retail and hotel development encompassing 548,900 sf of space. Construction is complete.
- *275 Albany Street.* This project consists of the construction of a mixed-use residential and retail development encompassing 330,000 sf of space (excluding parking). Construction is complete.
- *368 Congress Street.* This project consists of the construction of a mixed-use development encompassing a 120 room hotel and 6,000 sf of retail space. Construction is complete.

- *316-322 Summer Street.* This project consists of the construction of a mixed-use office and retail/restaurant development encompassing 140,000 sf of space. Construction is complete.
- *49-63 Melcher Street.* This project consists of the construction of a mixed-use office and retail development encompassing 221,500 sf of space. Construction is complete.
- *319 A Street Rear.* This project consists of the construction of a residential development encompassing 257,000 sf of space. Construction is complete.
- *Eleven West Broadway.* This project consists of the construction of a mixed-use development encompassing 50 residential units and 8,000 sf of retail space. Construction is complete.
- *One Channel Center.* This project consists of the construction of a 901,430 sf office development that includes parking and a park. Construction is complete.
- *Seaport Square – Parcel A.* This project consists of the construction of an 85,000 sf hotel. Construction is complete.
- *22-26 West Broadway.* This project consists of the construction of mixed use development encompassing 31 residential units and approximately 3,834 sf of retail space. Construction is complete.
- *Seaport Square.* This project consists of the construction of a mixed-use residential, office, hotel and retail/restaurant development that will encompass 6.5 million sf of space. Construction is partly complete.
- *Fan Pier.* This project consists of the construction of a mixed-use residential, office, hotel, retail and cultural/educational development that will encompass 3.3 million sf of space. Construction is partly complete.
- *Pier 4.* This project consists of the construction of a mixed-use residential, office, hotel and retail/restaurant development that will encompass 1.0 million sf of space. Construction is partly complete.
- *100 Acres Master Plan (remaining build-out).* This project consists of the construction of a mixed-use residential, office, retail/entertainment, cultural/education and hotel development that will encompass approximately 5 million sf of space. The plan has been approved by the BRA.
- *Parcel P-7a.* This project consists of the construction of a mixed-use residential and retail development that will encompass 125,000 sf of space. The project has been approved by the BRA.

- *399 Congress Street.* This project consists of the construction of a mixed-use development that will encompass approximately 414 residential units, approximately 12,000 sf of ground floor lobby, retail, and innovation space, and parking for approximately 144 vehicles. The project has been approved by the BRA.
- *Congress Street Hotel.* This project consists of the construction of a mixed-use residential, hotel and retail development that will encompass 372,000 sf of space.
- *Convention Center Phase 2.* This project consists of the construction of a 337,300 sf hotel with ground floor retail space
- *South Station Expansion.* This project consists of the expansion of South Station to support existing Northeast Corridor and commuter rail services, and to accommodate future service expansions by Amtrak and the MBTA. The project includes five primary elements: 1) expansion of the South Station terminal facilities to include the addition of up to seven tracks and four platforms, and the construction of a new passenger concourse and other amenities; 2) acquisition and demolition of the U.S. Postal Service general mail facility; 3) creation of an extension of the Harborwalk along a reopened Dorchester Avenue; 4) providing for the possibility of a future joint public/private development adjacent to and over an expanded South Station; and 5) providing adequate rail layover space for existing and future intercity and commuter rail service needs. The Traffic Analysis prepared in support of the South Station expansion project provided an analysis of three (3) build alternatives:
  - *Alternative 1 – Transportation Improvements Only.* This alternative would entail specific roadway, intersection, traffic control and parking/curbside management improvements to improve traffic operations, enhance safety and facilitate pedestrian and bicycle activity in the South Station area. Alternative 1 would include the restoration of Dorchester Avenue as a public way to Summer Street.
  - *Alternative 2 – Joint/Private Development Minimum Build.* This alternative would expand upon the elements of Alternative 1 to include a private development along Dorchester Avenue that would encompass approximately 660,000 sf of residential, office and commercial uses, including hotel and retail uses, and approximately 235 parking spaces. Alternative 2 would also include an extension of the South Station Connector into the back of the joint/private development.
  - *Alternative 3 – Joint/Private Development Maximum Build.* This alternative would expand upon the elements of Alternative 1 to include provisions for future private development by incorporating structural foundations into the overall station and track design to support the development of up to two million sf of mixed-use development along Dorchester Avenue consisting of

residential, office and commercial uses, including hotel and retail uses, and approximately 506 parking spaces. Similar to Alternative 2, Alternative 3 would include an extension of the South Station Connector into the back of the joint/private development.

Based on discussions with the consultant for the South Station Expansion project, *Alternative 1, Transportation Improvements Only*, was identified as the preferred alternative and is included as a part of this assessment.

No other development projects were identified at this time that are expected to impact future traffic volumes within the study area beyond the general background traffic growth rate.

2.3.1.2 General Background Traffic Growth

Consistent with the traffic volume projections completed in support of the South Station Expansion project,[8] a 0.5 percent per year compounded annual background traffic growth rate was determined to be appropriate to account for future traffic growth and presently unforeseen development within the study area. This growth rate was also noted as being consistent with traffic volume projections for the area developed by the CTPS.

2.3.1.3 Planned Transportation Infrastructure Improvement Projects

The following transportation infrastructure improvement projects were identified to support Alternative 1 of the South Station Expansion project, and are reflected in the future No-Build and Build condition analyses presented herein:

- Reopen Dorchester Avenue as a public street to Summer Street to include an extension of the Harborwalk by approximately one-half mile along the entire stretch of the Fort Point Channel, street furniture, landscaping and a separated bikeway (cycle track).

- Provide dedicated curbside space for taxicab, passenger drop-off, passenger pick-up, and shuttles along the reopened portion of Dorchester Avenue to address excessive curbside congestion along Atlantic Avenue.

- Remove six parking meters along Atlantic Avenue at Kneeland Street and reprogram the curb to accommodate drop-off or taxicabs

- Improve bicycle connectivity into Dewey Square along Atlantic Avenue by providing a bicycle lane along the west side of Atlantic Avenue from Kneeland Street to Essex Street.

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[8] Ibid 1.

- Implement upgrades at the following intersections to improve traffic flow, reduce queuing, and improve pedestrian and bicycle mobility:

  - Atlantic Avenue at Summer Street:

    - Eliminate the pedestrian crossing conflict by restriping the Atlantic Avenue northbound approach (convert the shared left-turn/though lane to a through lane) and providing diagonal crossing markings in the intersection;
    - Improve concurrent pedestrian phase timings at Summer Street/Purchase Street intersection to adequately accommodate pedestrians; and
    - Optimize all intersection signal splits and offsets.

  - *Purchase Street at Summer Street* – Provide a crosswalk across Summer Street on the westbound approach of the Summer Street/Purchase Street intersection to better accommodate the pedestrian desire line from South Station to Dewey Square.

  - *Summer Street at Dorchester Avenue* – Optimize signal timing and phasing, and incorporate bicycle-specific signal equipment, pavement markings, and detection into the intersection layout.

  - Surface Road/Essex Street/Lincoln Street:

    - Provide additional walk time through pedestrian lead intervals during the concurrent pedestrian phases;
    - Provide a more direct east-west pedestrian connection along Essex Street by installing a new crosswalk along the southern east-west crossing from Essex Street to the large median; and
    - Optimize the signal timings and phasing sequence.

  - *Congress Street at Dorchester Avenue* – Optimize signal timing and phasing, and incorporate bicycle-specific signal equipment, pavement markings, and detection into the intersection layout.

  - *Atlantic Avenue at Kneeland Street/Frontage Road/I-90 Off-Ramp* – Update the MBTA access drive detection system to allow for the access drive phase to be skipped if there is no vehicle present, and optimize the intersection timing, phasing and offset.

  - *Dorchester Avenue/West Broadway/Traveler Street* – Change the pedestrian operations to concurrent pedestrian phases and modify the West Broadway westbound approach lane configuration to accommodate one left-turn/through travel lane and one through/right-turn lane.

- *Dorchester Avenue/West 4th Street* – Optimize the traffic signal timing and the offset with Dorchester Avenue/West Broadway/Traveler Street intersection, and add concurrent pedestrian walk time.

- Transportation Demand Management (TDM) Measures:
  - Incorporate bicycle parking in the new headhouse on Dorchester Avenue.
  - Participate in the U.S. Environmental Protection Agency (EPA) SmartWay Transport Program to increase energy efficiency and reduce greenhouse gas emissions.
  - Provide electronic signage displaying transit schedule information.
  - Accommodate curbside space for a shuttle stop along Dorchester Avenue for shuttles that currently serve the South Boston Waterfront/Innovation District.
  - Work with the City of Boston to improve bicycle accommodations along Atlantic Avenue from Kneeland Street to Summer Street.
  - Prepare a Construction Mitigation Plan (CMP) for BTD to minimize disruption in the area throughout construction.

No other roadway improvement projects, aside from routine maintenance activities, were identified to be planned within the study area at this time.

2.3.1.4 No Build Traffic Volumes

The 2025 No Build condition peak-hour traffic-volumes were obtained from the Traffic Analysis prepared in support of the South Station Expansion project[9] and were developed by removing the trips associated with the Project that were included in the 2025 Build Condition traffic volume networks presented therein.[10] The resulting 2025 No-Build condition weekday morning and evening peak-hour traffic-volumes are shown on Figures 2-11 and 2-12, respectively.

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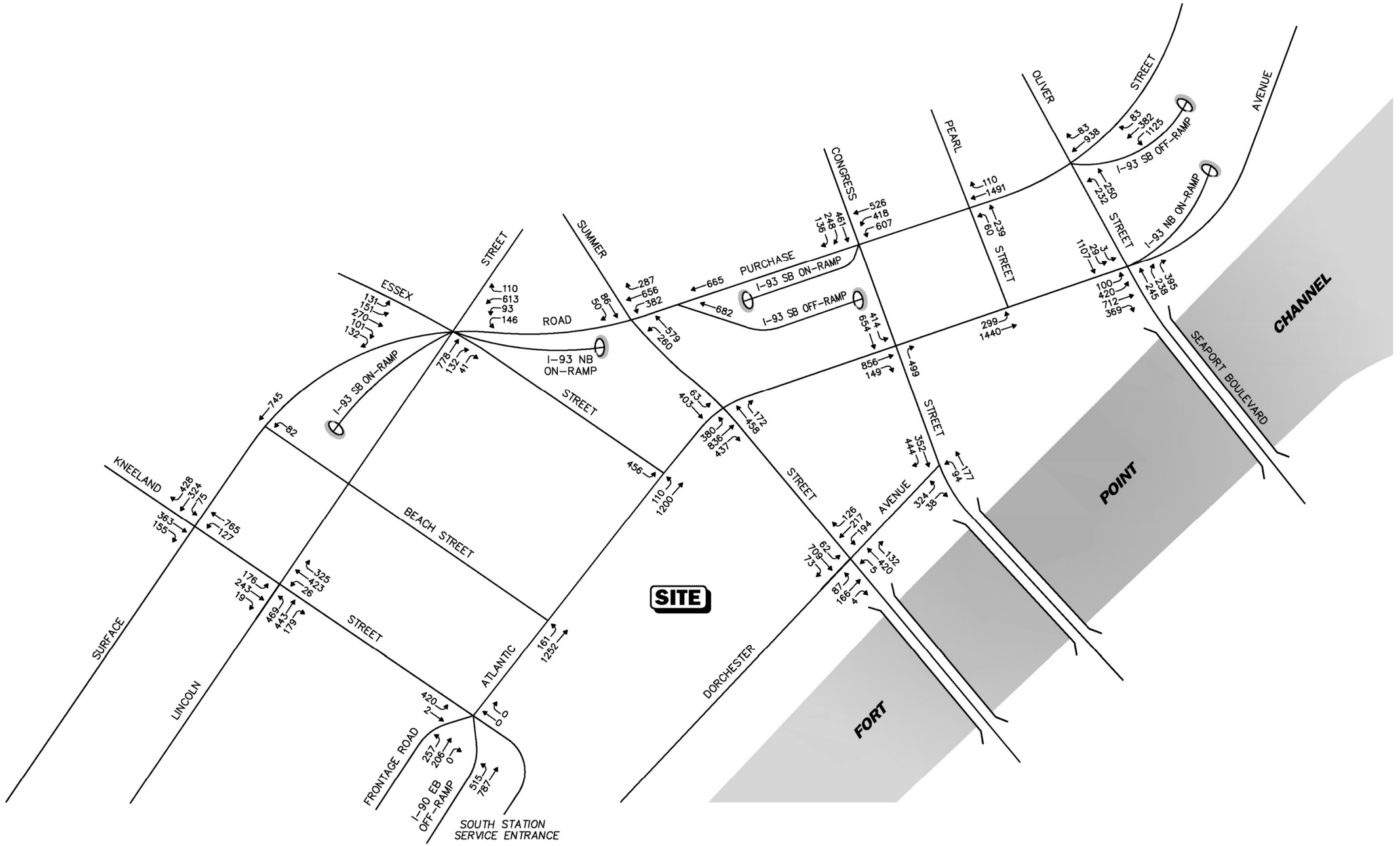
[9] Ibid 1.

[10] The Traffic Analysis prepared in support of the South Station Expansion project included traffic volumes for the approved development program for the Project site as defined in the February 28, 2006 Final PIR for Option A (all-office Phase 1).



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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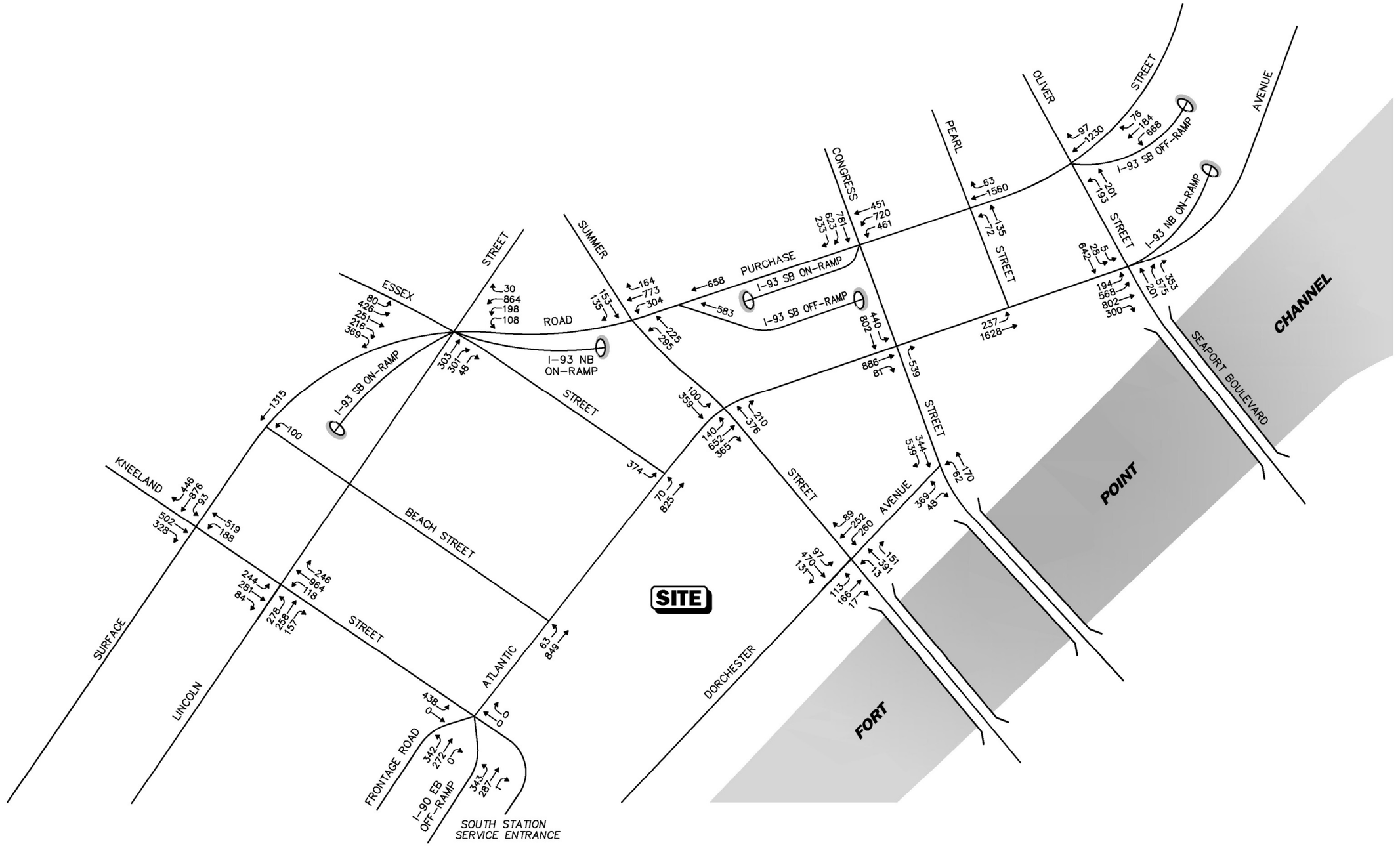
Figure 2-11

2025 No-Build Weekday Morning Peak Hour Traffic Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 2-12

2025 No-Build Weekday Evening Peak Hour Traffic Volumes

2.3.2 Project-Generated Trips

Design year (2025 Build) automobile, pedestrian/bicycle and public transportation (transit) trips for the study area were determined by estimating the trip characteristics of the Project and assigning these volumes on the transportation system. The following sections describe the procedures used to develop Build conditions (with the Project) within the study area.

2.3.2.1 Methodology

As described previously, several potential development programs are under consideration for the Project, all of which will include the same program for Phases 1 and 3 as well as the accessory retail in Phase 2, but may include different use alternatives for Phase 2. One Phase 2 alternative includes all residential/retail space with up to 375 residential units (either 260 condominiums or 375 rental units) and another Phase 2 alternative includes an all hotel alternative with 360 keys/rooms. The option with the highest overall number of trips (375 Phase 2 residential units) was used for the analysis as the associated trips and the impacts on the transportation infrastructure would be less for the other scenarios considered. A discussion of the trip-generation for this option follows, with the trip-generation calculations for the other options provided in the Appendix A.

In order to develop the base (unadjusted) trip characteristics of the Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)[11] for Land Use Codes (LUCs) 220, *Apartment*; 230, *Residential Condominium/Townhouse*; and 710, *General Office Building*; were used.

Given the availability of public transportation to the Project site, the extensive sidewalk network that links the Project site to Downtown Boston and the South Boston Waterfront, and the existing and proposed bicycle network, it is expected that a significant portion of the trips generated by the Project will be made by public transportation or will include pedestrian/bicycle trips. In order to disseminate the base ITE trip characteristics of the Project, which are expressed in vehicle trips, to the modes of travel that will be available to the Project site (automobile, public transportation and pedestrian/bicycle), vehicle occupancy ratios (VORs) were obtained from the *2009 National Household Travel Survey* published by the Federal Highway Administration (FHWA) and travel mode data was obtained from BTD. Table 2-6 summarizes the VOR and travel mode data that was used to distribute trips for the individual components of the Project to the modes of transportation that are available to the Project site.

Table 2-7 summarizes the anticipated trip characteristics for the NPC Project with the highest overall trips [office/residential development with up to 550 residential units (175 units in Phase 1 and up to 375 in Phase 2)] using the above methodology, with the detailed trip-generation calculations for the individual components of the Project and the other development options provided in Appendix A.

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[11] Trip Generation, 9th Edition; Institute of Transportation Engineers; Washington, DC; 2012.

Table 2-6 Travel Mode Split and Vehicle Occupancy Ratio[a]

	Mode of Travel									
	Automobile (Percent)			Transit (Percent)			Pedestrian/Bicycle (Percent)			
Land Use	Weekday Daily	AM Peak Hour	PM Peak Hour	Weekday Daily	AM Peak Hour	PM Peak Hour	Weekday Daily	AM Peak Hour	PM Peak Hour	VOR (Persons per Vehicle)
Residential:										
Entering	28	41	31	30	52	18	42	7	51	1.13
Exiting	28	31	41	30	18	52	42	51	7	1.13
Office:										
Entering	26	32	56	43	63	18	31	5	26	1.13
Exiting	26	56	32	43	18	63	31	26	5	1.13

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

Table 2-7 NPC Project - Trip-Generation Summary

Time Period/Direction	ITE Vehicle Trips	Person Trips				
		Automobile Trips	Transit Trips	Pedestrian /Bicycle Trips	Total Person Trips	Automobile Trips
Average Weekday Daily:						
Entering	5,915	1,777	2,621	2,286	6,684	1,572
Exiting	5,915	1,777	2,621	2,286	6,684	1,572
Total	11,830	3,554	5,242	4,572	13,368	3,144
Weekday Morning Peak Hour:						
Entering	1,237	453	874	71	1,398	401
Exiting	379	178	77	173	428	157
Total	1,616	631	951	244	1,826	558
Weekday Evening Peak Hour:						
Entering	442	220	90	189	499	195
Exiting	1,240	459	869	73	1,401	406
Total	1,682	679	959	262	1,900	601

2.3.2.2 Project-Generated Trip Summary

As can be seen in Table 2-7, prior to dissemination of Project-related trips to the various modes of travel that are available to the Project site, the NPC Project is projected to result in 11,830 unadjusted vehicle trips on an average weekday (again, two-way, 24-hour volume), with 1,616 unadjusted vehicle trips expected during the weekday morning peak-hour and 1,682 unadjusted vehicle trips expected during the weekday evening peak-hour.

After dissemination of Project-related trips to the available modes of transportation, the NPC Project is projected to result in 3,144 automobile trips (1,572 vehicles entering and 1,572 exiting) on an average weekday, with 5,242 transit trips and 4,572 pedestrian/bicycle trips. During the weekday morning peak hour, the NPC Project is projected to generate 558 automobile trips (401 vehicles entering and 157 exiting), with 951 transit trips and 244 pedestrian/bicycle trips. During the weekday evening peak hour, the NPC Project is projected to generate 601 automobile trips (195 vehicles entering and 406 exiting), with 959 transit trips and 262 pedestrian/bicycle trips.

The option with the highest overall number of trips [office/residential development with up to 550 residential units (175 in Phase 1 and 375 in Phase 2)] was used for the analysis. Should the reduced residential option (up to 260 residential units in Phase 2) or the Phase 2 360 key/room hotel move forward, the associated trips and the impacts on the transportation infrastructure would be less than the scenario studied.

2.3.2.3 NPC Trip-Generation Comparison

Table 2-8 presents a comparison of the trips (all modes) for the NPC and approved Final PIR development options that were shown to result in the highest overall number of trips (2016 NPC Project with up to 550 residential units in Phases 1 and 2 vs. PIR all office Option A).

As can be seen in Table 2-10, the NPC Project was shown to result in 26 fewer automobile trips on an average weekday when compared to the approved Final PIR Option A, with 1,634 fewer transit trips and 882 fewer pedestrian/bicycle trips. During the weekday morning peak-hour, the NPC Project was shown to result in 12 additional automobile trips, with 400 fewer transit trips and 39 additional pedestrian/bicycle trips. During the weekday evening peak-hour, the NPC Project was shown to result in 14 additional vehicle trips, with 478 fewer transit trips and 31 additional pedestrian/bicycle trips.

Table 2-8 Trip Generation Comparison – NPC Project vs. Final PIR Option A

Time Period	NPC Project			Final PIR Option A[a]			Change		
	(A) Automobile Trips	(B) Transit Trips	(C) Pedestrian/ Bicycle Trips	(D) Automobile Trips	(E) Transit Trips	(F) Pedestrian/ Bicycle Trips	(A-D) Automobile Trips	(B-E) Transit Trips	(C-F) Pedestrian/ Bicycle Trips
Average Weekday Daily:	3,144	5,242	4,572	3,170	6,876	5,454	-26	-1,634	-882
Weekday Morning Peak Hour:	558	951	244	546	1,351	205	+12	-400	+39
Weekday Evening Peak Hour:	601	959	262	587	1,437	231	+14	-478	+31

[a]Final PIR; South Station Air Rights; February 28, 2006.

2.3.2.4 Vehicle Trip Distribution and Assignment

The directional distribution of automobile trips to and from the Project site was determined based on a review of existing travel patterns within the study area and the roadway network serving the Project site. The trip assignment for the Project is consistent with that presented in the February 28, 2006 Final PIR which was based on the regional traffic model developed for the CA/T project. The general trip distribution for the Project is summarized in Table 2-9. The additional automobile trips expected to be generated by the Project were assigned on the study area roadway network as shown on Figures 2-13 and 2-14 for the weekday morning and evening peak hours, respectively.

Table 2-9 General Trip Distribution

Direction To/From	Roadway	Percentage
North	I-93	14
	Local Streets	10
South	I-93	12
	Local Streets	18
West	I-90	22
	Local Streets	12
East	Ted Williams Tunnel	10
	Local Street	2
TOTAL		100

2.3.3 Future Build Condition

2.3.3.1 Build Traffic Volumes

The 2025 Build condition traffic volumes were developed by adding the anticipated Project-generated (NPC Option B) automobile trips to the 2025 No-Build condition peak-hour traffic volumes. The resulting 2025 Build condition weekday morning and evening peak-hour traffic-volumes are graphically depicted on Figures 2-15 and 2-16, respectively.

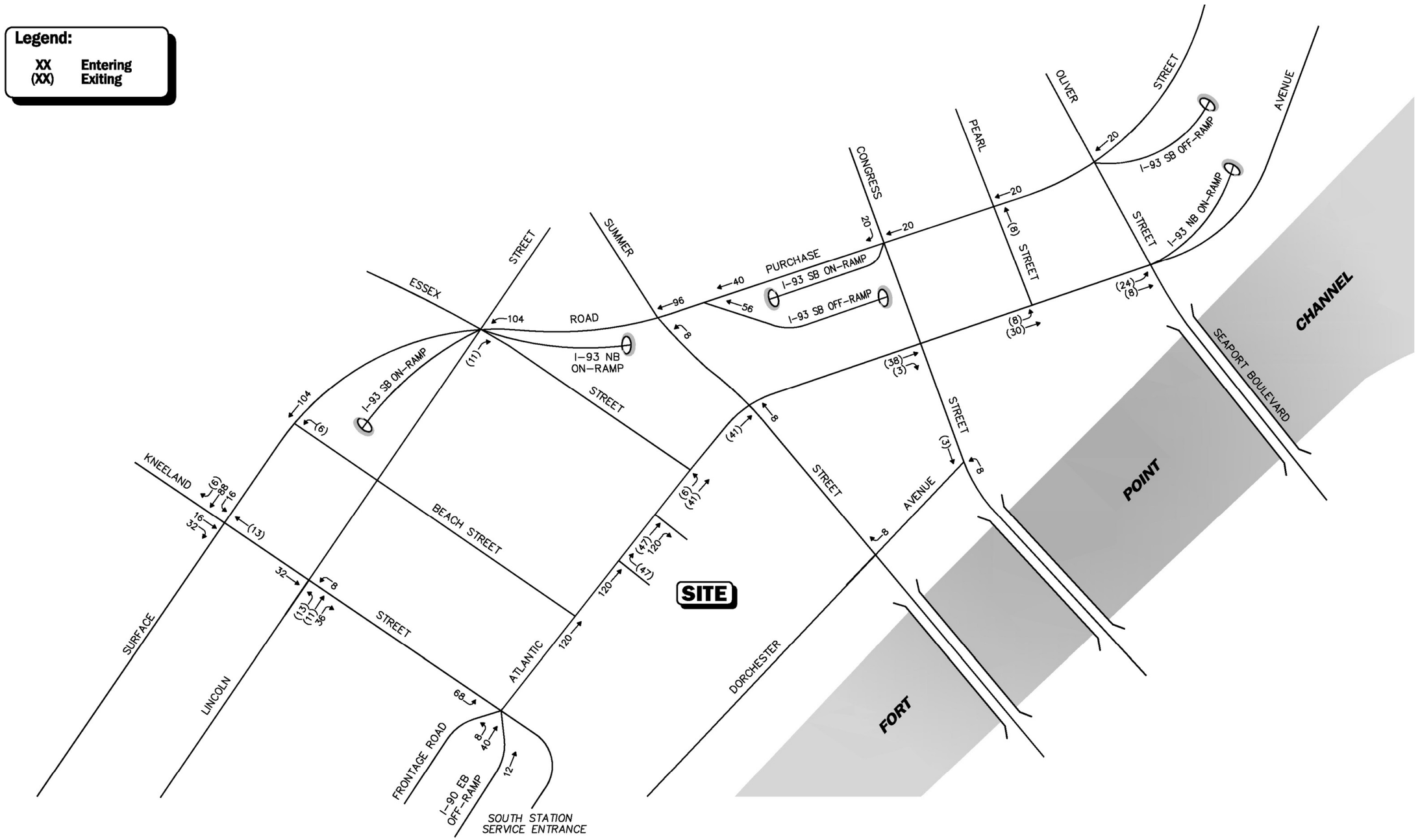

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Figure 2-13

Project-generated Weekday Morning Peak Hour Traffic Volumes

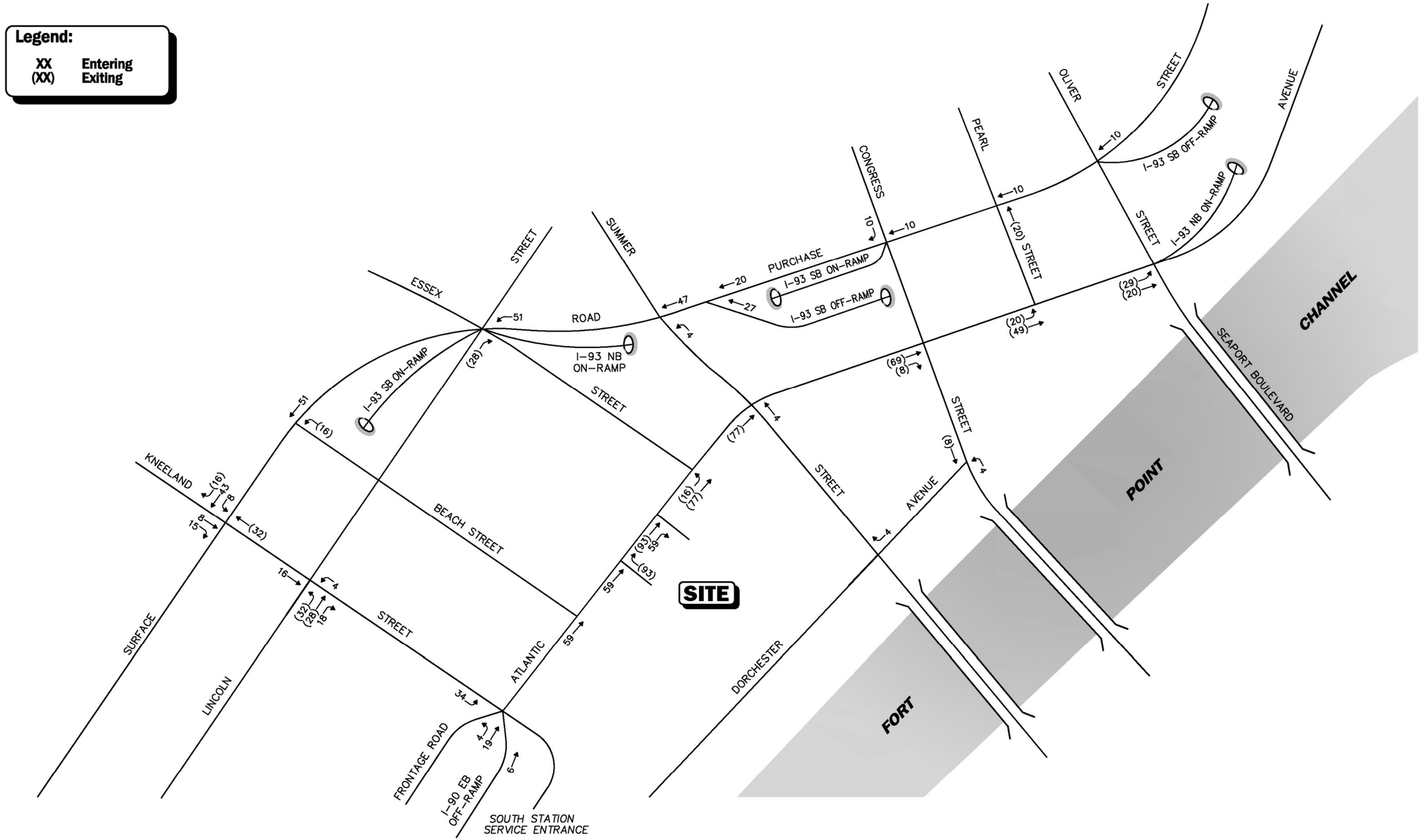

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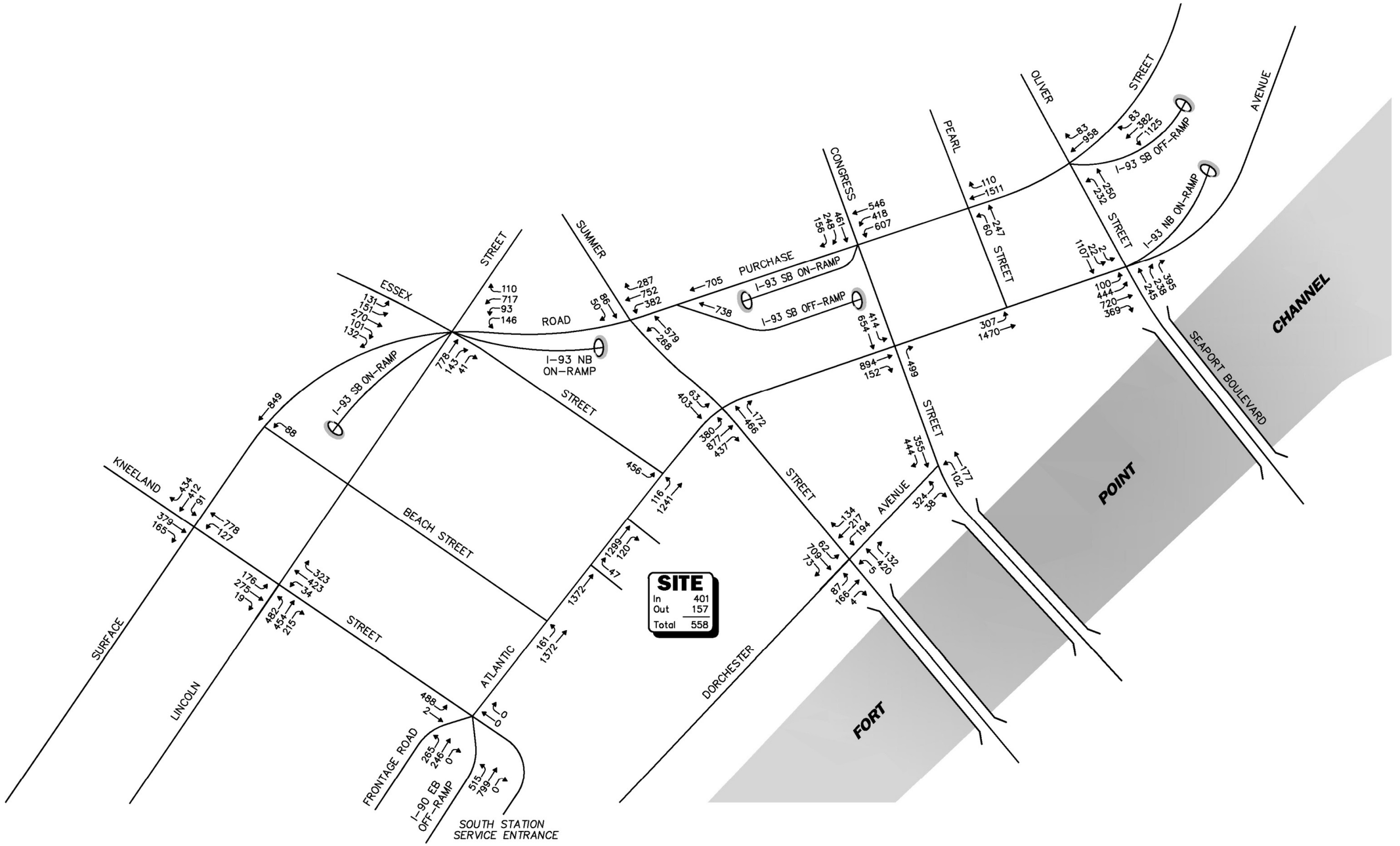
Figure 2-14

Project-generated Weekday Evening Peak Hour Traffic Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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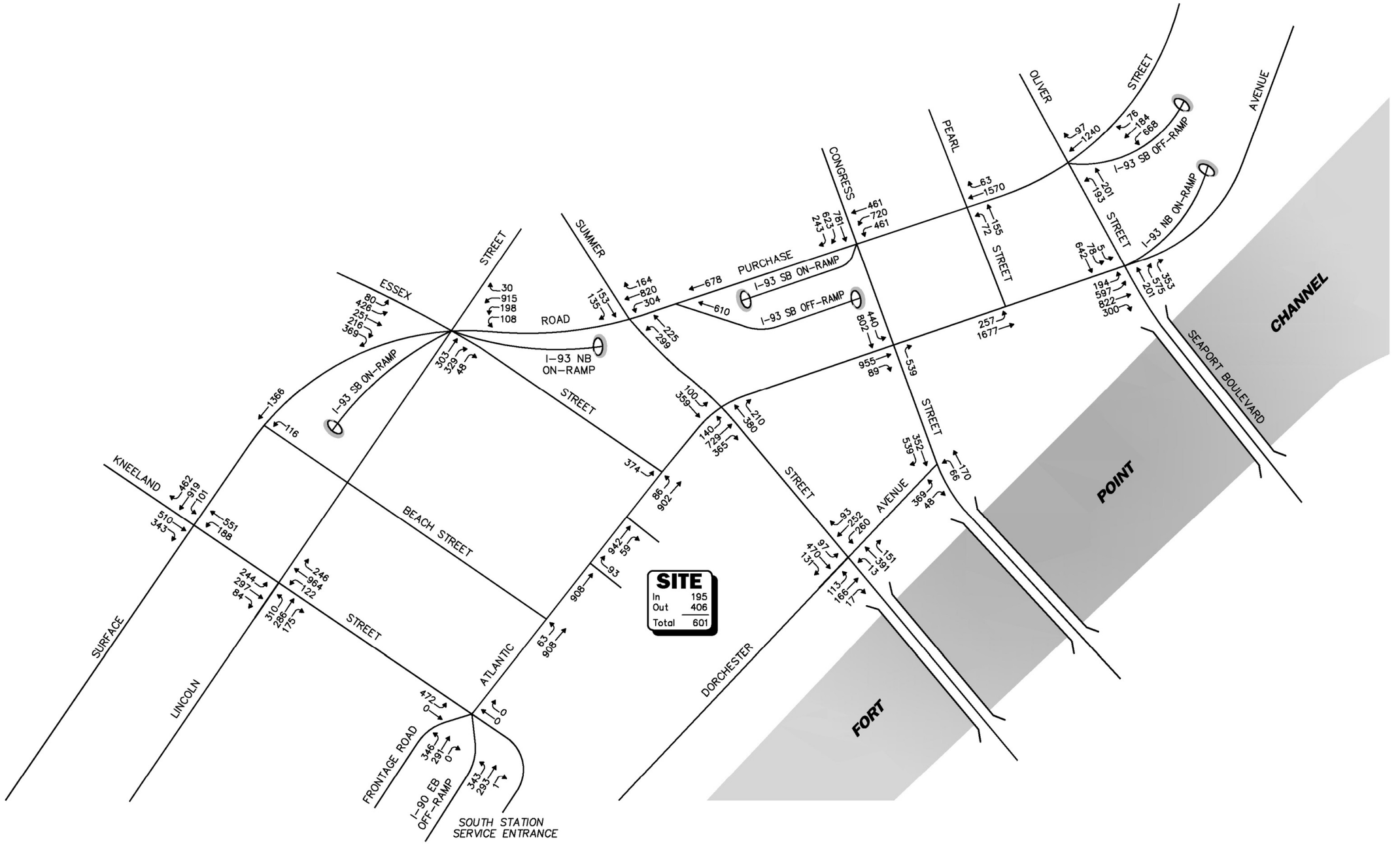
Figure 2-15

2025 Build Weekday Morning Peak Hour Traffic Volumes



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 2-16

2025 Build Weekday Evening Peak Hour Traffic Volumes

2.4 Transportation System Operations Analysis

Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue, analyses were conducted under Existing, No-Build and Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

2.4.1 Intersection Capacity Analysis

2.4.1.1 Methodology

Levels of Service - A primary result of capacity analyses is the assignment of level of service (LOS) to traffic facilities under various traffic-flow conditions.[12] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A LOS definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Signalized Intersections - The six levels of service for signalized intersections may be described as follows:

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than LOS A.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

[12] The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* Transportation Research Board; Washington, DC; 2000.

- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

In general, a level-of-service of D or better is considered acceptable in an urban area. Levels of service for signalized intersections are calculated using the operational analysis methodology of the 2000 *Highway Capacity Manual*. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. LOS designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 2-10 summarizes the relationship between LOS and control delay. The tabulated control delay criterion may be applied in assigning LOS designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 2-10 Level of Service Criteria for Signalized Intersections

Level of Service	Control (Signal) Delay Per Vehicle (Seconds)
A	$\leq$10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	$>$80.0

Unsignalized Intersections - The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.

- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2000 *Highway Capacity Manual.* LOS is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study, and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for LOS at unsignalized intersections are also given in the 2000 *Highway Capacity Manual*. Table 2-11 summarizes the relationship between LOS and average control delay for unsignalized intersections.

Table 2-11 Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Seconds Per Vehicle)
A	$\leq$ 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	$>$50.0

Vehicle Queue Analysis - Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro™ intersection capacity analysis software which is based upon the methodology and procedures presented in the 2000 *Highway Capacity Manual*. The Synchro™ vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of six seconds or more at an intersection. For signalized intersections, Synchro™ reports both the average (50th percentile) and the 95th percentile vehicle queue. For unsignalized intersections, Synchro™ reports the 95th percentile vehicle queue; however, for all-way STOP-control intersections, Synchro™ does not report vehicle queues and it is necessary to use the associated SimTraffic™ traffic model to obtain vehicle queue data. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only five percent of the time, or approximately three minutes out of 60 minutes during the peak one hour of the day (during the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length).

2.4.1.2 Analysis Results

LOS and vehicle queue analyses were conducted for 2014 Existing, 2025 No-Build and 2025 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized for the signalized and unsignalized study intersections in Tables 2-12 and 2-13, respectively, and are described in the following sections. The detailed analysis results are presented in Appendix A.

2.4.1.3 Signalized Intersections

Eleven of the 17 signalized intersections were found to be generally operating at LOS D or better during the peak hours under all analysis conditions.

The addition of NPC Project traffic to the 17 signalized study area intersections is predicted to result in a change in the overall LOS at only two of the intersections studied between the 2025 No-Build and 2025 Build condition, as described below.

Atlantic Avenue at Congress Street – This signalized intersection was predicted to operate at an overall LOS D during both the weekday morning and evening peak hours under 2025 No-Build conditions. The addition of NPC Project traffic was shown to result in no change in overall operating conditions predicted to occur during the weekday morning peak-hour, and a degradation in overall operating conditions at the intersection over 2025 No-Build conditions during the weekday evening peak-hour from LOS D to LOS E. Vehicle queues at the intersection were predicted to increase by no more than two vehicles with the addition of NPC Project traffic.

Purchase Street at Summer Street and the I-93 Southbound Off-Ramp – This signalized intersection was predicted to operate at an overall LOS E during the weekday morning peak-hour and at LOS D during the weekday evening peak-hour under 2025 No-Build conditions. No change in overall operating conditions was predicted to occur during the weekday morning peak-hour. The addition of NPC Project traffic was shown to result in a degradation in overall operating conditions at the intersection over 2025 No-Build conditions during the weekday evening peak-hour from LOS D to LOS E. Vehicle queues at the intersection were predicted to increase by no more than two vehicles with the addition of NPC Project traffic.

The following is a summary of the analysis results for the signalized intersections (in addition to the two described above) that were found to be operating at or over their design capacity (defined as LOS E or F). It is important to note that adding the NPC Project trips did not result in a change in LOS to the intersections described below.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary

Signalized Intersection/Peak Hour	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Surface Road at Kneeland Street												
Weekday Morning:												
Kneeland Street EB TH	0.60	41.5	D	5/6	0.64	40.7	D	6/7	0.65	40.8	D	6/8
Kneeland Street EB RT	0.14	36.5	D	0/2	0.15	35.0	C	0/2	0.16	35.0	C	0/2
Kneeland Street WB LT	0.30	35.6	D	2/4	0.38	33.9	C	3/5	0.38	33.9	C	3/5
Kneeland Street WB TH	0.60	39.1	D	11/12	0.63	37.0	D	11/12	0.64	38.1	D	12/13
Surface Road SB LT/TH	0.40	15.8	B	3/6	0.46	16.9	B	3/7	0.59	19.3	B	4/12
Surface Road SB RT	0.42	26.7	C	0/1	0.52	19.9	B	0/2	0.45	19.4	B	0/2
Overall	**0.45**	**30.3**	**C**	--	**0.50**	**30.4**	**C**	--	**0.56**	**30.4**	**C**	--
Weekday Evening:												
Kneeland Street EB TH	0.85	51.7	D	8/11	0.85	51.8	D	8/12	0.86	52.4	D	8/12
Kneeland Street EB RT	0.51	39.6	D	2/7	0.46	38.7	D	2/7	0.50	39.2	D	2/7
Kneeland Street WB LT	0.83	58.5	E	3/6	1.11	125.8	F	5/8	1.12	132.8	F	6/8
Kneeland Street WB TH	0.50	30.3	C	5/7	0.59	35.0	C	6/7	0.62	35.3	D	7/8
Surface Road SB LT/TH	0.77	16.5	B	6/10	0.90	25.2	C	14/21	0.95	30.9	C	19/23
Surface Road SB RT	0.40	17.2	B	0/2	0.47	25.6	C	2/4	0.52	28.1	C	2/6
Overall	**0.65**	**30.5**	**C**	--	**0.80**	**39.3**	**D**	--	**0.83**	**42.0**	**D**	--
Kneeland Street at Lincoln Street												
Weekday Morning:												
Kneeland Street EB LT/TH/RT	0.61	20.1	C	1/2	0.66	21.8	C	1/2	0.70	25.1	C	1/3
Kneeland Street WB LT/TH/RT	0.71	27.3	C	4/6	0.74	22.6	C	4/7	0.75	26.2	C	4/7
Lincoln Street NB LT	0.71	25.1	C	9/23	0.77	28.9	C	9/24	0.80	31.6	C	11/25
Lincoln Street NB TH	0.53	19.1	B	7/16	0.66	24.1	C	9/21	0.69	25.8	C	9/22
Lincoln Street NB RT	0.11	21.1	C	1/3	0.14	24.5	C	1/5	0.17	26.9	C	1/5
Overall	**0.65**	**23.4**	**C**	--	**0.69**	**24.1**	**C**	--	**0.72**	**25.1**	**C**	--
Weekday Evening:												
Kneeland Street EB LT/TH/RT	0.94	45.6	D	7/9	1.08	60.5	E	8/11	1.08	60.9	E	8/11
Kneeland Street WB LT/TH/RT	0.82	31.3	C	7/8	0.93	29.9	C	5/9	0.93	31.8	C	10/11
Lincoln Street NB LT	0.54	24.3	C	6/12	0.64	29.2	C	714	0.72	33.4	C	8/17
Lincoln Street NB TH	0.49	23.0	C	6/9	0.58	27.4	C	7/13	0.65	30.6	C	7/15
Lincoln Street NB RT	0.14	16.6	B	1/1	0.14	16.7	B	1/1	0.16	16.7	B	1/1
Overall	**0.68**	**32.1**	**C**	--	**0.80**	**37.4**	**D**	--	**0.83**	**38.4**	**D**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Kneeland Street at Atlantic Avenue, I-93 Northbound Ramps and I-90 Eastbound Ramps												
Weekday Morning:												
Kneeland Street EB LT	0.71	36.3	D	6/9	0.81	42.0	D	7/11	0.88	49.8	D	8/14
Kneeland Street EB LT/TH	0.67	33.0	C	6/9	0.73	34.8	C	7/11	0.80	39.0	D	8/13
Driveway WB TH/RT	0.00	0.0	A	0/0	0.00	0.0	A	0/0	0.00	0.0	A	0/0
I-93 Northbound Off-Ramp NB LT	0.47	34.7	C	4/12	0.76	54.4	D	7/16	0.87	67.6	E	7/17
I-93 Northbound Off-Ramp NB LT/TH	0.60	38.3	D	6/17	0.69	48.2	D	7/16	0.85	62.8	E	8/19
I-90 Westbound Off-Ramp NB LT	0.87	57.7	E	11/17	1.00	74.4	E	15/24	1.00	74.4	E	15/24
I-90 Westbound Off-Ramp NB TH	0.90	33.7	C	13/35	0.89	32.7	C	14/35	0.93	38.4	D	15/35
Overall	**0.82**	39.0	**D**	--	**0.87**	**47.4**	**D**	--	**0.90**	**53.6**	**D**	--
Weekday Evening:												
Kneeland Street EB LT	0.82	40.0	D	5/10	0.83	39.4	D	5/10	0.85	41.8	D	6/11
Kneeland Street EB LT/TH	0.75	32.7	C	4/9	0.75	32.1	C	5/10	0.77	33.5	C	5/10
Driveway WB TH/RT	0.04	48.4	D	0/0	0.00	0.0	A	0/0	0.00	0.0	A	0/0
I-93 Northbound Off-Ramp NB LT	0.50	32.6	C	5/9	0.90	63.0	E	10/19	0.97	77.7	E	11/20
I-93 Northbound Off-Ramp NB LT/TH	0.51	32.7	C	6/10	0.88	58.4	E	10/19	0.94	69.8	E	11/20
I-90 Westbound Off-Ramp NB LT	0.72	51.7	D	7/10	0.54	69.2	E	11/18	0.94	69.2	E	11/18
I-90 Westbound Off-Ramp NB TH	0.33	14.0	B	3/8	0.38	14.0	B	4/8	0.40	14.7	B	4/9
Overall	**0.61**	**33.4**	**C**	--	**0.84**	**48.0**	**D**	--	**0.87**	**53.3**	**D**	--
Atlantic Avenue at Beach Street												
Weekday Morning:												
Atlantic Avenue NB LT/TH	0.41	3.8	A	5/12	0.43	3.9	A	5/12	0.47	3.9	A	7/12
Overall	**0.41**	**3.8**	**A**	--	**0.43**	**3.9**	**A**	--	**0.47**	**3.9**	**A**	--
Weekday Evening:												
Atlantic Avenue NB LT/TH	0.39	5.8	A	2/4	0.40	5.9	A	2/4	0.40	5.9	A	2/4
Overall	**0.39**	**5.8**	**A**	--	**0.40**	**5.9**	**A**	--	**0.40**	**5.9**	**A**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Atlantic Avenue at Essex Street												
Weekday Morning:												
Essex Street EB LT	0.67	32.6	C	5/7	1.06	89.1	F	9/12	1.06	89.4	F	9/12
Atlantic Avenue NB LT/TH	0.62	14.3	B	8/12	0.65	14.3	B	9/12	0.67	14.4	B	10/12
Overall	**0.53**	**18.1**	**B**	--	**0.63**	**34.0**	**C**	--	**0.65**	**34.7**	**C**	--
Weekday Evening:												
Essex Street EB LT	0.61	33.6	C	5/6	0.78	43.4	D	7/8	0.78	43.4	D	7/8
Atlantic Avenue NB LT/TH	0.81	29.1	C	9/11	0.85	32.5	C	10/11	0.94	41.2	D	11/14
Overall	**0.63**	**30.3**	**C**	--	**0.69**	**35.9**	**D**	--	**0.75**	**41.8**	**D**	--
Atlantic Avenue at Summer Street												
Weekday Morning:												
Summer Street EB LT/TH	0.51	30.4	C	6/7	0.73	34.7	C	8/8	0.73	34.7	C	8/8
Summer Street WB TH/RT	0.71	57.2	E	6/7	0.85	50.1	D	6/8	0.86	50.1	D	7/8
Atlantic Avenue NB LT	0.60	23.1	C	5/11	0.78	28.0	C	8/13	0.78	28.0	C	8/13
Atlantic Avenue NB LT/TH	0.92	35.1	D	12/19	--	--	--	--	--	--	--	--
Atlantic Avenue NB TH	--	--	--	--	0.89	30.6	C	11/15	0.94	33.4	C	11/17
Atlantic Avenue NB RT	0.79	31.9	C	7/16	1.06	73.8	E	15/20	1.06	73.8	E	15/20
Overall	**0.62**	**37.4**	**D**	--	**0.74**	**42.3**	**D**	--	**0.74**	**42.4**	**D**	--
Weekday Evening:												
Summer Street EB LT/TH	0.97	63.3	E	8/10	1.01	66.0	E	8/9	1.01	68.6	E	8/10
Summer Street WB TH/RT	0.99	47.8	D	6/10	0.98	57.1	E	7/10	0.99	58.3	E	7/10
Atlantic Avenue NB LT	0.21	17.9	B	2/3	0.30	18.5	B	2/4	0.30	20.0	C	3/4
Atlantic Avenue NB LT/TH	0.79	24.8	C	7/13	--	--	--	--	--	--	--	--
Atlantic Avenue NB TH	--	--	--	--	0.70	32.7	C	7/11	0.78	25.9	C	9/11
Atlantic Avenue NB RT	0.88	35.6	D	8/17	0.88	35.0	C	9/16	0.88	35.0	C	10/16
Overall	**0.72**	**40.6**	**D**	--	**0.73**	**43.0**	**D**	--	**0.73**	**44.3**	**D**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Summer Street at Dorchester Avenue												
Weekday Morning:												
Summer Street EB LT/TH/RT	1.09	89.7	F	17/20	1.06	72.2	E	17/18	1.06	72.2	E	17/18
Summer Street WB LT/TH/RT	0.86	19.2	B	6/10	0.55	10.2	B	2/4	0.55	10.2	B	2/4
Dorchester Avenue NB LT	--	--	--	--	0.69	50.6	D	4/4	0.69	50.6	D	4/4
Dorchester Avenue NB LT/TH/RT	0.38	35.8	D	3/4	--	--	--	--	--	--	--	--
Dorchester Avenue NB LTH/RT	--	--	--	--	0.70	45.4	D	7/7	0.70	45.4	D	7/7
Dorchester Avenue SB LT	1.28	194.1	F	13/20	0.85	66.8	E	6/11	0.85	66.8	E	6/11
Dorchester Avenue SB TH/RT	0.16	46.2	D	2/3	0.95	73.9	E	12/15	0.97	79.0	E	12/15
Overall	**0.93**	**73.1**	**E**	--	**0.81**	**53.2**	**D**	--	**0.81**	**54.2**	**D**	--
Weekday Evening:												
Summer Street EB LT/TH/RT	0.87	36.5	D	11/12	1.06	72.3	E	15/17	1.06	72.4	E	15/17
Summer Street WB LT/TH/RT	0.87	23.2	C	7/17	0.48	7.3	A	4/4	0.48	7.3	A	4/4
Dorchester Avenue NB LT	--	--	--	--	0.70	47.0	D	5/5	0.77	55.4	E	5/5
Dorchester Avenue NB LT/TH/RT	0.31	27.6	C	2/3	--	--	--	--	--	--	--	--
Dorchester Avenue NB LTH/RT	--	--	--	--	0.81	49.8	D	7/9	0.81	49.8	D	7/9
Dorchester Avenue SB LT	1.06	81.9	F	12/20	1.00	73.1	E	7/15	1.00	73.1	E	7/15
Dorchester Avenue SB TH/RT	0.17	15.6	B	0/1	0.90	45.2	D	10/12	0.91	45.2	D	10/15
Overall	**0.80**	**36.7**	**D**	--	**0.87**	**48.4**	**D**	--	**0.87**	**48.5**	**D**	--
Congress Street at Dorchester Avenue												
Weekday Morning:												
Congress Street EB TH	0.64	23.2	C	12/17	0.59	19.1	B	8/14	0.59	19.2	B	8/14
Congress Street EB RT	0.35	37.0	D	4/5	0.40	41.2	D	6/8	0.40	41.7	D	6/8
Congress Street WB LT/TH	0.83	47.1	D	8/15	0.71	42.3	D	7/11	0.77	45.8	D	8/13
Dorchester Avenue NB LT/RT	0.88	70.2	E	11/12	0.89	49.5	D	12/13	0.89	49.5	D	12/13
Overall	**0.68**	**43.3**	**D**	--	**0.63**	**38.2**	**D**	--	**0.66**	**38.8**	**D**	--
Weekday Evening:												
Congress Street EB TH	0.55	11.8	B	6/8	0.60	21.1	C	8/11	0.67	25.4	C	8/11
Congress Street EB RT	0.39	10.3	B	0/0	0.45	23.8	C	1/3	0.45	27.7	C	1/3
Congress Street WB LT/TH	0.82	27.1	C	4/9	0.58	19.4	B	4/4	0.72	27.8	C	4/4
Dorchester Avenue NB LT/RT	0.92	47.5	D	10/15	0.90	42.3	D	12/16	0.90	42.3	D	13/16
Overall	**0.69**	**22.8**	**C**	--	**0.58**	**27.3**	**C**	-	**0.61**	**29.1**	**C**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Atlantic Avenue at Congress Street												
Weekday Morning:												
Congress Street EB LT	0.43	38.8	D	4/6	0.75	44.7	D	7/8	0.75	44.7	D	7/8
Congress Street EB TH	0.35	6.4	A	4/5	0.38	6.8	A	4/5	0.38	5.8	A	4/5
Congress Street WB RT	0.86	54.5	D	5/9	1.13	115.6	F	11/13	1.13	115.6	F	11/13
Atlantic Avenue NB TH/RT	0.82	16.8	B	2/6	0.90	21.9	C	4/9	0.94	23.3	C	5/9
Overall	**0.67**	**23.2**	**C**	--	**0.84**	**40.7**	**D**	--	**0.86**	**40.9**	**D**	--
Weekday Evening:												
Congress Street EB LT	0.77	38.5	D	6/8	0.97	57.5	E	7/11	0.97	57.5	E	7/11
Congress Street EB TH	0.45	4.0	A	3/3	0.48	4.0	A	3/3	0.48	4.0	A	3/3
Congress Street WB RT	0.95	50.5	D	7/8	1.13	101.7	F	12/13	1.13	109.5	F	13/14
Atlantic Avenue NB TH/RT	0.99	41.4	D	11/14	1.02	53.3	D	12/15	1.10	79.0	E	14/16
Overall	**0.87**	**31.7**	**C**	--	**0.97**	**51.4**	**D**	--	**1.00**	**62.6**	**E**	--
Atlantic Avenue at Pearl Street												
Weekday Morning:												
Atlantic Avenue NB LT/TH	0.40	3.8	A	3/3	0.52	5.8	A	5/6	0.54	5.8	A	6/7
Overall	**0.40**	**3.8**	**A**	--	**0.52**	**5.8**	**A**	--	**0.54**	**5.8**	**A**	--
Weekday Evening:												
Atlantic Avenue NB LT/TH	0.96	10.2	B	4/5	1.05	25.5	C	5/24	1.06	30.5	C	5/25
Overall	**0.96**	**10.2**	**B**	--	**1.05**	**25.5**	**C**	--	**1.06**	**30.5**	**C**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour/Movement	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Atlantic Avenue at Seaport Boulevard and Oliver Street												
Weekday Morning:												
Oliver Street EB LT/TH	0.72	8.7	A	3/3	0.98	18.3	B	3/8	0.98	18.3	B	3/8
Seaport Boulevard WB TH/RT	0.70	56.5	E	8/14	0.85	68.3	E	12/18	0.85	68.3	E	12/18
Seaport Boulevard WB RT	0.76	62.9	E	8/14	0.93	82.8	F	11/18	0.93	82.8	F	11/18
Seaport Boulevard WB RT	0.68	56.7	E	6/12	0.83	66.7	E	10/12	0.83	66.7	E	10/12
Atlantic Avenue NB LT	0.72	31.3	C	4/16	1.10	98.9	F	20/29	1.15	117.1	F	21/31
Atlantic Avenue NB LT/TH/RT	0.74	27.9	C	4/12	1.36	195.7	F	27/32	1.37	201.3	F	27/33
Overall	**0.72**	**30.9**	**C**	--	**1.09**	**96.5**	**F**	--	**1.10**	**101.0**	**F**	--
Weekday Evening:												
Oliver Street EB LT/TH	0.53	6.6	A	1/1	0.62	6.8	A	1/1	0.62	6.8	A	1/1
Seaport Boulevard WB TH/RT	0.91	64.1	E	9/17	1.21	153.2	F	16/25	1.21	153.2	F	16/25
Seaport Boulevard WB RT	0.85	55.8	E	9/12	1.13	122.3	F	14/23	1.13	122.3	F	14/23
Seaport Boulevard WB RT	0.84	55.0	D	8/15	0.91	64.5	E	9/17	0.91	64.5	E	9/17
Atlantic Avenue NB LT	0.85	38.5	D	14/15	1.08	75.2	E	20/24	1.12	96.2	F	24/25
Atlantic Avenue NB LT/TH/RT	0.87	36.2	D	14/16	1.16	109.4	F	23/27	1.19	122.8	F	26/28
Overall	**0.82**	**36.6**	**D**	--	**1.07**	**85.5**	**F**	--	**1.08**	**93.6**	**F**	--
Purchase Street at Oliver Street and I-93 Southbound Off-Ramp												
Weekday Morning:												
Oliver Street WB LT/TH	0.91	50.2	D	6/10	1.11	105.9	F	9/11	1.11	105.9	F	9/11
Purchase Street SB TH/RT	0.92	39.1	D	10/14	1.01	55.4	E	12/16	1.03	60.5	E	12/16
I-93 Southbound Off-Ramp SB LT	1.11	93.0	F	25/35	1.56	282.7	F	45/55	1.56	282.7	F	45/55
I-93 Southbound Off-Ramp SB TH/RT	0.80	46.9	D	10/17	0.96	68.8	E	13/22	0.96	68.8	E	13/22
Overall	**1.04**	**59.0**	**E**	--	**1.35**	**148.6**	**F**	--	**1.36**	**148.9**	**F**	--
Weekday Evening:												
Oliver Street WB LT/TH	0.68	40.7	D	3/4	0.97	52.3	D	5/6	0.97	52.3	D	5/6
Purchase Street SB TH/RT	0.91	35.9	D	10/16	1.05	65.5	E	16/20	1.06	68.1	E	16/20
I-93 Southbound Off-Ramp SB LT	1.02	70.7	E	17/26	1.20	136.6	F	25/33	1.20	136.6	F	25/33
I-93 Southbound Off-Ramp SB TH/RT	0.66	46.0	D	7/10	0.79	54.7	D	8/13	0.79	54.7	D	8/13
Overall	**0.94**	**46.7**	**D**	--	**1.13**	**81.0**	**F**	--	**1.13**	**82.2**	**F**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour/Movement	2014 Existing				2025 No-Build				2025 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue[d] 50th/95th	V/C	Delay	LOS	Queue[d] 50th/95th
Purchase Street at Pearl Street												
Weekday Morning:												
Pearl Street WB LT	0.19	48.5	D	2/4	0.28	49.6	D	2/4	0.28	49.6	D	2/4
Pearl Street WB TH	0.39	51.1	D	4/6	0.39	49.7	D	4/6	0.40	49.8	D	4/6
Purchase Street SB TH/RT	0.53	8.1	A	3/4	0.70	9.3	A	5/5	0.71	9.3	A	5/5
Overall	**0.42**	**16.9**	**B**	--	**0.52**	**17.0**	**B**	--	**0.53**	**17.1**	**B**	--
Weekday Evening:												
Pearl Street WB LT	0.45	42.2	D	3/3	0.47	42.6	D	3/3	0.47	42.6	D	3/3
Pearl Street WB TH	0.41	41.7	D	3/3	0.42	41.7	D	3/3	0.49	41.7	D	3/3
Purchase Street SB TH/RT	0.75	9.4	A	4/19	0.83	9.4	A	4/19	0.84	9.4	A	4/19
Overall	**0.59**	**13.7**	**B**	--	**0.66**	**13.8**	**B**	--	**0.66**	**13.8**	**B**	--
Purchase Street at Congress Street												
Weekday Morning:												
Congress Street EB TH	0.37	9.0	A	2/3	0.50	11.7	B	3/4	0.50	12.1	B	3/4
Congress Street EB RT	0.60	15.7	B	3/7	0.63	18.4	B	3/10	0.63	18.8	B	3/10
Congress Street EB RT	0.33	9.8	A	2/2	0.35	11.3	B	2/3	0.40	12.5	B	2/3
Purchase Street SB LT	0.69	10.9	B	3/8	0.97	32.1	C	7/26	0.97	32.1	C	7/27
Purchase Street SB LT	0.77	9.9	A	6/7	1.01	32.5	C	8/23	1.03	37.7	D	9/24
Purchase Street SB TH	0.77	9.9	A	6/7	1.01	32.5	C	8/23	1.03	37.7	D	9/24
Overall	**0.57**	**10.7**	**B**	--	0.69	**25.7**	**C**	--	**0.70**	**28.1**	**C**	--
Weekday Evening:												
Congress Street EB TH	0.68	17.1	B	5/8	0.72	18.2	B	5/9	0.72	18.3	C	5/10
Congress Street EB RT	1.20	123.8	F	24/30	1.20	124.2	F	23/32	1.20	124.4	F	23/32
Congress Street EB RT	0.48	15.7	B	3/5	0.48	15.8	B	3/5	0.49	16.2	B	3/6
Purchase Street SB LT	0.72	18.6	B	9/12	0.85	24.3	C	11/17	0.85	24.3	C	11/17
Purchase Street SB LT	1.21	125.4	F	24/32	1.41	207.7	F	31/39	1.41	207.7	F	31/39
Purchase Street SB TH	0.85	26.7	C	12/19	0.90	29.2	C	12/19	0.92	31.5	C	12/19
Overall	**1.01**	**62.8**	**E**	--	**1.07**	**80.3**	**F**	--	**1.07**	**80.3**	**F**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour/Movement	2014 Existing V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	2025 No-Build V/C	Delay	LOS	Queue[d] 50th/95th	2025 Build V/C	Delay	LOS	Queue[d] 50th/95th
Purchase Street at Summer Street and the I-93 Southbound Off-Ramp												
Weekday Morning:												
Summer Street EB TH	0.25	22.0	C	1/1	0.57	77.2	E	3/5	0.57	77.1	E	3/5
Summer Street EB RT	0.06	39.9	D	0/0	0.09	47.5	D	0/2	0.09	47.5	D	0/2
Summer Street WB LT	0.91	49.6	D	5/15	0.97	64.6	E	7/13	1.00	71.5	E	7/14
Summer Street WB LT/TH	0.62	25.4	C	3/6	1.06	76.0	E	11/15	1.06	76.0	E	11/16
Purchase Street SB LT/TH/RT	1.02	88.3	F	9/13	0.95	51.6	D	11/11	1.01	62.7	E	12/13
I-93 Southbound Off-Ramp SB LT/TH/RT	0.75	42.8	D	9/11	0.90	54.1	D	10/15	0.97	65.9	E	11/17
Overall	**0.76**	**50.5**	**D**	--	**0.91**	**60.8**	**E**	--	**0.96**	**68.0**	**E**	--
Weekday Evening:												
Summer Street EB TH	0.42	38.6	D	2/3	0.70	60.1	E	4/6	0.70	60.1	E	4/6
Summer Street EB RT	0.08	40.4	D	0/0	0.19	62.4	E	1/3	0.19	62.4	E	1/3
Summer Street WB LT	0.63	19.8	B	3/3	0.63	19.0	B	2/2	0.63	19.0	B	2/2
Summer Street WB LT/TH	0.69	18.0	B	3/4	0.62	16.0	B	2/2	0.62	16.0	B	2/2
Purchase Street SB LT/TH/RT	1.21	148.0	F	12/17	1.02	71.4	E	12/16	1.05	79.9	E	13/16
I-93 Southbound Off-Ramp SB LT/TH/RT	0.47	35.3	D	5/7	0.90	57.6	E	9/13	0.94	63.5	E	10/14
Overall	**0.69**	**72.2**	**E**	--	**0.83**	**52.6**	**D**	--	**0.85**	**57.1**	**E**	--

See notes at end of table.

Table 2-12 Signalized Intersection Level of Service and Vehicle Queue Summary (Continued)

Signalized Intersection/Peak Hour/Movement	2014 Existing				2025 No-Build				2025 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue[d] 50th/95th	V/C	Delay	LOS	Queue[d] 50th/95th
Surface Road at Essex Street and Lincoln Street												
Weekday Morning:												
Essex Street EB LT	0.69	38.9	D	7/11	0.84	50.7	D	9/15	0.84	50.7	D	9/15
Essex Street EB TH	0.82	48.6	D	8/13	0.86	53.8	D	9/14	0.86	53.8	D	9/14
Essex Street EB RT	0.79	50.3	D	6/11	0.81	50.3	D	7/12	0.81	50.3	D	7/12
Surface Road SB LT/TH/RT	0.62	19.7	B	7/8	0.74	22.5	C	6/10	0.74	24.2	C	8/10
Lincoln Street NB TH	0.71	38.3	D	9/11	0.96	57.7	E	13/18	0.95	57.7	E	13/18
Lincoln Street NB RT	0.56	39.7	D	4/7	0.67	45.3	D	5/9	0.67	45.3	D	5/9
Overall	**0.70**	**34.2**	**C**	--	**0.85**	**42.9**	**D**	--	**0.85**	**43.5**	**D**	--
Weekday Evening:												
Essex Street EB LT	0.91	46.3	D	9/19	1.02	69.4	E	17/25	1.02	69.4	E	17/25
Essex Street EB TH	0.62	27.0	C	4/7	0.62	27.6	C	4/7	0.62	27.6	C	4/7
Essex Street EB RT	1.18	128.7	F	17/25	1.19	129.2	F	22/31	1.19	129.2	F	22/31
Surface Road SB LT/TH/RT	0.77	28.2	C	9/10	1.02	56.9	E	12/16	1.02	59.1	E	14/17
Lincoln Street NB TH	0.42	35.3	D	4/6	0.44	35.9	D	4/6	0.47	37.7	D	4/6
Lincoln Street NB RT	0.90	66.8	E	9/16	1.01	91.0	F	11/19	1.18	147.1	F	13/21
Overall	**0.95**	**52.6**	**D**	--	**1.09**	**75.2**	**E**	--	**1.13**	**79.0**	**E**	--
Surface Road at Beach Street												
Weekday Morning:												
Beach Street WB LT	0.58	44.0	D	2/5	0.59	45.9	D	2/5	0.59	45.9	D	3/5
Surface Road SB TH	0.33	1.9	A	1/1	0.33	1.9	A	1/1	0.38	1.9	A	1/1
Overall	**0.31**	**6.1**	**A**	--	**0.31**	**6.9**	**A**	--	**0.35**	**6.9**	**A**	--
Weekday Evening:												
Beach Street WB LT	0.55	52.7	D	3/6	0.56	53.7	D	4/6	0.60	53.7	D	4/6
Surface Road SB TH	0.45	1.0	A	0/1	0.53	1.7	A	1/2	0.56	2.4	A	2/3
Overall	**0.40**	**5.1**	**A**	--	**0.46**	**5.4**	**A**	--	**0.49**	**6.4**	**A**	--

[a]Volume-to-capacity ratio.

[b]Control (signal) delay per vehicle in seconds.

[c]Level of Service.

[d]Queue length in vehicles.

EB = eastbound; WB = westbound; NB = northbound; SB = southbound; LT = left-turning movements; TH = through movements; RT = right-turning movements

Table 2-13 Unsignalized Intersection Level of Service and Vehicle Queue Summary

Unsignalized Intersection/ Peak Hour/Movement	2014 Existing				2025 No-Build				2025 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Atlantic Avenue at the Garage Exit Driveway												
Weekday Morning:												
Atlantic Avenue NB TH	--	--	--	--	--	--	--	--	1,372	0.0	A	0
Garage Exit Driveway WB RT	--	--	--	--	--	--	--	--	47	9.7	A	1
Weekday Evening:												
Atlantic Avenue NB TH	--	--	--	--	--	--	--	--	908	0.0	A	0
Garage Exit Driveway WB RT	--	--	--	--	--	--	--	--	93	9.0	A	1
Atlantic Avenue at the Garage Entrance Driveway												
Weekday Morning:												
Atlantic Avenue NB TH/RT	--	--	--	--	--	--	--	--	1,419	0.0	A	0
Weekday Evening:												
Atlantic Avenue NB TH/RT	--	---	--	--	--	--	--	--	1,001	0.0	A	0

[a]Demand in vehicles per hour.

[b]Average control delay per vehicle (in seconds).

[c]Level of Service.

[d]Queue length in vehicles.

EB = eastbound; WB = westbound; NB = northbound; SB = southbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Atlantic Avenue at Seaport Boulevard and Oliver Street – This signalized intersection was predicted to operate over its design capacity (LOS F) under 2025 No-Build and 2025 Build conditions during both the weekday morning and evening peak hours independent of the Project. Project-related impacts were defined as an increase in overall motorist delay of approximately eight seconds or less, with a predicted increase in vehicle queueing of approximately two vehicles.

