Project Notification Form

Redevelopment of the Government Center Garage

Boston, Massachusetts

SUBMITTED TO
Boston Redevelopment Authority

SUBMITTED BY
The HYM Investment Group, LLC
On behalf of
Bulfinch Congress Holdings, LLC

PREPARED BY
VHB Vanasse Hangen Brustlin, Inc.

IN ASSOCIATION WITH
CBTarchitects
Howard/Stein-Hudson Associates, Inc.
Rubin and Rudman, LLP
ARUP
McNamara/Salvia Inc.

June 2013

THE
HYM
INVESTMENT GROUP, LLC

June 5, 2013

Mr. Peter Meade
Chief Economic Development Officer
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Re: **Project Notification Form**
Redevelopment of the Government Center Garage
One Congress Street, Boston, Massachusetts

Dear Mr. Meade:

On behalf of Bulfinch Congress Holdings, LLC ("BCH"), the owner of the Project, The HYM Investment Group, LLC ("HYM") is pleased to submit the enclosed Project Notification Form (PNF) for the Redevelopment of the Government Center Garage project located at One Congress Street in downtown Boston (the "Project"). BCH, a joint venture of the National Electrical Benefit Fund and the Lewis Trust Group (the "Applicant"), purchased the property in 2007 with the primary goal of redeveloping the Garage. In 2010, BCH brought on HYM (the "Developer") to operate the Project and to develop a new viable redevelopment plan on behalf of BCH. BCH and HYM are collectively the project proponent (the "Proponent").

The approximately 4.8-acre site is comprised of a single fully built out parcel bounded by New Sudbury and New Chardon Streets on the south and north, respectively (the "Project Site"). The Project Site is bisected in a north-south direction by an extension of Merrimac Street (commonly referred to as Congress Street in this portion of the roadway) forming the major vehicular spine. Merrimac Street continues southward as Congress Street, which begins south of New Sudbury Street.

One of the primary development goals of the Project is to substantially revitalize a key portion of the Government Center Urban Renewal Plan Area, which had originally been developed as a 9-story 2,300 car parking garage. This parking garage has come to be seen as a barrier between the Bulfinch Triangle, the North End, Government Center, Beacon Hill and the West End neighborhoods. By replacing a massive unsightly barrier with two new vibrant mixed-use and appropriately scaled urban blocks, the Project will substantially contribute to improving the vitality and the urban design and architectural character of the Government Center and Bulfinch Triangle areas.

The Project consists of the construction of six new buildings and reuse of a portion of the existing parking garage in order to create a vibrant mix of uses that will enhance the surrounding neighborhood with new residential and retail activity, and provide for public realm improvements. The Project will introduce 771 new housing units (apartments and condominiums) and 204 new hotel rooms to the area as well as provide a total of approximately 1.3 million gross square feet of

office and 82,500 gross square feet of retail. The remaining portion of the parking garage will continue to provide sufficient commercial parking (for transient users) as well as overnight resident parking.

Overall, the Project will achieve the following key goals and benefits to the area:

1. Demolish a substantial portion of the garage, which will reconnect now-divided neighboring communities including the Bulfinch Triangle, the North End, Government Center, Beacon Hill, the West End, and would open Congress Street to daylight for the first time in almost half a century.

2. Create 18/7 activity with the introduction of 771 residential units which will add additional residents to an area that often has little activity after 5:00 pm – except for Bruins and Celtics games.

3. Create a new public plaza and pedestrian promenade, with a significant program of first floor retail, to serve as a gateway and connector between the Bulfinch Triangle (Canal Street), the Rose F. Kennedy Greenway and the emerging Market District.

4. Further transform the former site of an auto-centric above grade garage into a mixed-use transit oriented development with the construction of a new Hubway Station, new bike lanes on adjoining streets where none exist today and an enclosed secure 850-space bicycle parking center, which would be one of, if not the largest bicycle parking center in the City of Boston.

5. Provide a unique and sustainable project through the redevelopment and reuse of a portion of the existing Garage and by utilizing the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, in compliance with Article 37 of the City's Zoning Code (to target LEED Gold rating for office buildings and LEED Silver rating for residential buildings).

6. Create approximately 2,600 construction jobs, over $11 million in annual tax revenue and bring over 6,000 new employees from the creative industry, technology, lifestyle and health care sectors to a part of Boston traditionally dominated by government tenants.

7. Employ a multi-phased development approach and schedule which will allow the construction of major project phases without removing the entire parking structure and insure a continued parking supply for the area, particularly for commercial parking (daily transient users/visitors) and overnight resident parking.

The proposed redevelopment program is respectful of the goals of the *Greenway District Planning Study Use and Development Guidelines* (specifically, the Market District and Government Center sub-district) and is consistent with a number of the city's planning goals and initiatives for redevelopment of the area, including; (i) the Crossroads Initiative; (ii) Boston Complete Streets Guidelines; (iii) the Climate Action Plan; (iv) the updated Open Space Plan; (v) Article 45, Government Center/Markets District of the Zoning Code; and (vi) Article 37, Green Buildings of the Zoning Code. Also, the Project supports many regional and state-wide planning goals and initiatives. The City and the region as a whole will benefit from the Project as a result of its job creation, housing, and additional city and state tax revenues.

This report presents details about the Project and provides preliminary analysis of traffic/transportation, potential environmental impacts, and infrastructure needs in order to inform reviewing agencies and the community about the Project, its potential impacts, and the mitigation measures proposed to address those potential impacts. Requests for copies of this submittal should be directed to Lauren DeVoe at 617-924-1770 or via e-mail at ldevoe@vhb.com.

We look forward to working with you and your staff in your continuing review of this project.

Very truly yours,

The HYM Investment Group, LLC

Thomas N. O'Brien
Managing Director

Enclosure

Project Notification Form

Redevelopment of the Government Center Garage

Boston,
Massachusetts

Submitted to **Boston Redevelopment Authority**

Proponent **HYM Investment Group, LLC**
on behalf of Bulfinch Congress Holdings, LLC
One Congress Street
Boston, MA 02114

Prepared by **Vanasse Hangen Brustlin, Inc.**
101 Walnut Street
Watertown, MA 02472
In association with:
CBTarchitects
Howard/Stein-Hudson Associates, Inc.
Rubin and Rudman, LLP
ARUP
McNamara Salvia

June 2013

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1 Project Description

1.1 Introduction

Consistent with Article 80 of the Boston Zoning Code and Enabling Act, this report presents the Redevelopment of Government Center Garage project (the "Project"). The Project is generally located at One Congress Street between New Sudbury and New Chardon Streets in the Government Center area of Boston (the "Project Site"). Refer to Figure 1.1 for a site location map.

A remnant of the urban renewal era with an outdated program and planning form, the Project Site contains an antiquated and underutilized 11-story above grade parking garage structure with failing retail. Additionally, the Government Center Garage (the "Garage") is a physical, visual, and perceptual barrier between the surrounding neighborhoods. The prime objective of the Project is to break-up the existing 1960's urban renewal mega-block by opening Merrimac Street (referred to herein as Congress Street)[1] to air and daylight and creating two new vibrant, mixed use, appropriately scaled urban blocks with active and pedestrian-friendly ground floors and unique public spaces that will reconnect the areas around it. The Project aims to be a leader in sustainable, transit-oriented, and integrated redevelopment that will serve as a catalyst for further redevelopment of the Government Center area. By bringing back uses, such as residential and retail (which previously existed prior to 1960's urban renewal of the area) and introducing new office tenants from the new economy (high tech and creative industry), the Project will revitalize the area, which is currently dominated by government office use.

The Project is consistent with a number of the city's planning goals and initiatives for redevelopment of the area, including: (i) the Greenway District Planning Study Use and Development Guidelines (specifically, the Market District and Government Center sub-district); (ii) the Crossroads Initiative; (iii) Boston Complete Streets Guidelines; (iv) the Climate Action Plan; (v) the updated Open Space Plan; (vi) Article 45, Government Center/Markets District of the Zoning Code; and (vii) Article 37, Green Buildings of the Zoning Code. Also, the Project supports many regional and state-wide planning goals and initiatives.

This report presents details about the Project and provides preliminary analysis of traffic/transportation, potential environmental impacts, and infrastructure needs in order to inform reviewing agencies and the

[1] The portion of the public way that runs under the Garage is commonly referred to as Congress Street; however, according to the City of Boston's Street Book, it is named Merrimac Street.

community about the Project, its potential impacts, and the mitigation measures proposed to address those potential impacts. The following chapter presents the development team, background and history of the Project Site, and a summary of its public benefits. A discussion of how the Project is consistent with local, regional, and state planning goals and initiatives is also provided. Lastly, an overview of the public review and participation process, a summary of approvals, and an outline of subsequent sections of this report are also included.

1.2 Applicant Information

Bulfinch Congress Holdings, LLC ("BCH"), the owner of the Project, is a joint venture of the National Electrical Benefit Fund and The Lewis Trust Group (the "Applicant"). BCH purchased the property in 2007 with the primary goal of redeveloping the Garage; however, the recent recession brought on changed circumstances with all new development essentially stopping as the financial markets went into retreat. Through this time, BCH remained committed to the Project despite the on-site office component becoming 100 percent vacant when the U.S. Environmental Protection Agency (EPA) vacated the property. The recession also caused material drops in parking activity at the Garage. In 2009, BCH brought on The HYM Investment Group, LLC ("HYM") to operate the Project and to develop a new viable redevelopment plan on behalf of BCH (the "Developer"). BCH and HYM are collectively the project proponent (the "Proponent").

HYM is a Boston based real estate company focused on the acquisition, development and management of complicated urban mixed-use projects. For over 35 years, HYM's principals have been working on real estate ventures in the Boston, New York and Washington DC corridor. HYM develops, invests, owns and manages real estate assets for its own portfolio and on behalf of major institutional and private investors. HYM is committed to making a positive impact on the communities it works within. In addition to the Project, HYM is currently undertaking the NorthPoint project in Cambridge and Waterside Place in the Seaport District of Boston. The following lists the key members of the development team for the Project:

Developer

The HYM Investment Group, LLC on behalf of
Bulfinch Congress Holdings, LLC
One Congress Street, 10th Floor
Boston, MA 02114
(617) 248-8905
Contact: Thomas N. O'Brien, Managing Director
Douglas J. Manz, Director of Development

Legal Counsel

Rubin and Rudman, LLP
50 Rowes Wharf
Boston, MA 02110
(617) 330-7000
Contact: James Greene, Attorney

Architect/Sustainability

CBTarchitects
110 Canal Street
Boston, MA 02114
(617) 262-4354
Contact: David Hancock, Principal
Kishore Varanasi, Principal/Director of Urban Design

Civil Engineering, Permitting, Historic Advisor

Vanasse Hangen Brustlin, Inc./VHB
99 High Street, 10th Floor
Boston, MA 02210
(617) 728-7777
Contact: Howard Moshier, P.E., LEED AP, Senior Project Manager
Lauren DeVoe, AICP, LEED AP-BD+C, Senior Environmental Planner

Traffic Engineer

Howard/Stein-Hudson Associates, Inc.
38 Chauncy Street, 9th Floor
Boston, MA 02111
(617) 348-3314
Contact: Guy Busa, Jr., Principal

Sustainability Consultant

ARUP
955 Massachusetts Avenue
Cambridge, MA 02139
(617) 864 2987
Contact: Rebecca Hatchadorian, Sustainability Consultant

Structural Engineer

McNamara/Salvia, Inc.
160 Federal Street, #5
Boston, MA 02110
(617) 737-0040
Contact: Adam McCarthy

Wind Consultant

Rowan Williams Davies and Irwin Inc. (RWDI)
650 Woodlawn Road West
Guelph, Ontario, Canada N1K 1B8
(519) 823-1311
Contact: Jordan Gilmour, Project Manager

Parking Consultant

Walker Parking
20 Park Plaza
Boston, MA 02116
617-371-4514
Contact: Art Stadig, Vice President

Mechanical/Electrical Engineer

WSP Flack+Kurtz
88 Black Falcon Avenue Boston, MA 02210
617-371-4514
Contact: Allan Montpellier

Construction Manager

Tishman Construction Corporation, New England Region
An AECOM Company
66 Long Wharf, 2nd Floor
Boston, MA 02110
617-371-4514
Contact: Thomas A. Erickson, Executive Vice President

1.3 Project Area Description

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1.3.1 Background and History

The existing garage structure was built in the late 1960's as part of an urban renewal project – the Government Center Urban Renewal District, which mandated the clearance of numerous residential and commercial buildings for the construction of local, state, and federal government offices and other related facilities (residential uses were prohibited). This resulted in the construction of a mega-block parking garage, which visually and physically divided and disrupted the urban neighborhoods and districts around it. Conceived at a time when auto-centric policy dominated, the existing underutilized 2,300-space parking garage adds little to the vitality of the area around it and in many ways detracts from the vibrancy of this section of downtown Boston. Refer to Chapter 2, *Urban Design* for further details on the history and evolution of the project area.

The Garage was initially constructed to serve short-term parkers with a capacity of 1,865 commercial public parking spaces. In 1990, approximately 256,532 square feet of office space was added in two levels above the existing ninth floor of the Garage. At that time, 445 new parking spaces were added though reconfiguration and restriping in order to support the new office space, increasing the Garage capacity to approximately 2,300 spaces. Approximately 37,602 square feet of retail space is also part of the existing Garage, mostly along Congress Street, which has historically been heavily underutilized.

■

1.3.2 Project Area Location and Context

The Project Site is located within the 1964 Government Center Urban Renewal District, the more recently established Government Center/Markets District (Article 45 of the Code), and the Sudbury Street Restricted Growth Area. The Project Site is generally bounded by New Chardon Street to the north, the John F. Fitzgerald Surface Road (the "Surface Road")/Interstate-93 (I-93) Ramp Parcel to the east, New Sudbury Street to the south, and Bowker Street to the west. Refer to Figures 1.2 and 1.3 for project area context.

The Project Site is immediately adjacent to the following two distinct urban neighborhoods:

- Government Center – the location of Boston City Hall, Suffolk County courthouses, and state and federal office buildings, and
- Bulfinch Triangle, which consists of sports/entertainment uses (e.g., Boston TD Garden complex), offices, retail and residential buildings.

The Project Site is also nearby and/or connected to the following additional urban neighborhoods or distinct sections of the city:

- North End, which consists of residential and neighborhood retail, including restaurants;
- Market District and the Rose F. Kennedy Greenway (also referred to herein as the "Greenway");
- Financial District, which consists of office uses;
- West End, which consists of residential uses and, further northwest, institutional uses (e.g., hospitals/ medical offices); and
- Beacon Hill residential neighborhood.

This very mixed context offers many challenges, but also the opportunity to create a very positive intervention and reconnect the Project Site to these surrounding areas. The Project has the potential to unlock the value of various uses in close proximity. Refer to Chapter 2, *Urban Design* for further details on these distinct areas.

■

1.3.3 Existing Site Conditions

Figure 1.4 shows the existing conditions site plan and Figure 1.5 contains photographs of the current site conditions. The existing garage site totals approximately 176,549 square feet (approximately 4.053 acres), including Congress Street, and is comprised of a single fully built out parcel bounded by New Sudbury and

New Chardon Streets on the south and north, respectively. The existing garage site is bisected in a north-south direction by an extension of Congress Street forming the major vehicular spine.

Ownership is recorded as a single parcel of land from the center lines of Bowker, New Chardon, and New Sudbury Streets to the state highway property line. Various easements exist on, over, and under the parcel, which allow access for public streets and utilities, and for surface and underground construction and operation of MBTA bus and subway systems.

The Project Site, as defined herein, consists of 209,949 square feet, or 4.82 acres, exclusive of Congress Street, is composed of the existing garage site, adjacent roadway areas owned in fee by the Applicant, and a small 5,885-square foot area to be acquired. The area of Congress Street has been excluded from this calculation in order to show the area of the Project Site at the completion of the Project.

The existing garage structure spans Congress Street and occupies the parcels on both the east and west sides of the street (Figure 1.4). The current uses of the Project Site include:

- A 9-story, 2,300-space parking garage with an average daily demand of about 1,050 spaces;
- Approximately 256,000 square feet of office space on two floors built above the Garage;
- Approximately 37,000 square feet of retail space at grade and on the second floor along Congress Street;
- MBTA Haymarket bus facility serving several local and regional bus routes; and
- MBTA Haymarket Transit Station with access to the Green and Orange subway lines.

Enterprise Rent–a-Car operates from a kiosk in the ground-floor garage lobby on the west side of Congress Street and Zipcar maintains eight cars (including two Zipvans) in the Garage. Adjacent to the garage lobby entrance (and under the garage structure) is approximately 4,000 square feet of vacant retail storefront (Figure 1.4). The existing office space above the Garage is not fully occupied. Current tenants include state offices, PUMA, and technology company SCVNGR. Several small businesses currently operate on the east side of Congress Street, including a convenience store and a Dunkin' Donuts. Kaplan Learning Center previously occupied about 17,000 square feet of retail space, but recently vacated to a new location in the Kenmore Square area of Boston.

1.3.3.1 Existing Site Access

Congress Street is a two-way arterial street connecting northward to Storrow Drive and Cambridge via the Science Park Bridge, and southward to I-93 at South Station. Bowker Street to the west of the Project Site is a local street running from New Chardon to Hawkins Street. The Surface Road southbound on the east, adjacent to the Greenway, carries local traffic and is a continuous extension of Washington Street from the Charlestown Bridge to Chinatown. New Chardon Street on the north is a two-way arterial street accessing I-93 south and connecting Washington Street to the east and Cambridge Street to the west. New Sudbury Street is a one-way local street connecting from Cambridge Street and Beacon Hill to I-93 northbound and the North End at Surface Road/Washington Street northbound.

The main entrance to the Garage is off New Chardon Street and the main exit is onto New Sudbury Street. There is a secondary garage entrance is on New Sudbury Street closer to Congress Street. No garage

driveways are located on the portion of the Project Site east of Congress Street. Tenants and visitors to the office space use the elevator lobby located at the corner of New Chardon Street and Merrimac/Congress Street. Loading for the existing office space is via an exterior loading dock located on this same corner.

1.4 Description of the Proposed Project

Figure 1.6 shows the proposed conditions site plan and Figure 1.7 shows a rendering of the Project. Essentially, the Project consists of the transformation of an underutilized urban renewal above-grade parking structure into a vibrant transit-oriented mixed use development with a new public plaza and pedestrian connector. Redevelopment of the Project Site includes phased demolition of approximately half of the existing garage structure and construction of new residential, hotel, retail, and office space. A key goal and public benefit of the Project is to eliminate the eastern portion of the existing garage building that spans over Congress Street and the MBTA Haymarket bus facility; thereby, creating two distinct and appropriately scaled development parcels: the "West Parcel" and "East Parcel" (named after their location with reference to re-opened Congress Street).

The following sub-sections describe the Project in further detail, including the redevelopment goals/objectives, development program and project elements, and construction phasing. Chapters 2 through 6 of this report provide additional information on the Project.

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1.4.1 Project Goals and Objectives

The following are the key goals and objectives of the Project:

1. Daylight Congress Street and provide new views/vistas by breaking the mega-block into two appropriately scaled urban blocks.
2. Create a vibrant urban environment through the introduction of new/different uses (e.g., residential and hotel) and office and retail tenant mix.
3. Provide a viable phased redevelopment strategy that allows immediate community benefits with manageable construction impacts.
4. Enhance pedestrian connections through and around the Project Site.
5. Activate the public realm with new public open space and streetscape improvements.
6. Be a leader for sustainability.

Further definition of the goals/objectives and how the overall Project achieves them is further detailed below and in the following chapters.

■

1.4.2 Proposed Development Program and Key Project Components

The Project includes approximately 2.4 million gross square feet of net new transit-oriented, mixed use phased development and approximately 476,400 gross square feet of the remaining parking garage and office for a total of approximately 2.9 million gross square feet. The Project will introduce 771 new housing units (apartments and condominiums) and 204 new hotel rooms to the area as well as provide a total of approximately 1.3 million gross square feet of office and 82,500 gross square feet of retail. The Garage will continue to provide sufficient commercial parking (for transient users) as well as overnight resident parking. Table 1-1 below presents a summary of the proposed development program. As stated previously, the overall Project Site will be reconfigured into two smaller appropriately scaled urban blocks consisting of the West Parcel and the East Parcel.

The West Parcel is bounded by New Chardon Street to the north, Congress Street to the east, New Sudbury Street to the south and Bowker Street to the west (Figure 1.6). The main design goal of the redevelopment of the West Parcel is to enclose the existing garage structure to remain, where possible, with new uses that bring pedestrian activity to Merrimac, Congress, New Sudbury and New Chardon Streets. The remaining portion of the Garage, which includes existing parking and office uses at the existing number of stories and height (WP-G) will be surrounded by the following uses:

1. West Parcel Building 1 (WP-B1): A 45-story, 470-foot apartment building on New Sudbury Street
2. West Parcel Building 2 (WP-B2): A 48-story, 600-foot office building on New Chardon Street
3. West Parcel Building 3 (WP-B3): A 24-story, 275-foot apartment building on Congress Street

Appropriately, the West Parcel consists of the two largest buildings of the Project (apartments and office) set farthest back from the Greenway, North End, and Bulfinch Triangle. While these buildings are intended to be iconic, they will be designed as a background to the East Parcel. The West Parcel also defines the scale of New Chardon and New Sudbury Streets with a podium expression in keeping with adjacent development.

The East Parcel is bounded by New Chardon Street to the north, Surface Road/I-93 Ramp Parcel to the east, New Sudbury Street to the south and Congress Street to the west (Figure 1.6). The East Parcel allows for the unique opportunity of creating a new dynamic public plaza that will connect the Bulfinch Triangle, Rose F. Kennedy Greenway, and Congress Street. Three distinct buildings will be organized around this new public plaza:

1. EP Building 1 (EP-B1): A 23-story, 275-foot combined hotel and condominium building
2. EP Building 2 (EP-B2): A 9-story, 125-foot office building
3. EP Building 3 (EP-B3): A 4-story, 60-foot boutique retail building

In addition, the East Parcel will house a reconfigured MBTA Haymarket Bus Station, in coordination with the MBTA and BTD. Additional information on the Project Components, or phases, is provided in Chapter 2, *Urban Design.*

Table 1-1
Proposed Development Program

Building	Use	Size (GSF)	Building Height (# floors/feet)	Quantity
West Parcel				
WP-B1	Residential (Apartments)	490,550		403 units
	Retail	2,350		-
	Building 1 Total	*492,900*	*45 floors (470 feet)*	-
WP-B2	Office	1,186,500		-
	Retail	9,050		-
	Building 2 Total	*1,195,550*	*48 floors (600 feet)*	-
WP-B3	Residential (Apartments)	288,900		248 units
	Retail	8,400		-
	Building 3 Total	*297,300*	*24 floors (275 feet)*	-
WP-G[1]	Remaining Parking Garage	476,400	*10 floors (108 feet)*	1,159 spaces[2]
	West Parcel Sub-Total	2,462,150 (1,950,750 New)		651 units
East Parcel				
EPB-1	Residential (Condominiums)	120,150		120 units
	Hotel	147,500		204 keys
	Retail	17,400		-
	Building 1 Total	*285,050*	*23 floors (275 feet)*	*120 units* *204 keys*
EP-B2	Office	116,800		-
	Retail	20,300		-
	Building 2 Total	*137,100*	*9 floors (125 feet)*	-
EP-B3	Retail	25,000	*4 floors (60 feet)*	-
	East Parcel Sub-Total	447,150		120 units 204 keys
Full-Build	Residential	899,600		771 units
	Office	1,303,300		-
	Retail[3]	82,500		-
	Hotel	147,500		204 keys
	Parking	476,400		1,159 spaces
	TOTAL	2,909,300[4] (2,397,900 New)		

GSF Gross Square Feet
1 Portion of the existing garage structure to remain on the West Parcel.
2 Includes 935 existing parking spaces and 224 new (reconfigured) parking spaces.
3 May include approximately 15,000 GSF of sit-down restaurant space.
4 A preliminary total FAR of 11.6 without parking and 13.9 with parking.

1.4.2.1 Architectural Design

Congress Street will be strengthened not only by the removal of the eastern half of the Garage, but also through carefully considered design of the built environment. Two buildings are proposed along Congress Street to create a "gateway" reflecting the acute geometry of the urban grid. Their unique architectural

expression, mimicking each other, makes the pair a stronger composition than either building alone. (This pair of buildings is referred to as the "Congress Street Dyad"). Additional information on the proposed architectural design vision/goals of the Project and its individual components is provided in Chapter 2, *Urban Design*.

1.4.2.2 Pedestrian Reconnections & Open Space

Redevelopment of the Project Site, including removal of the eastern portion of the Garage provides the opportunity to more seamlessly reconnect Government Center and the Greenway with the Bulfinch Triangle and improve connections to other surrounding neighborhoods. Appropriately scaled building massing, new activated ground floors as well as streetscape improvements (consistent with Boston's Complete Streets guidelines) along Congress, New Sudbury, and New Chardon Streets will strengthen and enhance connections between Cambridge Street (edge of the Beacon Hill residential neighborhood) and the North End. Figure 2.7 of Chapter 2, *Urban Design* shows the proposed public realm improvement plan.

Removal of a portion of the Garage provides for an additional significant public benefit: the creation of a vibrant pedestrian urban square on the East Parcel. The East Parcel is at the nexus of some of the most important pedestrian desire lines connecting Canal Street and Bulfinch Triangle area, the Greenway, Washington Street, North End and the Market District. This proposed all-season open air pedestrian space will be anchored by a hotel/condominium building, boutique office building, and specialized retail. Design of this new public space aims to not only create a comfortable pedestrian environment, but also a great urban destination. In addition, the Project will enhance and update the existing pedestrian mid-block connection at the westernmost end of the Project Site from New Sudbury Street to Bowker Street. This pedestrian connection will be redesigned as part of Phase 1 construction (WP-B1, the first apartment building, and the reconstruction of New Sudbury Street). Refer to Chapter 2, *Urban Design* for further details.

All streets bordering the Garage, including major portions of New Sudbury Street, New Chardon Street, Congress Street and Bowker Street will be reconstructed to better align with Boston's Complete Streets guidelines and goals. Chapter 2, *Urban Design* provides additional detail on other specific improvements to each of the major street segments that surround the Project Site. All streets will have curbs removed and reset, pedestrian paving replaced, and auto paving repaired, resurfaced, and restriped. In conjunction with the BRA and Street Lighting Department, new street lighting will be provided continuing existing themes. The East Parcel public plaza will marry the lighting of Canal Street with pedestrian lighting of the Greenway. Street trees will be introduced where feasible and other landscape measures to enhance public experience will be provided. The median in Congress Street between New Sudbury and New Chardon will be rebuilt in design coordination sympathetic with the Congress Street median south of New Sudbury.

The Project will incorporate a substantial amount of green roof and roof garden/deck areas as an outdoor amenity for the residents and tenants of the various buildings as well as provide an environmental benefit. On the West Parcel, the portion of the Garage to remain will be converted into a series of green roof areas and roof garden/deck areas for the two residential buildings (WP-1 and WP-3) and the office building (WP-2) that will be constructed around and on top of the Garage. The hotel/condominium building (EP-B2) on the East Parcel will provide a unique roof top garden as an amenity to hotel guests and residents. At 110-feet high, this spectacular space is expected to have 360-degree views including to the North End and the Boston Harbor. The other East Parcel buildings may also incorporate green roofs and/or roof gardens, but are also

being contemplated for the installation of solar panel systems, as discussed further in Chapter 4, *Environmental Protection*.

All of the proposed green roofs and roof gardens, in addition to being a project amenity, will allow for material reduction of heat island effect and help manage rain water. Refer to Chapter 2, *Urban Design* for further details on the conceptual rooftop plan (illustrated in Figure 2.10).

1.4.2.3 Transportation and Parking

Vehicular Access

Street and traffic patterns will remain largely as they now exist with one notable exception and improvement, which is the relocation of the current garage entrance/exit on New Chardon Street to Bowker Street. This relocation and other access related items are described in further detail below. The Project will make no significant changes to the Congress Street thoroughfare other than bringing daylight to it by removal of the overhead garage structure.

West Parcel Access

The existing garage entrance/exit and office loading dock along New Chardon Street will be closed, allowing a substantial pedestrian friendly reconfiguration of the intersection of New Chardon Street and Merrimac/Congress Street. This intersection, particularly given the major entrance into the Garage, is an automobile-dominated and awkward intersection for pedestrians. The removal of this entrance/exit at the corner of New Chardon Street will allow for an improved more pedestrian/bicycle-friendly intersection. The second major change is that a new garage entrance/exit and a new loading dock will be located off of Bowker Street on the rear of the Garage. This will move the garage access and exit movements away from the New Chardon Street and Merrimac/Congress Street intersection and to the Bowker Street intersection. These two changes combined will improve both the pedestrian experience, but also improve the traffic operations around at this intersection.

In support of these two improvements, Bowker Street is proposed to be changed from one-way northbound to two-way operation in order to better access both the proposed new parking garage entrance/exit at the Hawkins Street intersection and the new primary loading dock for the West Parcel along Bowker Street.

East Parcel Access

Parking for the East Parcel will be at the Garage on the West Parcel, as no on-site parking is currently proposed east of Congress Street. A raised, plaza level pull-off is proposed to service the hotel and condominium pick-up/drop-off and valet demands while allowing for the unimpeded flow of traffic along Congress Street. Building loading and servicing at the East Parcel will be from several locations. The EP-B1 and EP-B2 will have loading docks on New Chardon Street. Additional curbside loading is proposed for EP-B3 at cut-ins along both New Chardon Street and New Sudbury Street.

Bus access to the current MBTA Haymarket Bus Station will remain from the Surface Road/I-93 Ramp Parcel. The bus station will be reconfigured to allow the creation of an appropriately scaled urban plaza on the East

Plaza and also optimize its current and expected future operations in coordination with the MBTA. Refer to Chapter 3, *Transportation and Parking* for further details.

Parking

The Project will decrease the overall parking supply to approximately 1,159 spaces—all of which will be provided on the West Parcel. The portion of the existing garage structure over Congress Street and the East Parcel will be demolished and not replaced. The proposed number of parking spaces will be sufficient to meet the Project's parking requirements, current daily transient usage as well provide continued overnight parking for the adjacent neighborhoods. Refer to Chapter 3, *Transportation and Parking* for further details.

Public Transit

Future residents, employees, and visitors are expected to take advantage of the Project's proximity to an extensive public transit network described previously and more fully in Chapter 3, *Transportation and Parking*.

Bicycle Improvements & Amenities

The Proponent supports the City's efforts in advancing bicycle use by providing bicycle accommodation as part of the Project and proposes to implement a number of significant bicycle accommodations. The West Parcel will be incorporating an 850-space bicycle parking/storage facility for employees and residents, which will be one of the largest such facilities in the City of Boston. As part of this, the Project will incorporate employee changing rooms and showers. On the East Parcel the Proponent will be installing a new Hubway bicycle sharing station. In addition, bicycle racks will be readily available for short-term parking by visitors at major building entrances and near public open spaces. Refer to Chapter 3, *Transportation and Parking* for further details.

1.4.2.4 Sustainability

The Project is inherently sustainable as it aims to: (i) utilize land efficiently through redevelopment of an obsolete above-grade parking garage with a dense mixed-use program; (ii) promote the use of alternative modes of transportation; (iii) encourage pedestrian activity; (iv) promote the use of local materials; (v) provide for a high-quality indoor environment for users; (vi) and reduce environmental impacts both locally and globally. The Proponent is committed to continued exploration of practical ideas for creating a high performance development, which contributes to urban resilience in Boston. Project design will be goal-oriented with goals generally focused on reduced environmental impact and improved occupant comfort as well as contribution to the community. The Proponent is committed to incorporating many key aspects of sustainability and high performance building design, where applicable and feasible. The following framework has been established to guide project design and future operations:

1. Positive contribution to the community and built environment
2. Model for transit oriented development
3. Ability to cope with future climate change
4. Energy Efficiency

5. Resource Efficiency (i.e., water, waste, and materials)
6. Sustainable Operations

This framework will serve to further develop specific targets, goals, and strategies for the Project and each of its Project Components as they move forward through design. Goal-oriented design will be utilized throughout the process. The Project as a whole will meet Article 37, Green Buildings and the Proponent has set a goal to achieve LEED-CS Gold for the office components and LEED Silver for the residential components.

One innovative sustainable element to highlight is the incorporation of on-site rooftop solar panel systems on the East Parcel office building, which will offset the energy use associated with the public plaza (i.e., pedestrian area lighting) making it a zero net energy (ZNE) exterior space. Refer to Chapter 4, *Environmental Protection* for further details on the approach to incorporating sustainability throughout the Project.

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1.4.3 Project Phasing Summary

Figure 1.8 presents the conceptual phasing summary diagrams and Figure 1.9 shows renderings of each key phase. One of the development goals of the Project is to substantially revitalize a key portion of the Government Center Urban Renewal Plan Area, which had originally been developed as a 9-story 2,300 car parking garage. This parking garage has come to be seen as a barrier between the Bulfinch Triangle, the North End, Government Center, Beacon Hill and the West End neighborhoods. The Proponent proposes to remove this barrier and to recreate enhanced pedestrian connectivity between and among these neighborhoods. In order to undertake such a monumental redevelopment, the Project will need to be undertaken in phases.

The Project has been conceived and planned with a flexible mixture of complementary and mutually reinforcing uses. Project phasing is intended to provide certainty that the full build-out can be achieved over time, which is key to the Project's feasibility. Current phasing anticipates beginning the enabling work and construction of the first Project Component in 2016, with construction completion of such Project Component scheduled for 2020. The Proponent anticipates that construction will occur in four general phases along with an enabling pre-redevelopment phase over a period of approximately 20 years, as outlined below:

- Enabling Phase;
- Phase 1: Construction of WP-B1 (apartment building);
- Phase 2: Construction of WP-B2 (office building);
- Phase 3A-B: Demolition of half of the existing garage structure (the portion on the East Parcel and over Congress Street) and construction of WP-B3 (apartment building—half of the gateway buildings, or Congress Street Dyad); and
- Phase 4A-C: Redevelopment of the East Parcel, including EP-B1 (hotel/condominium building—completion the Congress Street Dyad), EP-B2 (office building), and EP-B3 (retail building).

Refer to Figures 1.10a through 1.10e for diagrams of each construction phase with a list of key public benefits associated with each phase.

1.5 Summary of Public Benefits

Project-related benefits include significant urban design and public realm improvements, increased housing opportunities, expanded retail options, job creation and additional tax revenues. By replacing a massive unsightly barrier with two new vibrant mixed-use and appropriately scaled urban blocks, the Project will substantially contribute to improving the vitality and the urban design and architectural character of the Government Center and Bulfinch Triangle areas. Each phase of construction will include some level of public benefits/amenities (Figures 1.10b-1.10e).

Public Realm

- Enhance the connectivity between the Bulfinch Triangle, Government Center, West End, North End and Beacon Hill as well as the emerging Market District.
- Create 18/7 activity by bringing new residents to an area that often has little activity after 5:00 pm.
- Dramatically improve the public realm and architectural character of Congress Street.
- Introduce sky and daylight along Congress Street between New Sudbury and New Chardon Streets.
- Create multiple new vistas, including new views of the Custom House Tower and iconic downtown buildings, such as 60 State Street and the Financial District towers.
- Create a new public plaza and promenade to serve as a gateway to and connector between the Bulfinch Triangle and the Rose F. Kennedy Greenway and facilitate pedestrian movement around the Surface Road/I-93 Ramp Parcel.
- Create retail-oriented public space that will continue the Market District northward and connect to Canal Street in the Bulfinch Triangle.
- Completely enclose the existing garage structure on three sides with a dynamic ground-floor retail program and residential/office lobbies as well as apartment units on the upper floors on the West Parcel.
- Frame Congress Street as an important through-way and view corridor by constructing half of the unique Congress Street Dyad.
- Enhance and activate New Chardon and New Sudbury Streets with streetscape improvements and new ground-floor residential and office lobbies, and retail uses.
- Enhance the existing neglected and degraded public pedestrian mid-block connection from New Sudbury Street to Bowker Street.
- Create new urban open space opportunities at the street level on the corner of New Chardon and Congress Streets.
- Create new urban open space opportunities on the rooftop of the Garage and on the proposed building rooftops while improving water quality and reducing heat island effect through green roofs/roof gardens for use by residents, tenants, and hotel guests.
- Explore the addition of retail as an interim improvement around the MBTA Haymarket bus facility on the East Parcel.

Design

- Implement an innovative phased approach to:
  - Significantly improve the market viability of the Project;
  - Allow the existing parking garage to remain operational during construction;
  - Limit construction impacts; and
  - Provide sustained construction jobs over a longer period (over 2,600 construction jobs in all trades).
- Unlock the potential of the East Parcel for the new public plaza and a dynamic and vibrant mixed use development.
- Upgrade the existing garage lobby entrance and installation of new garage elevators.
- Scale the height of the East Parcel buildings to be consistent with the Bulfinch Triangle.

Transportation

- Utilize the extensive transportation infrastructure currently serving the Project Site, including MBTA subway lines (the Orange and Green Lines), the Haymarket Bus Station, and the I-93 entrance/exit ramps.
- Improve pedestrian safety and vehicular circulation by relocating the existing New Chardon Street garage entrance/exit to the Bowker Street/Hawkins Street intersection.
- Improve traffic circulation to the regional highway system and local roadway network by allowing vehicles exiting the Garage from Bowker Street to take a right onto New Chardon Street and go directly to I-93 Southbound (not currently allowed).
- With the relocation of the Garage entrance to Bowker Street, significantly improve the intersection of New Chardon Street and Merrimac/Congress Street for pedestrians, bicyclists and vehicles.
- Implement Boston Complete Street Guidelines with provision of new bicycle lanes and enhanced pedestrian facilities along Congress, New Chardon, and New Sudbury Streets.
- Provide secure on-site bicycle storage facility for residents and employees, and exterior at-grade short-term bike parking for visitors and customers, including an 850-space bicycle parking/storage facility with showers and changing rooms on the West Parcel.
- Provide for bicycle sharing opportunities by adding a Hubway bike sharing station on the East Parcel at the existing MBTA Haymarket bus facility.
- Provide garage parking for displaced BPD parking (42 spaces).
- Improve efficiency of and enhance public realm surrounding the MBTA Haymarket bus facility operations.

Environmental/Sustainability

- Take advantage of existing infrastructure developed to support the density of the downtown core.
- Revitalize an underutilized urban renewal era above grade structured parking garage, use land efficiently

with dense mixed-use development, promote the use of alternative modes of transportation, encourage pedestrian activity, enhance the surrounding neighborhood, promote the use of local materials, provide for a high-quality indoor environment for users, and reduce environmental impacts both locally and globally.

- Incorporate sustainability throughout by thoughtfully planning for efficient use of energy and resources through all stages of design and during operations.
- Develop a framework to develop specific targets, goals and strategies for the Project (i.e., a project sustainability plan) to be used by the design team moving forward through the design process, construction, and into operations.
- Provide a unique and sustainable project through the redevelopment and reuse of the existing Garage and by utilizing the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, in compliance with Article 37 of the City's Zoning Code (to target LEED Gold rating for office buildings and LEED Silver rating for residential buildings).
- Create a "net zero energy" public space through the installation of solar panels on the East Parcel office building that will provide electricity for the plaza lighting and/or water features.
- Provide ten (10) Electric Vehicle (EV) charging stations and additional designated preferred parking spaces for fuel-efficient/electric vehicles in the existing garage.
- Provide for beneficial impacts on water quality through the process of redevelopment and updating to current stormwater management standards, including rainwater harvesting for on-site re-use, groundwater recharge and phosphorous mitigation.
- Lease and operate the buildings in a sustainable manner (i.e., following construction of each component, develop Tenant Manual/Guidelines to ensure that the sustainability efforts are implemented throughout operation).

Social and Economic

- Become a catalyst for growth and redevelopment in the Government Center and Bulfinch Triangle neighborhoods.
- Support the City's goal of promoting diversification and expansion of Boston's economy by adding hotel uses to serve both business and tourist demands, and by creating new local jobs.
- Provide 771 new housing units with approximately 102 units designated as affordable, per Boston's Inclusionary Housing Ordinance.
- Encourage the diversification and expansion of Boston's economy in new areas of economic activity with the creation of a new class A office building targeted to creative industry, technology, lifestyle and health care tenants in an area traditionally dominated by government tenants
- Support the future Boston Public Market by introducing new uses to the area, which will bring new residents, customers, and employees.
- Create over 2,600 construction jobs in all trades and over 6,000 permanent jobs (full-time and part-time).
- Create a total of approximately $11 million in new annual local tax revenue.

- Provide approximately $12.6 million in housing and jobs linkage (Development Impact Project Exactions) over the life of the Project.

1.6 Consistency with Applicable Plans and Policies

The proposed mixed use Transit Oriented Development (TOD) is consistent with and supports a number of the city's planning goals and initiatives for redevelopment of the area and the city as well as regional and state-wide planning goals and objectives. The following sections describe project consistency with applicable local, regional, and state planning initiatives and policies.

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1.6.1 City of Boston

1.6.1.1 Greenway District Planning Study Use and Development Guidelines

In August, 2010, the BRA published a draft of the *Greenway District Planning Study Use and Development Guidelines* (the "Planning Study").[2] The Planning Study contains details of the planning and design goals of the BRA and the City of Boston for construction and rehabilitation of buildings and parcels of land abutting or affecting the Greenway from Chinatown to the North End. The Planning Study divides the Greenway into sections corresponding to existing neighborhoods. The Project Site is located within the "Market District and Government Center" sub-district. In summary, the key goals for this sub-district include:

1. Increase residential opportunities;
2. Expand the Market District in Boston's Downtown; and
3. Improve the architectural quality and retail transparency of this area as a compliment to the North End.

The Planning Study calls for the redevelopment of the Project Site and the replacement of the current structure with other buildings which would better reflect the goals of activation and connectivity of this area with adjacent areas, and the emergence of a vibrant live and work area in this section of the Downtown. The goals of the Planning Study include greater growth, density and heights on the western edge of the Property and retaining the scale of the adjacent Bulfinch Triangle buildings on the eastern edge of the Property. The Planning Study urges any redevelopment of the Property to increase the connectivity of the Property with the North End, the Market District and the Bulfinch Triangle.

The Project addresses the first key goal of the Planning study by introducing 651 apartments and 120 condominiums to the area as well as other uses to (hotel and retail) to create a vibrant area. The streetscape and pedestrian amenities will also be improved by the Project consistent with the Planning Study goal of

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[2] Boston Redevelopment Authority, *Greenway District Planning Study Use and Development Guidelines*, August 2010.

activating pedestrian spaces adjacent to the Greenway and extending the Market District into and through the Project Site.

As further detailed in Chapter 2, *Urban Design*, the Project also responds to and is consistent with the Planning Study by including buildings with greater heights and density on the westerly portion of the Project Site and buildings with much lower heights and density on the easterly portion of the Property. The mixture of the different massings of the proposed buildings on the eastern and western portions of the Property, the removal of the portion of the existing building that currently is over Congress Street, the introduction of residential, hotel and greater retail uses, and the improvement of the streetscape and pedestrian realms will all foster a greater sense of neighborhood and major connection for the Downtown, Bulfinch Triangle and North End areas – all goals of the Planning Study.

Market District and Government Center Sub-district

Adjacent to Boston's government and financial centers and located near the waterfront, the Market District and Government Center sub-district is bounded by Congress Street to the west, Clinton Street to the north, the Greenway to the east, and Chatham Street to the south. A recent adoption of Article 45, Government Center/Markets District of the Zoning Code establishes the zoning regulations for the comprehensive plan for the District, as required by the provisions of the Downtown Interim Planning Overlay District (Article 27D of the Zoning Code).The city's historic Faneuil Hall and Quincy Market were long ago converted to a tourist-oriented "festival" market. Adjacent to Fanueil Hall, the historic Haymarket has continued operating two days a week year-round as one of the largest street markets in the U.S. Haymarket's 100 vendors sell mainly inexpensive produce from the city's wholesale market, attracting some 15,000 daily shoppers of nearly all ethnic backgrounds from across the city. This public market is an essential part of the Boston food distribution system, especially for low-income consumers. The BRA is currently developing a strategy for enhancing the operation of Haymarket, while creating a public market district around it; thus, growing the market into its surrounding area. For years, the market has been overcrowded, unattractive, and in need of aesthetic improvements. The BRA is currently planning for the construction of an all-season/year-round indoor market next to Haymarket in two publicly owned parcels. The creation of an indoor public market that will be "center of the Boston food world" has been proposed on Parcel 7 in vacant ground-level retail space, in addition to an indoor-outdoor market on Parcel 9 as an extension of Haymarket to allow new year-round food operations.

The Project supports the planning initiatives of the sub-district by introducing new customers to the new Boston Public Market in the form of new residents and workers. Additionally, the reconfigured public plaza on the East Parcel will allow for an extension of the Market District with additional retail and better pedestrian connectivity from Canal Street, West End, and Beacon Hill back to the Market District.

1.6.1.2 Open Space Plan 2008-2014

In January 2008, Mayor Thomas M. Menino released the city's updated *Open Space Plan 2008-2014*.[3] The plan addresses the need for "a dynamic, better integrated open space system with improved linkages, more spaces

[3] City of Boston Department of Parks and Recreation, *Open Space Plan 2008-2014*, January 2008. Website: http://www.cityofboston.gov/parks/pdfs/OSP2010/OSP0814_0.1.1_PreIntroductionDocuments.pdf

to meet new or unmet needs, and protection of the natural resource and environmental base of the open space system." The plan calls for further expansion through the Department of Parks and Recreation's acquisition program, through co-development of open space when the private or institutional sectors expand, and through a network of greenways, trails, and bikeways to better access the existing and new spaces, as well as to enjoy recreation, such as walking, hiking, and bicycling.

Under current conditions, the Project Site is nearly 100 percent impervious and offers little in the way of passive open space. The Project incorporates public open space in the form of the proposed East Parcel public plaza as well as an improved pedestrian connection at Bowker Street, new bike lanes and bike share facilities, and the daylighting of Congress Street. The Project will also provide public realm improvements consistent with the Boston Complete Streets Guidelines, including street trees along adjacent sidewalks creating pedestrian- and bike-friendly connections to the existing open space network. For the residents and tenants, the Project will incorporate a substantial amount of green roof and roof garden/deck areas as an outdoor amenity on the various buildings as well as provide an environmental benefit (i.e., reduction of heat island effect/maintain comfortable micro-climate as well as help manage the roof runoff).

1.6.1.3 Climate Action Plan

On Earth Day, April 22, 2011, Mayor Thomas M. Menino released *A Climate of Progress* –the City's updated Climate Action Plan.[4] This Plan encompasses the April 2010 consensus report *Sparking Boston's Climate Revolution: Recommendations of Boston's Climate Action Leadership Committee and Community Advisory Committee*[5] and is to be used in tandem with *Sparking the Climate Revolution* by including a set of wide-ranging recommendations aimed at significantly reducing greenhouse gas (GHG) emissions and preparing for the risks of climate change in Boston. The five overarching recommendations of the Climate Action Leadership Committee are:

1. Reduce Boston's overall GHG emissions 25% by 2020 and 80% by 2050 (consistent with the state's goals);
2. Immediately start incorporating projected effects of climate change — particularly sea-level rise, heat waves, and more intense storms — in all planning and review for municipal and private projects;
3. Develop a comprehensive public engagement effort, including a public commission and strong partnerships with community organizations;
4. Use climate action opportunities to advance Boston's green economy and jobs goals; and
5. Ensure that climate action has clear public and private leadership and sufficient public and private resources.

Achieving these goals for reducing the effects of climate change, cultivating a city of green buildings, and advancing sustainability in multiple realms is intended to drive economic development and innovation. In 2010, the City of Boston was designated a Green Community under the Green Communities Designation and Grant Program, an initiative of the Department of Energy Resources (DOER). In order to be designated a

4 City of Boston, *A Climate of Progress: City of Boston Climate Action Plan Update*, April 2011. Website: http://www.cityofboston.gov/Images_Documents/A%20Climate%20of%20Progress%20-%20CAP%20Update%202011_tcm3-25020.pdf

5 City of Boston, *Sparking Boston's Climate Revolution Recommendations of the Climate Action Leadership Committee and Community Advisory Committee*, April 2010. Website: http://www.cityofboston.gov/Images_Documents/BCA_full_rprt_r5_tcm3-19558.pdf

Green Community and, therefore, eligible for grant money available annually, communities are required to meet five rigorous qualification criteria one of which includes minimizing life-cycle costs, such as adopting and implementing the Stretch Energy Code.[6] As part of the sustainability goals for the Project, discussed further in Chapter 4, *Environmental Protection,* the Proponent and design team have started to develop an energy conservation strategy that aims to incorporate energy efficiency and conservation measures into the building design and future operations with the intent of not only meeting, but exceeding the minimum energy performance required by the Stretch Energy Code. The Project includes innovative approaches to reducing fossil fuel use, such as the proposed zero net energy (ZNE) East Parcel public plaza where exterior public space will utilize solar panels installed on proposed building rooftops. The Proponent is also committed to using the Leadership in Environmental and Energy Design (LEED) green building rating system as a tool to ensure the energy efficiency performance goals of the Project are met (as well as other sustainable elements). The overall sustainability goals and objectives of the Project are expected to result in a reduction in GHG emissions, which supports the City's Climate Action Plan goals to reduce GHG emissions.

As part of the sustainability plan, the Project has started to address climate change impacts and planning for resilience in its early stage planning. In response to the risks and vulnerabilities of more severe flooding and potential sea level rise, the Project intends to implement measures to make it more resilient to predicted changes. Refer to Chapter 4, *Environmental Protection* for further details.

The Climate Action Plan also seeks to dramatically reduce transportation-related GHG emissions. The Project achieves this first and foremost by locating a mix of uses in close proximity to a major regional employment center that is Downtown Boston and accessible by a variety of mass transit alternatives. Downtown workers will have new opportunities to live within walking distance of their work; thereby, reducing automobile dependence. Unlike many major retail developments in the region, which are essentially completely automobile-dependent, the retail component of the Project will create a new transit-accessible shopping destination serving the surrounding neighborhoods. Additionally, the proposed pedestrian and bicycle improvements (i.e., new bike lanes, bike sharing station, and on-site secure bicycle storage), car sharing services, and a public Electrical Vehicle (EV) charging station and parking will encourage alternative modes of transportation to/from the Project Site and contribute to reduced GHG emissions associated with gasoline compared to a conventional development dependant on single-occupancy vehicles.

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1.6.2 Regional Planning

The City of Boston is located within the Metropolitan Area Planning Council (MAPC) planning area. In May 2008, the MAPC issued its *MetroFuture: Making a Greater Boston Region*.[7] MetroFuture is MAPC's plan for Greater Boston to better the lives of the people who live and work in the region through the year 2030. MetroFuture includes detailed goals for development and preservation, and specific strategies to equitably distribute the benefits and burdens of growth. A key goal of MetroFuture is to focus growth where

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6 Effective January 1, 2011, the City of Boston adopted the Stretch Energy Code (8th Edition Building Code, Appendix 115.AA); there is a concurrency period through June 30, 2011. Its adoption brings to Boston a standard that will require new commercial buildings over 5,000 square feet in size, including multi-family residential buildings over three stories, to operate at an energy efficiency level 20% better than that required under the base energy code criterion, ASHRAE 90.1-2007.

7 *MetroFuture: Making a Greater Boston Region*, Massachusetts Area Planning Council, May 2008 (updated December 2008).

infrastructure already exists, including public transit in order to preserve natural resources. Other goals include the following:

- **Sustainable Growth Patterns:** Population and job growth will be focused in developed areas already well-served by infrastructure.
- **Housing Choices:** A diverse array of housing choices will meet the needs of the region's residents.
- **Healthy Communities:** Residents will be safe, healthy, well-educated, and engaged in their community.
- **Regional Prosperity:** A globally-competitive regional economy will provide opportunity for all the region's workers.
- **Transportation Choices:** An efficient transportation system will offer more choices and make it easier to get around.
- **Healthy Environment:** Natural resources will be protected thanks to a strong "environmental ethic."

The Project accomplishes many of the smart growth principles recommended by MAPC, including:

- Redevelopment of an underutilized urban site with existing infrastructure, including public transit;
- Partial re-use of an existing Garage and reduced site disturbance;
- New housing opportunities, including affordable housing options;
- New employment opportunities;
- Transportation Demand Management, or TDM, measures to reduce single-occupancy vehicles;
- Provide the opportunity for new transportation choices, such as car and bicycle sharing; and
- Sustainable/green building features, including energy and water efficient building systems; thereby, reducing the Project's impacts on the environment.

The Project is located in a targeted growth area (the Boston "Metropolitan Core") and helps meet many of the goals and objectives of the comprehensive MetroFuture, including focusing new development in city and town centers, near transit and infrastructure, and preserving both environmental and financial resources that would be lost to sprawling, low density development. The Project will help meet these goals in part by developing sustainable buildings and enhancing the pedestrian environment while taking advantage of nearby existing public transportation.

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1.6.3 Commonwealth of Massachusetts

1.6.3.1 Governor's Clean Energy and Climate Plan

The Global Warming Solutions Act of 2008 requires the Secretary of Energy and Environmental Affairs (EEA) to establish a statewide limit on GHG emissions of between 10 percent and 25 percent below 1990 levels for 2020 - on the way toward an 80 percent reduction in emissions by 2050 - along with a plan to achieve the 2020

target. In 2010, Secretary Ian A. Bowles issued the state-wide *Clean Energy and Climate Plan for 2020*, which contains the measures necessary to meet these limits.[8] A key goal of the plan is to assist and encourage businesses, households, municipalities, and institutions to better manage their energy needs by incorporating renewable and alternative sources of energy. The Project supports the state's Clean Energy and Climate plan by incorporating on-site alternative and renewable energy sources to reduce the Project's dependence on fossil fuels, including EV charging stations in the Garage and solar panel systems to provide energy for the East Parcel public plaza.

1.6.3.2 Executive Order 385 – Planning for Growth

Generally, Executive Order 385 (EO 385) aims "…to actively promote sustainable economic development practices by advocating for state activities that are supported by adequate infrastructure and that are designed in such a way so that they do not adversely impact the natural environment." The Project is consistent with EO 385 because its design aims to redevelop a previously developed urban site with existing and adequate infrastructure, including public transit; therefore, reducing environmental impacts, such as traffic, new impervious surface, and new land alteration. The Project will improve water quality through proposed modifications/upgrades to the stormwater management system and incorporate rainfall harvesting for on-site irrigation use and groundwater recharge. The Project aims to create a mix of activity and provides for new employment and diverse housing opportunities, including the creation of approximately 2,600 construction jobs in all trades over the 20-year construction period and new transit-accessible employment opportunities (permanent part-time and full-time jobs) as well as 771 new housing units approximately 100 of which will be designated as affordable—all of which will support the local and state economy. Furthermore, as demonstrated in this report, the Proponent will minimize any unavoidable environmental impacts through the implementation of mitigation measures, to the extent feasible.

1.6.3.3 Commonwealth's Sustainable Development Principles

The Project is consistent with several of the Office of Commonwealth Development's Sustainable Development Principles.[9] The following lists the smart growth principles that the Project is consistent with.

- **Concentrate Development and Mix Uses.** The Project best fits this principle because it consists of redevelopment of an underutilized urban site with existing/adequate infrastructure and promotes a vibrant mixed-use development that will re-use part of the existing building.
- **Advance Equity.** The Project will be developed in coordination with the City and its uses aim to support and remain consistent with the City's vision for the area.
- **Make Efficient Decisions.** A key goal of the Project is to utilize the existing site and parking garage to the extent practicable in order to limit site work. The Project also introduces new pedestrian-friendly and transit-accessible employment and housing opportunities; therefore, reducing traffic.

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8 Secretary of the Executive Office of Energy and Environmental Affairs, *Massachusetts Clean Energy and Climate Plan for 2020*, December 29, 2010.

9 Commonwealth of Massachusetts Sustainable Development Principles (website link: http://www.mass.gov/Agov3/docs/smart_growth/patrick-principles.pdf)

- **Protect Land and Ecosystems.** The Project addresses the principle of protecting land and ecosystems by redeveloping a previously disturbed/developed area in place of a 'greenfield' outside of the City.
- **Use Natural Resources Wisely.** The Project promotes sustainable planning and design elements, including energy and water efficient building systems and operations, reduced construction and operational waste, and environmentally-preferable materials.
- **Expand Housing Opportunities.** The Project will expand housing opportunities, including affordable housing units in the Government Center district of Boston which currently has no housing.
- **Provide Transportation Choices.** The Project promotes TOD with both rapid transit and bus stops at the Project Site. In addition, transportation choices will be expanded for residents and visitors. Pedestrian and bicycle access and circulation will be enhanced as part of the Project, including the opportunity for a new Hubway bike sharing station on-site.
- **Increase Job and Business Opportunities.** The Project provides for new employment opportunities (hundreds of construction jobs in all trades and new transit-accessible permanent part-time and full-time jobs) and may be a catalyst for future additional redevelopment in the area.
- **Promote Clean Energy.** The Proponent plans to install Electric Vehicle (EV) charging stations and preferred parking in the Garage. In addition, the Project is incorporating solar panels on one or more of the East Parcel buildings to generate electricity for the adjacent new public plaza and the buildings themselves.
- **Plan Regionally.** The Project was developed taking into consideration regional context, access, market area, and economics and is consistent with the goals of the MAPC's MetroFuture plan for the Boston Metro region.

1.7 Public Participation

The Proponent is committed to maintaining an open dialogue with all interested parties. The public will have the opportunity to review this PNF report as well as future documents submitted for individual Project Components, as required. The Proponent, in coordination with the BRA, plans to set up a public review process. In general, the process will include several Impact Advisory Group (IAG) public meetings to go over the Project and specific topics, as needed. In addition, the Proponent will be meeting with community groups, various Boston agencies/departments, the MBTA, and the Massachusetts Environmental Policy Act (MEPA) Office as well as other stakeholder groups.

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1.7.1 Impact Advisory Group

In October 2000, Mayor Thomas M. Menino outlined the Impact Advisory Group (IAG) process in "An Order Relative to the Provision of Mitigation by Development Projects in Boston." The Mayor further amended the process in April 2001, in "An Order Further Regulating the Provision of Mitigation by Development Projects in Boston" in order to increase the representation of local elected officials. These Orders, adopted by the BRA Board, create a comprehensive framework to clarify the role of the BRA, the City, the developer, and the community in the determination and mitigation of the impacts of development.

The IAG may contain up to fifteen (15) members, two (2) each nominated by the state senator, state representative, and district city councilor, and the remainder by appointment of the Mayor on the recommendation of residents, businesses, and community organizations as well as at-large city councilors. The IAG advises the BRA on impact and mitigation. IAGs offer BRA staff the chance to work closely with diverse members of the community to understand local concerns, needs, and opportunities. IAG members are invited to take part in the public agency scoping sessions called for in Article 80 of the Boston Zoning Code. The IAG is also encouraged to take part in community meetings that allow for public review and discussion of proposed projects. IAG members are offered the opportunity to review for comment major submissions by a project proponent as well as the Cooperation Agreement between the developer and the BRA prior to its adoption by the BRA.

IAGs do not replace the role of the greater community in the development review process, rather they strengthen the public participation process. The IAG is an overlay to the existing process that allows for greater understanding by the BRA of local concerns and greater public insight into the thinking of the BRA and other public agencies involved in the development review process. An IAG was previously formed for this Project Site for the former redevelopment proposal. The Proponent will work with the BRA on coordinating with a reconvened IAG as the Project moves forward. Multiple meetings are anticipated to be held with the IAG to solicit input on the Project.

1.8 Approvals

Table 1-2 below provides a comprehensive list of what approvals and/or permits are anticipated to be applicable to the Project or the individual Project Components. Generally, this list summarizes the more extensive reviews/approvals that will be required.

Each of the Project Components may be subject to Large Project Review under Section 80B of the Zoning Code and/or the MEPA as well as individual local and state permits. Because the Project is a phased on which design development will proceed sequentially, it is anticipated that any required Article 80B, Large Project Review will occur at different times for separate Project Components.