Purchase Street at Oliver Street and the I-93 Southbound Off-Ramp – This signalized intersection was predicted to operate over its design capacity (LOS F) under 2025 No-Build and 2025 Build conditions during both the weekday morning and evening peak hours independent of the Project. Project-related impacts were defined as an increase in overall motorist delay of approximately one second, with no material increase in vehicle queueing predicted.

Purchase Street at Congress Street – This signalized intersection was predicted to operate at an LOS C during the weekday morning peak-hour under both the 2025 No-Build and 2025 Build conditions, and over its design capacity (LOS F) under 2025 No-Build and 2025 Build conditions during the weekday evening peak-hour independent of the Project. Project-related impacts were defined as an increase in overall motorist delay of approximately two seconds, with a predicted increase in vehicle queueing of approximately one vehicle.

Surface Road at Essex Street and Lincoln Street – This signalized intersection was predicted to operate at an LOS D in both the 2025 No-Build and 2025 Build conditions weekday morning peak-hour, and at its design capacity (LOS E) under 2025 No-Build and 2025 Build conditions during the weekday evening peak-hour independent of the Project. Project-related impacts were defined as an increase in overall motorist delay of approximately four seconds, with a predicted increase in vehicle queueing of approximately two vehicles.

2.4.1.4 Unsignalized Intersections

All movements at the two unsignalized study area intersections (the access points to the Project site from Atlantic Avenue) are predicted to operate at LOS A during both the weekday morning and evening peak hours, with vehicle queues of no more than one vehicle.

2.4.2 Pedestrian Impact Analysis

The Project is expected to result in up to 4,572 pedestrian/bicycle trips on an average weekday, and between 200 and 260 pedestrian/bicycle trips during the weekday peak commuter hours. As described in Section 2.2.4, the Project site is served by an interconnected sidewalk infrastructure that links the Project to Downtown Boston and the South Boston Waterfront, with the signalized intersections within the study area providing marked crosswalks, pedestrian traffic signal equipment and phasing. A Hubway bicycle sharing station is provided at South Station, and bicycle accommodations are provided along Atlantic Avenue, Surface Road, Purchase Street and Seaport Boulevard, which link the Project site to other bicycle facilities in the City and the region. Improvements to these accommodations are proposed in conjunction with the South Station Expansion project, as detailed herein, that will improve and expand pedestrian and bicycle access to the Project site.

In conjunction with the Project, the sidewalk along Atlantic Avenue will be improved to accommodate pedestrian access to the Project site, and secure bicycle parking will be provided within the proposed parking garage, with bicycle racks provided at an appropriate location along Atlantic Avenue proximate to the pedestrian entrances to the Project for short-term bicycle parking. In addition, the Proponent will consult with Hubway to determine if an additional Hubway bicycle sharing station can be accommodated along Atlantic Avenue to serve both the Project and the South Station Bus Terminal.

The existing and improved pedestrian and bicycle network in the South Station area, and the associated accommodations that will be provided as a part of the Project, will afford sufficient capacity to accommodate the increased pedestrian and bicycle activity that will be associated with the Project. It is important to note that the capacity analyses and the associated pedestrian and bicycle improvements that have been defined for the South Station Expansion project reflect a larger development proposal for the Project than is currently proposed.

2.4.3 Public Transportation Impact Analysis

Transit trips associated with the Project were assumed to be distributed among the major transit services in proportion to their expected usage by line and direction. The usage of each transit line was calculated based on the analysis that was completed for the Urban Ring project. The distribution of ridership, expressed as a peak load point or the point on the service with the highest ridership, was developed by the CTPS for the MBTA for the Commuter Rail and the private bus lines serving the South Station Bus Terminal, and for all MBTA buses and subway lines, distinguished by direction approaching downtown Boston. This information is summarized in Table 2-14.

Table 2-14 Peak Period Transit Peak Loads

	Transit Line	Percent Distribution
Commuter Rail:	Worcester/Framingham	2.61
	Needham	1.02
	Franklin	2.34
	Providence/Stoughton	4.65
	Fairmount	0.54
	Middleborough/Lakeville	2.26
	Greenbush	1.59
	Kingston/Plymouth	1.73
	Subtotal:	16.74
Subway:	Green Line – West	13.34
	Green Line – North	10.90
	Red Line – North	9.37
	Red Line – South	12.20
	Orange Line – North	9.28
	Orange Line – South	8.63
	Blue Line	7.61
	Subtotal:	71.33
Bus and Commuter Boats:	South Station Bus Lines	0.36
	MBTA Bus Lines (Includes Silver Line)	10.78
	Commuter Boats	0.79
	Subtotal:	11.93
TOTAL:		100

The transit ridership by line for the Project is assumed to follow the general distribution of ridership shown in Table 2-14. The percent distribution of the transit lines was applied to the transit peak period totals for the NPC Project from Table 2-7 to produce the forecast peak hour transit trips by transit line. The results are shown in Table 2-15.

For all transit services, the ridership shown in Table 2-15 represents the increase of transit riders on that line during the weekday morning and evening peak hours. The Red Line, between Park Street and South Station, carries all of the transit trips of the Project that are transferring from the Green Line. Similarly, the Red Line, between Downtown Crossing and South Station, also carries all transit trips of the Project that are transferring from the Green, Orange and Blue Lines. Table 2-16 presents the total projected Red Line ridership from the Project between South Station and Park Street by way of Downtown Crossing.

Table 2-15 Project Peak-Hour Transit Riders

	Transit Line	Morning Peak Hour Entering	Morning Peak Hour Exiting	Evening Peak Hour Entering	Evening Peak Hour Exiting
Commuter Rail:	Worcester/Framingham	23	2	2	22
	Needham	9	1	1	9
	Franklin	20	2	2	20
	Providence/Stoughton	41	4	4	40
	Fairmount	5	0	1	5
	Middleborough/Lakeville	20	2	2	20
	Greenbush	14	1	1	14
	Kingston/Plymouth	15	1	2	15
	Subtotal:	147	13	15	145
Subway:	Green Line – West	117	11	12	116
	Green Line – North	95	8	10	95
	Red Line – North	82	7	8	81
	Red Line – South	107	9	11	106
	Orange Line – North	81	7	8	81
	Orange Line – South	75	7	8	75
	Blue Line	66	6	7	66
	Subtotal:	623	55	64	620
Bus and Commuter Boats	South Station Bus Lines	3	0	0	3
	MBTA Bus Lines (Includes Silver Line)	94	8	10	94
	Commuter Boats	7	1	1	7
	Subtotal:	104	9	11	104
All Services	TOTALS	874	77	90	869

Table 2-16 Total Project Red Line Ridership - South Station to Park Street

		Morning Peak Hour Entering	Morning Peak Hour Exiting	Evening Peak Hour Entering	Evening Peak Hour Exiting
Red Line	Downtown Crossing – South Station	516	46	53	514
Red Line	Park Street- Downtown Crossing	294	34	30	292

As shown on Table 2-15, the majority of the transit trips associated with the Project are expected to use the subway system, with a projected increase in peak-hour ridership of up to 117 passengers on any one subway line. Peak-hour ridership on the Commuter Rail system is expected to increase by up to 41 passengers on any individual train. Increases in

bus and commuter boat ridership associated with the Project are expected to be relatively modest. As indicated previously, the South Station Expansion project and the associated improvements to South Station reflect a larger development proposal and associated increase in transit ridership for the Project than is currently proposed.

2.4.4 Parking

In conjunction with the Project, the South Station Bus Terminal will be expanded by approximately 106,000 sf on property owned by the MBTA, and a new parking garage will be constructed above the bus terminal which will include 895 spaces in addition to the existing MBTA parking garage. After construction of the new garage, the combined parking garages (new garage and MBTA garage) will provide 1,083 parking spaces. Access to the new and expanded parking garage will be provided by the South Station Connector and the ramp system that serves the South Station Bus Terminal, as well as by way of driveways (one entering drive and one exiting drive) located off Atlantic Avenue.

As proposed, the Project will provide up to 460 parking spaces for the office component of the Project (or a parking ratio of 0.4 spaces per 1,000 sf), leaving 435 spaces (out of the 895 new spaces) to serve the residential and/or hotel component (or a parking ratio of between 1.0 and 0.79 spaces per residential unit for the 435 unit and 550 unit residential development options, respectively); under the Phase 2 hotel option, the number of spaces provided would be capped at a ratio not to exceed 1.0 space per residential unit (175 units) and 0.4 spaces per hotel room (360 rooms), resulting in 319 spaces, with the balance of the parking (116 spaces) to be provided as commercial or visitor parking). These parking ratios are consistent with the BTD recommended parking ratios for the District in which the Project site is located.

2.4.5 Loading/Delivery Impacts

Loading and delivery activities associated with the Project will occur in two designated off-street loading areas: one accessed from the South Station Connector and the ramp system that serves the South Station Bus Terminal (serving Phases 1 and 2) and the second situated at the south end of the Project site that will be accessed from Atlantic Avenue (serving Phase 3). Both loading areas will be enclosed and will be located internal to the structures that will occupy the Project site. The loading area accessed from the South Station Connector has been designed to accommodate the turning and maneuvering requirements of a large tractor semi-trailer combination (WB-67 design vehicle), and will serve as the primary loading area for Project. The Atlantic Avenue loading area is situated outside of the sidewalk area and has been designed to accommodate smaller delivery trucks (SU-30/40 design vehicle).

Passenger drop-off/pick-up activities associated with the Project will occur both within the parking garage as well as along Atlantic Avenue, with curbside use (other than curb cuts for parking entrance and exit) limited to taxis or as defined by BTD.

2.5 Transportation Improvement Program

The previous sections of this assessment have quantified and evaluated in detail the impact of the Project on the transportation infrastructure. This section presents a summary of Project-related improvements that are designed to: 1) address existing deficiencies identified as a part of this assessment; 2) minimize the impact of the Project on the transportation system and proximate neighborhood areas; and 3) provide safe and efficient access to the Project site.

2.5.1 Proposed Improvements

The Proponent is committed to the implementation of a comprehensive transportation improvement program that is designed to reduce the impact of the planned development on the transportation infrastructure. The major elements of the improvement program have been identified in the TAPA that was executed between BTD and the Proponent for the previously approved development that was to occupy the Project site, and can be separated into three primary categories: i) Project site access accommodations; ii) off-site improvements; and iii) TDM measures. In addition, the framework of a construction traffic and parking management plan have also been developed for the Project. The elements of the planned transportation improvement program are discussed in detail in the following sections.

2.5.1.1 Project Site Access

Access to the Project site will be provided from the South Station Connector and the ramp system to the South Station Bus Terminal, and from one-way entrance and exit drives that will intersect the east side of Atlantic Avenue between Beach Street and East Street. Primary loading and delivery activities associated with the Project will occur in two designated off-street loading areas: one accessed from the South Station Connector and the ramp system that serves the South Station Bus Terminal (serving Phases 1 and 2) and the second situated at the south end of the Project site that will be accessed from Atlantic Avenue (serving Phase 3). . Both loading dock areas will be enclosed and will be located internal to the structures that will occupy the Project site. The loading area accessed from the South Station Connector has been designed to accommodate the turning and maneuvering requirements of a large tractor semi-trailer combination (WB-67 design vehicle) internal to the loading dock area. The following measures are anticipated relative to the access drives serving the Project site:

- The driveway serving the loading dock area off Atlantic Avenue is anticipated to be designed as a pan-type driveway so that the sidewalk is maintained at a consistent grade along Atlantic Avenue. Audible and visual pedestrian warning devices should be installed at the driveway to warn pedestrians of vehicles that may be exiting the loading area.

- Vehicles exiting the Project onto Atlantic Avenue will be placed under STOP-sign control.
- Centerline pavement markings, where provided, will consist of a double-yellow line in accordance with the centerline pavement marking standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[13]
- All signs and other pavement markings to be installed within the development will conform to the applicable standards of the MUTCD.
- Signs, landscaping and other features to be installed adjacent to the Project site driveways on Atlantic Avenue will be designed and maintained so as not to restrict lines of sight to or from the drives for vehicles, pedestrians or bicyclists.

2.5.1.2 Off-Site Improvements

Atlantic Avenue

Consistent with the requirements of the previously approved TAPA, the Proponent will complete the following improvements along Atlantic Avenue subject to receipt of all necessary rights, permits and approvals:

- Reconstruct the sidewalk and streetscape area along the Project site frontage on Atlantic Avenue commensurate with the phasing of the Project, generally from north to south. These improvements will be implemented by the Proponent as the build-out of the Project progresses along the Atlantic Avenue corridor, with all sidewalk and streetscape improvements completed prior to the issuance of the final Certificate of Occupancy for the Project as set forth in the Site Plans.

- Redesign/reconfigure the curb-side use along the east side of Atlantic Avenue between Summer Street and Kneeland Street to accommodate the installation of the Project driveways and to extend the existing cab stand areas. These improvements will be completed prior to the issuance of the first Certificate of Occupancy for the development.

2.5.1.3 Transportation Demand Management Program

Introduction

The Project site affords superior access to public transportation given its location at the southern hub of the MBTA Commuter Rail system at South Station and the South Station Bus Terminal. In addition to the MBTA Commuter Rail system, these important transportation nodes afford connections to intercity and interstate bus lines, MBTA bus

[13] *Manual on Uniform Traffic Control Devices* (MUTCD); Federal Highway Administration; Washington, DC; 2009.

services, Amtrak train services, and MBTA subway service via the Silver Line and Red Line. Headhouses for the Silver Line and Red Line are located on the corners of the Atlantic Avenue/Summer Street intersection and immediately adjacent to the Project site. Further, South Station is the location of one of the most active Hubway bicycle rental stations in the City, offering opportunities to expand the service to accommodate the increased demands associated with the Project. In conjunction with the Project, the South Station Bus Terminal will be expanded by approximately 106,000 sf and increase bus gate capacity by approximately 50 percent on property owned by the MBTA.

The following pedestrian and bicycle improvements/accommodations, TDM measures, and trip reduction strategies are proposed with the goal of further minimizing the Project's overall impact, and will be implemented commensurate with initial phase of the Project unless indicated otherwise.

Pedestrian Improvements

As part of the Project, the Proponent will define and enhance pedestrian facilities as follows:

- The sidewalk and streetscape area will be reconstructed along the Project site frontage on Atlantic Avenue commensurate with the phasing of the Project, generally from north to south.
- Street lighting will be provided around the building perimeter and along Atlantic Avenue.
- Full handicapped access will be provided on-site, including elevators and ramps for barrier-free access.
- Sidewalks will be constructed so as to be flush with all driveways and garage entrances.
- Pedestrian warning devices (signs, voice and light devices, mirrors, etc.) will be provided at all garage driveways for pedestrian safety.

In addition, the Proponent will provide funding and data to the City for the completion of a South Station/Leather District Pedestrian Access Study (see Section 2.5.1.4).

Bicycle Accommodations

The Project will include provision of safe, secure, weather protected bicycle racks and/or storage lockers within the Project site. Signs will be provided at appropriate locations within the Project site directing bicyclists to the bicycle storage facilities. Short-term bicycle parking will be provided at an appropriate location along Atlantic Avenue defined in consultation with BTD and the BRA. The location of the short-term bicycle parking will be commensurate with the build-out of the Project as building entrances are defined along

Atlantic Avenue. In addition, an on-site shower and locker facility will be provided for occupants of the Project.

Traffic Reduction Strategies

In order to reduce single occupant vehicle (SOV) travel to the Project site and encourage the use of alternative modes of transportation to reach the planned development, the following traffic reduction strategies will be implemented in conjunction with the Project:

- A full-time, on-site Transportation Coordinator will be assigned;
- Join the A Better City Transportation Management Association (TMA);
- Coordinate with MassRIDES through the A Better City TMA to provide commuter services to employees of the Project;
- Through the A Better City TMA, make available information regarding public transportation services, maps, schedules and fare information to tenants, employees, residents and guests of the Project;
- Work with the A Better City TMA to develop an orientation packet to be provided to all tenants, employees and residents of the Project detailing the elements of the TDM program supported by the Project, including car/vanpool matching programs, public transportation options, bicycle and walking alternatives and the "guaranteed-ride-home" program;
- Promote the use of public transportation to residents and employees in website based materials including links to the appropriate home pages of the MBTA and MassRIDES;
- Provide at least three car sharing (Zipcar or similar service) parking spaces within the parking garage;
- Provide at least two carpool/vanpool designated parking spaces within the parking garage;
- Provide at least two designated parking spaces for alternatively fueled vehicles within the parking garage;
- Provide at least two electric vehicle charging stations within the parking garage;
- Participate in the MBTA Corporate T-Pass Program to the extent practical and as allowable pursuant to corporate policies;
- Offer a "guaranteed-ride-home" to all employees that car/vanpool or that use public transportation as provided through the TMA;
- Through the A Better City TMA, provide a periodic newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules and other travel options;

- Promote bicycle use as an alternative to SOV travel by providing promotional material on bicycle commuting and bicycle safety, and offer incentives for bicycle use;
- Provide an on-site shower and locker facility for occupants of the Project;
- Encourage occupants to participate in MassRIDES' NuRide program which rewards employees that choose to walk, bicycle, carpool, vanpool or that use public transportation; and
- Coordinate with Hubway to locate an additional bicycle sharing station along Atlantic Avenue at an appropriate location that is convenient to the pedestrian entrances to the Project and the entrance to the South Station Bus Terminal.

In addition, an annual occupant survey and traffic monitoring program will be implemented through the A Better City TMA (see Section 2.5.1.7) that will be used to document the effectiveness of the traffic reduction program.

Alternative Work Schedules

Flexible working hours allow employees to choose their own starting and finishing times by establishing a required core time such as 9:00 a.m. to 4:00 p.m.; this allows employees of office tenants to vary work schedules and reduces peak-hour demand. Project office tenants will evaluate the feasibility of implementing a flextime policy and/or telecommuting for clerical/office employees in order to reduce peak-hour traffic demands.

On-Site Banking/Direct Deposit

Project office tenants will be encouraged to offer employees the option of direct deposit of paychecks in order to reduce off-site trips and the overall volume of employee traffic.

2.5.1.4 South Station/Leather District Pedestrian Access Study

The Proponent will provide a monetary contribution to BTD for dedicated use in completing a comprehensive pedestrian access study for the South Station area and the Leather District. These funds will be provided to BTD in an appropriate form prior to the issuance of a Building Permit for the Project. In support of this pedestrian access study, the Proponent will conduct, and provide to BTD, pre-construction pedestrian counts during the weekday morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak periods along Atlantic Avenue and Summer Street, at the entrances to both the South Station Bus Terminal and the South Station Head House, as well as at the intersections defined in conjunction with the Traffic Monitoring Program (see Section 2.1.5.7). The amount of the contribution to BTD for this study will be the difference between $50,000 and the cost to provide the pre-construction pedestrian counts.

2.5.1.5 Construction Management Plan (CMP)

An important component of the transportation improvement program is an effective series of measures designed to minimize traffic flow and safety impacts during the Project's construction phase. Summarized below are several measures which the Proponent and the general contractor will undertake during the construction phase of the Project.

- The Proponent will coordinate with BTD regarding all transportation-related construction impacts of the Project.
- Prior to the implementation of any planned construction activities within the public right-of-way, the contractor will submit to BTD for review and approval a traffic and pedestrian management plan.
- The general contractor will join the A Better City TMA in order to coordinate trip reduction strategies during the construction phase of the Project.
- The general contractor, through the A Better City TMA, will implement a car/vanpool program in order to reduce construction-related traffic and parking demands associated with the Project.
- The general contractor will be encouraged to offer subsidies to workers that use public transportation to be used toward the purchase of MBTA "Charlie Cards". Employees that participate in the program would also be eligible for the "guaranteed-ride-home" program through the A Better City TMA.
- Designated truck routes will be established to govern how trucks access the Project site. The goal of this commitment is to have construction trucks use only the regional highway system (Interstates 90 and 93) and to avoid using residential city streets to the extent practical. Construction contracts for the Project will include notification of this provision and contain explicit language prohibiting travel through the Leather District, excepting Kneeland Street.
- Secure fencing and sidewalk staging protection will be provided in areas affected by the construction to protect nearby pedestrian and vehicular traffic. Gate entrances into the construction area(s) will be determined jointly with BTD.
- Secure on-site storage will be provided for tools and equipment in an effort to minimize construction-related vehicle trips to the site.
- Full or partial street closures will be avoided to the extent possible. Should a partial street closure be necessary in order to off-load construction materials and/or complete construction-related activities, the closure will be limited to off-peak periods as defined by the BTD so as to minimize the impact on vehicular and pedestrian flow. Police details will be utilized as required by the BTD.
- During construction activities, as required by BTD, a police detail will be placed on-site within the sidewalk/street area to control pedestrian, bicycle and construction vehicle conflicts.

- Construction worker parking will be prohibited along Atlantic Avenue and in on-street areas within the Leather District. Construction contracts for the Project will include notification of this prohibition.

2.5.1.6 Loading and Deliveries

Loading and delivery activities associated with the Project will occur in two designated off-street loading areas as described above. Both loading areas will be enclosed and will be located internal to the structures that will occupy the Project site. The loading area accessed from the South Station Connector has been designed to accommodate the turning and maneuvering requirements of a large tractor semi-trailer combination (WB-67 design vehicle), and will serve as the primary loading area for Project. The Atlantic Avenue loading area is situated outside of the sidewalk area and has been designed to accommodate smaller delivery trucks (SU-30/40 design vehicle).

The loading areas will be managed by the building management team, and signs will be posted in the loading areas informing drivers of the five-minute idle time. Loading and delivery activities will be carefully coordinated, scheduled and managed by the property management team to ensure that truck activity impacts associated with the Project are minimized during the commuter peak hours and avoid sensitive streets within the City.

2.5.1.7 Traffic Monitoring Program

The Proponent, by and through the A Better City TMA, will conduct a post-development traffic monitoring and employee survey program in order to evaluate the success, and to refine the elements, of the TDM program. The monitoring program will include obtaining traffic volume information at the driveways serving the Project site and an employee and resident survey of commuting modes. The results of the annual monitoring program will be provided to the BRA and BTD. The monitoring program will be performed annually commencing upon the issuance of a Certificate of Occupancy for the first phase of the Project, and will continue for a period of two-years after the issuance of the Final Certificate of Occupancy for Project.

In conjunction with the traffic monitoring program, the Proponent will conduct manual TMCs, pedestrian counts and bicycle counts during the weekday morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak periods at the following intersections in the South Station area:

1. Atlantic Avenue/Kneeland Street/Frontage Road/I-90 Eastbound Off-Ramp
2. Atlantic Avenue/Beach Street
3. Atlantic Avenue/Project Site Drive
4. Atlantic Avenue/East Street/ Project Site Drive

5. Atlantic Avenue/Essex Street
6. Atlantic Avenue/Summer Street
7. Summer Street/Purchase Street
8. Surface Road/Essex Street/Lincoln Street
9. Surface Road/Beach Street
10. Kneeland Street/South Street
11. Kneeland Street/Lincoln Street
12. Kneeland Street/Surface Road

The TMCs will be conducted prior to the start of construction of each phase of the Project, and will be repeated six months after the issuance of the Final Certificate of Occupancy for Project. The Proponent will prepare a Synchro™ network for the defined intersections each time that the TMCs are completed, and will perform a detailed capacity analysis for each peak period (weekday morning and evening peak hours). In conjunction with this analysis, the Proponent will provide recommendations to BTD regarding potential modifications to the traffic signal timing and sequencing as may be required in order to improve intersection operations, and will provide long-term recommendations concerning potential future intersection improvements that could be undertaken by the City or others to facilitate the safe and efficient movement of vehicles and pedestrians in the South Station area. The Synchro™ network, analysis and data files will be provided to BTD and will be summarized in a written report. This information will be provided to BTD prior to the end of the calendar year in which the data is collected and analyzed.

In addition, the Proponent will install a pan-tilt zoom (PTZ) traffic monitoring camera at the following locations: Dorchester Avenue at Summer Street, Atlantic Avenue at Congress Street, and Kneeland Street at Lincoln Street; or alternate locations designated by BTD. The installation will include all necessary appurtenances required for transmitting the video signal to, and allowing remote operation of the camera from, BTD's Traffic Operations Center. The PTZ traffic monitoring cameras will be installed within 90 days after the issuance of the first Building Permit for the Project.

2.5.2 Conclusion

With implementation of the elements of the transportation improvement program described in the previous section, this assessment has demonstrated that the Project can be accommodated within the confines of the transportation system in a safe and efficient manner. The Proponent has committed to mitigation as a part of the City of Boston TAPA

and will ensure that proper Project mitigation will be implemented as may be required to accommodate the Project and commensurate with the planned build-out and occupancy of the development.

Chapter 3.0

Development Review Component

3.0 DEVELOPMENT REVIEW COMPONENT

3.1 Environmental Component

3.1.1 Wind

RWDI evaluated the changes from the previously approved project to the currently proposed Project, and investigated how the changes would impact pedestrian level winds compared to the previously approved project. RWDI focused on the Phase 2 building, as the impacts on the pedestrian level winds from the currently proposed Phase 1 building are anticipated to be similar to the previously approved project. The previously approved Phase 2 tower resulted in increased pedestrian level winds at some locations west of the site. The increased width of the elevation of the Phase 2 tower along Atlantic Avenue has broadened that area of impact. However, similar to the wind conditions resulting from the previously approved Phase 2, the wind conditions are expected to be appropriate for the planned use (suitable for standing or sitting). On the east side of the Phase 2 building, the wind conditions are anticipated to be similar or better than the previously approved project since the Phase 2 tower will be set back farther from the eastern edge of the podium.

3.1.2 Shadow

A shadow study was included in the Final PIR and provided a description of the anticipated shadows on 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. on June 21 and September 21. The shadow study also analyzed the impacts of new shadow from the previously approved project at 11:00 a.m. and 1:00 p.m. on May 21 and October 21. A shadow study was also completed to show compliance with Chapter 362 of the Acts of 1990 (regarding shadow impacts on Boston Common).

To determine the impacts of new shadow from the currently proposed Project on the surrounding area, the analyses above were completed for the currently proposed Project. The results of the shadow study are included in Appendix B.

The shadow analysis shows that the shadow impacts from the currently proposed Project will be similar to the previously approved project. The changes to the massing result in additional shadow at the pedestrian level to the west of the site from Phase 2 in the morning, and slightly more shadow from Phase 1 in the morning. In the middle of the day, shadow impacts will be similar to the previously approved project, with less shadow from Phase 1 during March 21, June 21 and September 21 due to the narrower floor plates on the upper floors in the currently proposed Project, but more shadow on Atlantic Avenue from Phase 2 on March 21 and September 21 due to the change in the massing. In the afternoon, shadows from Phase 1 will be similar to the previously approved project and less new shadow from Phase 2 will be cast to the east than the previously approved project. At 6:00 p.m. on June 21, the shadow will be similar except for new shadow on the USPS

property to the east of the site being cast by Phase 2. At 6:00 p.m. on September 21, new shadow will be less than previously proposed because of shadow cast by buildings approved since the previous shadow studies done for this project in 2006, and recently constructed or under construction.

Consistent with the Final PIR, a shadow analysis was also completed for May 21 and October 21 at 11:00 a.m. and 1:00 p.m. The shadow impacts at these time periods will be similar to the previously approved project, with slightly more shadow from Phase 2.

Similar to the findings in the Final PIR, the currently proposed Project will not cast new shadow onto Boston Common during the time periods studied, which are not otherwise permitted to be cast under Chapter 362 of the Acts of 1990 and therefore will comply with Chapter 362 of the Acts of 1990.

3.1.3 Daylight

A daylight analysis for the previously approved project was included in the Draft PIR submitted on October 2, 2000. The analysis included viewpoints looking toward each proposed building from Atlantic Avenue, and toward Phase 1 from Summer Street. The analysis concluded that the daylight obstruction values will be "similar to those in the adjacent Leather District and less than those typically found in the Financial District." In addition, the analysis found that the daylight obstruction values for the previously approved project were "primarily due to the completion of the streetwall along Atlantic Avenue and not the height of the proposed buildings."

The changes to the Project have minimal impact of the massing of the streetwall, but rather to the massing of the buildings above the podium portion; therefore, it is anticipated that the daylight obstruction impact will be similar to the previously approved project.

3.1.4 Air Quality

The Final PIR included microscale and mesoscale air quality analyses concluding that the previously approved project, using conservative estimates, would be below the relevant National Ambient Air Quality Standards (NAAQS) thresholds.

The changes to the previously approved project are not anticipated to significantly change the currently proposed Project's air quality impacts related to proposed mechanical equipment or traffic. The emergency generators, and potentially boilers, will be permitted through the Massachusetts Department of Environmental Protection's (MassDEP) Environmental Results Program (ERP) which requires an analysis of the emergency generators and certain boilers.

3.1.5 Noise

The Final PIR included an analysis of the previously approved project's mechanical equipment in regard to noise impacts, and concluded that the previously approved project, with appropriate mitigation, would not introduce significant outdoor mechanical equipment noise into the surrounding community.

The predicted exterior sound levels were expected to meet the City of Boston noise regulations. The Project site is in an area of high ambient noise, due to the vehicular activity on Atlantic Avenue and Summer Street, and MBTA locomotives idling at South Station. The currently proposed Project is not expected to add significant noise to the surrounding area.

The currently proposed Project will include appropriate measures to ensure compliance with the City of Boston Zoning District Noise Standards and the MassDEP Noise Policy.

3.1.6 Solid Waste

Solid waste generation will be similar to the previously approved project. The Project will generate solid waste typical of mixed-use developments. Solid waste generated by residents and tenants will be collected and disposed of off-site by a licensed contractor. The Proponent will implement an aggressive recycling program throughout the Project, and residents will be encouraged to recycle. Recycled materials are expected to include newspaper, plastics, glass, cardboard, cans, and bottles.

With the exception of household hazardous wastes typical of mixed-use developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials.

The Project is being designed to accommodate an aggressive recycling program with state-of-the-art waste management equipment in order to reduce the amount of solid waste that will be generated by the Project. The Proponent will institute its recycling program which has been implemented throughout its portfolio of over 450 properties and contributed towards its recognition by the U.S. Environmental Protection Agency as a recipient of its Sustained Excellence Award for the last seven consecutive years.

There will be a designated recycling/trash room on every residential floor in the Phase 1 building.

3.1.7 Geotechnical/Groundwater

The foundation design will be very similar to that described in the Final PIR. Installation of the Phase 1 building foundations is not anticipated to cause adverse impacts to the existing South Station structure nor to neighboring facilities or groundwater levels. The Phase 2 and 3 buildings will be supported on existing foundations, and also not cause adverse impacts.

The foundations for the Phase I Tower are planned to consist of high capacity reinforced concrete Load Bearing Elements (LBEs) bearing in bedrock and installed using slurry wall construction techniques. The use of slurry wall-type excavation methods for foundation installation, common in Boston, results in very low vibrations and noise, avoids loss of ground and ground movements, and is very protective of nearby buildings and other facilities. The LBEs will also not transfer vertical or horizontal loads to adjacent structures.

A reinforced concrete LBE "cap" will be constructed on top of the LBE units within an excavation supported laterally by drilled-in soldier piles with lagging or drilled-in secant piles.

Two columns supporting a portion of the existing train station concourse curtain wall and roof are immediately adjacent to the planned LBE foundation of the Phase 1 building. As a conservative precaution these columns, currently supported on end-bearing piles, will be underpinned using drilled-in micropiles installed deep into bedrock in advance of LBE installations.

The site is located outside of the Groundwater Conservation Overlay District as established by Boston Zoning Code Article 32. The Project will be designed and constructed in a manner that does not adversely impact area groundwater levels. The lowest building floors are planned to be finished at about El. 4 NGVD 29, which is at, or above, normal groundwater levels. New below-grade spaces will be waterproofed and designed to not impact groundwater levels.

Construction plans and specifications will establish various procedural requirements, vibration limits and similar performance criteria related to the underground work. The Proponent will conduct pre-construction condition surveys of South Station and other neighboring buildings. Elevation monitoring points will be established at key locations on surrounding buildings, features within the train platform area and other above-grade facilities, and monitored before and during the below-grade work. Existing groundwater observation wells in the area will be monitored. Vibration monitoring will be performed as required to document the anticipated low-vibration conditions.

3.1.8 Solar Glare

The currently proposed Project is anticipated to use a glass with lower reflectivity than the previously approved project.

3.1.9 Construction Impacts

The construction-related impacts, and anticipated mitigation regarding air quality, noise and construction waste, are anticipated to be similar to those described in the Final PIR.

The Proponent will follow City and MassDEP guidelines which will direct the evaluation and mitigation of construction impacts. Coordination with the City and other developers will be essential to minimize construction-related impacts to the surrounding community.

A construction management plan will be submitted to BTD for review and approval prior to issuance of a Building Permit (BTD CMP). The BTD CMP will include detailed information on specific construction mitigation measures and construction methodologies to minimize impacts to abutters and the local community. Techniques such as barricades, walkways, painted lines, and signage will be used as necessary. Construction management and scheduling—including plans for construction worker commuting and parking, routing plans and scheduling for trucking and deliveries, protection of existing utilities, maintenance of fire access, and control of noise and dust—will minimize impacts on the surrounding environment. Throughout Project construction, a secure perimeter will be maintained to protect the public from construction activities.

The Proponent, in collaboration with the MBTA and other parties impacted by construction, has prepared a phased construction management plan for construction activities within the transportation center (MBTA CMP) with the goal of minimizing or mitigating impacts upon passenger use of South Station throughout construction, especially upon the passenger waiting area in the Head House concourse. The MBTA CMP includes detailed drawings depicting each phase of construction, and outlines mitigation measures to ensure adequate passenger circulation and continued access to the waiting area and concourse facilities.

Under the current design, changes to the existing Head House concourse space are limited to the construction period. At no time will the current design result in the reduction of square footage within the concourse. Throughout the approximately four year period of construction, all existing access points to the Head House and Head House concourse via Dewey Square, Summer Street, and Atlantic Avenue will remain open. Similarly, pedestrian access from the train platforms to the adjacent U.S. Post Office facility and Dorchester Avenue will continue.

The MBTA CMP describes how continuous access from the Head House to the bus terminal can be provided during construction.

3.2 Sustainability

3.2.1 Green Building

3.2.1.1 Introduction

The Project intends to incorporate state-of-the-art sustainable design features, where feasible and reasonable. Accordingly, the Phase 1 building is targeting achievement of LEED Gold using the Leadership in Energy and Environmental Design (LEED) Green Building Rating System—LEED v2009 Core & Shell. The LEED approach for Phases 2 and 3 will be

developed as those portions of the Project move forward, and the appropriate Article 37 documentation will be submitted to the BRA as required, but are anticipated to target achieving LEED Gold eligibility for office uses and Silver for residential uses.

The Project is deeply committed to building a sustainable work-live community at South Station. The proposed mixed-use, transit-oriented development aims to revitalize an underutilized urban site by using land efficiently, promoting the use of alternative modes of transportation, encouraging pedestrian activity, and improving air and water quality on the site. Phase 1 will strive for reduced energy and water consumption. Strategies for achieving these goals include reducing the amount of potable water used for plumbing and irrigation through highly efficient fixtures and irrigation systems, and properly ventilating the building for occupant health and safety. Phase 1 will incorporate energy conservation measures such as efficient lighting and HVAC systems to reduce building energy consumption over a less efficient building of similar size and function. The final design and construction of Phase 1 will create a sustainable building to promote the internal building environmental quality for the residents, customers and employees, enhance the surrounding neighborhood locally, and reduce environmental impacts globally. Following construction, the building owner will develop manuals for implementation by property managers and building occupants in an effort to further encourage sustainability through operations of the building. Additionally, Phase 1 will be pursuing a WELL certification for the office core and shell component.

3.2.1.2 LEED Approach

The Proponent is targeting LEED Gold Certification under the USGBC LEED for Core and Shell Rating System version 2009 for Phase 1.

The Project team is currently tracking 60 'YES' credit points with an additional 11 'MAYBE' credit points still under consideration. The preliminary LEED Checklist is included on the next page.

Sustainable Sites (SS)

Construction Activity (SS Prerequisite 1). An erosion and sedimentation control (ESC) plan for all construction activities will be developed and enforced. Documents outlining the implementation of the ESC measures applicable to this site will be provided in the construction submission.

Site Selection (SS Credit 1). The Project site has previously been completely developed, is located in an urban area and, meets all of the criteria for this credit.