Table 1-2
List of Anticipated Permits and Approvals

Agency/Department	Permit/Approval/Action
Federal	
Federal Aviation Administration	▪ Determination of No Air Hazard to Air Navigation
U.S. Environmental Protection Agency	▪ NPDES General Permit
Commonwealth of Massachusetts	
Department of Transportation (MassDOT)	▪ Vehicle Access Permit (if required)
Department of Environmental Protection (DEP), Division of Water Pollution Control	▪ Sewer Connection and Extension Permit ▪ Groundwater Discharge Permit (if required)
DEP Division of Air Quality Control	▪ Pre-construction notice
Executive Office of Energy and Environmental Affairs (MEPA Office)	▪ Certificate of adequacy from the Secretary ▪ Public Benefits Determination
Massachusetts Bay Transportation Authority	▪ Approval of alterations to MBTA Haymarket bus facility ▪ Amend Easement (if required)

Agency/Department	Permit/Approval/Action
Commonwealth of Massachusetts (continued)	
Massachusetts Historical Commission	▪ Determination of No Adverse Effect or Memorandum of Agreement
Massachusetts Water Resources Authority	▪ Construction Dewatering Permit (if required)
City of Boston	
Boston Air Pollution Control Commission	▪ Parking Freeze Permit Modification for reduction of parking spaces
Boston Civic Design Commission	▪ Review and approval pursuant to Article 28 of the Boston Zoning Code
Boston Committee on Licenses	▪ Parking Garage Permit ▪ License for Storage of Inflammables
Boston Fire Department	▪ Fuel storage permit
Boston Inspectional Services Department	▪ Building Permit (Long Form) ▪ Demolition Permit ▪ Certificate of Occupancy
Boston Landmarks Commission	▪ Review pursuant to Article 85 of the Boston Zoning Code for demolition of the Garage
Boston Parks and Recreation Commission	▪ Commission approval, in accordance with City Ordinance 7-4.11[1]
Boston Public Improvement Commission/ Department of Public Works	▪ License for installation of groundwater monitoring well ▪ Specific Repair Plan ▪ Street and Sidewalk Occupation Permits ▪ Tieback/Earth Retention Permit ▪ Air Rights Discontinuance (if required)
Boston Redevelopment Authority	▪ Review under Article 80, including Large Project Review, as required pursuant to Article 80B of the Zoning Code and PDA Review, as required pursuant to Article 80C of the Zoning Code ▪ Review pursuant to Article 37, Green Buildings of the Boston Zoning Code ▪ Development Impact Project Agreement pursuant to Article 80B-7 of the Boston Zoning Code
Boston Transportation Department	▪ Transportation Access Plan Agreement ▪ Review and approval of a Construction Management Plan
Boston Water and Sewer Commission	▪ Sewer Extension/Connection Permit ▪ Sewer Use Discharge Permit ▪ Site Plan Approval ▪ Construction Dewatering Permit
Boston Zoning Commission	▪ Zoning Approval subject to BRA recommendation and approval under Article 80C of the Zoning Code, including PDA Approval
Mayor of the City of Boston	▪ Zoning Approval subject to BRA recommendation and approval under Article 80C of the Zoning Code, including PDA Approval
Boston Zoning Board of Appeal	▪ Zoning and Building Code variance(s) (if required)
Boston Departments & Agencies	▪ Comments for Article 80B review ▪ General Operational Permits, Licenses (if required)

NPDES National Pollutant Discharge Elimination System
MEPA Massachusetts Environmental Policy Act
PDA Planned Development Area
1 Because the Project Site is located within 100 feet of the North End park portion of the Rose F. Kennedy Greenway

■

1.8.1 Zoning

As previously mentioned, the Project Site is situated within the Government Center/Markets District (the "District"), as established by Article 45 of the Code ("Article 45"), and is located within the Sudbury Street Restricted Growth Area. The Project Site is also situated in a Restricted Parking Overlay District. Prior to the adoption of Article 45 and Map 1H, the Project Site had been situated within a B-8-U, General Business, Special Purpose Overlay District Urban Renewal (URO) district. The general proposed uses: residential hotel; office; and retail, except for the parking garage, are allowed in the District. Pursuant to Section 45-14.4 of the Code, a parking garage and take-out restaurant are uses permitted conditionally in the District. Although accessory parking use in the District is listed in Section 45-14.3 of the Code as an Allowed Use, it remains subject to the restrictions of the Restricted Parking Overlay District and would require approval from the Zoning Board of Appeal (ZBA). In addition to the off-street parking provisions of the Code, the parking garage is also subject to the regulations of the Boston Air Pollution Control Commission.

Article 45, Section 45-6.1 of the Code imposes the following dimensional requirements upon the Project Site: a maximum floor area ratio (FAR) of 6.0, and a maximum height of 80 feet. Such limitations with respect to FAR and height may be modified to allow for an increase of maximum FAR to 7.0 and a height of 100 feet provided that a proposed project is subject to or has elected to comply with Large Project Review under Section 80B of the Code and has received a Certification of Compliance from the Director of the BRA pursuant to Section 80B-6 of the Code. The former district (B-8-U) imposed an FAR limitation of 8.0 for the current building and uses, and exempted the Project Site from all other dimensional requirements of the Code.

As noted above, the Project Site had been located within a URO district, which had been adopted pursuant to Section 3-1 of the Code and provided for certain zoning relief to allow the construction and use of the existing garage and office/retail structure. With the adoption of Article 45 on April 1, 1991, the urban renewal district was eliminated.

Zoning relief for the Project will be required for certain uses and conditions imposed upon such uses and certain dimensional limitations of the underlying zoning district. Such zoning relief would require BRA recommendation and approval in accordance with the Code and may be obtained through either the Boston ZBA or the Boston Zoning Commission, depending upon the appropriate permitting and approval procedure necessary to ensure continued controls on the development of the Project and to ensure the provision of Project benefits and mitigation.

1.9 PNF Report Contents

This report examines Project-related issues, such as urban and architectural design, sustainable and green building design, transportation, environmental impact categories, including air quality and noise, infrastructure systems, and historic resources.

Chapter 2: Urban Design presents the planning and design goals, describes the neighborhood context and public realm, describes the visual aesthetics and architectural design of the Project, including height and

massing of the structures, and describes the proposed ground level treatment, including pedestrian amenities and landscaping.

Chapter 3: Transportation and Parking presents the traffic assessment and access study for the Project, including proposed traffic-related improvements and construction traffic management measures.

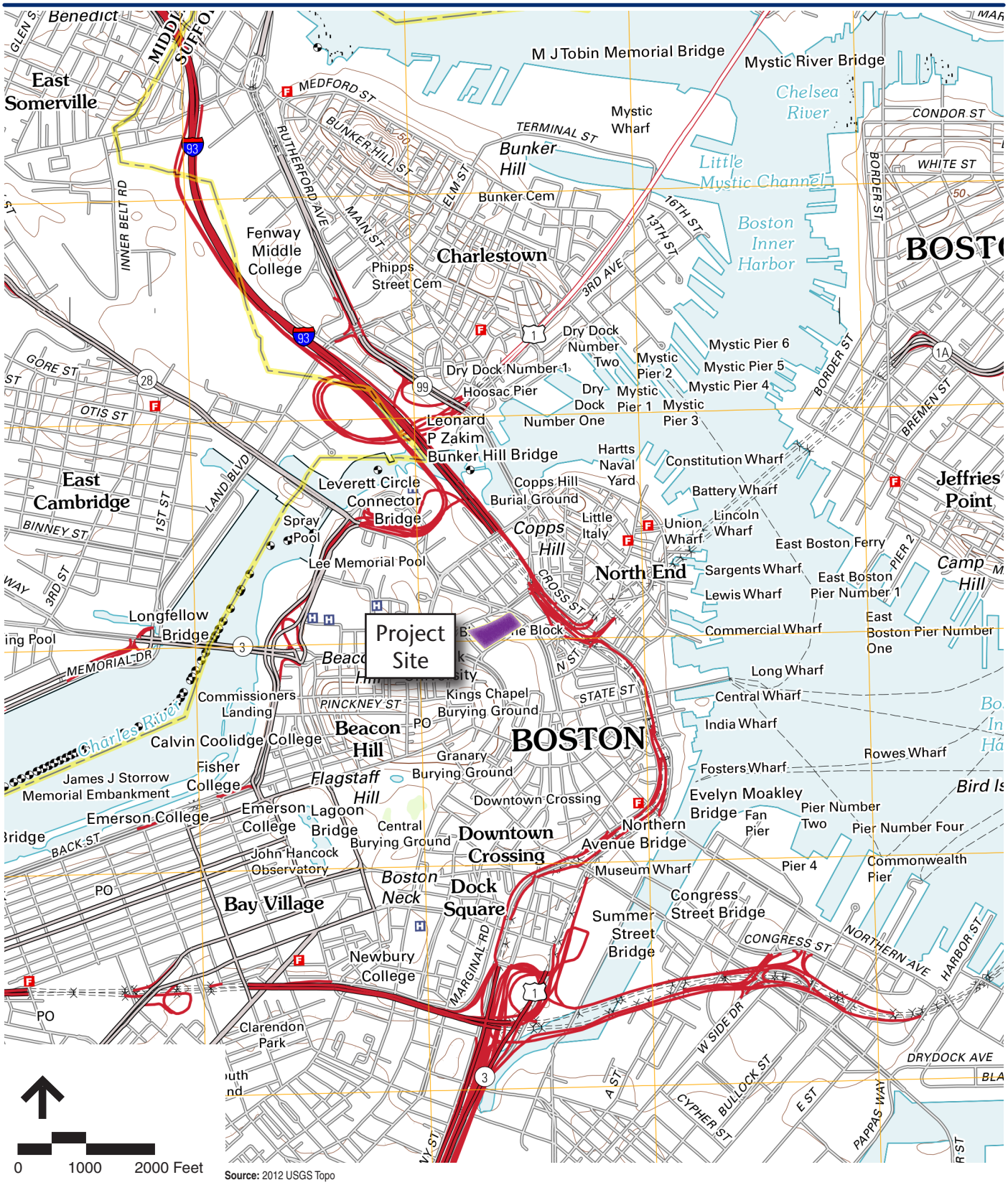
Chapter 4: Environmental Protection presents findings from the environmental studies that assess the potential Project impacts and the proposed feasible measures intended to mitigate, limit, or minimize Project impacts.

Chapter 5: Infrastructure describes the anticipated water consumption and sewage generation, and proposed utilities, including stormwater management facilities required for the Project.

Chapter 6: Historic Resources identifies any historic properties /districts within close proximity of the Site, and describes any effects to these properties and proposed mitigation as a result of the Project.

Supporting attachments include:

- Attachment 1: Letter of Intent
- Attachment 2: Traffic Impact Study
- Attachment 3: Historic Resources Supporting Documentation



Source: 2012 USGS Topo

Redevelopment of Government Center Garage
Boston, MA

Figure 1.1

Site Location Map

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.

Source: 22008 MassGIS 15cm Aerial

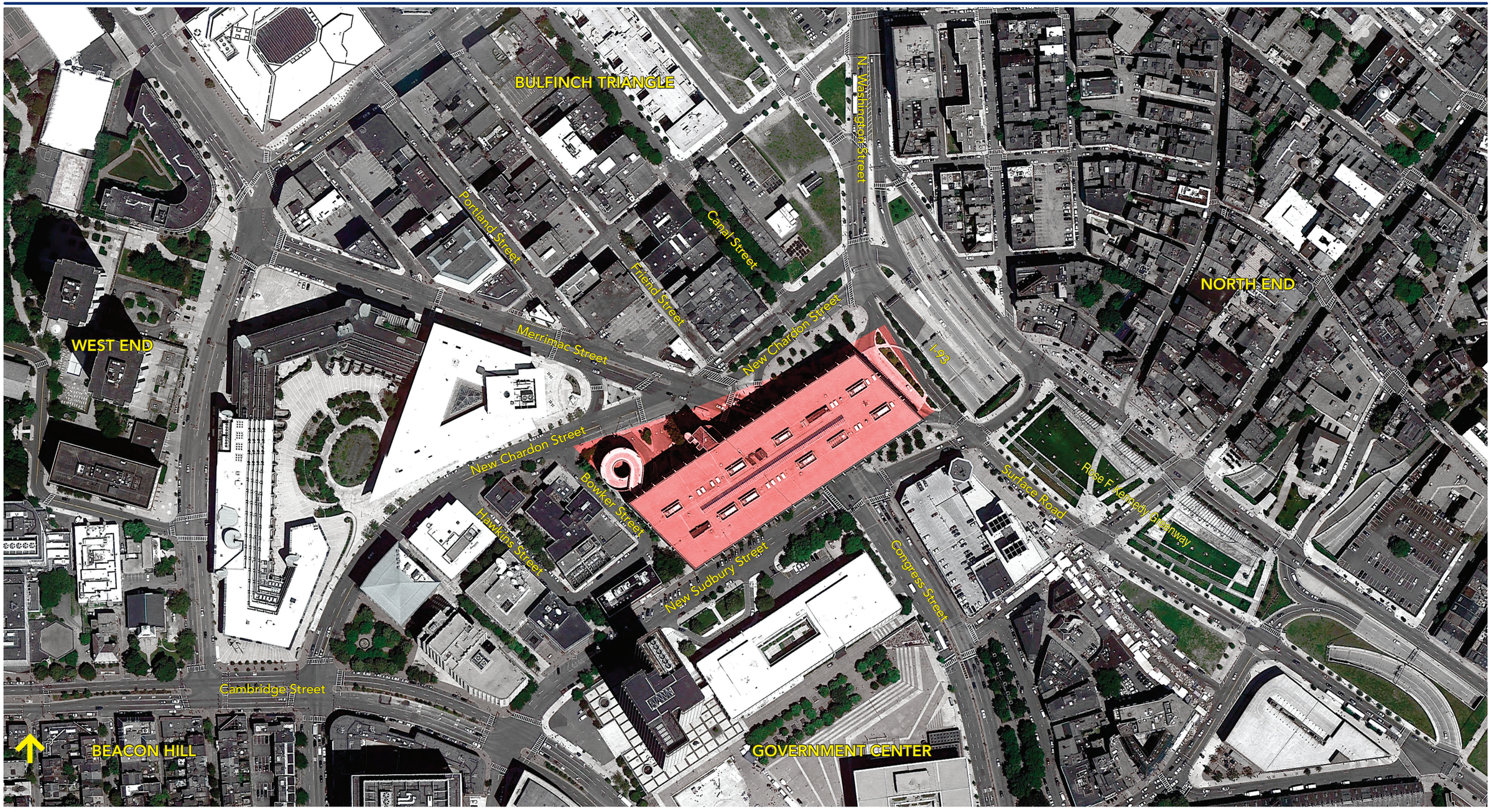
Redevelopment of Government Center Garage
Boston, MA

Figure 1.2

Site Context

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.



Redevelopment of Government Center Garage
Boston, MA

Figure 1.3

Aerial Image of the Existing Garage

THE HYM INVESTMENT GROUP, LLC

cbt

Redevelopment of Government Center Garage
Boston , MA

Figure 1.4
Existing Conditions Site Plan

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.

Aerial View

View from Congress Street

View from New Sudbury Street

View from Canal Street extension

Redevelopment of Government Center Garage
Boston, MA

Figure 1.5

Existing Site Photographs

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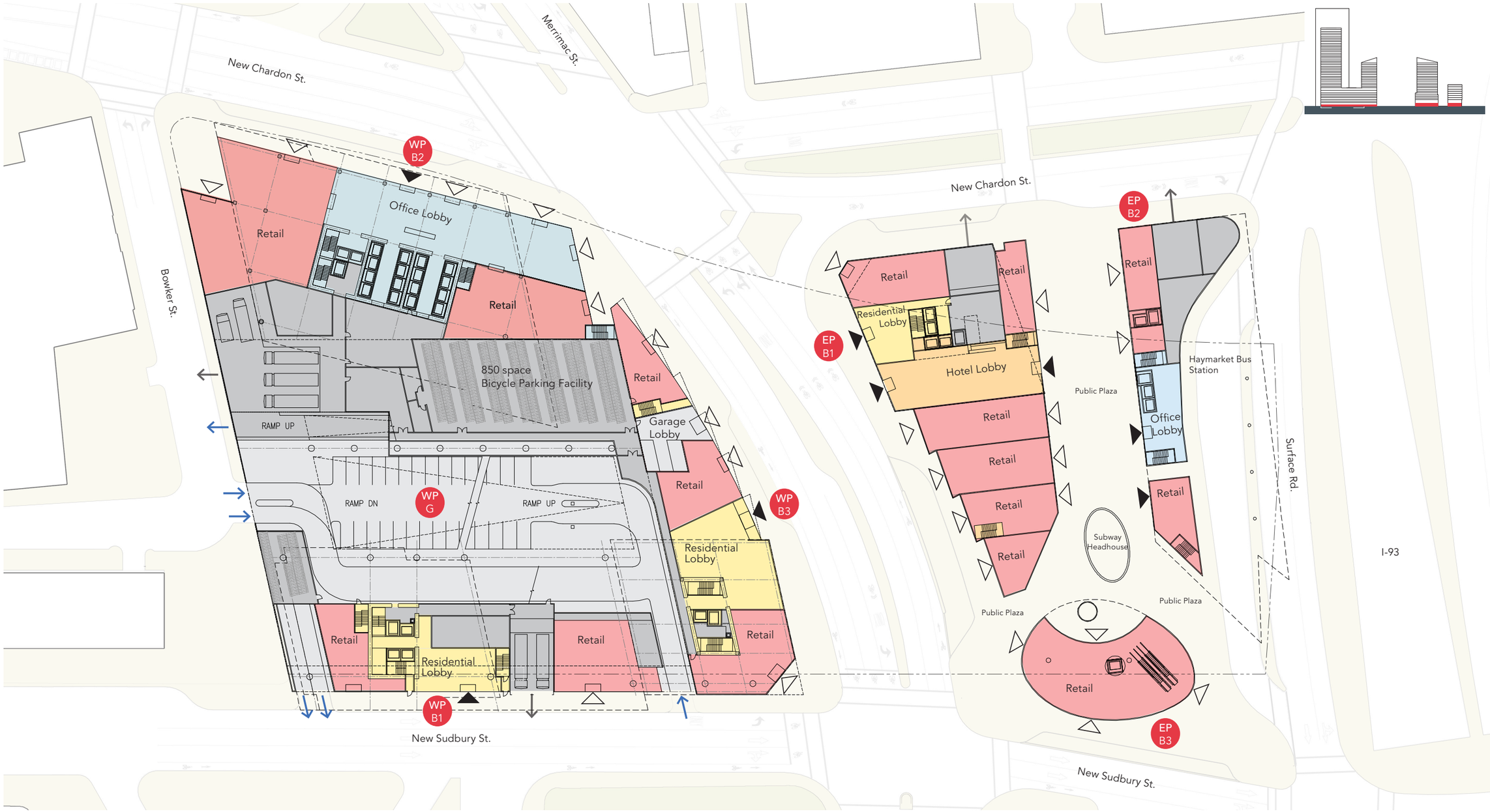
LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID



Redevelopment of Government Center Garage
Boston, MA

Figure 1.6

Proposed Site Plan

THE HYM INVESTMENT GROUP, LLC cbt

Redevelopment of Government Center Garage
Boston, MA

Figure 1.7

Rendering from the Rose Kennedy Greenway

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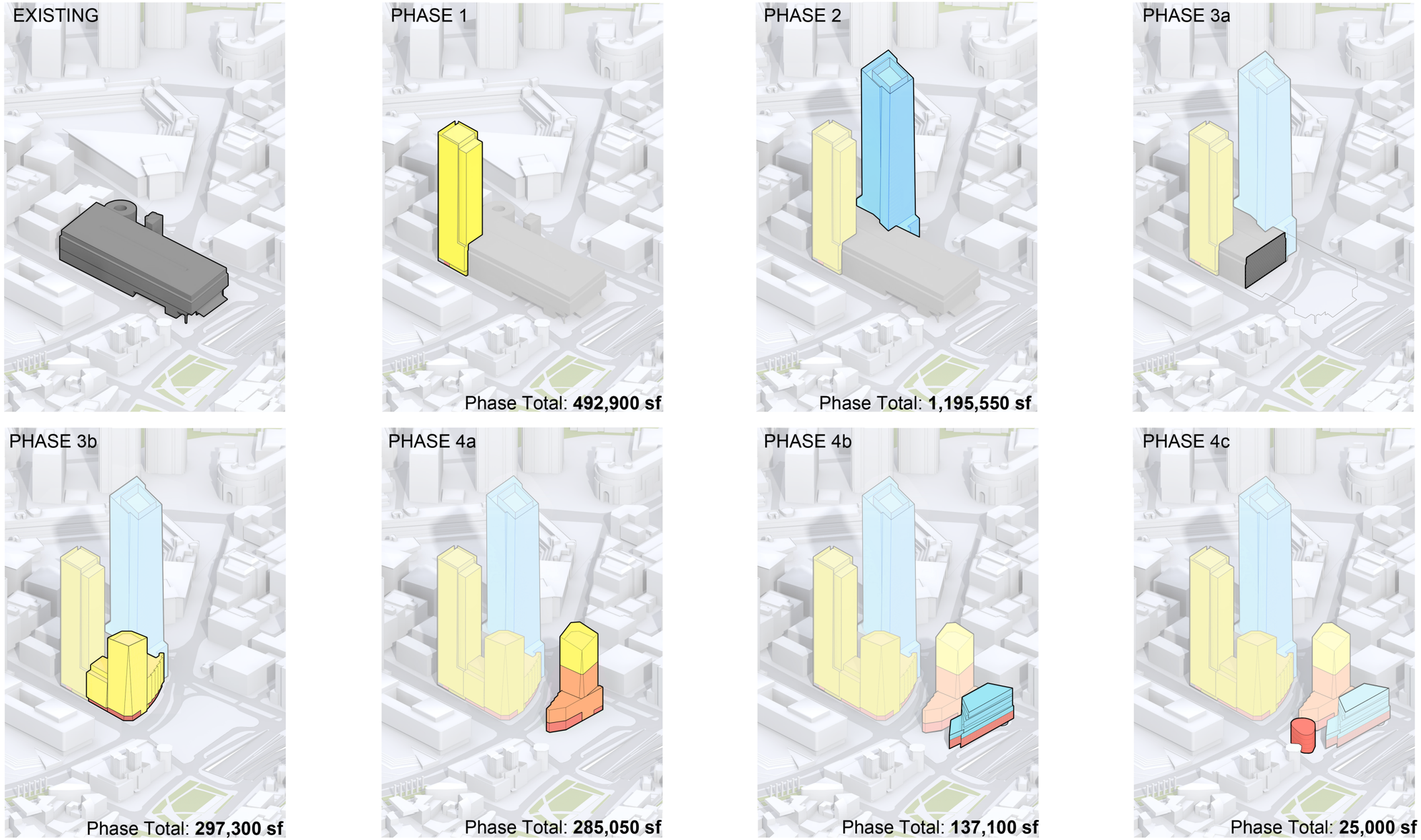

Redevelopment of Government Center Garage
Boston, MA

Figure 1.8

Phasing Summary

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Phase 1

Phase 3

Phase 2

Phase 4

Redevelopment of Government Center Garage
Boston, MA

Figure 1.9

Phasing Visual Impressions

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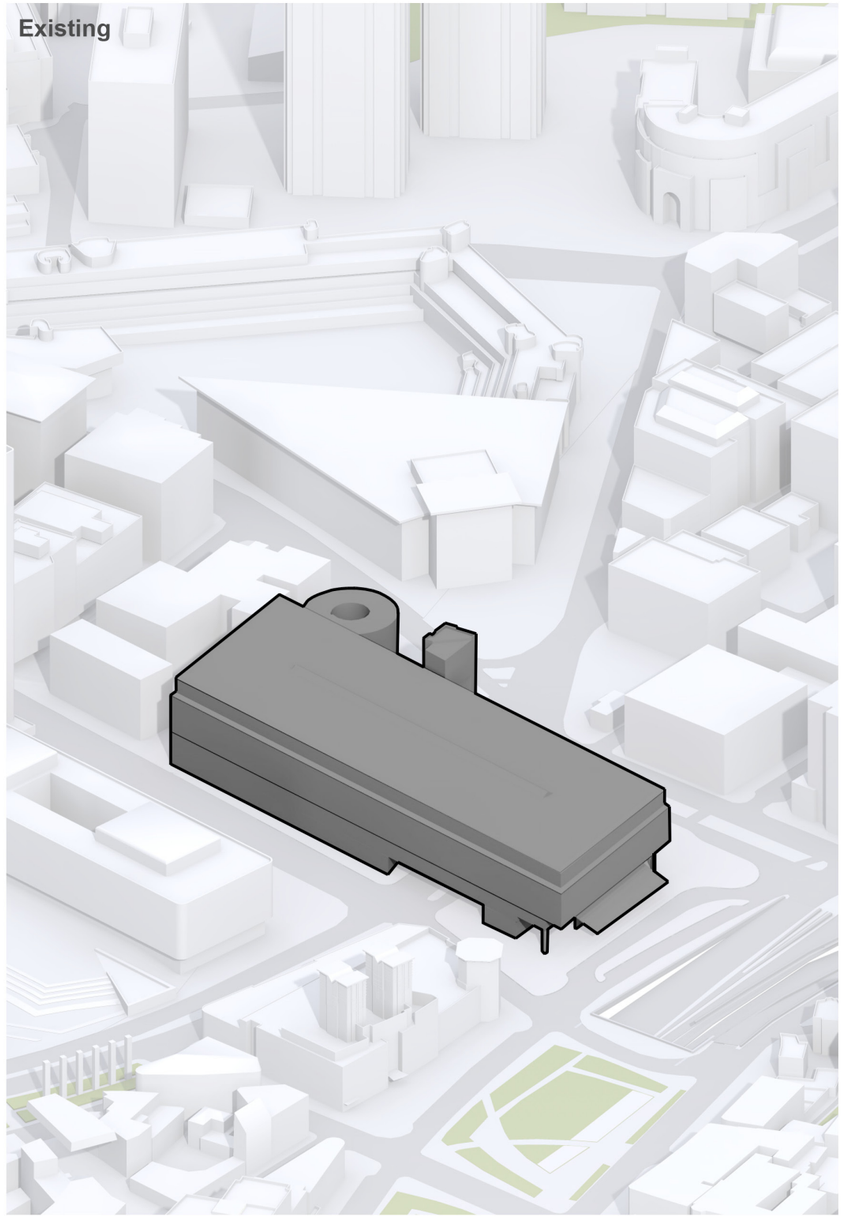
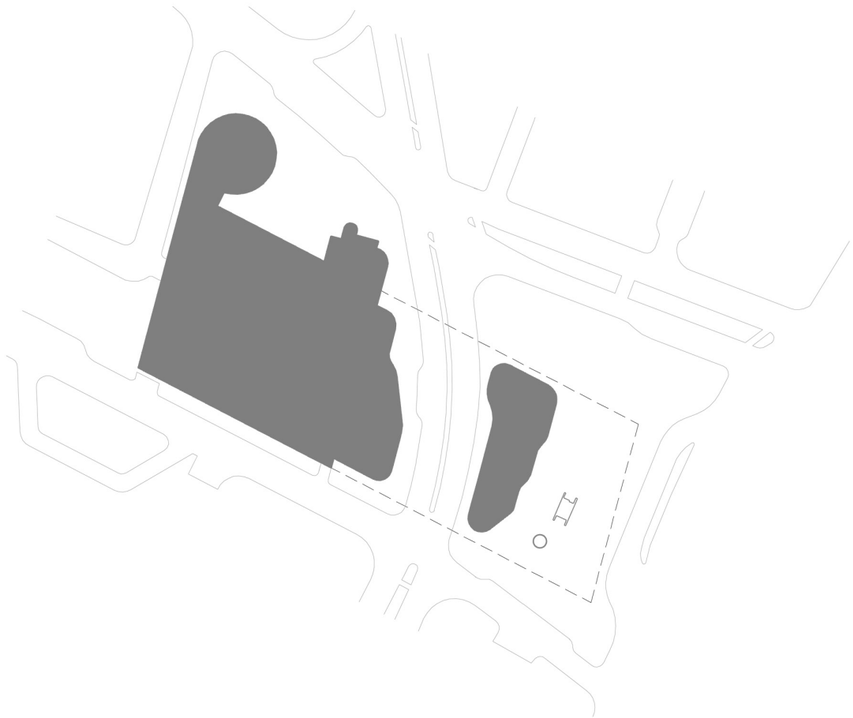


SITE DIAGRAM



PROGRAM	AMOUNT IN PHASE	% OF TOTAL
RESIDENTIAL	0 sf	0
OFFICE	35,000 sf (existing to remain)	3
RETAIL	0 sf	0
HOTEL	0 sf	0
PARKING SPACES	2,310 spaces (existing)	

Redevelopment of Government Center Garage
Boston, MA

Figure 1.10a

Enabling Phase

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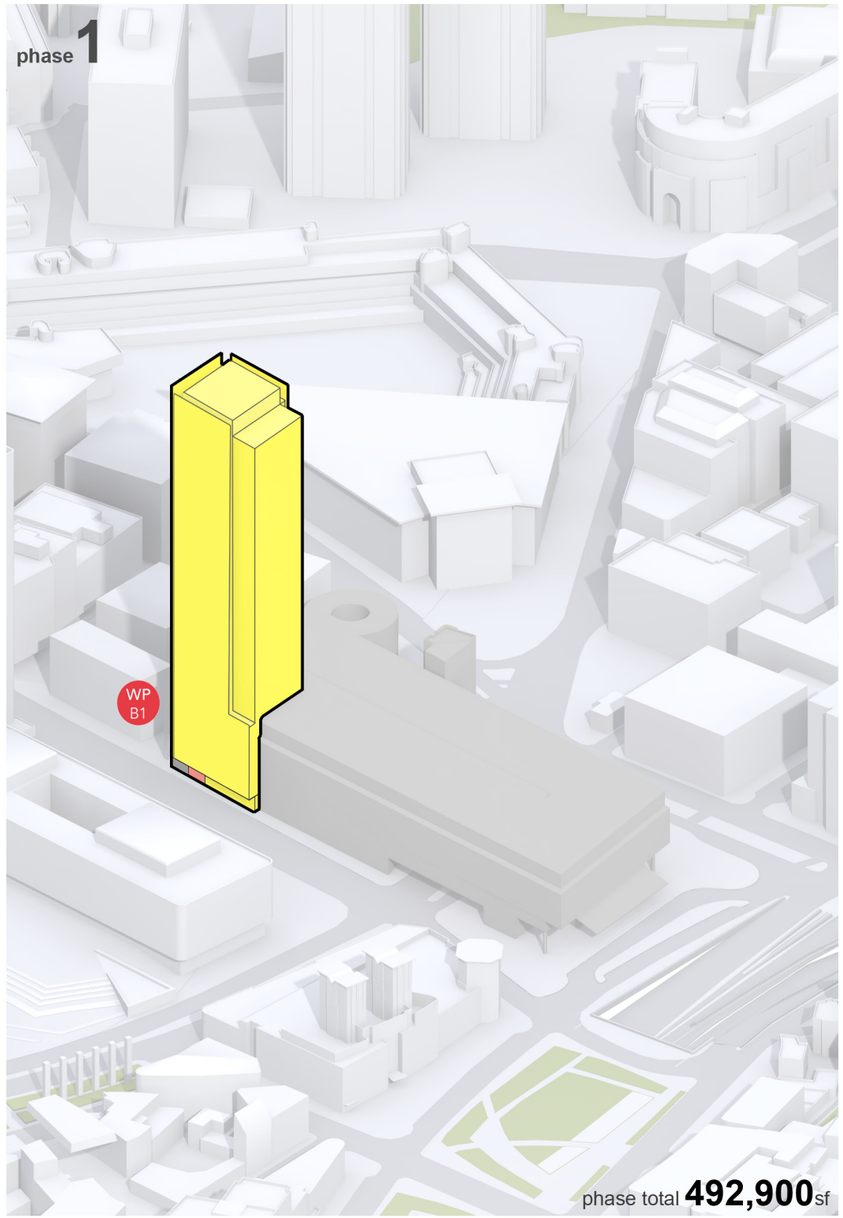
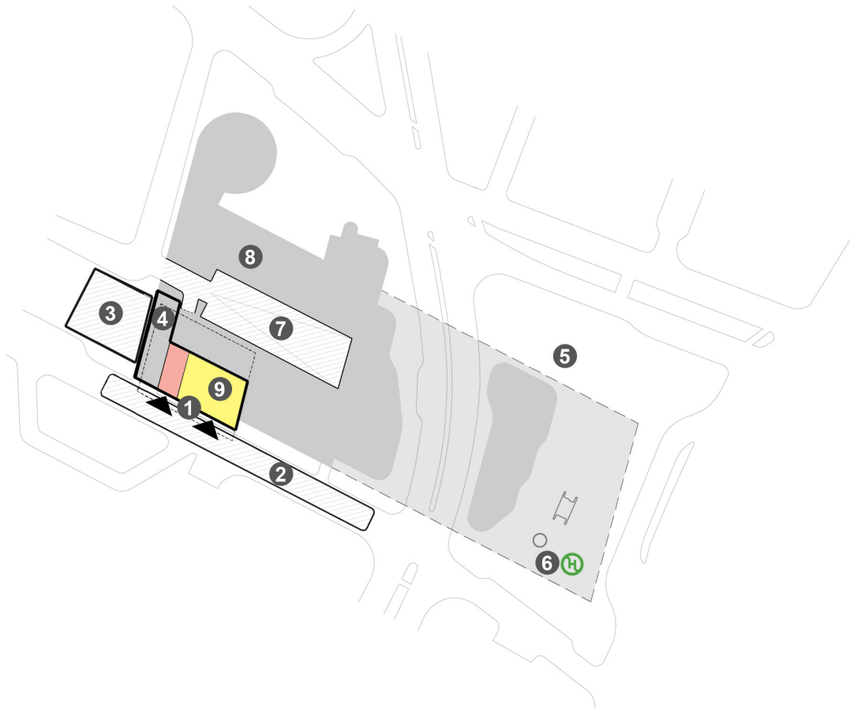


SITE DIAGRAM



PROGRAM	AMOUNT IN PHASE	% OF TOTAL
RESIDENTIAL	490,550 sf (403 units)	55 %
OFFICE	0 sf	0 %
RETAIL	2,350 sf	2 %
HOTEL	0 sf	0 %
PARKING SPACES	15 spaces added	2,325 spaces at end of phase

COMMUNITY BENEFITS

1. Enhance and activate New Sudbury Street along West Parcel with streetscape improvements and new ground-floor residential lobby and retail
2. Implement Boston Complete Street Guidelines with provisions of a new bicycle lane and enhanced pedestrian facilities along New Sudbury Street
3. Enhance the existing neglected and degraded public pedestrian mid-block connection from New Sudbury Street to Bowker Street
4. Provide on-site bicycle storage facility for residents and exterior at-grade short-term bike parking for visitors and customers
5. Explore the addition of retail as an interim improvement around the MBTA Haymarket bus facility on the East Parcel
6. Add a new Hubway bike share station on the East Parcel at the existing MBTA Haymarket bus facility
7. Provide garage parking for displaced BPD (42 spaces)
8. Add five (5) electric car charging stations to the existing garage and provide preferred parking area for fuel-efficient vehicles
9. Provide 403 new housing units with approximately 53 units designated as affordable per Boston's Inclusionary Housing Ordinance
10. Create over 500 construction jobs in all trades
- Create approximately $1.5 million in new local real estate tax revenue

Redevelopment of Government Center Garage
Boston, MA

Figure 1.10b

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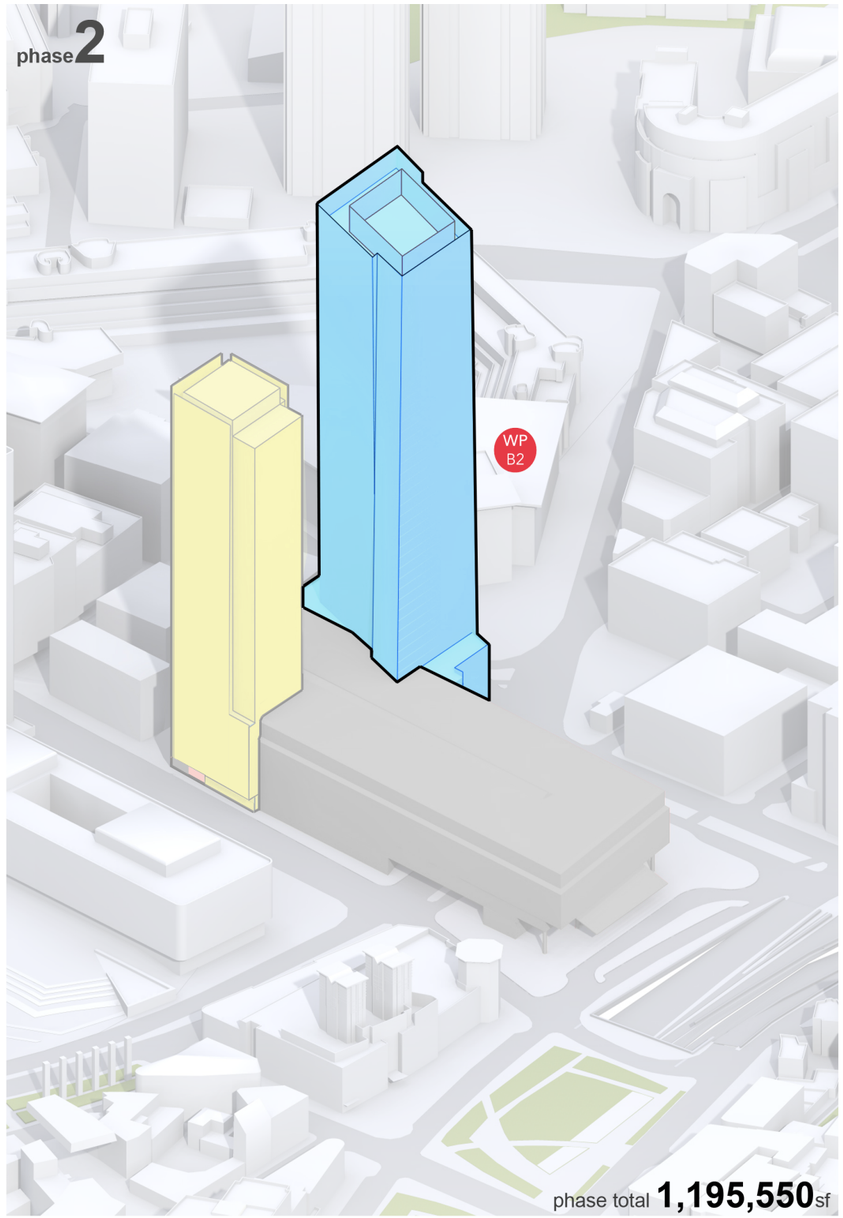
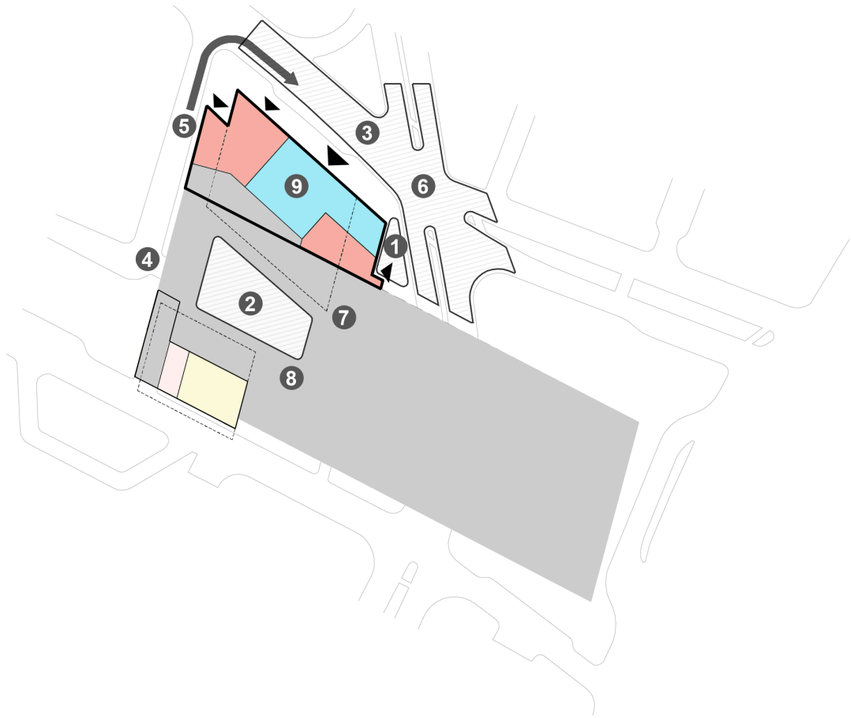
Phase 1 - Apartment Building
(WP B1)



SITE DIAGRAM



PROGRAM	AMOUNT IN PHASE	% OF TOTAL
RESIDENTIAL	0 sf	0 %
OFFICE	1,186,500 sf	88 %
RETAIL	9,050 sf	11%
HOTEL	0 sf	0 %
PARKING SPACES	224 spaces added	2,534 spaces at end of phase

COMMUNITY BENEFITS

1. Create new urban open space opportunities at the ground-floor (corner of New Chardon and Merrimac Streets)
2. Improve water quality and reducing heat island effect through green roofs/roof garden for use by residents and office tenants
3. Implement Boston Complete Street Guidelines with provisions of new bicycle lanes and enhanced pedestrian facilities along New Chardon Street
4. Improve pedestrian safety and vehicular circulation by relocating the existing New Chardon Street garage entrance/exit to the Bowker Street/Hawkins Street intersection
5. Improve traffic circulation to the regional highway system and local roadway network by allowing vehicles exiting the Garage from Bowker Street to make a right turn onto New Chardon Street and go directly to I-93 Southbound (not currently allowed)
6. With the relocation of the Garage entrance to Bowker Street, significantly improve the intersection of Merrimac, Congress, and New Chardon Streets for pedestrians, bicyclists and vehicles
7. Provide a new 850-space bicycle storage facility with showers and changing rooms for employees of the new office building
8. Provide five (5) additional electric car charging stations in the existing garage and provide additional preferred parking area for electric vehicles
9. Encourage the diversification and expansion of Boston's economy in new areas of economic activity with the creation of a new class A office building targeted to creative industry, technology, lifestyle and health care tenants in an area traditionally dominated by government tenants
- Provide exterior at-grade short-term bicycle parking adjacent to the office lobby and new retail stores for visitors and customers
- Create over 1,000 construction jobs in all trades and bring 4,000-5,000 new economy jobs to the site
- Create approximately $6.5 million in new annual local real estate tax revenue.

Redevelopment of Government Center Garage
Boston, MA

Figure 1.10c

Phase 2 - Office Building (WP B2)

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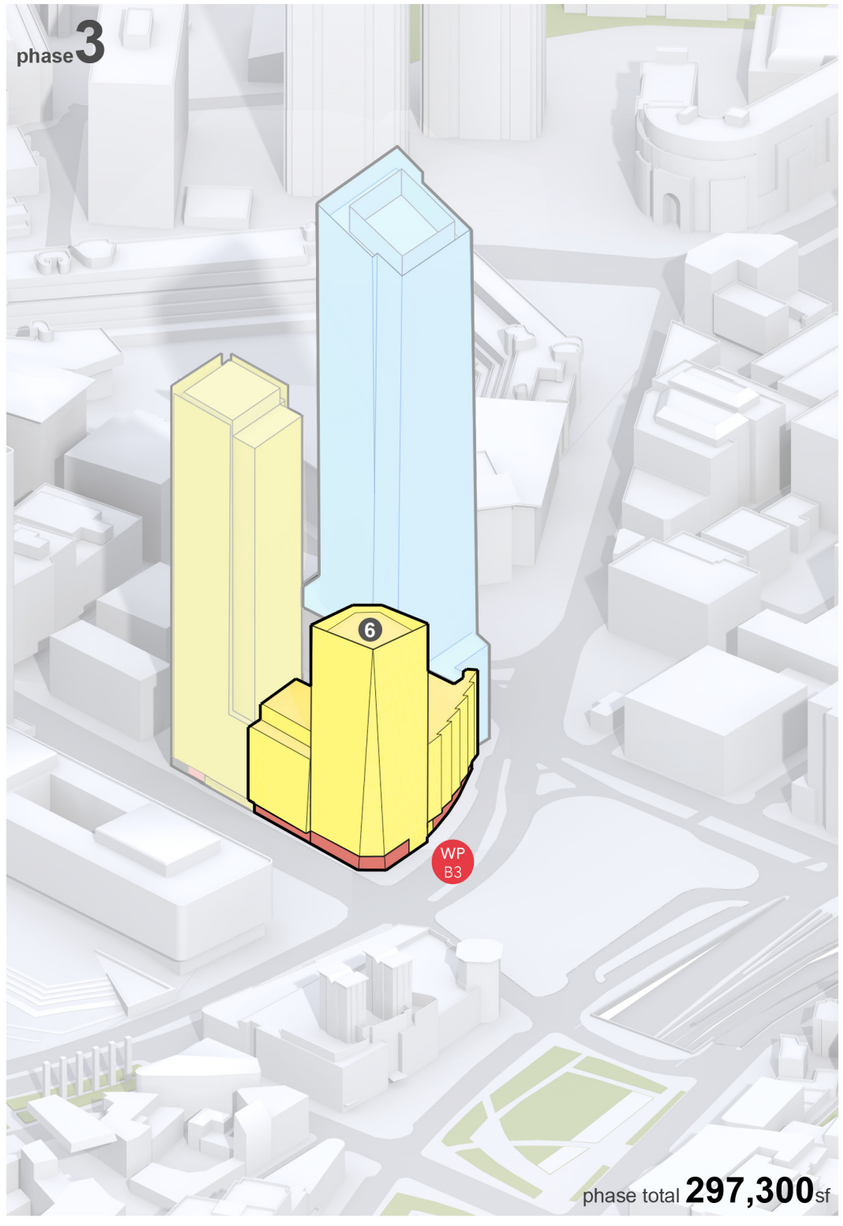
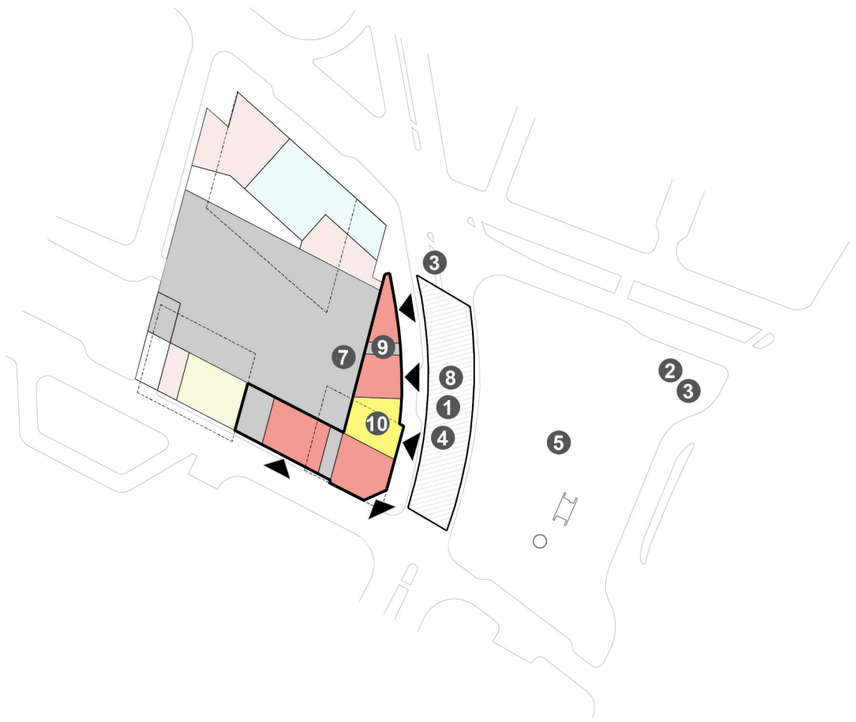


SITE DIAGRAM



PROGRAM	AMOUNT IN PHASE	% OF TOTAL
RESIDENTIAL	288,900 sf = 248 units	32 %
OFFICE	0 sf	0 %
RETAIL	8,400 sf	10%
HOTEL	0 sf	0%
PARKING SPACES	1,375 spaces removed	1,159 spaces at end of phase

COMMUNITY BENEFITS

1. Introduce sky and daylight along Congress Street between New Sudbury and New Chardon Streets
2. Visually connect Bulfinch Triangle, North End, and Market District
3. Create multiple new vistas, including new views of the Custom House Tower and iconic downtown buildings, such as 60 State Street and the Financial District towers
4. Dramatically improve the public realm and architectural character of Congress Street
5. Unlock the potential of the East Parcel for the new public plaza and a dynamic and vibrant mixed use development
6. Begin to frame Congress Street as an important through-way and view corridor by constructing half of the unique Congress Street Dyad
7. Completely enclose the existing garage structure with new active uses, including ground-floor retail and building lobbies as well as apartment units on the upper floors
8. Implement Boston Complete Street Guidelines with provisions of a new bicycle lane and enhanced pedestrian facilities along Congress Street
9. Upgrade existing garage lobby entrance and installation of new garage elevators
10. Provide 248 new housing units with approximately 33 units designated as affordable per Boston's Inclusionary Housing Ordinance
- Expand the on-site bicycle storage center, as needed, and provide exterior at-grade short-term bicycle parking adjacent to the new apartment building lobby and new retail
- Create 350-400 construction jobs in all trades and bring 800-900 employees to the East Parcel (Hotel, Retail and Office)
- Create $1.0 million new annual local real estate tax revenue

Redevelopment of Government Center Garage
Boston, MA

Figure 1.10d

Phase 3 - Apartment Building
(WP B3)

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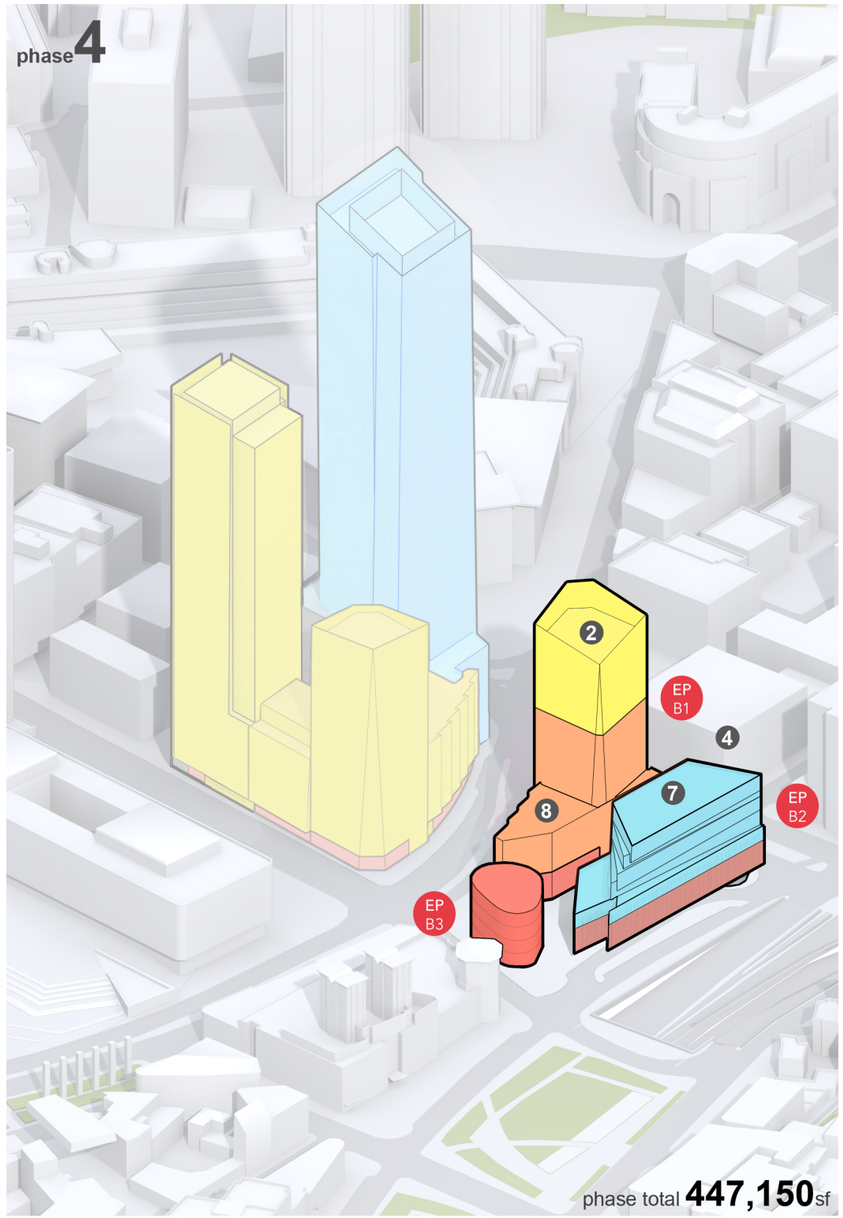
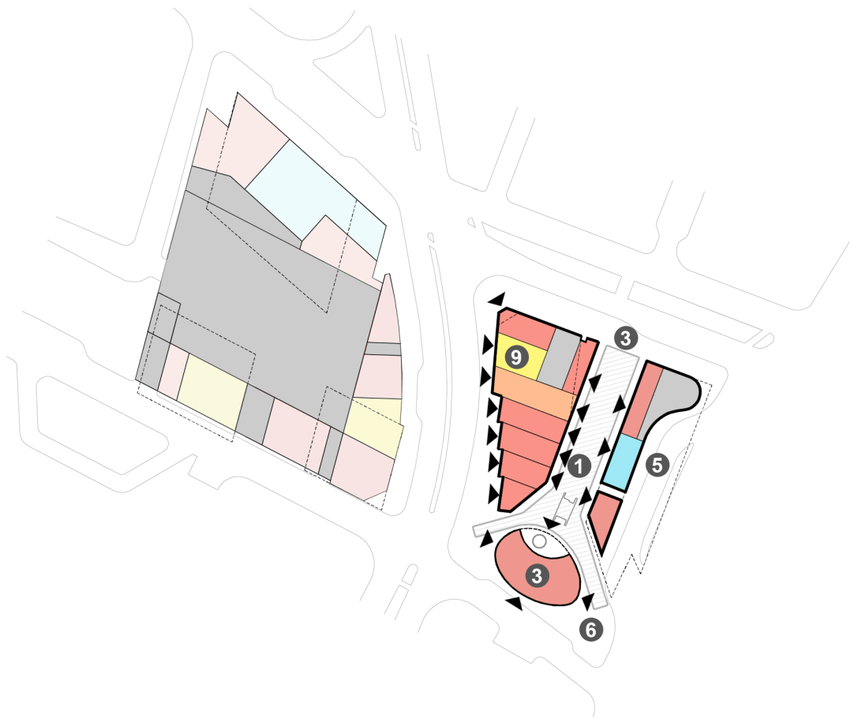


SITE DIAGRAM



PROGRAM	AMOUNT IN PHASE	% OF TOTAL
RESIDENTIAL	120,150 sf (120 units)	13%
OFFICE	116,800 sf	9%
RETAIL	62,700 sf	76%
HOTEL	147,500 sf (204 keys)	100%
PARKING SPACES	0 spaces added	1,159 spaces at end of phase

COMMUNITY BENEFITS

1. Create a new public plaza and promenade to serve as a gateway to and connector between the Bulfinch Triangle and the Rose F. Kennedy Greenway and facilitate pedestrian movement around the Surface Road/I-93 Ramp Parcel
2. Complete the unique Congress Street Dyad and bring a vibrant 18/7 hotel condominium building with two stories of retail to activate the East Parcel
3. Create retail-oriented public space that will continue the Market District northward and connect to Canal Street in the Bulfinch Triangle
4. Scale the height of the East Parcel buildings to be consistent with the Bulfinch Triangle
5. Improve efficiency of and enhance public realm surrounding the MBTA Haymarket bus facility operations
6. Provide for bicycle sharing opportunities by continuing to maintain and expand, as necessary, the Hubway bike share station provided in Phase 1
7. Create a “net zero energy” public space through the installation of a solar panel system on the East Parcel office building that will provide electricity for the plaza lighting and/or water features
8. Support the city’s goal of promoting diversification and expansion of Boston’s economy by adding hotel uses to serve both business and tourist demands, and by creating new local jobs
9. Bring additional residents with the inclusion of 120 condominium units above the hotel of which approximately 16 will be designated as affordable per Boston’s Inclusionary Housing Ordinance
- Create 600-700 construction jobs in all trades and 750 new permanent jobs (hotel, retail, and office jobs)
- Create approximately $2 million in new annual local real estate tax revenue

2
Urban Design

2.1 Introduction

The redevelopment of the Garage is a once-in-a-century opportunity to remake a portion of the City of Boston by pursuing a wide range of strategies to create both a highly nuanced and yet a highly transformative development. There are few sites in Downtown Boston that offer such a sizable land parcel combined with such unparalleled transportation access. The Project Site presents an opportunity to unlock many physical, visual, programmatic, and perceptual disconnects resulting from its urban renewal history. This redevelopment proposes an approach that is deeply rooted in Boston building tradition. The built form of each individual Project Component will respond to the visual and physical conditions, and context of its location on the Project Site. This design response will make these truly Boston buildings, where the collective composition of buildings transcends local scale and context to create a built form that is of a global metropolitan scale, and decidedly, of the 21st Century.

A remnant of the urban renewal era with an outdated program and planning form, the Garage is currently a physical, visual and perceptual barrier between the North End, Bulfinch Triangle and Government Center neighborhoods. The Project will address the ills of 1960s urban renewal initiatives by reuniting these neighborhoods strategically. The prime objective is to break the existing mega-block by opening Congress Street to air and daylight, creating two new vibrant mixed-use appropriately scaled urban blocks with active and pedestrian-friendly ground floors and public spaces. The Project Site also boasts excellent transit access with direct or one transfer connection to the entire MBTA transit system along with direct access from the Interstate 93. In addition, proposed enhancements to pedestrian and bicycle infrastructure with a new bicycle center, incorporation of bike sharing programs such as Hubway, creating bicycle lanes on all streets surrounding this development and enhancing the pedestrian crossings at the intersections around this development will make this a truly remarkable TOD redevelopment.

The proposed development program introduces housing and hospitality uses, which will add more residents to enhance the emerging 18 hours per day, 7 days per week (“18/7”) vitality of Downtown Boston and support the proposed retail development and public plaza as well as enhancing the prospects of retail uses within a 10 to 15 minute walk. In short, the redevelopment will significantly further the reemergence of downtown Boston as a world class place to live and work. Further, the Project will become a catalyst for the redevelopment of the entire Government Center area.

The following sections provide a discussion of the neighborhood context, the Project's civic function as a lynch pin, the Proponent's development and design intents, a detailed descriptions of the public realm and architecture, and a discussion of planning principles.

2.2 Planning Framework

Table 2-1 presents the key guiding principles and design goals that serve as a basis for the redevelopment of the Project Site.

Table 2-1
Planning Principles and Design Goals

Planning Principle	Design Goal
1. Build on the City's investments already made in the Rose F. Kennedy Greenway and Market District	a. Create a transformative catalyst development with a great balance of public realm, mix of uses and density by removing the existing garage structure over Congress Street and adjacent to the Greenway
	b. Support the goals of the BRA's Crossroads Initiative and the Greenway District Planning Study
	c. Allow a dynamic and strong ground floor retail to enhance the City's emerging Market District
2. Sustainably repurpose Urban Renewal (public) infrastructure	a. Enliven pedestrian connections among nearby neighborhoods of North End, Bulfinch Triangle and Government Center Area
	b. Increase the Project Site's activity and usability after 5 o'clock by introducing significant residential and hospitality uses
	c. Increase City tax revenue and create construction jobs in an economy that continues to recover
	d. Appropriately phased redevelopment creates immediate benefits with manageable construction impacts
3. Become a model for mixed-use, transit-oriented development	a. Leverage significant transit access with the two subway lines (Orange & Green) and the MBTA Haymarket bus facility.
	b. Incorporation of a new 850 space bicycle facility, new Hubway Station and new bike lanes on all adjacent streets
	c. Schedule construction in phases to ensure continuous parking supply and access
4. Strive for excellence in architecture and public space	a. Create buildings that are a representation of the future and moving forward but also respect and respond to the surrounding neighborhoods.
	b. Create active and transparent ground floors and upper floors that engage the public realm
	c. Create a public space in the East Parcel that complements the surrounding open spaces but also enhances the attractiveness of the surrounding districts

2.3 Project Description

The Project will create two urban blocks named West Parcel and East Parcel named after their location with reference to the re-opened Congress Street. The West Parcel is bounded by Congress Street to the east, New Sudbury Street to the south, Bowker Street to the west and New Chardon Street to the, north. The East Parcel is bounded by Congress Street to the west, New Sudbury Street to the south, Surface Road/I-93 Ramp Parcel to the east and New Chardon Street to the north.

The West Parcel consists of the podium of the remaining existing garage structure (WP-G) surrounded by various uses on three sides. There are three buildings that will surround this podium on this parcel:

1. WP-B1: A 470-foot apartment building
2. WP-B2: A 600-foot office building
3. WP-B3: A 275-foot apartment building

The East Parcel provides the opportunity to create a unique and vibrant public plaza with a pedestrian connection between Bulfinch Triangle, the Rose F. Kennedy Greenway, and Congress Street. Organized around this public plaza are three buildings:

1. EP-B1: A 275-foot combined hotel and condominium building
2. EP-B2: A 125-foot office building
3. EP-B3: A 60-foot boutique retail building

In addition, the East Parcel will house the reconfigured MBTA Haymarket bus facility.

2.4 Project Site and Historical Context

■

2.4.1 Neighborhood Context

As illustrated by Figure 2.1, the Project Site is immediately adjacent to the following two distinct urban neighborhoods as well as the Surface Road/I-93 Ramp Parcel (a key component of the Central Artery inter-state highway system):

- Government Center – the location of Boston City Hall, Suffolk County courthouses, and state and federal office buildings, and federal office buildings; and
- Bulfinch Triangle, which consists of sports/entertainment uses, such as the TD Garden sports and entertainment complex, offices, retail and residential.

The Project Site is also nearby and connected to the following additional urban neighborhoods or distinct sections of the City (Figure 2.1):

- North End, which consists of residential and neighborhood retail, including restaurants;
- Market District and the Rose F. Kennedy Greenway;

- Financial District, which consists of office uses;
- West End, which consists of residential uses and, further northwest, institutional uses (e.g., hospitals/ medical offices); and
- Beacon Hill residential neighborhood.

As a result of 350 years of development, each of these neighborhoods has a particular building and street design, a unique use pattern by time of day, day of week, and season, and specific urban identity in Bostonians' mental map of the City.

The Project Site is located within the previous Government Center Urban Renewal District, the more recently established Government Center/Markets District (Article 45 of the Code), and the Sudbury Street Restricted Growth Area.

2.4.1.1 The Government Center Urban Renewal District

The Government Center Urban Renewal District was a product of post World War II planning based on the then-current idea that 64 acres of narrow streets, small blocks, and mixed residential/business uses housed in non-fireproof, largely low-rise, structures which had suffered from decades of disinvestment should be replaced with new high-rise development on large blocks featuring wide streets for traffic, generous open spaces for light and air, and wider spaces between buildings for easy access. The resulting development was focused on government offices for federal, state, county and municipal functions. This district is characterized by large buildings with predominately office use. There is very little activity generated in the district in the evening or on the weekend; minor non-weekday activity is created along its edges by the adjacent residential neighborhoods and the Market District (described further below).