LEED® Core & Shell v2009 Scorecard

NORESCO
United Technologies

South Station Tower

Level pursuing: Gold

6/8/2016

Y	M (strong)	M (weak)	N	Sustainable Sites		A/B/C*	
Y				Prerequisite 1	Construction Activity Pollution Prevention		
1				Credit 1	Site Selection		
5				Credit 2	Development Density & Community Connectivity		
			1	Credit 3	Brownfield Redevelopment		
6				Credit 4.1	Alternative Transportation, Public Transportation Access		
2				Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	C	
3				Credit 4.3	Alternative Transportation, Low-Emitting & Fuel Efficient Vehicles		
2				Credit 4.4	Alternative Transportation, Parking Capacity		
			1	Credit 5.1	Site Development, Protect or Restore Habitat		
		1		Credit 5.2	Site Development, Maximize Open Space		
			1	Credit 6.1	Stormwater Design, Quantity Control		
			1	Credit 6.2	Stormwater Design, Quality Control		
1				Credit 7.1	Heat Island Effect, Non-Roof		
1				Credit 7.2	Heat Island Effect, Roof		
			1	Credit 8	Light Pollution Reduction		
1				Credit 9	Tenant Design and Construction Guidelines		
22	0	1	5	28 Possible Points			

Y	M (strong)	M (weak)	N	Water Efficiency		A/B/C*	
Y				Prereq 1	Water Use Reduction, 20% Reduction	A	
2				Credit 1.1	Water Efficient Landscaping, Reduce by 50%		
	2			Credit 1.2	Water Efficient Landscaping, No Potable Water or No Irrigation		
			2	Credit 2	Innovative Wastewater Technologies	B	
2				Credit 3.1	Water Use Reduction, 30% Reduction	A	
1				Credit 3.2	Water Use Reduction, 35% Reduction		
		1		Credit 3.3	Water Use Reduction, 40% Reduction		
5	2	1	2	10 Possible Points			

Y	M (strong)	M (weak)	N	Energy and Atmosphere		A/B/C*	
Y				Prerequisite 1	Fundamental Commissioning of the Building Energy Systems		
Y				Prerequisite 2	Minimum Energy Performance, 10% new	A	
Y				Prerequisite 3	Fundamental Refrigerant Management	C	
		3		Credit 1	Optimize Energy Performance, 12%	A	
			1		Optimize Energy Performance, 14%	A	
			17		Optimize Energy Performance, 16% - 48%		
			4	Credit 2	On-Site Renewable Energy, 1%	B	
2				Credit 3	Enhanced Commissioning		
	2			Credit 4	Enhanced Refrigerant Management	C	
3				Credit 5.1	Measurement & Verification, Base Building		
3				Credit 5.2	Measurement & Verification, Tenant Submetering		
2				Credit 6	Green Power, 35%		
10	2	3	22	37 Possible Points			

Y	M (strong)	M (weak)	N	Materials and Resources		A/B/C*	
Y				Prerequisite 1	Storage & Collection of Recyclables		

Y	M (strong)	M (weak)	N	Materials and Resources		A/B/C*	
					Building Reuse, Maintain 75% of Existing Walls, Floors & Roof		
1				Credit 2.1	Construction Waste Management, Divert 50% From Disposal		
1				Credit 2.2	Construction Waste Management, Divert 75% From Disposal		
			1	Credit 3	Materials Reuse, 5%		
1				Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)		
1				Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)		
1				Credit 5.1	Regional Materials, 10% Extracted, Processed & Manufactured		
	1			Credit 5.2	Regional Materials, 20% Extracted, Processed & Manufactured		
			1	Credit 6	Certified Wood		
5	1	0	7	13 Possible Points			

Y	M (strong)	M (weak)	N	Indoor Environmental Quality		A/B/C*	
Y				Prerequisite 1	Minimum IAQ Performance	C	
Y				Prerequisite 2	Environmental Tobacco Smoke (ETS) Control	C	
1				Credit 1	Outside Air Delivery Monitoring	C	
1				Credit 2	Increased Ventilation	C	
1				Credit 3	Construction IAQ Management Plan, During Construction		
1				Credit 4.1	Low-Emitting Materials, Adhesives & Sealants		
1				Credit 4.2	Low-Emitting Materials, Paints & Coatings		
1				Credit 4.3	Low-Emitting Materials, Flooring Systems		
1				Credit 4.4	Low-Emitting Materials, Composite Wood & Agrifiber Products		
1				Credit 5	Indoor Chemical & Pollutant Source Control	C	
			1	Credit 6	Controllability of Systems, Thermal Comfort	C	
1				Credit 7	Thermal Comfort, Design		
		1		Credit 8.1	Daylight and Views, Daylight 75% of spaces		
1				Credit 8.2	Daylight and Views, Views for 90% of Spaces		
10	0	1	1	12 Possible Points			

Y	M (strong)	M (weak)	N	Innovation & Design Process		A/B/C*	
1				Credit 1.1	Exemplary Performance, SSc4.1 Alternative Transportation, Public Transportation Access		
1				Credit 1.2	Pilot Credit 57 Enhanced Acoustical Performance		
1				Credit 1.3	Innovation in Design, Integrated Pest Management		
1				Credit 1.4	Exemplary Performance, EAc6		
1				Credit 1.5	Exemplary Performance, SSc7.1		
1				Credit 2	LEED® Accredited Professional		
6	0	0	0	6 Possible Points			

Y	M (strong)	M (weak)	N	Regional Priority Credits		A/B/C*	Zip code: 02110
			1	Credit 1.1	SSc3 Brownfield Redevelopment		
1				Credit 1.2	SSc7.1 Heat Island, Non-Roof		
1				Credit 1.3	SSc7.2 Heat Island, Roof		
			1	Credit 1.4	SSc6.1 Stormwater Design, Quantity Control		
2	0	0	2	4 Possible Points			

60	5	6	39

0 - 39	Insufficient
40 - 49	Certified
50 - 59	Silver
60 - 79	Gold
80 - 110	Platinum

Project Points	Maybe
60	11
Gold	

* Tenant Lease / Sales Agreement Categories

A - MUST include data from entire building including tenant spaces. If no tenant savings are in the design, must assume baseline case

Development Density (SS Credit 2). The Project meets all of the criteria of this credit under Option 2 – Community Connectivity by being located on a previously developed site, within ½ mile of a residential neighborhood with an average density of 10 units per acre, and within ½ mile of at least 10 basic services with pedestrian access.

Alternative Transportation (SS Credits 4.1, 4.2, 4.3, 4.4). The Project is located above South Station which provides MBTA Commuter Rail and Subway, Amtrak, and private bus services, and includes an expansion of the existing bus terminal. The Project will include bicycle storage and changing rooms.

Heat Island Effect –Non-Roof (SS Credit 7.1). The Project places 100% of its parking under cover and will pursue an exemplary performance credit.

Heat Island Effect – Roof (SS Credit 7.2). The Project will specify high reflectance roof materials for at least 75 percent of the roof area. Areas with white TPO (SRI = 100) will contribute positively to credit achievement and white concrete roof pavers (SRI = 85) will also contribute.

Tenant Design and Construction Guidelines (SS Credit 9). Tenants will receive a Tenant Criteria Manual outlining the sustainable design and construction features incorporated into the building, as well as the overall sustainability goals and objectives for tenant space build out.

Water Efficiency (WE)

Water Use Reduction (WE Prerequisite 1; WE Credit 3.1, 3.2). Appropriate low-flow and low-consumption plumbing fixtures for the office and residential units are anticipated to achieve a reduction in water usage of 35% over the baseline.

Water Efficient Landscaping (WE Credit 1.1). Irrigation for the landscaped area will be reduced by 50% over a baseline. Strategies for achieving this credit include specifying native and adaptive plantings for the landscape design, using drip over spray irrigation and selecting an irrigation system with a high controller efficiency.

Energy and Atmosphere (EA)

Fundamental Commissioning (EA Prerequisite 1). Commissioning of the mechanical and electric building systems will be conducted. A compliant third party commissioning agent (CxA) has been engaged by the owner for purposes of providing basic commissioning services for the building energy related systems, including Heating Ventilation Air Conditioning & Refrigeration (HVAC&R), lighting, and domestic hot water systems. The CxA will verify the building systems are installed, calibrated and perform to the buildings owners' project requirements through verification and performance reviews of the systems to be commissioned. The CxA will provide a summary report.

Minimum Energy Performance (EA Prerequisite 2). The energy code utilized for Phase 1 will be the required Massachusetts Stretch Energy Building Code, which is more stringent than ASHRAE Standard 90.1-2007. Based on energy modeling, Phase 1 will achieve at least a 10% energy cost savings over an ASHRAE 90.1-2007 baseline. Therefore, the Project will meet the criteria of this prerequisite.

Refrigerant Management (EA Prerequisite 3). Non-CFC-based refrigerants will be utilized for Phase 1. Water-cooled condensing units, heat pumps, and packaged AC units will use refrigerant type R-410A.

Optimize Energy Performance (EA Credit 1). See EA Prerequisite 2.

Enhanced Commissioning (EA Credit 3). An independent consultant will be contracted to be the CxA. The consultant's activities will be required for all applicable systems installed, although some commissioning activities may be limited by the core and shell scope. Testing procedures will be noted in the project commissioning plan for all systems, and noted in LEED documentation.

Enhanced Refrigerant Management (EA Credit 4). As stated in EA Prerequisite 3 above, non-CFC-based refrigerants will be utilized for Phase 1. Water-cooled condensing units, heat pumps, and packaged air conditioning units will use refrigerant type R-410A. Further, the fire suppression system will not contain CFCs, HFCs, or Halons. Refrigerants used in the selected HVAC&R equipment will be calculated for ODP and GWP.

Measurement & Verification (EA Credit 5.1, 5.2). Six points under this credit are achievable by providing building-level metering for energy and water consumption. Phase 1 will commit to sharing this data with the United States Green Building Council (USGBC) for five years from the date of occupancy.

Green Power (EA Credit 6). Phase 1 may purchase Green-e certified renewable energy credits equal to 35% of the building's energy use for two years in order to achieve this credit.

Materials and Resources (MR)

Storage and Collection of Recyclables (MR Prerequisite 1). There will be a designated recycling/trash room, 40 sf, on every residential floor, with a bi-sorter trash chute that will allow the user to switch between disposing trash and recyclables, which drops directly to the central trash and recycling room.

Construction Waste Management (MR Credits 2.1, 2.2). The construction manager will implement a waste management plan that will seek to divert at least 75 percent of construction and demolition waste material removed from the site from landfills through

recycling and salvaging. This credit pursued aggressively is an opportunity to gain an exemplary performance credit of 95 percent construction waste recycling (see the Innovation in Design credits below).

Recycled Content (MR Credits 4.1, 4.2). Two points under this credit are expected to be achievable. Project specifications will encourage provision and tracking of materials with recycled content where practical.

Regional Materials (MR Credits 5.1). One point under this credit is expected to be achievable. Project specifications will encourage provision and tracking of materials that have been manufactured and extracted/harvested within 500 miles of the building site.

Indoor Environmental Quality (IEQ)

Minimum IAQ Performance (IEQ Prerequisite 1). The ventilation code utilized for the Project will be ASHRAE Standard 62.1-2007, as required by the present Massachusetts Building Code.

Environmental Tobacco Smoke Control (IEQ Prerequisite 2). This prerequisite will be achieved.

Outside Air Delivery Monitoring (IEQ Credit 1). Phase 1 will install permanent monitoring systems to ensure that ventilation systems maintain design minimum requirements. All monitoring equipment will be configured to generate an alarm when the airflow values or carbon dioxide (CO_2) levels vary by 10% or more from the design values via either a building automation system alarm to the building operator, or a visual or audible alert to the building occupants.

Increased Ventilation (IEQ Credit 2). Phase 1 will increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard 62.1-2007 (with errata but without addenda) as determined by IEQ Prerequisite 1: Minimum Indoor Air Quality Performance.

Construction IAQ Management Plan – During Construction (IEQ Credit 3). An Indoor Air Quality Management plan will be implemented during the construction phase that meets the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines For Occupied Buildings Under Construction, 2nd edition, 2007, ANSI SMACNA 008-2008 (Chapter 3), as required.

Low-Emitting Materials (IEQ Credits 4.1, 4.2, 4.3, 4.4). Project specifications will encourage provision and tracking of adhesives, sealants, paint, and carpet with low VOC content limits, as prescribed by the respective applicable standards. Additionally, composite wood products with no added urea-formaldehyde will be specified. Flooring systems will

meet the FloorScore standard, Carpet and Rug Institute Green Label and Green Label Plus program as applicable, and flooring adhesive and coatings will meet the requirements of IEQ credit 4.3.

Indoor Chemical and Pollutant Source Control (IEQ Credit 5). Permanent entryway systems are expected to be installed at high-volume building entrances to prevent air contaminants from entering the building. Housekeeping and laundry areas are expected to be separated and exhausted to outside to comply with the requirements of this credit. Air handling units are expected to be provided with appropriate filtration to meet the credit.

Thermal Comfort - Design (IEQ Credit 7). The building envelope and HVAC systems have been designed to meet the requirements of ASHRAE 55-2004.

Daylight and Views, Views for 90% of Spaces (IEQ Credit 8.2). Phase 1 has large windows with ample access to views to the regularly occupied spaces.

Innovation in Design (ID)

Integrated Pest Management (ID Credit). This credit is achieved by providing a plan for integrated pest management (IPM) that meets the requirements of LEED for Existing Buildings, Operations and Maintenance EQc3.6, including designing a plan for IPM, and implementing it 100% of the time. This approach to pest management limits the negative impacts that conventional pest management often has on the health of building occupants, and uses the least-toxic means of pest management possible.

Exemplary Performance of SSc4.1. This credit will be met by going beyond the requirements of SSc4.1 and building on a site within ¼ mile of at least two bus stops with access to four or more bus lines and a frequency of service of at least 200 rides per day.

Exemplary Performance of SSc7.1. This credit will be met by having 100% of parking under cover for the project.

Exemplary Performance of EAc6. This credit will be met by increasing green power purchases for Phase 1 from 35% to 70% (see EA Credit 6).

Enhanced Acoustical Performance, Pilot Credit 57. Phase 1 will design and locate exterior noise sources so that noise levels from Phase 1 at the nearest property line or public right of way are a minimum of 5 dBA below the existing ambient noise levels without Phase 1, and no more than 60 dBA. Ambient sound level will be measured as a Day-Night Equivalent Level (Ldn), and future sound levels from Phase 1 will be calculated. Project building equipment noise will be evaluated with respect to existing levels, and mitigated as required to not exceed the levels set out above. Emergency equipment (e.g., generators) do not need to meet these noise requirements; however, an operations plan must be included to

describe their schedule for periodic testing. Noise sources may include building equipment mounted on the rooftop, inside building but exterior venting, or located at grade, transformers, traffic associated with the building, and other sources.

LEED Accredited Professional (ID Credit 2). The project team includes multiple LEED Accredited Professionals.

Tenant Guidelines

The owner will attach to tenant leases (both office and residential) an exhibit with information on the sustainable/green building features of the Project and how the tenant can participate/support sustainability through their operations and/or use of the leased space. An office Tenant Guidelines document will include information on the sustainable aspects of the site and the base building design and operation, and will further encourage the tenant(s) to make their build-out as sustainable as possible. Residential Tenant Guidelines will include information on the sustainable aspects of the site and the base building design and operation, including education on installed energy star appliances and a copy of the 'No Smoking' policy in the common areas. These guidelines will further encourage the residential tenant(s) to support the sustainable features, such as tips/measures to reduce energy use, coordinate carpooling to work with other tenants, City of Boston recycling information.

Regional Priority Credits

The concept of Regional Priority Credits (RPCs) was introduced in the LEED 2009 rating systems to incentivize the achievement of credits that address geographically specific environmental priorities. RPCs are not new LEED credits, but are existing credits that USGBC chapters and regional councils have designated as being particularly important for their areas and are achieved in the form of a bonus point. The RPCs that may be achievable for the Project are as follows:

- SSc7.1: Heat Island Effect, Non-Roof; and
- SSc7.2: Heat Island Effect, Roof.

3.2.2 Climate Change Resilience

3.2.2.1 Introduction

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

The expected life of the Project is anticipated to be approximately 50 years. Therefore, the Proponent planned for climate change conditions projected to 50 years into the future. A copy of the completed checklist is included in Appendix C. The responses are preliminary and may be updated as the Project design progresses.

3.2.2.2 Extreme Heat Events

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

- Installing operable windows where possible and practical;
- Using Energy Recovery Ventilation to reduce cooling loads; and
- Specifying high albedo roof tops and green roofs to minimize the heat island effect.

3.2.2.3 Sea Level Rise

According to the IPCC, if the sea level continues to rise at historic rates, the sea level in Massachusetts as a whole will rise by one foot by the year 2100. However, using a high emissions scenario of climate change, sea level rise (SLR) could reach approximately six feet by 2100. As described in "Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery" recently released by MassDOT (the "MassDOT Report"), "one of the challenges presented by the wide range of SLR projections is the inability to assign likelihood to any particular [SLR] scenario."[2] To be conservative, in the year 2070, SLR could be as high as approximately four feet, resulting in a mean higher high water (MHHW) level of approximately 15.2 feet Boston City Base (BCB). The elevation of the first floor on Atlantic Avenue is approximately 18.4 feet BCB. The main lobbies for the buildings will be located on an upper floor. In the event that the Atlantic Avenue entry lobbies are not accessible, the buildings will continue to be accessible and operational through other routes. In addition, essential mechanical equipment will be located above the potential flood level.

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[1] IPCC (Intergovernmental Panel on Climate Change), 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Avery, M. Tignor, and H. L. Miller (eds.)]. Cambridge University Press, Cambridge, UK, and New York, 996 pp.

[2] Massachusetts Department of Transportation, et al. "MassDOT-FHWA Pilot Project Report: Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery." November 2015.

Alone, MHHW of approximately 15.2 feet BCB would have no impact on the Project site; however, as shown in the MassDOT Report, combined with storm surge at the right tide, flooding would be anticipated to occur at the Project site.[3] The storms in the Boston area that could create these flood conditions would be Nor'easters and tropical storms. Currently, hurricanes occur less frequently than Nor'easters, however, in the future according to the MassDOT Report, it is anticipated that there will be roughly the same number of tropical storms impacting the Boston area as Nor'easters. In addition, the intensity of storms is anticipated to increase. The risks of each type of storm differ: hurricanes are typically shorter in duration, but are more intense and create a larger storm surge; Nor'easters are longer in duration, but create a smaller storm surge. For this reason, a hurricane would need to impact Boston within a short window to create flooding as shown in the MassDOT Report, while Nor'easters are more likely to create flooding given that they have a higher probability of impacting the area during the rising tide and high tide.

The MassDOT Report shows that by 2070, the Project site is anticipated to have up to a 1% annual chance of flooding by at least 2 inches. By 2070, the 100-year flood is anticipated to have a flood level up to one foot on the Atlantic Avenue side of the site. The impacts from sea level rise and storm events will be mitigated by providing access to the buildings from locations in addition to Atlantic Avenue, and locating mechanical and electrical equipment on the upper floors will help mitigate against potential flood conditions. The fuel tank and associated pump for the Phase 1 emergency generator will be located below ground level, but will be designed to be resilient to flooding. In addition, the South Station Expansion project includes a proposal to raise the seawall along Dorchester Avenue to mitigate against potential future flooding.

3.2.2.4 Rain Events

As a result of climate change, the Northeast is expected to experience more frequent and intense storms. To mitigate this, the Proponent will take measures to minimize stormwater runoff and protect the Project's mechanical equipment, including placing essential equipment on upper levels. The Project will be designed to reduce the existing peak rates and volumes of stormwater runoff from the site, and promote runoff recharge to the greatest extent practicable.

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[3] The MassDOT Report, funded by the Federal Highway Administration, studied the impact of sea level rise and future storm impacts related to climate change on the Central Artery in Boston. As part of this project, a hydrodynamic model was developed for Boston Harbor, including inland areas that cover portions of Boston, including the Project Site. This model is able to provide site-specific information about the risk of potential future flooding in the years 2030, 2070 and 2100 related to storm events, in particular Nor'easters and tropical cyclones (i.e., hurricanes).

3.2.2.5 Drought Conditions

Under the high emissions scenario, the occurrence of droughts lasting one to three months could go up by as much as 75% over existing conditions by the end of the century. To minimize the Project's susceptibility to drought conditions, water conservation fixtures will be included in the design, including aeration fixtures and appliances that will be chosen for water conservation qualities.

3.2.2.6 Energy Model

A preliminary energy model has been completed for the Project and shows that Phase 1 will reduce energy costs by approximately 10% from the baseline.

3.2.2.7 Renewable Energy

The Project team has evaluated the feasibility of including solar photovoltaic or a combined heat and power unit with the Project. The utility service to Phase 1 is from spot network vaults. In order to protect the network, the utility company restricts the capacity of an interconnected distributed generation unit to 1/15th of the minimum projected power load. This makes the use of solar photovoltaic or a combined heat and power unit impractical.

3.3 Urban Design

The design of the Project follows the same fundamental design principles as it had for the previously approved project. The Phase 1 building's main axis aligns with the South Station Head House and extends through Dewey Square and the Financial District. It serves as a well-tailored terminus of the Rose Kennedy Greenway. The oval form respectfully echoes the curve of the historic South Station Head House. The tower wall will be clad in a lightly reflective glass and the tower top will be gently lit at night, adding another landmark to downtown Boston.

The Phase 1 building is now mixed use in program, with commercial offices below and residential above. The massing has been subtly refined and sculpted so that the transition in the program is blended into a singular form. The north façade runs continuously as the dominant unifying face aligned with the Head House entry. The southern end of the Phase 1 building has become dramatically slender, which will have equal visual impact to commuters and visitors arriving from the south. The visual result of these subtle transformations is that the Phase 1 building is both the terminus to the Greenway, but also the prow of the city's growth toward the Seaport District and South Boston. Because of this transformative refinement, the Phase 1 building top no longer slopes as it had previously, as this would inhibit the impact and importance of this dual orientation.

The inclusion of residential space in the Phase 1 building program has had a positive impact on Atlantic Avenue. The previous atrium space was appropriate in scale for an all office tower, but with the inclusion of residential space, the lobby requires a more discrete

presence, and was reduced in height. The former atrium has been filled in with four floors of amenity/retail space for the Project. The result will be a more activated street-wall, humanly scaled and proportioned that will create a vibrant street life during off-peak hours. The terrace at the interconnecting Sky Street level will continue to create a setback respectful to the height of the Head House, but has been broadened to provide greater opportunity for outdoor activity. The end result on the pedestrian realm will be one of a smaller scale presence that reflects the architectural character of existing buildings in the Leather District. There is also an increased clearance between the Head House and the lobby, improving pedestrian flow and access to daylight, facilitating a direct pedestrian link between the station, the adjacent USPS property and the waterfront.

Lastly, the configuration for the Phase 2 massing has been greatly simplified. It has been realigned to have a more rational relationship to the Atlantic Avenue street wall. It will vastly improve the access to daylight, air and view between Phase 1 and Phase 2, which will ultimately help to ensure the viability of the Project.

3.4 Infrastructure

The changes to the Project program result in a decrease in wastewater generation from approximately 357,250 gallons per day (gpd) to approximately 280,290 gpd. Projected water use will also decrease from approximately 282,400 gpd to approximately 225,819 gpd. As the previously approved project indicated, water and sanitary services will be provided by the Boston Water and Sewer Commission (BWSC).

The changes to the Project since the previously approved project will not result in a change in impact to the stormwater drainage system. As previously anticipated, stormwater runoff generated from the Project site will be conveyed through the existing on-site stormwater drainage controls and to the existing 24-inch stormwater drainage line in Atlantic Avenue.

To minimize sewage generation and water usage, the Project will meet applicable code requirements for the installation of low-flow fixtures.

In terms of stormwater, given that the Project site is mainly impervious now and will remain as such post-construction, the stormwater runoff peak rates are expected to remain relatively the same. At this time, based on the existing structures surrounding the site including tunnel structures below, it is anticipated that infiltration to meet BWSC Site Plan requirements will not be feasible. As the design and engineering of the Project continues, the Proponent will meet with BWSC to review the Project and discuss the stormwater management design. The Project will obtain BWSC Site Plan approval for the proposed water, sanitary, and stormwater connections.

3.5 Historic Resources

The Final PIR identified historic resources on the Project site and within the Project's vicinity, including the South Station Head House, the Leather District and other properties and historic districts listed, and eligible for listing in the State and National Registers of Historic Places. The Final PIR also identified measures to mitigate the Project's potential impacts to significant historic resources. The current Project's impacts to historic resources are generally consistent with the previously approved project. Since the filing of the Final PIR, the Proponent has entered into a Memorandum of Agreement (MOA) with the Massachusetts Historical Commission, with the concurrence of the Boston Landmarks Commission, and the Proponent is committed to implementing the mitigation measures and design review as set forth in the MOA.

The Phase 1 building's main axis continues to align with the South Station Head House, and its oval form respectfully echoes the curve of the historic Head House. In addition, the reduced height of the Phase 1 building's previous office ground floor lobby to more discrete and separate office and residential entrances will be an improvement to the pedestrian realm and result in a scale more consistent with the architectural character of the Leather District.

The revised configuration for the Phase 2 massing provides for an improved relationship with the Atlantic Avenue street wall. In addition, the increased distance between the Phase 2 building and the Phase 1 building vastly improves the access to daylight, air and view between Phase 1 and Phase 2 when viewed from the Leather District.

While the changes to the massing result in minor adjustments in the amount of additional shadow to National Register-eligible and National Register-listed historic resources in the vicinity, the shadow analysis concludes that the impacts will be similar to the previously approved project. The Final PIR identified shadow impacts to the National Register-eligible Weld Building, 265 Purchase St. (BOS.1722) on October 21st at 11:00 a.m. The updated shadow studies, including in Appendix B, reveal some additional shadow will be cast on the Weld Building at the same time period as well as at noon on March 21st and September 21st.

The Final PIR also identified shadow impacts on some buildings within the National Register-listed Leather District; specifically, several buildings fronting on Atlantic Avenue at 9:00 a.m. on March 21st, June 21st, September 21st and December 21st and at 11:00 a.m. on May 21st and October 21st. The updated studies reveal minor increases and decreases in the amount of shadow during these same time periods as well as some additional shadow at noon on March 21st and September 21st.

The shadow studies included with the Final PIR also identified shadow cast on a couple of buildings within the National Register-listed Fort Point Channel Historic District; specifically, two buildings fronting on Summer Street at 6:00 p.m. on June 21st. The updated

studies reveal a minor increase in the amount of shadow during the same time period as well as on September 21st at 6:00 p.m.

Similar to the shadow impacts associated with the previously approved project, the impacts identified above will not impact the historic or architectural characteristics which qualify the resources for listing in the National Register. As noted above, the Proponent is committed to implementing the measures to mitigate impacts to historic resources as set forth in the MOA with the Massachusetts Historical Commission.

3.6 Accessibility

The Accessibility Checklist is included in Appendix D.

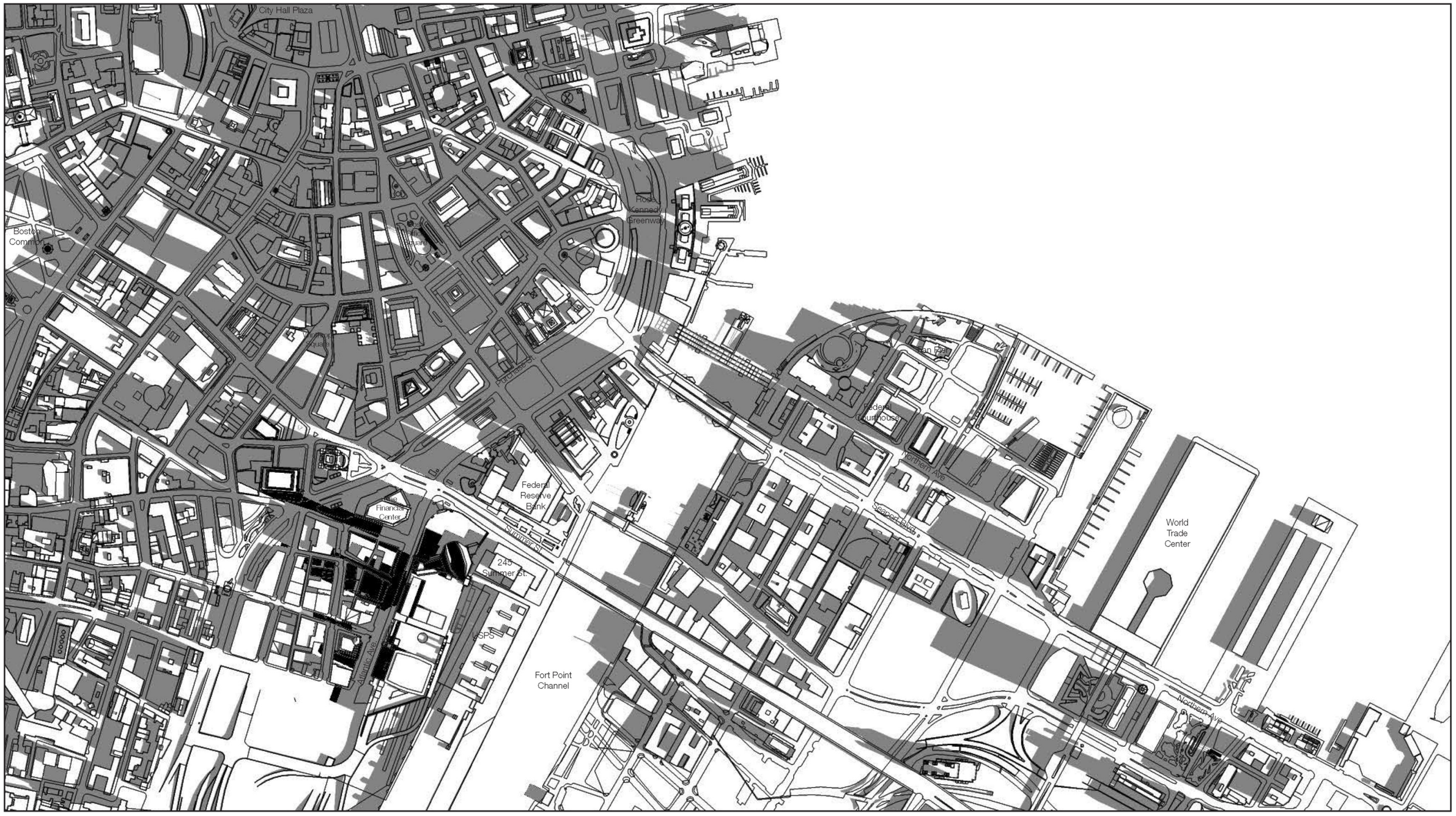
Appendix A

Transportation

The Transportation Appendix is available upon request.

Appendix B

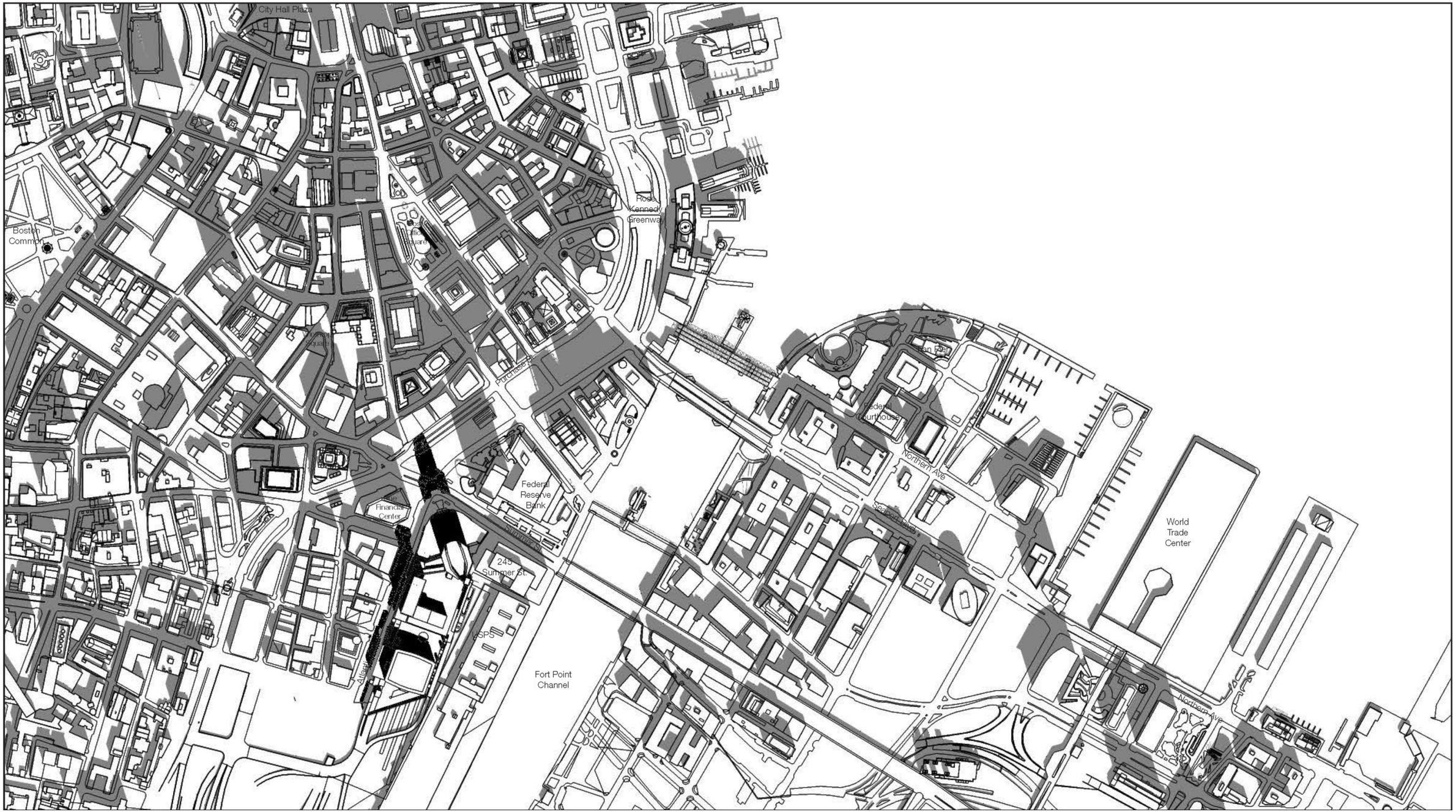
Shadow Graphics



South Station Air Rights **Boston, Massachusetts**

Figure 1

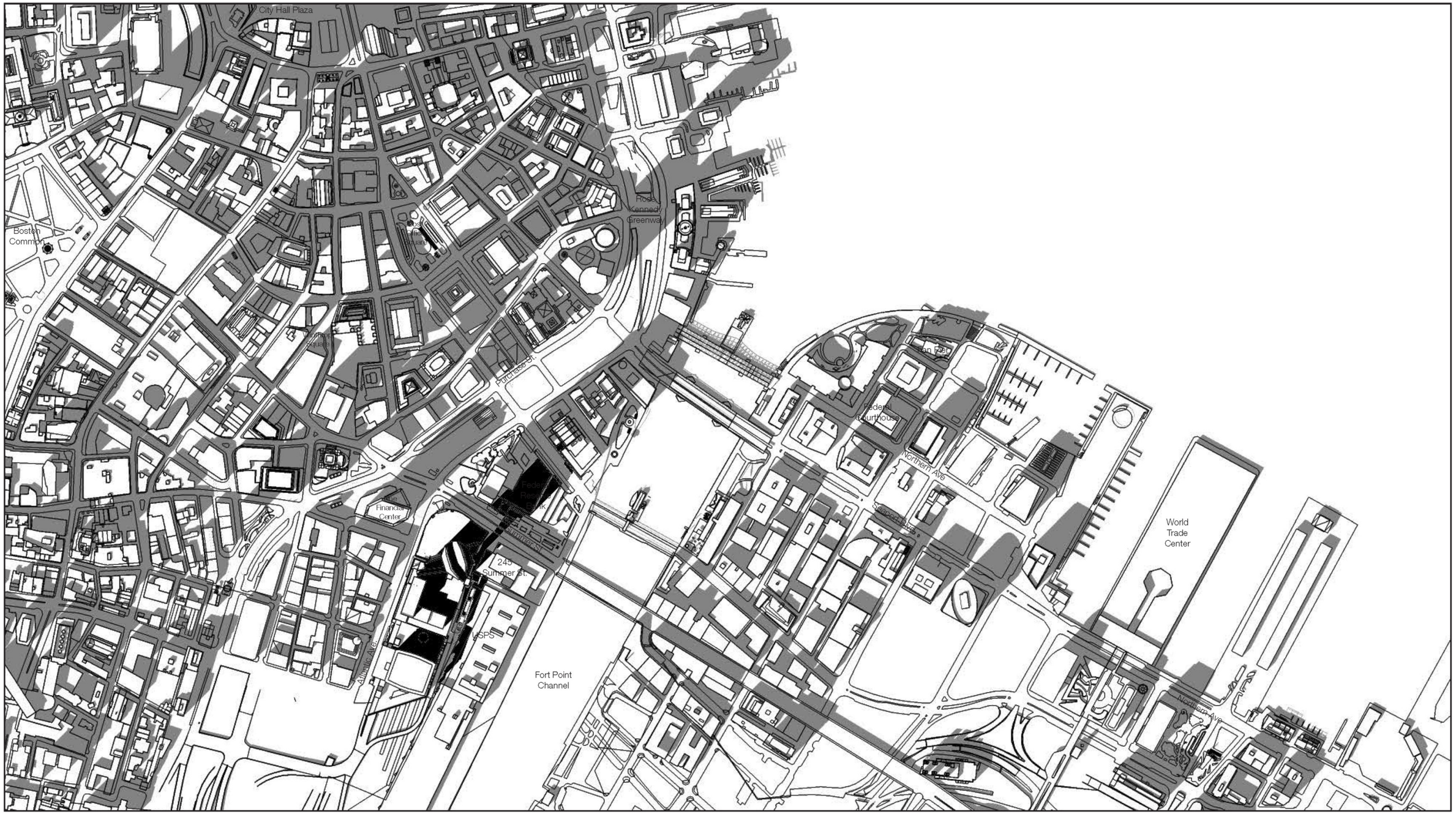
Shadow Study: March 21, 9:00 a.m.



South Station Air Rights **Boston, Massachusetts**

Figure 2

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



South Station Air Rights **Boston, Massachusetts**

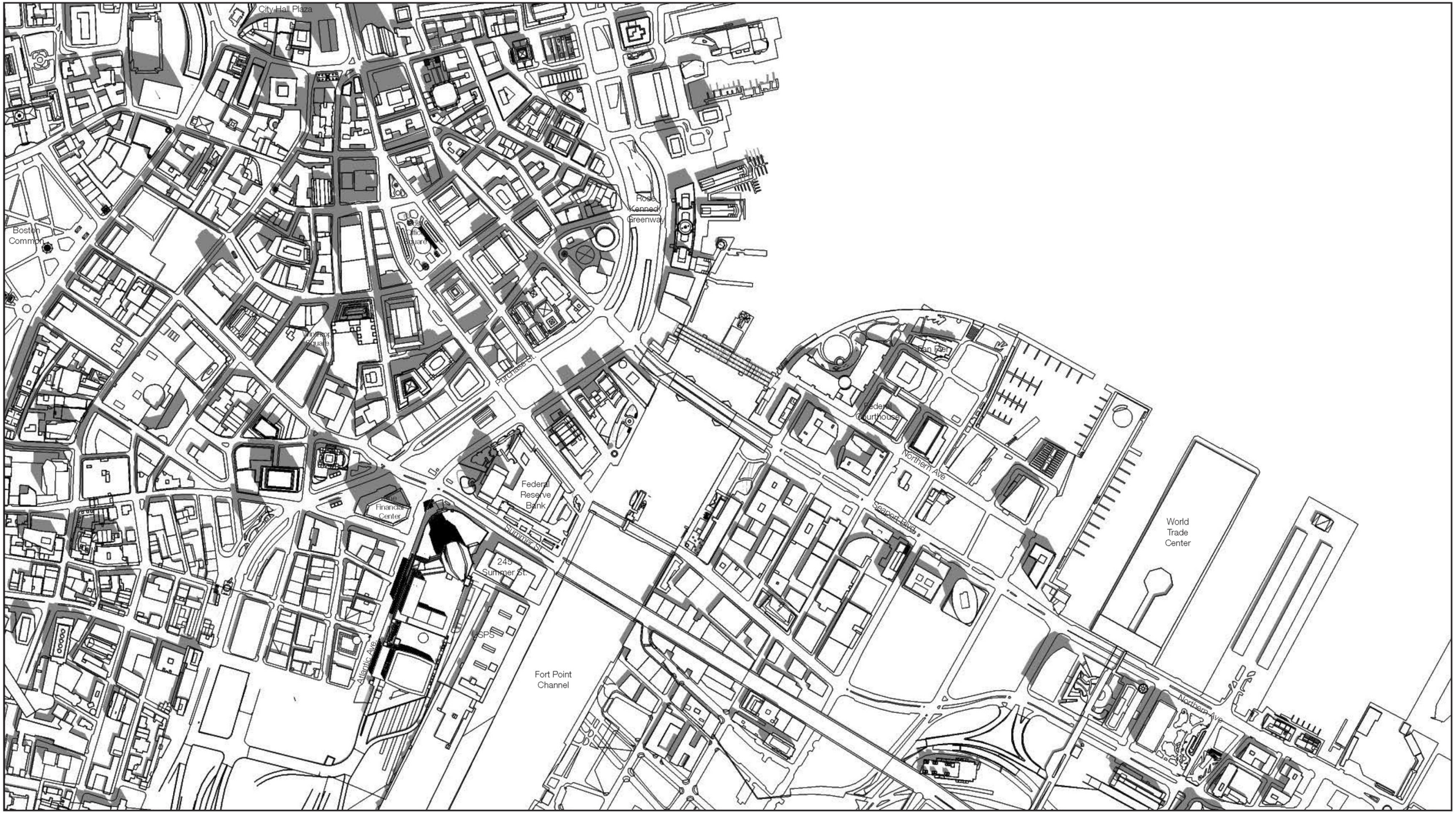
Figure 3

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

South Station Air Rights **Boston, Massachusetts**

Figure 4

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



South Station Air Rights **Boston, Massachusetts**

Figure 5

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

South Station Air Rights **Boston, Massachusetts**

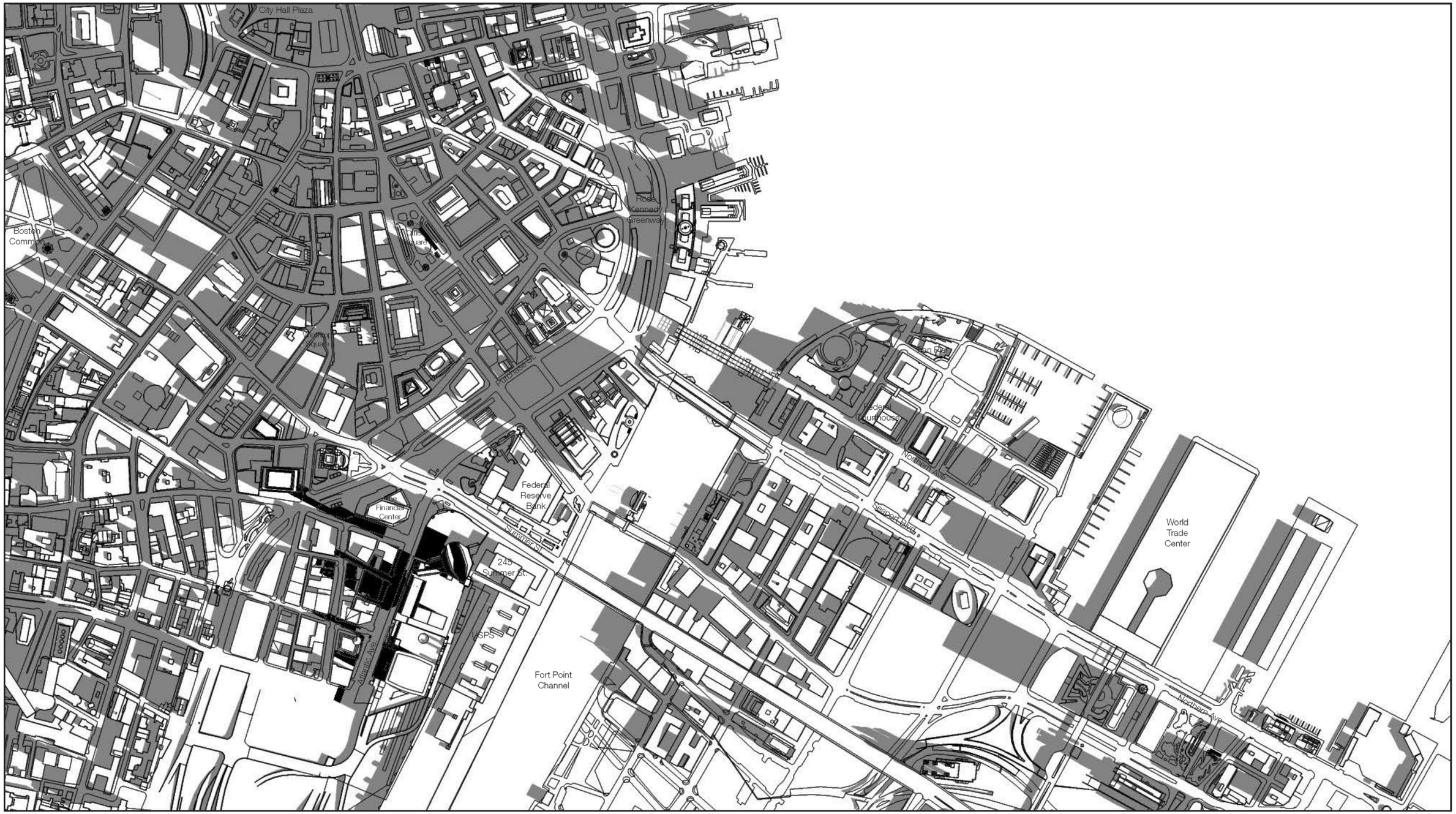
Figure 6

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

South Station Air Rights **Boston, Massachusetts**

Figure 7

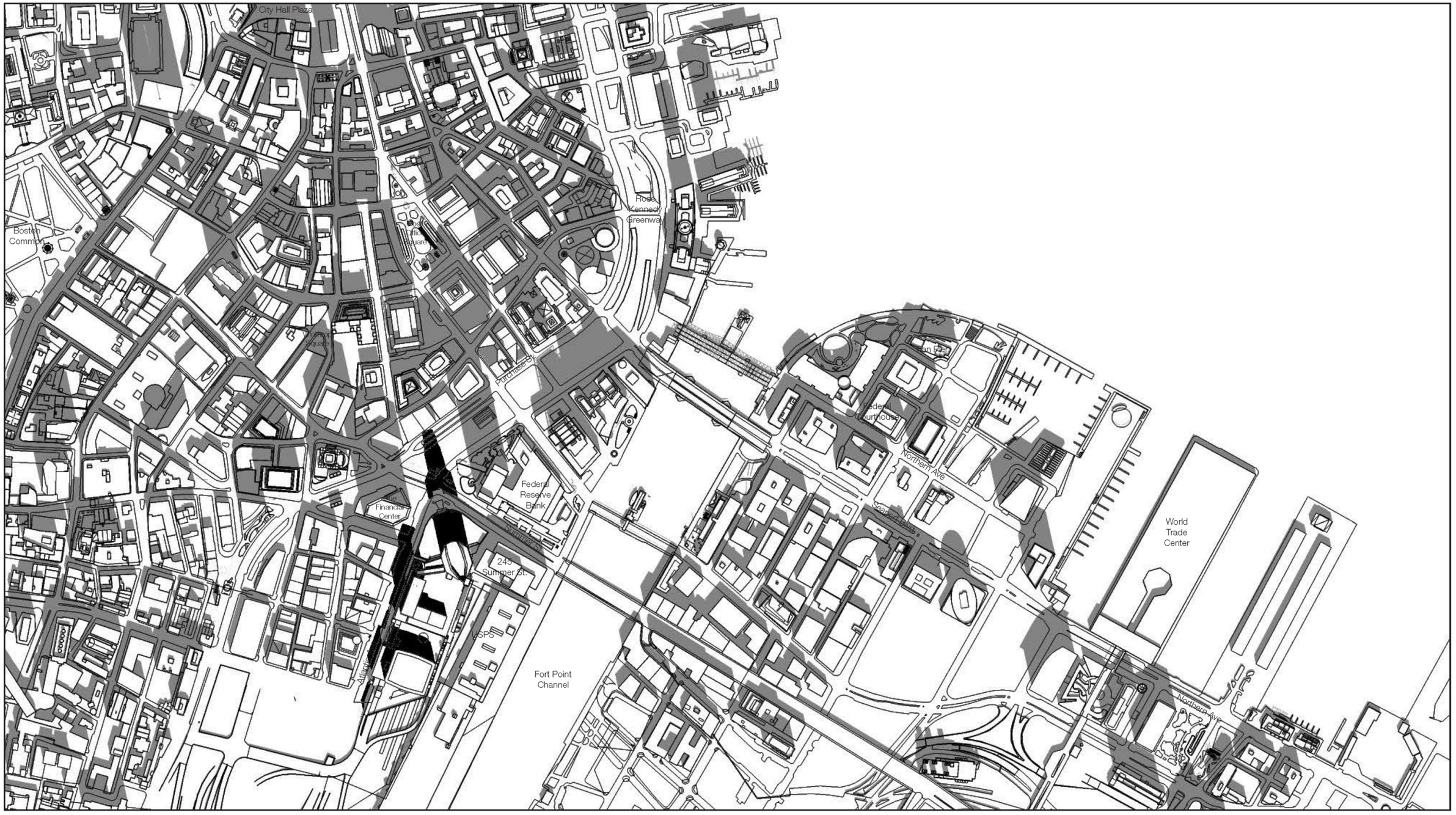
Shadow Study: June 21, 6:00 p.m.



South Station Air Rights **Boston, Massachusetts**

Figure 8

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



South Station Air Rights **Boston, Massachusetts**

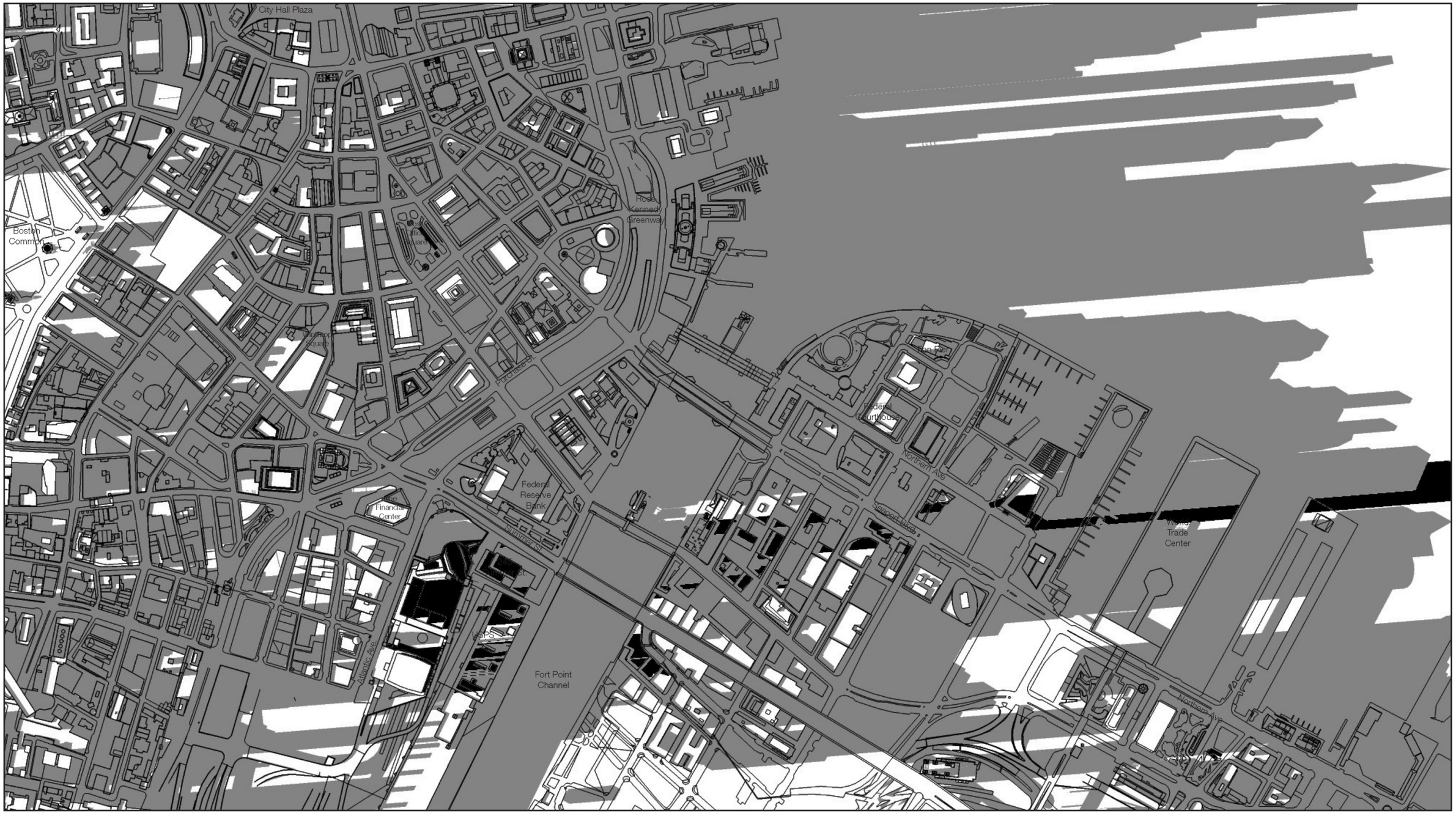
Figure 9

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

South Station Air Rights **Boston, Massachusetts**

Figure 10

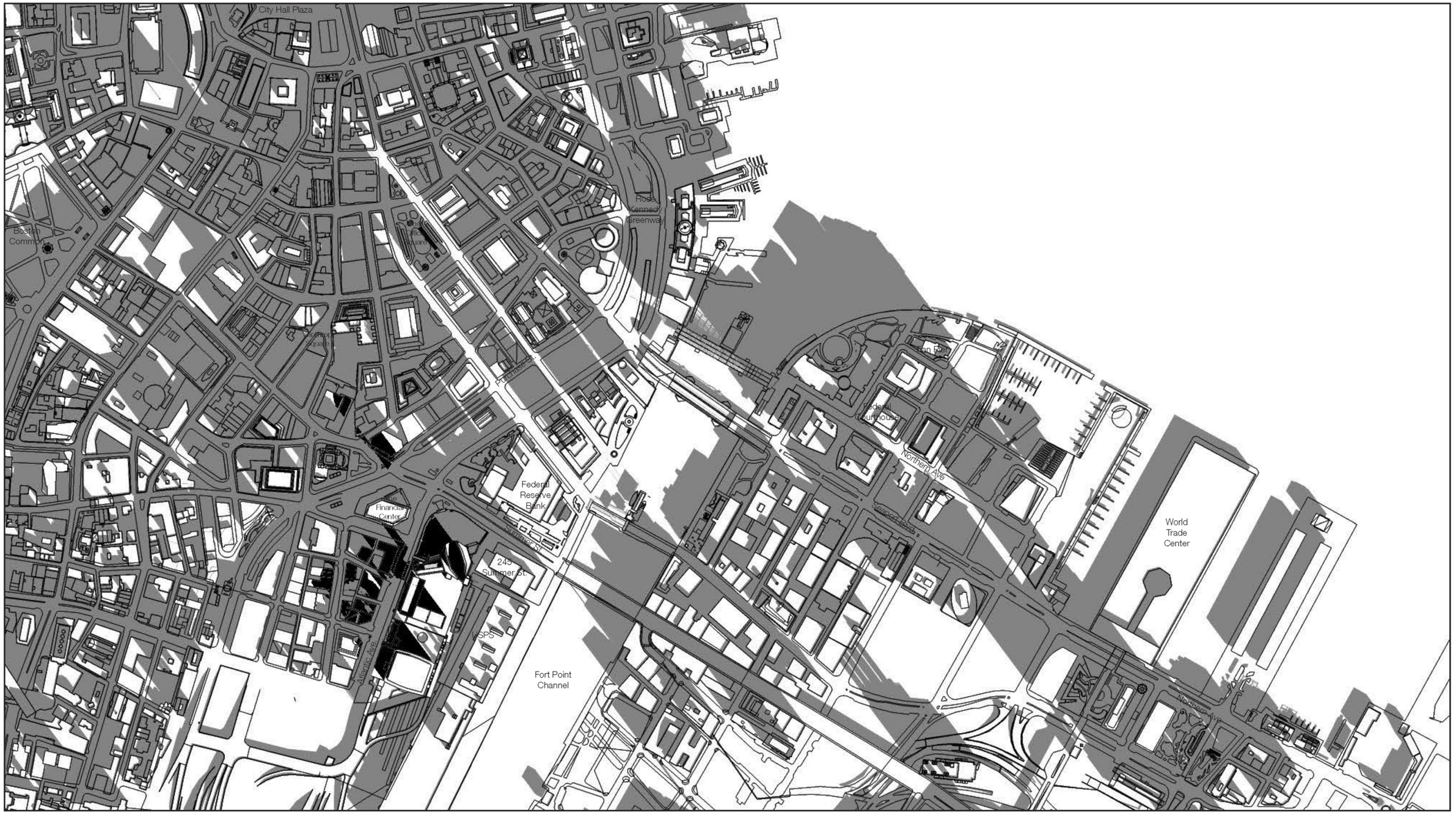
Shadow Study: September 21, 3:00 p.m.



South Station Air Rights **Boston, Massachusetts**

Figure 11

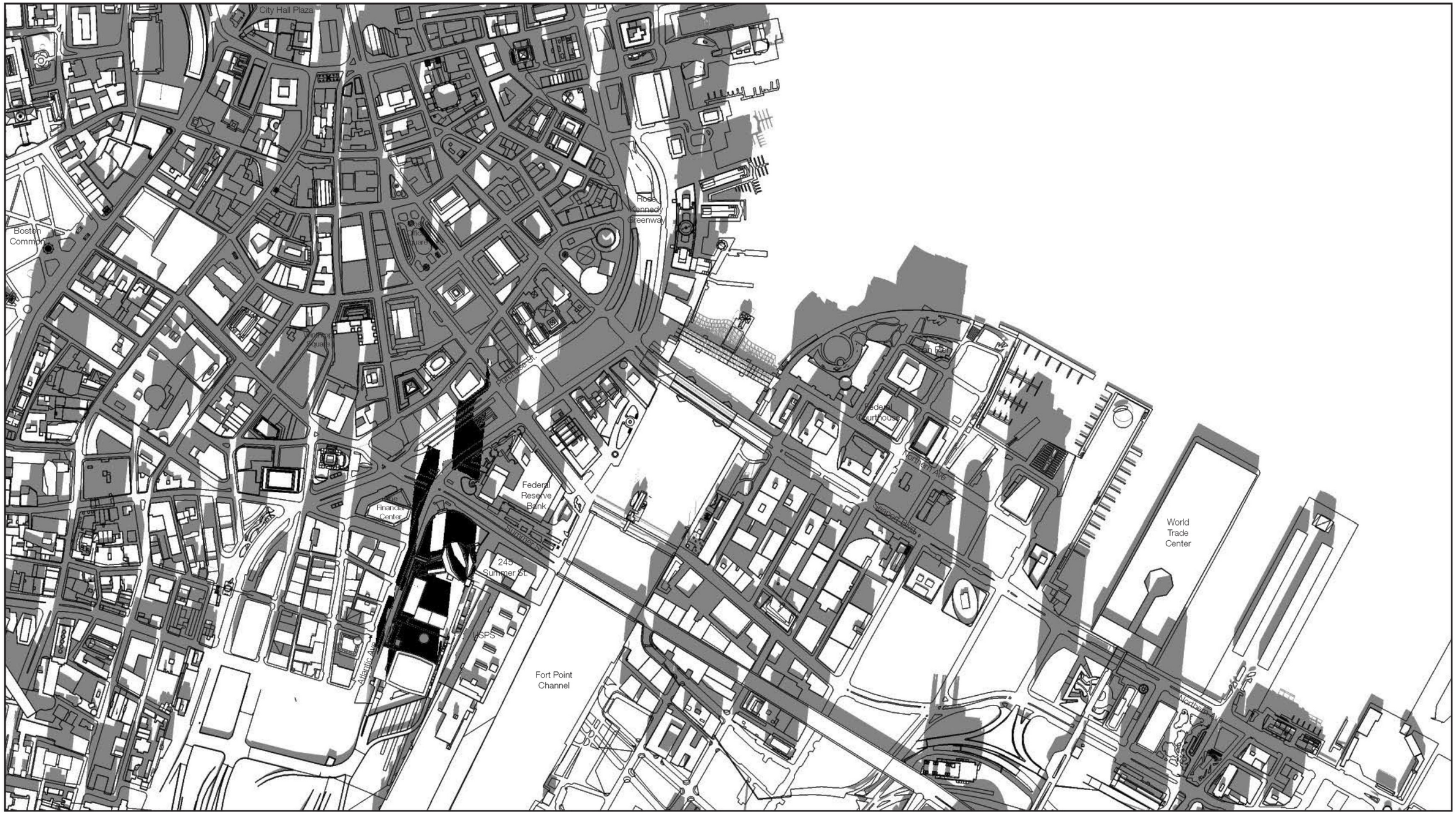
Shadow Study: September 21, 6:00 p.m.



South Station Air Rights **Boston, Massachusetts**

Figure 12

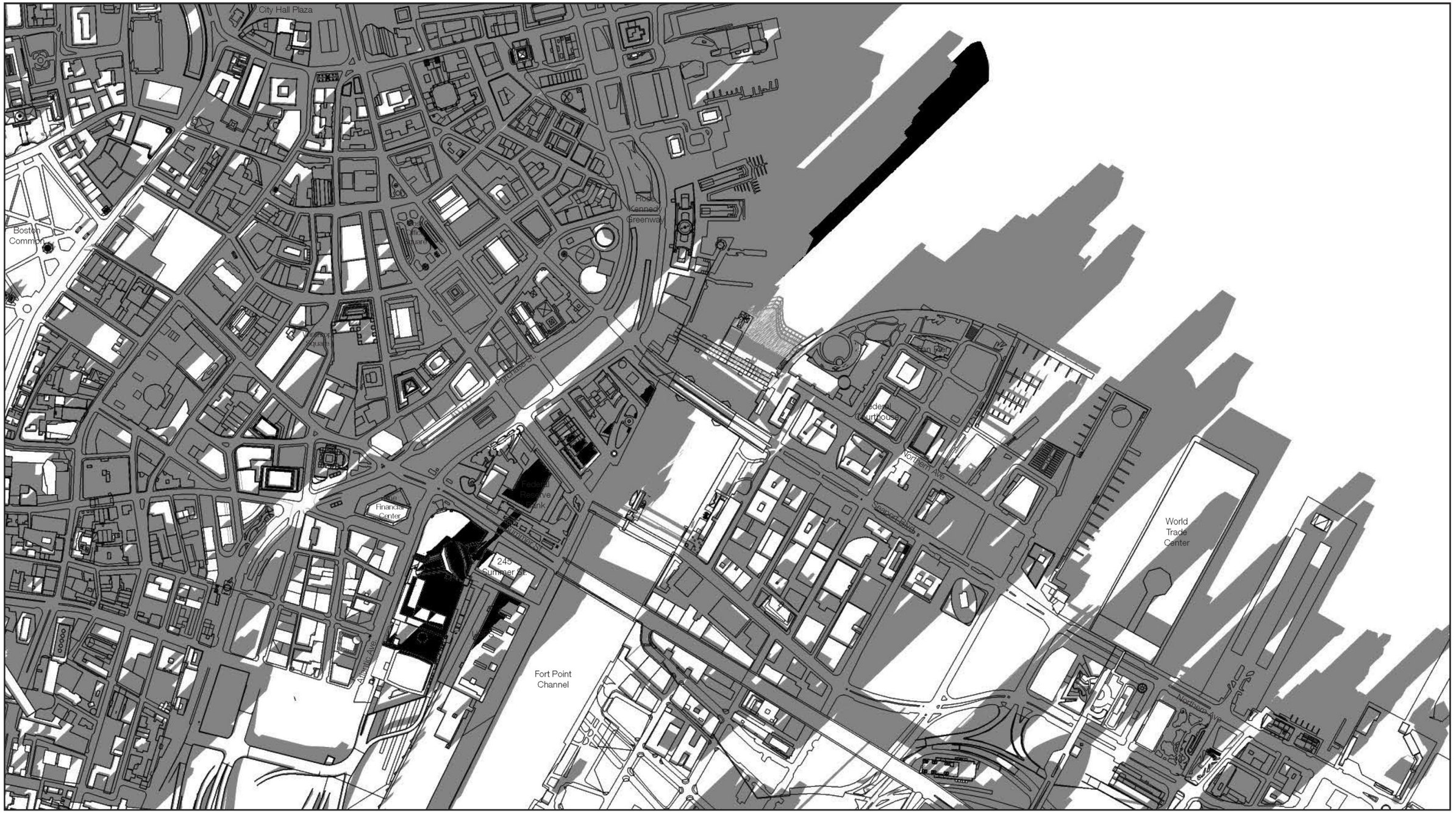
Shadow Study: December 21, 9:00 a.m.



South Station Air Rights **Boston, Massachusetts**

Figure 13

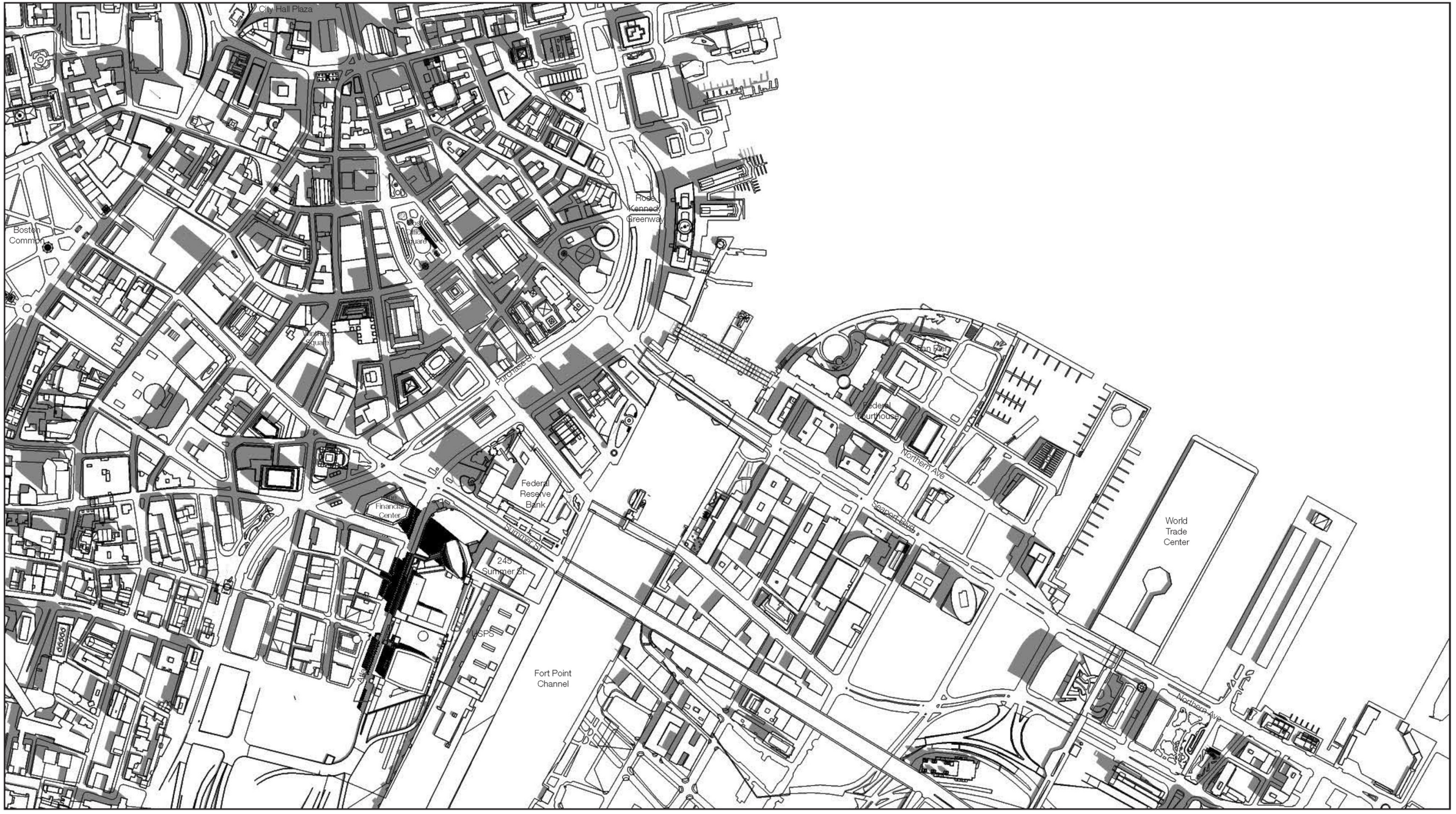
Shadow Study: December 21, 12:00 p.m.



South Station Air Rights **Boston, Massachusetts**

Figure 14

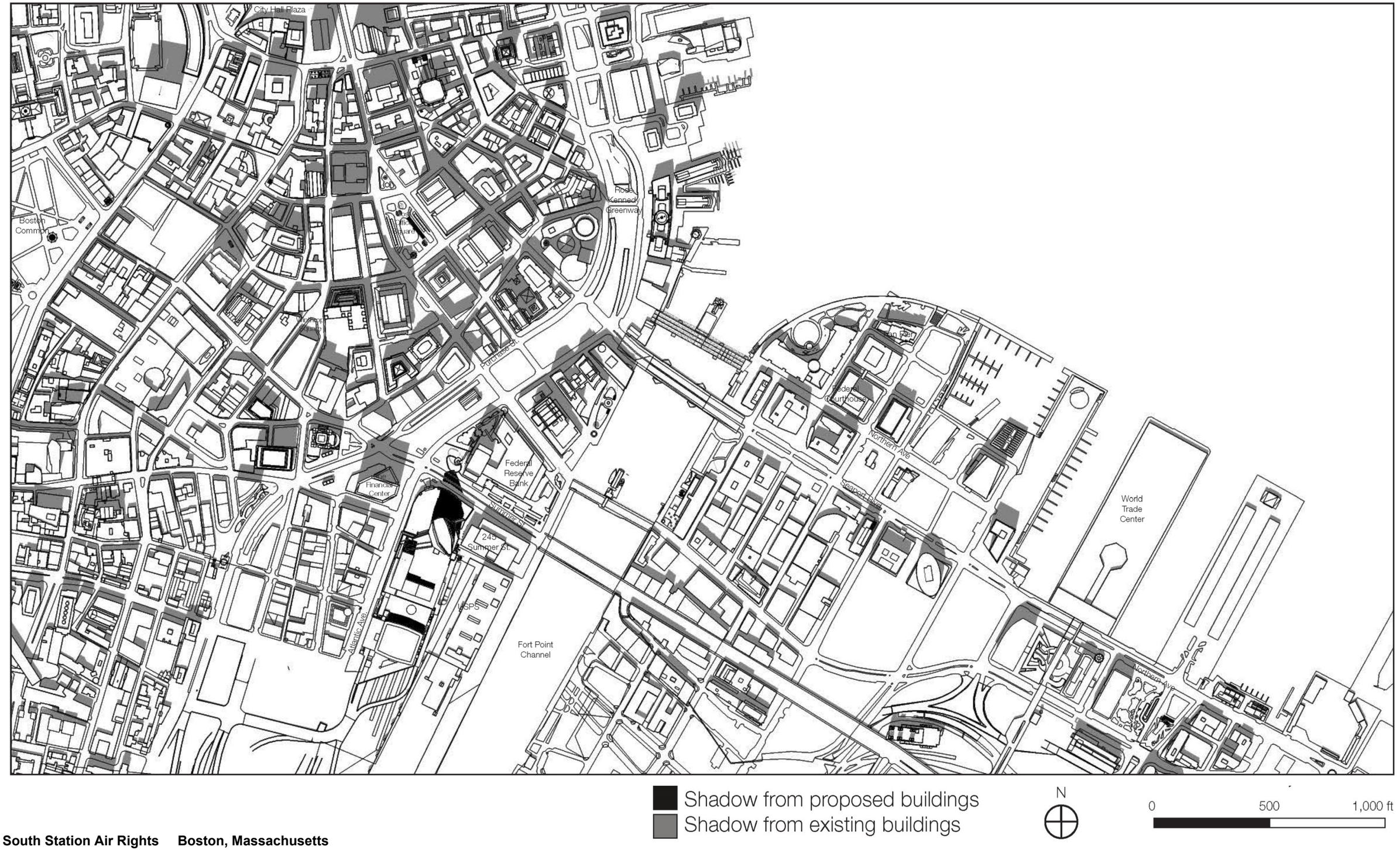
Shadow Study: December 21, 3:00 p.m.