2.4.1.2 Bulfinch Triangle

The Bulfinch Triangle neighborhood was laid out in the early 19th century by Charles Bulfinch to fill the stagnant Mill Pond created by a colonial causeway built across the town cove. Bulfinch's plan incorporated routes from downtown Boston to Charlestown (via Washington Street) and to East Cambridge (via Merrimac Street) as two sides of the triangle, and the Causeway as the third side. The neighborhood's fabric has been strongly influenced by transportation facilities – first by a canal (connecting the harbor to the Charles River) left in the original infill development; then by the railroads terminating at North Station, one of which ran parallel to the canal to approximately where the Garage stands; then the portals for the Washington Street (MBTA Orange Line) and Tremont Street (MBTA Green Line) subways and their elevated extensions to Everett and Lechmere Square; then by the elevated Central Artery. All of these earlier developments are gone, moved or replaced underground. North Station has been moved back to allow commercial development along the north side of Causeway Street and the transportation corridor is being redeveloped as new apartments, condos, and hotels over the Central artery and MBTA tunnels. What had recently been a district of quasi-industrial and lower echelon service uses is rapidly becoming a mixed neighborhood of smaller professional offices and boutique hotels in old mid-rise buildings and new mid-rise residential buildings. Figure 2.2 illustrates the recent evolution of the Bulfinch Triangle and other areas immediately surrounding the Project Site. The neighborhood is currently home to many pubs and restaurants popular

with attendees at TD Garden events. Canal, Friend, Portland and Beverly Streets are all used by North Station commuter train passengers walking to and from Government Center and Financial District jobs.

2.4.1.3 North End

The North End is one of the traditional colonial neighborhoods of Boston which has grown north and east by land filled from its original establishment on the slopes of Copps Hill. It is a predominately residential neighborhood with restaurants, shops, banks, services, and civic buildings providing continuous street frontage along Hanover and Salem Streets. The most frequent building type is a smaller low rise brick walk-up apartment building. As in any continuously occupied neighborhood with roots in the 17th century, the North End is home to churches, shops, schools and other institutions.

2.4.1.4 Market District

The Market District takes its name from the Quincy and Faneuil Hall markets, the adjacent Haymarket and the soon to be developed Boston Public Market on the ground floor of the Parcel 7 Garage. This district is unified by regional mercantile use at ground level more than by architectural style or predominant building use. The new Boston Public Market promises the sale of fresh produce, artisan meats and cheeses, seafood and other Massachusetts products on an 18/7 basis, which will draw more customers to the Market District.

2.4.1.5 Rose F. Kennedy Greenway

The Rose F. Kennedy Greenway is a product of the Central Artery reconstruction and the result of an intensive public planning effort in the late 80's and early 90's. The chain of parks and open spaces leading from South Station nearly to North Station is a welcome green relief, a pleasant pedestrian path, and a connector of neighborhoods severed or separated by the elevated highway structure. It is characterized by carefully designed, well-maintained, densely populated public parkland. Activities include strolling, sitting, conversation, informal games, formal entertainments and festivals, tourist information, and food trucks. New Sudbury Street reaches the North End Greenway Parcels and provides a convenient connection to Salem and Hanover Streets.

In summary, the Project Site is at the meeting point of a number of very distinct neighborhoods. This very mixed context offers many challenges, but also the opportunity to create a very positive intervention. In addition, the Project has the potential to unlock the value of various sites within close proximity. The proposed design is based on planning principles and design goals formulated to bring the neighborhoods together – to contribute to all and to be a good neighbor.

■

2.4.2 Project Site Context Evolution

The Project Site is a result of multiple historic layers,the resolution of which is vital to unlocking the connectivity between the adjacent neighborhoods (Figure 2.1). As many areas in Boston, the Project Site is a landfill created out of filling the Mill Pond, which resulted in the creation of Bulfinch Triangle. The Project

Site was a part of the thriving urban fabric at the turn of 20th Century where Bulfinch Triangle, North End, and, previously, Scollay Square (redeveloped as Government Center) seamlessly merged together, and South and North Washington Streets connected to each other. The East Parcel was of great significance at the apex of Bulfinch Triangle and was previously called the Haymarket Square.

Initially constructed in the 1950s as a partly elevated and partly tunneled divided highway, The John F. Fitzgerald Expressway (also known as the Central Artery, or I-93), created a major visual, physical and perceptual barrier between the neighborhoods and rendered Haymarket Square and adjoining neighborhoods undesirable. Also at this time of dependency on automobile transportation, the Garage was conceived as a part of the Government Center URP and was thought necessary to provide concentrated automobile parking resources to attract workers from suburban households into the metropolitan core. The previous West End and Scollay Square residential neighborhoods and their fabric were eradicated and housing as a use was prohibited in the new Urban Renewal District. The Government Center URP further exacerbated the major breaks in urban fabric created by the Central Artery. South and North Washington Streets were disconnected, and New Chardon and Congress Streets were introduced and constructed as major vehicular streets.

In the late 1990s, the TD Garden was rebuilt on top of North Station (a train station which was originally a hub for the Boston and Maine Railroad and is now a hub for MBTA Commuter Rail and Amtrak trains) with its own parking facility. Other recent developments have also added parking within and near the Project Site. The removal of Central Artery and the creation of Rose F. Kennedy Greenway (which maintained the Central Artery alignment as an urban layer) in the mid-1990s to the early 2000s was a radical first step towards the undoing of the urban renewal era planning and unlocking the potential of downtown Boston, including the Project Site. The removal of Central Artery also spurred development of new apartments in the Bulfinch Triangle, the Parcel 7 Garage, and the future Boston Public Market—all in close proximity to the Project Site. The surrounding neighborhoods, including the North End have continued to develop as vibrant residential neighborhoods mixing rental and ownership opportunities with retail, commercial, entertainment, dining and hotel uses. Boston in general, has become much more a mixed use metropolitan center rather than predominately a central workplace.

Also, over the last couple of decades, the Massachusetts Bay Transit Authority (MBTA) has invested in major upgrades to its public transit system serving the Project Site. The Orange line has been extended to the north, both the Green and Orange lines have been put underground, MBTA Haymarket Station and other nearby stations have been rebuilt, and new rolling stock and signal systems have been provided. Because of improved service and facilities in the project area, commuting by public transit has become an attractive alternative to commuting by automobile. In the future, the Green Line extension to Medford will further enhance public transit connectivity to the Government Center area.

In the center of all this positive change, which is bringing vibrancy back to the adjacent neighborhoods, sits the Garage—a massive urban renewal barrier that even more so no longer fits within the urban context of the area and is a obsolete relic of auto-centric parking infrastructure of the 1960's.

2.5 Design and Planning Strategies

This section describes how the Project meets the goals and objectives of the BRA's Greenway District Planning Study (referred to herein as the "Study"). The Project Site falls within the 'Market District and Government Center' sub-district. The Study establishes design guidelines for developments along the Rose F. Kennedy Greenway. The study places equal weight on the corridor-wide urban design issues and the individual role of each potential building parcel along its edges. The Study also recognizes the Project Site as the largest single site with the potential for significant redevelopment near the Greenway District. The Project Site's eastern edge presents a unique opportunity to replace an inactive parking garage face with a higher and better use. The guidelines provide that:

> *"While this eastern edge should retain the scale of the adjacent context in the Bulfinch Triangle and Parcel 7 Garage, the western portions of the site appear capable of supporting much greater density and heights up to 600' without adversely affecting the Greenway parks environmentally."*

The Project is consistent with the Study design guidelines where the higher elements on the West Parcel are located away from and gradually scale down towards the Greenway. The Project directly complies with the design guidelines on the East Parcel, which recommend heights up to 150 feet along the Greenway edge. The Project provides heights varying from 60 feet at the New Sudbury Street end of the Greenway to 125 feet on the New Chardon Street end allowing for a careful scaling towards Parcel 7, Parcel 9, the North End and the Greenway. A comparison between the Study guidelines and the Project is shown in Figure 2.3. Figures 2.4a and 2.4b show building cross sections that illustrate the 'stepping down' of the buildings from the West Parcel to the East Parcel.

2.6 Reconnecting Neighborhoods

Just as the removal of the Central Artery has reconnected the North End with Government Center and the Market District with the Waterfront, the removal of the eastern half of the Garage will reconnect Government Center and the Greenway with the Bulfinch Triangle and improve all the surrounding neighborhoods. Improvements and pedestrian amenities along New Sudbury Street will go a long way to making the connection between Cambridge Street and the North End stronger.

The new East Parcel public plaza will be a direct connector from the Greenway to Washington Street and the eastern part of the Bulfinch Triangle as well as from Government Center and the Market District via Congress Street to Canal Street. These desire lines are recognizable as the chosen paths of pedestrians through the existing MBTA Haymarket bus facility. The proposed redevelopment will make these connections much more pleasant by opening the path to light and air, and providing planting amenities and retail services along the way. The public plaza will also serve as a continuation of the Market District – adding one more link in the chain of markets from Faneuil Hall to Canal Street, and Washington Street, as illustrated in Figure 2.5.

2.7 Opening Vistas and Overcoming Barriers

As illustrated in Figures 2.6a and 2.6b, removal of the eastern portion of the Garage will provide multiple benefits, including opening several new vistas. Long vistas of this sort are critical to mental mapping of cities. Supported by the active built environment around the East Parcel public plaza these newly opened vistas will bring the surrounding neighborhoods closer together by overcoming the sense of barrier that now exists. When looking southeast down Congress Street from Merrimac Street, the Project will provide a view of the Custom House Tower (Figure 2.6a). Furthermore, Congress Street looking north from City Hall will no longer be closed by an intrusive 11-story building providing a new view to the Bulfinch Triangle buildings and a better sense of this arterial street (Figure 2.6b).

Figure 2.6c provides a before and after view from the East Parcel public plaza. Looking south from Canal Street through the new public plaza and through the daylighted Congress Street, the Project will provide new views of iconic downtown buildings, such as the Custom House Tower and 60 State Street. Looking east towards the Greenway along New Sudbury Street, the Project will create a more attractive and active street wall replacing the current garage facade (Figure 2.6d).

2.8 Public Realm and Open Space

Removal of a portion of the Garage offers the opportunity to more seamlessly connect surrounding neighborhoods with active ground floor uses, attractive sidewalk and streetscapes and appropriately scaled massing. One of the biggest public benefits of the Project will be the creation of a vibrant new pedestrian plaza on the East Parcel. The East Parcel is at the nexus of some of the most important pedestrian desire lines connecting Canal Street and Bulfinch Triangle area, the Greenway, Congress Street, Washington Street, North End and the Market District. This proposed all-season and open air pedestrian space, surrounded by retail and with one of the entrances to the MBTA Haymarket Station, would not only create a comfortable pedestrian environment but also a great urban destination. Figure 2.7 illustrates the proposed public realm improvements, including new public open space. The key to creating a vibrant and successful public space on the East Parcel will depend on ground floor uses that would complement the Market District and Bulfinch Triangle. The Project includes active publicly accessible ground floors and will attract visitors to this area of the City. Figure 2.8 illustrates the proposed ground floor activation and potential use types.

The new public plaza will be a highly programmed public space with various activities throughout the day and the year. In the morning it would be as much a place for commuters to either pass through or stop for breakfast or coffee. During the mid-day, the public plaza will bustle with restaurants along with musicians performing and food trucks surrounding the space. The new public plaza will transform at night with improved night lighting, restaurants busy with TD Garden visitors, market district shoppers and residents from near and far.

In addition, the Project will be enhancing and updating an existing pedestrian mid-block connection at the westernmost end of the Project Site from New Sudbury Street to Bowker Street. This pedestrian connection will be redesigned along with the construction of the first apartment building and the reconstruction of New Sudbury Street.

2.9 Developing Appropriate Scale and Massing

The redevelopment of the Garage will provide a presence felt both from near and far. The existing 11-story monolithic super block is clearly out of context in the surrounding neighborhoods. A project of this nature, which is surrounded by districts of varying scales and character with shifting urban grids and historic layers, requires a resolution at multiple scales. In addition, given the scale of the Project itself, the massing should consider its presence on the skyline of Boston from various perspectives. The project design aims to mediate these scales very carefully while delivering a visionary project for Boston.

■

2.9.1 East Parcel

The eastern edge of the Project Site relates directly to the Bulfinch Triangle and the Blackstone Block in scale and character. This end of the Project Site is also directly adjacent to the Greenway and the North End. It is generally important to maintain a medium scale on this edge in order to carefully respond to these conditions. The East Parcel is also the lynchpin for various visual and physical desire-lines between the Greenway, Canal Street, Congress Street, Merrimac Street and North Washington Street. Hence the form of the buildings on the eastern edge of this block are kept to a lower height and also shaped by the desire to connect Canal Street to both the Greenway and the Market District via Congress Street.

The East Parcel is comprised of three buildings:

1. A wedge shaped office building facing the Greenway;
2. A small retail building; and
3. A hotel/condominium building fronting Congress Street.

The wedge shaped office building facing the Greenway is designed to maintain the emerging frontage along the Greenway from Bulfinch Triangle Parcels 2A, B and C to the Parcel 7 Garage to the south and the proposed Parcel 9. This unique office building with panoramic views of Boston, steps back from the North End Parks and Parcel 7 Garage to create an appropriate transition to the Bulfinch Triangle. The boutique retail building at the southern end of the new public plaza (EP-B3) will be in scale with the Parcel 7 Garage, but also creates an iconic terminus to Canal Street. The retail building will also have a great presence on the Greenway and Congress Street. Lastly, the hotel/condominium building along Congress Street will be discussed in the following section as it belongs to a transitional zone

■

2.9.2 Congress Street Dyad

One of the key benefits of the Project is the opening up of Congress Street to the sky, which begs the question of the nature of the re-opened through-way. The Project addresses Congress Street at two scales—a mediating element between the east and west blocks requiring a scale and massing that has the transitional quality between the two. At a city-wide scale, Congress Street could be considered a major threshold between downtown and Bulfinch Triangle. To reflect this threshold, the Project proposes to treat the buildings along

Congress Street as a pair, which have similar architectural qualities and size (refer to Figures 2.6a and 2.6b for renderings of these buildings). To this end, these buildings are treated as a mirrored pair to create a strategic urban moment (the "Congress Street Dyad"). This Congress Street 'Dyad' (a term that has meaning in multiple disciplines, including music, mathematics, genetics, biology and ancient Greek society) suggests a lasting romantic dialogue between any two objects or individuals that is balanced, intense, emotional and memorable. The two in dyad normally appear identical albeit with slight differences. The scale of Congress Street is defined carefully following a podium and upper massing expression while allowing the upper massing to be expressed fully at the intersections of New Chardon and New Sudbury Streets. Further, the Congress Street Dyad follow the acute geometry of the urban grid and their massing is reflective of that geometry and resolution of it with a unique architectural expression of the buildings.

■

2.9.3 West Parcel

A significant design goal of the West Parcel redevelopment is to enclose or hide the portion of the Garage to remain with new buildings. The West Parcel will be developed with three buildings:

1. An apartment building fronting New Sudbury Street;
2. An office building fronting New Chardon Street; and
3. An apartment building fronting Congress Street (as part of the Congress Street Dyad).

Appropriately, the West Parcel consists of the two largest buildings of the Project (the apartment building, WP-B1, and office building, WP-B2) as they are set back from the Greenway, North End, and Bulfinch Triangle. While these buildings are intended to be iconic, they will be designed as a background to the East Parcel and the Congress Street Dyad. Architecturally, an attempt has been made to maintain simplicity in form and to create slenderness by shaping these buildings where necessary. The West Parcel also defines the scale of New Chardon and New Sudbury Streets with a podium expression in keeping with adjacent development.

■

2.9.4 The Skyline

It is vital that such a project be highly elegant and transformative while still allowing for urban vistas from a distance. The Downtown, Government Center and West End developments are a fabric of towers on the skyline; additional towers are proposed at North Station and Martha Road. The visual presence of the Project has been studied in depth for its appearance on both the existing and the emerging Boston skyline as well as from various distant view points and neighborhoods such as the Greenway, North End, West End, Bulfinch Triangle and Beacon Hill. The proposed composition and scale of the overall Project is fitting to such a lynchpin location in the City. Refer to Figure 2.9 for a rendering of the proposed skyline view.

2.10 Continuity of Use

Although the Garage is heavily underutilized for its original size and purpose, and has a harsh visual impact, it does provide parking supply to the area. In addition, new non-government tenants (PUMA & SCVNGR) have found a home in the office space above the Garage. It is the Proponent's intent, indeed an important basic tenet of this development, to maintain an adequate parking supply through all phases and retain these new economy tenants while adding development and improving the public realm. Therefore, the design goal for which much effort has been expended is to design the Project in a way so that it can be phased to allow continuous use of the Garage. This will be accomplished through a series of enabling works within the Garage, structural design to allow construction of the new West Parcel Project Components (WP-B1, WP-B2, and WP-B3) through the interstitial spaces of the Garage, and controlled selective demolition in lieu of implosion. The phasing is also designed to provide public benefit and public realm improvements with each phase and sub-phase.

2.11 Pedestrian Ways and Enhancements

All streets bordering the Garage, including major portions of Congress Street, New Sudbury Street, New Chardon Street and Bowker Street will be reconstructed to better align with Boston's Complete Streets guidelines and goals. Below is additional detail on other specific improvements to each of the major street segments that surround the Project Site as well as site-wide streetscape improvements.

■

2.11.1 Congress Street (under the Garage)

Removal of the Garage over Congress Street will improve the public realm and pedestrian experience in the following ways:

1. Provide daylight, sunlight, and air;
2. Significantly reduce the noise levels;
3. Remove the columns which currently impede continuous pedestrian flow;
4. Narrow the street cross section for automobiles allowing for the addition of bicycle lanes, wider sidewalks and better pedestrian crossings;
5. Opens up great urban vistas particularly to the Custom House Tower (Figure 2.6b); and
6. Attract new retail tenants to the continuous storefronts the redevelopment will provide.

■

2.11.2 New Sudbury Street

As previously mentioned, New Sudbury Street is a very important connection and a primary street and sidewalk connection between Cambridge Street and the North End. But the current walk down the sidewalk lacks the very barest of pedestrian amenities. The sidewalk is defined by diagonally parked cars on one side; a bare concrete wall on the other; nine stories of open concrete car park directly above. The proposed design

improves this through narrowing the street by eliminating the diagonal parking area and widening the sidewalk from the existing Boston Police Station to the Greenway. This narrowing of the street also allows for the first apartment building (WP-B1) to land structural columns just outside the face of the existing garage structure and to incorporate single-loaded units that cover and wrap the Garage exterior. The new apartment building, now hiding the Garage along this stretch from view, will activate the street and engage pedestrians with new entrances, retail, and apartment units, together creating a vibrant and safe street environment. The proposed reconstruction of New Sudbury Street along this section will follow Boston Complete Street Guidelines with provision of a bicycle lane and enhanced pedestrian conditions. The vision for New Sudbury Street is illustrated in Figure 2.6d.

■

2.11.3 New Chardon Street

The greatest improvement to pedestrian amenities along the south sidewalk of New Chardon Street will be the removal of the existing parking garage entry/exit, the office loading dock, and the great concrete spiral ramp. These will be replaced with office and hotel lobbies and retail space. This will also allow for a complete reconfiguration of the intersection of New Chardon and Merrimac Streets which are currently highly traveled pedestrian crossing areas, yet very dangerous and convoluted. The proposed reorganization will allow for more direct and safe pedestrian crossings of these streets. In addition, bicycle lanes will be included on New Chardon Street.

■

2.11.4 Bowker Street Pedestrian Connection

Bowker Street is a hidden but important mid-block connection between New Chardon and New Sudbury Streets. Given the grade difference between the two streets and the existing and potential future desire lines, Bowker Street becomes an important connection to enhance. The proposed development will enhance the pedestrian experience, upgrade existing landscape areas, improve crossings and also enhance the pedestrian connection between New Sudbury and New Chardon Streets through Bowker Street.

■

2.11.5 Streetscape Improvements

All adjacent street segments will have curbs removed and reset, pedestrian paving replaced, and auto paving repaired, resurfaced, and restriped. In addition, bike lanes will be incorporated and sidewalks will be upgraded. The median in Congress Street between New Sudbury and New Chardon Streets will be rebuilt in design coordination sympathetic with the Congress Street median south of New Sudbury Street.

All new street lighting will be provided continuing existing themes of Congress Street. The lighting for the East Parcel public plaza will marry the lighting of Canal Street with the pedestrian lighting of the North End Greenway parks. New Chardon and New Sudbury Streets will receive lighting planned in conjunction with the BRA and Street Lighting Department. Street trees will be introduced where feasible and other landscape measures to enhance the public experience will be provided.

2.12 Green Roofs & Roof Gardens

The proposed redevelopment will incorporate a substantial amount of green roof and roof garden/deck areas as an outdoor amenity for the residents and tenants as well as a sustainable measure for the various buildings. Figure 2.10 illustrates the conceptual roof plan of the proposed green roofs and roof gardens.

The West Parcel, which has approximately 50 percent of the existing garage structure, will be converting its currently ballasted roof into a series of green roof areas and roof garden/deck areas for the two apartment buildings and the office building that will be built around and through the Garage. This will particularly be an important amenity to the residents of the West Parcel.

The East Parcel will also incorporate green roofs and/or roof gardens /decks. There will be a unique roof top garden on the hotel/condominium building. At 110-feet high, this spectacular space will have 360-degree views including to the harbor and the North End. Also, the smaller East Parcel retail building will incorporate both green roofs and roof decks/gardens. In addition, the East Parcel office building (EP-B2) will incorporate solar panels to generate energy for the lighting of the new public plaza and office building.

Combined, the Project will introduce approximately 32,000 square feet of green roof and roof garden/decks combined. All of the proposed green roofs and roof gardens, in addition to being an amenity for the redevelopment, will allow for material reduction of heat island effect and help manage the rain water.

2.13 Improved Vehicle Access and Circulation

Street and traffic patterns will remain largely as they now exist; however, there will be two key changes. First, the garage entrance/exit and office loading dock from New Chardon Street will be closed, allowing a substantial pedestrian friendly reconfiguration of the intersection of New Chardon and Merrimac Street. This intersection, particularly given the major entrance into the Garage, is a vehicular dominated and awkward intersection. The removal of this entrance and exit at the corner of New Chardon Street will allow for a improved more pedestrian/bicycle friendly intersection and the addition of new retail and a new lobby entrance for the new West Parcel office building (WP-B2).

The second major change is that a new garage entrance/exit and a new loading dock will be located off of Bowker Street on the rear of the Garage. This will move the Garage access and exit movements away from the Merrimac/New Chardon Street intersection and to the Bowker Street intersection. To support this change, Bowker Street will be changed from one-way operation to two-way operation.

These two changes combined will improve both the pedestrian experience, but also improve the traffic operations around the Merrimac/New Chardon Street intersection. Refer to Chapter 3, *Transportation and Parking* for further details.

2.14 Architecture, Aesthetics, and Visual Considerations

The Project will create six individual buildings in addition to the remaining portion of the Garage. In keeping with the general context of the surrounding neighborhood each building will have its own address, identity and direct pedestrian entrance from the street. One of the critical contributions of this proposal is to surgically build around the Garage through phases and eventually maintain the western portion of the Garage for parking while removing the eastern portion of the Garage. The Project proposes that ultimately, the three major facades of the remaining garage structure will be covered and the ground floors and podium levels both in East and West Parcels engage the public space with active program elements. In addition, the opportunity is to compose the massing of the Project in an elegant fashion to respond to the urban considerations by developing footprints that create slender and sensitive buildings. Figures 2.11a through 2.11k demonstrate this objective through the floor plans of the Project. Figures 2.12a through 2.12e show the building elevations from the surrounding roadways.

■

2.14.1 West Parcel Building Design

WP-B1 will have an entrance and address on New Sudbury Street. This building is currently designed as a "point block" building that is a residential floor plate composed of apartments surrounding a central elevator core (as opposed to a corridor building with apartments down both sides of a central hallway). It will be a relatively slender upper massing with a floor plate of about 10,000 square feet, which is a departure from typical bigger floor plates that are quite common in Boston. The exterior building façade treatment, or "skin," will be carefully articulated precast concrete with some elements of glass curtain wall and metal panel infill. WP-B1 (apartment building) will have operable windows giving its facades a readable scale. The lower levels of this apartment building pass through and in front of the Garage. One set of structural columns will pass within an existing interstitial space in the existing Garage and a second set of columns will land just outside the Garage. This set of columns just outside the Garage will allow the addition of single-loaded apartment units which will wrap and hide the Garage from view in this area. At the ground level, the apartment building will have a new residential lobby and new adjacent retail activating the street level and also hiding the Garage from view in this area.

The proposed office building (WP-B2) will have an address and lobby entrance on New Chardon Street. It will be a glass and aluminum curtain wall clad building 600 feet tall. It is generally intended to be a highly efficient, modern, multi-tenant downtown office building; but it will have a modest degree of elegant rooftop articulation and a broad canopy and a small street front public plaza marking its entrance. Its mass (floor plate size) will be approximately 23,000 square feet per floor, appropriate for a urban Class A office building and similar to the floor plates of other recently built class A office buildings, such as Atlantic Wharf. The office building will not have operable windows, but the pattern and texture of mullions and non-transparent materials will provide a scale-giving texture. Adjacent to the office lobby will be new street front retail spaces, completing the conversion of the former garage entrance and helix area into a vibrant street front with very active pedestrian and street front uses.

Once the office building (WP-B2) is complete then the eastern portion of the Garage will be completely removed. After completion of this demolition, the second apartment building on the West Parcel (WP-B3) can

be constructed. This second apartment building will, on the lower levels, be a corridor building with single-loaded units that wrap the Garage to remain on Congress and New Sudbury Streets. Once the building is above the existing garage height, it will transition into a small point block building footprint at the corner of New Sudbury and Congress Streets. The design of WP-B3, as part of the Congress Street Dyad, will be similar in architecture and context as the hotel/condominium building on the East Parcel which is described next.

■

2.14.2 East Parcel Building Design

The proposed hotel/condominium building (EP-B1) will be a corridor building on the lower levels as it follows Congress Street and forms one side of the new pedestrian plaza. As the building goes up it transitions into a small point block building footprint at the corner of New Chardon and Merrimac Streets. Together WP-B3 and EP-B1 represent the Congress Street Dyad, or pair, which will have a dynamic architectural quality with resolving of the acute corners formed by the urban grid of Boston through unique resolutions of building geometry. These buildings will also represent the gateway quality while being highly transparent along Congress Street.

A smaller 125-foot tall office building is located on the East Parcel (EP-B2) along the Greenway. This trapezoidal shape building is uniquely formed by the public desire lines of the new public plaza that connects Washington Street, Canal Street and the Greenway. This unique form also steps down from the Bulfinch Triangle towards the Greenway to respond carefully to the context. This building will play a threshold role by responding to two scales – a bottom portion that responds to the more solid historic nature of the Blackstone Block while the upper portion begins to transition to a more transparent idiom consistent with rest of the development.

Lastly, the retail building in East Parcel (EP-B3) is intended to be iconic, transparent and glowing while providing a great terminus to Canal Street, but also celebrating the intersection of Congress Street, the Greenway, and Canal Street with shared presence on all three streets.

■

2.14.3 Completion of the Project

Once the Project is complete, the western portion of the Garage along New Sudbury, New Chardon, and Congress Streets will be enclosed on three sides by retail and lobbies on the ground floor and single-loaded apartment units or office space on Floors 2-11. Only a portion of the Garage façade will remain visible on the Bowker Street façade. More specifically, New Sudbury Street façade will be covered by the apartment buildings (WP-B1 and WP-B3). The Congress Street façade will be covered with an extension of WP-B3 and the New Chardon Street façade will be covered by WP-B2. Thus, the Project will appear to be a group of buildings filling two city blocks with mid-rise infill between the new buildings, not unlike other parts of downtown Boston.

2.15 Sustainable Urbanism

Cities sustain themselves through positive growth and change. It is in the nature of healthy cities, such as Boston, to protect the best of the past while redeveloping to meet the needs of its citizens. To this end, the act of repurposing vehicle parking infrastructure and integrating it with a density and mix of uses at a significant transportation node is sustainable from a social, environmental and economic standpoint. The Project demonstrates how these multiple independent variables can be interconnected to create a development that is highly sustainable and a model for future development in Boston. The following summarizes how the Project represents sustainable urbanism:

- Unlocks connections between various neighborhoods and integrates them
- Enhances access to alternative modes of transportation, including public transit (subway and bus) a new Hubway bike share station, an 850-space bicycle storage facility, access to car share programs – a true mobility hub
- Massing, orientation and density are used to passively maximize energy efficiency
- Creates an East Parcel public plaza that extends and enhances the experience of the Market District and the Rose F. Kennedy Greenway
- Proposes to reuse the remaining portion of the existing garage structure and precast members
- Improves pedestrian level comfort at street and public spaces
- Green roofs mitigate heat island effect
- Embraces a strategy for water efficiency through storm water management and water reuse
- Installation of a solar panel system on the East Parcel to allow for a zero net energy (ZNE) public plaza.

Redevelopment of Government Center Garage
Boston, MA

Figure 2.1

Neighborhood Adjacencies

THE HYM INVESTMENT GROUP LLC cbt

1. LOVEJOY WHARF-
336,335 SF
The Beale Company
100 Residential Units
Retail
Parking Spaces

2. TD GARDEN DEVELOPMENT
1,300,000 SF
Boston Properties
Mixed-Use Development
(To Be Approved)
Residential/Hotel
45,000 SF Supermarket

3. NASHUA ST. RESIDENCES
636,551 SF
Avalon Bay
503 Residential Units
270 Parking Spaces

4. PARCEL 1A- TRINITY
275,639 SF
241 Residential Units
35,000 Retail
121 Parking Spaces

5. THE VICTOR (PARCEL 1)
361,000 SF
Simpson Housing
284 Residential Units
14,910 SF Retail
142 Parking Spaces

6. THE MERANO
491,700 SF
Boston Development
230 Residential Units
210 Key Hotel
184 Parking Spaces

7. ONE CANAL (PARCEL 2ABC)
438,800 SF
Trinity
320 Residential Units
21,300 Retail
159 Parking Spaces

8. FORECASTER BLDG
104,750 SF
121 Portland LLC
62 Residential Units
4,080 SF Retail
44 Parking Spaces

9. NORTH BENNET SCHOOL
North Bennet Street School
65,000 SF

10. PARCEL 9
UNKNOWN
To be decided

11. 20 SOMERSET ST
156,000 SF
Suffolk University
Academic Building

12. GARDEN GARAGE
958,000 SF
Equity Residential
500 Residential Units
850 Parking Spaces

13. GOVERNMENT CENTER GARAGE
2,400,000 SF
THE HYM INVESTMENT GROUP LLC
771 Residential Units
204 Hotel Keys
1,300,000 SF Office
82,500 SF Retail
1,159 Parking Spaces

14. CAUSEWAY STREET IMPROVEMENTS
15. FRIEND STREET IMPROVEMENTS

LEGEND

- Under Review
- Board Approved
- Under Construction
- Recently Completed
- Letter of Intent Submitted

Redevelopment of Government Center Garage
Boston, MA

Figure 2.2

Neighborhood Evolution

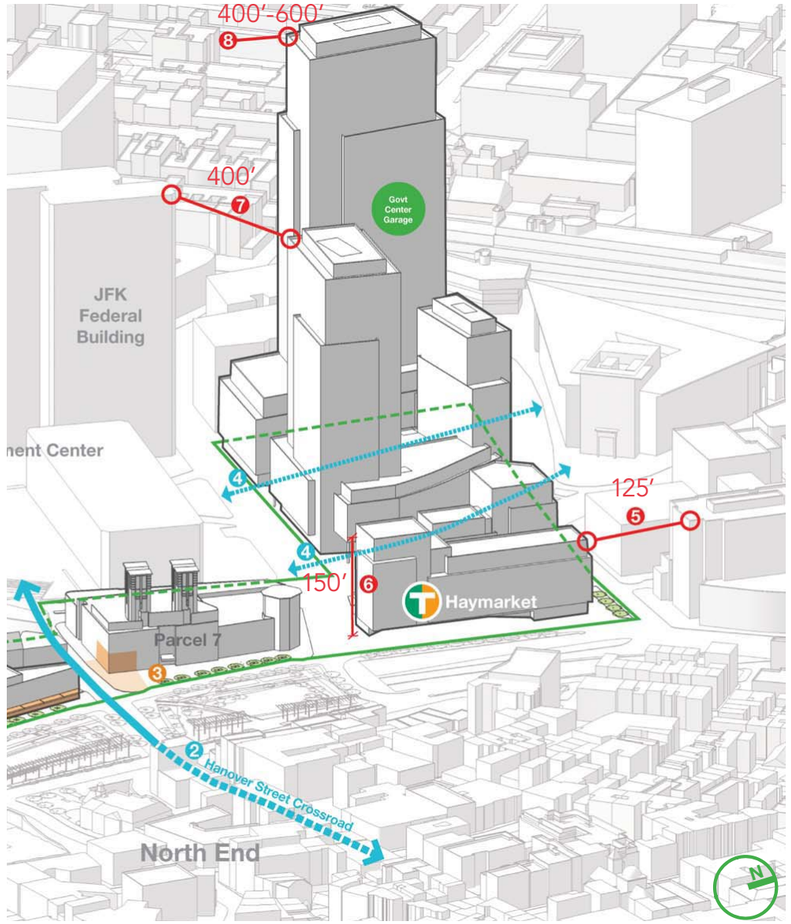
THE HYM INVESTMENT GROUP, LLC cbt

Dimensional Criteria

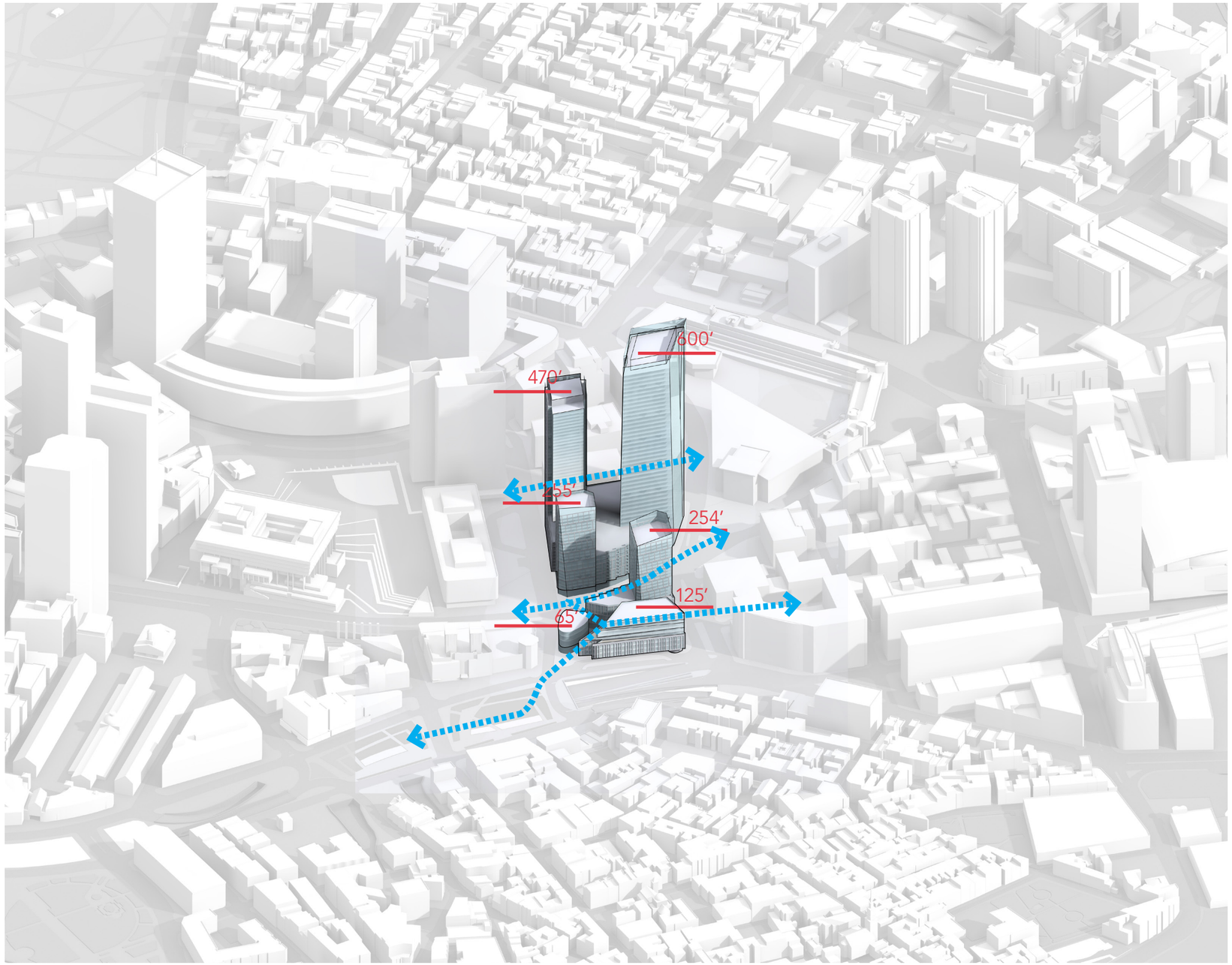
5 125’ to correspond with the heights in the Bulfinch Triangle.
6 150’ at the New Sudbury Street corner of the existing Government Center Garage.
7 400’ or approximately aligned with the taller portion of the JFK Federal Building.
8 400-600’ matching the tallest buildings in the Downtown.

Connectivity

4 North-South connections between the Government Center Garage site and the Bulfinch Triangle will link the Market District to this important mixed-use and entertainment zone, and to the critical transportation hubs at Haymarket and North Station.



BRA Greenway Study & Guidelines



Proposed

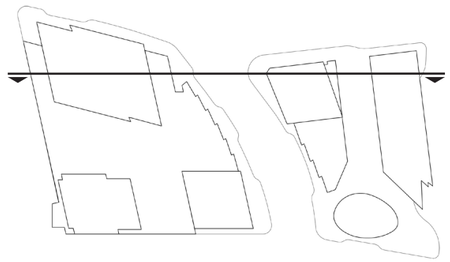
Redevelopment of Government Center Garage
Boston, MA

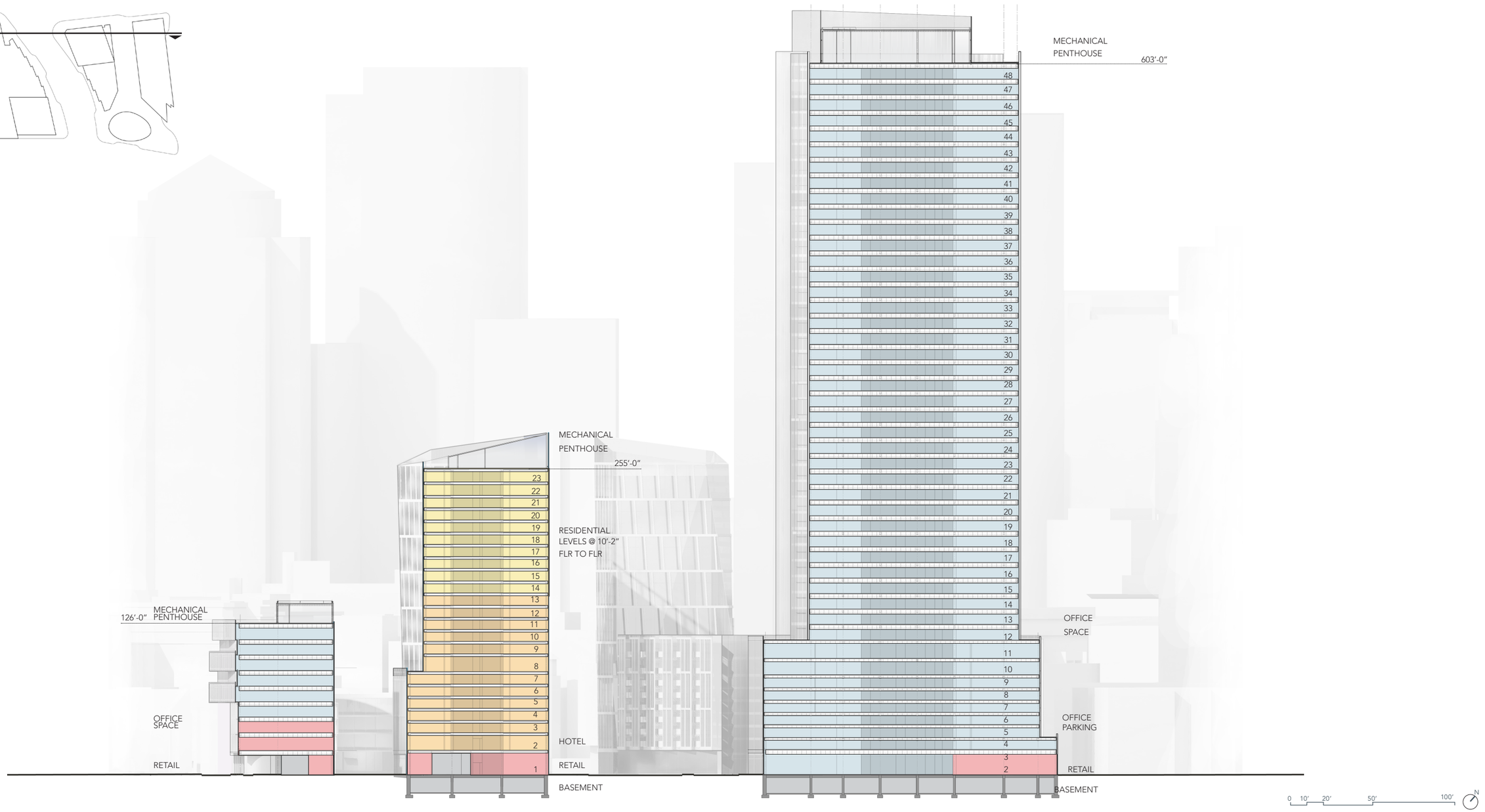
Figure 2.3

Compliiance with BRA Greenway Study & Guidelines

THE HYM INVESTMENT GROUP, LLC cbt

LEGEND Residential · Hotel · Office · Retail · Parking · Back of House/ Service · Green Roof (Not Occupied) · Landscaped Area · Primary Pedestrian Entry · Secondary Pedestrian Entry · Cars Entry/ Exit · Service Vehicles Entry/Exit · XX YY Parcel ID & Building ID





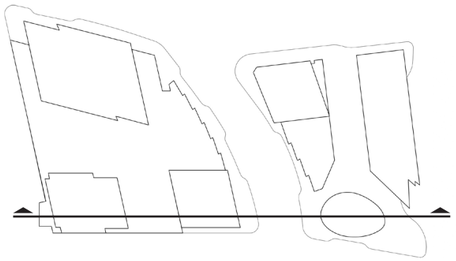
Redevelopment of Government Center Garage
Boston, MA

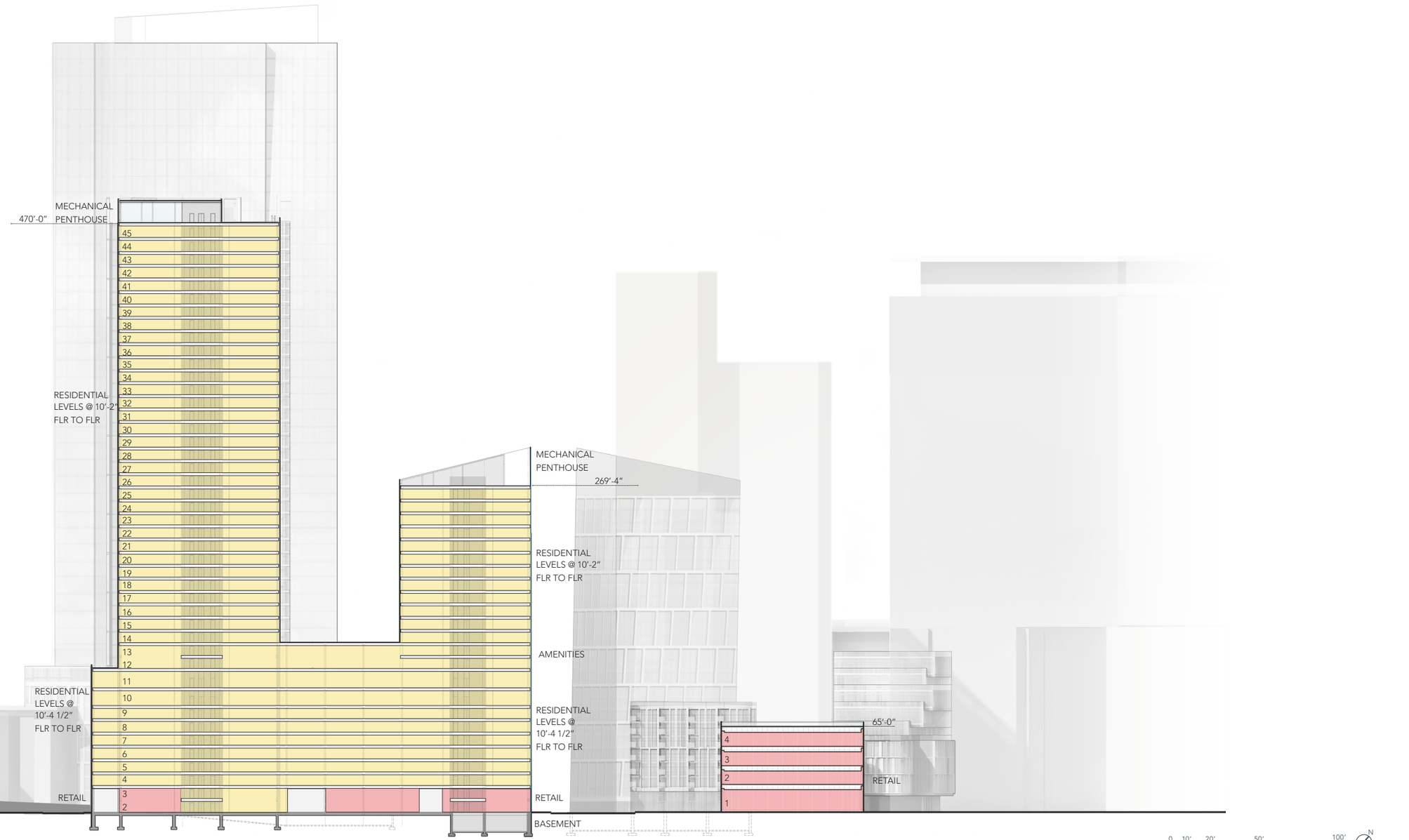
Figure 2.4a

Proposed Project Site Section
Looking South

THE HYM INVESTMENT GROUP, LLC · cbt

LEGEND Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID



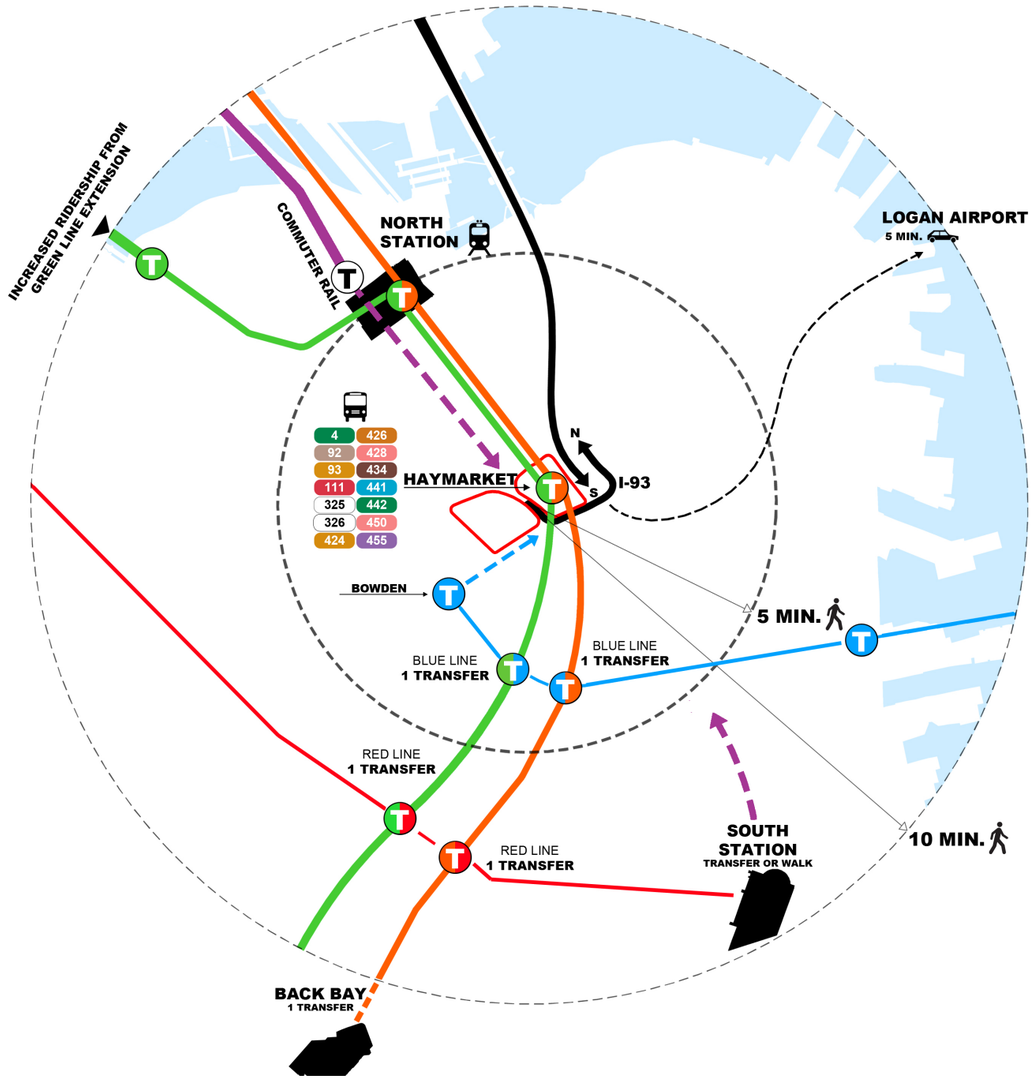


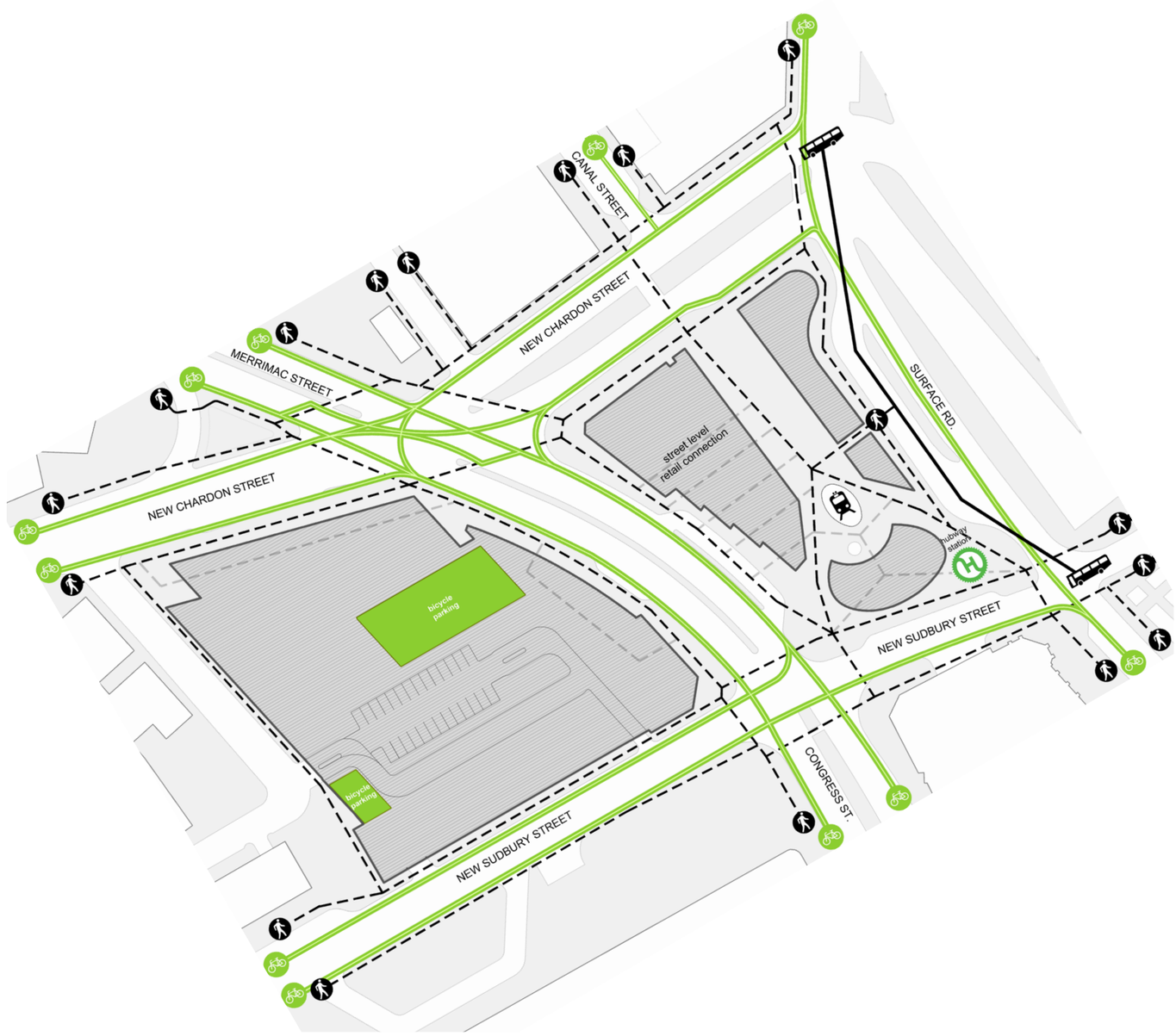
Redevelopment of Government Center Garage
Boston, MA

Figure 2.4b

Proposed Project Site Section
Looking North

THE HYM INVESTMENT GROUP LLC cbt

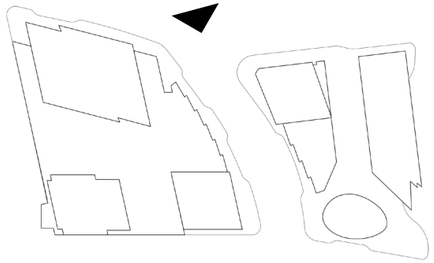




Redevelopment of Government Center Garage
Boston, MA

Figure 2.5

Neighborhood Connectivity



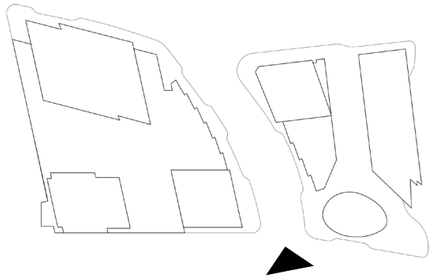
Before

After

Redevelopment of Government Center Garage
Boston, MA

Figure 2.6a

View From Merrimac Street
looking SE



Before

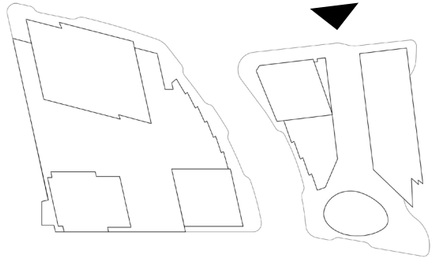
After

Redevelopment of Government Center Garage
Boston, MA

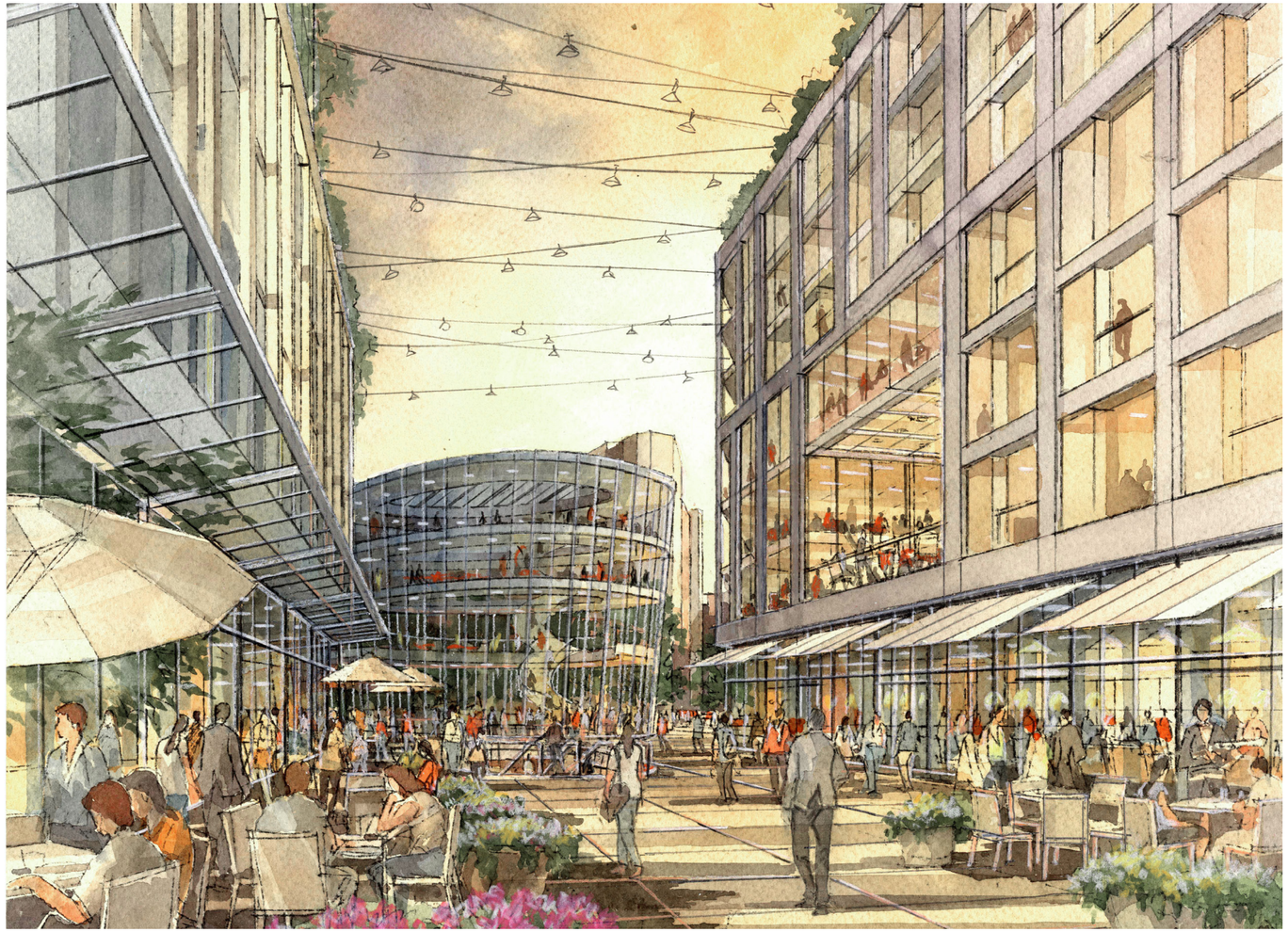
Figure 2.6b

View from Congress Street
Looking NW

THE HYM INVESTMENT GROUP, LLC cbt



Before



After

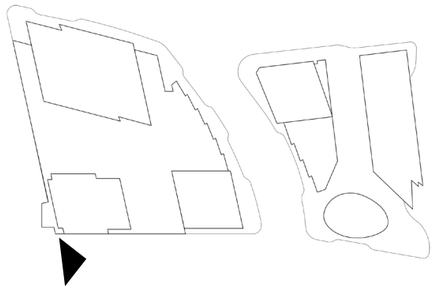
Redevelopment of Government Center Garage
Boston, MA