South Station Air Rights **Boston, Massachusetts**

Figure 15

Shadow Study: May 21, 11:00 a.m.



South Station Air Rights **Boston, Massachusetts**

Figure 16

Shadow Study: May 21, 1:00 p.m.

South Station Air Rights **Boston, Massachusetts**

Figure 17

Shadow Study: October 21, 11:00 a.m..

South Station Air Rights **Boston, Massachusetts**

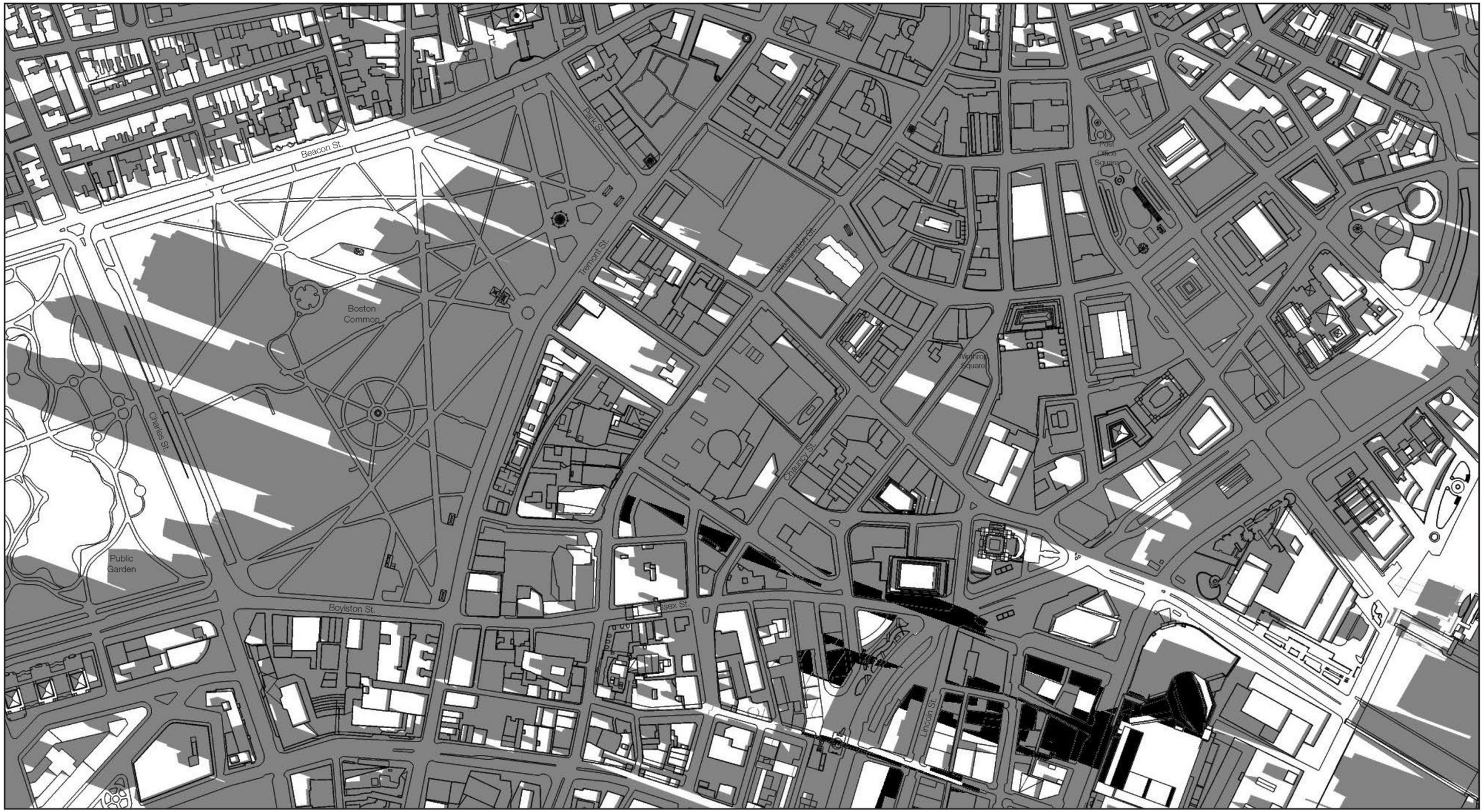
Figure 18

Shadow Study: October 21, 1:00 p.m.

South Station Air Rights **Boston, Massachusetts**

Figure 19

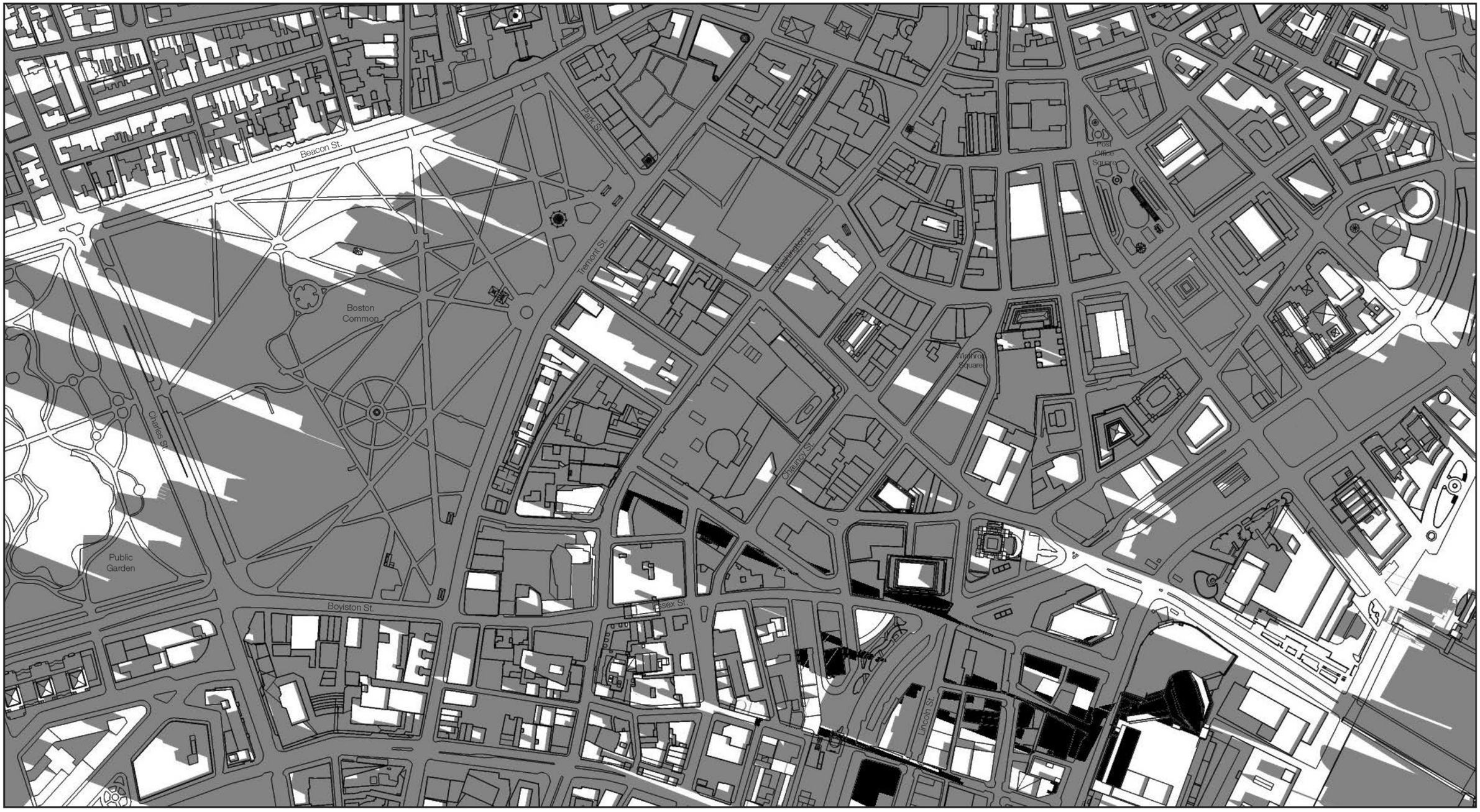
Boston Common Shadow Study: September 28, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 20

Boston Common Shadow Study: October 5, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

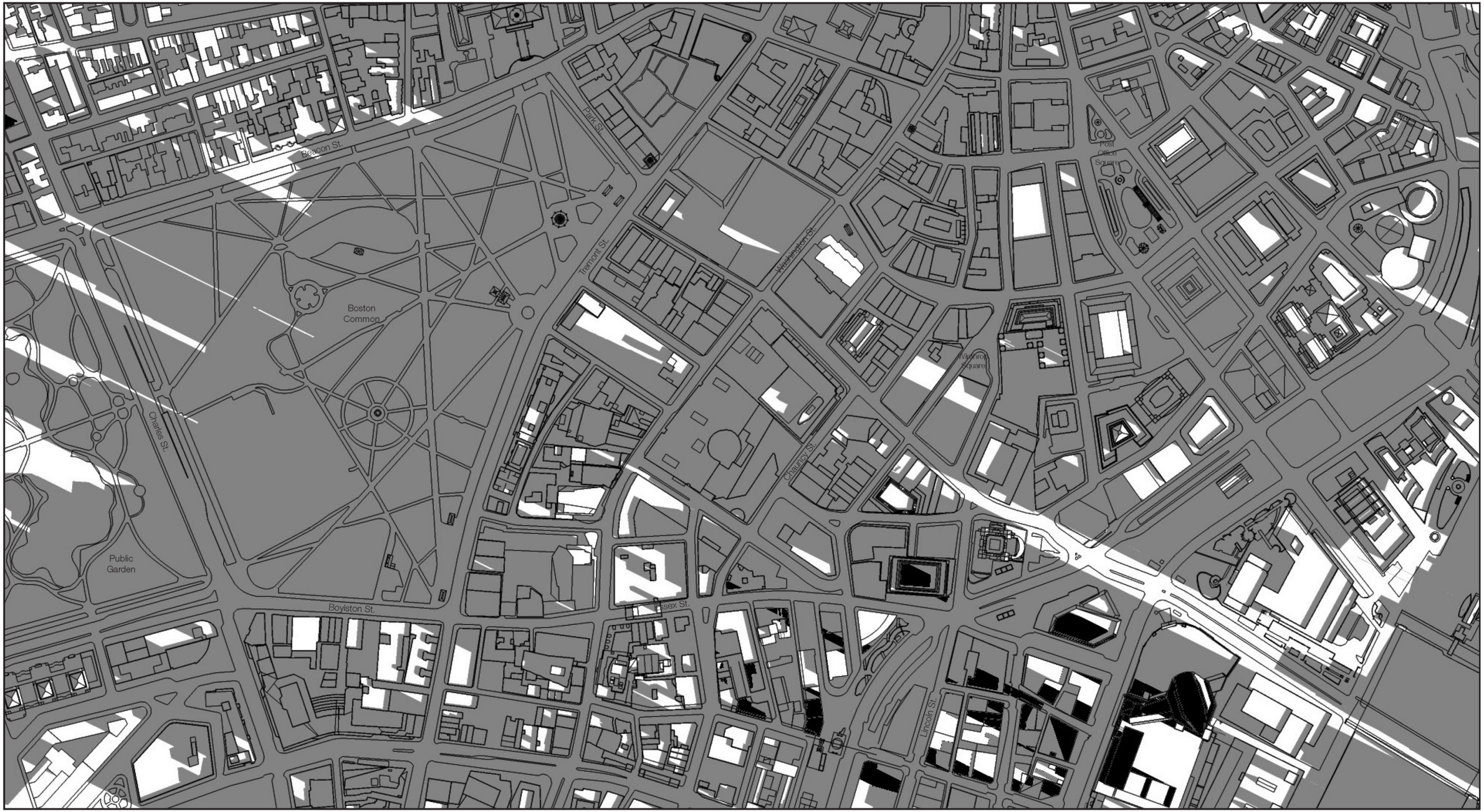
Figure 21

Boston Common Shadow Study: October 12, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 22

Boston Common Shadow Study: October 19, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

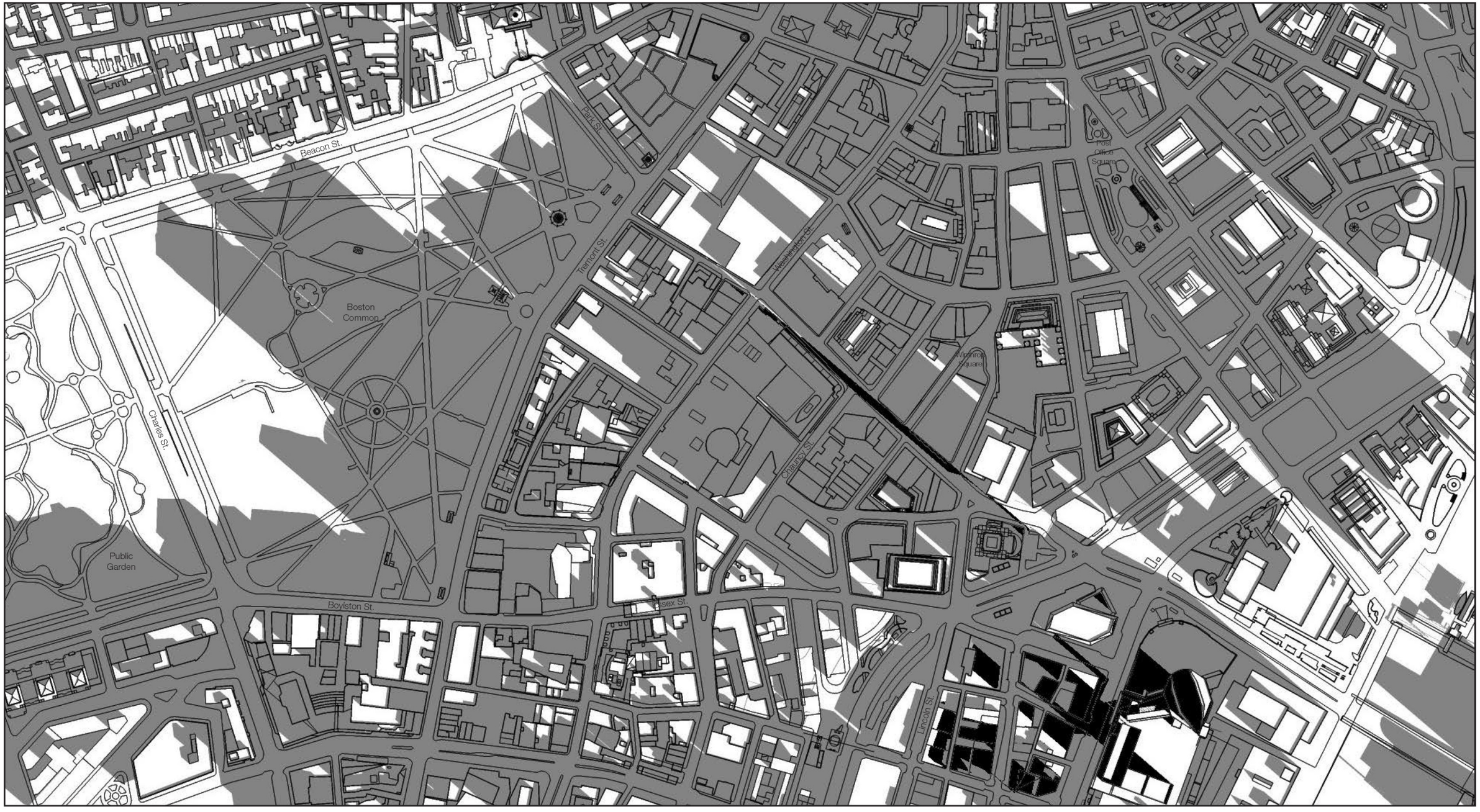
Figure 23

Boston Common Shadow Study: October 26, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 24

Boston Common Shadow Study: November 2, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 25

Boston Common Shadow Study: November 9, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

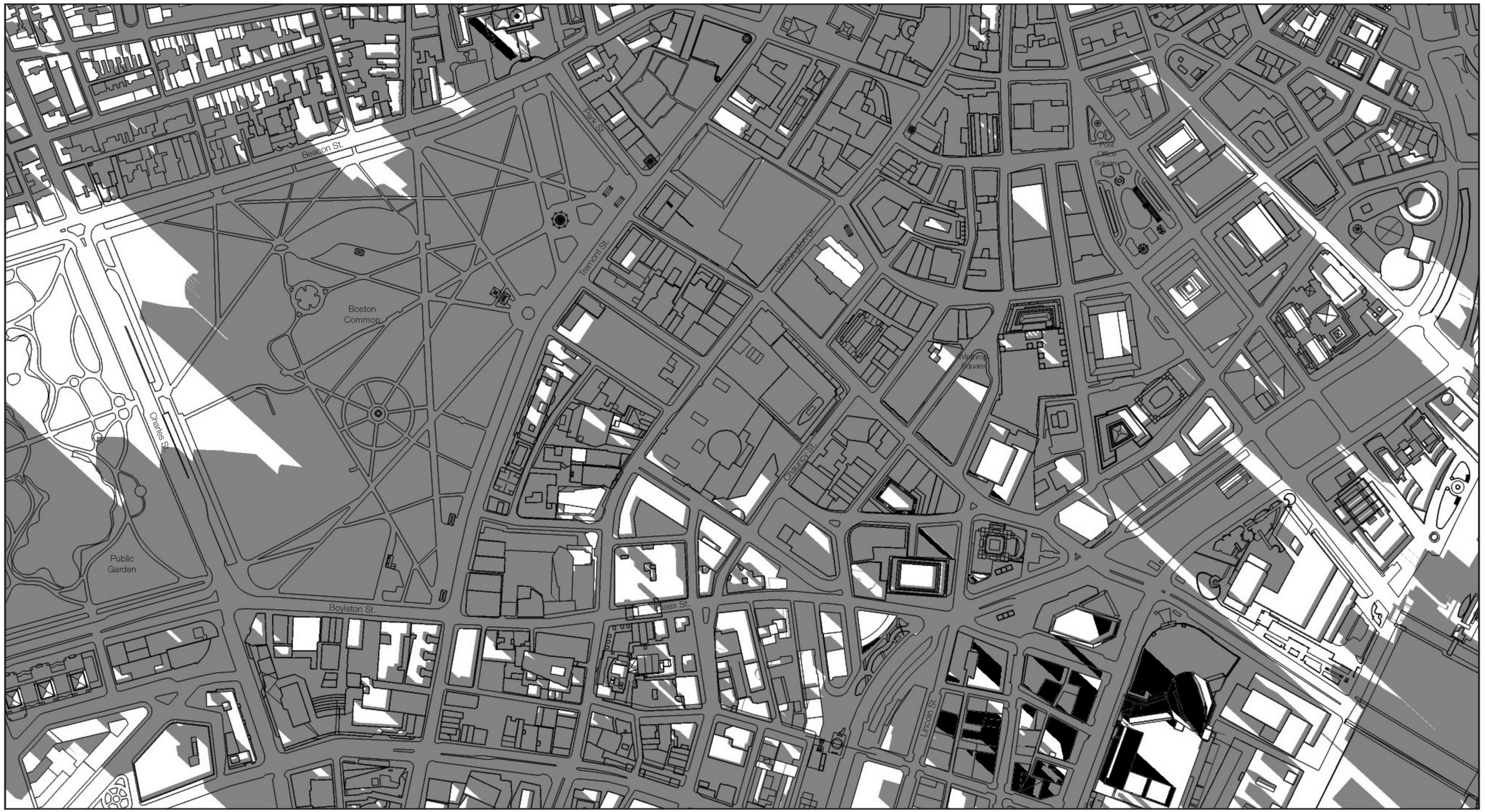
Figure 26

Boston Common Shadow Study: November 16, 8:00 a.m..

South Station Air Rights Boston, Massachusetts

Figure 27

Boston Common Shadow Study: November 23, 8:00 a.m..



Shadow from proposed buildings
Shadow from existing buildings

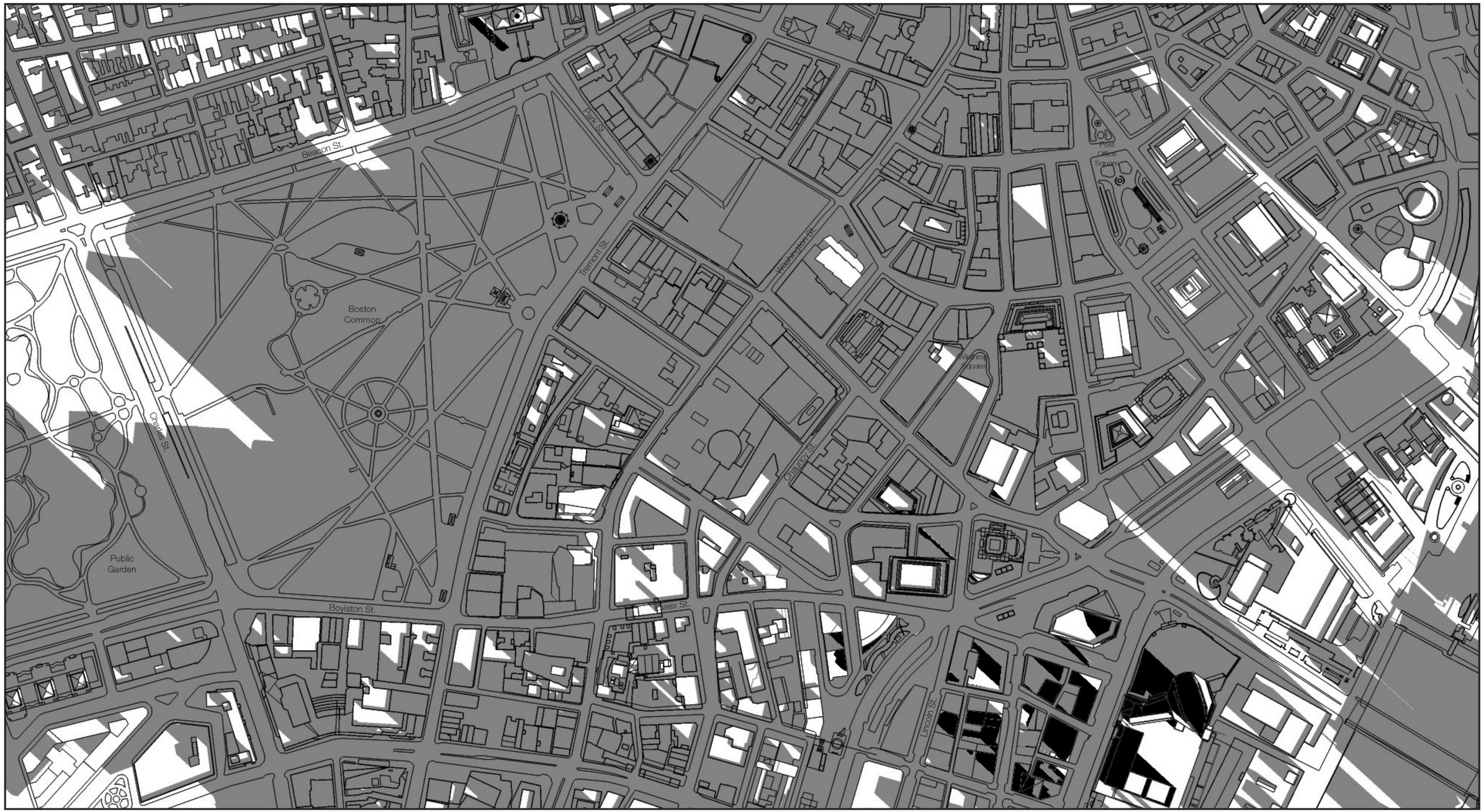
N

0 500 1,000 ft

South Station Air Rights Boston, Massachusetts

Figure 28

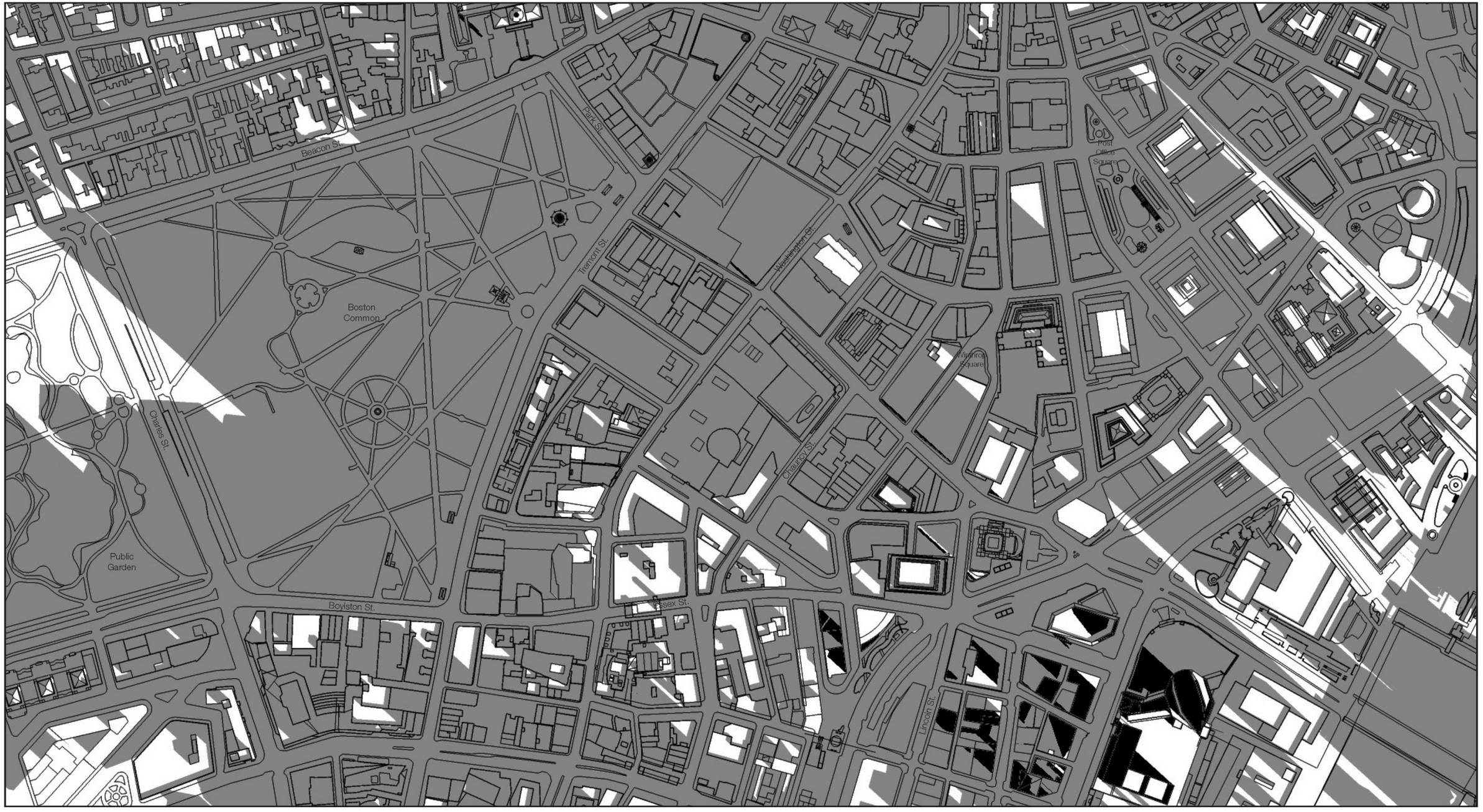
Boston Common Shadow Study: November 30, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 29

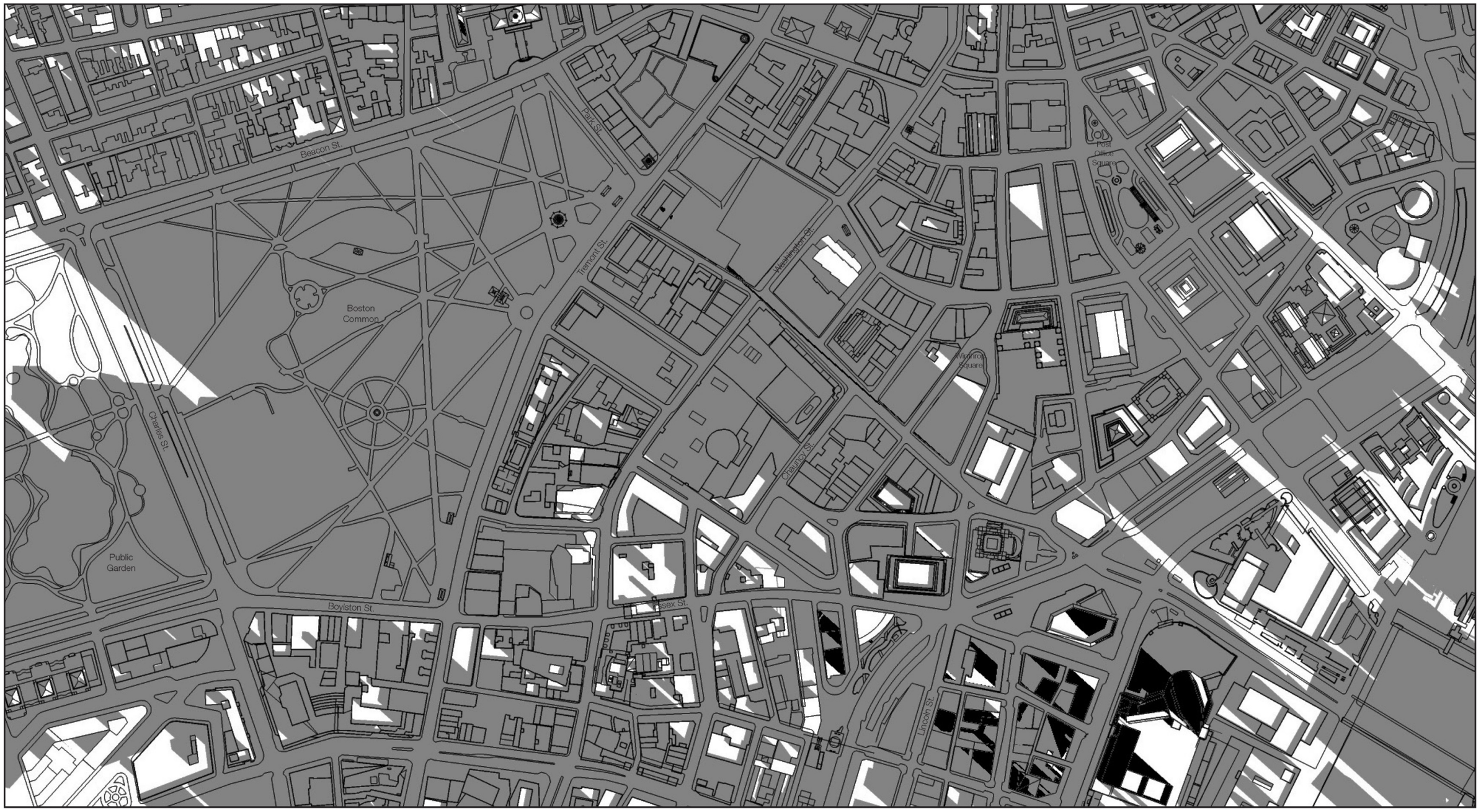
Boston Common Shadow Study: December 7, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 30

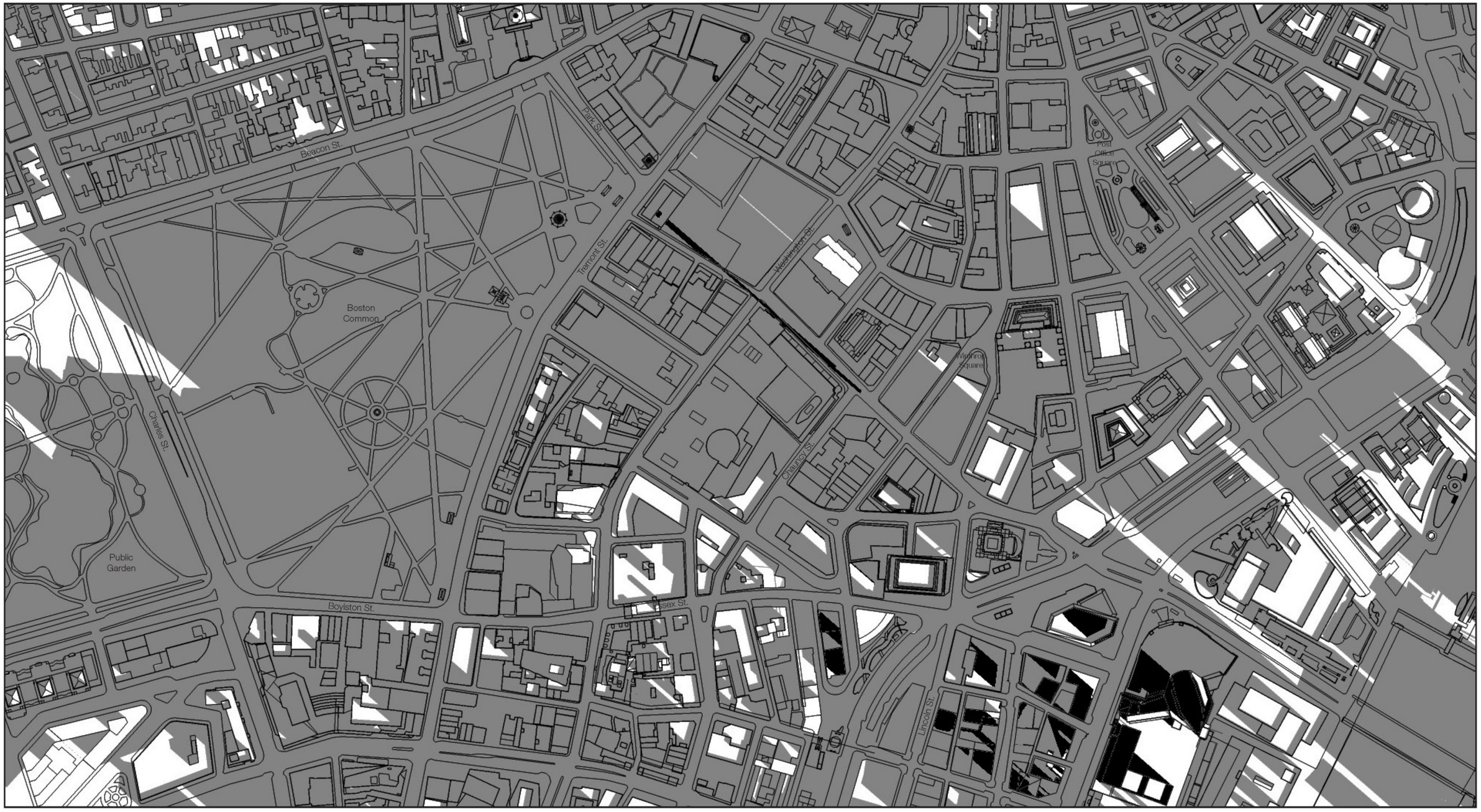
Boston Common Shadow Study: December 14, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 31

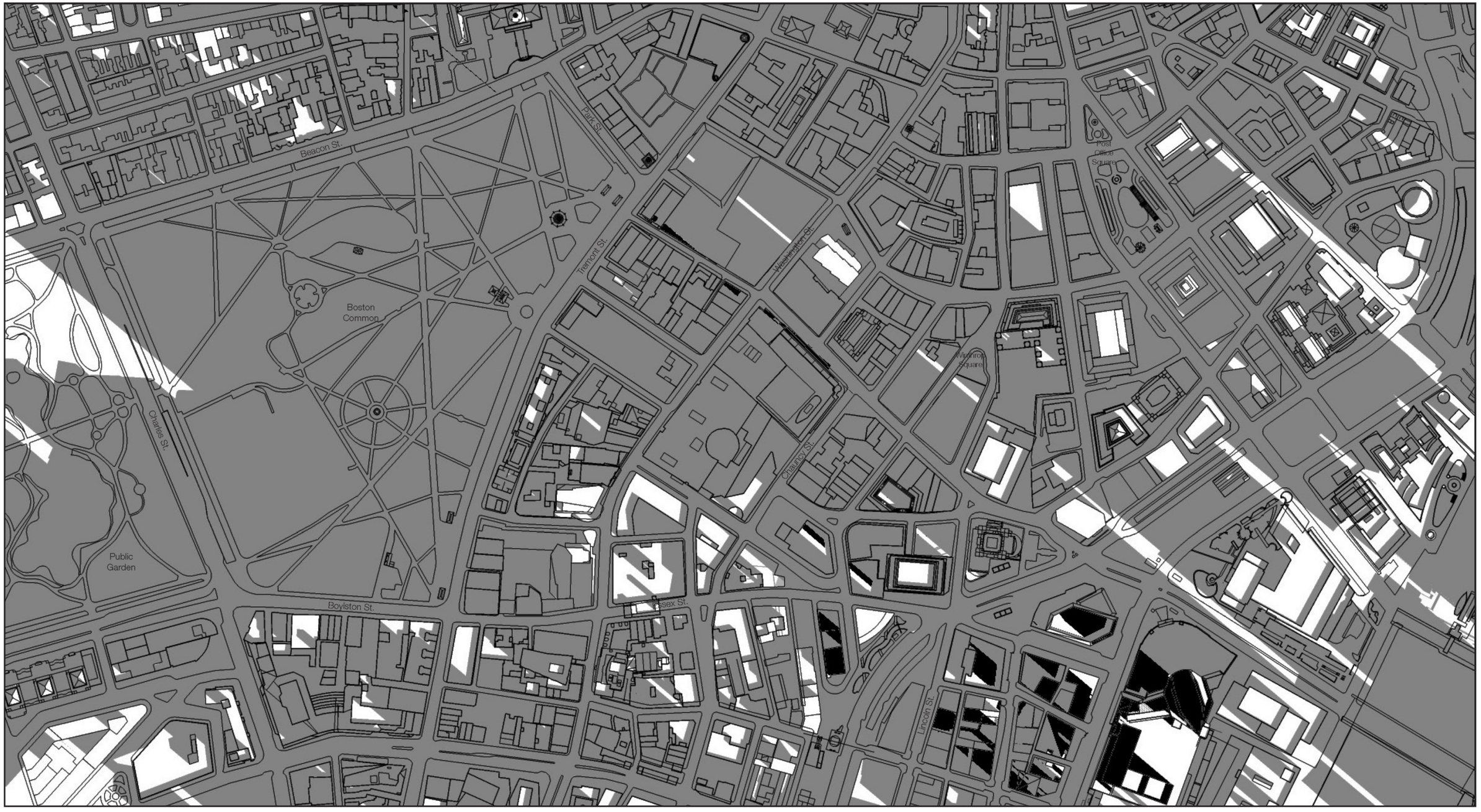
Boston Common Shadow Study: December 21, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 32

Boston Common Shadow Study: December 28, 8:00 a.m..



South Station Air Rights **Boston, Massachusetts**

Figure 33

Boston Common Shadow Study: January 4, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 34

Boston Common Shadow Study: January 11, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 35

Boston Common Shadow Study: January 18, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 36

Boston Common Shadow Study: January 25, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 37

Boston Common Shadow Study: February 1, 8:00 a.m..

Shadow from proposed buildings
Shadow from existing buildings

N

0 500 1,000 ft

South Station Air Rights Boston, Massachusetts

Figure 38

Boston Common Shadow Study: February 8, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 39

Boston Common Shadow Study: February 15, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 40

Boston Common Shadow Study: February 22, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 41

Boston Common Shadow Study: February 29, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

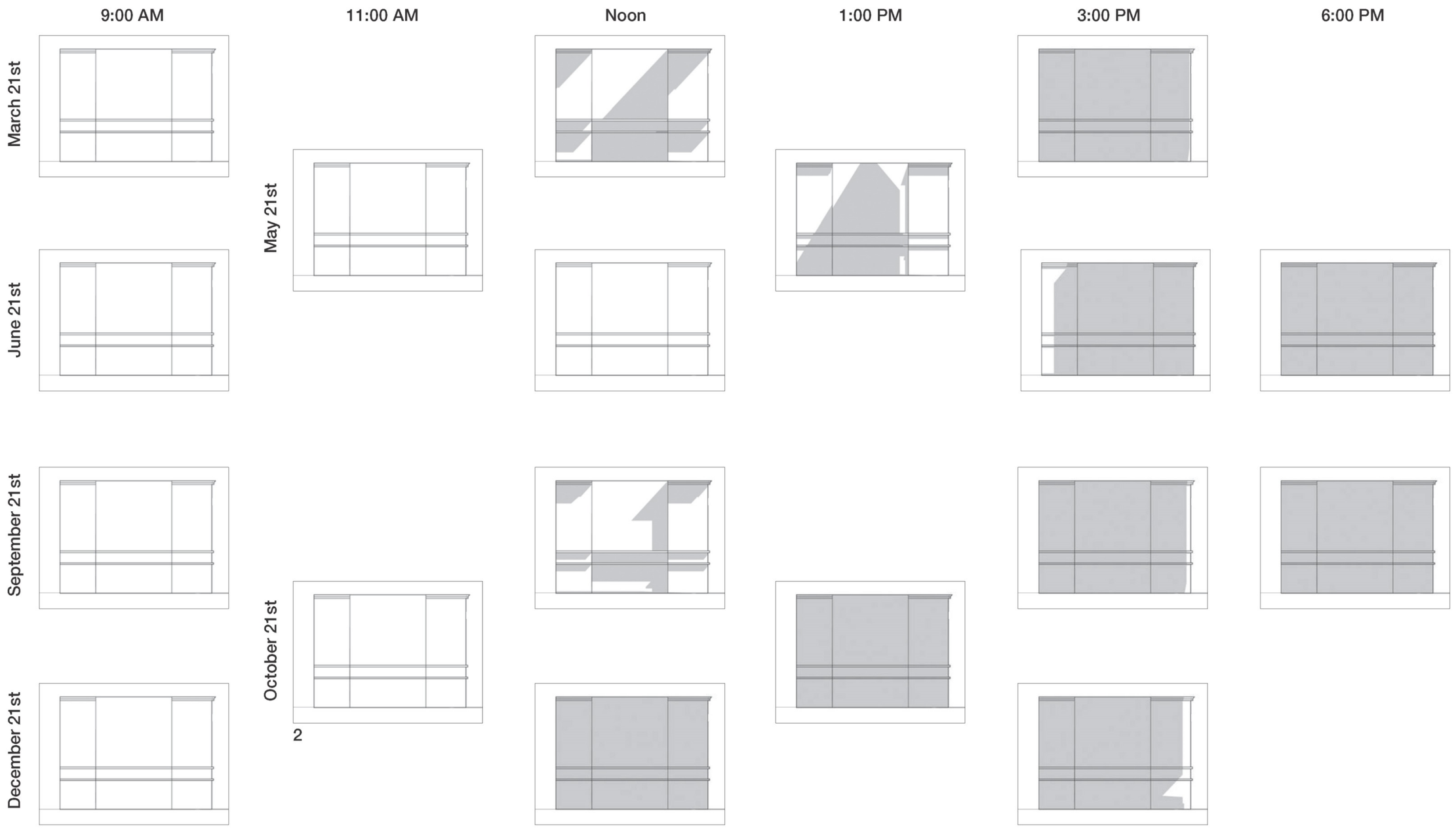
Figure 42

Boston Common Shadow Study: March 7, 8:00 a.m..

South Station Air Rights **Boston, Massachusetts**

Figure 43

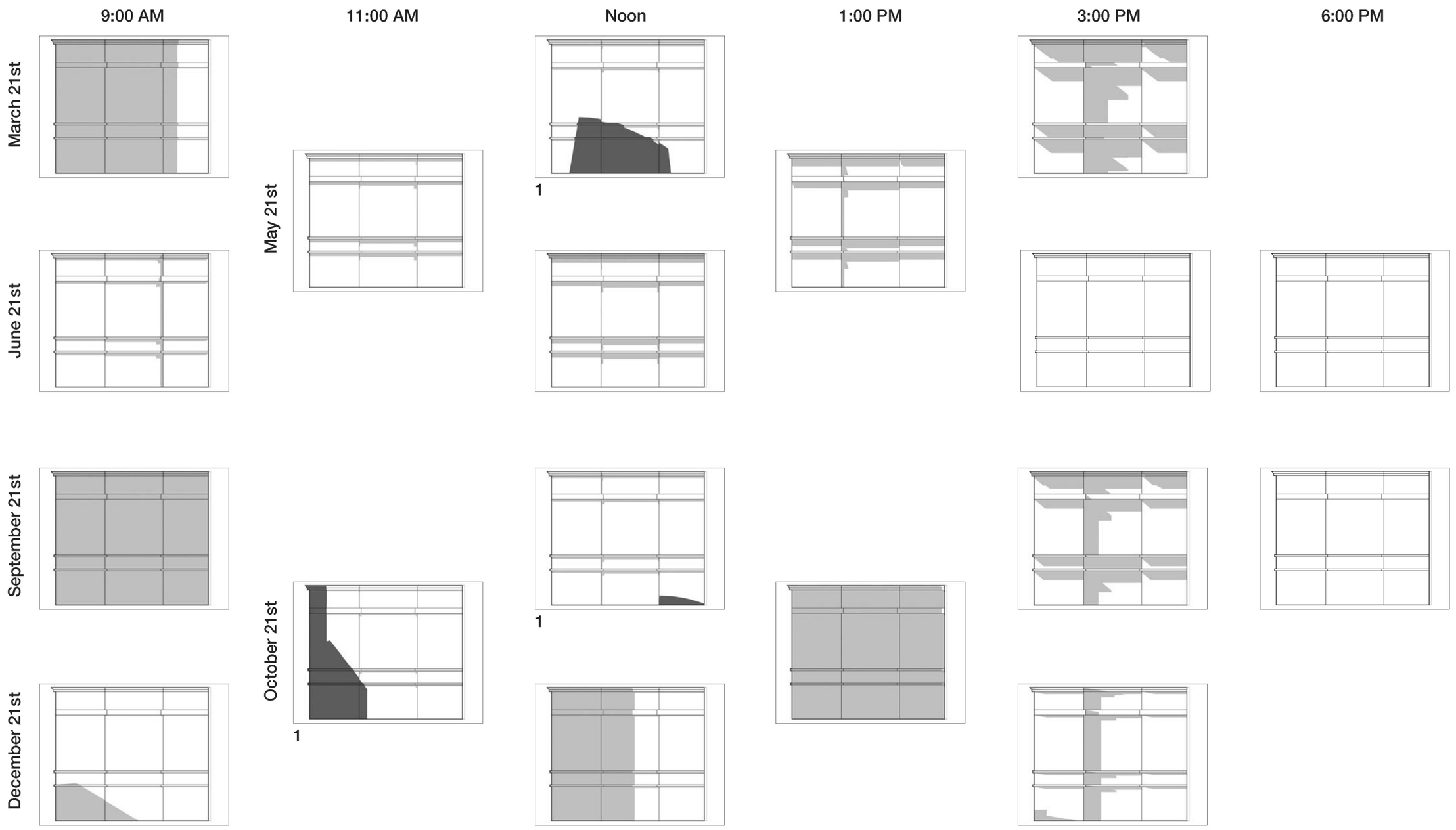
Boston Common Shadow Study: March 14, 8:00 a.m..



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 44

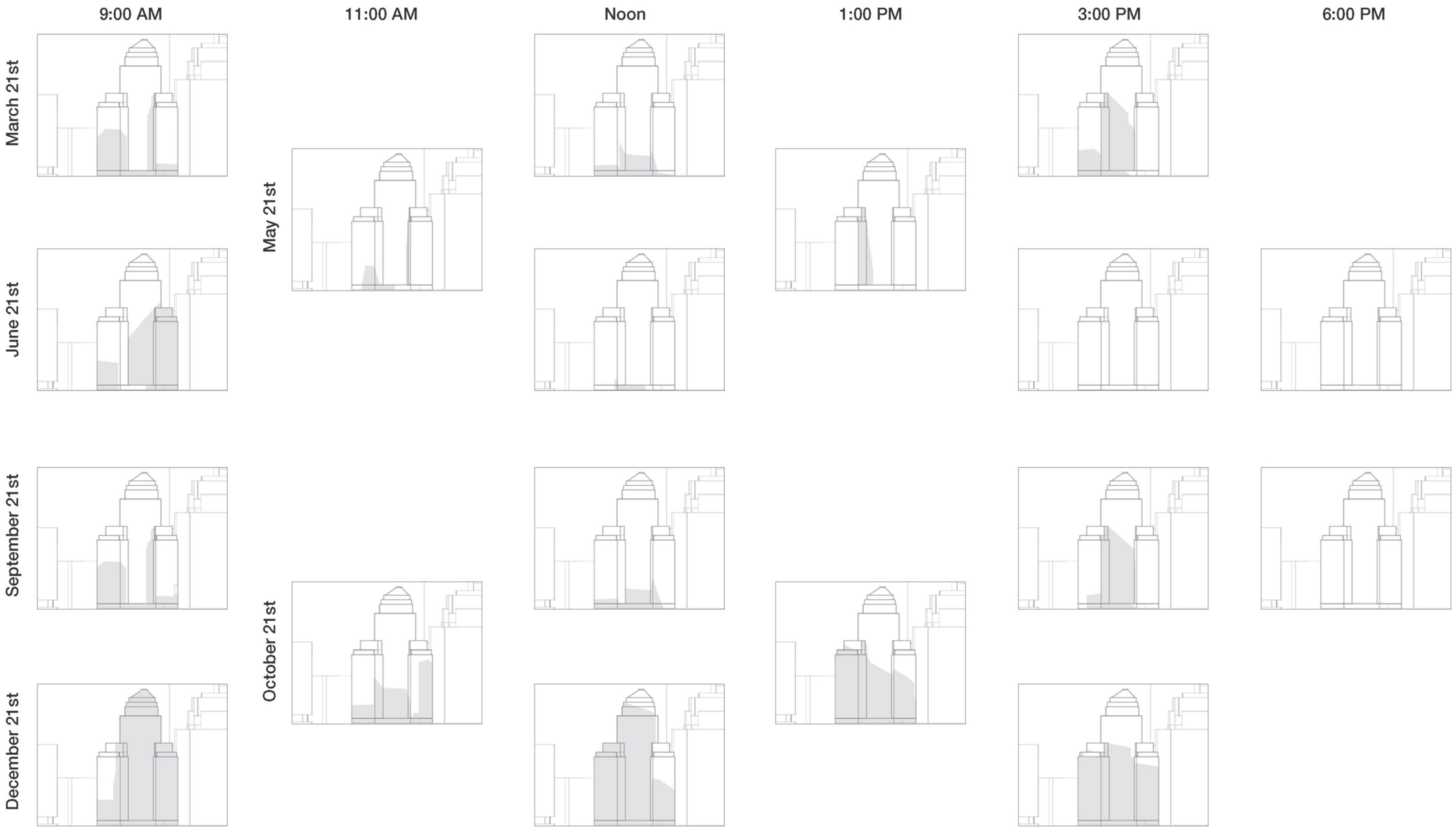
Façade Shadow Study: Weld Building – Federal Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 45

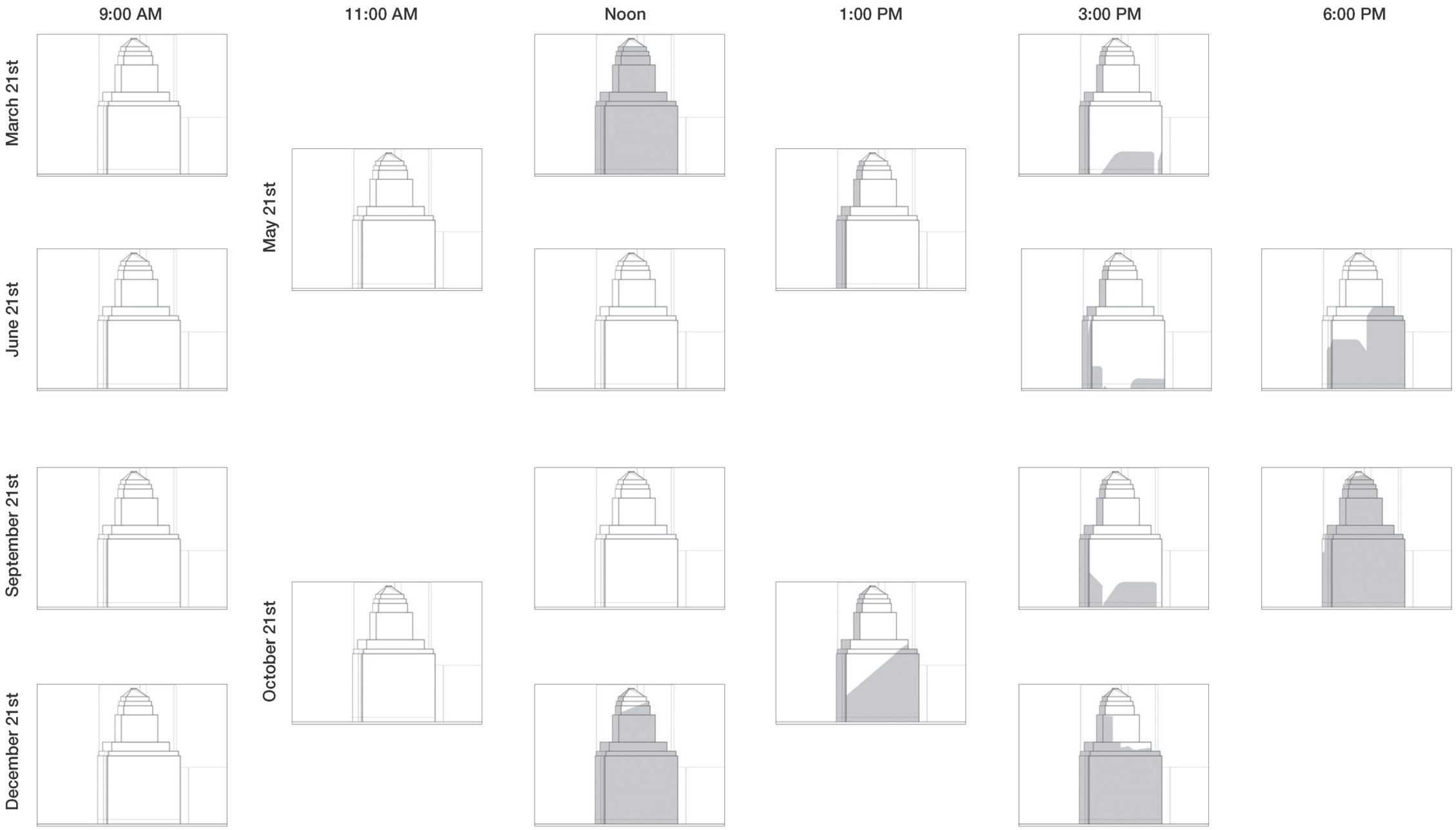
Façade Shadow Study: Weld Building – Purchase Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 46

Façade Shadow Study: United Shoe Machinery Building – High Street Elevation

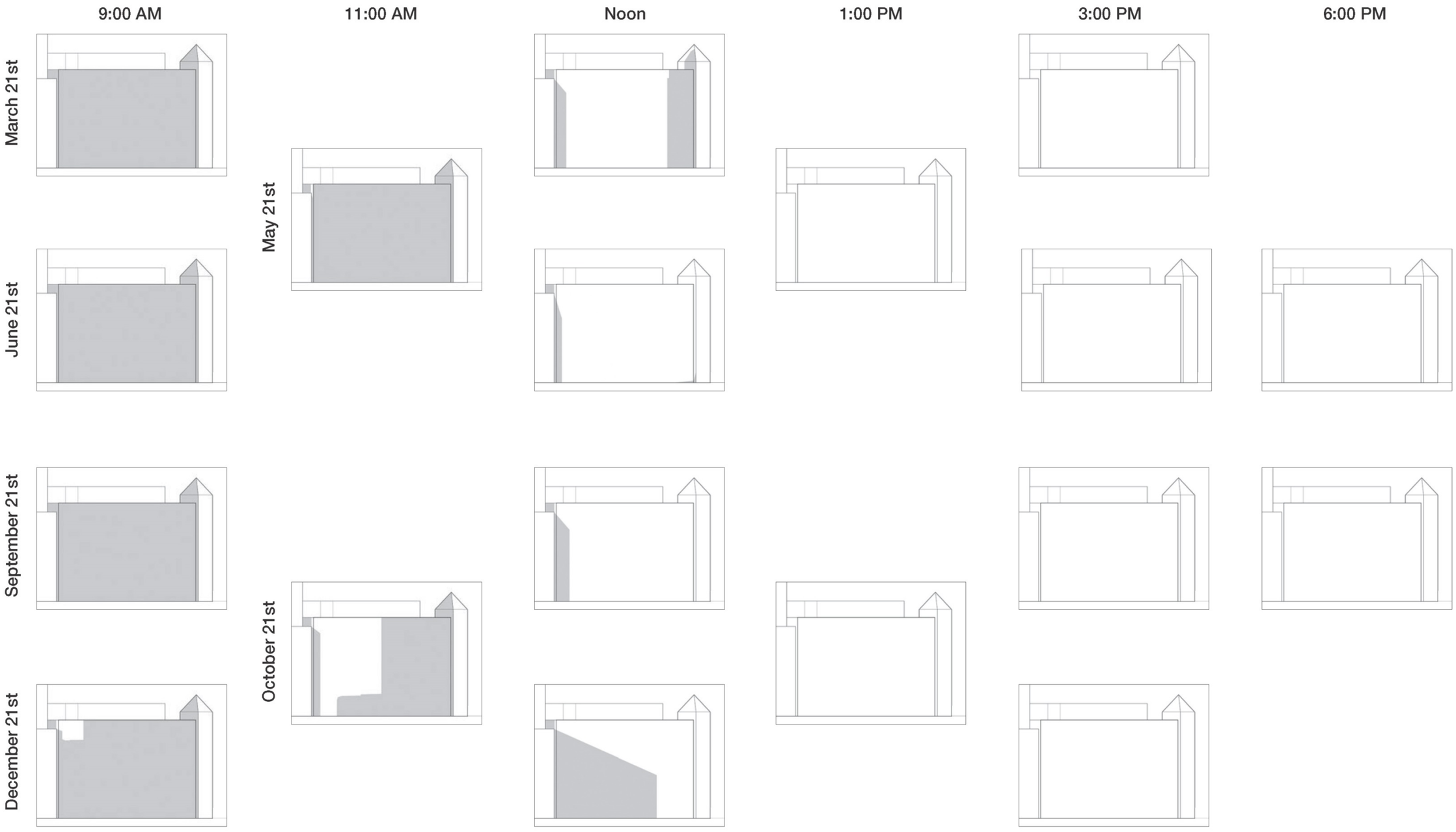


1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

South Station Air Rights Boston, Massachusetts

Figure 47

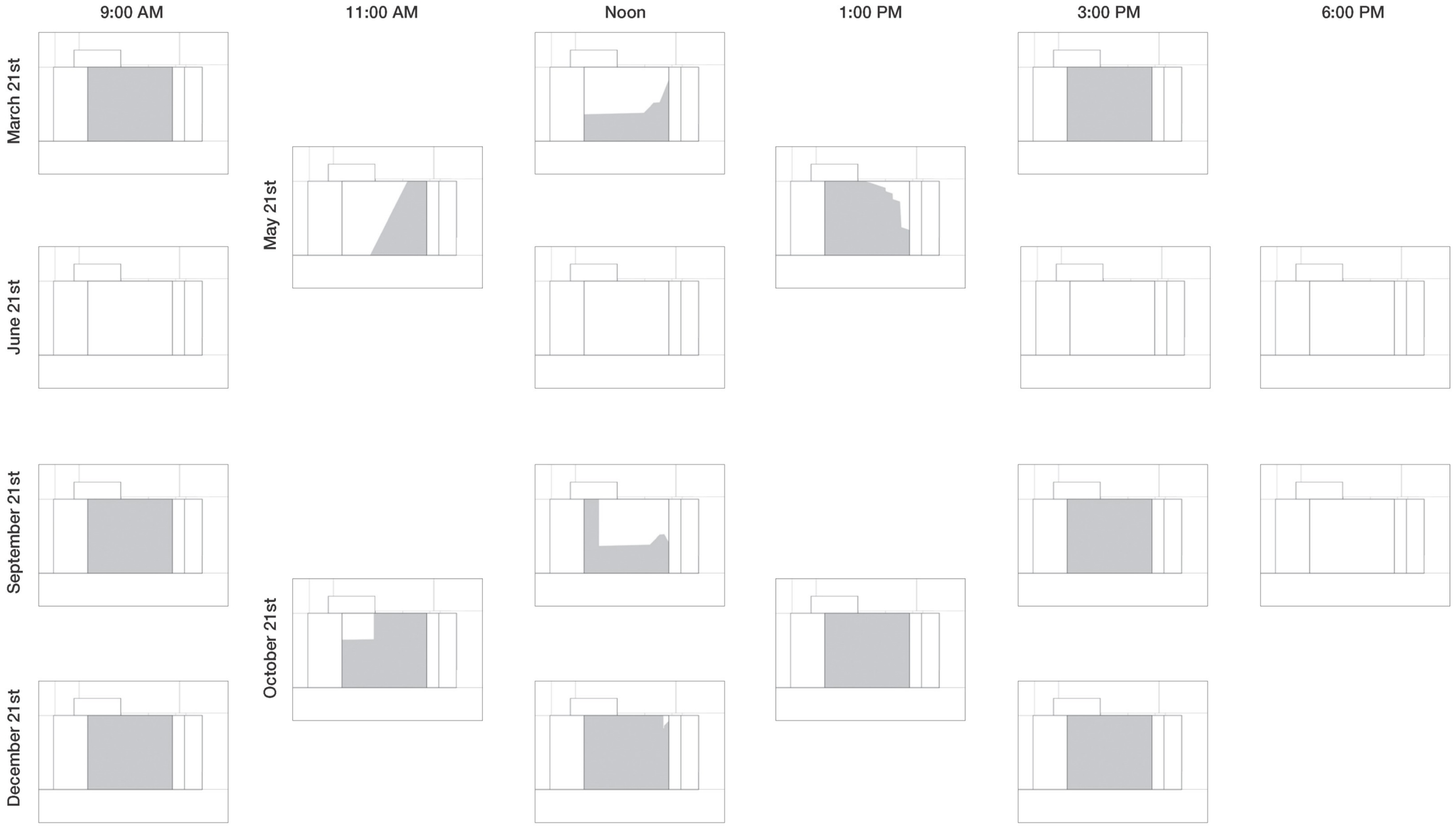
Façade Shadow Study: United Shoe Machinery Building – Federal Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 48

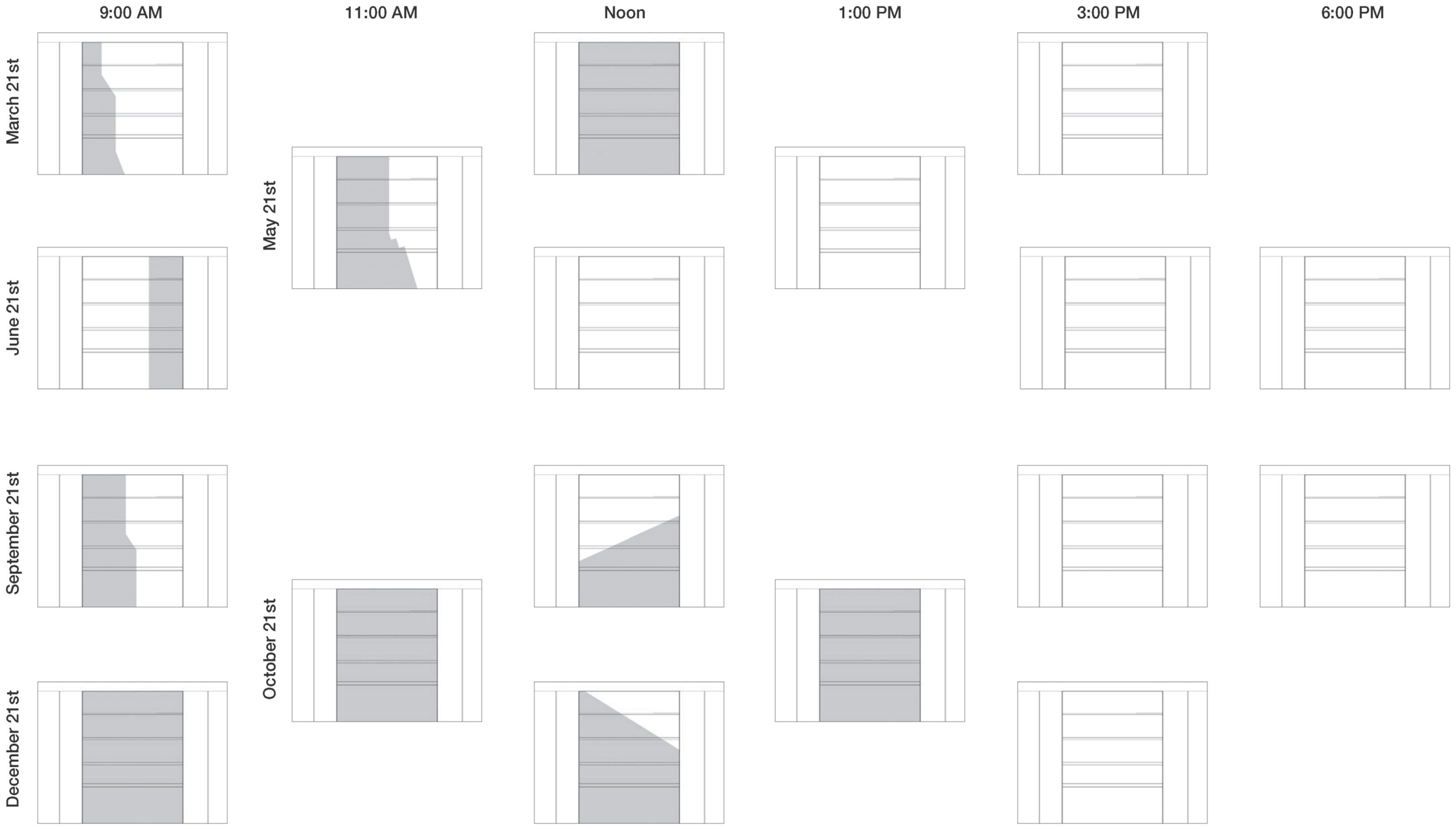
Façade Shadow Study: Bedford Building – Lincoln Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 49

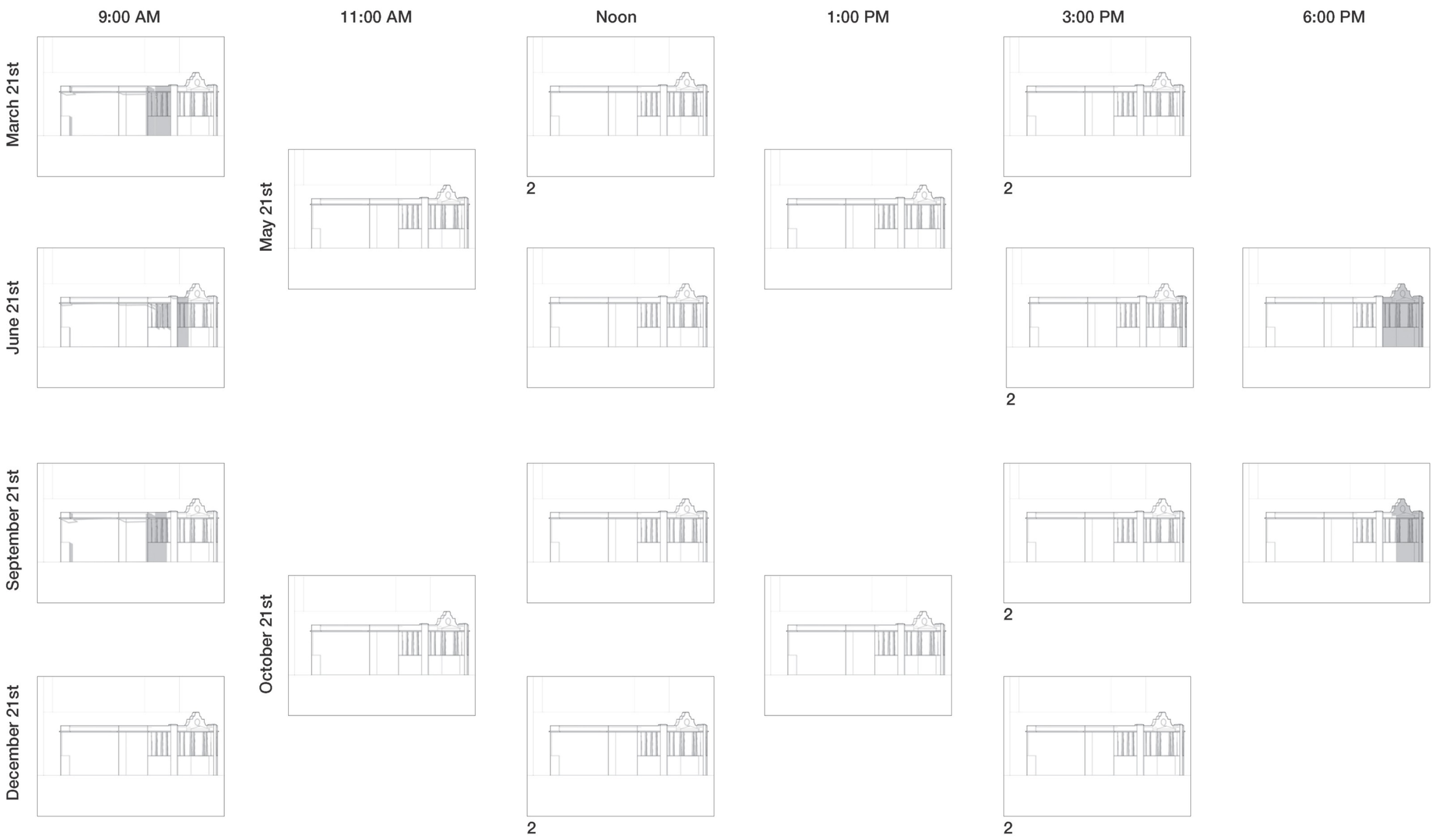
Façade Shadow Study: Church Green – Bedford Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 50

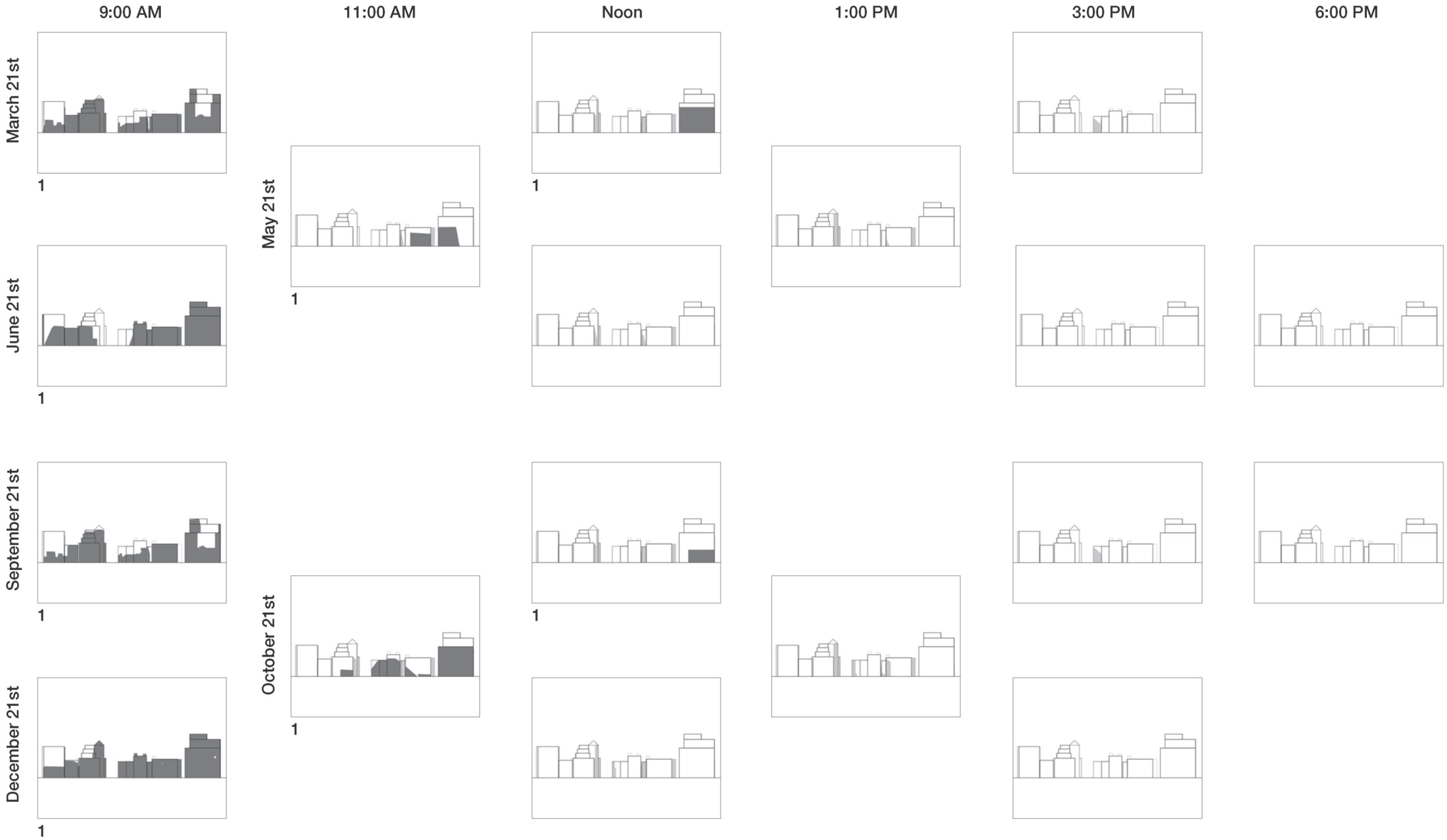
Façade Shadow Study: Church Green – Lincoln Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 51