Figure 2.6c

View of the New Public Plaza

THE HYM INVESTMENT GROUP, LLC

cbt



Before

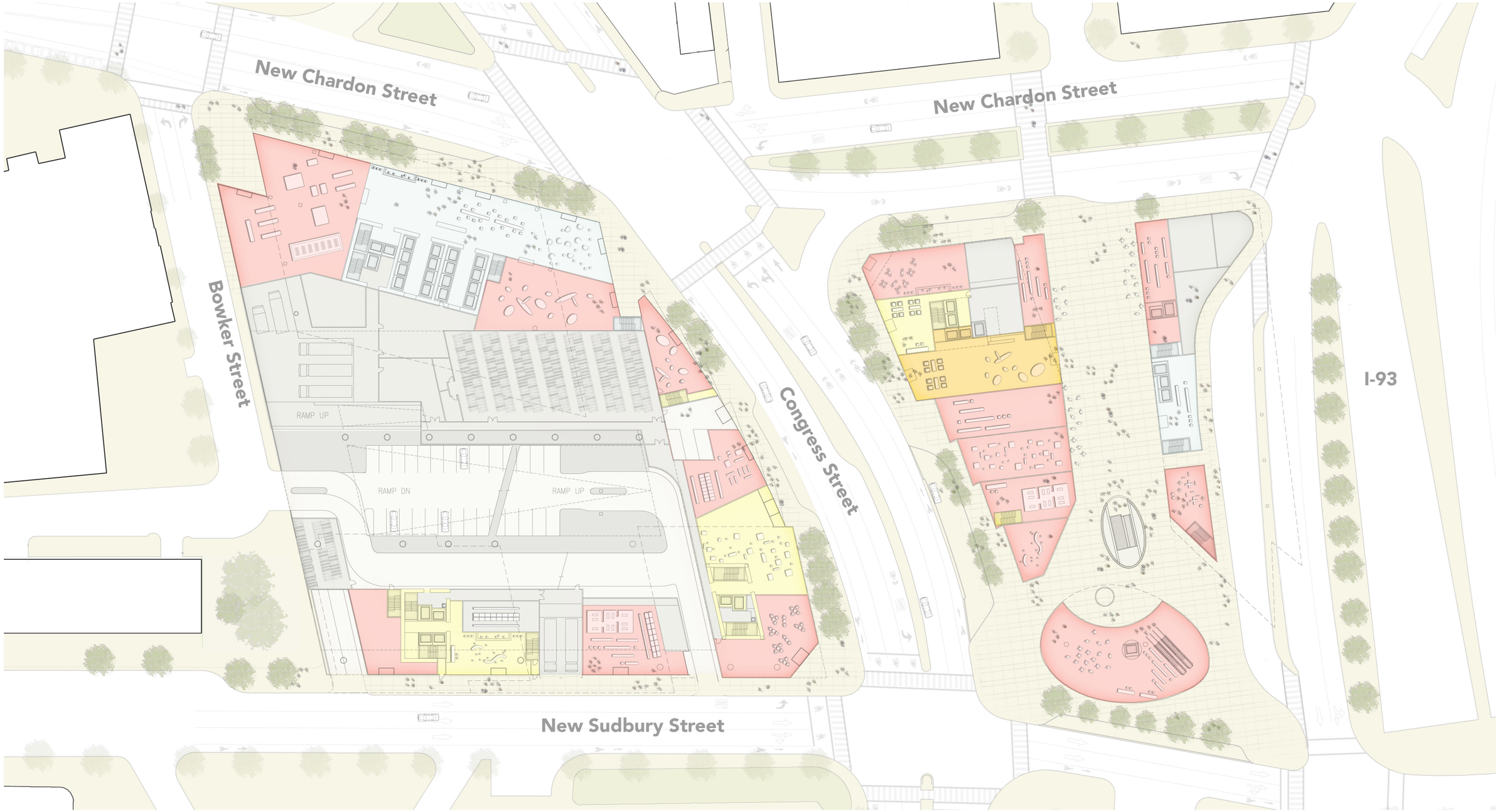
After

Redevelopment of Government Center Garage
Boston, MA

Figure 2.6d

View from New Sudbury Street

THE HYM INVESTMENT GROUP, LLC cbt



Redevelopment of Government Center Garage
Boston, MA

Figure 2.7

Proposed Public Realm Plan

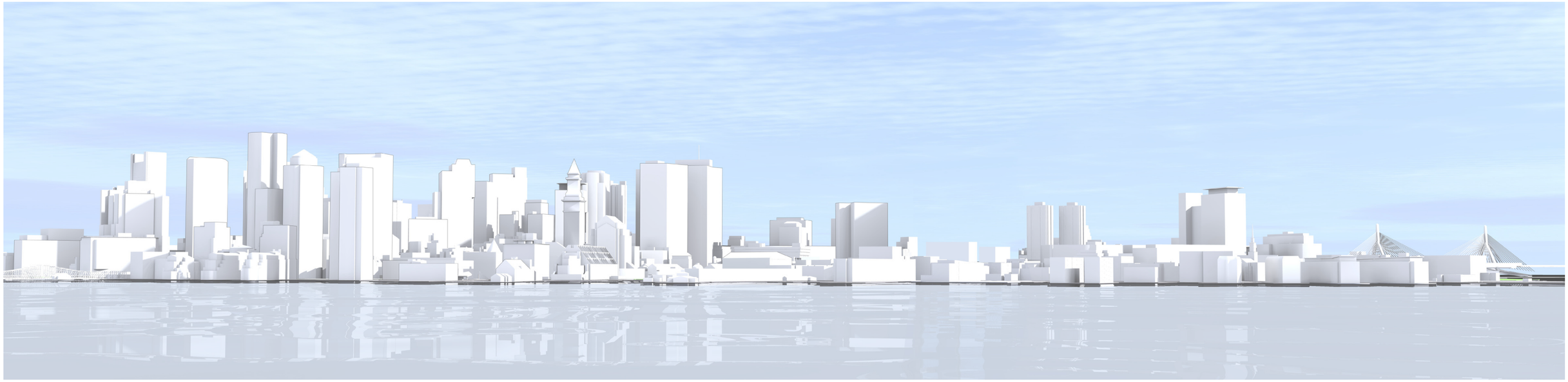
THE HYM INVESTMENT GROUP, LLC cbt

Redevelopment of Government Center Garage
Boston, MA

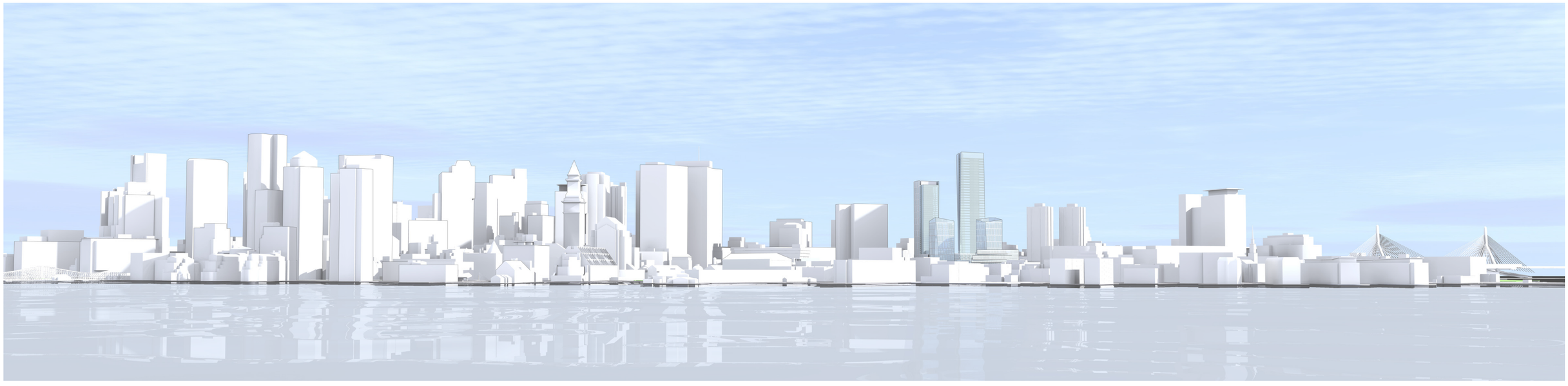
Figure 2.8

Transformative Public Realm

THE HYM INVESTMENT GROUP, LLC cbt



Before



After

Redevelopment of Government Center Garage
Boston, MA

Figure 2.9

Proposed City Skyline Elevation

THE HYM INVESTMENT GROUP, LLC cbt

Redevelopment of Government Center Garage
Boston, MA

Figure 2.10

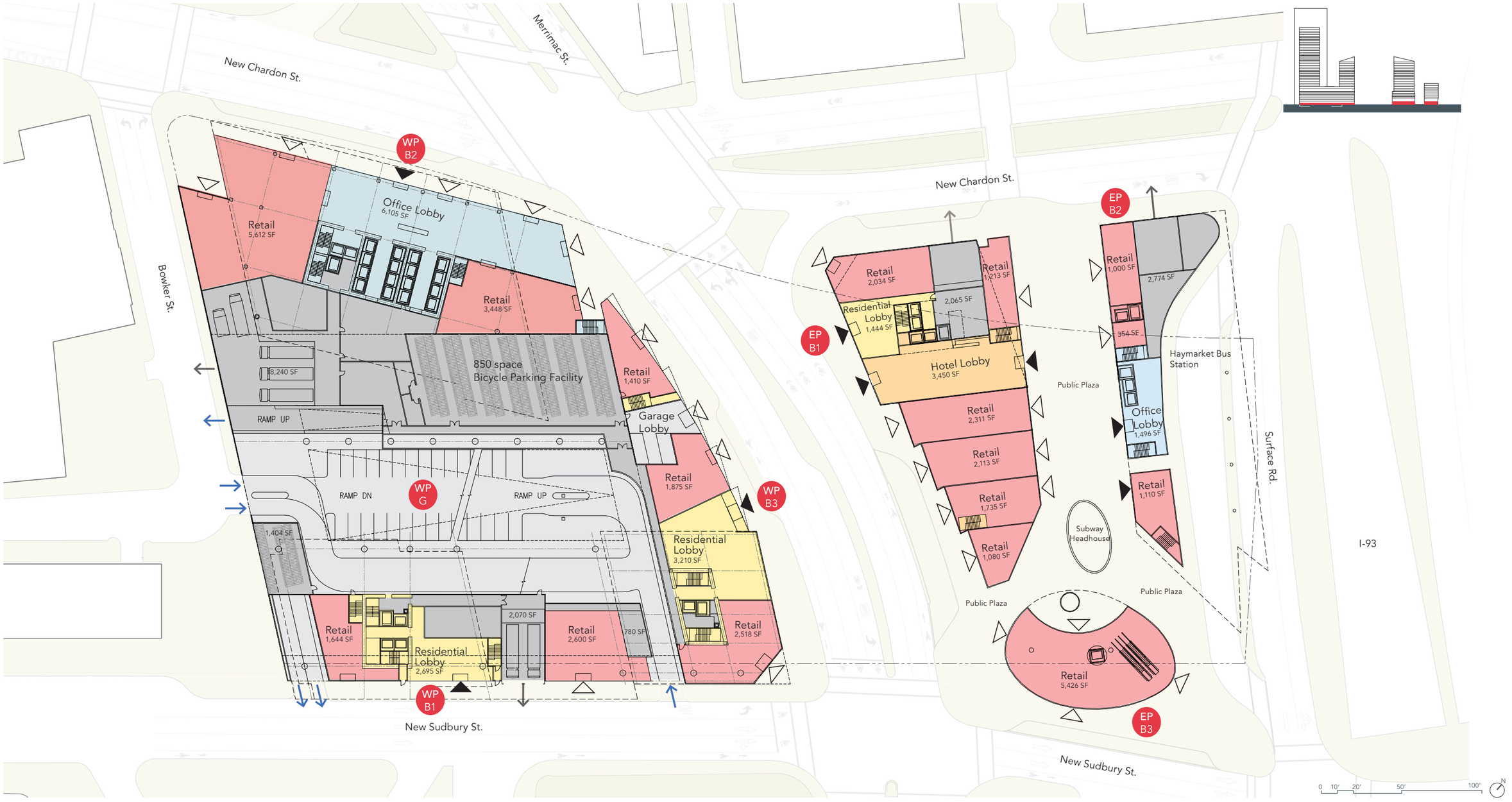
Proposed Conceptual Roof Plan

THE HYM INVESTMENT GROUP LLC

cbt

LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID



Redevelopment of Government Center Garage
Boston, MA

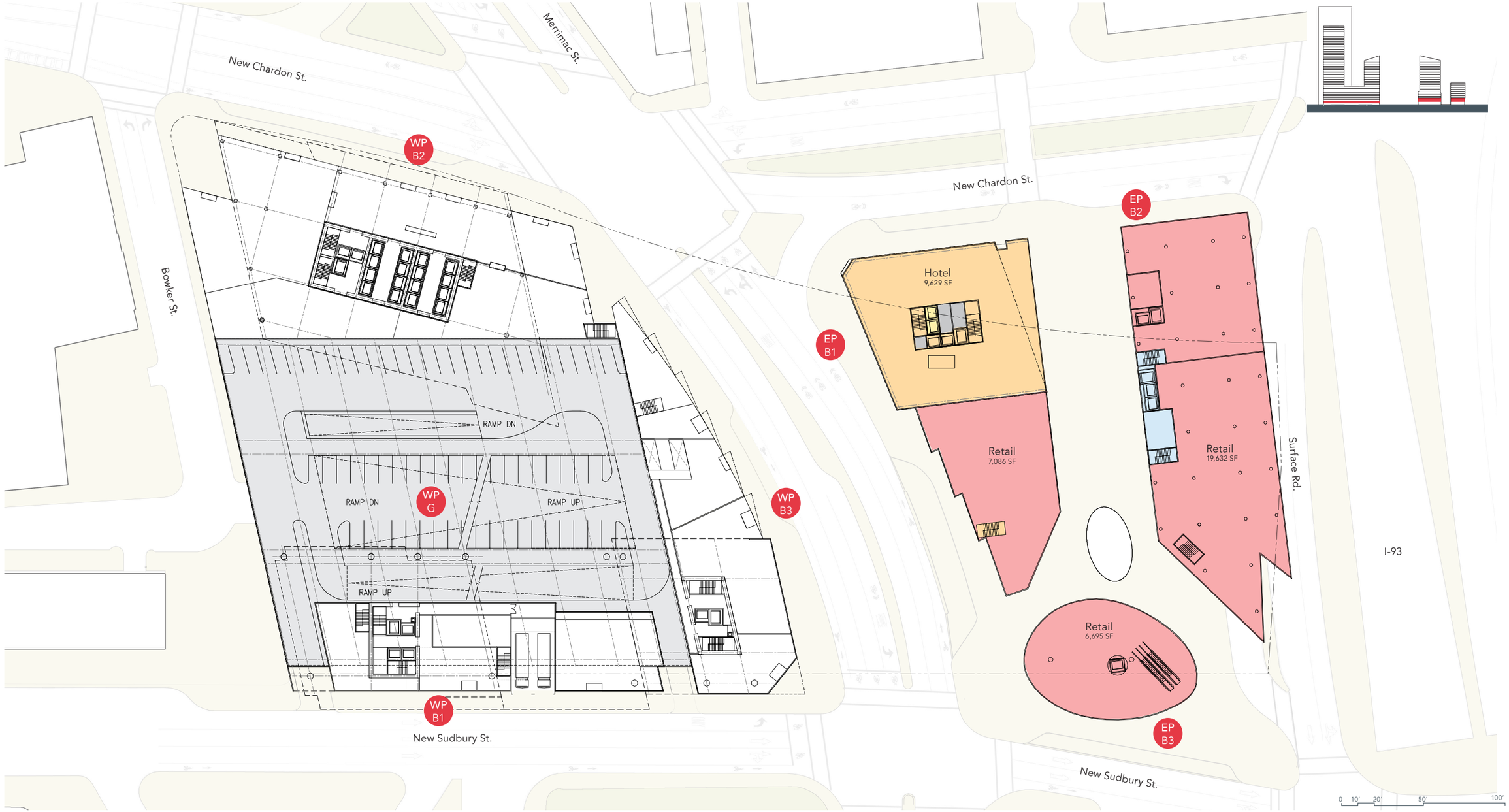
Figure 2.11a

Proposed Street Level Plan
(Level 02 (Ground Level))

THE HYM INVESTMENT GROUP, LLC | cbt

LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID



Redevelopment of Government Center Garage
Boston, MA

Figure 2.11b

Proposed Level 03 Plan

THE HYM INVESTMENT GROUP LLC

cbt

LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID

New Chardon St.

Merrimac St.

Bowker St.

New Garage
18,227 SF

Office
6,691 SF

WP B2

RAMP DN

RAMP UP

WP G

WP B3

1 Bedroom 986 SF

1 Bedroom 800 SF

Studio 600 SF

1 Bedroom 750 SF

1 Bedroom 840 SF

2 Bedroom 920 SF

1 Bedroom 780 SF

Studio 615 SF

2 Bedroom 965 SF

1 Bedroom 790 SF

1 Bedroom 850 SF

Studio 680 SF

1 Bedroom 700 SF

1 Bedroom 940 SF

1 Bedroom 620 SF

Studio 545 SF

Studio 545 SF

1 Bed 635 SF

WP B1

New Sudbury St.

New Chardon St.

EP B1

Hotel
18,182 SF

EP B2

Office
19,632 SF

Surface Rd.

I-93

Retail
6,695 SF

EP B3

New Sudbury St.

0 10' 20' 50' 100' N

Redevelopment of Government Center Garage
Boston, MA

Figure 2.11c

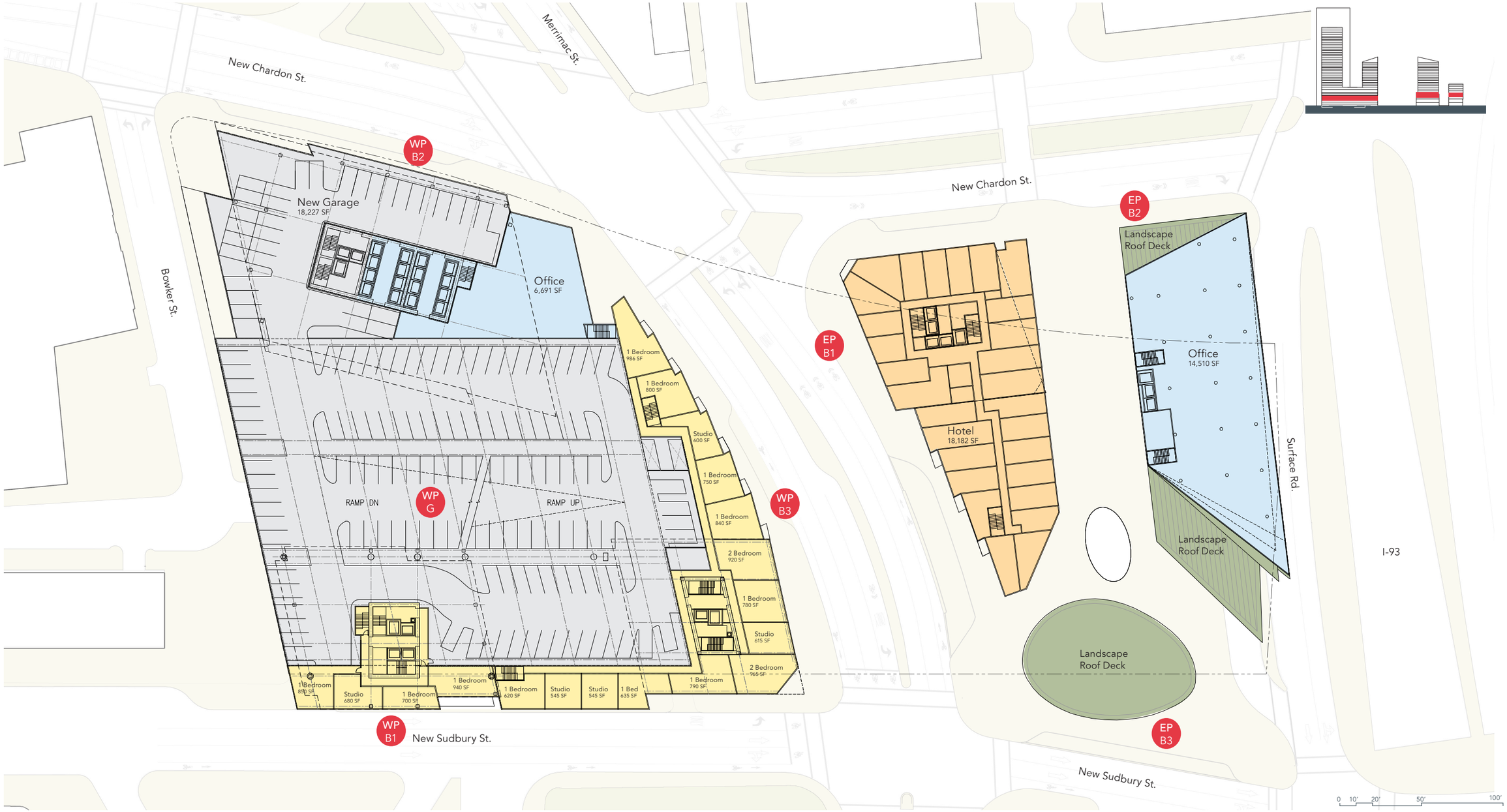
Proposed Lower Level Plan
(Level 04)

THE HYM INVESTMENT GROUP, LLC

cbt

LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID



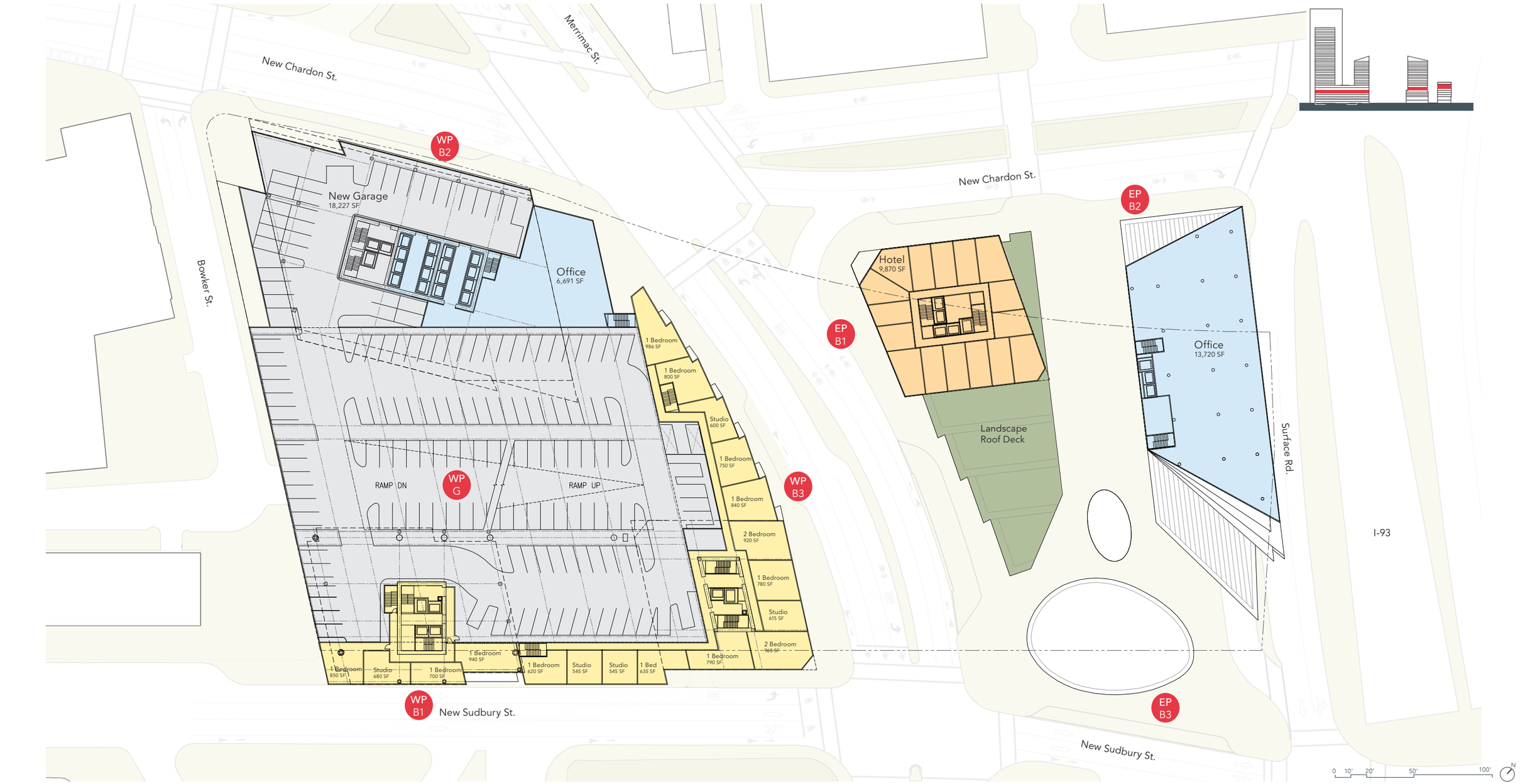
Redevelopment of Government Center Garage
Boston, MA

Figure 2.11d

Proposed Typical Lower Plan
(Level 05-07)

THE HYM INVESTMENT GROUP, LLC

cbt



Redevelopment of Government Center Garage
Boston, MA

Figure 2.11e

Proposed Typical Lower Level Plan
(Level 08-09)

THE HYM INVESTMENT GROUP, LLC

cbt

LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID

New Chardon St.

Merrimac St.

New Chardon St.

Bowker St.

WP B2

New Garage
18,227 SF

Office
6,691 SF

Existing Garage
35,014 SF

RAMP DN

WP G

1 Bedroom 986 SF

1 Bedroom 800 SF

Studio 600 SF

1 Bedroom 750 SF

1 Bedroom 840 SF

WP B3

2 Bedroom 920 SF

1 Bedroom 780 SF

Studio 615 SF

2 Bedroom 965 SF

Mechanical
18,707 SF

388

1 Bedroom 850 SF

Studio 680 SF

1 Bedroom 700 SF

1 Bedroom 940 SF

1 Bedroom 620 SF

Studio 545 SF

Studio 545 SF

1 Bed 635 SF

1 Bedroom 790 SF

WP B1

New Sudbury St.

EP B1

Hotel
9,870 SF

EP B2

Office
13,327 SF

Surface Rd.

I-93

EP B3

New Sudbury St.

0 10' 20' 50' 100' N

Redevelopment of Government Center Garage
Boston, MA

Figure 2.11f

Proposed Office/Mechanical Level Plan
(Level 10)

THE HYM INVESTMENT GROUP, LLC

cbt

LEGEND

Residential
Hotel
Office
Retail
Parking
Back of House/ Service
Green Roof (Not Occupied)
Landscaped Area
Primary Pedestrian Entry
Secondary Pedestrian Entry
Cars Entry/ Exit
Service Vehicles Entry/Exit
XX YY Parcel ID & Building ID

New Chardon St.
Merrimac St.
Bowker St.
New Chardon St.
Surface Rd.
I-93
New Sudbury St.
New Sudbury St.

WP B2
EP B2
EP B1
WP G
WP B3
WP B1
EP B3

Hotel
9,870 SF

Office
13,327 SF

Office
59,523 SF

Mechanical
18,707 SF

2 Bedroom 920 SF
1 Bedroom 780 SF
Studio 615 SF
2 Bedroom 965 SF
1 Bedroom 790 SF
1 Bedroom 940 SF
1 Bedroom 620 SF
Studio 545 SF
Studio 545 SF
1 Bed 635 SF
1 Bedroom 850SF
Studio 680 SF
1 Bedroom 700 SF

0 10' 20' 50' 100' N

Redevelopment of Government Center Garage
Boston, MA

Figure 2.11g

Proposed Office/Mechanical Level Plan
(Level 11)

THE HYM INVESTMENT GROUP LLC
cbt

LEGEND

Residential
Hotel
Office
Retail
Parking
Back of House/ Service
Green Roof (Not Occupied)
Landscaped Area
Primary Pedestrian Entry
Secondary Pedestrian Entry
Cars Entry/ Exit
Service Vehicles Entry/Exit
XX YY Parcel ID & Building ID

New Chardon St.
Merrimac St.
Bowker St.
New Chardon St.
New Sudbury St.
New Sudbury St.
Surface Rd.
I-93

WP B2
Office
24,780 SF
Green Roof
(not occupied)
Landscape
Roof Deck
WP G
WP B3
Amenities
10,640 SF
Amenities
8,845 SF
Roof Deck
Studio
510 SF
2 Bedroom
1,030 SF
1 Bedroom
630 SF
1 Bedroom
645 SF
1 Bedroom
685 SF
1 Bedroom
830 SF
2 Bedroom
1,030 SF
WP B1
EP B1
Hotel
9,865 SF
EP B2
Office
13,327 SF
EP B3

0 10' 20' 50' 100' N

Redevelopment of Government Center Garage
Boston, MA

Figure 2.11h

Proposed Level 12-13 Plan

THE HYM INVESTMENT GROUP, LLC
cbt

LEGEND

Residential | Hotel | Office | Retail | Parking | Back of House/ Service | Green Roof (Not Occupied) | Landscaped Area | Primary Pedestrian Entry | Secondary Pedestrian Entry | Cars Entry/ Exit | Service Vehicles Entry/Exit | XX YY Parcel ID & Building ID

Redevelopment of Government Center Garage
Boston, MA

Figure 2.11i

Proposed Typical Upper Level Plan

THE HYM INVESTMENT GROUP, LLC | cbt

LEGEND

Residential
Hotel
Office
Retail
Parking
Back of House/ Service
Green Roof (Not Occupied)
Landscaped Area
Primary Pedestrian Entry
Secondary Pedestrian Entry
Cars Entry/ Exit
Service Vehicles Entry/Exit
XX YY Parcel ID & Building ID

New Chardon St.
Merrimac St.
New Chardon St.
Bowker St.
Surface Rd.
I-93
New Sudbury St.
New Sudbury St.

WP B2
EP B2
EP B1
WP G
WP B3
WP B1
EP B3

Office
24,780 SF

3 Bedroom 1,495 SF
2 Bedroom 1,200 SF
2 Bedroom 1,268 SF
1+ Bedroom 1,025 SF
1+ Bedroom 945 SF
3 Bedroom 1,340 SF
3 Bedroom 1,430 SF
2 Bedroom 1,230 SF

1 Bedroom 820 SF
2 Bedroom 1,140 SF
2 Bedroom 1,204 SF
1 Bedroom 780 SF
1 Bedroom 780 SF
2 Bedroom 1,143 SF
1 Bedroom 755 SF
3 Bedroom 1,535 SF

0 10' 20' 50' 100' N

Redevelopment of Government Center Garage
Boston, MA

Figure 2.11j

Proposed Penthouse Plan

THE HYM INVESTMENT GROUP, LLC
cbt

LEGEND

Residential
Hotel
Office
Retail
Parking
Back of House/ Service
Green Roof (Not Occupied)
Landscaped Area
Primary Pedestrian Entry
Secondary Pedestrian Entry
Cars Entry/ Exit
Service Vehicles Entry/Exit
XX YY Parcel ID & Building ID

New Chardon St.
Merrimac St.
New Chardon St.
Bowker St.
Surface Rd.
I-93
New Sudbury St.
New Sudbury St.

WP B2
BOH/Services
20,936 SF
EP B2
BOH/Services
11,040 SF
EP B1
WP G
44 SPACES FOR P PARKING
RAMP UP
WP B3
BOH/Services
6035 SF
WP B1
EP B3

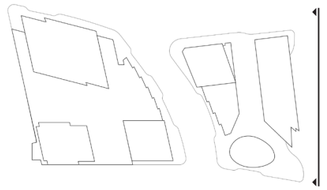
0 10' 20' 50' 100'
N

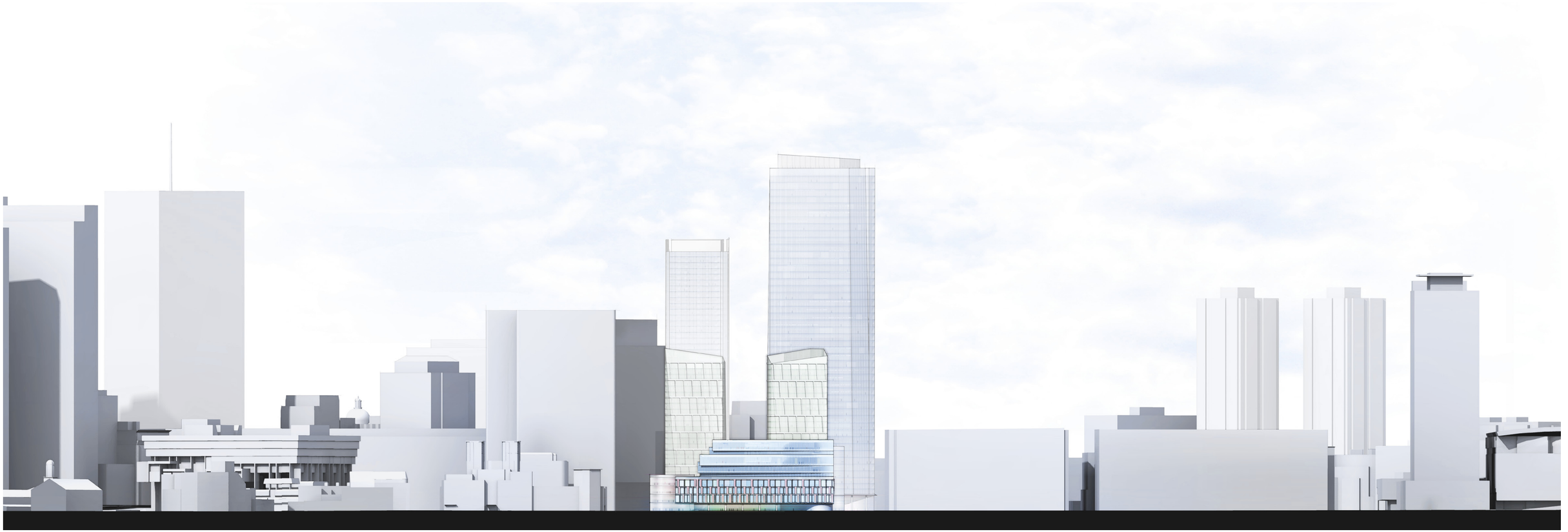
Redevelopment of Government Center Garage
Boston, MA

Figure 2.11k

Proposed Basement Plan

THE HYM INVESTMENT GROUP, LLC
cbt





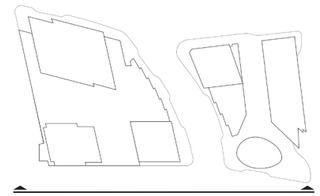
Redevelopment of Government Center Garage
Boston, MA

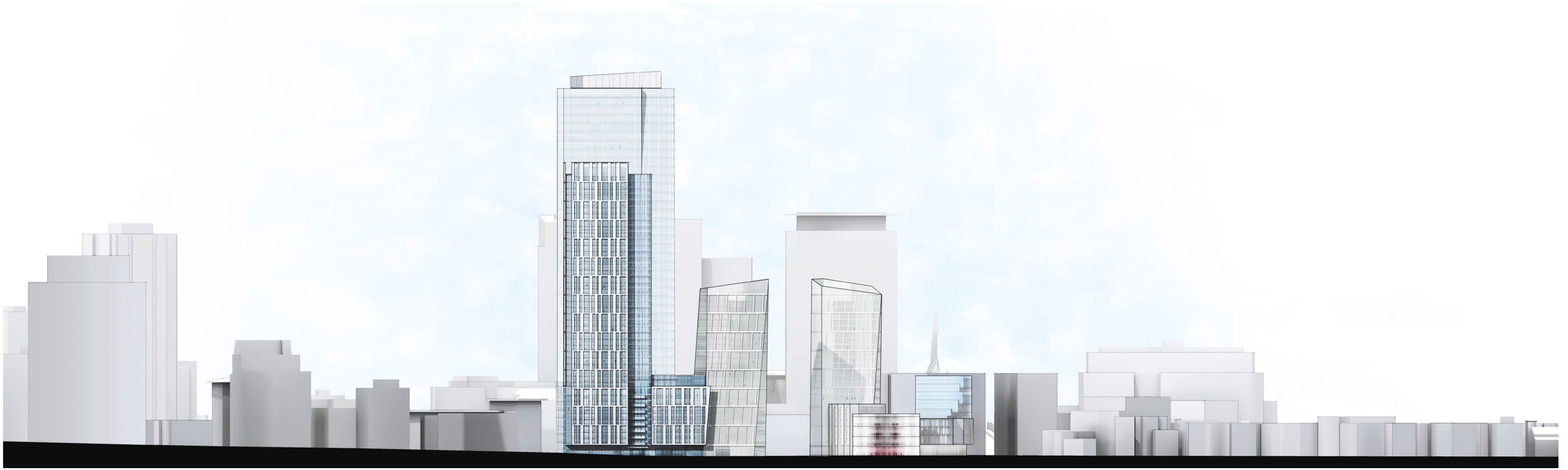
Figure 2.12a

Proposed Greenway Elevation

THE HYM INVESTMENT GROUP, LLC

cbt





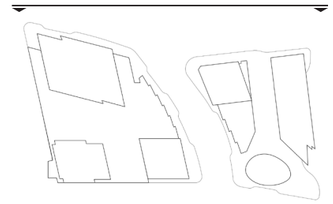
Redevelopment of Government Center Garage
Boston, MA

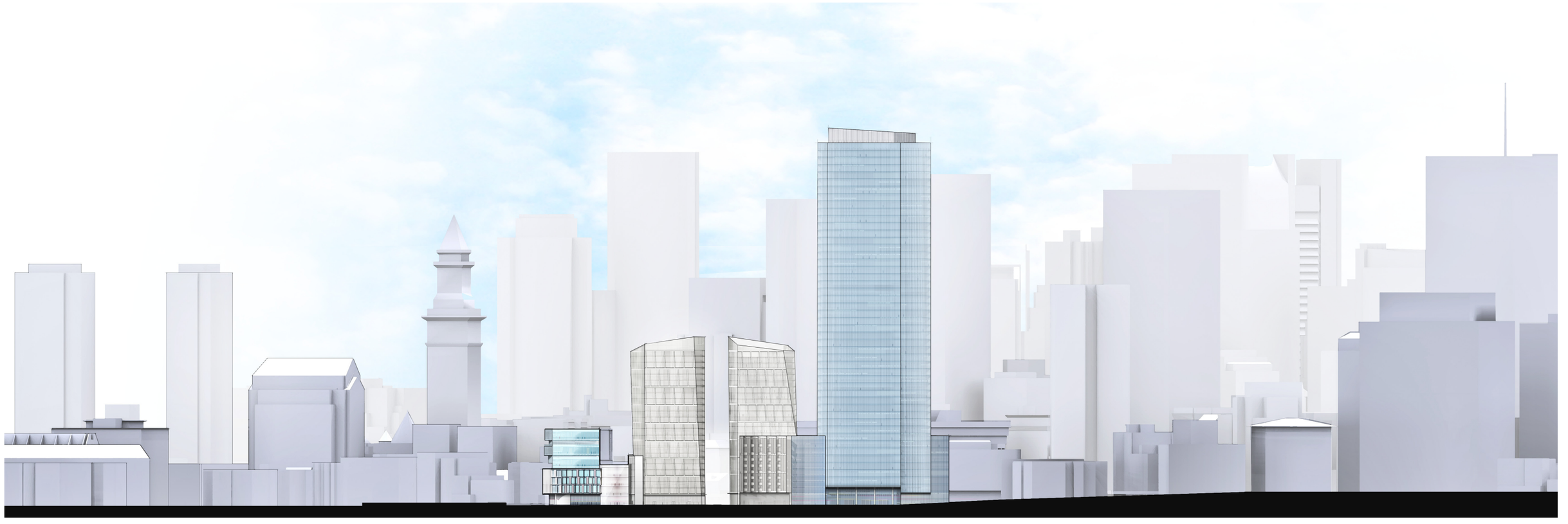
Figure 2.12b

Proposed New Sudbury Elevation

THE HYM INVESTMENT GROUP, LLC

cbt





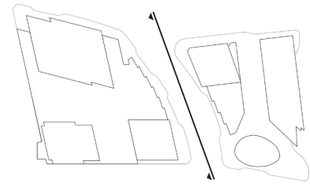
Redevelopment of Government Center Garage
Boston, MA

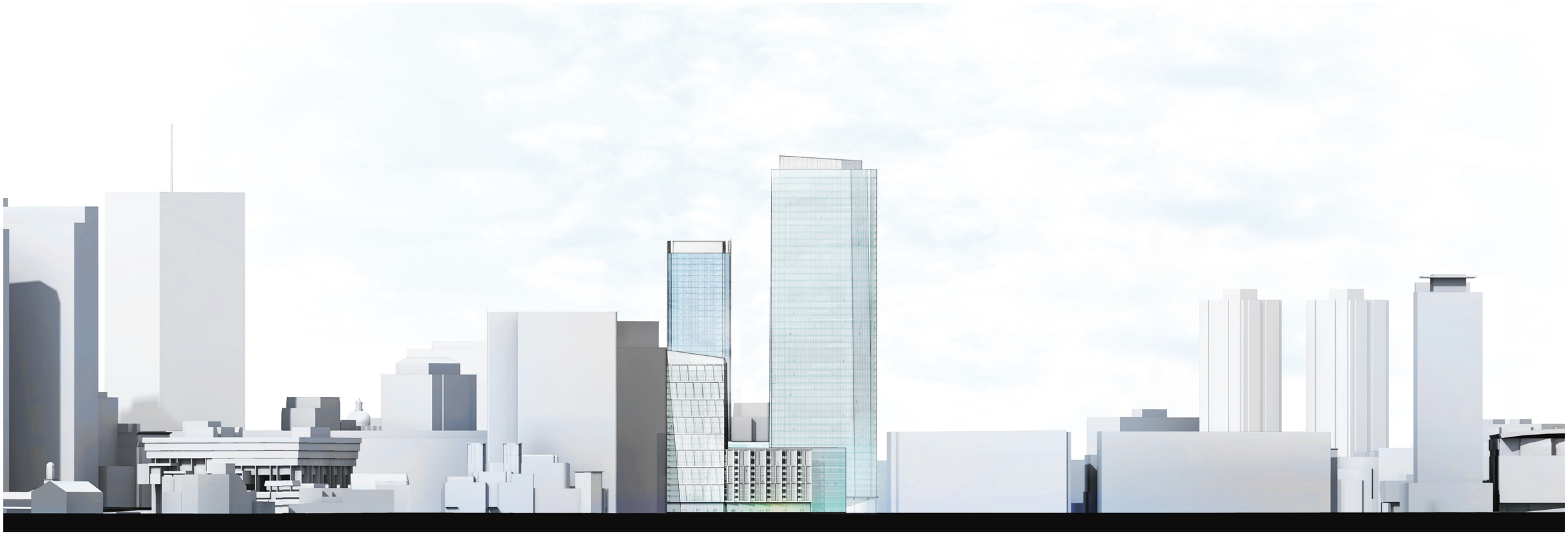
Figure 2.12c

Proposed New Chardon
Elevation

THE HYM INVESTMENT GROUP LLC

cbt



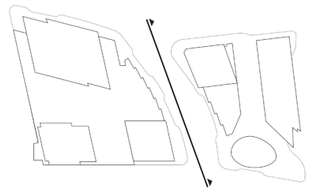


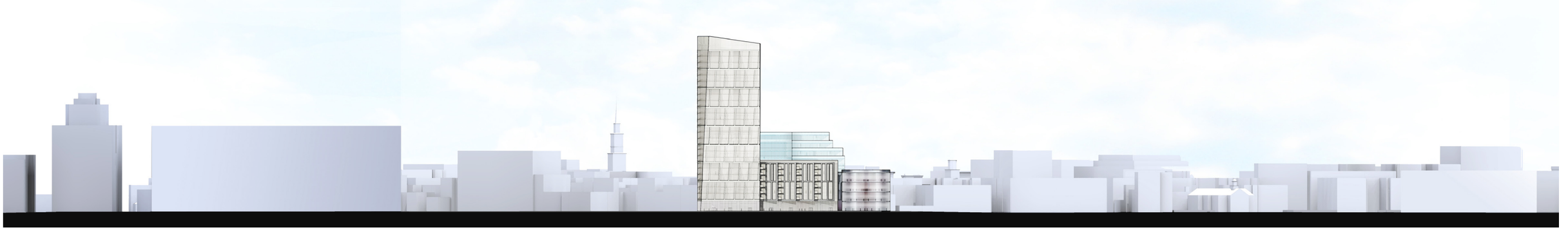
Redevelopment of Government Center Garage
Boston, MA

Figure 2.12d

Proposed Congress Street West Elevation

THE HYM INVESTMENT GROUP LLC cbt





Redevelopment of Government Center Garage
Boston, MA

Figure 2.12e

Proposed Congress Street East Elevation

THE HYM INVESTMENT GROUP, LLC

cbt

3 Transportation and Parking

3.1 Introduction

The following chapter addresses the Project as it relates to transportation and parking and presents the proposed methodology for the technical analyses provided in Attachment 2. The technical analyses include a comprehensive assessment of the Project's transportation impacts including traffic, transit, pedestrian, bicycle, parking and loading capacity assessments as well as identification of mitigation, where necessitated. The Proponent has developed the transportation components in cooperation with the Boston Transportation Department (BTD), the Boston Redevelopment Authority (BRA), and the community.

3.2 Project Description

In 1967, as part of the Government Center URP, the Garage was built to serve short-term parkers with a capacity of 1,865 commercial public parking spaces. Originally built to support the redevelopment of the area around Scollay Square through a public-private venture, the Garage converted to private ownership after the institution of the "parking freeze" in downtown Boston as part of the Clean Air Act of 1975. In 1990, about 256,532 square feet of office space was added in two levels above the existing ninth floor of the Garage. At that time, 445 new parking spaces were added though reconfiguration and restriping to support the new office space, increasing the Garage parking capacity to 2,310 spaces, which have been significantly underutilized. Approximately 37,602 square feet of retail space also currently exists as part of the Garage, mostly along Congress Street. This retail space has historically been underutilized.

■

3.2.1 Existing Conditions

The existing garage structure spans Congress Street and occupies parcels on both the east and west sides of the street. Garage driveways are currently located on the West Parcel, providing vehicle access from and egress to both New Sudbury Street and New Chardon Street. No garage driveways are located on the East Parcel. Tenants and visitors to the office space use the garage elevator lobby located on the West Parcel at the corner of New Chardon Street and Merrimac/Congress Street. Enterprise Rent–a-Car operates from a kiosk in

this garage lobby. Adjacent to the garage lobby entrance along Congress Street (and under the Garage) is approximately 4,000 square feet of vacant retail storefront.

Today, the existing approximately 256,000 gross square feet of office space above the Garage is not fully occupied. Current tenants include state agencies, PUMA, and a technology company, SCVNGR. Loading for the existing office space is provided by an exterior loading dock located on the same corner of New Chardon and Merrimac/Congress Streets as the main garage entrance.

Several small businesses currently operate on the Project Site east of Congress Street, including a small convenience store and a Dunkin' Donuts. In addition, Kaplan Learning Center has occupied about 17,000 square feet of retail but they have recently vacated to a new location in Kenmore Square. The East Parcel also contains ingress and egress for transit passengers at both the MBTA Haymarket Station (Orange and Green lines) and an at-grade MBTA Haymarket bus transfer facility.

Directly adjacent and east of the Project Site are the on-ramps to I-93 and the Sumner Tunnel. The North End neighborhood and Rose Kennedy Greenway are easily accessible to the southeast of the Project Site. Immediately west of the Project Site is the Boston Police Department (BPD) Area A-1 police station, EDIC buildings, NSTAR substation, Channel 7 and a Verizon building. The Project Site abuts Government Center to the south and Bulfinch Triangle to the north.

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3.2.2 Proposed Development Program

As described more fully in Chapter 1, *Project Description* and shown in Figure 1.6, the Project includes 651 apartment units and 120 condominium units, 204 hotel rooms, a net increase of 44,898 square feet of retail/restaurant space and a net increase of 1,046,768 gross square feet of office space. The existing MBTA Haymarket Station ingress and egress will be integrated into the new East Parcel public plaza. Approximately 1,159 vehicle parking spaces and approximately 850-space secure bicycle parking facility will be provided on-site in the Garage.

Table 3-1
Project Summary

Land Use	Existing	Proposed		Overall Net Change
		West Parcel	East Parcel	
Apartments	-	651 units		+ 651 units
Condominiums	-		120 units	+ 120 units
Hotel Rooms	-	--	204 rooms	+ 204 rooms
Retail/Restaurant	37,602 gsf	19,800 gsf	62,700 gsf	+ 44,898 gsf
Office	256,532 gsf	1,186,500 gsf	116,800 gsf	+ 1,046,768 gsf
Garage Parking Spaces	2,310 spaces	1,159 spaces[1]		-1,151 spaces
Bicycle Storage	17 spaces	850 spaces		+833 spaces

gsf gross square feet
1 Includes 42 parking spaces reserved for BPD.

Because the Project will displace some existing on-street parking for the BPD's Area A-1 station, approximately 42 spaces in the Garage will be reserved specifically for BPD parking. Additionally, a component of commercial public parking will be maintained in the Garage during each phase of construction and in the final build-out of the Project. Of the total 1,159 spaces, the majority will be shared among building residents, hotel guests, commercial tenants, and the general public, except for the 42 spaces designated for BPD parking and approximately 100 spaces which may be reserved for certain on-site uses.

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3.2.3 Project Phasing

The Proponent anticipates that construction will occur in four general phases along with the garage enabling pre-redevelopment phase, as outlined below:

- Enabling Phase;
- Phase 1 – construction of WP-B1 (apartment building);
- Phase 2 – construction of WP-B2 (office building);
- Phase 3A-B – Garage Demolition (East Parcel and over Congress Street) and construction of WP-B3 (apartment building); and
- Phase 4A-C – redevelopment of the East Parcel, including EP-B1 (hotel/condominium building), EP-B2 (office building), and EP-B3 (retail building).

The enabling phase will reconstruct, reinforce, and reconfigure portions of the Garage, mostly in the West Parcel, in support of future redevelopment phases of the Project. Phase 1 and Phase 2 construction will focus on the West Parcel, including the first apartment building on the southwest corner of the West Parcel (WP-B1) and the office building on the northwest corner (WP-B2). Once these buildings are constructed, the Garage over the East Parcel and over Congress Street can be demolished (Phase 3A). Phase 3B consist of construction of the second apartment building on the southeast corner of the West Parcel (WP-B3). The last phase of development, Phase 4, will involve redevelopment of the East Parcel buildings. Phase 4A includes a hotel and condominium building along Congress Street (EP-B1). Phase 4B consists of an office and retail building fronting the Surface Road/I-93 Ramp Parcel (EP-B2). Phase 4C, the last and final phase, includes a retail building along New Sudbury Street (EP-B3). In addition, improvements to the East Parcel include a new public pedestrian plaza connecting the North End Greenway Parcels and the northwest corner of Congress Street/New Sudbury Street through to Canal Street at New Chardon Street as well the MBTA Haymarket bus facility and MBTA Haymarket Station head houses.

3.3 Existing Transportation Conditions

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3.3.1 Existing Site Access

The primary pedestrian access to the Garage and the offices located at One Congress Street is from the southwest corner of the New Chardon Street and Merrimac/Congress Street intersection. Along the East

Parcel, the mostly retail uses have scattered access points. As described in other sections of this report, new pedestrian access points for the Project will be developed along all street frontages.

Existing vehicular access to the Garage is from both its north side along New Chardon Street and the south side along New Sudbury Street. The current primary vehicular entrance is from New Chardon Street at its intersection with Merrimac Street. Another entrance is along New Sudbury Street just west of Congress Street. Due to the right turn restriction at the New Chardon Street vehicular exit, the primary garage exit is along New Sudbury Street approximately 300 feet west of Congress Street. The Project will retain both the vehicle entrance and vehicle exit along New Sudbury Street but will close the New Chardon Street driveways. This New Chardon Street entrance/exit will be moved from New Chardon Street to Bowker Street to allow all major vehicle movements to/from the regional highway network.

The current primary location for building servicing to the West Parcel is from a visible exterior loading and trash area along New Chardon Street adjacent to the garage entrance driveway. The majority of servicing for the retail establishments on the East Parcel is currently done curbside.

Vehicular access to the current at-grade MBTA Haymarket bus facility is from the I-93 Surface Road. Pedestrians access the bus facility plaza from all directions. Access to the MBTA Haymarket Station, which provides access to Orange and Green line subway service, is also from the bus facility plaza. Additional MBTA Haymarket Station access is from the primary head house on Congress Street just south of New Sudbury Street on the ground level of the Parcel 7 Garage.

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3.3.2 Existing Public Transportation

The east side of the Project Site is located above the MBTA Haymarket Station, which provides connections to Orange and Green line subway service. Additionally, there are several other MBTA stations within a quarter-mile, or about a 7-minute walk, of the Project Site, including those on the Orange Line at North Station and State Street station, the Green Line at North Station and Government Center Station, and the Blue Line at Bowdoin, Government Center, and State Street stations. North Station also provides access to the MBTA's regional commuter rail trains serving the northern and northwestern suburbs of Boston. The MBTA Haymarket Bus Station located on the East Parcel provides bus bays for service for the Route 111 buses to Chelsea/Revere and certain 400 series commuter buses serving the north shore communities of Salem, Lynn, Revere, Saugus and Melrose.

MBTA public transportation services within the study area are shown on Figure 3.1 and listed in Table 3-2 below.

Table 3-2
MBTA Transit Service within a 1/4-mile of the Project Site

Service	Origin/Destination	Rush-hour Headway (minutes)
	Rapid Transit Routes	
Orange Line	Forest Hills–Oak Grove	4–5
Blue Line	Bowdoin–Wonderland	5
Green Line	Boston College – Lechmere Cleveland Circle - Lechmere Riverside - Lechmere Heath Street – Lechmere	6–7
	Local Bus Routes	
Route 4	North Station-World Trade Center via Federal Courthouse and South Station	11-15
Route 92	Assembly Sq. Mall–Downtown via Sullivan Sq., Main St. and Haymarket Station	15-18
Route 93	Sullivan Sq. Station–Downtown via Bunker Hill Street and Haymarket Station	7–8
Route 111	Woodlawn or Broadway and Park Avenue–Haymarket Station via Tobin Bridge	7-10
	Express Bus Routes	
Route 325	Elm Street, Medford–Haymarket Station via Fellsway West, Salem Street, and I-93	15-20
Route 326	West Medford–Haymarket Station via Playstead Road, High Street, Medford, and I-93	12-20
Route 352	Burlington-Boston Via Route 128 and I-93	20-30
Route 354	Woburn Express-Boston Via Woburn Square and I-93	15-20
Route 424	Eastern Avenue and Essex Street–Haymarket Station or Wonderland Salem Depot–Haymarket Station or Wonderland Salem Depot–Central Square, Lynn, via Highland Avenue	30
Route 426	Central Square, Lynn–Haymarket Station via Cliftondale	15-20
Route 428	Oaklandvale–Haymarket Station via Granada Highlands	30-40
Route 434	Peabody–Haymarket Express via Goodwin's Circle	1 daily roundtrip
Route 450	Eastern Avenue and Essex Street–Haymarket Station or Wonderland Salem Depot–Haymarket Station or Wonderland Salem Depot–Central Square, Lynn via Highland Avenue	30

A combination of nine express buses and four local bus routes currently call or use the MBTA Haymarket bus facility as a terminus or an intermediate stop. Five of the express buses run only during peak AM and PM periods, and one express bus only runs one daily round trip. Out of these 13 bus routes, only one local bus (Route 111) and five express buses (the Route 400's to the inner suburbs) actually utilize the MBTA Haymarket bus facility bays proper. All other buses that are scheduled to stop at MBTA Haymarket Station do so curbside along the approaches to the Congress Street and New Sudbury Street intersection. Of those buses that actually enter the bus facility, approximately 65% of the total daily bus trips are from the Route 111 buses (Chelsea/Revere) contributing to well over 75% of all patrons using the MBTA's Haymarket bus facility.

The MBTA operates for 20 hours of the day with the commuter peak periods being the busiest. The peak periods of use at the MBTA Haymarket bus facility are more limited to being only on weekdays between 7:00 and 8:30 AM and 4:30 and 6:00 PM. Since none of the 400 series bus routes are in service on weekends, the only activity in the bus facility on weekends is from the Route 111 buses. Due to the low frequency of service

for the 400 series routes during the typical weekday non-peak commuter periods, the MBTA Haymarket bus facility is primarily utilized by the Route 111 buses during non-peak commuter periods.

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3.3.3 Existing Parking

3.3.3.1 On-Street Parking

On-street parking immediately abutting the Project is shown in Figure 3.2. On-street parking regulations around the Project Site are a mix of no parking/no stopping; parking reserved for police and court vehicles, commercial loading zones, and metered parking.

3.3.3.2 Off-Street Parking

The Garage has a total of 2,310 parking spaces in nine above-ground levels. Of the total on-site parking supply, 1,865 are commercial public parking spaces and 445 are "exempt" employee parking. Current weekday occupancy of the Garage generally peaks between 11:00 AM – 2:00 PM and averages approximately 1,050 vehicles or approximately 45% of the available parking capacity. Of these average daily parkers, about 830 (80%) use monthly passes and 220 (20%) are transient parkers, or those who pull tickets and pay by the hour. Typical overnight parking at the Garage is approximately 600 vehicles with weekday nights and weekend nights being very similar. Monthly pass holders account for slightly over 90% of overnight parkers. Peak weekend parking demand is between 10:00 PM – 11:00 PM and is also at about 600 vehicles. Average daytime weekend mid-day parking is around 525 vehicles (85% monthly, 15% transient). Average parking demand for an event at TD Garden (Celtics and Bruin's games) ranges from 550 spaces on a weeknight and 600 spaces on a weekend night.

In addition to the Garage, approximately 12,617 off-street parking spaces are available in garages and lots within a seven minute walk of the Project Site. Of these, approximately 5,199 are private spaces and 7,418 are public commercial parking spaces. Area garages account for 10,312 of these parking spaces and 2,305 spaces are in surface parking lots. These facilities are identified in Figure 3.3. Off-street parking structures within a ¼ -mile of the Project Site are listed in Table 3-3 below. Table 3-4 below lists the off-street surface parking lots within ¼ -mile of the Project Site.

Table 3-3
Off-Street Garage Parking Structures within 1/4-mile of the Project Site

Map #	Address	Parking Garage Facility	Private Capacity	Public Capacity
A	50 Cambridge Street	Center Plaza Garage	0	586
B	100 Cambridge Street	Saltonstall Building	466	0
C	19 Staniford Street	Hurley Building	180	0
D	City Hall	City Hall Executive Garage	28	0
E	City Hall	City Hall Garage	60	0
F	Congress Street	JFK Building Garage	180	0
G	Congress Street Parcel 7	Parcel 7 Garage	0	310
H	Parmenter Street/Prince Street	44 Prince Street, LLC	70	0
J	101 Merrimac Street	101 Merrimac Street Garage	0	70
K	80 Causeway Street	MBTA North Station/TD Garden	54	1,221
L	35 Lomasney Way	TD Garden Garage	0	710
M	60 Staniford Street	Longfellow Place Garage	490	0
N	226–234 Causeway Street	234 Strada	66	0
P	600 Commercial Street	North End Garage	445	200
Q	6 Medford Street	Ninety 8 North, LLC	9	0
R	130–140 Bowdoin Street	Boston View Apartments	0	107
S	1 Bowdoin Square	Bowdoin Square Office Building	25	0
T	1 Ashburton Place/Bowdoin Street	McCormack Building	482	0
U	Bowdoin Street at Derne Street	State House Garage	136	0
V	Cambridge Street	Charles River Plaza Garage	0	794
W	1 Beacon Street	One Beacon Street Garage	0	150
X	73 Tremont Street	73 Tremont Garage	0	120
Y	45 Province Street	45 Province Street	110	184
Z	275 Washington Street	Pi Alley Garage	0	600
AA	1 Devonshire Place	Devonshire Tower	109	87
AB	Causeway Street	Tip O'Neil Building Garage	239	0
AC	80–102 Fulton Street	Fulton Court Condo Trust	59	0
AD	28 State Street	28 State St LLC	150	0
AE	75 State Street	75 State Street Garage	0	700
AF	60 State Street	60 State Street Associates	78	227
AG	53 State Street	Exchange Place	93	0
AJ	Clinton Street	Clinton Street Garage	0	597
AH	200 State Street	Marketplace Center Garage	0	120
		Subtotal - Parking Garages	3,529	6,783

Table 3-4
Off-street Surface Parking Lots within a 1/4-mile of the Project Site

Map #	Address	Parking Lot Facility	Private Capacity	Public Capacity
1	61 New Sudbury Street	JFK Lot	23	0
2	Alley 102	Alley 102	17	0
3	Creek Square	Creek Square Lot	10	0
4	Blackstone Street	BDPW Lot	14	0
5	Baldwin Place	Real Prop Lot	0	4
6	174 N. Richmond Street	Richmond Street Lot	12	0
7	133–147 North Street	133–147 North Street	15	0
8	34 Cooper Street	D'Amore Parking	67	0
9	60 Endicott Street	Endicott at Stillman Street	10	0
10	55 Cooper Street	DCR Employee Lot	6	0
11	165 Canal Street	165 Canal Street	19	0
12	26–28 Lancaster Street	VIP Parking Lot	0	26
13	302–320 Friend Street	Friend Street Lot	0	41
14	200–204 Friend Street	Friend Street Lot	12	0
15	168 Friend Street	P & P	0	83
16	235–239 Friend Street	J & O Lot	0	26
17	70 Charter Street	Michael Angelo School Lot	10	0
18	57 Friend Street	57 Friend Street Lot	0	0
19	70 Lancaster Street	Stanihope – Lancaster Street	0	50
20	90 N. Washington Street	Pinstripe Parking	0	47
21	181–183 N. Washington Street	Ruggiero Lot	0	7
22	266–234 Causeway Street	234 Strada	0	14
23	Lovejoy Place	Lovejoy Place Parking Lot	0	47
24	580 Commercial Street	Commercial @ Charter Street Lot	0	49
25	75 Nashua Street	MGH Lot	800	0
26	151 Beverly Street	Charton-Realty Parking Lot	0	53
27	20 Staniford Street	Staniford Street Lot	35	0
28	185 Cambridge Street	Charles River Plaza Lot	160	0
29	325 N. Bennet Street	N. Bennet Street Lot	30	0
30	12–14 Ashburton Place	Ashburton Place Lot	0	38
31	17 Beacon Street	Beacon Street Lot	0	24
32	219–223 North Street	120 Fulton Street Parking	13	0
33	56 Fulton Street	Fulton Street Lot	110	0
34	Cross Street @ Stillman Street	N/A	0	4
35	9 Chatham Street	N/A	0	10
36	Hawthorne Place	Braman-Dow Lot	0	112
37	70 Fulton Street	North End Community Nursing HM	19	0
38	100 Nashua Street	Suffolk County	99	0
39	360 Cardinal O'Connell Way	Regina Cleri Lot	13	0
40	41 Blossom Street	N/A	25	0
41	585 Commercial Street	585 Commercial Street Lot	48	0
42	263 Beverly Street	DCR Employee Lot	73	0
43	60 Joy Street	Peter Faneuil School Lot	15	0
44	200 Cambridge Street	Boston Fire Department Lot	15	0
		Subtotal for Parking Lots	1,670	635
		Subtotal for Parking Lots + Parking Garages within 7-minute walk	5,199	7,418
		Total Capacity – All Off-Street Facilities within 7-minute walk		12,617

3.3.3.3 Existing Bicycle Facilities

Currently, the roadways adjacent to the Project Site have no designated bicycle lanes or markings. According to the "Bike Routes of Boston" website issued by the City of Boston, Congress Street, Cambridge Street, Merrimac Street, Cross Street, and Martha Road are designated "advanced"-level bike routes suitable for experienced and traffic-confident cyclists. State Street, Causeway Street, Commercial Street, and Endicott Street are designated as "intermediate"- level routes, suitable for riders with some on-road experience. The pathway from Chatham Street to North Street between Faneuil Hall and the Quincy Marketplace, Thoreau Path in Charles River Park, and a pathway through North Station to the Charles River bike paths are designated as shared-use bike paths.