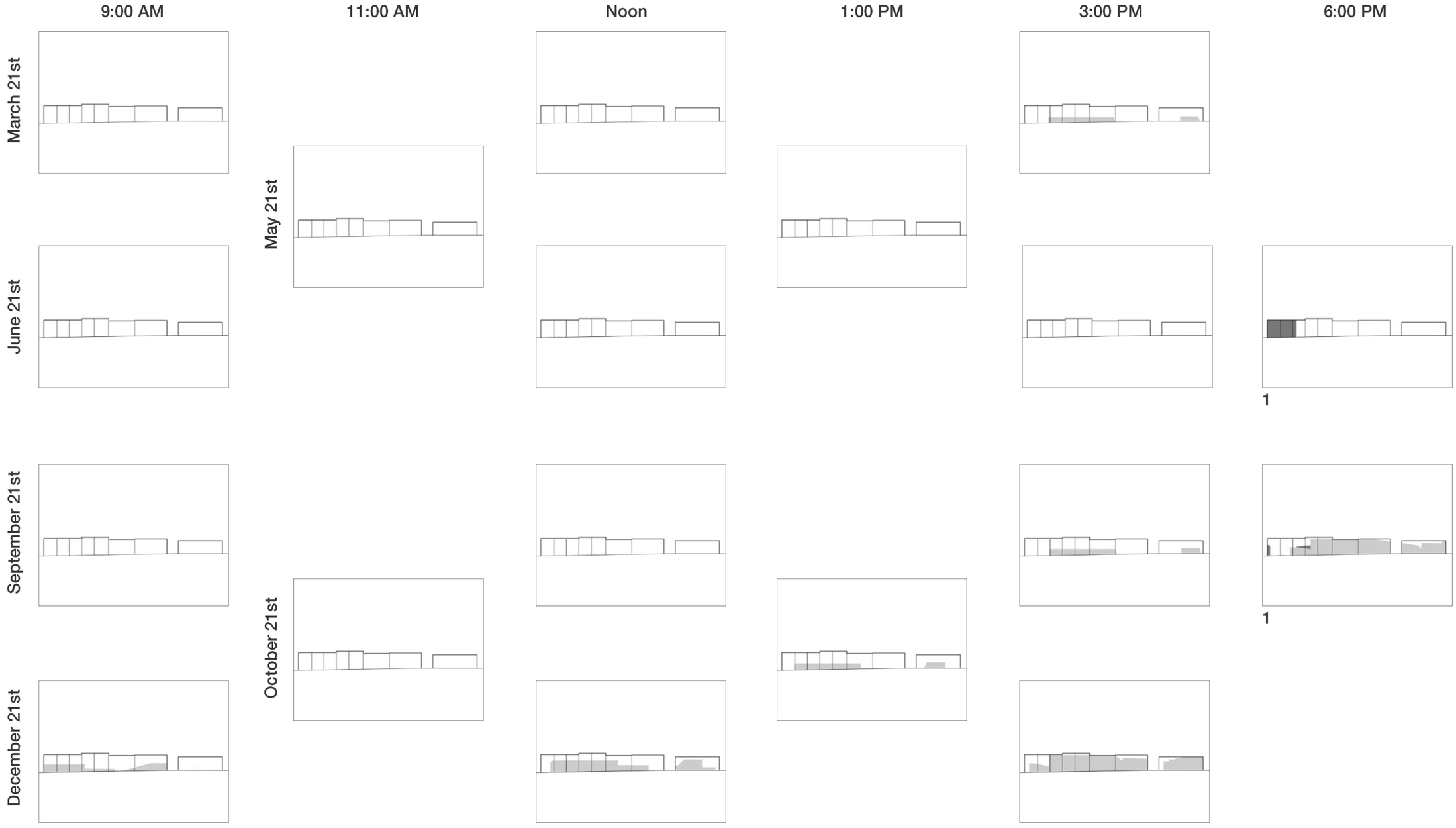
Façade Shadow Study: South Station Head House – Summer Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 52

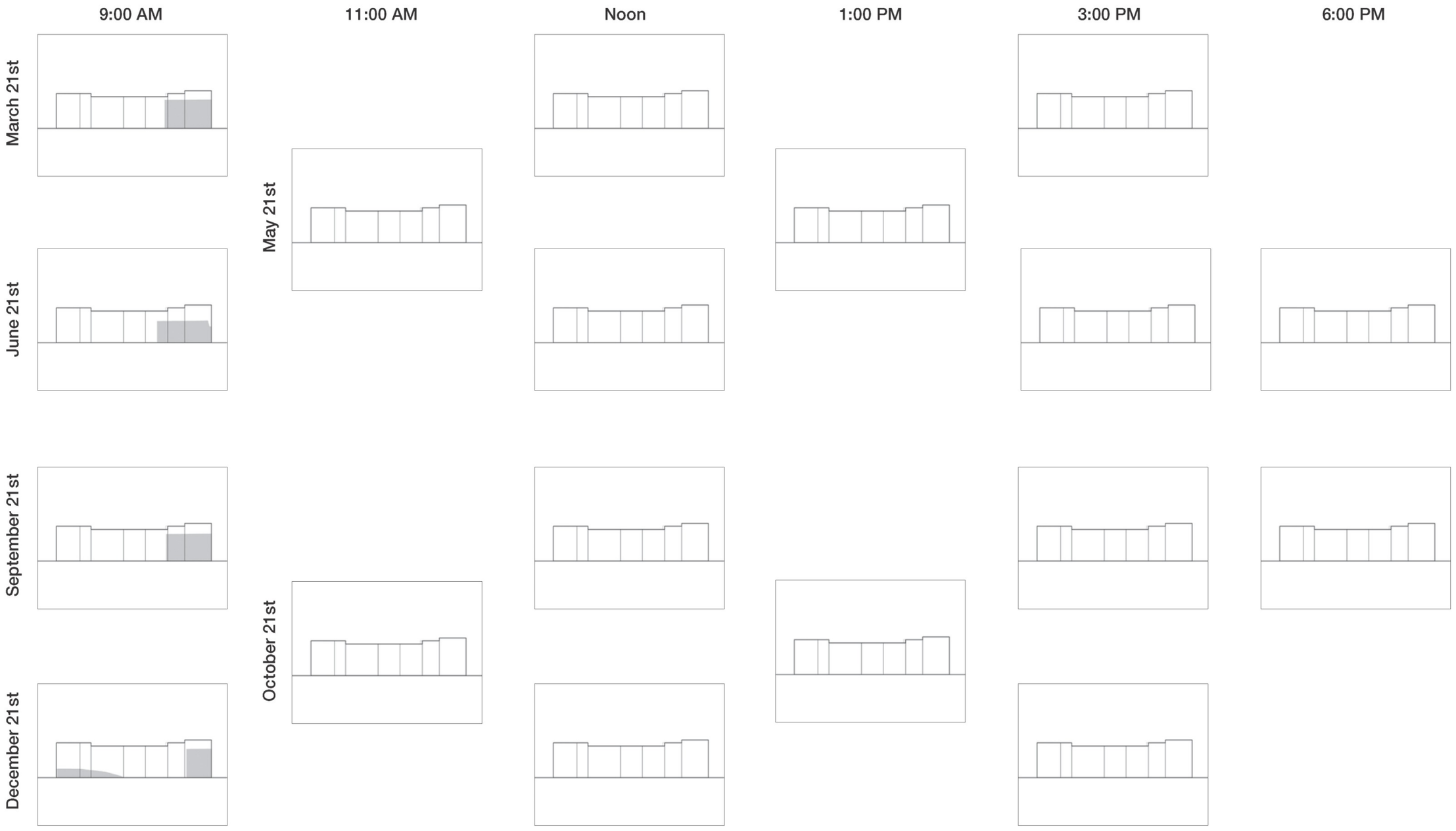
Façade Shadow Study: Leather District – Atlantic Avenue Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 53

Façade Shadow Study: Fort Point District – Summer Street Elevation



1 Some impact from proposed buildings
2 See Figures 1 to 18 for impacts to roofs of buildings

Figure 54

Façade Shadow Study: Textile District – Edinboro Street Elevation

Appendix C

Climate Change Checklist

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

A.1 - Project Information

Project Name:	**South Station Air Rights**
Project Address Primary:	
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**David Perry, Hines, David.Perry@hines.com**

A.2 - Team Description

Owner / Developer:	**South Station Phase I Owner LLC (an affiliate of Hines Interests Limited Partnership and Gemdale Propertues and Investment Corporation Limited)**
Architect:	**Pelli Clark Pelli Architects and Kendall/Heaton Associates Inc.**
Engineer (building systems):	**Cosentini**
Sustainability / LEED:	**Noresco**
Permitting:	**Epsilon Associates**
Construction Management:	**TBD**
Climate Change Expert:	

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

☐ PNF / Expanded PNF Submission	☐ Draft / Final Project Impact Report Submission	☐ BRA Board Approved	☑ Notice of Project Change
☐ Planned Development Area	☐ BRA Final Design Approved	☐ Under Construction	☐ Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	Residential, Office, Retail, Hotel
List the First Floor Uses:	*Retail, Lobbies, Mechanical*

What is the principal Construction Type – select most appropriate type?

☐ Wood Frame	☐ Masonry	☑ Steel Frame	☑ Concrete

Describe the building?

Site Area:	*361,076 SF*	Building Area:	*2,522,000 SF*
Building Height:	*Up to 678 Ft.*	Number of Stories:	*Up to 51 Flrs.*
First Floor Elevation (reference BCB):	*18.4 ft.*	Are there below grade spaces/levels, if yes how many:	*No*

A.5 - Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)? **(Phase 1)**

Select by Primary Use:	☐ New Construction	☑ Core & Shell	☐ Healthcare	☐ Schools
	☐ Retail	☐ Homes Midrise	☐ Homes	☐ Other
Select LEED Outcome:	☐ Certified	☐ Silver	☑ Gold	☐ Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	*Yes (Phase 1)*	Certified:	*Yes*

A.6 - Building Energy-

What are the base and peak operating energy loads for the building?

Electric:	*(kW)*	Heating:	*23,000 (MBtu/hr)*
What is the planned building Energy Use Intensity:	*(kWh/SF)*	Cooling:	*2,800 (Tons/hr)*

What are the peak energy demands of your critical systems in the event of a service interruption?

Electric:	*6,500 (kW)*	Heating:	*87 kW*
		Cooling:	*144 kW*

What is nature and source of your back-up / emergency generators?

Electrical Generation:	*6,750 (kW)*		Fuel Source:	*Diesel*
System Type and Number of Units:	☑ Combustion Engine	☐ Gas Turbine	☐ Combine Heat and Power	*4 Units*

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

What is the full expected operational life of key building systems (e.g. heating, cooling, ventilation)?

Select most appropriate:	☐ 10 Years	☑ 25 Years	☐ 50 Years	☐ 75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

8/91 Deg.

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

95 Deg.	*5 Days*	*6 Events / yr.*

What Drought characteristics will be used for project planning – Duration and Frequency?

30-90 Days	*0.2 Events / yr.*

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

45 Inches / yr.	*4 Inches*	*0.5 Events / yr.*

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

105 Peak Wind	*10 Hours*	*0.25 Events / yr.*

B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:	***TBD***
How is performance determined:	Energy model

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:	☑ High performance building envelop	☑ High performance lighting & controls	☐ Building day lighting	☐ EnergyStar equip. / appliances
	☑ High performance HVAC equipment	☑ Energy recovery ventilation	☐ No active cooling	☐ No active heating
Describe any added measures:				

What are the insulation (R) values for building envelop elements?

Roof:	*R = TBD*	Walls / Curtain Wall Assembly:	*R = 0.06*
Foundation:	*R = TBD*	Basement / Slab:	*R = TBD*
Windows:	*U = 0.41*	Doors:	*R = TBD*

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

☐ On-site clean energy / CHP system(s)	☐ Building-wide power dimming	☐ Thermal energy storage systems	☐ Ground source heat pump
☐ On-site Solar PV	☐ On-site Solar Thermal	☐ Wind power	☑ None
Describe any added measures:			

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate:	☐ Connected to local distributed electrical	☐ Building will be Smart Grid ready	TBD Connected to distributed steam, hot, chilled water	☐ Distributed thermal energy ready

Will the building remain operable without utility power for an extended period?

	No	If yes, for how long:	*Days*
If Yes, is building "Islandable?			
If Yes, describe strategies:			

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	☐ Solar oriented – longer south walls	☐ Prevailing winds oriented	☐ External shading devices	☐ Tuned glazing,
	☐ Building cool zones	☑ Operable windows	☑ Natural ventilation	☐ Building shading
	☐ Potable water for drinking / food preparation	☐ Potable water for sinks / sanitary systems	☐ Waste water storage capacity	☑ High Performance Building Envelop
Describe any added measures:				

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	☐ High reflective paving materials	☐ Shade trees & shrubs	☑ High reflective roof materials	☑ Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:	☐ On-site retention systems & ponds	☑ Infiltration galleries & areas	☐ Vegetated water capture systems	☑ Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	☐ Hardened building structure & elements	☑ Buried utilities & hardened infrastructure	☐ Hazard removal & protective landscapes	☐ Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

TBD, The South Station Expansion project includes a proposal for a higher seawall to mitigate against future flooding

Describe site conditions?

Site Elevation – Low/High Points:	*Entrance lobby at 18.4 feet Boston City Base. Building lobbies at approximately 95' above grade or higher*
Building Proximity to Water:	*~375 Ft.*

Is the site or building located in any of the following?

Coastal Zone:	*Yes*	Velocity Zone:	*No*
Flood Zone:	*No*	Area Prone to Flooding:	*No*

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*No*	Future floodplain delineation updates:	*No*

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

0 Ft.

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. ***Otherwise you have completed the questionnaire; thank you!***

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*3 Ft.*	Frequency of storms:	*0.25 per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*N/A*	First Floor Elevation:	*18.4 ft*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

☐ Systems located above 1st Floor.	☑ Water tight utility conduits	☐ Waste water back flow prevention	☐ Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes	If yes, to what height above 100 Year Floodplain:	*Access lobby from parking garage ~60 feet above grade*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	No
If Yes, describe:	

Will the building remain occupiable without utility power during an extended period of inundation:

No	If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:	*Yes. Majority of Project will be above South Station with additional access options*	☐ Hardened / Resilient Ground Floor Construction	☐ Temporary shutters and or barricades	☑ Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	*Not necessary per note above*	☐ Surrounding site elevation can be raised	☐ Building ground floor can be raised	☐ Construction been engineered
Describe additional strategies:				

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	*No*	☐ Solar PV	☐ Solar Thermal	☐ Clean Energy / CHP System(s)
		☐ Potable water storage	☐ Wastewater storage	☐ Back up energy systems & fuel

Describe any specific or additional strategies:	

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov

Appendix D

Accessibility Checklist

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
    a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
    a. http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Boston Complete Street Guidelines
    a. http://bostoncompletestreets.org/
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
    a. http://www.cityofboston.gov/Disability
5. City of Boston – Public Works Sidewalk Reconstruction Policy
    a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
    a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations
    a. http://www.mbta.com/about_the_mbta/accessibility/

Article 80 | ACCESSIBILTY CHECKLIST

Project Information

Project Name:	**South Station Air Rights Project**
Project Address Primary:	**650 Atlantic Avenue**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**David Perry, Hines, David.Perry@hines.com**

Team Description

Owner / Developer:	**South Station Phase I Owner LLC (an affiliate of Hines Interests Limited Partnership and Gemdale Properties and Investment Corporation Limited)**
Architect:	**Pelli Clarke Pelli Architects and Kendall/Heaton Associates**
Engineer (building systems):	**Cosentini**
Sustainability / LEED:	**Noresco**
Permitting:	**Epsilon Associates, Inc.**
Construction Management:	**TBD**

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	**BRA Board Approved**
BRA Design Approved	Under Construction	Construction just completed:

Article 80 | ACCESSIBILTY CHECKLIST

Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One to Three Unit	**Residential - Multi-unit, Four +**	Institutional	Education
Commercial	**Office**	**Retail**	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	*Train Terminal; Residential, Office, Hotel and Retail Lobbies*		

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	**Steel Frame**	**Concrete**

Describe the building?

Site Area:	*361,076 SF*	Building Area:	*2,522,000 SF*
Building Height:	*678 Ft.*	Number of Stories:	*Up to 51 Flrs.*
First Floor Elevation:	*18.4' BCB Elev.*	Are there below grade spaces:	*No*

Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and proximate institutions such as, but not limited to hospitals, elderly and disabled housing, and general neighborhood information. The proponent should identify how the area surrounding the development is accessible for people with mobility impairments and should analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the development neighborhood and identifying characteristics.	The proposed project site is located on the south side of the Financial District and adjacent to the Leather District. The site boundaries include Summer Street to the north, Atlantic Avenue to the west, The US Post Office and 245 Summer Street properties to the east, and the train tracks to the south.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	The site is served by the Acela Express, Lake Shore Limited and Northeast Regional intrastate rail lines. Also the CapeFLYER, Fairmont Line, Framingham/Worcester Line, Franklin Line, Greenbush Line, Kingston/Plymouth Line, Middleborough/Lakeview Line, Needham Line, and the Providence/Stoughton Line regional rail lines serve the site. The Red Line and Silver Line, in addition the 4, 7 11, 448, 449, and 459 local bus lines serve South Station.

List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Massachusetts General Hospital, Tufts University School of Dental Medicine, Sackler School of Biomedical Sciences, William J. Ostiguy High School, Josiah Quincy School, Quincy Upper School.
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	The site is a key public use facility. U.S Postal Service, Federal Reserve Bank of Boston, The Rose Kennedy Greenway

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?	Yes
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	Site sidewalk finishes include standard brick and two types of granite pavers.
Are the sidewalks and pedestrian ramps existing-to-remain? **If yes,** have the sidewalks and pedestrian ramps been verified as compliant? **If yes,** please provide surveyors report.	Selective demolition of sidewalks and pedestrian ramps to occur. Sidewalks are not designed to that level of detail at this time.
Is the development site within a historic district? **If yes,** please identify.	No

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	*N/A*
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Atlantic Avenue: Sidewalk approximately 29' feet wide, with 140'-0" frontage. 10' planting and paving zone adjacent to Atlantic Avenue, with remaining 19' as pedestrian zone.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	Sidewalks to be constructed of pavers and bricks to match existing condition and City Standard. Atlantic Avenue 10' planting and paving zone to have granite pavers with brick infill. Tree wells to be covered by metal grate, flush with sidewalk.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	N/A
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	No
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	N/A

Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?	527, not including existing MBTA parking.
What is the total number of accessible spaces provided at the development site?	11 spaces total, including 2 van spaces
Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	No
Where is accessible visitor parking located?	Distributed on each floor, closest accessible location to the garage elevators.
Has a drop-off area been identified? **If yes,** will it be accessible?	Accessible Office drop-off area located on level P1 near garage elevators and on Atlantic Avenue. Accessible Residential drop off area is located on Parking Level P4.
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	See attached plans.

Article 80 | ACCESSIBILTY CHECKLIST

Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	See attached plans.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Atlantic Avenue Entry flush condition with elevator access to shuttle lobby above. Entry from parking to be flush to either building entrance or garage elevator lobby entrance.
Are the accessible entrance and the standard entrance integrated?	Yes.
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes. Diagram of accessible paths attached.
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	Signage is not developed at this time.

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

What is the total number of proposed units for the development?	There will be 175 units.
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	All 175 units will be for sale as condominiums. All are market rate.
How many accessible units are being proposed?	None. As per 521 CMR, condominiums will comply with the requirements for Group 1 units. An accessible route will be provided to each apartment and all rooms and spaces in the dwelling unit. As required by 521 CMR, certain apartment spaces and elements shall be adaptable.

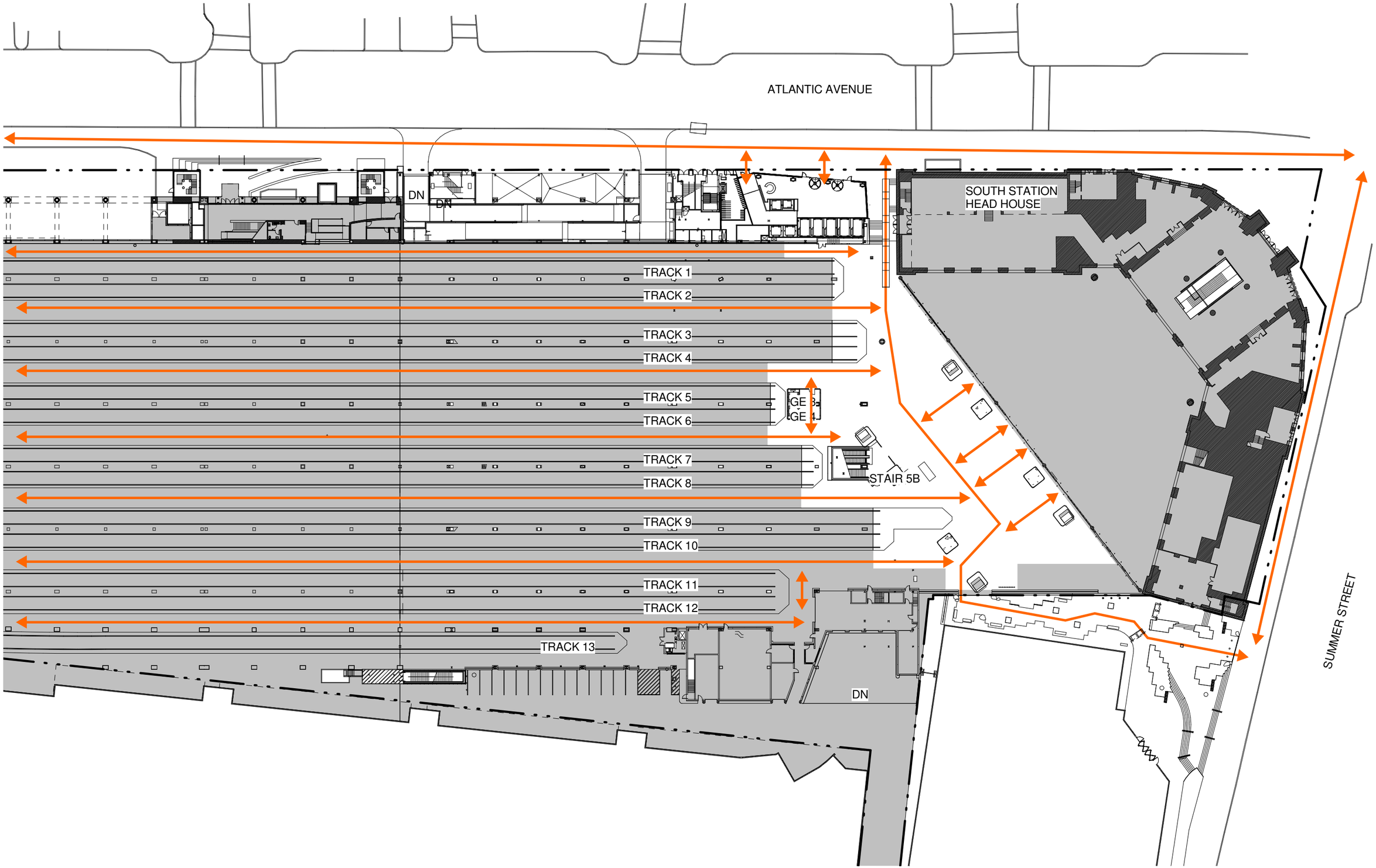
Article 80 | ACCESSIBILTY CHECKLIST

Please provide plan and diagram of the accessible units.	No accessible units are required.
How many accessible units will also be affordable? If none, please describe reason.	
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	No.
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	No
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities



KENDALL HEATON ASSOCIATES

ACCESSIBLE ROUTES THROUGH SITE

BOSTON SOUTH STATION

1/64" = 1'-0"

06/20/16

ATLANTIC AVENUE

DROP OFF

DROP OFF

OFFICE ENTRY

RESIDENTIAL ENTRY

SOUTH STATION HEAD HOUSE

GE 3

GE 4

STAIR 5B

SUMMER STREET

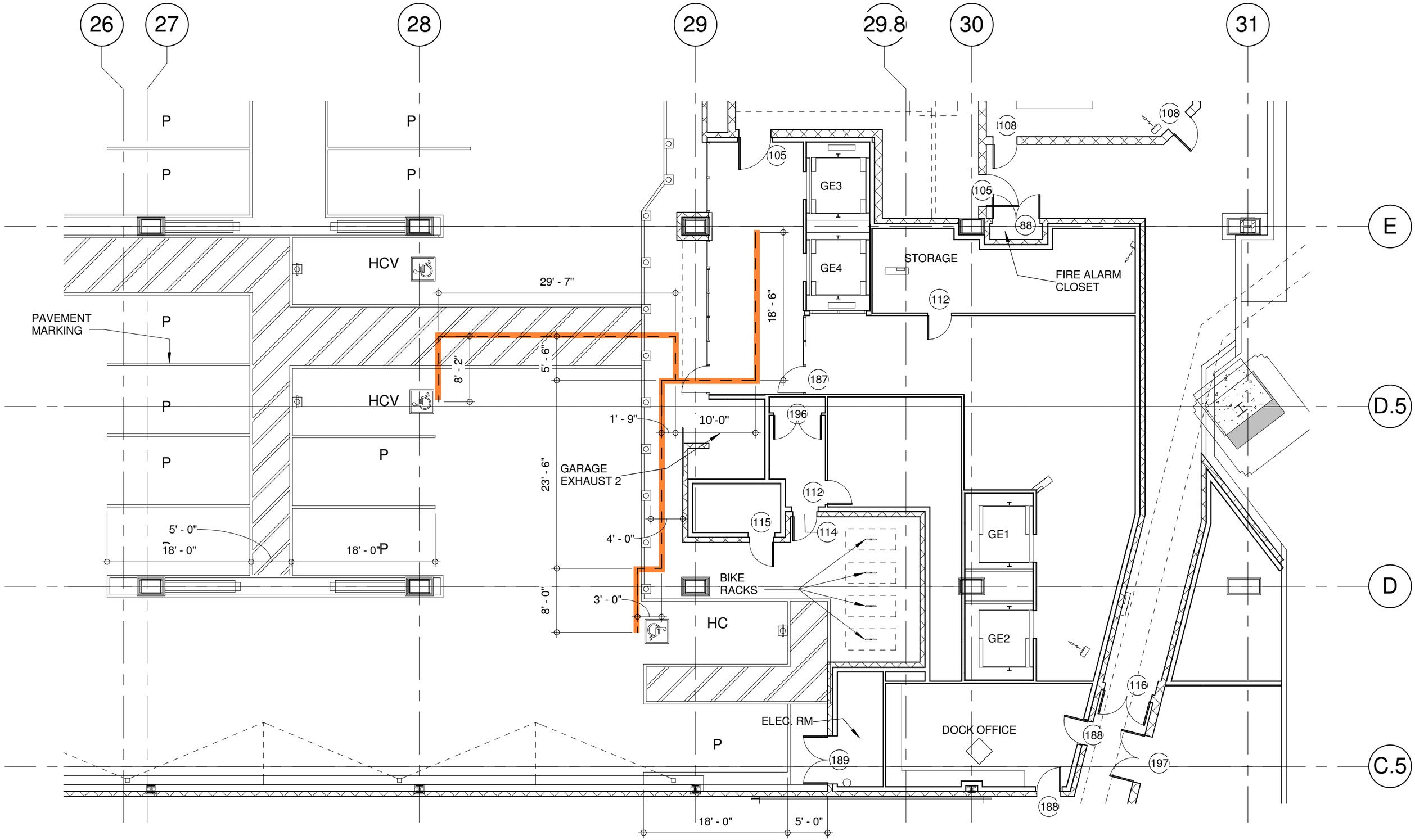
KENDALL HEATON ASSOCIATES

BOSTON SOUTH STATION

ACCESSIBLE ROUTE - VEHICLE DROP OFF AT ATLANTIC AVENUE

1/32" = 1'-0"

06/20/16



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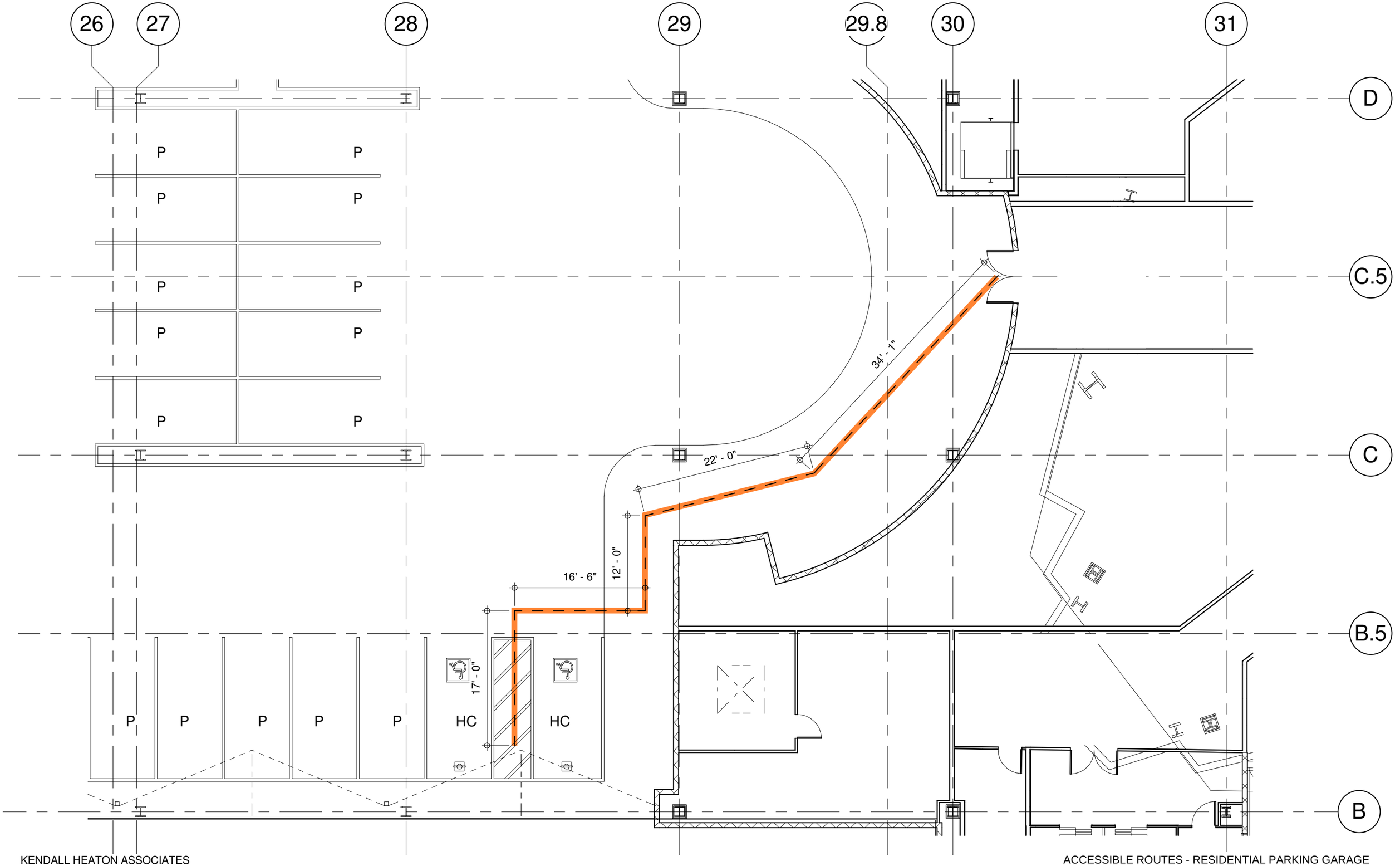
ACCESSIBLE ROUTES - OFFICE PARKING GARAGE

BOSTON SOUTH STATION

3/32" = 1'-0"

06/20/16



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ACCESSIBLE ROUTES - RESIDENTIAL PARKING GARAGE

BOSTON SOUTH STATION

3/32" = 1'-0"

06/20/16

TOTAL OCCUPIABLE AREA:

12,700 sq. ft.

OUTDOOR TERRACE BELOW

CANOPY

OVER-RUNS

OPEN TO BELOW

RES. OFFICE

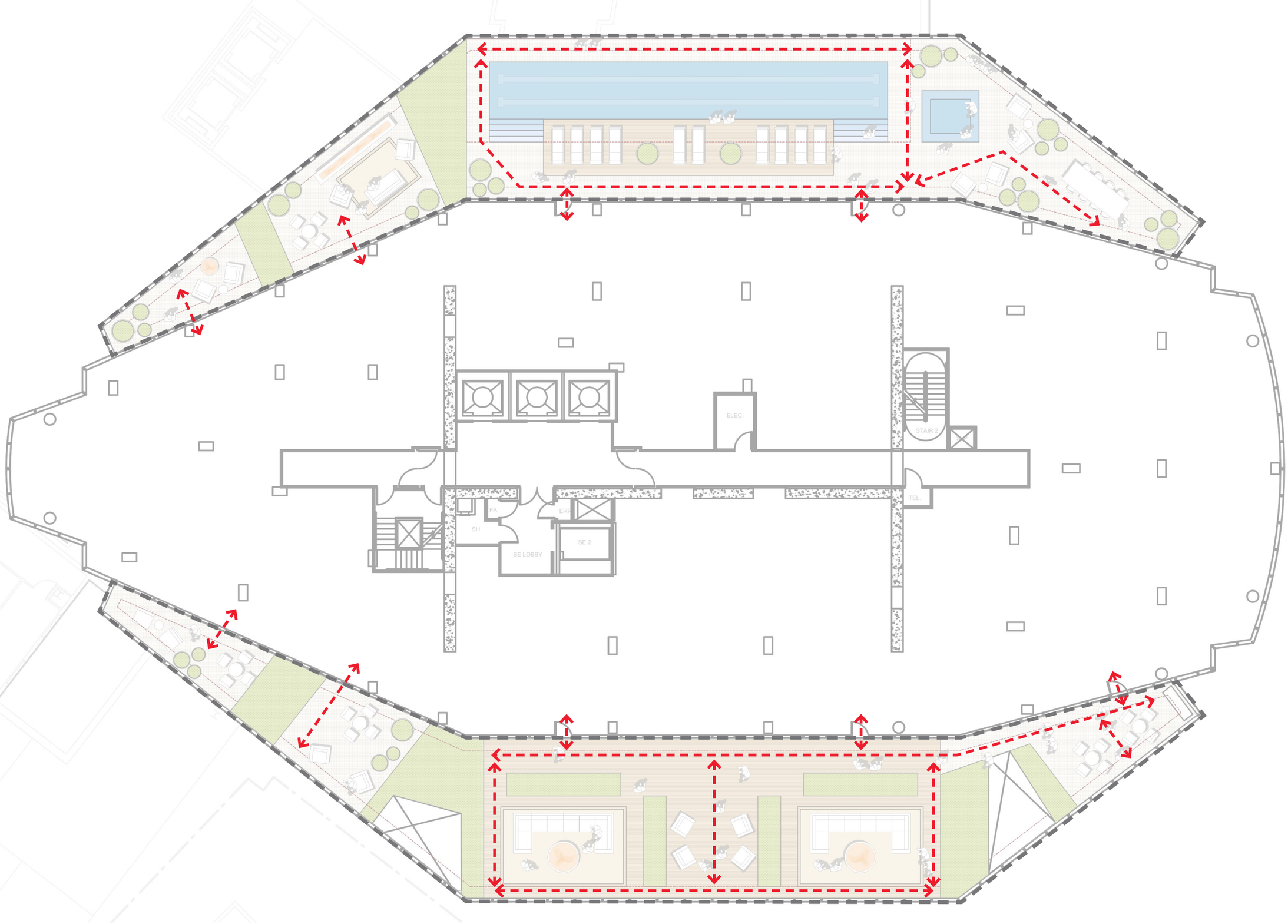
OFFICE / AMENITY
10,000 SF +/-

RESIDENTIAL LOBBY

OFFICE / AMENITY
15,000 SF +/-

OJB

ACCESSIBLE ROUTES -LEVEL 135' SCHEME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