Bicycle and Car Sharing

Figure 3.4 identifies the bicycle and car sharing locations within a 7-minute walk the Project Site. Hubway is a bicycle sharing system that was launched in July 2011 in Boston. The program has grown to currently provide over 100 stations and 1,000 available bikes in Boston, Brookline, Cambridge, and Somerville, with new station demand being high. One of the highest demand locations in the entire Hubway system is at North Station (TD Garden, Legends Way). Hubway stations in close proximity to the Project Site are summarized in Table 3-5.

Table 3-5
Hubway Bike Sharing Stations

Location	Number of Stations
Government Center – City Hall	19
TD Garden (Legends Way)	53
Cross Street/Hanover Street	19
Cambridge Street/Joy Street	15
Union/North/Congress Streets	19
Aquarium Station	19
Total	144

The Proponent will provide a new Hubway bike sharing station on the East Parcel. This will allow on-site residents, employees, customers and commuters from the MBTA Haymarket subway and bus routes to have direct access to a bicycle sharing station.

Car sharing, predominantly provided by Zipcar in the Boston area, supplies easy access to vehicular transportation for those who do not own cars. Enterprise Rent-A-Car has also started car sharing service in the Boston area, one of which currently exists in the Garage. Vehicles are rented hourly or daily with all vehicle costs (gas, maintenance, insurance, and parking) included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. Eight Zipcar vehicles, including one "Zipvan", are located within the Garage as well as two Enterprise car sharing vehicles. Table 3-6 summarizes the locations and number of car sharing services in the area of the Project Site.

Table 3-6
Car Sharing Services

Location	Number of Vehicles
Government Center Garage	
Zipcar	8 (including 2 Zipvan)
Enterprise	2
100 Cambridge Street	8
Center Plaza	2
75 State Street	2
Pi Alley Garage	7
Charles River Plaza	4
Charles River Park/Staniford St.	10
North End Garage	4 (including 1 Zipvan)
585 Commercial Street	10
Total	57

3.4 Traffic Impact and Access Study Overview

In May 2009, the BTD issued a transportation scope of work for the prior development proposal at the Project Site. While the Project has reduced in scale and become more mixed use since that time, the framework of the BTD comment letter and scope has been adopted as a guideline for developing the transportation study for the Project. The study involves a comprehensive transportation impact analysis and includes an evaluation of traffic, transit, pedestrian, bicycle, parking, and loading/service operations.

■

3.4.1 Traffic Analysis Methodology

Existing and future traffic conditions have been evaluated through an analysis of intersection capacity operations. Included in Attachment 2 is an analysis of level of service and delay at the study area intersections defined by BTD using Trafficware's Synchro 6.0 software, which is based on the traffic operational analysis methodologies of the Transportation Research Board's 2000 *Highway Capacity Manual* (HCM). Level of service and delay (in seconds) are determined based on intersection geometry and available traffic data for each intersection. Synchro also evaluates the effects of progression and queuing at adjacent intersections.

In support of this analysis, intersection turning movement volumes are compiled from new and recent traffic counts for the weekday AM and PM peak periods. Pedestrian and bicycle counts are also provided at key intersections.

The traffic analysis evaluates Year 2013 (existing conditions) weekday AM peak hour and PM peak hour intersection conditions. Future year evaluation has been conducted for a 15-year full-build horizon and will include assessment of Year 2028 No-Build and Year 2028 Build intersection operations, reflecting future conditions without and with the Project.

The results of the analysis quantify the future transportation impacts associated with the redevelopment of the Project Site. Appropriate mitigation measures will be proposed if needed.

3.4.1.1 Study Area

The traffic analysis describes and evaluates the following 36 study intersections, as identified by the BTD and shown in Figure 3.5.

- New Sudbury Street/Congress Street;
- New Sudbury Street/Cambridge Street;
- New Sudbury Street/Blackstone Street/Surface Road;
- New Sudbury Street/Cross Street/I-93 Northbound On-ramp;
- New Chardon Street/Cambridge Street;
- New Chardon Street/Congress Street/Merrimac Street;
- New Chardon Street/Canal Street;
- New Chardon Street/North Washington Street/Sumner Tunnel Off-ramp/I-93 Southbound and Callahan Tunnel On-ramps;
- New Chardon Street/Hawkins Street;
- New Chardon Street/Bowker Street;
- North Washington Street/Cross Street/Cooper Street;
- North Washington Street/Beverly Street;
- North Washington Street/Thatcher Street/Valenti Way;
- North Washington Street/Causeway Street (Keany Square);
- Merrimac Street/Staniford Street/Causeway Street/Lomasney Way (Lowell Square);
- Cambridge Street/Staniford Street;
- Hanover Street/Congress Street;
- Hanover Street/Surface Road;
- Hanover Street/Cross Street;
- Causeway Street/Portland Street;
- Causeway Street/Haverhill Street;
- Mercantile Street/Surface Road;
- State Street/Surface Road;
- Beverly Street/Valenti Way;
- Atlantic Avenue/Mercantile Street/Cross Street;
- Atlantic Avenue/State Street;
- Cross Street/North Street;
- I-93 Northbound Off-ramp/Surface Road/North Street;
- North Street/Congress Street;
- I-93 Southbound Off-ramp/Surface Road/Clinton Street;
- Surface Road/Walk to the Sea;

- Atlantic Avenue/Walk to the Sea;
- North Street/Union Street;
- North Street/Clinton Street; and
- Cross Street/Commercial Street.

In addition to the vehicular level of service analysis for the above locations, a detailed pedestrian level of service analysis was conducted at:

- New Sudbury Street/Congress Street;
- New Chardon/Canal Street; and
- New Chardon Street/Congress Street/Merrimac Street.

3.4.1.2 Planned Roadway Improvements

Several roadway improvement projects proposed by others are located in the immediate vicinity of the Project Site. These include:

- The Causeway Street Reconstruction project as part of the City of Boston's Crossroads Initiative;
- Final roadway circulation improvements in the Bulfinch Triangle as proposed in connection with the Central Artery/Tunnel Surface Transportation Action Forum (STAF) recommendations;
- Reconstruction of Cambridge Street as part of the MBTA's improvements to Government Center station;
- BTD's signal retiming and sequencing for the Central Artery Traffic Signal Optimization Study along the Rose F. Kennedy Greenway corridor; and
- Bicycle accommodation (bike lanes) along various corridors by BTD's Boston Bike Network project.

These improvements are assumed to be completed by the time of Project completion.

■

3.4.2 Future Transportation Conditions

3.4.2.1 Site Access

As shown on Figure 3.6, the Project will shift the West Parcel's current primary single pedestrian access point at One Congress Street to each of the individual proposed new buildings. Additional pedestrian access to ground floor retail will be distributed along the perimeter of the Project on New Sudbury, Congress, and New Chardon streets as well as the new public plaza and pedestrian connector through the East Parcel to Canal Street. The primary pedestrian access to public parking will remain approximately mid-block along the west side of Congress Street. Curbside pick-up/drop-off is proposed for all significant buildings.

Vehicular access for all parking at the Project will remain at the West Parcel. The Project will retain both the south vehicle entrance and exit along New Sudbury Street, but will close the current north driveway entrance and exit on New Chardon Street at the Merrimac/Congress Street intersection. The north driveway will be moved from New Chardon Street to Bowker Street at its general intersection with Hawkins Street. This will

allow vehicles exiting the Garage to take a right onto New Chardon Street, which is currently not allowed from the existing driveway, and will greatly improve vehicle movements to and from the regional highway system and local roadway network. This relocation also vastly improves both vehicle and pedestrian operations and safety at the New Chardon Street and Merrimac/Congress Street intersection.

The Project proposes to narrow New Sudbury Street from four travel lanes to three vehicle lanes and one bicycle lane to allow for structures and building lobbies to be built outside of the current garage façade. In order to maintain satisfactory traffic and pedestrian operations, the angled Boston Police Parking (26 spaces) will be eliminated along the north New Sudbury Street curb. This BPD parking will be replaced in a dedicated nest area of the lower level of the Garage with direct access and egress from Bowker Street at Hawkins Street.

The Project will change Bowker Street from one-way northbound to two-way operations in order to better access both the proposed new garage entrance and exit at its terminus at Hawkins Street and the new primary loading dock for the West Parcel along Bowker Street. This will require the removal of curbside parking along Bowker Street, the majority of which (15 spaces) is currently designated as police parking for the District A-1 Police Station. This parking will also be replaced in the lower level of the Garage.

The primary loading dock for the West Parcel will be accessed from Bowker Street. A secondary loading dock is proposed on New Sudbury Street to serve the WP-B1 and WP-B3 apartment buildings as the Bowker Street loading dock may be inaccessible to these apartment buildings. In addition, the Bowker Street loading dock will be built after the WP-B1 apartment building and during Phase 2 when the office tower (WP-B2) is constructed; thus, it will not be available for the earlier apartment tower occupancy.

Separate pedestrian access is also proposed for each of the individual East Parcel buildings. A major pedestrian promenade is proposed along a critical pedestrian desire line between the Canal Street crossing on New Chardon Street and the northwest corner of Surface Road/New Sudbury to the North End and Greenway parcels as well as the northeast corner of the Congress Street/New Sudbury Street providing improved connectivity between Government Center/Faneuil Hall/Financial District to North Station. The multiple retail uses on the East Parcel will be accessible along this promenade.

Parking for the East Parcel will be at the West Parcel, as no on-site parking is currently proposed east of Congress Street. It would be extremely difficult to provide a parking structure on the East Parcel due to the presence of two MBTA subway tunnels and limited width of the proposed structures. A raised, plaza level pull off area (similar to the treatment at Rowes Wharf) is proposed for the hotel/condominium building along the east side of Congress Street. This area will service the hotel and condominium pick-up/drop-off and valet demands while allowing for the unimpeded flow of traffic along Congress Street. Surface treatment of this pull off area will blend with that of the adjacent sidewalks so as to appear as part of the pedestrian experience. Building loading and servicing at the East Parcel will be from several locations. The hotel/condominium and office/retail buildings will have loading docks on New Chardon Street. Additional curbside loading is proposed for retail uses at cut-ins along both New Chardon Street and New Sudbury Street. The loading cut-ins will be similarly treated to have the look and feel of the East Parcel's pedestrian plaza.

No changes to the MBTA Haymarket bus or subway operations are planned as part of the Project. Vehicular access to the current MBTA Haymarket bus facility will remain from Surface Road. The Project has been

coordinating with the MBTA to reconfigure and optimize the MBTA Haymarket bus facility to better utilize the space. The intent is to maintain or improve current bus operations and service levels while providing sufficient width on the East Parcel to create a new public plaza and pedestrian connector that is appropriately scaled given its importance in connectivity between Government Center and North Station along the Canal Street axis.

As compared in Figure 3.7, the reconfigured MBTA Haymarket bus facility will provide similar bus capacity and curb lengths as the existing bus facility by shifting the outer bus loading bay to a cut-in along Surface Road for the local Route 111 bus and shifting the current inner bus lane to the general location of the existing outer bus lane to handle the Route 400 series commuter buses. As part of the construction of the smaller East Parcel office building, the MBTA Haymarket bus facility will be located partially under this new building. Pedestrians will continue to be able to access the bus facility from all directions. Access to the MBTA Haymarket Station (Orange and Green Lines) will be maintained through its current head house which will be incorporated into the new pedestrian promenade/urban plaza located in the middle of the East Parcel.

Vehicular Circulation and Pedestrian Improvements Adjoining the Site

The following is a summary list of planned roadway, bicycle, and pedestrian improvements and mitigation items adjoining the Project Site (Figure 3.6):

- Provision of a pedestrian promenade connecting the major Canal Street pedestrian crossing at New Chardon Street (Bulfinch Triangle/North Station) to the northwest corner of Surface Road/New Sudbury (crossing to the North End Greenway parcels) as well as the northeast corner of Congress Street/New Sudbury Street (Government Center/Faneuil Hall/Financial District).
- Addition of a garage exit ramp to Bowker Street to improve exiting vehicle circulation patterns and thereby area traffic operations, particularly during the PM peak period.
- Relocation of the north garage driveways from New Chardon Street (and within the intersection of Merrimac/Congress Street) to Bowker Street improving traffic operations and pedestrian safety at the New Chardon Street and Merrimac/Congress Street intersection.
- Relocation of the loading dock and associated driveways from New Chardon Street and Merrimac/Congress Street intersection to Bowker Street.
- Conversion of Bowker Street from one-way northbound to two-way operations including the elimination of curb use.
- Addition of police parking in a new dedicated nest area on the lower level of the Garage accessed from Bowker Street replicating current police parking on Bowker Street and on New Chardon Street that is proposed to be eliminated.
- Elimination of police parking at the Project Site along New Sudbury Street to allow sidewalk widening and room for the apartment building lobbies.
- Travel lane reconfiguration and elimination of curb use on New Sudbury Street at the Project Site.
- Travel lane configuration and sidewalk improvements on Congress Street at the Project Site.
- Reconfiguration of the MBTA Haymarket bus facility.

- Creation of an 850-space on-site shared bicycle parking facility.
- Provision of a new Hubway station on the East Parcel.
- Addition of new bike lanes on the surrounding segments of New Sudbury Street, New Chardon Street and Congress Street.

3.4.2.2 Trip Generation

Trip generation estimates for the proposed Project have been calculated based on rates derived from the Institute of Transportation Engineer's (ITE) Trip Generation (9th Edition) manual. The following ITE land use codes (LUC) were used in the development of Project-related trips.

- **Land Use Code 222 -- High-Rise Apartment.** This land use code is described as rental dwelling units located in one common building that has 10 levels (floors) or more as well as multiple elevators. These apartments may be studio or one-four bedroom apartments.
- **Land Use Code 232 – High Rise Condominium**. A High Rise Condominium is defined as owner-occupied residential condominiums or townhouses within the same building structure that consist of three or more floors.
- **Land Use Code 310 -- Hotel.** This land use code is defined as a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention centers, limited recreational facilities (e.g., pool, fitness room), and/or other retail services or shops.
- **Land Use Code 820 -- Shopping Center/Retail**. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store. Due to the Project's Downtown location, the retail activity is expected to exhibit the trip generation characteristics of a portion of a shopping district since it is, in effect, part of a larger shopping opportunity experience. Therefore, LUC 820 is the most comparable category for trip generation.
- **Land Use Code 932 -- Quality Restaurant.** This land use consists of eating establishments of high quality, with average turnover rates of at least one hour or longer. Generally, quality restaurants do not serve breakfast, some do not serve lunch, and all serve dinner.
- **Land Use Code 710 -- General Office.** General office is defined as an office building containing multiple tenants. An office building typically contains a mixture of professional services.

Trip generation for the public commercial parking spaces to be retained in the Garage was estimated based on several sources, including 24-hour existing driveway counts and transient parking demand characteristics identified in the 2007 One Congress Redevelopment Study by Walker Parking Consultants. Based the future parking demand and supply discussed later in Section 3.4.4.6, trip generation for commercial public parking is based on the availability of approximately 550 spaces for such purposes during a typical weekday.

3.4.2.3 Travel Mode Share Assumptions

The ITE rates produce vehicle trip estimates, which are converted to person trips based on average vehicle occupancy rates. Using BTD's mode split data for Area 2 and local vehicle occupancy rates, shown in Table 3-7, the person trips are then reallocated to walk/bike, transit and vehicle mode shares. Based on the land use trip rates, travel mode shares, and vehicle occupancy rates, the resulting Project-generated trips were calculated and shown by land use category in Table 3-8 below.

Table 3-7
Travel Mode Shares and Vehicle Occupancy Rates

Land Use		Walk/Bike Share	Transit Share	Vehicle Share	Vehicle Occupancy Rate
Daily					
Residential	In	42%	30%	28%	1.2
	Out	42%	30%	28%	1.2
Hotel	In	59%	20%	21%	1.8
	Out	59%	20%	21%	1.8
Retail/Restaurant	In	41%	35%	24%	1.8
	Out	41%	35%	24%	1.8
Office	In	31%	43%	26%	1.2
	Out	31%	43%	26%	1.2
Commercial Parking	In	50%	0%	50%	1.22/1.8[1]
	Out	50%	0%	50%	1.22/1.8[1]
AM Peak Hour					
Residential	In	7%	52%	41%	1.2
	Out	51%	18%	31%	1.2
Hotel	In	14%	46%	40%	1.8
	Out	58%	10%	32%	1.8
Retail/Restaurant	In	14%	46%	40%	1.8
	Out	58%	10%	32%	1.8
Office	In	5%	63%	32%	1.2
	Out	26%	18%	56%	1.2
Commercial Parking	In	50%	0%	50%	1.2/1.8[1]
	Out	50%	0%	50%	1.2/1.8[1]
PM Peak Hour					
Residential	In	51%	18%	31%	1.2
	Out	7%	52%	41%	1.2
Hotel	In	58%	10%	32%	1.8
	Out	14%	46%	40%	1.8
Retail/Restaurant	In	58%	10%	32%	1.8
	Out	14%	46%	40%	1.8
Office	In	26%	18%	56%	1.2
	Out	5%	63%	32%	1.2
Commercial Parking	In	50%	0%	50%	1.2/1.8[1]
	Out	50%	0%	50%	1.2/1.8[1]

Source: Boston Transportation Department
1 Monthly Parkers/Transient Parkers. Walk trips are generated by commercial parking in the reverse direction of vehicle person trips that vary by type of commercial parking.

Table 3-8
Total Project Trip Generation

Land Use			Walk/Bike Trips[1]	Transit Trips[1]	Vehicle Trips[1]
		Daily			
Residential Apartments (651 units)		In	584	417	336
		Out	584	417	336
Residential Condominiums (120 units)		In	151	108	87
		Out	151	108	87
Hotel (204 rooms)		In	468	159	93
		Out	468	159	93
Retail/Restaurant (82,500 sf)		In	1,817	616	359
		Out	1,817	616	359
Office (1,303,300 sf)		In	1,817	2,520	1,313
		Out	1,817	2,520	1,313
Commercial Parking [2]		In	1,620	0	900
		Out	1,620	0	900
	Total	In	6,457	3,820	3,088
	Total	Out	6,457	3,820	3,088
		AM Peak Hour			
Residential Apartments (651 units)		In	4	30	21
		Out	90	32	47
Residential Condominiums (120 units)		In	1	8	5
		Out	32	11	17
Hotel (204 rooms)		In	11	36	18
		Out	29	5	9
Retail/Restaurant (82,500 sf)		In	30	99	48
		Out	95	16	29
Office (1,303,300 sf)		In	85	1,065	466
		Out	60	41	111
Commercial Parking [2]		In	124	0	74
		Out	133	0	69
	Total	In	255	1,238	632
	Total	Out	439	105	282
		PM Peak Hour			
Residential Apartments (651 units)		In	74	26	39
		Out	6	45	31
Residential Condominiums (120 units)		In	21	8	11
		Out	2	13	9
Hotel (204 rooms)		In	39	7	12
		Out	9	30	15
Retail/Restaurant (82,500 sf)		In	158	27	49
		Out	33	108	52
Office (1,303,300 sf)		In	82	57	153
		Out	80	1,003	439
Commercial Parking [2]		In	158	0	30
		Out	54	0	88
	Total	In	532	125	294
	Total	Out	184	1,199	634

1 These trip totals do not account for the discontinuation of existing trips to the Project Site. See Table 3-11 for net new trips.
2 Trips generated by the commercial parking spaces are based on the mid-day availability of approximately 550 spaces, as presented in the shared parking analysis of Table 3- 15.

Vehicle trips currently generated by the Garage and on-site office and retail uses, as shown in Table 3-9, were determined from garage gate counts conducted in October 2012 at the New Chardon Street and New Sudbury Street driveways. It is assumed that all vehicle trips associated with the currently occupied office and retail are included in these driveway counts. The on-site office space was about 72 percent occupied at the time of the garage gate counts and the retail space was about 70 percent occupied.

Table 3-9
Existing Site Trip Generation

		Walk/Bike Trips	Transit Trips	Vehicle Trips
Daily	In	3,647	1,019	1,800
	Out	3,647	1,019	1,800
AM Peak Hour	In	200	285	147
	Out	214	12	137
PM Peak Hour	In	312	26	61
	Out	114	300	176

The existing site generates approximately 3,600 vehicle trips over the course of a day, including 147 entering and 137 exiting vehicle trips during the AM peak hour, and 61 entering and 176 exiting vehicle trips during the PM peak hour. The existing walk trips generated by the Project Site are primarily associated with the parking spaces in the Garage, as drivers and passengers walk to their final destination. Additional trips that would be associated with full occupancy of both the existing office and retail supply is presented in Table 3-10.

Table 3-10
Trip Generation of Currently Vacant Space

Land Use			Walk/Bike Trips	Transit Trips	Vehicle Trips
		Daily			
Office (69,528 sq. ft.)		In	143	198	103
		Out	143	198	103
Retail (11,277 sq. ft.)		In	255	86	50
		Out	255	86	50
	Total	In	398	284	153
		Out	398	284	153
		AM Peak Hour			
Office (69,528 sq. ft.)		In	6	72	32
		Out	4	3	8
Retail (11,277 sq. ft.)		In	2	6	3
		Out	4	1	1
	Total	In	8	78	35
		Out	8	4	9
		PM Peak Hour			
Office (69,528 sq. ft.)		In	5	4	10
		Out	5	65	28
Retail (11,277 sq. ft.)		In	21	4	6
		Out	5	18	9
	Total	In	26	8	16
		Out	10	83	37

It is assumed that within the 15-year horizon year of the transportation analysis, full occupancy of both the office and retail space would occur and the associated trips would form the baseline from which the traffic impacts would be assessed.

Subtracting both the existing trip generation and the expected trip generation from on-site vacant space from the proposed Project-related trip generation yields the net new trips. The net new trips by travel mode are summarized in Table 3-11 and will be the basis for future year transportation impact analysis.

Table 3-11
Net New Trip Generation for Project Site

		Walk/Bike Trips	Transit Trips	Vehicle Trips
Daily	In	2,412	2,517	1,135
	Out	2,412	2,517	1,135
AM Peak Hour	In	47	875	450
	Out	217	89	136
PM Peak Hour	In	194	91	217
	Out	60	861	421

Estimated daily vehicle trips to and from the Project Site are expected to increase by 2,270 vehicle trips. During the AM peak hour, an estimated 450 new vehicle trips in and 136 new vehicle trips out will occur, while during the PM peak hour, 217 new vehicle trips in and 421 new vehicle trips out will occur.

3.4.2.4 Vehicle Trip Distribution

The vehicular trip distribution is based on BTD guidelines, using origin-destination characteristics for Area 2, a BTD-designated zone that encompasses the Project Site. The vehicle trip distribution shown in Table 3-12 indicates that the majority of traffic will use the regional highway system to access the Project Site. Figures 3.8 and 3.9 present expected local vehicle trip distribution to and from the Project Site, respectively, given the access and egress driveway locations. As indicated in these graphics, the majority of Project vehicles will only have a short trek on surface streets between the regional highway system and the Project Site.

Table 3-12
Project Vehicle Trip Distribution

	Arriving at Project Site	Exiting from Project Site
Regional Routes		
North via I-93 and Route 1	26%	26%
South via I-93 and I-90	34%	35%
West via I-90 and Storrow Drive	15%	15%
East via Sumner and Callahan Tunnels	6%	6%
Regional Subtotal	81%	82%
Local Routes		
North	6%	5%
South	7%	7%
East	1%	1%
West	5%	5%
Local Subtotal	19%	18%

3.4.4.5 Transit Trip Distribution

Table 3-13 summarizes the transit trip distribution developed from ridership forecasts published in the MBTA's "Urban Ring Phase 2 Revised DEIR/DEIS", November 2008. Because the Project Site is located at the MBTA Haymarket Station, almost 60% of transit riders to the Project are expected to arrive via the Green Line and Orange Line, including transfers from other services. Attachment 2 evaluates peak hour transit service capacity relative to the number of projected new transit trips.

Table 3-13
Transit Trip Distribution

Service	Percent Distribution
Subway/Bus Rapid Transit	
Green Line	31%
Orange Line	30% [1]
Red Line	23%
Blue Line	7%
Silver Line	10%
Commuter Rail	
North Station Commuter Rail	4%
South Station Commuter Rail	8%
Bus	
Bus Routes	4%
Express Bus Routes	1%

[1] Includes 11% that directly use Orange Line and 19% that transfer from other transit services. The total of the percent distribution is greater than 100% because transferring riders are included in both services.

3.4.4.6 Future Parking

The Project will decrease overall parking supply at the Project Site to approximately 1,159 spaces. The physical garage structure itself will be contained entirely on the West Parcel. The portion of the Garage that extends over Congress Street and the East Parcel will be demolished and not replaced. The remaining garage structure will be hidden from view by various Project Components. Portions of the remaining garage structure will be reconfigured to accommodate the Project Components. Internal vehicle circulation will also be reconfigured, including the provision of new access and egress points along Bowker Street and eliminating the New Chardon Street driveways.

The parking supply proposed for the Project is at or below the maximum ratios determined for the area by BTD in their district-based parking goals and guidelines. Based on current trends in parking demand in downtown Boston, certain land uses exhibit lower ratios than the BTD maximum guidelines, including those for; residential apartments at 0.50 per unit vs. 1.0 per unit, condominiums at 0.70 per unit vs. 1.0 per unit, and hotel keys at 0.25 per unit vs. 0.40 per unit. The general aggregate for office use in the downtown core also trends to 0.30 spaces/1,000 square feet, less than the 0.40 per 1,000 square feet maximum guideline. Non-destination retail uses, similar to those proposed as part of the Project, tend to attract more pass-by or secondary trips in the downtown area and generally do not require parking specific to their use.

The proposed improvements to New Sudbury Street and changes in circulation to Bowker Street will require the elimination of approximately 42 on-street parking spaces dedicated to Boston's District A-1 Police Station. The Project will provide replacement parking to the Boston Police Department for approximately 42 vehicles in the lower level of the Garage with direct access and egress to Bowker Street at Hawkins Street.

Parking demand for the Project assigned by associated land use and compared to suggested BTD parking ratios is presented in Table 3-14 below.

Table 3-14
Project Parking Demand

Land Use	Size	Parking Ratios		Proposed Project Parking Demand
		Maximum BTD Guidelines	Proposed Project	
Residential Apartments	651 units	0.50 – 1.0 per unit	0.50 per unit	326 spaces
Residential Condominiums	120 units	0.50 – 1.0 per unit	0.70 per unit	84 spaces
Hotel Rooms	204 rooms	0.40 per key	0.25 per key	51 spaces
Retail/Restaurant	82,500 sf	0.40 per 1,000 sf	0.0 per 1,000 sf (use public parking)	0 spaces
Office	1,303,300 sf	0.40 per 1,000 sf	0.30 per 1,000 sf	391 spaces
Replacement Police Parking	na	na	na	42 spaces
Total Project Parking Demand				894 spaces

sf square feet

Shared Parking

For a mixed-use development with a common parking garage, the most efficient use of the parking resource is to "share" rather than have assigned or dedicated parking for each land use (although a certain number of parkers will demand reserved spaces, such as executive office workers and condominium unit owners). Parking for the condominium and hotel uses, for example, will peak at night, while parking demand for the office space will peak during the day. Residential parking demand during the weekday remains at about 45% of nighttime demand with hotel parking at about 35% of nighttime demand. Weeknight demand for residential and hotel is assumed to be at 100%. Typical leased office parking is only utilized at about 80% due to various out-of-office commitments such as off-site meetings along with vacations and other personal time away from the office. At night, office component drops to about 10% of weekday demand. By managing its parking resource, the Project can also free up parking for commercial public transient use (i.e., the short-term parking of vehicles destined to the surrounding area offices and retail shops) and monthly parking (i.e., overnight neighborhood residential parking and/or monthly leased commuter parking).

Previously, the City, through the BED and BTD asked that a component of transient public commercial parking be retained at the Project. Current data indicates that peak transient parking use is mid-day on a typical weekday and approximately 220 spaces. Most of the current overnight parking for area residents, which is both transient parking and those who purchase monthly passes (about 600 spaces), can be accommodated in the Garage by sharing the parking resource. Additional demand for nighttime events at TD

Garden, which on average ranges between 500 and 600 spaces can also be accommodated by instituting a shared parking arrangement within the Garage.

Table 3-15 presents a summary of shared use parking demand for the Project and identifies the ability to provide public commercial parking for approximately 555 vehicles during the weekday, about 567 spaces on weeknights, and about 725 spaces on weekend days. Since parking supply available for commercial parking is above that currently exhibited by transient use at the Garage, it is expected that these parking spaces would ultimately be used by both transient parkers and monthly parkers.

Table 3-15
Project Parking Demand – Shared Use

Land Use	Project Parking	Shared Parking					
		Weekday		Weeknight		Weekend Day	
		Percent occupied	Spaces occupied	Percent occupied	Spaces occupied	Percent occupied	Spaces occupied
Residential Apartments	326 spaces	45%	147	100%	326	60%	195
Residential Condominiums Shared	34 spaces	45%	15	100%	34	60%	20
Residential Condominiums Reserved	50 spaces	na	50	na	50	na	50
Hotel Rooms	51 spaces	35%	18	100%	51	60%	38
Retail/Restaurant [1]	0 spaces	na	na	na	na	na	na
Office Shared	391 spaces	80%	332	10%	39	10%	39
Office Reserved	50 spaces	inc. in shared	inc. in shared	na	50	na	50
Replacement Police Parking	42 spaces	na	42	na	42	na	42
Total Project Shared Parking Demand			604		592		434
Total Project Parking Supply			1,159		1,159		1,159
Available for Public Parking			555		567		725

1 Retail parkers are assumed to use available public parking.

Reduction of Commercial Public Parking Supply

The Garage was originally built in the 1960's with 1,865 spaces and was expanded to 2,310 spaces in the 1980's. In 2013, the Garage is heavily underutilized with only approximately 45% of available parking supply being used on a typical day. The high vacancy rate may be reflective of many local and societal factors and trends that affect travel choices in Boston. Each of the following factors may be contributing to the current under-capacity operation of the Garage and will continue to influence how Boston commuters and residents make travel decisions in the future.

- *Improved and expanded transit service.* Metropolitan residents commuting into downtown have more transit options than when the Garage was first built. In the 1970's and 1980's, the MBTA extended the subway lines on both the Red Line (to Alewife and Quincy Center) and Orange Line (to Oak Grove). In the past 15 years, ridership on all transit lines has increased. Commuter rail service has been extended

south into Providence and west to Worcester, along with restored service on the Old Colony and Greenbush lines. System wide, commuter rail ridership has increased by almost 50% since 1997.

- *Urban population rates.* The population of the City of Boston reached its peak in 1950, but like many other cities, declined thereafter. In recent decades, Boston's population has been increasing and is now over 600,000 people, the highest number since 1970. The central downtown district experienced a 23% population growth (over 5,000 residents) between 2000 and 2010. The increased supply of downtown housing units is attracting "empty nesters" and young professionals who do not want to commute to work by automobile.

- *Auto-ownership*. Based on 2010 census data, about 55% of households in the central district of Boston do not own a vehicle. The residential parking demand is trending at about 0.50 spaces per unit in downtown neighborhoods.

- *Car sharing services.* An alternative to car ownership, auto share services provide access to vehicles for short-term use. Zipcar, the most popular auto sharing service in Boston, estimates each of its Zipcars replaces 20 privately owned vehicles. There are many Zipcar locations in downtown Boston, including eight vehicles at the Garage. More recently, Enterprise started a car share program, which has two vehicles at the Garage.

- *Gasoline prices.* Increasing gasoline prices motivate some drivers to reduce auto use and switch to other travel modes such as transit or bicycles.

- *Parking supply and cost.* The parking "freeze", established in 1976 by the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency, was put in place to improve and maintain air quality in the region by limiting the number of new public parking spaces and thereby reducing auto travel into the City. The policy, while capping the public supply (at 35,556 spaces), allows the economics of supply and demand to influence parking fees, which are some of the highest in the nation.

- *Additional parking capacity.* Commercial public parking capacity was added to downtown Boston in the 9 years after the Garage was built and before the parking freeze was imposed upon the City. In addition, the parking supply has significantly increased for "exempt" spaces, or those that are not open to the public but rather ancillary to a particular development, thereby reducing overall demand for commercial public parking.

- *Increased bicycle use.* Bicycle use and awareness is rising in the City. About 2.1% of Boston commuters biked to work in 2009, up over 120% from 2007. Between 2007 and 2010, the City created over 52 miles of new bicycle lanes. Hubway, launched in July 2011, is a bicycle sharing system with more than 100 stations and 1,000 bicycles available throughout Boston, Brookline, Cambridge, and Somerville.

- *Social and environmental concerns.* Increased awareness of sustainability and the desire to reduce dependence on oil, motivate many people to reduce or avoid auto travel.

Reducing the supply of public parking at the Garage will complement many of these trends and reinforce public policy decisions that aim to reduce auto dependency and encourage alternative modes of travel. In

addition, it is important to note that the reduction of parking supply at the Garage will result in the return of approximately 700 underutilized commercial public parking spaces to the parking freeze bank. This will give the City of Boston an opportunity to provide additional public parking spaces in other parts of the City that may need additional parking supply. Overall, it allows the City to be more efficient with the limited parking supply it is allowed to have.

Displaced Parking

With the overall reduction in parking supply and the additional parking demand made by the Project, the Project will displace some parking. While the future parking supply will be able to accommodate transient commercial parking, a number of commuter parkers who enter into weekday monthly leases will be displaced (approximately 500 spaces). A detailed assessment of displaced parking for the construction phases of the Project and the final full build-out of the Project is provided in Attachment 2. As part of this detailed assessment, current parking capacity and available occupancy data for typical weekday periods have been determined at several nearby parking garages. Each of the eight identified garages listed below have more than 300 spaces and each are a seven-minute walk from the Project Site. Combined, these garages have 5,518 commercial public parking spaces. The approximately 500 displaced parking spaces represent 9% of the supply provided by these nearby garages and can be absorbed within their current vacancy levels:

- Parcel 7 Garage, 310 public spaces
- TD Garden Garage, 710 public spaces
- MBTA North Station Garage, 1221 public spaces.
- Center Plaza Garage, 586 public spaces.
- Charles River Plaza Garage, 794 public spaces.
- Clinton Street Garage, 597 public spaces.
- 75 State Street Garage, 700 public spaces.
- Pi Alley Garage, 600 public spaces.

3.4.4.7 Bicycle Accommodations

The Proponent supports the City's efforts in advancing bicycle use by providing bicycle accommodation as part of the Project and will be implementing a number of new bicycle accommodations.

The Project will include a parking/storage area for approximately 850 bicycles on the West Parcel for longer-term bicycle storage, which will be one of the largest, if not largest, bicycle parking facility in the City of Boston. This facility will incorporate employee changing rooms and showers. In addition, the proposed bicycle parking facility is located adjacent to proposed retail areas, which may attract a bicycle retail vendor as part of the facility.

Bicycle racks will be readily available for short-term parking by visitors at major building entrances and near public open spaces. Due to the nature of land uses at the Project Site, there is significant opportunity to share both short-term visitor and longer-term employee and resident bicycle parking.

In addition, the Proponent will provide a new Hubway station on the East Parcel near the new public plaza and MBTA Haymarket Station and bus facility. The Proponent will work with Boston Bikes to determine the best location on the East Parcel for a Hubway station.

Attachment 2 provides a detailed assessment of bicycle demand and proposed bicycle parking supply as well as the ability to "share" bicycle parking between internal Project Components.

3.4.4.8 Service and Loading

As conceptually shown in Figure 3.6, the primary loading and building servicing area for the West Parcel is located off Bowker Street. This loading area will primarily service the office building (WP-B2). Bowker Street is proposed to change from one-way northbound to two-way operations in order to better access the loading area and prevent the need for vehicles to loop around on Hawkins Street.

The loading area for the West Parcel's apartment buildings (WP-B1 and WP-B2) is located on New Sudbury Street, as the Bowker Street loading dock is inaccessible to these buildings due to garage ramp structures.

Building loading and servicing at the East Parcel will be from several locations. Loading docks servicing the East Parcel are proposed on New Chardon Street for both the hotel/condominium and office/retail buildings. Additional curbside loading is proposed for retail uses at cut-ins along both New Chardon Street and New Sudbury Street. A detailed assessment of loading demands by parcel and use is provided in Attachment 2.

3.4.4.9 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures aimed at minimizing automobile usage and Project-generated traffic impacts. The TDM program will support the City's efforts to reduce dependency on the automobile by encouraging the use of alternatives to driving, especially during peak time periods. The Proponent is prepared to take advantage of the excellent transit access for marketing the Project to future residents, office tenants, hotel operators, and restaurant and retail tenants to encourage the use of public transportation, ridesharing, bicycling, and walking through implementation of the following demand management measures discussed in this section.

The TDM program may include an on-site transportation coordinator, transit pass subsidies for employees, secure bicycle parking areas, and distributions of transit maps and schedules to residents, guests, and employees. Specific TDM measures will be codified in the Transportation Access Plan Agreement (TAPA) for the Project.

Alternative Mode Benefits/Tactics

To achieve the highest use of public transportation, ridesharing, walking and biking at the Project Site, the following actions will be implemented:

- A Transportation Coordinator will be appointed as part of the building management to encourage these alternative modes;

- The building management will join and participate in the local Transportation Management Association (TMA) on behalf of commercial tenants and residents;
- The Project will implement and develop appropriate parking ratios in cooperation with the BTD district parking ratios; and
- To encourage more sustainable habits for automobile drivers, at least ten recharging stations for electric cars will be provided in the Garage.

Public Transportation

The following promotion and incentive measures aim to increase public transit use to and from the Project Site:

- Work with the MBTA to improve station access/egress at the MBTA Haymarket Station and the bus facility as well as their integration with a new public plaza;
- Post information about public transportation and car-sharing options;
- Provide transit, bike, and pedestrian access information on a future project web-based application accessible to residents and hotel guests;
- Encourage employers to subsidize on-site full-time employees' purchase of monthly transit passes;
- Promote to commercial tenants that, as employers, they can save on payroll-related taxes and provide employee benefits when they offer transportation benefits such as subsidized public transportation; and
- Encourage employers to arrange to provide Guaranteed Ride Home during hours in which public transit service is no longer available to employee's home.

Parking/Ridesharing/Carsharing

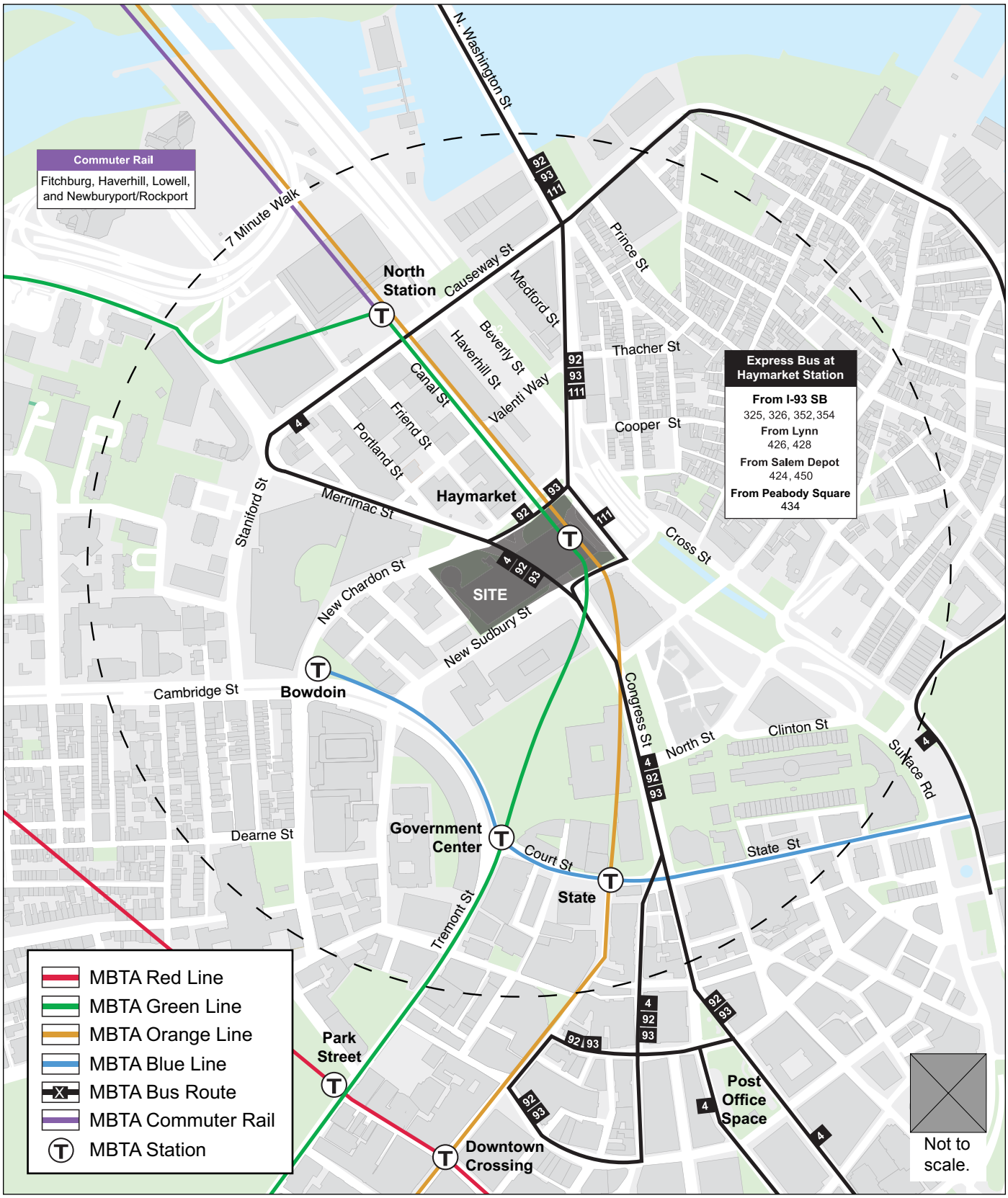
The following measures aim to minimize the vehicle trip activity generated by the Project Site:

- Participate in area airport shuttle services;
- Continue to offer car share spaces in the Garage;
- Discourage drive-alone employee commuting by providing extremely limited employee parking in the Garage;
- Provide on-line registration for the RideSource ride-matching program through the local TMA membership; and
- Provide access to information on area carpool and vanpool participants through the local TMA membership.

Bicycle Facilities

The Proponent supports the City's efforts in advancing bicycle travel by introducing on-site bicycle accommodations, including bicycle lanes or other safety improvements, where feasible and applicable. The following measures aim to encourage bicycles as an alternative to single-occupancy vehicles:

- On-site bicycle storage, including at-grade bicycle racks for short-term bicycle parking by visitors at major building entrances and an 850-space bicycle parking facility in the Garage for secure long-term bicycle parking for residents and/or employees who commute by bicycle;
- Employee changing rooms and showers will be provided near the Garage bicycle parking facility;
- Participate in the Hubway program by adding an additional bicycle sharing station on the East Parcel; and
- Incorporating bicycle facilities/lanes in all roadway and intersection mitigation associated with the Project (consistent with Boston's Complete Street Guidelines).

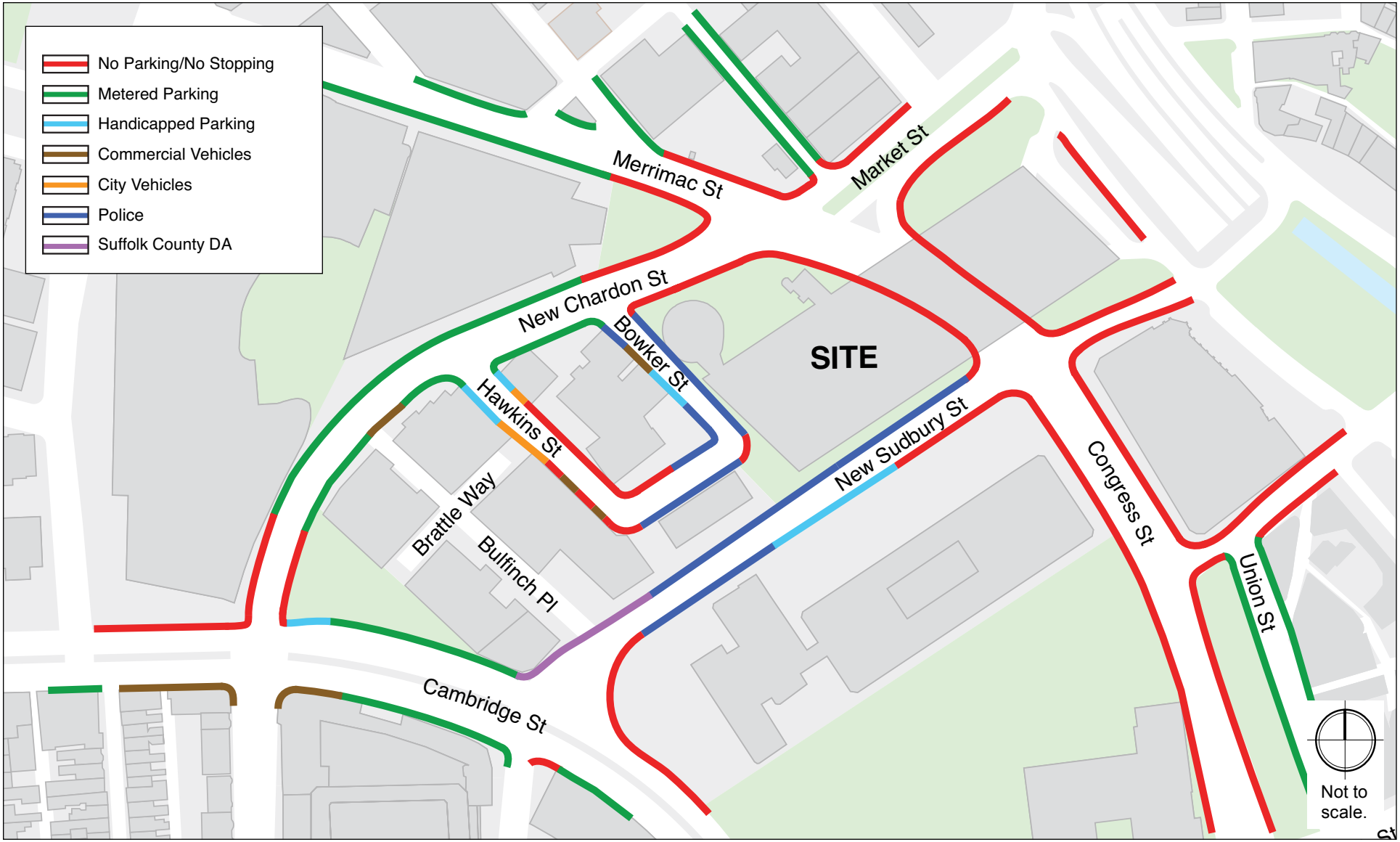


Redevelopment of Government Center Garage
Boston, MA

Figure 3.1

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

Public Transportation in the Study Area

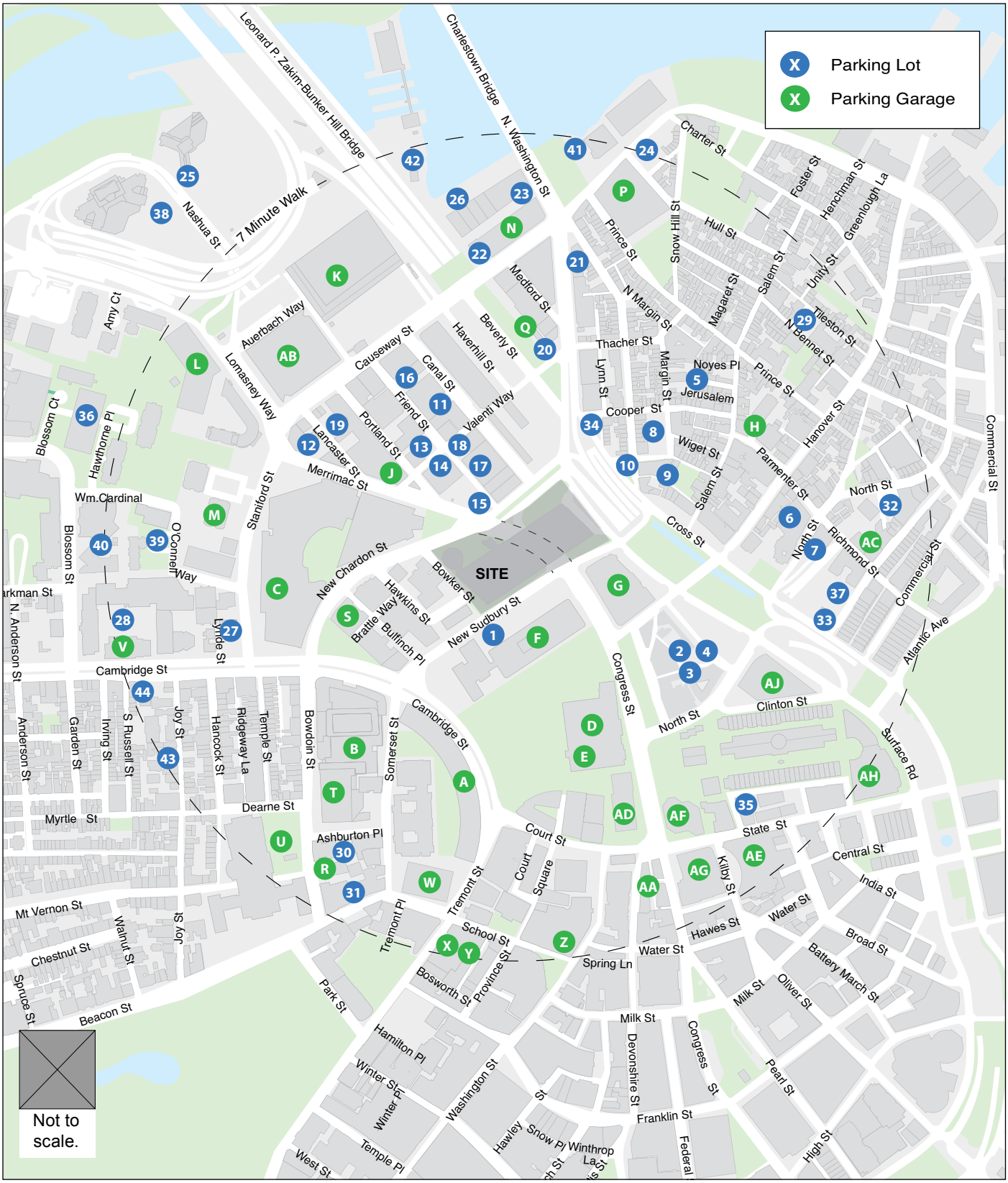


Redevelopment of Government Center Garage
Boston, MA

Figure 3.2

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

On-street
Curbside Inventory



Redevelopment of Government Center Garage
Boston, MA

Figure 3.3

Howard/Stein-Hudson Associates, Inc.
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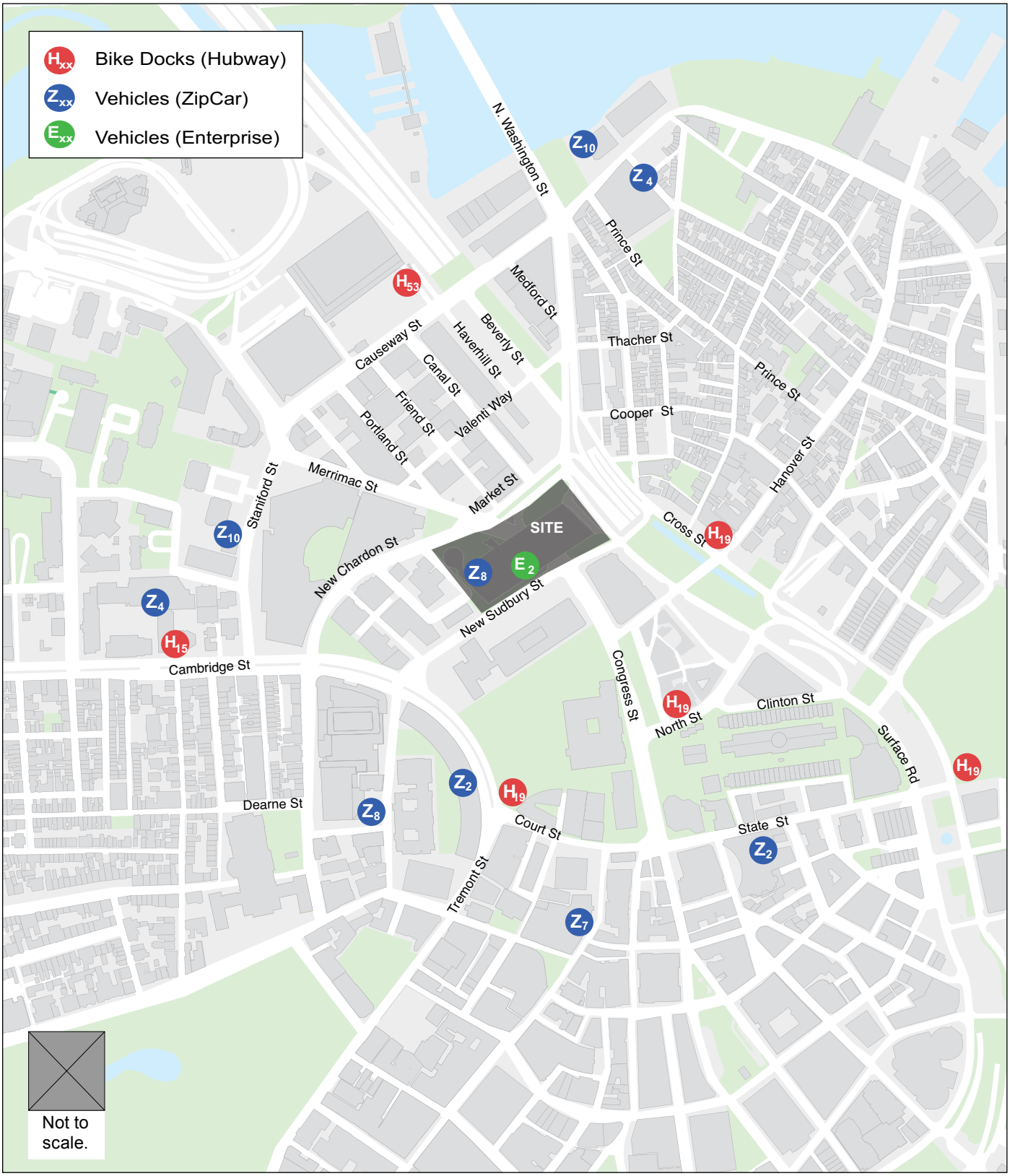
Off-street Parking in the Study Area



Redevelopment of Government Center Garage
Boston, MA

Figure 3.4

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

Car and Bike Sharing Locations

Redevelopment of Government Center Garage
Boston, MA

Figure 3.5

Study Area Intersections

Howard/Stein-Hudson Associates, Inc.
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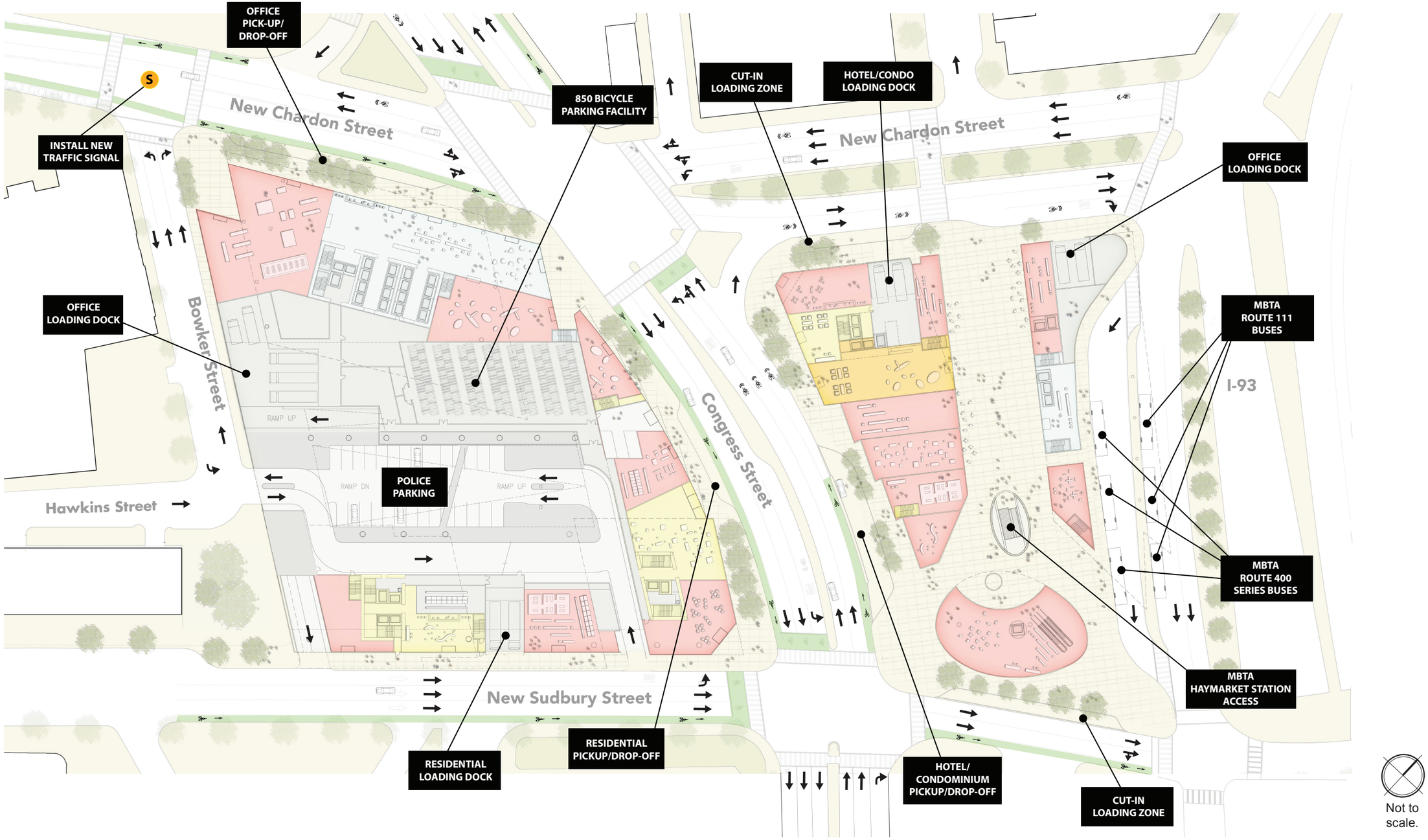

Not to scale.

Redevelopment of Government Center Garage
Boston, MA

Figure 3.6

Howard/Stein-Hudson Associates, Inc.
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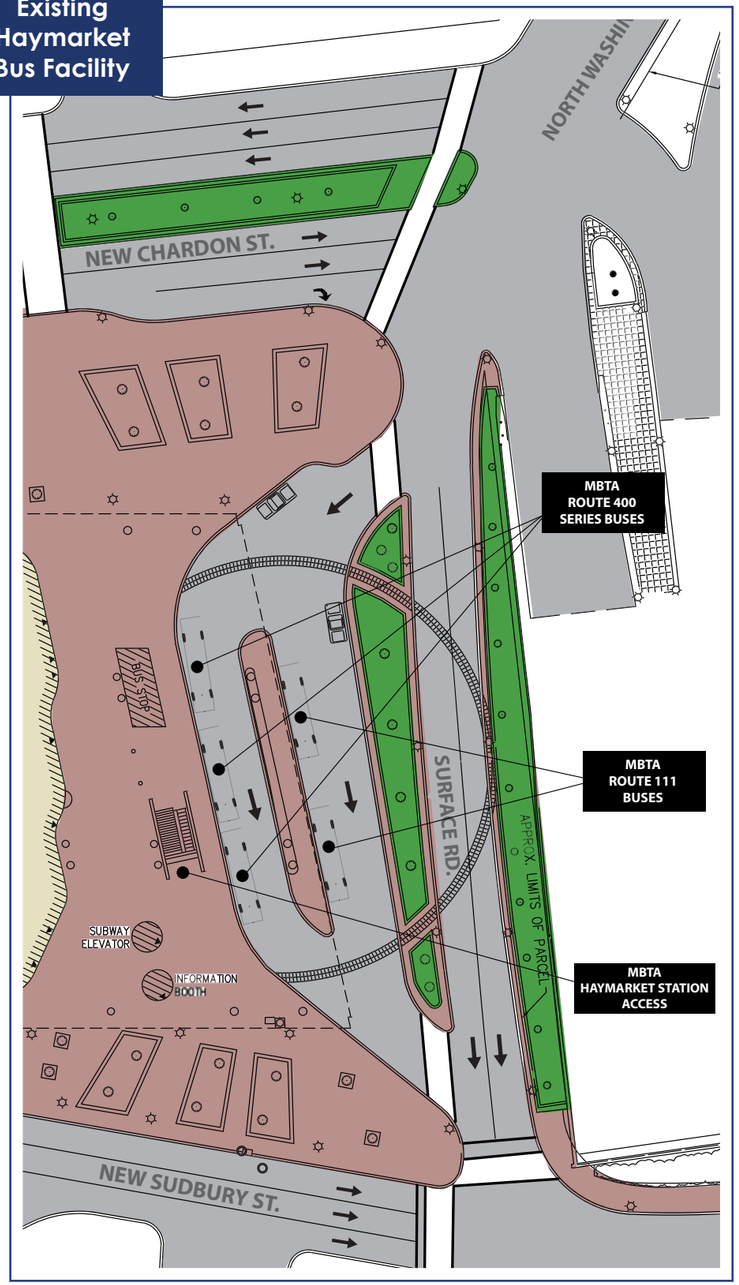
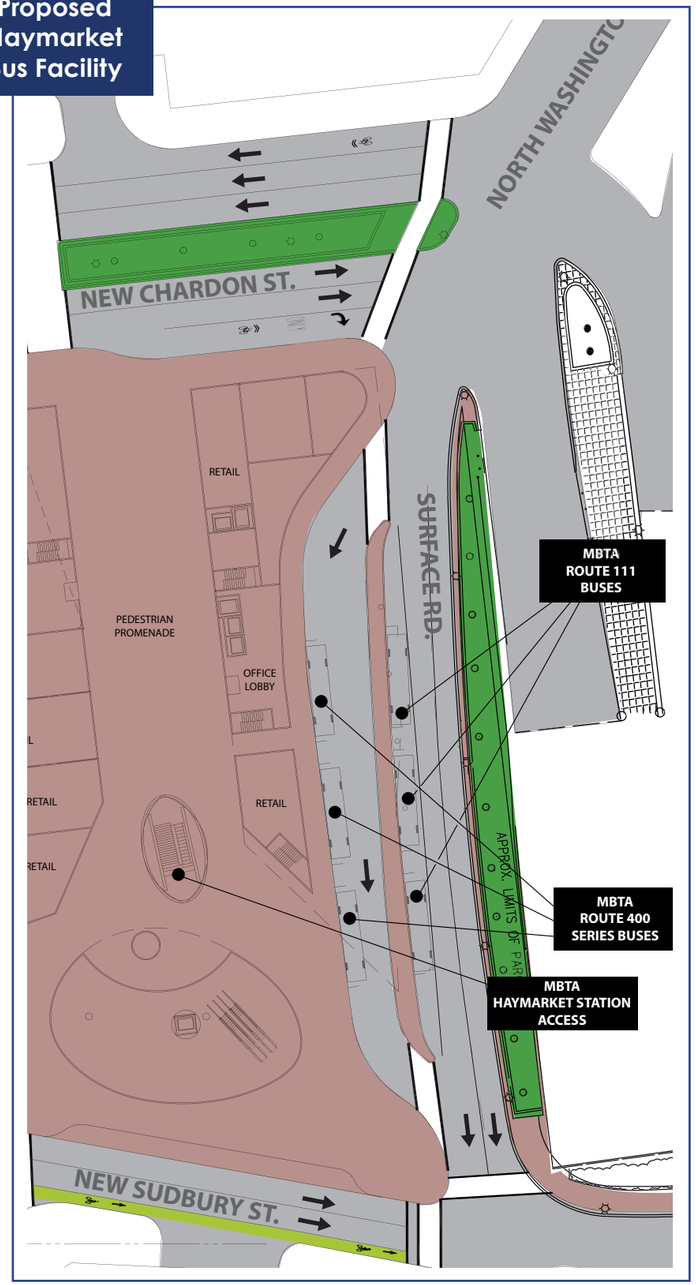
Traffic Access and Circulation Plan

Existing Haymarket Bus Facility



Proposed Haymarket Bus Facility



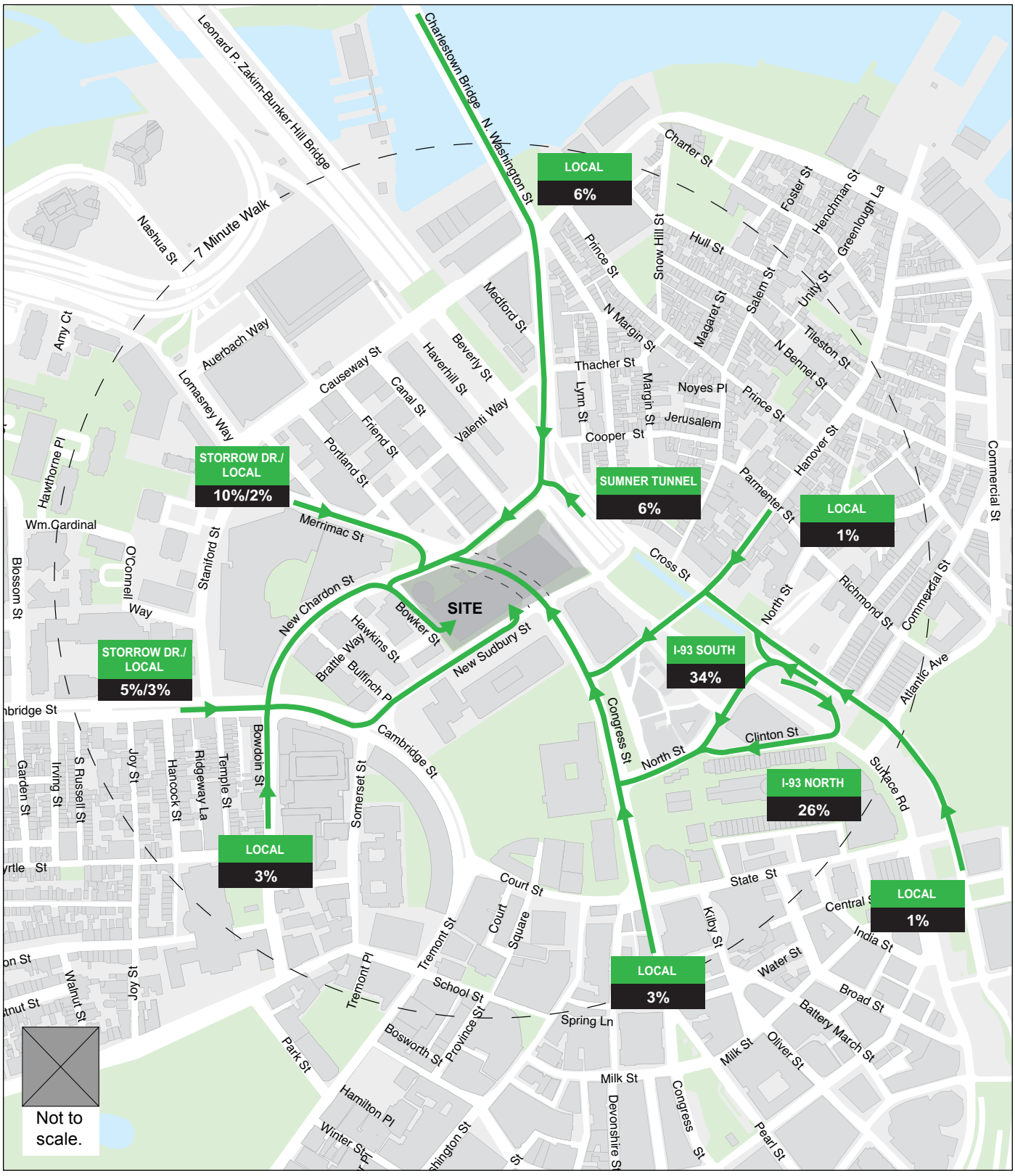
Not to scale.

Redevelopment of Government Center Garage
Boston, MA

Figure 3.7

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

Comparison of Existing and Proposed Haymarket Station Bus Facility

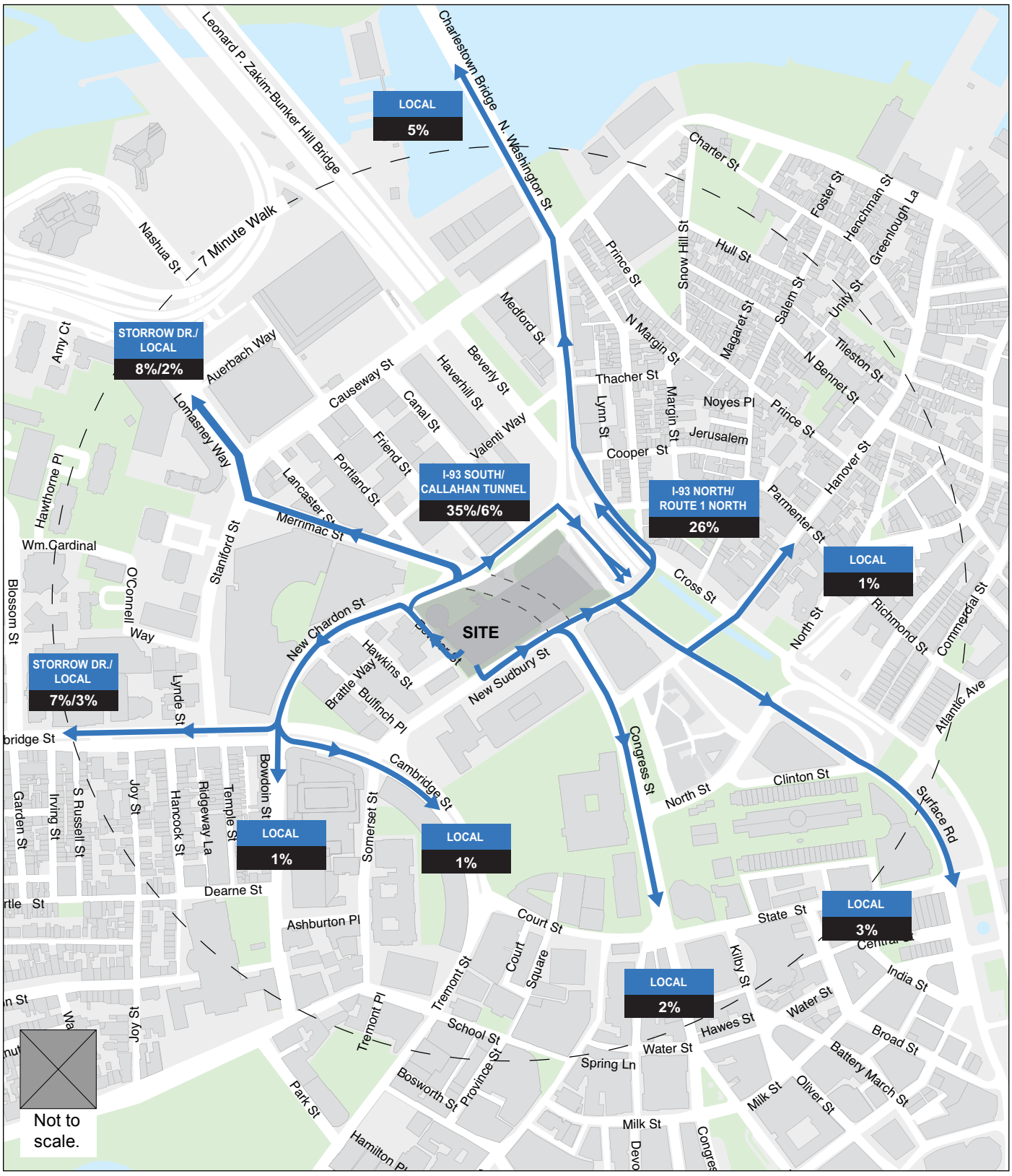


Redevelopment of Government Center Garage
Boston, MA

Figure 3.8

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

Entering Vehicle Trip Distribution



Redevelopment of Government Center Garage
Boston, MA

Figure 3.9

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

Exiting Vehicle
Trip Distribution

4

Environmental Protection

4.1 Introduction

The overall goal of the Project is to develop the Project Site with a variety of new uses while avoiding or minimizing potential adverse environmental and community impacts to the greatest extent feasible. Impacts will be mitigated by the substantial community benefits redevelopment will bring to the community, including the realization of a significant component of the City's planning goals for Government Center and surrounding area. This chapter discusses the anticipated potential environmental impacts as a result of the Project, in accordance with Article 80 of the Zoning Code, where applicable. This chapter assesses potential Project-related impacts in the following categories:

- Wind (qualitative)
- Shadow
- Solar Glare (qualitative)
- Water Quality
- Flood Hazard Zones
- Solid and Hazardous Waste
- Groundwater/Geotechnical
- Green Building/Sustainability

This chapter also outlines the proposed environmental analyses to be provided later as individual Project Components are designed in more detail and submitted for BRA review and approval. These documents will include more specific measures intended to mitigate, limit, or minimize impacts, where appropriate, as required by local, state, and federal regulation. These categories are as follows:

- Daylight
- Air Quality
- Noise
- Temporary Construction Impacts

4.2 Wind

A qualitative assessment was conducted to estimate the pedestrian wind conditions around the Project (by phase) compared to the existing and proposed surroundings. Three significant wind directions were simulated in this assessment and the resulting wind conditions predicted. Where required, mitigation concepts have been recommended.

■

4.2.1 Methodology

Wind flows around the Project and its surroundings were simulated using Virtualwind™, which is a proprietary software developed by RWDI for the qualitative assessment of pedestrian wind conditions. The prevailing winds from the west-northwest, northeast and southwest were simulated for the existing site with the full build-out of the Project. The architectural model of the Project provided sufficient massing details that would affect wind flows in the area. Landscaping was not included in the computer model, either at grade or on the podium. Figure 4.1 identifies the potential wind sensor locations for the future wind tunnel assessment.

4.2.1.1 Pedestrian Wind Comfort Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 miles per hour (mph) should not be exceeded more than one percent of the time. The second set of criteria used by the BRA to determine the acceptability of specific location is based on the work of Melbourne. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing or walking. The criteria are expressed in terms of benchmarks for the 1-hour mean wind speed exceeded one percent of the time (i.e., the 99th percentile mean wind speed) and are presented in Table 4-1.

Table 4-1
Boston Redevelopment Authority Mean Wind Criteria*

Melbourne Category	Description	Criteria*
1. Comfortable for Sitting	Recommended for outdoor cafes and amenities that promote sitting.	≤12 miles per hour
2. Comfortable for Standing	Appropriate at major building entrances, bus stops or other areas where people may want to linger but not necessarily sit for extended periods of time.	>12 and ≤15 miles per hour
3. Comfortable for Walking	Appropriate from sidewalks, plazas, parks where people are more likely to be active and receptive to some wind	>15 and ≤19 miles per hour

Melbourne Category	Description	Criteria*
	activity.	
4. Uncomfortable for Walking	Considered a nuisance for some activities, but can be acceptable, depending upon the season and use of an area.	>19 and ≤27 miles per hour
5. Dangerous	Wind speeds can adversely affect a pedestrian's balance and footing.	> 27 miles per hour

Source: Boston Redevelopment Authority
* Applicable to the hourly mean wind speed exceeded one percent of the time.

The wind climate found in a typical urbanized area in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BRA effective gust velocity criterion of 31 mph. However, without any mitigation measures; the general wind climate in Boston can be uncomfortable for more passive activities such as sitting.

■

4.2.2 Preliminary Wind Impacts

Based on the computer model results, most of the existing site is comfortable for walking. Existing uncomfortable wind activity occurs at the southwest and northeast corners of the building, due to site exposure and/or adjacent tall buildings.

Based on the qualitative assessment, the Proponent and the design team are aware of the potential for high wind activity and/or channeling wind flows around and/or through the Project Site. A key goal is to continue to assess potential wind impacts in order to mitigate though design, with special attention to the East Parcel public plaza in order to provide a comfortable public space. Vertical wind control measures, such as wind screens can be used to slow horizontal flows. Additionally, canopies around building corners can help redirect downwashing flow. Alternatively, arcades and colonnades can be considered.

4.3 Shadow

A preliminary shadow impact assessment was conducted for the Project. It should be noted that the architecture will be refined and will likely change as project design progresses; therefore, the results of this shadow analysis must be considered as preliminary and approximate.

■

4.3.1 Methodology

The shadow study has been prepared using methodologies consistent with accepted practices for such studies completed under Article 80B review. The shadow analysis provides a comparison of the No-Build and Build Conditions. This is accomplished by using a three-dimensional model of the project area using data provided

by the BRA, updated to include nearby foreseeable projects. The analysis is based on the BRA's 3D massing model for the project area neighborhood and includes planned and currently approved projects. The study was completed using standard sun altitude and azimuth data for each study date estimated to occur at 42°20'38"N latitude and 71°6'7"W longitude. Shadows cast by the Project's new buildings have been plotted for the equinoxes and solstices at 9:00 am, 12:00 noon, 3:00 pm, and at 6:00 pm on the Summer Solstice. These shadows are compared to shadows from all existing buildings and permitted projects (shown in grey) at the same times to create thirteen illustrations of net new shadow (shown in red) on Figures 4.2 through 4.5.

■

4.3.2 Preliminary Shadow Impacts

The Project, like any new building development in Boston, will cast shadow on areas to its west, northwest, north, northeast and east. Both new shadow and new sunlight access have been studied for each of the four phases of development, and each phase is compared to the phase before it. The preliminary assessment based on the massing for the Project indicates impacts will generally be to streets, rooftops and sidewalks with little impact on public open spaces. Unusual, however, for new development in Boston, the Project will, starting in Phase 3, provide periods of sunlight on streets now covered or shaded by the existing garage structure throughout the year. Because the eastern half of the Garage will be removed and replaced with three smaller buildings and a public open space, shadow is actually eliminated on parts of Congress Street and the East Parcel.

These areas of new sunlight are illustrated in a gold color on Figures 4.2 through 4.5; indicating areas currently in shadow which will not be in shadow following the Project's completion. Areas that will benefit from new sunlight are generally within the immediate surroundings of the Project Site, in particular the newly opened portion of Congress Street, the East Parcel open space, and the Friend Street corridor in the Bulfinch Triangle.

4.3.2.1 Phase 1 (WP-B1) Shadows

Phase 1 includes an apartment building on New Sudbury Street (WP-B1). On the equinoxes, the apartment building will cast new shadow on New Sudbury Street in the morning and early afternoon and on the southbound I-93 on-ramps in the afternoon (Figures 4.2a and 4.2c). On early summer mornings, the apartment building will add a small amount of incremental shadow to the north end of Bowker Street, but by noon and through the afternoon the shade will fall mostly on the existing garage roof. In the late afternoon, new shadow will fall across part of Congress Street and onto the roof of the MBTA Haymarket bus facility.

Winter shadows, cast by the sun low in the sky, are very long everywhere, including under the existing condition (Figure 4.2d). Given this environment, net new shadow from the first phase apartment building is fairly minimal falling on Friend Street for about an hour in mid-morning and on Merrimac Street outside the courthouse for a short period mid-day. Other than these times it appears that added shadow in winter will primarily fall on rooftops.

4.3.2.2 Phase 2 (WP-B2) Shadows

During the summer, the office building on New Chardon Street (WP-B2) will add new morning shadow in the courtyard of the state office building; its summer shadow at noon will fall on the plaza in front of the Brooke Courthouse, but its afternoon shadow will fall largely on the garage roof, with a short period of evening shadow extending across the Parcel 7 Garage to the Greenway (Figure 4.3b). During the spring and fall mornings, as shown on Figures 4.3a and 4.3c, respectively, new shadow will occur along Merrimac Street. In the late afternoon, shadows will extend to the edge of the North End reaching across the I-93 ramp parcels to add shadows for a short period (an hour or less) to the streets and an undeveloped parcel where Washington Street meets New Sudbury to the east of the ramp parcel.

During winter months a few minutes of additional shadow will fall on Portland Street in the morning. The mid-day shadow will fall across the future "One Canal Street" development on Bulfinch Triangle parcels 2ABC and afternoon shadow will fall on North End rooftops and on a very small portion of the harbor across Atlantic Avenue (Figure 4.3d). However, in general, streets will be shaded by existing North End buildings during winter afternoons and very little net new shadow will fall on public places.

4.3.2.3 Phase 3A-B (Partial Garage Demolition & WP-B3) Shadows

Phase 3A includes demolition of the eastern portion of the Garage in preparation for the phase four construction as well as construction of an apartment building on the corner of Congress and New Sudbury Streets (WP-B3), or Phase 3B. During the equinoxes, the new building will cast shadow largely on areas currently shaded by the Garage (shown in a grey color) resulting in very little net new shadow (Figures 4.4a and 4.4c). Other areas currently shaded by the Garage, but opened to sunlight as a result of removing part of the garage structure are indicated as net new sunlight by an gold color in Figure 4.4.

Through the summer, except for the late afternoon/early evening when new shadow will fall across Congress Street and the Parcel 7 Garage, new shadows from this phase will generally fall in areas currently shaded by the existing garage structure (Figure 4.4b). Unlike the current condition where Congress Street passes under the Garage and receives neither direct sunlight nor skylight, any portion of this public way shaded by the new buildings will actually be quite bright, illuminated by abundant daylight every day and long into the summer evenings. Apart from a very small increment of new shadow midday on Canal Street new winter shadow from this phase appears to primarily fall on roof tops (Figure 4.4d).

4.3.2.4 Phase 4A-C (East Parcel Buildings) Shadows

Phase 4 includes the completion of the Project with the construction of three buildings on the East Parcel (EP-B1, EP-B2, and EP-B3) and the new public plaza. Figure 4.5 shows the net new shadow for Phase 4 along with the permanent new sunlight resulting from the demolition and removal of the eastern half of the Garage. On the equinoxes, modest areas of new shadow will occur on Canal Street at New Sudbury and for a brief period in the late afternoon on the Surface Road/I-93 Ramp Parcel (Figures 4.5a and 4.5c). This will be balanced by permanent new sunlight on Congress Street through most of the morning. Also, although Congress Street

between New Chardon and New Sudbury Streets will be in the shade of the other Project Components, it will be open to bright skylight.

During the summer, the East Parcel buildings will cast small increments of new shadow on Merrimac Street in the early morning, New Sudbury in midday and the ramp parcel in late afternoon and evening (Figure 4.5b). The new public plaza will receive direct sun in some parts throughout the days from February through October. Net additional shadow in winter from Phase 4 will fall across small areas of New Sudbury, Canal, and Washington Streets (Figure 4.5d). Congress Street, where the Garage has been removed, will receive direct sun in the morning throughout the year.

4.4 Solar Glare

The proposed buildings will be designed to minimize solar glare that could have an adverse safety impact on traffic near the Project and to minimize solar heat gain in nearby buildings. The exterior building materials have not yet been selected; however it is generally unlikely that highly reflective glass will be employed in any of the building facades. Specific solar glare and heat gain impacts will be studied under Article 80B, Large Project Review as Project Components are proposed and the exterior design and potential façade details are further defined.

■

4.4.1 Solar Glare Impacts

Glare occurs when the intensity of the Sun's light, reflected into a driver's view, is distractive; but it is a problem then only if the glare is within a field 30 degrees left or right of the line of sight, and lower than 30 degrees above the horizontal. To assess this potential the Project's exterior geometry will be analyzed from critical viewpoints to see if there is the potential for substantial, frequently recurring glare. Horizontal angles of the building facades and building heights will be used to "map" the areas of the skydome reflected into the drivers' view. A table of sun angles and times will then be used to establish the times when potentially distractive glare might occur. Glare will be mitigated by the use of non-reflective materials in the building facades.

Critical viewpoints will be those of drivers in traffic approaching the Project Site from the south along Congress Street, from the northwest along Merrimac Street, from the northeast along Washington Street, and from the West on both New Chardon and New Sudbury Streets. The tops of the taller buildings and the east façade of the office building on the East Parcel will be visible to drivers coming north along Atlantic Avenue and by drivers exiting at Government Center from I-93 northbound and turning left into North Street.

■

4.4.2 Solar Heat Gain Impacts

Summer heat gain at the facades of nearby buildings can be caused by the selective reflection of infrared frequencies of the Sun's light by a building's glazing Heat gain is most associated with south and southwest facing facades and is mitigated by reducing the area of vision glass. The residential buildings forming the south face of the Project will likely not be all-glass facades, thus substantially reducing the potential for heat

gain at nearby facades. The south face of the office building will reflect onto the roof of the Garage. The west face will not reflect into any nearby tall buildings. The broad face of the east office building faces east and is not likely to cause any undue heat gain because there are no nearby buildings.

4.5 Water Quality

The Project is not expected to result in the introduction of any additional peak flows, pollutants or sediments that would impact the receiving waters of the BWSC's stormwater drainage system. The Project is located in a densely developed area consisting primarily of impervious rooftops and paved surfaces. The Boston Water and Sewer Commission (BWSC) owns and maintains an extensive system of catch basins, manholes, and drain pipes in the area immediately adjacent to the Project Site and has recently constructed major improvements to its system in the nearby Bulfinch Triangle.

The Project will reduce stormwater flows and improve stormwater quality through the use of stormwater control measures, as follows:

- *Green Roofs* – the Proponent is considering and evaluating the application of green roofs on roof areas, where appropriate.
- *Rainwater Harvesting* – the Proponent is considering harvesting roof runoff for use in mechanical make-up water.
- *Groundwater Recharge* - the Proponent will continue to evaluate the potential for groundwater recharge, particularly on the East Parcel where the Garage will be demolished.

In addition to these measures, throughout project design, the Proponent will explore ground-level stormwater management control measures, such as tree pit filters and vegetated planter areas. All proposed stormwater management controls will be established in compliance with BWSC standards. Refer to Chapter 5, *Infrastructure* for further details.

4.6 Flood Hazard Zones

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the Project Site (City of Boston, Map Number 25025C0081G). This map shows that the Project Site is located in Zone C, Area of Minimal Flooding. The Project Site does not contain any wetlands. Section 4.9.5 below considers potential effects of extensive flooding from sea level rise and storm surges in the future.

4.7 Solid and Hazardous Waste

There are no known hazardous materials at the Project Site. In accordance with the LEED Prerequisite for Materials and Resources (Storage and Collection of Recyclables), the building will include recycling facilities/space for all uses. Each residential and office floor as well as the Garage will have access to facilities

and space for collection of recyclable materials. The retail tenants will utilize disposal services that recycle waste off-site.

4.8 Groundwater and Geotechnical Impact

■

4.8.1 Existing Subsurface Conditions

Beneath the Project Site's paved surface there is a layer of granular fill. The fill deposit is underlain by a discontinuous organic deposit across the east end of the Site. Across the west end of the Site, the granular fill deposit is directly underlain by a marine deposit, which also extends below the organic deposit across the east portion of the Site. The marine deposit overlies a discontinuous thickness of glacial till, which is plastered directly on the bedrock surface.

Existing groundwater levels across the Project Site range from about five (5) to twenty five (25) feet below the existing ground surface depending on one's location within the site, or Elevation + 15 to Elevation + 5 above the Boston baseline sea level. The groundwater level is anticipated to be perched on the surface of the organic and marine deposits and will be influenced by leakage into and out of adjacent utility lines, as well as by environmental factors such as periods of high precipitation or drought. The Project Site is located outside the limits of the Groundwater Conservation Overlay District (GCOD) as defined in Article 32 of the City of Boston Zoning Code.[1]

■

4.8.2 Proposed Subsurface Conditions

As currently planned, the Project will include only relatively minor disturbance to soil and groundwater. The Project does not include large areas of subsurface parking and no other large or deep spaces are planned below grade, so excavations will be generally limited to deep foundations driven into the soil. Certain limited areas of shallow excavation are described below.

An analysis of existing sub-soil conditions, groundwater levels, the amount and method of excavation, potential for ground movement and settlement during excavation as well as the potential impact on adjacent buildings and utilities will be provided as part of the Article 80B, Large Project Review. A description of measures to ensure that groundwater levels are maintained during and after construction will also be provided for each Project Component.

No major subsurface excavation is anticipated which would disturb these subsurface conditions. There will be minor excavation within the center bay of the Garage during the Phase 1. This is necessitated by work in the garage itself to enable construction of the first apartment building. The excavation itself is not expected to reach groundwater, and the resulting construction will be waterproofed and designed to resist hydrostatic uplift.

▼

1 This zoning article sets forth guidelines for promoting the infiltration of runoff from impervious site areas within the district.

Phase 2, construction of the office building (WP-B2), will have a single underground level for utilities and elevator pits. As with the garage excavation ground water levels are well below the proposed extent of excavation. No permanent dewatering is anticipated.

The buildings of Phases 3 and 4 may also have utility basements but no deep excavations. These will be located in the areas where groundwater is higher; therefore some local temporary dewatering during excavation is anticipated. To the extent practical, the groundwater will be recharged outside the area of excavation. When this is not readily achievable, the extracted water will be treated per MWRA and BWSC requirements and discharged to storm drains.

Foundations for all buildings are expected to be drilled or driven piles, caissons, or mini-piles, all installed from the surface. Also, basements will be fully waterproofed and designed to resist hydrostatic uplift without permanent dewatering.

4.9 Sustainable Design/Green Building

The Project is inherently sustainable as it aims to utilize land efficiently through redevelopment of an obsolete above-grade parking garage site with a dense mixed-use development, promote the use of alternative modes of transportation, encourage pedestrian activity, promote the use of local materials, provide for a high-quality indoor environment for users, and reduce environmental impacts both locally and globally. The Proponent is committed to continued exploration of practical ideas for creating a sustainable development that contributes to urban resilience in Boston. Project design will be goal-oriented generally focused on reduced environmental impact and improved occupant comfort as well as contribution to the community. The Proponent is committed to incorporating many key aspects of sustainability and high performance building design, where applicable and feasible.

The Project as a whole will meet Article 37, Green Buildings of the Zoning Code. The Proponent has set an overall design goal of achieving LEED certification through the GBCI for the Project Components (a targeting a Gold rating under LEED-Core and Shell (CS) for the office components and Silver rating under LEED-New Construction (NC) for residential components). In addition, the Project will also achieve one of the four Boston Green Building Credits (Modern Mobility) and will explore compliance with Groundwater Recharge (although the Project is not subject to Article 32, Groundwater Conservation Overlay District). Generally, it is the Proponent's intent to lease and operate the buildings in a sustainable manner.

In order to incorporate sustainability into the Project, early on in the design process the Proponent brought on a sustainability consultant, which led the design team in a comprehensive sustainability workshop. The workshop's primary focus was to develop a sustainability vision and to set priorities for the Project. The workshop sought to define the long-term view for the Project as it will be implemented over a span of time. More importantly, the workshop focused on creating a positive contribution to Boston's fabric for decades to come. The following key drivers, or goals, emerged from the workshop:

1. Positive contribution to the community and built environment
2. Model for transit oriented development

3. Ability to cope with future climate change
4. Energy Efficiency
5. Resource Efficiency (i.e. water, waste and materials)
6. Sustainable Operations

This list of goals is the framework for the further development of specific targets, goals, and strategies in the form of a sustainability plan for the Project. The sustainability plan will be used by the design team as each of the Project Components are advanced through the design process, construction, and into operations. The following sections describe each framework element, including specific elements to be evaluated further.

■

4.9.1 Sustainability Goal #1: Positive Contribution to the Community and Built Environment

Key benefits of the Project are the revitalization of an underutilized urban site, removal of an unsightly barrier to the public realm, and giving back daylight and open space to the public as well as to introduce a mix of vibrant 18/7 uses, including new housing. As described in detail in Chapter 2, *Urban Design*, through the proposed East Parcel public plaza the Project will re-organize/re-configure and enhance the connection between the Rose F. Kennedy Greenway and the Bulfinch Triangle—a connection heavily dominated by buses, automobiles, and interstate highway access.

A major goal of the sustainability plan is to create comfortable (i.e., temperature-wise and acoustically) and vibrant spaces that the public and building occupants want to utilize. The following objectives have been identified in order to meet Sustainability Goal #1:

- Consider maintaining radiant/uniform temperatures, reducing wind, and gaining sun exposure.
- Reduce heat island effect/create a positive and comfortable microclimate through the integration of greenery (i.e., tree canopy cover and at grade multi-tiered planting)
- Address stormwater runoff with innovative Low-Impact Design elements, such as rain gardens
- Consider potential acoustical and air quality impacts through the re-design of the MBTA Haymarket bus facility, in cooperation with the MBTA
- Consider wind and vehicular traffic noise in the rooftop gardens.

Figure 4.6 illustrates the potential wind conditions to be considered for user comfort.

■

4.9.2 Sustainability Goal #2: Efficient Transportation – Be a Model for TOD

The Project is a model for transit-oriented development, or TOD, since it reduces the need for single-occupancy vehicle use by proposing density in an area accessible by pedestrians and supported by an extensive public transit network. The MBTA Haymarket Station, which provides access to two MBTA subway lines, the Orange and Green Lines, as well as fourteen MBTA bus routes is within the Project Site.

Additionally, the Project Site is within walking distance (less than a half mile) of North Station, providing access to MBTA commuter rail service and the AMTRAK Downeaster service. Three MBTA Blue Line subway stations are also within walking distance of the Project Site. The MBTA Blue Line also provides direct public transportation access to Logan International Airport. Figure 4.7 illustrates the extensive alternative transportation infrastructure that serves the Project Site.

As described more fully in Chapter 2, *Urban Design*, the Project will implement Boston's Complete Streets Guidelines to the surrounding public streets. The Complete Streets approach "puts pedestrians, bicyclists and transit users on equal footing with motor-vehicle drivers" and promotes healthy living by providing alternative transportation infrastructure (i.e., sufficient sidewalks and bicycle lanes). The objective is to ensure Boston's streets are: (i) multi-modal (i.e., pedestrians, people with disabilities, bicyclists, transit users, motor vehicle drivers); (ii) green (i.e., street trees with plants and soils to collect runoff to reduce flooding and pollution as well as environmentally-sensitive materials); and (iii) smart (i.e., intelligent signals, smart meters, Electric Vehicle (EV) charging stations, car and bicycle-sharing, way-finding and social networks for greater system efficiencies and user convenience).

In keeping with the nature of a TOD, the portion of the existing garage to be demolished represents 700 unneeded commercial parking spaces that will be removed from commercial use discouraging single-occupancy vehicle use. These parking spaces will be put back into the city's parking freeze bank to be allowed for construction elsewhere by others in areas underserved by commercial parking.

The following objectives have been identified in order to meet Sustainability Goal #2:

- Reconfigure adjacent streets around the Project Site to reflect and exemplify Boston's Complete Street Guidelines (i.e., add bicycle lanes and pedestrian cross walks and sidewalks).
- Continue to provide for car share services (both Zipcar and Enterprise car and van share services will continue to operate in a portion of the Garage).
- Provide new bicycle facilities, including the installation of a new Hubway bike share station on the East Parcel and an 850-space secure bicycle parking facility on the West Parcel for employees and residents.
- Provide EV charging stations and priority parking for electric and hybrid vehicles.
- Consider/evaluate ways to encourage alternative transportation through TDM measures (e.g., complimentary 1 year memberships to Hubway and/or Zipcar for residents).
- Encourage the use of the extensive public transit system through technology (e.g., real-time tracking displays of 'live' subway schedules may be installed in the main lobbies of the proposed buildings).

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4.9.3 Sustainability Goal #3: Energy Efficiency

As part of the sustainability plan, the Proponent and design team have started to develop an energy strategy that focuses on demand reduction, systems efficiency and energy recovery with the intent of not only meeting but exceeding the minimum energy performance required by the Stretch Energy Code (the "Energy Conservation Plan"). Energy modeling will be used throughout the design process to test the proposed features and systems to optimize the design for energy efficiency. Energy modeling allows projects to test different options for their impact on overall energy use.

Specific energy reduction targets will be established early in the design process, based on benchmarking data from tools, such as EPA's Target Finder and preliminary energy modeling results. This will provide the Proponent and design team with the necessary information to establish achievable energy targets for the Project. Further, it is the intent of the Proponent to support and comply with the recently adopted Building Energy Reporting and Disclosure Ordinance.[2] Refer to Figure 4.8 for a graphic illustration of the Energy Conservation Plan. The following sections describe the key objectives to achieving Sustainability Goal #3.

4.9.3.1 Demand Reduction

The first step in designing energy efficient buildings is to optimize passive design in order to reduce a buildings' fundamental demand for energy. This step includes assessing building massing, orientation, potential for harvesting daylight, and solar access. The Project has conducted early solar analysis to better understand inter-block shading effects, and solar exposure on each facade throughout the day and year (Figure 4.9). This analysis has helped to develop a preliminary façade strategy that responds to solar orientation to lower solar heat gains, to allow daylight into spaces and to lower both peak and on-going demands for energy. A summary of the analysis is below.

North/Northeast
These facades have solar access for approximately nine months of the year from February to November each morning, from sunrise to 11 AM. These facades experience low sun altitude angles. This is the coolest time of the day.

South/Southeast
These facades have solar access throughout the year from sunrise until mid-afternoon; 2pm (summer) to 4pm (winter). These facades experience the highest sun altitude angles at mid-day as well as low altitude angles in the afternoon. The solar access in this direction includes the hottest part of the day. Interblock shading from the two apartment buildings (WP-B1 and WP-B3) will benefit the office building (WP-B2). The lower half of the office floors will be shaded by the taller residential building (WP-B1) in varying degrees throughout the year. This is most beneficial in the summer.

South/Southwest
These facades have solar access throughout the year from mid-day, 12pm (summer) and 11am (winter) until sunset. These facades experience low sun altitude angles in the late afternoon and early summer evenings. The solar access occurs during the hottest time of the day making these façades the highest priority to mitigate solar heat gains. Only the apartment building (WP-B3) benefits from interblock shading from the office building (WP-B2).

[2] On February 22, 2013, Mayor Thomas M. Menino filed the Building Energy Reporting and Disclosure Ordinance with the Boston City Council. As a component of the City's Climate Action Plan to meet the Mayor's greenhouse gas reduction goal of 25 percent by 2020, this Ordinance requires all large and medium sized buildings to report their annual energy and water use to the City of Boston. The Ordinance, which passed on May 8, 2013 with 9-4 City Council vote, is intended to encourage building owners to participate in local utility energy efficiency programs and educate tenants on building performance.

North/Northwest
These facades have the least solar access throughout the year; only in the summer after 5pm. In most instances, these facades do not receive any significant direct solar exposure. When there is solar access, the facades will experience the low altitude angles. The apartment buildings (WP-B1 and WP-B3) receive interblock shading from the office building (WP-B2).

The Proponent will further evaluate demand reduction strategies for each Project Component during the Article 80B, Large Project Review. Strategies may include the following:

- Design building facades to respond to their specific orientation to manage solar heat gains. Window to wall ratios (WWRs) will be studied to balance daylight, views, aesthetics and solar heat gains and orientation specific solutions developed.
- All facades will implement materials with high thermal performance for both glazing and opaque wall areas.

4.9.3.2 Daylighting Strategies

Another key element of demand reduction is to maximize opportunities for natural daylight to illuminate spaces and subsequently reduce the need for artificial lighting and energy use. Several strategies will be explored with the intent of improving daylight to spaces:

- Enhance daylight in the office spaces (WP-B2 and EP-B2) by designing the office building to maximize daylight penetration into the space.
- Enhance daylight provision at Level 11 of the existing office redevelopment plan (WP-B2) by considering the use of light pipes and/or cutting an internal courtyard at the level 11 roof to bring light into the floor plan.

4.9.3.3 Systems Efficiency and Energy Recovery

After demand reduction strategies have been implemented, the next step towards an energy efficient building is designing the mechanical, electrical and plumbing systems to be efficient and to recover available energy where practical. The design team plans to engage the utility providers to explore opportunities for incentives to help implement energy efficient systems and energy recovery equipment which help to reduce peak loads and overall demands.

Given the density, mix of uses and complementary energy profile associated with those uses, opportunities for energy sharing at the plant level will be explored, including potential for combined heat and power (CHP). Life cycle cost analysis will be a critical part of this study. Energy sharing allows major plant systems, such as chilled water and/or condensers water loops, to be interlinked. The interlinking would allow the Project to manage individual building peak loads more efficiently and reduce the overall sizing of plant equipment as compared with plant systems sized on an individual building basis. This approach also allows the Project to develop as planned in phases while not requiring the space and initial capital investment for a more traditional central plant.

Each building type presents different opportunities for energy efficiency. The office building (WP-B2) will explore the following systems and technologies:

- Active Chilled Beam systems
- AHUs with low pressure fans and variable flow (water and air) in conjunction with active chilled beams
- Economizers
- Demand Controlled Ventilation
- Energy Recovery Wheel
- NEMA premium efficiency motors
- Variable Frequency Drives (VFDs)
- Daylight (i.e. photo-sensors) and dimmable lighting controls within the daylight zone
- Occupancy sensors throughout
- Energy efficient lighting

The apartment buildings (WP-B1 and WP-B3) will utilize heat pumps to provide heating and cooling to the units. Energy recovery wheels could also be implemented as well as energy efficient equipment and appliances will be utilized (i.e., Energy Star appliances). Designing the units for effective natural ventilation will be a focus for the design team so that occupants may choose not to use HVAC systems for portions of the year, which could result in significant energy reductions.

4.9.3.4 Renewable Energy Systems

The Proponent and design team will explore the use of Transpired Solar Collectors at air intakes to preheat fresh air and, therefore, reduce the need for energy to heat air for the office buildings (WP-B2 and EP-B2). When preheating fresh air is not required (i.e., in the summer, this system is bypassed).

The roof of the East Parcel office building (EP-B2) has been identified as the most viable area for the incorporation of solar panels. Further analysis will be conducted to determine the viability for implementation of one or a combination of systems. With this building planned in the final phase of the Project and given the expectation that solar panels will increase efficiency with lower costs in the future, the viability of such a system will only increase with time. The approach would be to use the electricity provided by these rooftop solar panel systems to offset the energy use associated with the public plaza (i.e. pedestrian area lighting), to make this a zero net energy (ZNE) exterior space.

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4.9.4 Sustainability Goal #4: Resource Efficiency

Sustainability Goal #4 aims to reduce the amount of resources used to construct and operate the Project Components. The following sections describe the key objectives to achieving Sustainability Goal #4.

4.9.4.1 Water Conservation

At the site level, several strategies for water efficiency may be implemented to reduce the need for potable water and reduce stormwater generation. These include:

- Rainwater collection and re-use will be explored. The collected water is anticipated to be used for cooling tower make-up water.
- Extensive and intensive green and landscape roof areas are planned, including green roof systems which are proven to reduce stormwater generation and peak runoff rates, reduce heat island effects, increase aesthetics and biodiversity and increase thermal and acoustic performance.
- Native and adapted plantings in addition to low water demand plantings will be used throughout the landscaped areas to reduce the need for landscape irrigation.

To reduce potable water consumption within the buildings, highly efficient water fixtures that meet and/or exceed Water Sense standards will be utilized. Up to 30 to 40 percent savings in potable water use as compared to minimum requirements are achievable through efficient fixtures. An even higher water savings could be reached with more innovative fixtures, such as EPA Water Sense fixtures. Additionally, residential units will be individually metered such that tenants will pay for their water usage which is shown to reduce consumption. Figure 4.10 illustrates the comprehensive water conservation approach.

4.9.4.2 Materials

A key objective of the Project is maintaining half of the garage structure intact and in use, which results in a significant savings in embodied energy and materials. Keeping half the garage structure significantly reduces the need for raw materials and associated energy to transport new materials and rebuild the Garage in addition to reducing the amount of construction waste created in demolition. Figure 4.11 illustrates the embodied energy saved from the Project.

For the portion of the garage structure to be removed, the Proponent will consider options to reuse the material for other purposes such as aggregates. Within the buildings, materials will be selected that meet the LEED criteria for indoor environmental quality for paints and coatings, adhesives and sealants, flooring systems, furniture and furnishings, and ceiling and wall systems.

4.9.4.3 Waste

Recycling programs and facilities will be implemented by building contractors throughout the Project to reduce the amount of waste that is sent to landfill. Recycling collection will consist of glass, plastics, metals (aluminum and steel), paper, wood and cardboard.

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4.9.5 Sustainability Goal #5: Ability to Cope with Future Climate Change

The Project has started to address climate change impacts and planning for resilience in its early stage planning. Predictions for Boston include one to two feet of sea level rise by 2050 and three to six feet by 2100. Additional climate change issues predicted for Massachusetts per the 2011 Massachusetts Climate Change Adaptation Report, include an increase in extreme weather events, increased precipitation, increase in the number of days with extreme heat (i.e., temperatures greater than 90°F and 100°F) and fewer days of snow yet increased winter precipitation.

The eastern portions of the Project Site have been identified as vulnerable to future sea level rise as well as flooding due to storm surge associated with major weather events. As a response to these risks and vulnerabilities the Project intends to implement measures to make it more resilient to predicted changes. The following are proposed elements which will be explored to mitigate flooding and sea level rise impacts:

- Provide major plant equipment and systems at least one level above the ground-floor or, at minimum, protect them from anticipated levels of street inundation
- Provide air intake and exhaust areas at least one level above ground-floor
- Do not implement areaways to provide ventilation
- Provide green roofs and rain gardens planned throughout the development which will reduce stormwater runoff and reduce peak flow rates which in turn help to reduce the risk of flooding in major rain events

The following are proposed elements which will be explored to mitigate rising temperature impacts:

- Design the residential units for improved natural ventilation to reduce the reliance on mechanical ventilation systems.
- Green roofs, rain gardens and multi-tiered planting planned throughout the development will reduce heat island effects creating a cooler microclimate within the Project Site.
- As part of the energy modeling process, climate files that reflect the predicted increase in temperature can be used to better understand how the buildings and their systems perform under different climate conditions. This understanding can then be taken into account when designing major plant and overall HVAC systems.

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4.9.6 Sustainability Goal #6: Sustainable Operations

The Project will explore metering and display technologies to allow for operational monitoring of energy and water use to encourage ongoing improvement as well as to embrace the City's Building Energy Reporting and Disclosure Ordinance. Each residential unit will have an energy and water meter so that tenants will directly receive those bills. Office and retail tenants will also directly pay for electricity use. Direct payment and control of use has shown to encourage reduction in consumption of energy and water. The Project will also explore opportunities to further meter end uses controlled by the owner to have a better understanding

of the energy profile and therefore be able to identify areas and specific systems for energy conservation measures and ongoing improvement. In addition, real-time displays within the Project Site in public areas will be explored so tenants and visitors alike can have an understanding of resource use where they live and/or work.

Green tenancy lease agreements will also be developed for the office and retail uses to encourage tenants to reduce their environmental impacts and take advantage of sustainability systems and features installed in the base building.

4.10 Daylight

The Project is expected to alter the view of the skydome from the Project Site's adjacent streets and sidewalks. Due to the planning goals for the area (e.g., mixed-use development of higher densities), the Project will have some new skydome impacts where taller buildings are constructed and brought closer to the street edge than the existing garage, which is set back from the street in some places (i.e., New Chardon Street). However, by removing the large portion of the Garage that currently covers Congress Street creating a tunnel effect; the Project will improve the amount of daylight that penetrates through the Project Site. Removal of this portion of the Garage will provide a substantial community benefit in terms of daylight at the Project Site and is consistent with the City's plans for this area. Additionally, by removing the portion of the garage located above the East Parcel, additional daylight will be provided to the East Parcel public plaza.

The proposed mixed-use nature of the Project will increase the foot traffic along the adjacent sidewalks of Congress Street, New Chardon Street and New Sudbury Street, which will be further improved with new public realm improvements. In addition, the new East Parcel public plaza/promenade, open to the sky, will enhance the pedestrian connection from Canal Street to the North End Greenway Parks. The net effect of the Project will be a substantial enhancement of the public realm in this area.

As required by the Section 80B-2(c) of the City of Boston Zoning Code, an analysis of the percentage of skydome obstructed under no build and build conditions with particular focus around the Rose F. Kennedy Greenway will be provided for each Project Component as part of the Article 80B, Large Project Review.

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4.10.1 Methodology

The daylight analysis will be prepared using the BRA's Daylight Analysis Program (BRADA) and in accordance with the requirements of Article 80B. The daylight analysis will use the BRADA (described further below) by comparing the existing/no-build condition to the build condition. The following viewpoints will be used for this daylight analysis:

- **New Chardon Street –** This viewpoint is located on the centerline of New Chardon Street, centered on the northern façades for the existing garage and Project.
- **John F. Fitzgerald Surface Road –** This viewpoint is located on the centerline of John F. Fitzgerald Surface Road, centered on the eastern façade for the existing garage and Project.

- **New Sudbury Street –** This viewpoint is located on the centerline of New Sudbury Street, centered on the southern façade for the existing garage and Project.

These viewpoints represent one viewpoint for each major building façade fronting a public way or passage, as appropriate. The viewpoints from Congress Street looking west and east to the existing garage structure cannot be modeled because of the tunnel effect created by the garage that connects over the street. In this case, the existing skydome is fully obstructed and the Project can only improve the skydome obstruction.

4.10.1.1 BRADA Software

The BRADA program was developed in 1985 by the Massachusetts Institute of Technology to estimate the pedestrian's view of the skydome taking into account the massing and building materials used. The software approximates a pedestrian's view of a site based on input parameters such as: location of viewpoint, length and height of buildings and the relative reflectivity of the building facades. The model typically uses the midpoint of an adjacent right-of-way or sidewalk as the analysis viewpoint. Based on these data, the model calculates the perceived skydome obstruction and provides a graphic depicting the analysis conditions.

4.11 Air Quality

Potential air quality impacts associated with the Project will be associated with Project-generated vehicular traffic emissions as well as Project-specific stationary sources, such as mechanical equipment. As discussed previously, the Project will incorporate an extensive TDM plan, which will result in reduced air emissions.

A comprehensive air quality assessment will be conducted for each Project Component as part of the Article 80B, Large Project Review. The air quality assessment may include the following analyses (described further below):

1. A regional (mesoscale) analysis of the ozone precursor impacts of volatile organic compounds (VOC), nitrogen oxides (NO_X), and particulate matter ($PM_{2.5}$ and PM_{10}); and
2. A localized (microscale), or "hot spot," analysis of local carbon monoxide (CO) concentrations at specific traffic intersections.

Regarding stationary sources, such as new furnaces, fuel burning equipment, and/or boilers as well as emergency generators, the Proponent will apply for any DEP air permits, as required by DEP regulations under 310 CMR 7.00. The analysis will include a description of the heating and mechanical systems, including emergency generators and the location of identified building and garage air intake and exhaust vents. Measures to avoid any violation of air quality standards will be described. The air quality assessment will also include a qualitative discussion of Ultra-Fine Particulates (PM0.1).

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4.11.1 Air Quality Regulatory Context

The purpose of the air quality assessment is to demonstrate that the Project satisfies applicable local, state, and federal air quality requirements. The 1990 Clean Air Act Amendments (CAAA) and the Massachusetts

State Implementation Plan (SIP) require that proposed projects not cause any new violation of the NAAQS for pollutants of concern, or increase the frequency or severity of any existing violations, or delay attainment of any NAAQS. The EPA has established the NAAQS to protect the public health. The NAAQS for CO are presented in Table 4-2 below.

The predominant source of air pollution anticipated from typical project developments is emissions from Project-related motor vehicle traffic. Carbon monoxide is directly emitted by motor vehicles. Their concentrations can be calculated and compared to the NAAQS. The regional (mesoscale) air quality analysis will also evaluate increases in pollutants to determine if the Project is consistent with the Massachusetts SIP.

The U.S. Environmental Protection Agency (EPA) and DEP have established guidance for modeling and review for air quality analysis prepared pursuant to the Massachusetts Environmental Policy Act (MEPA) process. The City of Boston requires that air quality analyses prepared as required under Article 80B meet the EPA and DEP guidelines.

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4.11.2 Air Quality Assessment Methodology

The following sections generally describe the methodology approach to the comprehensive air quality analysis. The Proponent will work with the BRA, BED, and DEP to establish appropriate methodology and parameters of the air quality analysis for each building during Article 80B and/or MEPA review.

4.11.2.1 Mesoscale Analysis Methodology

The mesoscale analysis will estimate the area wide emissions of VOC, NO_X, PM_{10}, and $PM_{2.5}$ during a typical day (24-hour period) in the peak ozone season (summer) for the existing, future no-build, and future build air quality conditions for the Project. The no-build condition will include existing garage emissions, regional background traffic growth, and planned roadway improvements without the Project. The mesoscale analysis will evaluate the change (with and without the Project) in emissions from the average daily traffic volumes, roadway lengths, and vehicle emission rates. DEP guidelines require that the air quality study utilize traffic (volumes, speeds, and roadway geometry) and emissions factor data for existing and future (no-build and build) conditions. The traffic and emissions data are incorporated into the EPA and DEP air quality models to generate emissions estimates that demonstrate whether or not a proposed action will have air quality impacts.

The mesoscale study area, at a minimum, includes all the roadway links and intersections that are projected to experience a ten percent increase in traffic from the Project and that experience a Level-of-Service (LOS) designation of "D" or lower under existing or future conditions. These conditions will be determined by the traffic impact and access study, as described further in Attachment 2.

Table 4-2
National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour[1]	None	
	35 ppm (40 mg/m^3)	1-hour[1]	None	
Lead	1.5 ug/m^3 [2]	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb [3]	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour[4]		
Particulate Matter (PM_{10})	150 ug/m^3	24-hour[5]	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15 ug/m^3	Annual (Arithmetic Mean) [6]	Same as Primary	
	35 ug/m^3	24-hour[7]	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour[8]	Same as Primary	
	0.08 ppm (1997 std)	8-hour[9]	Same as Primary	
	0.12 ppm	1-hour (applied to limited areas) [10]		
Sulfur Dioxide	0.03 ppm	Annual	0.5 ppm	3-hour[1]
	0.14 ppm	24-hour[1]	0.5 ppm	3-hour
	75 ppb[11]	1-hour	None	

1 Not to be exceeded more than once per year.
2 Final rule signed October 15, 2008.
3 The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.
4 To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
5 Not to be exceeded more than once per year on average over 3 years.
6 To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 μg/m3.
7 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 μg/m3 (effective December 17, 2006).
8 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
9 (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—would remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) EPA is in the process of reconsidering these standards (set in March 2008).
10 (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.
11 (a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb

4.11.2.2 Microscale ("Hot Spot") Analysis Methodology

The purpose of the microscale analysis is to demonstrate that future CO concentrations will meet the NAAQS. Utilizing the traffic data described in Attachment 2, the hot spot (microscale) analysis will evaluate localized impacts of mobile source maximum 1-hour and 8-hour CO concentrations from vehicles traveling

on roadways and through traffic intersections within the project area during the peak CO season (winter) for the Project. At a minimum, the microscale analysis will include the intersections that are projected to experience a ten percent increase in Project-related traffic and that experience a LOS designation of "D" or lower under existing or future conditions. These conditions are to be determined by the traffic impact and access study, as described further in Attachment 2. Following the EPA's modeling guidelines, EPA's mobile source models (MOBILE and CAL3QHC Version 2[3]) will be used to calculate the worst-case of 1-hour and 8-hour CO concentrations.[4] The maximum concentrations will then be compared to the NAAQS. Stationary source CO concentrations from garage entrances/exits and exhaust outlets will be evaluated to determine potential pedestrian level air quality impacts as well as impacts to nearby adjacent buildings and future residents of the Project. EPA's stationary source model (AERMOD) will be used to calculate worst-case concentrations from the parking garage using the traffic and mobile source emission factor data. The maximum concentrations will then be compared to the NAAQS.

4.12 Noise

Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, work, or recreation. How people perceive sound depends on several measurable physical characteristics, including sound intensity (often equated to loudness) and frequency (commonly referred to as tone or pitch; typically measured in Hertz).

Typical noise sources include vehicular traffic (highways), mechanical equipment, such as chillers, garage exhaust fans, and emergency generators. The creation of the East Parcel public plaza creates an on-site sensitive receptor that will need to be considered due to noise from the adjacent MBTA Haymarket bus facility. The current project design of EP-B2 incorporates ground floor retail and a new office lobby which will act as a screen to mitigate the existing bus noise.

Enclosing three sides of the Garage provides a noise benefit as it will screen existing noise internal to the Garage (i.e., engine noise, car alarms). Noise mitigation measures (i.e., enclosing loading docks and mechanical equipment) will be considered and assessed as Project Components are designed. As part of the Article 80B, Large Project Review, noise impacts associated with each Project Component will be analyzed in order to demonstrate compliance with the City of Boston noise regulations and applicable state and federal regulations and guidelines, including U.S. Department of Housing and Urban Development (HUD) interior noise criteria for residential uses.

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4.12.1 Noise Regulatory Context

The City of Boston and HUD have developed noise impact criteria that establish noise thresholds deemed to result in adverse impacts. The noise analysis for the Project will compare existing and future sound levels to

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3 *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*, US Environmental Protection Agency, Office of Air Quality Planning and Standards, Technical Support Division; Research Triangle Park, NC; EPA-454/R-92-005; November 1992

4 *Guideline for Modeling Carbon Monoxide From Roadway Intersections*, US Environmental Protection Agency, Office of Air Quality Planning and Standards, Technical Support Division; Research Triangle Park, NC; EPA-454/R-92-006 (Revised); September 1995

the criteria and determine whether or not the Project will be impacted by the nearby transportation facilities surrounding the site or generates noise impact at sensitive receptor locations in the vicinity of the Project.

4.12.1.1 City of Boston Noise Regulation

The City of Boston developed noise standards that establish noise thresholds deemed to result in adverse impacts. The noise analysis for the Project Components will use these standards to evaluate whether the proposed development will generate sound levels that result in adverse impacts.

Under Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts and the City of Boston Code, Ordinances, Title 7, Section 50, the Air Pollution Control Commission of the City of Boston has adopted Regulations for the Control of Noise in the City of Boston.[5] These regulations establish maximum allowable sound levels based upon the land use affected by the proposed development. Table 4-3 summarizes the maximum allowable sound levels that should not be exceeded.

Table 4-3
City of Boston Noise Standards by Zoning District

Land Use Zone District	Daytime (7:00 AM – 6:00 PM)	All Other Times (6:00 PM – 7:00 AM)
Residential	60 dB(A)	50 dB(A)
Residential/Industrial	65 dB(A)	55 dB(A)
Business	65 dB(A)	65 dB(A)
Industrial	70 dB(A)	70 dB(A)

Source: Regulations for the Control of Noise in the *City of Boston, Air Pollution Control Commission*.

For a residential zoning district, the maximum noise level affecting residential uses shall not exceed the Residential Noise Standard. The residential land use noise standard is 60 dB(A) for daytime periods (7:00 AM to 6:00 PM) and 50 dB(A) for nighttime conditions (6:00 PM to 7:00 AM). The City of Boston also regulates sound levels of any construction devices, excluding impact devices (discussed below under the 'Construction Phasing and Temporary Impacts' section).

4.12.1.2 HUD Noise Impact Criteria

HUD has established guidelines and procedures, which are presented in The Noise Guidebook[6] (The "Guidebook"), in assessing noise impacts on residential developments. The HUD standard is intended to protect residential receptors from sound levels that cause interference with normal activities, such as sleep and conversation

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5 City of Boston Air Pollution Control Commission, *Regulations for the Control of Noise in the City of Boston*. (website: http://www.cityofboston.gov/Images_Documents/noise_reg_tcm3-13127.pdf)

6 Section 51.103, The N*oise Guidebook*, U.S. Department of Housing and Urban Development, Office of Environment and Energy.

HUD has established an L_{dn} of 65 dB or lower as an acceptable exterior sound level and an L_{dn} of 45 dB as an interior standard. L_{dn} represents a Day-Night average sound level. This is the average of all sound levels that occur during a 24-hour period, with a significant penalty (10 dB) added to sound levels that occur between 10:00 PM and 7:00 AM. Sound levels above 65 dB but not exceeding 75 dB are normally unacceptable. However, with noise attenuation measures such as special building construction material, a waiver may be granted. HUD considers sound levels above 75 dB to be unacceptable.

HUD's guidance and procedures states that if the proposed residential development is located near a major noise source, such as within 15 miles of an airport, within 1,000 feet of a major highways or roads, or within 3,000 feet of a railroad line, then the Proponent must undertake a noise assessment.

4.12.1.3 Massachusetts DEP

Because the Project is likely to include one or more emergency generators for building life safety, an appropriate DEP air permit (Self Certification) will be applied for during the design and construction process. Additionally, DEP regulations (310 CMR 7.00) include noise requirements for operation of emergency generators, which need to be documented within 60 days of the initial operation. The Proponent will submit the appropriate permit application to DEP, including the noise mitigation measures, such as acoustic enclosures and exhaust silencers necessary to meet the DEP's noise criteria.

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4.12.2 Noise Assessment Methodology

The noise assessment will evaluate the potential noise impacts for the existing, no-build, and build conditions and will consist of two key components:

1. The evaluation of potential noise impacts from activities associated with the Project on nearby sensitive receptor locations; and
2. The evaluation of potential noise impacts on the proposed residential units (i.e., from nearby major transportation facilities).

4.12.2.1 Potential Project-Related Noise Impacts

The noise assessment will include the noise impacts associated with the Project's operations, such as mechanical equipment (heating, ventilating, and air conditioning (HVAC) units, cooling towers, and an emergency generators) and loading dock activities (location of the loading area and management of deliveries at the Project Site). The noise assessment will present measurements of existing ambient background sound levels and include a quantitative evaluation of potential Project-generated sound levels. The noise study area and sensitive receptor locations will be identified.

The noise analysis will determine the maximum potential sound levels at the sensitive receptor locations using the manufacturer's technical specifications for the mechanical equipment. Applying the properties of sound propagation over hard ground, the noise analysis will project sound levels to sensitive receptor locations from each of the mechanical equipment to determine the overall maximum sound level that would

be experienced at the sensitive receptor locations. The noise analysis will assume sound level reductions due to distance and building blockages from the surrounding buildings. Noise reduction measures will be described and assessed, as appropriate and necessary, to minimize and/or eliminate adverse noise impacts from the Project on the nearby community.

4.12.2.2 Potential Noise Impacts on the Project

Since the Project includes a residential component, the noise analysis will evaluate the potential noise impacts to future residents from nearby transportation facilities, such as airports, railroads, and major highways. HUD's guidance and procedures states that if the proposed residential development is located near a major noise source, such as within 15 miles of an airport, within 1,000 feet of a major highways or roads, or within 3,000 feet of a railroad line, then the Proponent must undertake a noise assessment. The Project Site is located at distances that are at or within the HUD requiring a noise assessment. The Project Site is located:

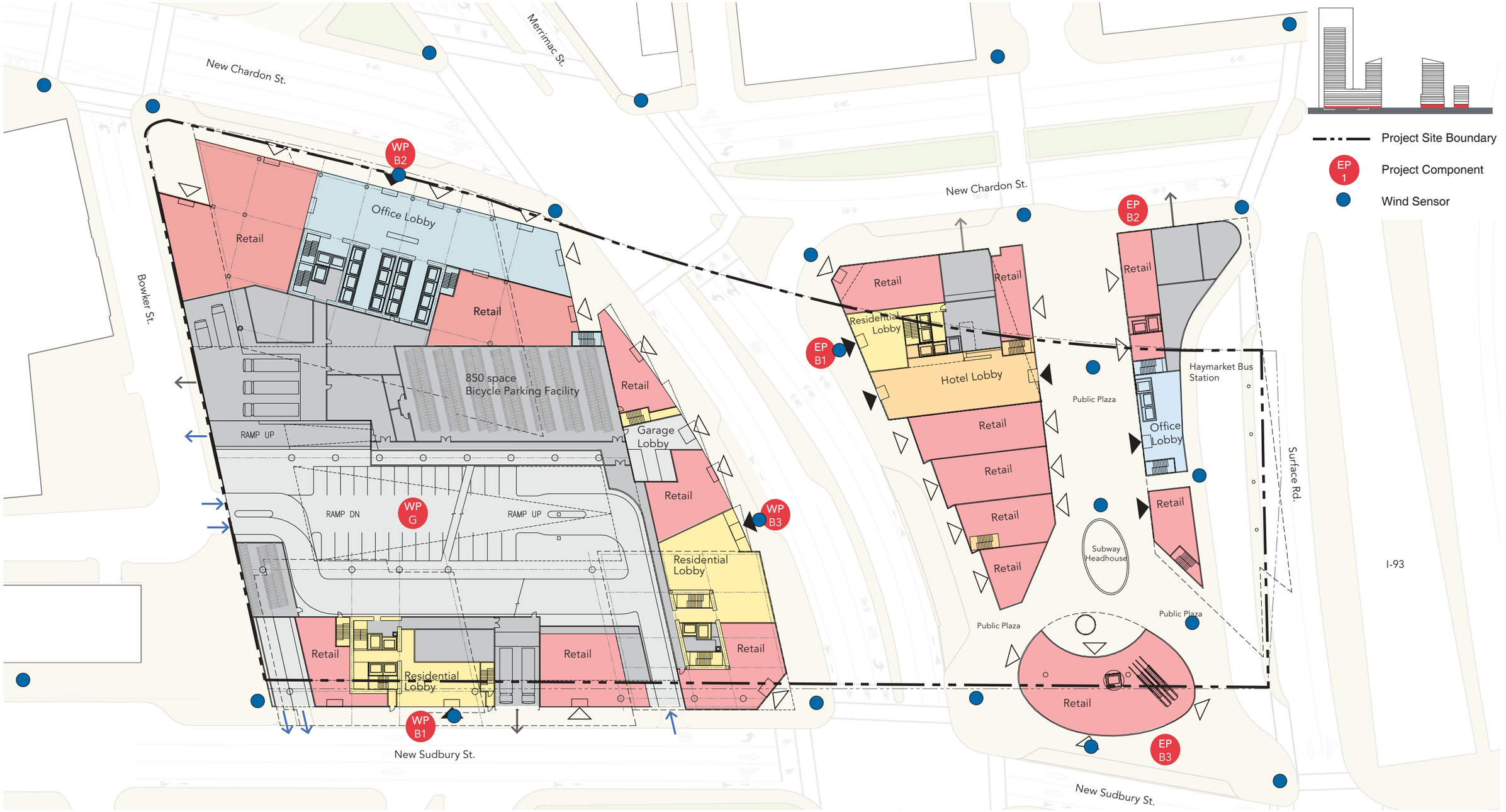
- Approximately two miles from Logan International Airport;
- Approximately 2,000 feet from the MBTA commuter rail tracks; and
- Approximately 250 feet from Interstate 93 (I-93).

If the exterior sound levels exceed the HUD criteria for interior uses, mitigation that will create an appropriate sound environment, such as wall design and construction and/or window construction will be evaluated as part of the noise assessment.

4.13 Temporary Construction Impacts

Construction impacts are temporary in nature and are typically related to air (dust), noise, and stormwater runoff. Temporary construction-period impacts will be managed to minimize disruption to the surrounding neighborhood. Construction management plans (CMPs) will be prepared for each Project Component as part of the Article 80B, Large Project Review and will address the following temporary construction-related impacts:

- Site Preparation
- Construction staging
- Stormwater runoff
- Air quality/dust
- Noise
- Truck traffic management
- Hazardous Materials and Solid Waste
- Odor and Rodent Control
- Public Safety during Construction



Redevelopment of Government Center Garage
Boston, MA

Figure 4.1

Potential Wind Sensor Locations

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.

SPRING EQUINOX (MARCH 21ST) - PHASE ONE

9:00AM

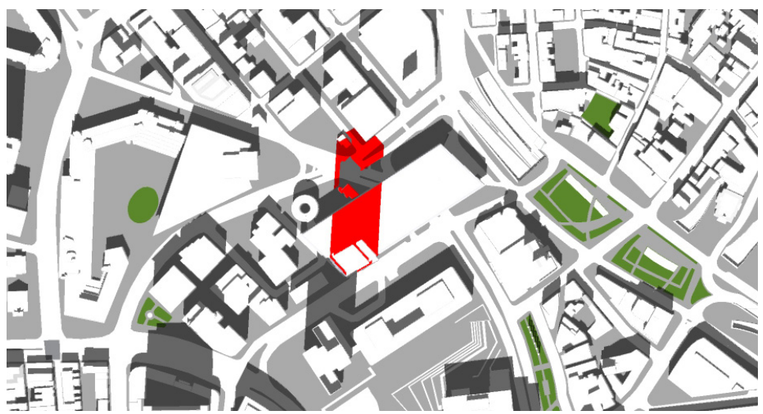
12:00PM

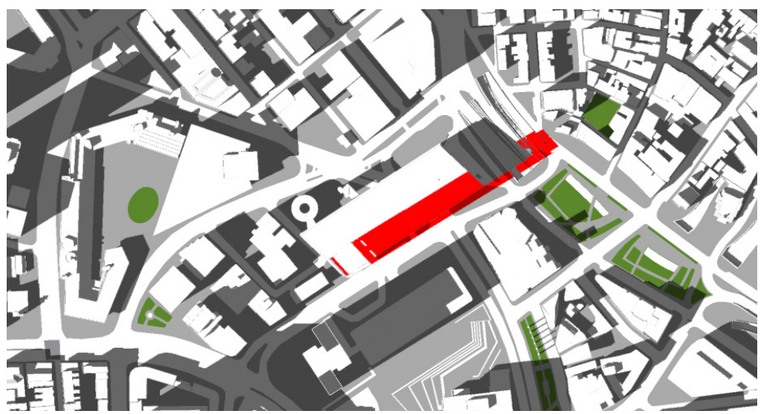
3:00PM

PRE-DEVELOPMENT

NET SHADOW

NET SHADOW DETAIL





Redevelopment of Government Center Garage
Boston, MA

Figure 4.2a

THE HYM INVESTMENT GROUP, LLC

cbt

Shadow Study on Spring Equinox
March 21st
NET SHADOW

SUMMER SOLSTICE (JUNE 21ST) - PHASE ONE

9:00AM

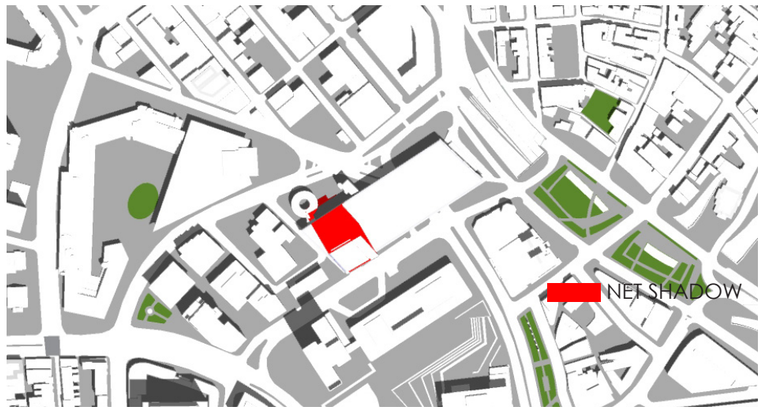
12:00PM

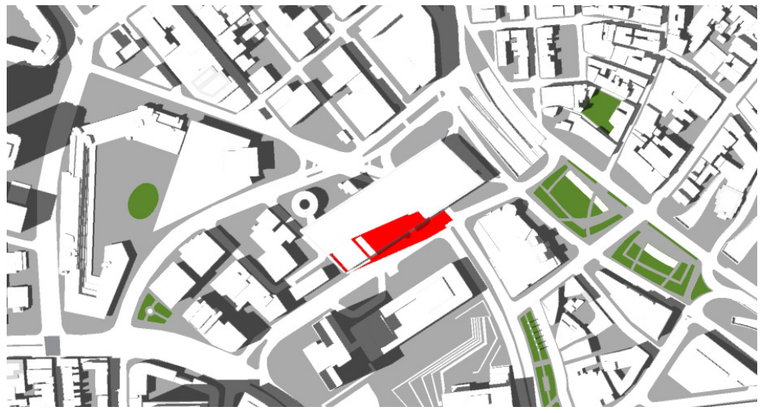
3:00PM

PRE-DEVELOPMENT

NET SHADOW

NET SHADOW DETAIL





Redevelopment of Government Center Garage
Boston, MA

Figure 4.2b

THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Summer Solstice
June 21st

NET SHADOW

5:00PM

Redevelopment of Government Center Garage
Boston, MA

Figure 4.2b (cont.)

THE HYM INVESTMENT GROUP LLC cbt

Shadow Study on Summer Solstice
June 21st

NET SHADOW

FALL EQUINOX (SEPTEMBER 21ST) - PHASE ONE

9:00AM

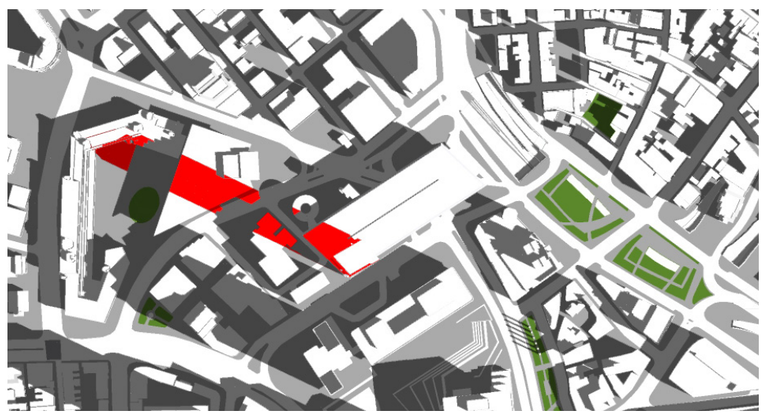
12:00PM

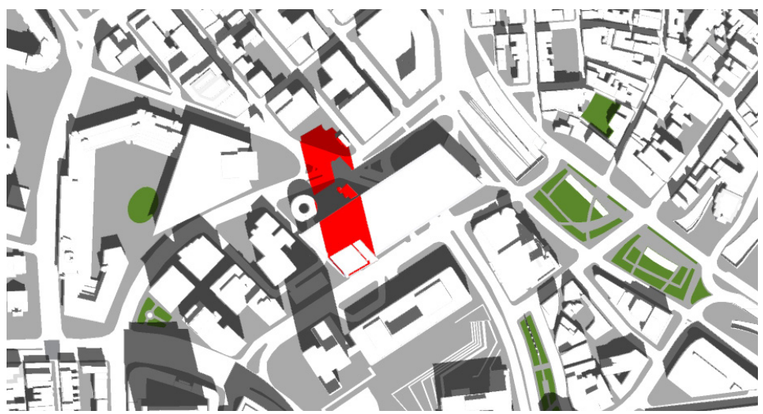
3:00PM

PRE-DEVELOPMENT

NET SHADOW

NET SHADOW DETAIL





Redevelopment of Government Center Garage
Boston, MA

Figure 4.2c

THE HYM INVESTMENT GROUP, LLC

cbt

Shadow Study on Fall Equinox
September 21st

NET SHADOW

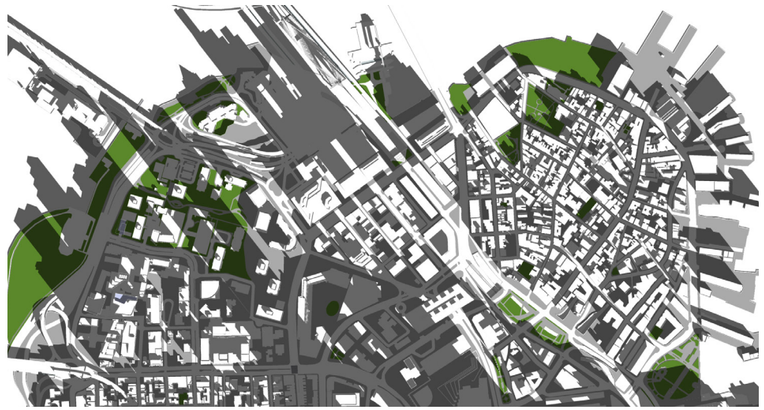
WINTER SOLSTICE (DECEMBER 21ST) - PHASE ONE

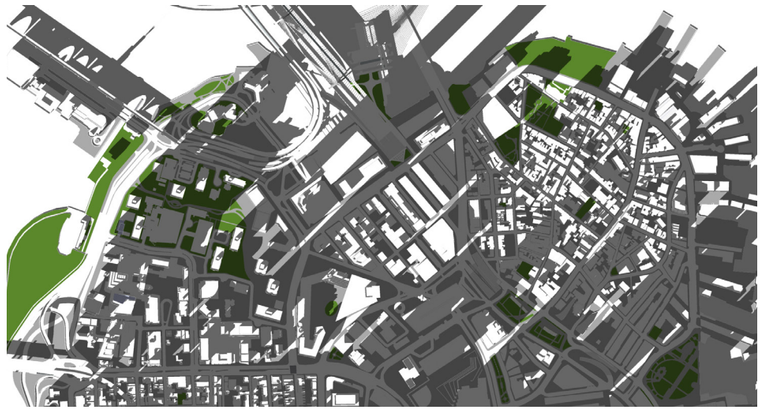
9:00AM

12:00PM

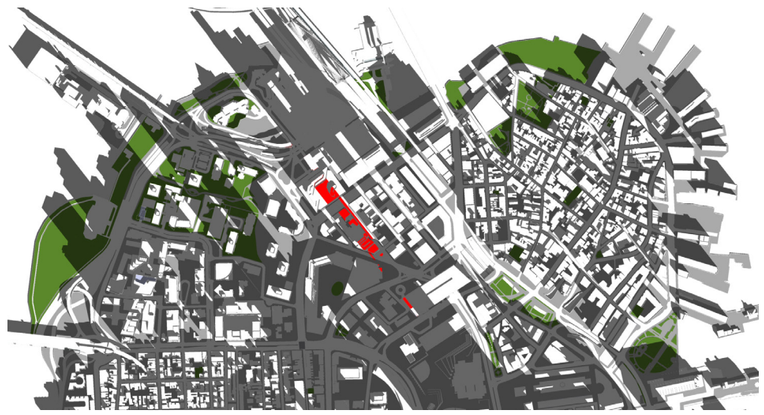
3:00PM

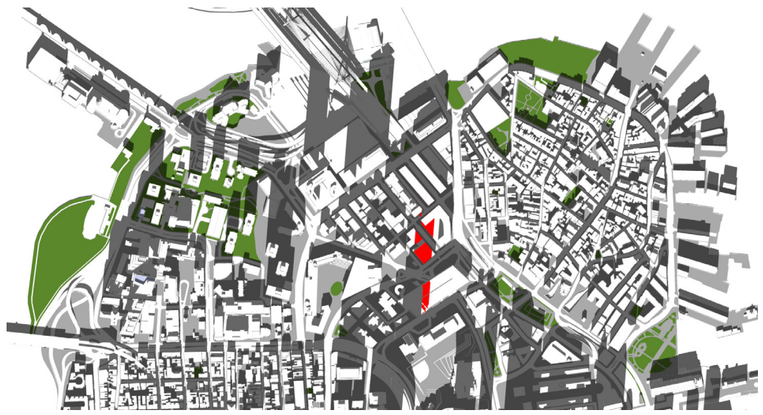
PRE-DEVELOPMENT

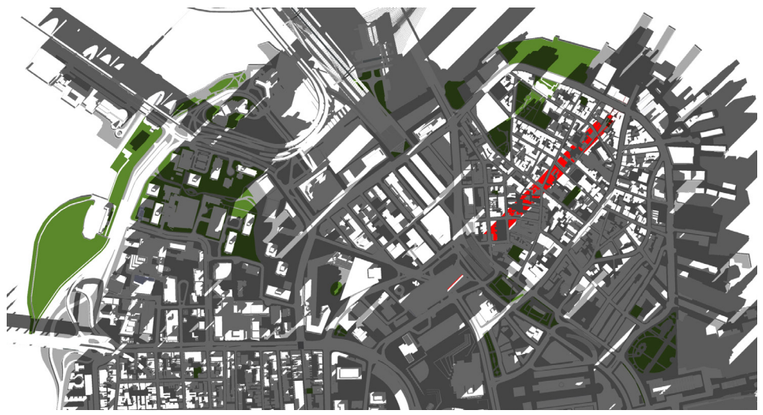




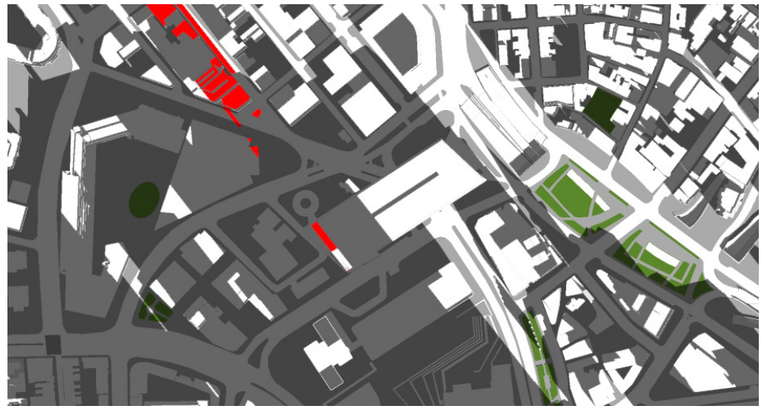
NET SHADOW

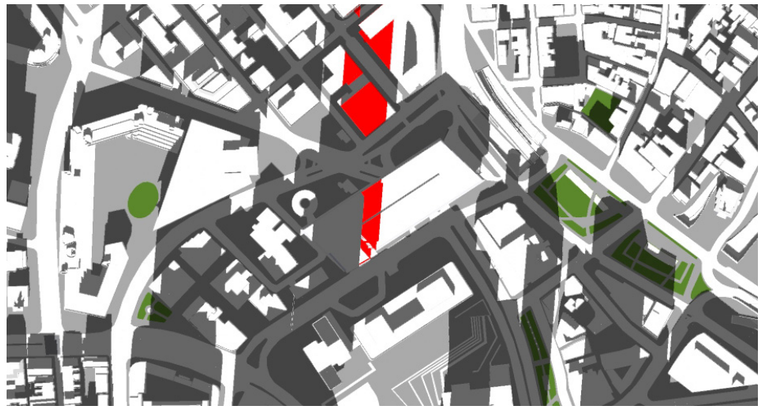






NET SHADOW DETAIL





Redevelopment of Government Center Garage
Boston, MA

Figure 4.2d

HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Winter Solstice
December 21st

NET SHADOW

SPRING EQUINOX (MARCH 21ST) - PHASE TWO

9:00AM

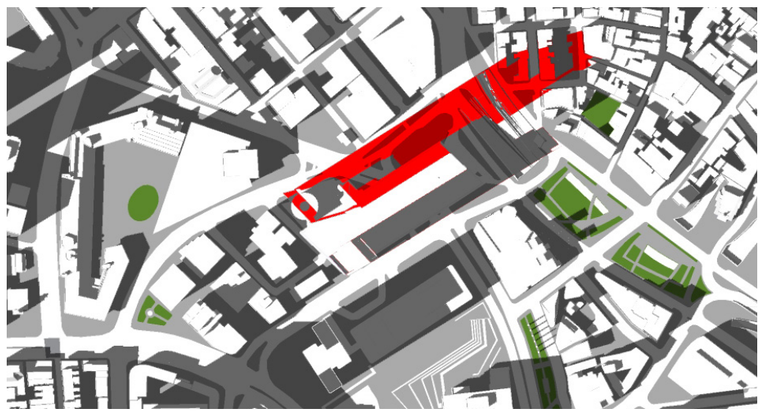
12:00PM

3:00PM

PHASE ONE SHADOW

NET SHADOW

NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

Figure 4.3a

Shadow Study on Spring Equinox
March 21st

NET SHADOW

SUMMER SOLSTICE (JUNE 21ST) - PHASE TWO

9:00AM

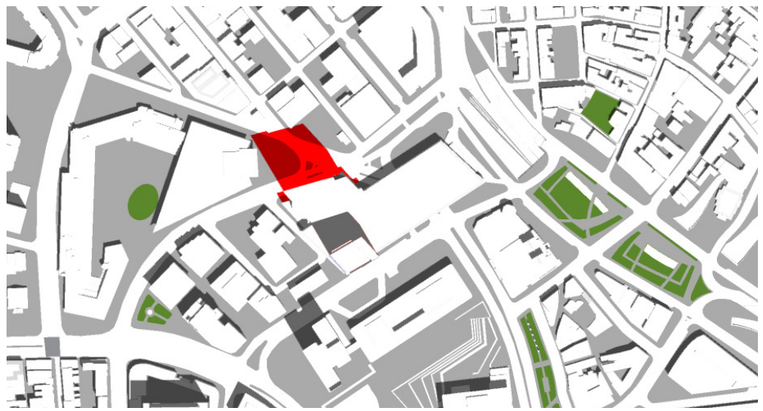
12:00PM

3:00PM

PHASE ONE SHADOW

NET SHADOW

NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

Figure 4.3b

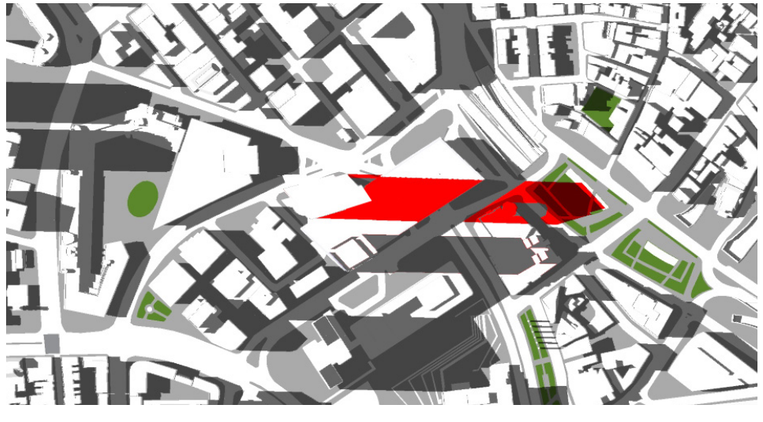
THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Summer Solstice
June 21st

NET SHADOW

5:00PM



Redevelopment of Government Center Garage
Boston, MA

Figure 4.3c (cont.)

THE HYM INVESTMENT GROUP LLC cbt

Shadow Study on Summer Solstice
June 21st

NET SHADOW

FALL EQUINOX (SEPTEMBER 21ST) - PHASE TWO

9:00AM | 12:00PM | 3:00PM

PHASE ONE SHADOW

NET SHADOW

NET SHADOW DETAIL

Redevelopment of Government Center Garage
Boston, MA

Figure 4.3c

THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Fall Equinox
September 21st

NET SHADOW

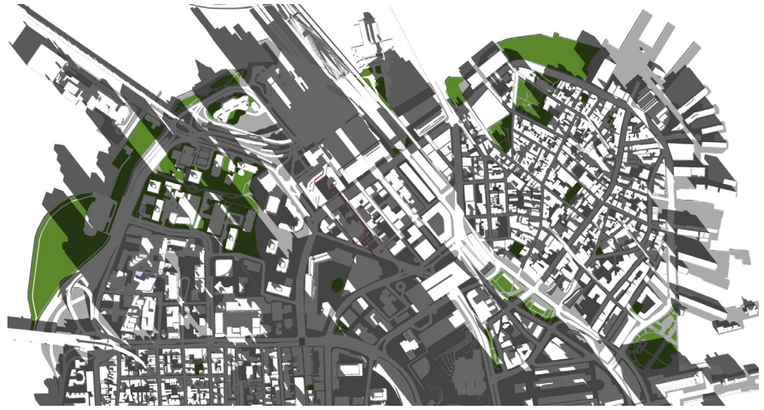
WINTER SOLSTICE (DECEMBER 21ST) - PHASE TWO

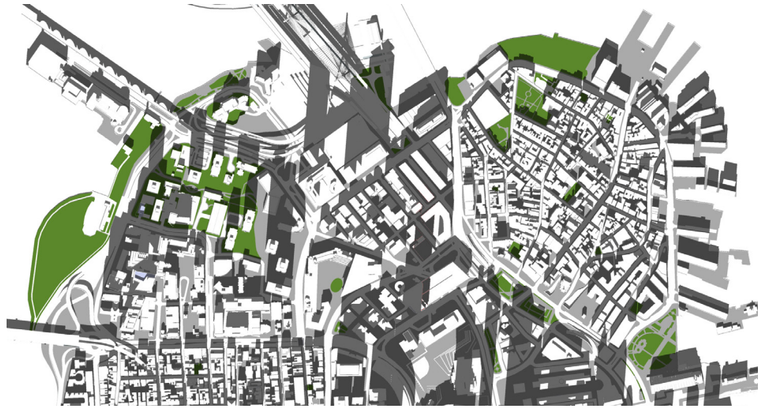
9:00AM

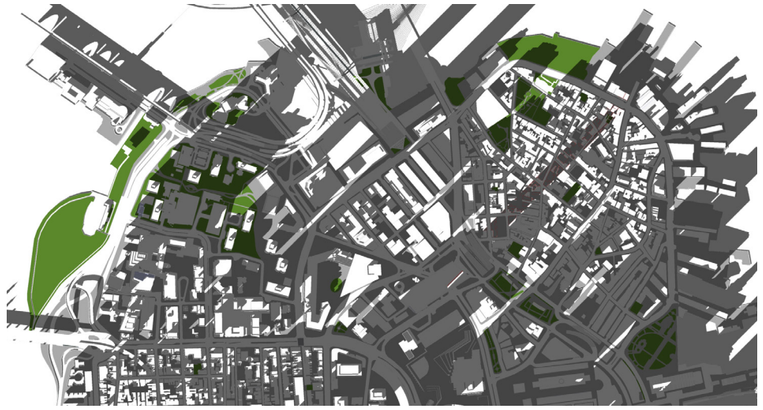
12:00PM

3:00PM

PHASE ONE SHADOW







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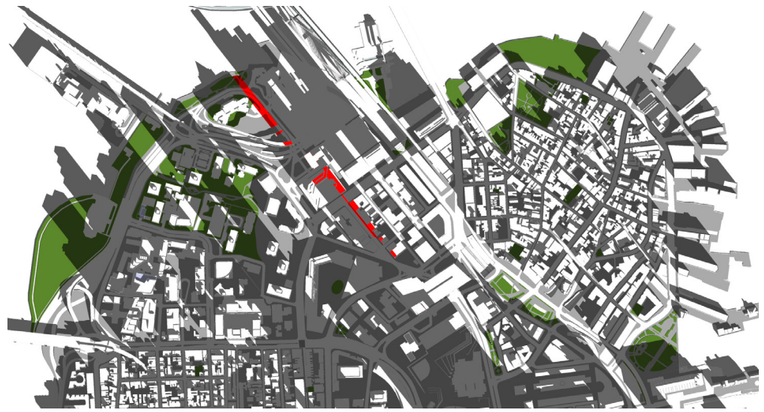

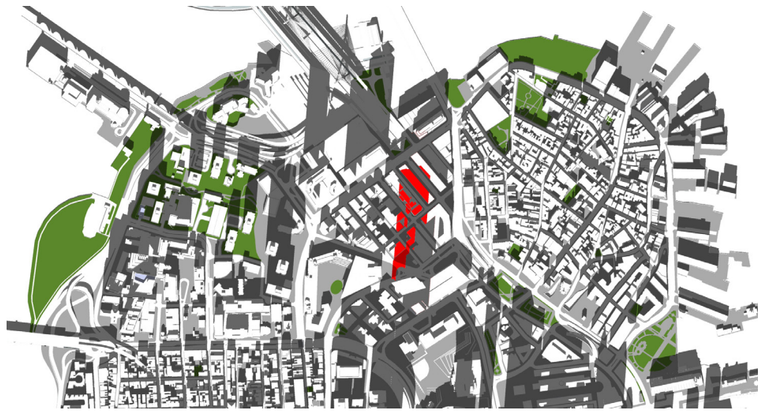

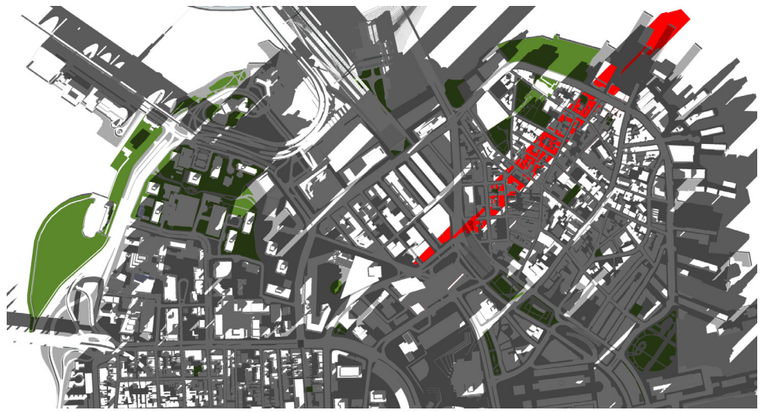

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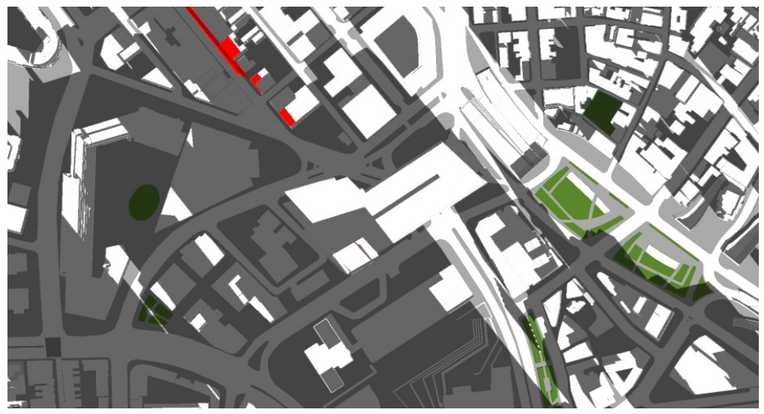
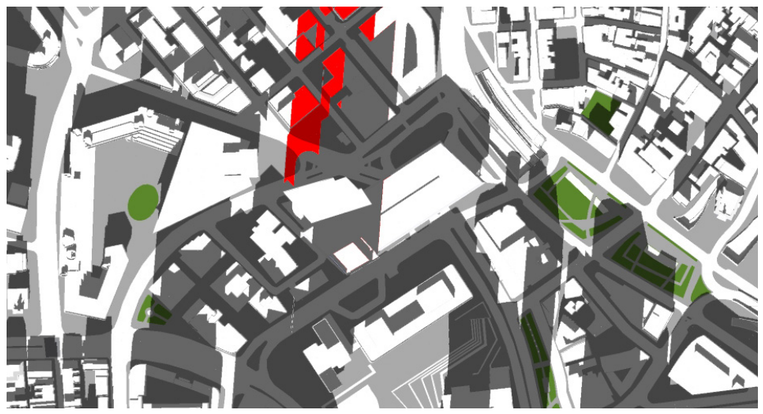
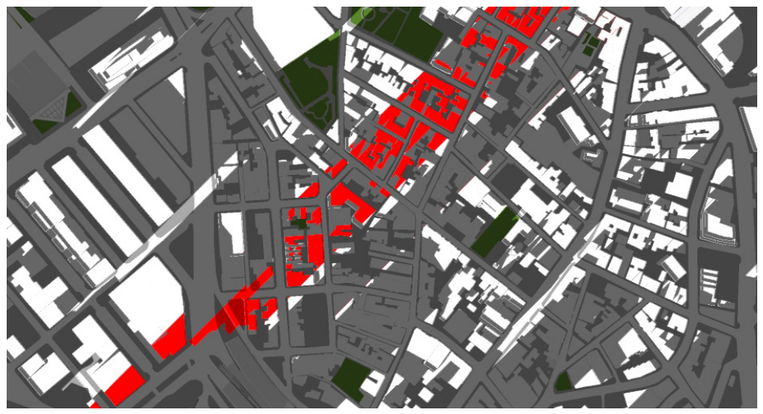






Redevelopment of Government Center Garage
Boston, MA

Figure 4.3d

THE HYM INVESTMENT GROUP, LLC

cbt

Shadow Study on Winter Solstice
December 21st

NET SHADOW

SPRING EQUINOX (MARCH 21ST) - PHASE THREE

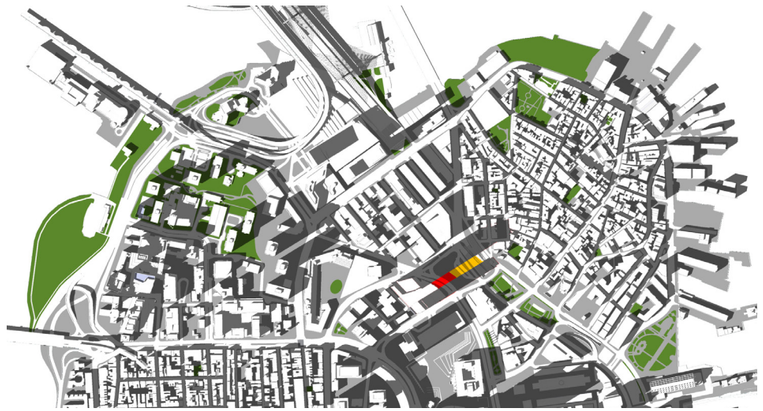
9:00AM

12:00PM

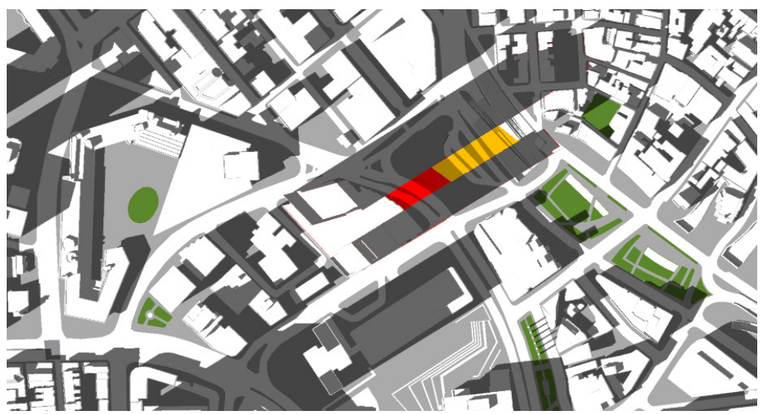
3:00PM

PHASE TWO SHADOW

NET SHADOW



NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

Figure 4.4a

THE HYM INVESTMENT GROUP, LLC

cbt

Shadow Study on Spring Equinox
March 21st
NET SUNLIGHT
NET SHADOW

SUMMER SOLSTICE (JUNE 21ST) - PHASE THREE

9:00AM

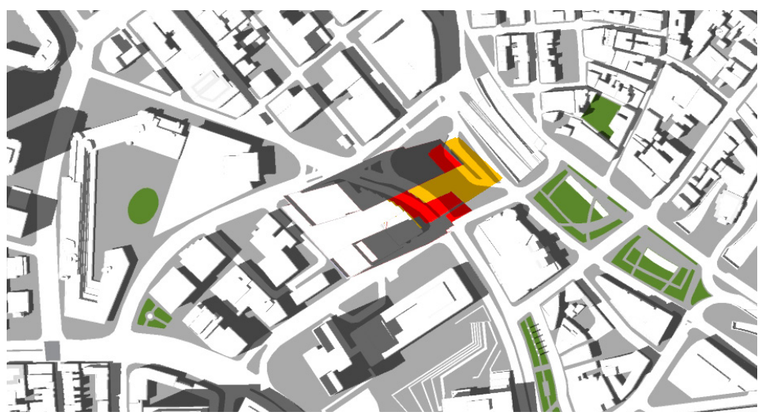
12:00PM

3:00PM

PHASE TWO SHADOW

NET SHADOW

NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

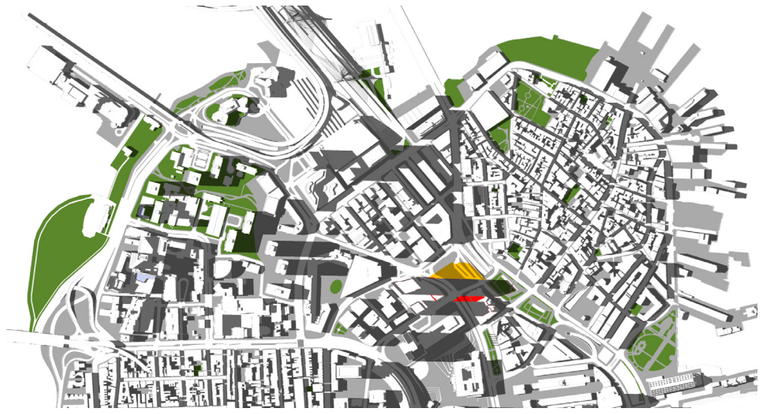
Figure 4.4b

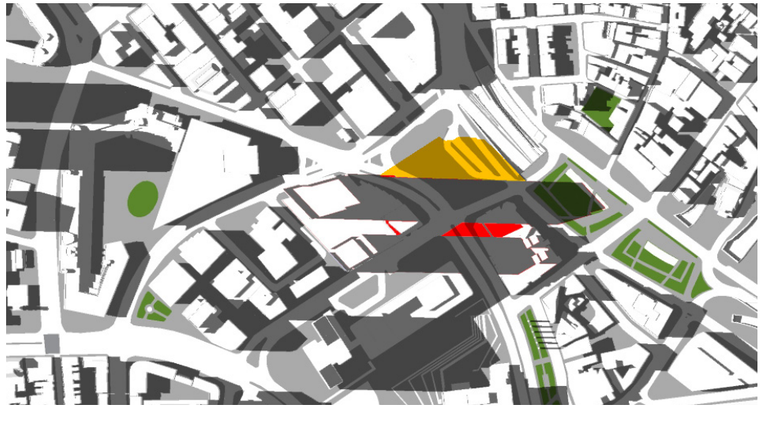
THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Summer Solstice
June 21st
NET SUNLIGHT
NET SHADOW

5:00PM





Redevelopment of Government Center Garage
Boston, MA

Figure 4.4b (cont.)

THE HYM INVESTMENT GROUP LLC cbt

Shadow Study on Summer Solstice
June 21st
NET SUNLIGHT
NET SHADOW

FALL EQUINOX (SEPTEMBER 21ST) - PHASE THREE

9:00AM

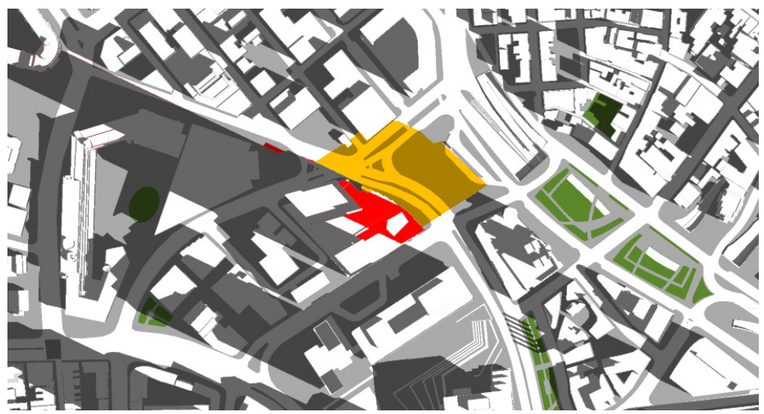
12:00PM

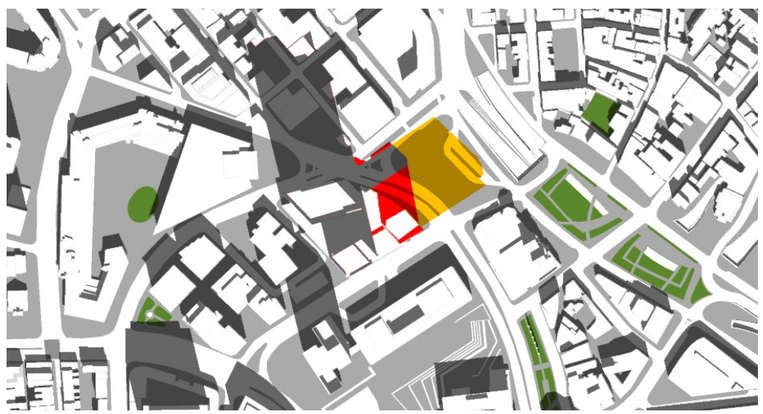
3:00PM

PHASE TWO SHADOW

NET SHADOW

NET SHADOW DETAIL





Redevelopment of Government Center Garage
Boston, MA

Figure 4.4c

THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Fall Equinox
September 21st
NET SUNLIGHT
NET SHADOW

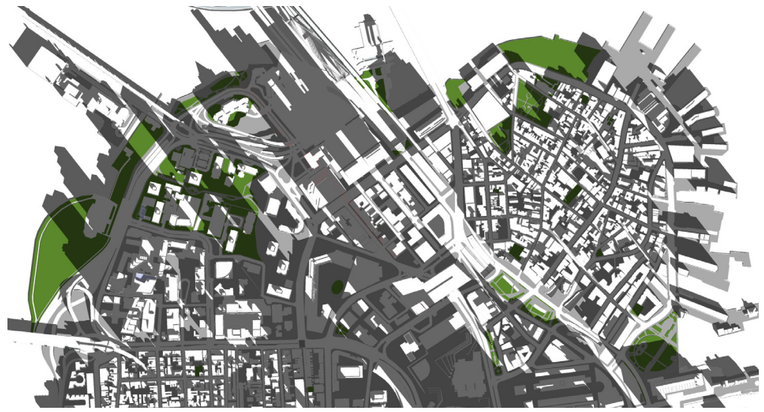
WINTER SOLSTICE (DECEMBER 21ST) - PHASE THREE

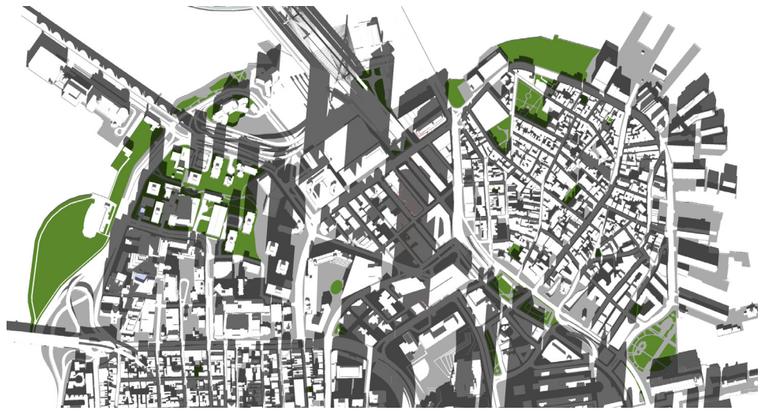
9:00AM

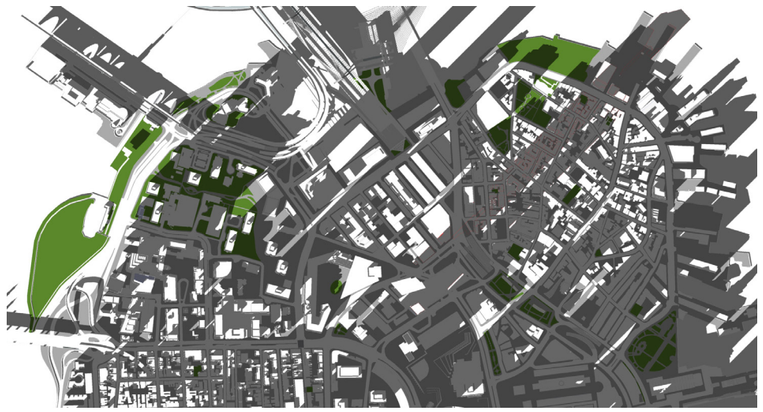
12:00PM

3:00PM

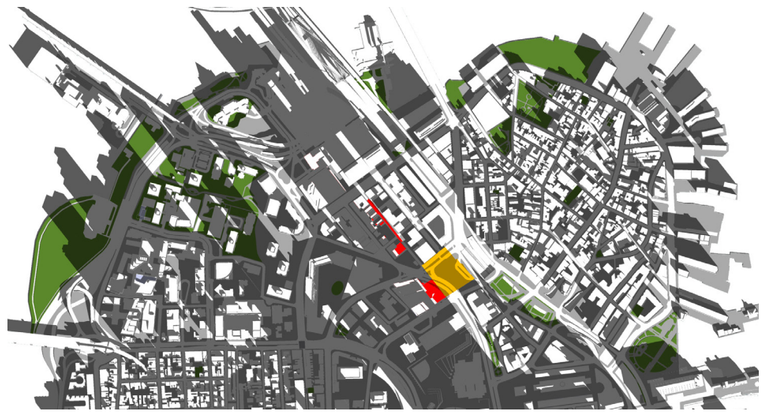
PHASE TWO SHADOW

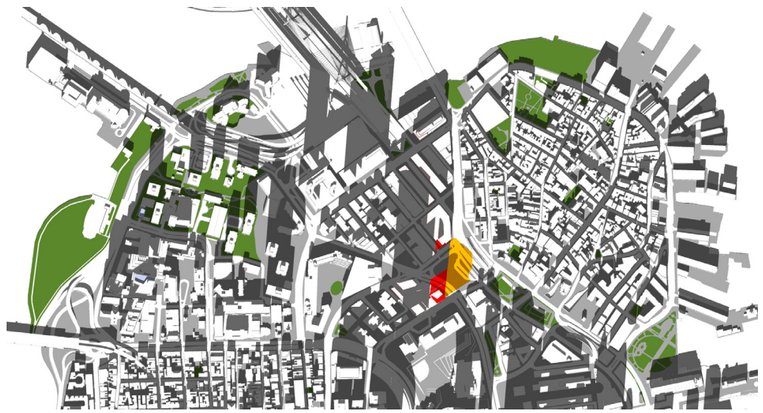


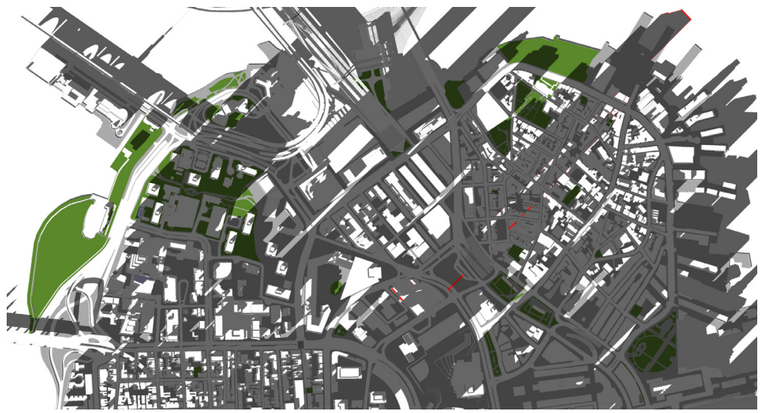




NET SHADOW







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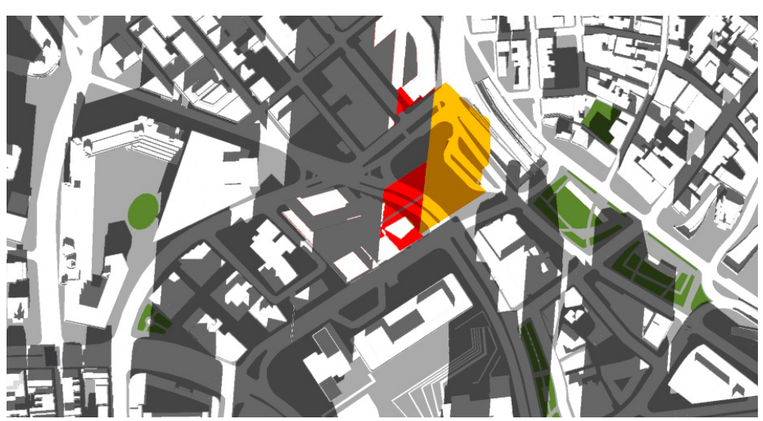


Redevelopment of Government Center Garage
Boston, MA

Figure 4.4d

THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Winter Solstice
December 21st
NET SUNLIGHT
NET SHADOW

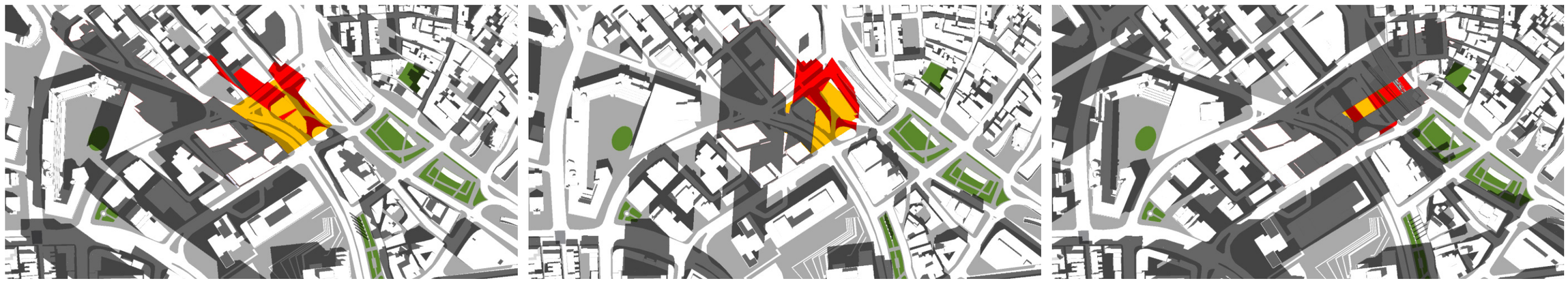
SPRING EQUINOX (MARCH 21ST) - PHASE FOUR

9:00AM | 12:00PM | 3:00PM

PRE-DEVELOPMENT

NET SHADOW

NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

Figure 4.5a

THE HYM INVESTMENT GROUP, LLC cbt

Shadow Study on Spring Equinox
March 21st
NET SUNLIGHT
NET SHADOW

SUMMER SOLSTICE (JUNE 21ST) - PHASE FOUR

9:00AM

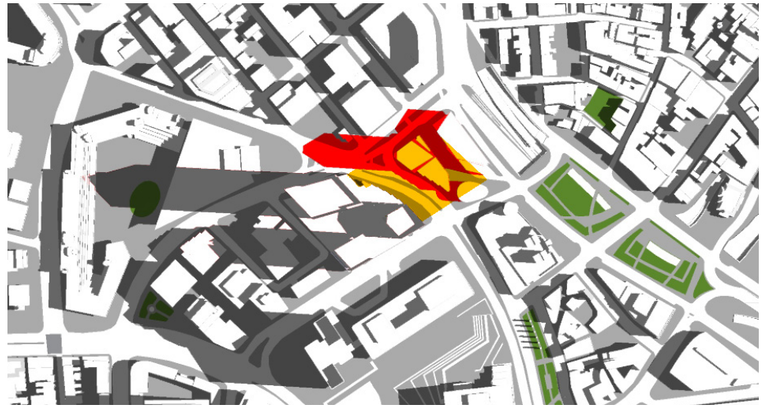
12:00PM

3:00PM

PRE-DEVELOPMENT

NET SHADOW

NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

Figure 4.5b

THE HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Summer Solstice
June 21st
NET SUNLIGHT
NET SHADOW

5:00PM

Redevelopment of Government Center Garage
Boston, MA

Figure 4.5b (cont.)

THE HYM INVESTMENT GROUP LLC cbt

Shadow Study on Summer Solstice
June 21st
NET SUNLIGHT
NET SHADOW

FALL EQUINOX (SEPTEMBER 21ST) - PHASE FOUR

9:00AM

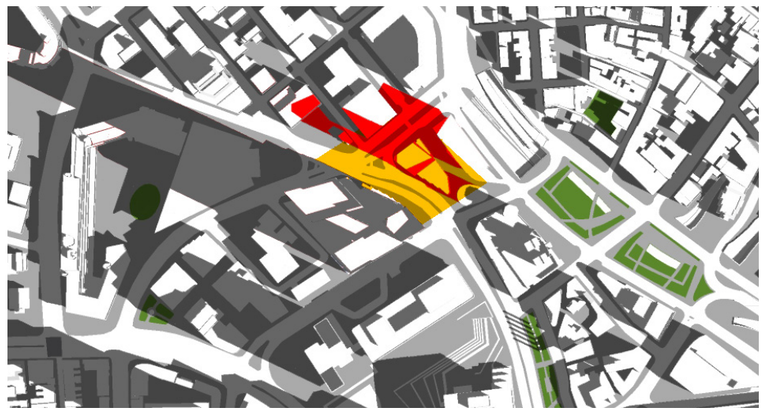
12:00PM

3:00PM

PRE-DEVELOPMENT

NET SHADOW

NET SHADOW DETAIL



Redevelopment of Government Center Garage
Boston, MA

Figure 4.5c

HYM INVESTMENT GROUP LLC

cbt

Shadow Study on Fall Equinox
September 21st
NET SUNLIGHT
NET SHADOW

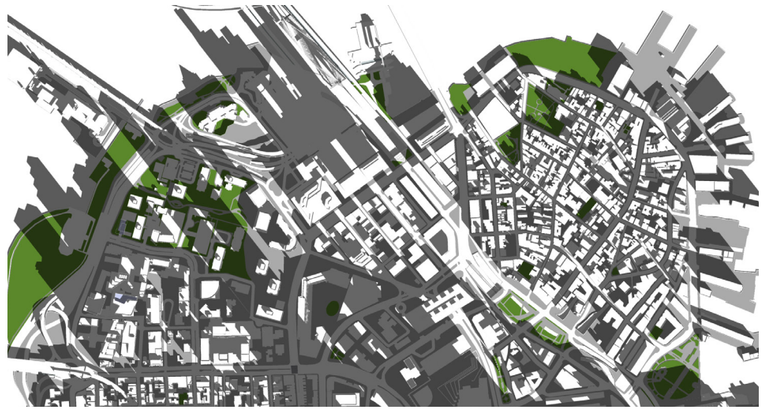
WINTER SOLSTICE (DECEMBER 21ST) - PHASE FOUR

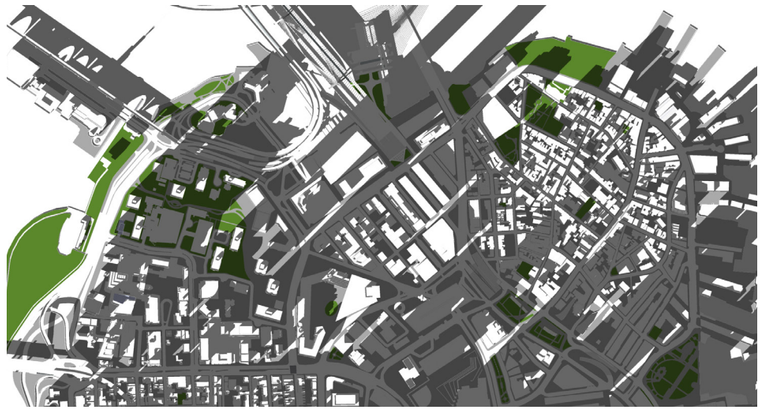
9:00AM

12:00PM

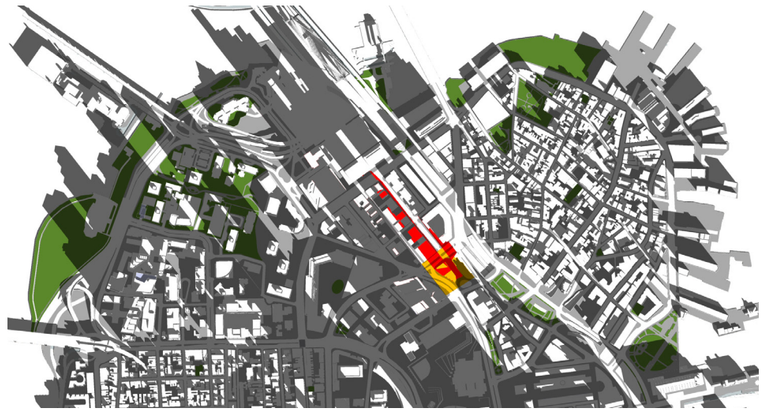
3:00PM

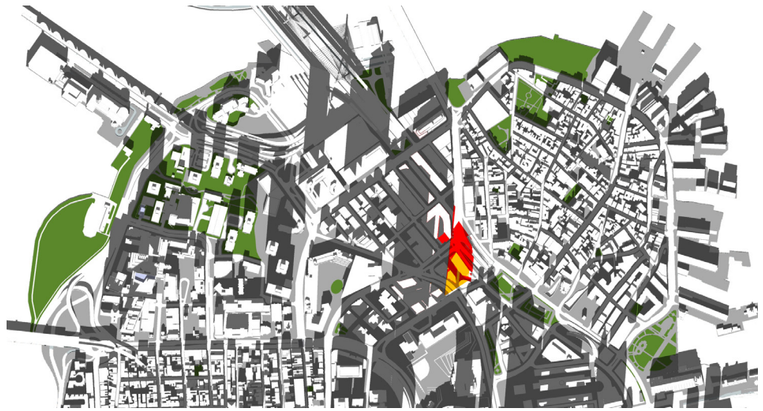
PRE-DEVELOPMENT

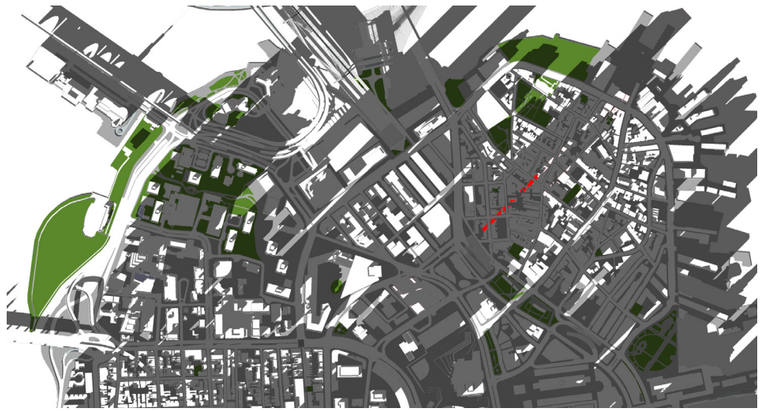




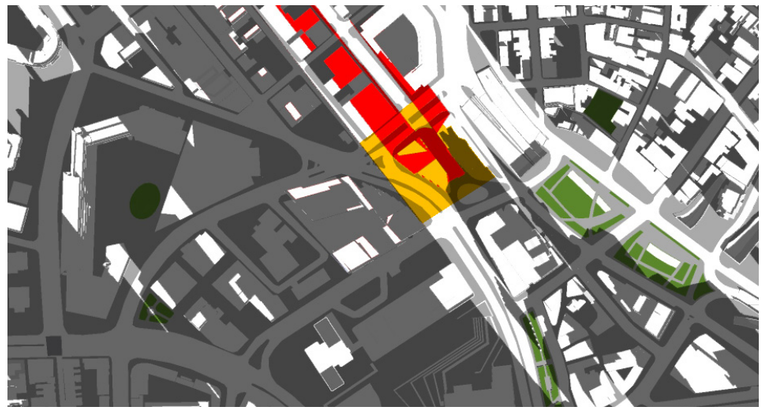
NET SHADOW

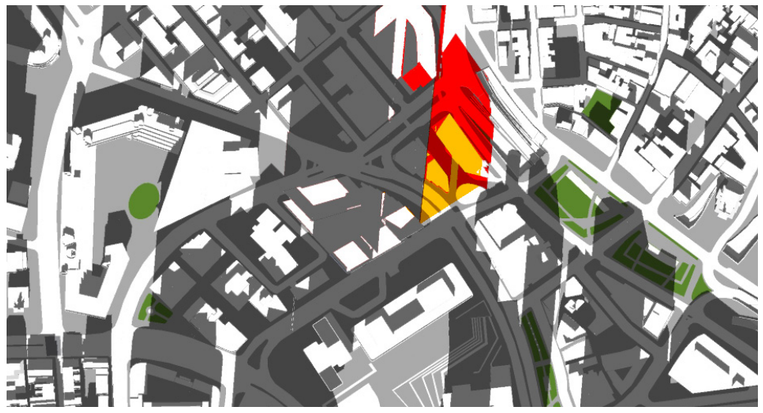






NET SHADOW DETAIL





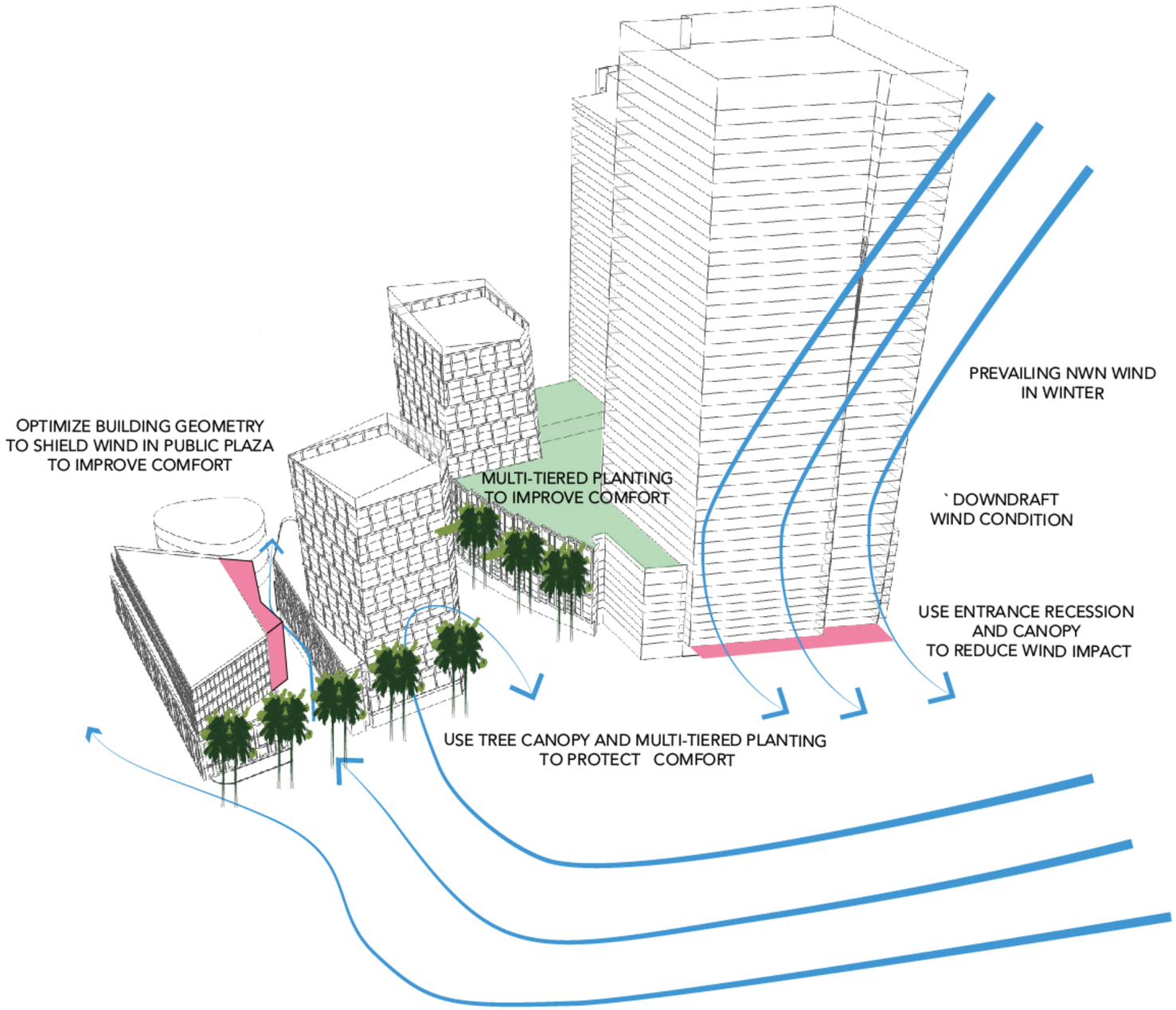
Redevelopment of Government Center Garage
Boston, MA

Figure 4.5d

THE HYM INVESTMENT GROUP, LLC

cbt

Shadow Study on Winter Solstice
December 21st
NET SUNLIGHT
NET SHADOW



Redevelopment of Government Center Garage
Boston, MA

Figure 4.6

Sustainability Diagram - Wind

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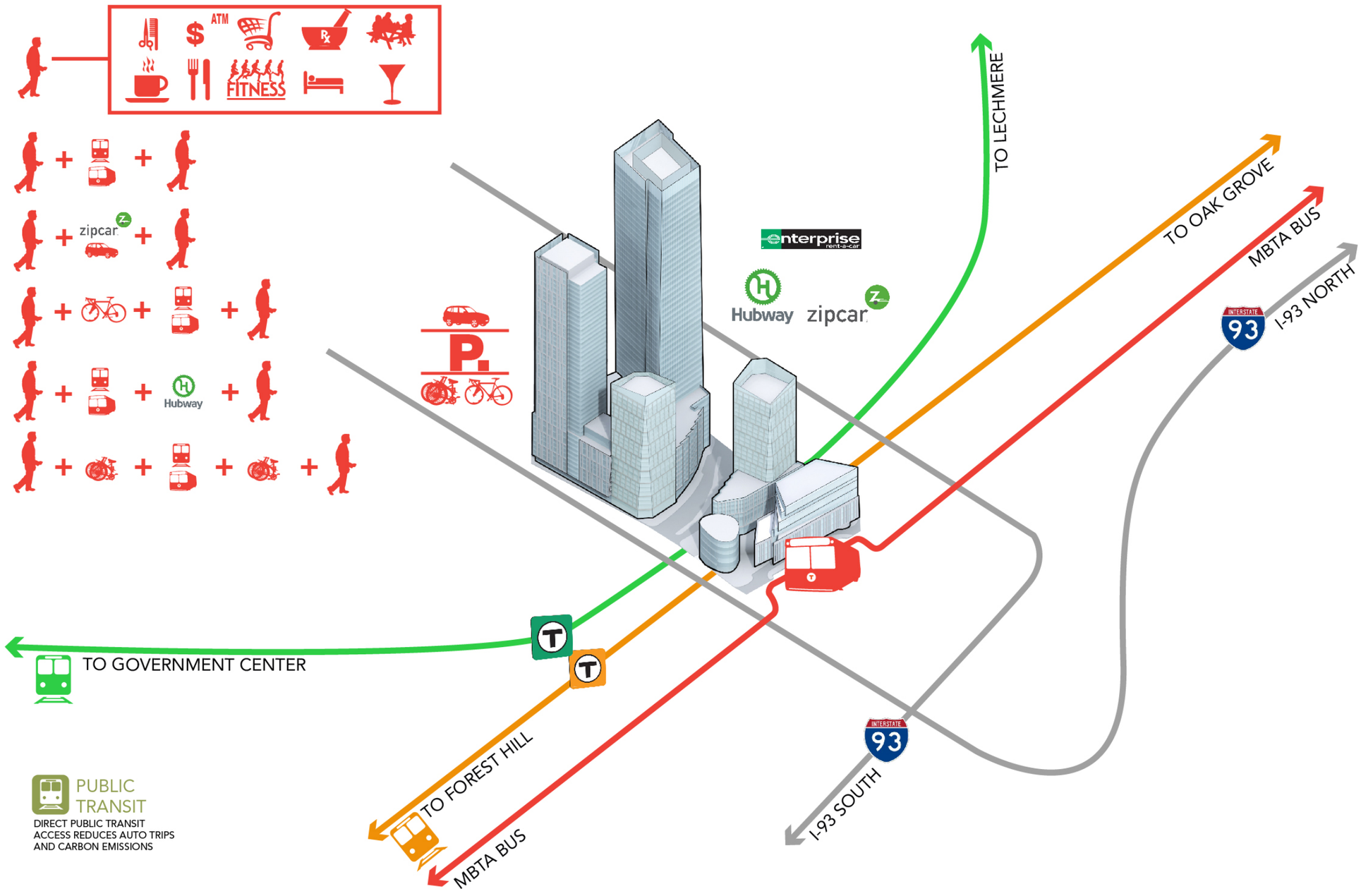

Redevelopment of Government Center Garage
Boston, MA

Figure 4.7

Sustainability Diagram - Mobility

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ENERGY RECOVERY VENTILATION

ENERGY RECOVERY PROCESS OF EXCHANGING THE ENERGY CONTAINED IN NORMALLY EXHAUSTED BUILDING OR SPACE AIR AND USING IT TO TREAT THE INCOMING OUTDOOR VENTILATION AIR IN HVAC SYSTEMS.

TRANSPIRED SOLAR COLLECTORS

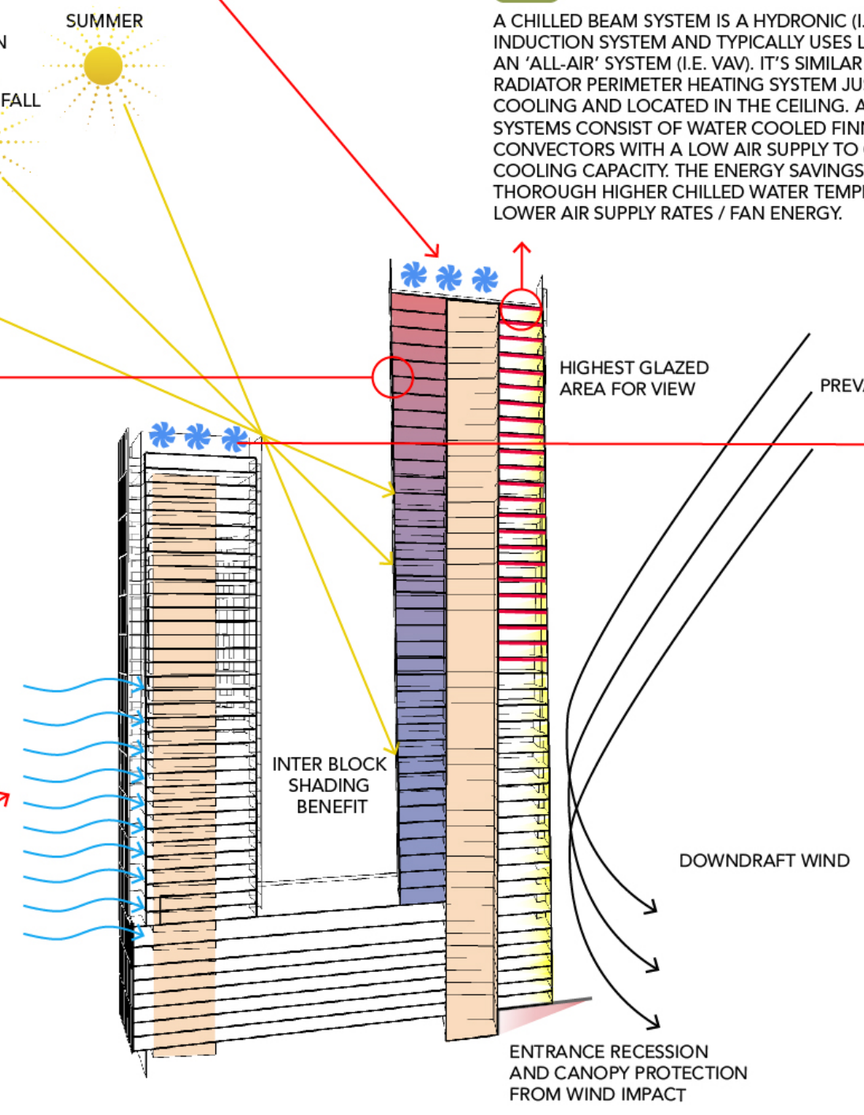
EXPLORING USE OF TRANSPIRED SOLAR COLLECTORS AT INTAKES TO PREHEAT FRESH AIR AND THEREFORE, REDUCE THE NEED FOR ENERGY TO PREHEAT THE AIR.

DEMAND CONTROLLED VENTILATION

THE FAN SPEED IS CONTROLLED BY THE PERCENT OF CO2 IN THE EXHAUST STREAM: THE MORE THE CO2, THE FASTER THE FAN RUNS ON THE FRESH AIR SIDE TO SUPPLY MORE FRESH AIR.

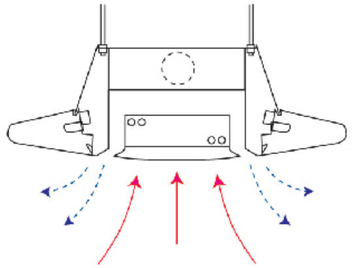
NATURAL VENTILATION

HIGH AND LOW LEVEL OPERABLE OPENINGS IMPROVE NATURAL VENTILATION FOR RESIDENTIAL TOWERS



ACTIVE CHILLED BEAM SYSTEMS

A CHILLED BEAM SYSTEM IS A HYDRONIC (I.E. WATER) INDUCTION SYSTEM AND TYPICALLY USES LESS ENERGY THAN AN 'ALL-AIR' SYSTEM (I.E. VAV). IT'S SIMILAR TO A FIN TUBE RADIATOR PERIMETER HEATING SYSTEM JUST USED FOR COOLING AND LOCATED IN THE CEILING. ACTIVE CHILLED BEAM SYSTEMS CONSIST OF WATER COOLED FINNED TUBE CONVECTORS WITH A LOW AIR SUPPLY TO GET THE HIGHEST COOLING CAPACITY. THE ENERGY SAVINGS ARE REALIZED THOROUGH HIGHER CHILLED WATER TEMPERATURES USED AND LOWER AIR SUPPLY RATES / FAN ENERGY.



LOW PRESSURE FANS

BALANCE FAN PRESSURE WITH DUCT SIZING TO OPTIMIZE VENTILATION SYSTEM AND LOWER ENERGY USE.

VARIABLE SPEED DRIVES

VSDS ALLOWS SYSTEMS TO RESPOND TO DEMAND AND SAVE ENERGY.

WATER

RAINWATER COLLECTED AND REUSED FOR COOLING TOWER MAKE-UP WATER.

LIGHTING CONTROL

ENERGY EFFICIENT LIGHTING CONTROLS. PHOTOSENSORS WITH DIMMABLE SWITCHES IN DAYLIGHT ZONE AND OCCUPANCY SENSORS THROUGHOUT.

Redevelopment of Government Center Garage
Boston, MA

Figure 4.8

Sustainability Diagram - Potential Sustainable Measures

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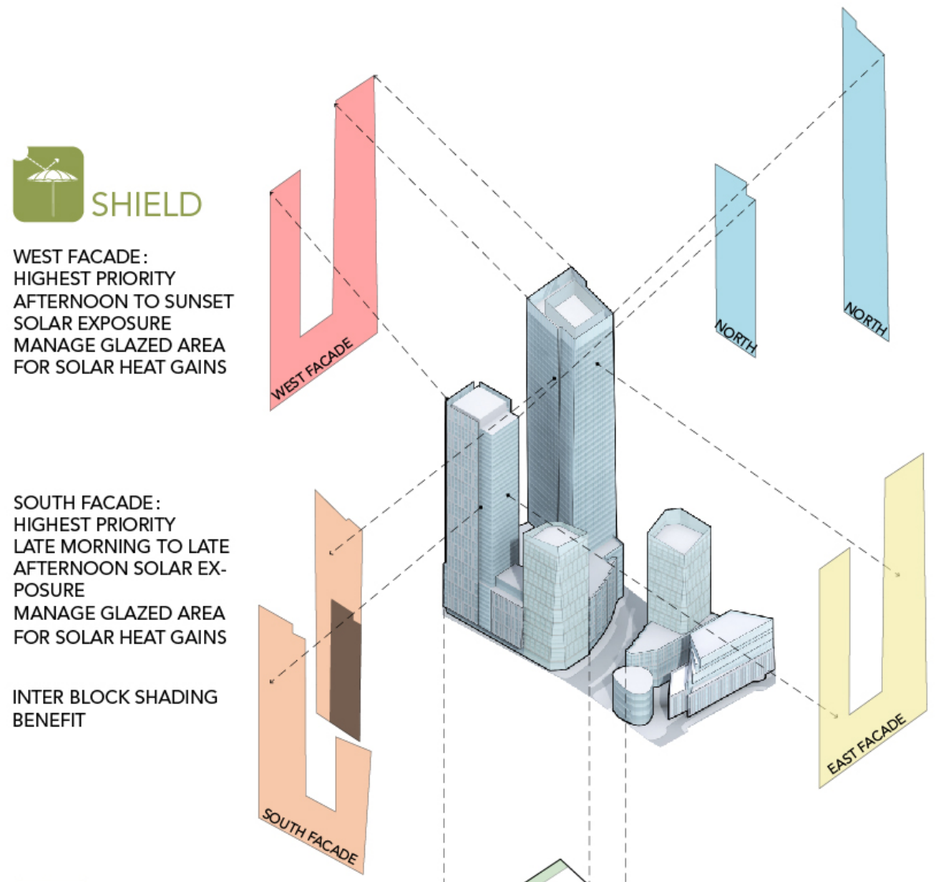

SHIELD

WEST FACADE:
HIGHEST PRIORITY
AFTERNOON TO SUNSET
SOLAR EXPOSURE
MANAGE GLAZED AREA
FOR SOLAR HEAT GAINS

SOUTH FACADE:
HIGHEST PRIORITY
LATE MORNING TO LATE
AFTERNOON SOLAR EX-
POSURE
MANAGE GLAZED AREA
FOR SOLAR HEAT GAINS

INTER BLOCK SHADING
BENEFIT

SHIELD

NORTH FACADE:
LOW PRIORITY
LEAST SOLAR EXPOSURE
HIGHEST GLAZED AREA
FOR VIEW
NATURAL DAYLIGHT AND
LOW SOLAR HEAT GAINS

EAST FACADE:
HIGH PRIORITY
MORNING SOLAR EXPOSURE
MANAGE GLAZING AREA FOR
SLOAR HEAT GAINS

GREEN ROOF

NATIVE AND ADAPTED PLANTING
LOWER WATER DEMAND
REDUCED HEAT ISLAND EFFECTS
REDUCED STORM WATER GENERATION
REDUCED PEAK RUNOFF
IMPROVED THERMAL PERFORMANCE
IMPROVED ACOUSTIC PERFORMANCE
IMPROVED BIODIVERSITY

SOLAR PV

90KW SOLAR PV ARRAY TO
PRODUCE ELECTRICITY FOR
PUBLIC PLAZA SITE
LIGHTING

Redevelopment of Government Center Garage
Boston, MA

Figure 4.9

Sustainability Diagram - Building Envelopes

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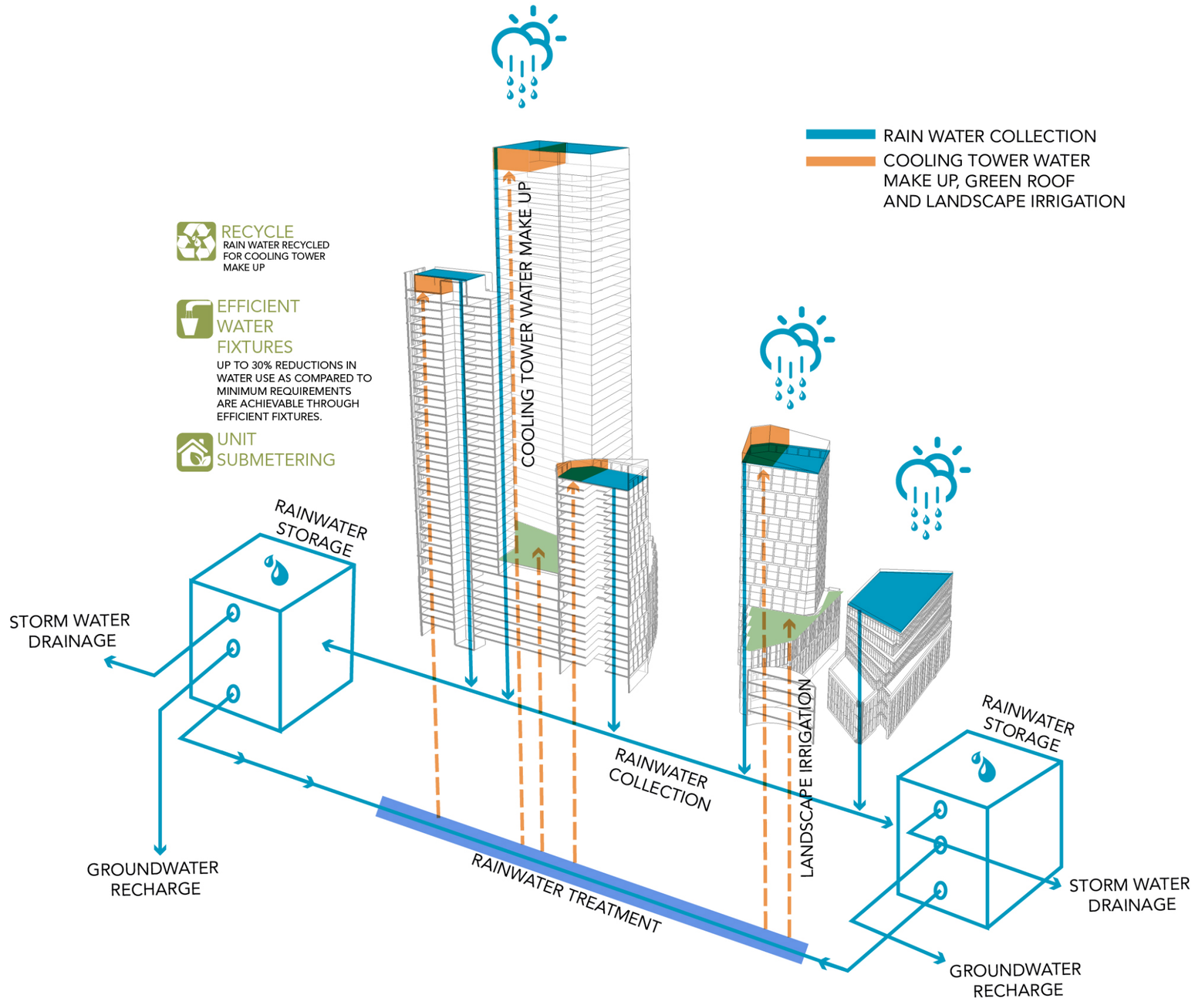

Redevelopment of Government Center Garage
Boston, MA

Figure 4.10

Sustainability Diagram - Water

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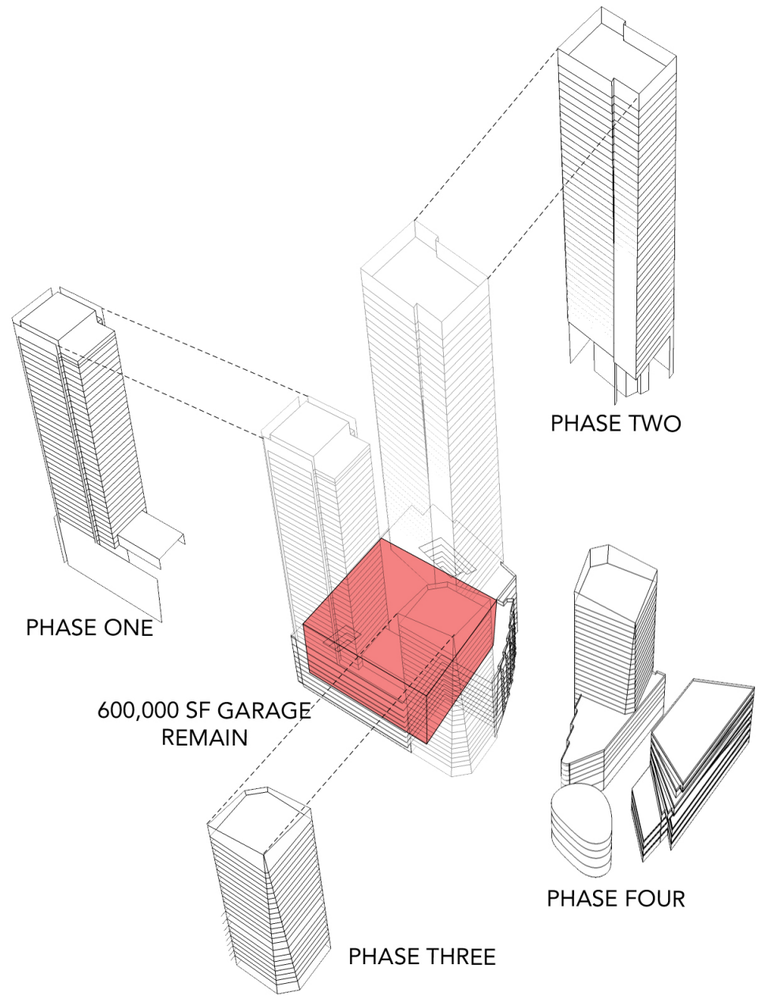

TO DEMOLISH THE 476,000 SF GARAGE:	**6,300,000 MILLION BTU**
TO REBUILD THE 476,000 SF GARAGE:	**462,000,000 MILLION BTU**
TOTAL EMBODIED ENERGY SAVED:	**468,300,000 MILLION BTU**
AMOUNT OF GAS EQUIVALENT:	**4,072,174 GALLONS**

SOURCE: www.thegreenestbuilding.org

Redevelopment of Government Center Garage
Boston, MA

Figure 4.11

Sustainability Diagram -
Embodied Energy

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5 Infrastructure

5.1 Introduction

This section identifies the infrastructure needs of the Project and describes the systems that will support the Project. The Project will use the existing water, sewer, electrical and natural gas systems available in public streets adjacent to the Project Site. These systems include those owned or managed by the Boston Water and Sewer Commission (BWSC), private utility companies, and on-site infrastructure systems. Research indicates that these services are available at the site frontage. All system availabilities will be further defined through coordination with the utility authorities as the project design progresses. Figure 5.1 shows the existing sewer and water lines as well as other utilities that serve the Project Site.

5.2 Sanitary Sewer

Local sanitary sewer service is provided by BWSC via the following systems:

- An 18-inch sanitary sewer located in New Sudbury Street and Merrimac Street (also known as Congress Street for this portion of the roadway), which flows to the Merrimac Street/New Chardon Street intersection, ultimately connecting to the West Side Interceptor.
- 12-inch sanitary sewers in Bowker Street that connect to a 15-inch sanitary sewer in New Chardon Street that ultimately connects to the West Side Interceptor.
- Both sanitary sewer systems eventually discharge to the Deer Island Treatment Plant for treatment and disposal.

The Proponent will coordinate with BWSC on the design and capacity for proposed connections to their sewer systems. In addition, the Proponent will submit a General Service Application and site plan to the BWSC for review as project design progresses. Table 5-1 presents a summary of wastewater generation by Project Component.

Table 5-1
Net New Wastewater Generation

Building	Use	Quantity	Flow Rate (gpd)	Sewage Generation (gpd)
New Project-Related Sewage Generation				
West Parcel				
WP-B1	Residential	403	110/bdrm	44,330
	Retail	2,350	50/1,000 sf	118
WP-B1 Total				*44,448*
WP-B2	Office	1,186,500	75/1,000 sf	88,988
	Retail	9,050	50/1,000 sf	453
WP-B2 Total				*89,441*
WP-B3	Residential	248	110/bdrm	27,280
	Retail	8,400	50/1,000 sf	420
WP-B3 Total				*27,700*
East Parcel				
EP-B1	Residential	120	110/bdrm	13,200
	Hotel	204	110/room	22,440
	Retail	17,400	50/1,000 sf	870
EP-B1 Total				*36,510*
EP-B2	Office	116,800	75/1,000 sf	8,760
	Retail	20,300	50/1,000 sf	1,015
EP-B2 Total				*9,775*
EP-B3	Retail	25,000	50/1,000 sf	1,250
EP-B3 Total				*1,250*
Total New Project-Related Sewage Generation				209,124
Existing Sewage Generation to be Removed				
Existing Garage	Office	256,000	(75/1,000sf)	(19,200)
	Retail	37,100	(50/1,000sf)	(1,855)
Existing Total				*(21,055)*
Total Existing to be Removed				(21,055)
Net New Wastewater Generation				188,069

In total, the Project will generate an estimated 188,000 gallons per day (gpd) of new wastewater flows. As shown in Table 5-1, WP-B2 generates approximately 89,500 gpd, which exceeds the 50,000 gpd trigger requiring a Sewer Connection Permit from the DEP. Under current regulations, the other Project Components would only require either DEP Self-certifications or BWSC approval.

Sanitary sewer connections for the Project are likely to be on New Chardon Street, Merrimac Street, Congress Street and New Sudbury Street. The sanitary sewers are available along the frontage and should be available at numerous locations. Individual building connections will be determined as each phase advances and will be included in subsequent Article 80 and BWSC filings.

5.3 Water Supply

Domestic and fire protection water at the Project Site is provided by BWSC in the following streets and sizes:

- A 16-inch fire service main in New Sudbury Street;
- A 12-inch Southern High (SH) main in New Sudbury Street;
- A 12-inch Southern Low (SL) main in New Sudbury Street;
- A 16-inch fire service main in Merrimac Street;
- A 12-inch SH main in Merrimac Street/Congress Street;
- A 12-inch SL main in Merrimac Street/Congress Street;
- A 16-inch fire service in New Chardon Street (westerly of Merrimac Street);
- A 12-inch fire service in New Chardon Street (easterly of Merrimac Street);
- A 30-inch SL main in New Chardon Street (westerly of Merrimac Street);
- A 12-inch SL main in New Chardon Street (easterly of Merrimac Street);
- A 16-inch SH main in New Chardon Street (westerly of Merrimac Street);
- A 12-inch SH main in New Chardon Street (easterly of Merrimac Street);
- 12-inch SH mains in Bowker Street; and
- 12-inch and 8-inch SL mains in Bowker Street.

Domestic water and fire protection connections will be provided via the 12-inch and 16-inch mains. The larger mains provide local area supply and capacity for the system as a whole.

Domestic water demand is based on estimated sewage generation with an added factor of 10 percent for consumption, system losses and other use. Based upon sewage generation rates outlined in the DEP Sewer Connection and Extension Regulations, 310 CMR 15.203.f, the Project will require approximately 207,000 gpd.

As discussed in the stormwater section below and sustainability sections of this report (Chapter 4, *Environmental Protection*), the Proponent will be actively exploring means to reduce domestic water demand, including the harvesting of rain water for mechanical uses and irrigation and the careful selection of plumbing fixtures.

5.4 Stormwater Management

The Project is located in a densely developed area consisting primarily of impervious rooftops and impervious paved surfaces. BWSC owns and maintains an extensive system of catch basins, manholes and drain pipes in the area immediately adjacent to the Project Site. This system of pipes, catch basins and manholes drains to specific areas within the Charles River Watershed.

The storm drainage system serving the Project Site drains primarily to the Charles River. The surface drainage for New Sudbury Street, Merrimac Street/Congress Street, New Chardon Street and Bowker Street drains to Combined Sewer Outfall (CSO) 049 in Charles River near the Nashua Street Jail.

Targeting the treatment of the first inch of stormwater runoff per BWSC requirements, equivalent to an estimated volume of 14,700 cubic feet, the Project is exploring the use of stormwater control measures, as follows:

- *Subsurface infiltration systems* – the Proponent is considering the use of sub-grade, precast concrete infiltration systems, designed to detain and infiltrate stormwater runoff from both impervious and pervious surfaces.

- *Green roofs* – the Proponent is considering the establishment of green roofs.
- *Rainwater harvesting* – the Proponent is considering the harvesting of roof runoff for use in mechanical make-up water, and irrigation.
- *Tree pit filters* - the use of tree pit filtration along curb lines is being considered as a method to improve road runoff water quality.
- *Proprietary treatment devices* – proprietary filter devices (i.e. JellyFish, Vortechnics, etc.) may also be used as a method to improve stormwater quality.

In addition to these measures, the design team will be exploring ground-level stormwater management control measures, such as bioretention swales, tree pit filters, and landscaped planter areas. Proposed stormwater management controls will be established in compliance with BWSC standards.

Given that, under existing conditions, the Project Site is virtually impervious, the Project is not expected to result in the introduction of any additional peak flows, volumes, pollutants or sediments that would potentially impact the receiving waters of the BWSC's stormwater drainage system.

5.5 Utilities

■

5.5.1 Energy

Gas service at the Project Site is provided by National Grid in Sudbury Street, New Chardon Street and Bowker Street. National Grid has three existing gas mains that could potentially service the Project: a 6-inch main in Bowker Street, a 6-inch main in New Chardon Street and a 16-inch main in New Sudbury Street. Depending on the source of energy selected for the Project Components, the total net new natural gas demand for the Project could be approximately 92,800 cubic feet per hour (CFH) and is broken down as follows:

- WP-B1 – 18,000 CFH
- WP-B2 – 37,000 CFH
- WP-B3 – 13,000 CFH
- EP-B1 – 16,000 CFH
- EP-B2 – 6,000 CFH
- EP-B3 – 2,800 CFH

As each of the Project Components progress, the Proponent will coordinate with National Grid to further define the service requirements. Should the Proponent elect to use steam as an energy source, natural gas demand would be reduced.

NSTAR operates underground electric systems in Merrimac Street/Congress Street, New Chardon Street, New Sudbury Street, Bowker Street and Hawkins Street. These systems include primary power serving an existing electrical substation on Hawkins Street. The total electrical demand associated with the Project is estimated at 22,700 kW and is broken down as follows:

- WP-B1 – 4,000 kW
- WP-B2 – 11,600 kW
- WP-B3 – 2,400 kW
- EP-B1 – 2,800 kW
- EP-B2 – 1,400 kW
- EP-B3 – 500 kW

As the design of the Project Components progress, the Proponent and NSTAR will coordinate the final design and installation of electrical service.

■

5.5.2 Telecommunications

The Proponent will select private telecommunications companies to provide telephone, cable and data services. There are several potential candidates with substantial downtown Boston networks capable of providing service and there are numerous duct bank systems in the streets abutting the Project Site. Upon selection of a provider or providers, the Proponent will coordinate service connection locations and obtain appropriate approvals.

■

5.5.3 Steam

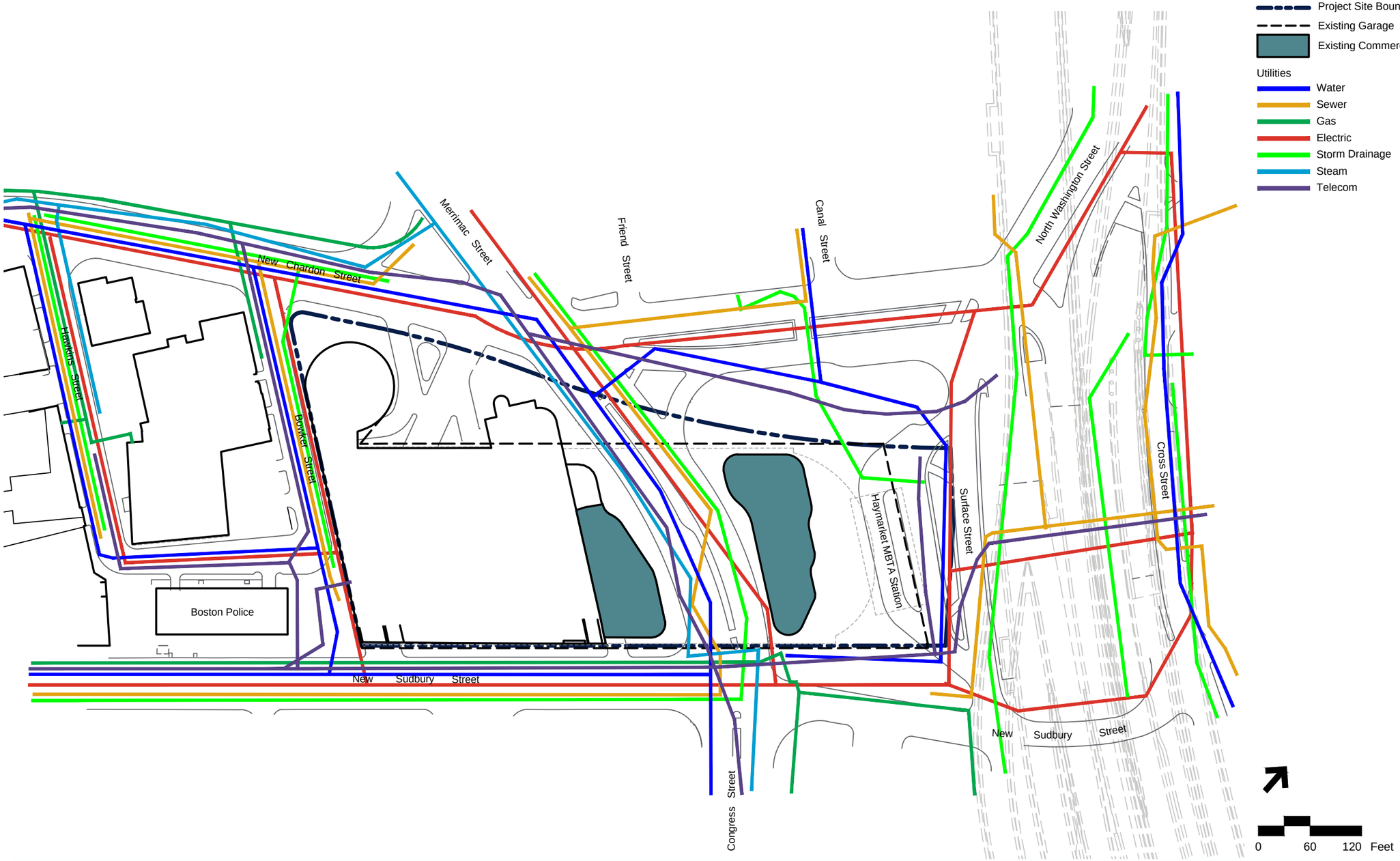
Veolia/Trigen owns underground steam system in the area including the following:

- A 14-inch main in Merrimac Street/Congress Street;
- A 12-inch main in New Chardon Street;
- A 6-inch main in Bowker Street.

As the design progresses, the Proponent and Veolia/Trigen will coordinate the final design and installation of steam infrastructure should the Proponent elect to use Veolia/Trigen steam for heating and/or hot water needs. Should steam be selected as an energy source, natural gas demand will be reduced accordingly. The estimated steam demand for the Project would total 70,200 pounds per hour (lb/hr) and is broken down as follows:

- WP B1 – 14,600 lb/hr
- WP B2 – 35,600 lb/hr
- WP B3 – 9,200 lb/hr
- EP B1 – 4,200 lb/hr
- EP B2 – 5,800 lb/hr
- EP B3 – 800 lb/hr

\\vhb\proj\Boston\11679.00\graphics\FIGURES\PDA\Existing Utilities.dwg



Redevelopment of Government Center Garage
Boston , MA

Figure 5.1
Existing Utilities

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.

6 Historic Resources

6.1 Introduction

This chapter provides information on the inventoried and listed historic properties that are on and within a ¼-mile radius of the Project Site and possible impacts to them as a result. Inventoried and listed property information was obtained from the Boston Landmarks Commission (BLC), the Massachusetts Historical Commission (MHC), and the Massachusetts Cultural Resource Information System (MACRIS), the MHC on-line database.

6.2 Historical Context

The area in which the Project Site is located is in the 1964 Government Center Urban Renewal District, which was the focus of clearance and new construction for a nexus of local, state, and federal government offices and other related facilities in the 1960s and 1970s. The Project Site is surrounded by numerous historic neighborhoods and districts of Boston, including the Bulfinch Triangle to the north, the North End to the east, and Government Center and Faneuil Hall to the south.

6.3 Historic Resources in the Vicinity of the Project Site

The inventoried and listed districts and properties on and within a ¼-mile radius are shown on Figure 6.1. The table provided in Attachment 3 lists these resources with more detailed information (e.g., address). The list is arranged by the following designations:

- National Register districts
- MHC inventoried areas (documented on Form A or a BLC street inventory form)
- National Register individually listed properties
- MHC individually inventoried properties, outside of the North End
- MHC individually inventoried properties within the North End (that are within the ¼-mile radius)

For greater context, Figure 6.2 identifies all of the inventoried properties within the ¼-mile radius as well as National-Register listed properties within a larger area of the downtown area.

■

6.3.1 Government Center Garage (BOS.2024)

The Government Center Garage (BOS.2024) was inventoried by the BLC in 1980. Additional information on the building and a consultant evaluation of possible significance when it reaches the age of 50 years (2016) was provided in an updated form completed in June 2009 for the BLC.

The building, which dates to 1966, was jointly designed by Saul Glaser & Associates and Boston City Hall's architects, Kallman, McKinnell & Knowles. The large scale building with some ground-level retail covers two city blocks and spans Congress Street. Designed in the Brutalist style, the building is composed of pre-cast concrete elements that include beams, columns piers, and spandrels.

The MBTA Haymarket Station on the East Parcel has been assigned two MHC #s (BOS.920 and BOS. 923), but no forms were found at either the BLC or the MHC. The station elements were recorded as part of the MBTA Phase I Survey. The date assigned to BOS.920 is 1905, while BOS.923 has a date of 1898. These construction dates certainly do not correspond to the above-ground infrastructure of the station, which dates to the 1960s and more recent alterations.

There are no previously documented archaeological resources in or adjacent to the Project Site. As the Project Site consists of a building from 1966, it is assumed that there is no potential for archaeological resources on the Project Site as a result of extensive ground disturbance.

■

6.3.2 Other Adjacent and Nearby Inventoried and Listed Properties

There are previously inventoried and listed properties near the Project Site, largely due to the fact that buildings and structures in downtown Boston were extensively documented in the 1980s by the BLC with additional documentation update efforts in more recent years. A small number of these properties, and largely only inventoried, are adjacent to the Project Site.

Only one National Register of Historic Places district is adjacent to the Project Site: the Bulfinch Triangle Historic District. This district is directly north of the Project Site (Figure 6.1). The district contains a collection of mainly late 19th and early 20th century brick warehouse and commercial buildings.

Directly west of the Government Center Garage on the west side of Bowker Street are four inventoried properties: the District 1 Police Station (BOS.2023), a 1968 structure which fronts on Sudbury Street; the Temporary Home for Women (BOS.1904) at 40-50 Bowker Street, which dates to 1924; Overseers of the Public Welfare Building (BOS. 1783) which carries the address of 35 Hawkins Street and also dates to 1924; and the Boston Edison substation (BOS.948) at 33 Hawkins Street, which was built in 1927 (Figure 6.1). In previous reviews of the Project Site, MHC stated that the last two named properties (Overseers of the Public Welfare Building and the Boston Edison Substation) were eligible for the National Register of Historic Places under Criterion A (association with significant events) at the local level (Brona Simon to Secretary Ian A. Bowles, April 21, 2009).

South of the Project Site is the John F. Kennedy Federal Office Building (BOS.1617), which also dates to 1966 and shares the mid-20th century urban renewal story of this area (Figure 6.1). The building has not been subject to an official evaluation of its National Register eligibility, due to its age.

6.4 Potential Impacts to Historic Resources

As described previously in Chapter 1, *Project Description*, the Project will remove, in planned phases, the eastern half of the Garage, which is an inventoried property. The remaining western portion of the Garage on the West Parcel will be enclosed on three sides by new building or facades. The remaining side facing Bowker Street will remain partially open. The property has not been subjected to an official evaluation of its historic significance due to its relatively recent date of construction.

Based on preliminary analyses, potential impacts of the new buildings on historic resources in the vicinity of the Project have been considered and are discussed in the following sections. As each Project Component is designed and submitted for BRA review and approval under the Article 80B, Large Project Review of the Zoning Code, a more refined understanding of potential impacts on historic resources will be presented. Specific measures intended to mitigate, limit, or minimize impacts, where appropriate, as required by local, state, and federal regulation will also be included in these documents.

■

6.4.1 Pedestrian Wind

Chapter 4, *Environmental Protection* presents a qualitative assessment of changes to pedestrian wind conditions due to the Project. Existing uncomfortable wind activity occurs at the southwest and northeast corners of the building, due to site exposure and/or adjacent tall buildings. Based on the wind impact assessment, the Proponent and design team are aware of the potential for high wind activity and/or channeling flows. A key goal of project design is to continue to assess potential wind impacts in order to mitigate such potential wind impacts through design. Special attention will be given to potential wind impacts on nearby historic resources, including Bulfinch Triangle District and Bowker Street properties west of the Project Site.

Each Project Component will undergo Article 80B, Large Project Review under BRA requirements, which will include a complete pedestrian wind analysis demonstrating anticipated wind conditions. Where required, mitigation concepts will be considered and evaluated.

■

6.4.2 Shadow

The following sections discuss the potential new shadow anticipated on some of the adjacent inventoried and listed properties based on the preliminary shadow impact assessment conducted for the Project, as presented in Chapter 4, *Environmental Protection*. It should be noted that the architecture will be refined and will likely change as project design progresses; therefore, the results of this shadow analysis must be considered as preliminary and approximate.

6.4.2.1 West Parcel Building 1 (WP-B1)

The shadow impact assessment indicates that WP-B1 will only have a partial shadow impact on the Government Center Garage (BOS.2024) at the spring equinox on March 21st (Figure 4.2a)

At the summer solstice (June 21st) there will be a partial shadow impact in the morning only on the Overseers of the Poor building (BOS.1783) on Hawkins Street; the Temporary Home for Women buildings (BOS.1984) on Bowker Street; and the O'Neal Building (BOS.1903) on New Chardon Street. A small portion of the southwest end of the Government Center Garage (BOS.2024) will be affected at all times during the day (Figure 4.2b).

At the fall equinox (September 21st), this phase will have partial shadow impacts in the morning only on the courtyard of the Lindemann Mental Health Center (BOS.1618) and the Government Center Garage (BOS.2024) (Figure 4.2c).

A small section of the Bulfinch Triangle Historic District, along Portland Street, the Government Center Garage (BOS.2024), and possibly some individually inventoried properties in the North End will be partially impacted by shadow at the winter solstice (December 21st) (Figure 4.2d). Properties in the North End will only be impacted in the late afternoon.

6.4.2.2 West Parcel Building 2 (WP-B2)

WP-B2 will have partial shadow impacts in the morning only on a small portion of the Bulfinch Triangle Historic District at the spring equinox on March 21st (Figure 4.3a). A small number of properties in the North End and a portion of the Government Center Garage (BOS.2024) will be impacted in the late afternoon.

At the summer solstice (Figure 4.3b), only a small portion of the courtyard of the Lindemann Mental Health Center (BOS.1618) will have shadow impacts in the morning. A small section of the Government Center Garage (BOS. 2024) will be affected in the afternoon.

A small section of the Lindemann Mental Health Center (BOS. 1618) will receive new shadow in the morning only at the fall equinox (September 21st). Small sections of the Bulfinch Historic District will receive new shadow in the afternoon (12 p.m. and 3 p.m.). The Government Center Garage (BOS. 2024) will receive a small amount of shadow in the late afternoon (Figure 4.3c).

At the winter solstice, small sections of the Bulfinch Triangle Historic District will receive new shadow, largely to the south edge of the district along New Chardon Street. Individual properties in the North End will only receive new shadow in the late afternoon (Figure 4.3d).

6.4.2.3 West Parcel Building 3 (WP-B3)

At all four times of the year that were studied (spring equinox, summer solstice, fall equinox and winter solstice), WP-B3 will not result in any new shadow on inventoried and listed properties that are in or adjacent to the Project Site (Figure 4.4a-through 4.4d) with the exception of a small section of the remaining sections of the Government Center Garage (BOS. 2024).

6.4.2.4 East Parcel

The three East Parcel Project Components (EP-B1, EP-B2, and EP-B3) will only add new shadow on the Bulfinch Triangle Historic District at the winter solstice (December 21st) in the morning only (Figure 4.5d). At no other times of the year are inventoried or listed historic properties affected by this phase of development (Figures 4.5a through 4.5d).

■

6.4.3 Traffic

There will be additional traffic on Bowker Street, the short street between New Chardon and Sudbury Streets just west of the Government Center Garage (BOS. 2024), as a result of new entrance/egress and loading dock proposed on Bowker Street. Additional traffic on this street is not anticipated to have an effect on the inventoried properties on Bowker Street as the presence of additional cars will not have an adverse visual or audio effect on the properties.

■

6.4.4 Views

Views of the existing garage structure from the National Register-listed Bulfinch Triangle Historic District were not among the characteristics for which the resource was listed. Therefore, the Project is not expected to have a negative view impact in the historical context of the Bulfinch Triangle Historic District.

Views of the Project from the Bowker and Hawkins Street properties will not affect these properties as any significance they might possess does not include their setting. Additionally, their current setting has been greatly altered since their original construction.

The removal of sections of the Government Center Garage (BOS. 2024) over Congress Street and the opening up of the East Parcel with a new public plaza provides a significant public benefit. As discussed further in Chapter 2, *Urban Design* and illustrated in Figures 2.6a and 2.6b, removal of a portion of the existing garage structure will have a positive effect where new pedestrian views of the National Register-listed Custom House Tower in the Financial District will be gained.

6.5 Coordination of Historic Resource Reviews

■

6.5.1 Boston Landmarks Commission

The BLC will review the proposed demolition of the garage structure through the Article 85 Demolition Delay Review ("Article 85 review") and the proposed Project Components through the Chapter 254 review. The Chapter 254 review is briefly described below in under Section 6.5.2 below.

Every building in Downtown Boston, regardless of its age, that is proposed for demolition is subject to the Article 85 review, which seeks to provide a predictable process for reviewing requests to demolish buildings. The Proponent will follow the requirements of the Article 85 review when project planning and timing requires the submission of an Article 85 application to the BLC.

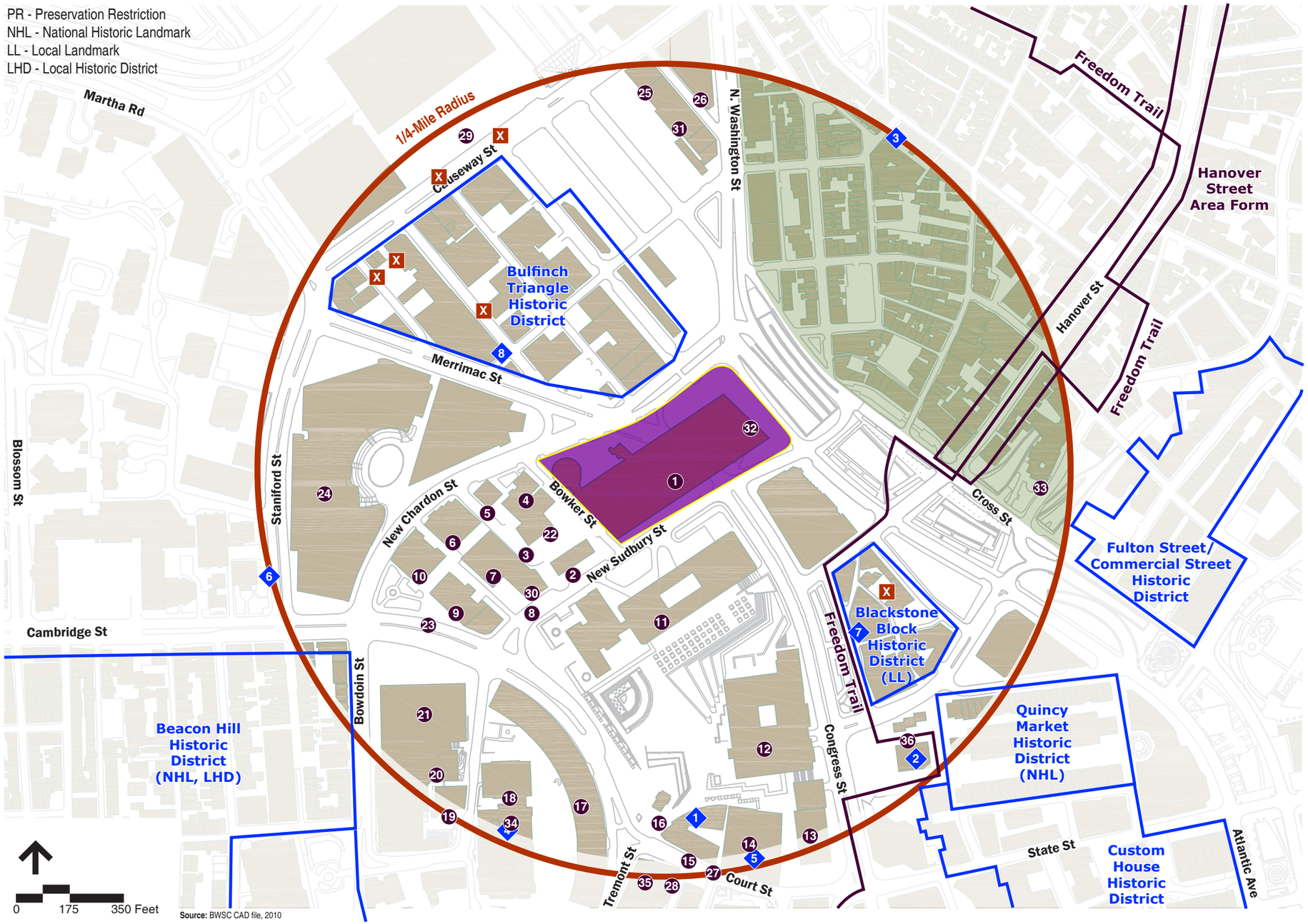
■

6.5.2 Massachusetts Historical Commission

The Proponent will consult with the MHC if there is state or federal involvement in the Project. State involvement in a project triggers a review of project impacts and consultation with the MHC, in addition to the BLC, as required by MGL Chapter 9 Section 27 C (known commonly as Chapter 254), which requires that all projects with involvement of state bodies be reviewed by the MHC to identify potential impacts to historic and archaeological resources included in the State Register of Historic Places.

Federal involvement in a project triggers Section 106 of the National Historic Preservation Act of 1966, as amended (commonly known as Section 106, which requires federal agencies (such as the Army Corps of Engineers) to take into account the effects of their undertaking (permits, funding, licensing, approvals) on historic properties. MHC is involved in this review as a consulting party and is requested by the federal agency to concur on National Register eligibility and project impacts determinations.

The Proponent will submit appropriate documentation to begin these reviews when project planning and timing requires these submissions.



Project Site
National Register Historic Districts
MHC Inventoried Area

National Register Individually Listed Properties
1. Sears Crescent and Block
2. Faneuil Hall (NHL, PR, LL)
3. Vermont Building
4. John Adams Courthouse
5. Ames Building (LL)
6. Old West Church (NHL, PR)
7. Union Oyster House (NHL, LL)
8. 138-142 Portland Street

MHC Individually Inventoried Properties
1. Government Center Parking Garage
2. District 1 Police Station
3. Boston Edison Substation
4. Overseers of the Public Welfare Building
5. O'Neal Building (Jewish Family and Children's Services)
6. Royal Globe Insurance Company
7. R.K.O. General Building
8. One Bulfinch Place
9. New England Telephone and Telegraph
10. Bulfinch Building
11. JFK Federal Building
12. Boston City Hall
13. New England Merchants National Bank
14. One Washington Mall
15. City Bank and Trust Building
16. Government Center MBTA Station
17. One, Two and Three Center Plaza
18. Suffolk County Courthouse Addition
19. Metropolitan District Commission Building
20. McCormack Office Building
21. Leverett Saltonstall Building
22. Temporary Home for Women
23. Bowdoin Street MBTA Station
24. Lindemann Mental Health Center
25. Dow Braman and Company Building
26. Keaney Square Building
27. Old Colony Trust Building
28. United States Trust Company Building
29. North Station MBTA Substation and Signal Tower
30. Capital Bank Building
31. 6-24 Medford Street
32. Haymarket MBTA Station
33. Traffic Tunnel Administration Building
34. Rufus Choate Statue
35. Hemenway Building
36. Faneuil Hall Greenhouses

X MHC Individually Inventoried Properties Demolished
North End - Please see Table 6-1 for list of properties

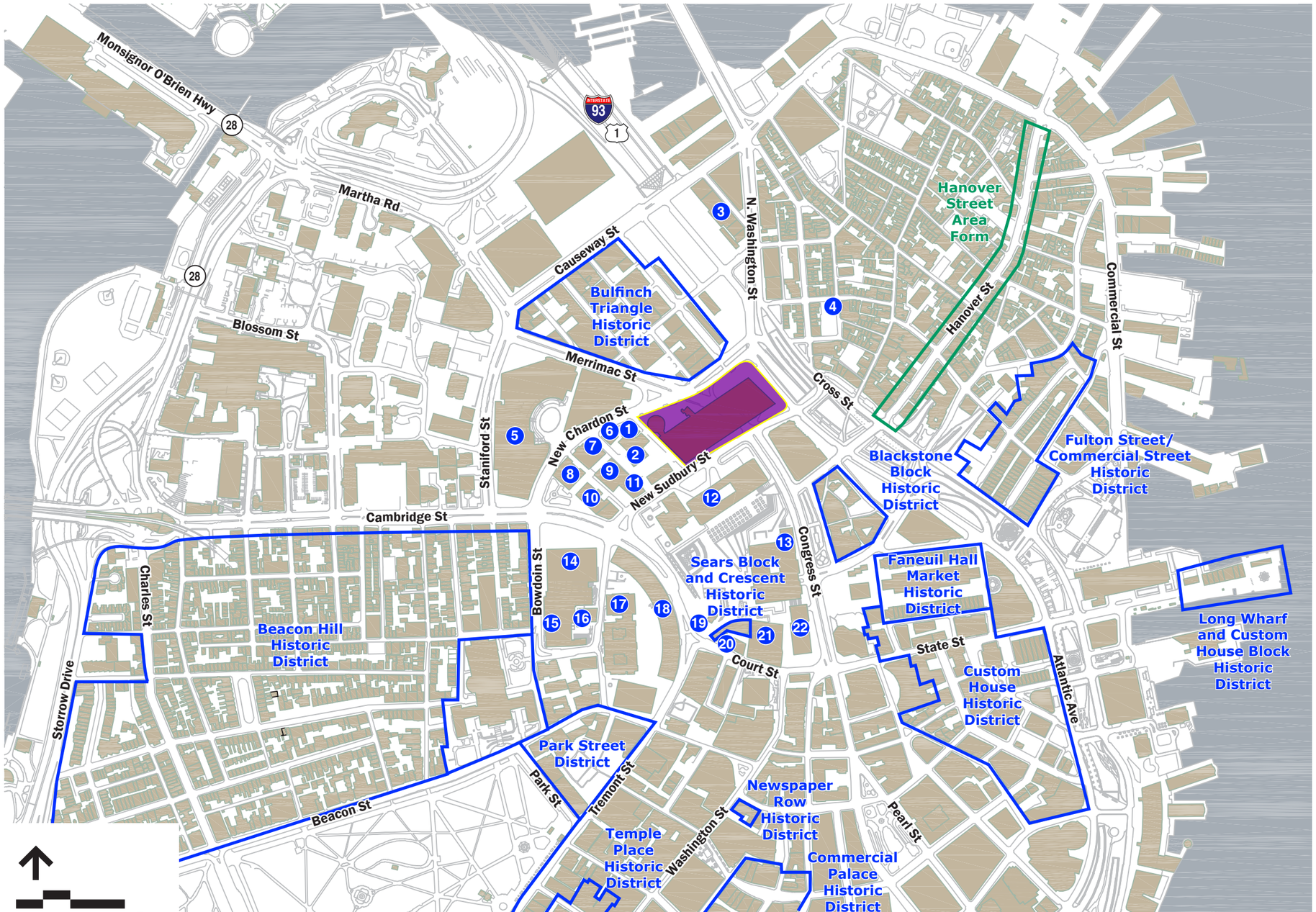
Redevelopment of Government Center Garage
Boston, MA

Figure 6.1

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.

Historic Resources
Inventoried and National Register Listed Properties and Districts within a 1/4-Mile Radius of Project Site



Source: BWSC CAD file, 2010

Redevelopment of Government Center Garage
Boston, MA

Figure 6.2

THE HYM INVESTMENT GROUP, LLC

VHB Vanasse Hangen Brustlin, Inc.

Historic Resources
National Register Districts and Individual Properties

7

Project Certification

This Project Notification Form has been submitted to the Boston Redevelopment Authority, as required by Article 80 of the Zoning Code, on the 5th of June, 2013.

Proponent
The HYM Investment Group, LLC

Thomas N. O'Brien
Managing Director

Preparer
Vanasse Hangen Brustlin, Inc.

Lauren DeVoe, AICP, LEED AP BD+C
Senior Environmental Planner

Attachment 1: Letter of Intent

THE
HYM
INVESTMENT GROUP, LLC

June 21st, 2011

BY HAND

Peter Meade, Director
Boston Redevelopment Authority
9th Floor City Hall
One City Hall Plaza
Boston, MA 02201-1007

Re: Letter of Intent to File Project Notification Form
Government Center Garage Project

Dear Mr. Meade:

In accordance with the Executive Order of Mayor Thomas M. Menino entitled "An Order Relative To The Provision Of Mitigation By Development Projects In Boston" and Article 80 of the Boston Zoning Code ("Code"), this Letter of Intent is submitted to the Boston Redevelopment Authority ("BRA") on behalf of Bulfinch Congress Holdings LLC ("BCH"), represented by The HYM Investment Group, LLC, for the Government Center Garage Project ("Proposed Project").

The Proposed Project involves the redevelopment of the Government Center Garage, which consists of a site area of approximately 176,549 square feet (approximately 4.053 acres) and an existing 11-story parking garage and commercial office structure with approximately 2,300 parking spaces and 283,000 square feet of office and retail space. The proposed phased redevelopment of the existing structure will consist of a new mixed-use, multi-phased and multi-story development project for residential, office, retail, transportation and hotel uses, totaling approximately 2,400,000 square feet of floor area, over a reconstructed and integrated parking facility. The Proposed Project will require zoning relief under the Code.

This Letter of Intent and the Project Notification Form that will be filed for the Proposed Project will supersede and replace the prior proposal, submitted for the garage site in 2008. The project now proposed for BRA review will provide the following improvements and benefits to the area:

1. The Proposed Project will remove the unsightly barrier of the Government Center Garage from its current prominent position over Congress Street and close to the Rose Fitzgerald Kennedy Greenway.

2. The Proposed Project will contain a dynamic and strong first-floor retail program that will enhance and connect the City's emerging Market District.

One Congress Street, 10th Floor, Boston, MA 02114 ▪ P. 617.248.8905 ▪ F. 617.248.8958 ▪ www.hyminvestments.com

3. The Proposed Project will enhance the existing pedestrian flow and create new pedestrian corridors which will enliven the connections among the neighborhoods of the West End, North End, Beacon Hill and Government Center.

4. The Proposed Project will have a major residential component which will bring additional residents to an immediate area that often has little activity after 5:00 pm.

5. The Proposed Project will create several thousand construction jobs and millions of dollars of new tax revenue for the City at a time when both are needed.

6. The Proposed Project will be guided by many of the principles established by the BRA in both the Crossroads initiative and the Greenway District Planning Study.

7. The Proposed Project will employ a multi-phased development approach and schedule that will allow the construction of major project phases without removing the entire parking structure at any one time and thereby ensuring a continued parking supply for the area.

HYM and BCH look forward to a close working relationship with the BRA, the appointed IAG, the community and city agencies during the Article 80 review of the proposed project.

Thank you for your consideration of this letter.

Very truly yours,

Thomas N. O'Brien
Bulfinch Congress Holdings, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 10th Floor
Boston, MA 02114

cc: Jeffrey J. Kanne
Eva H. Hill
James H. Greene, Esquire

Attachment 2: Transportation Supplemental Information

A2

Transportation Supplemental Information

A2.1 Introduction

This transportation and parking section presents existing and future transportation conditions associated with the proposed Redevelopment of the Government Center Garage project (the "Project") be located on Congress Street in the Government Center area of downtown Boston. This section provides supplemental information to Chapter 3, *Transportation and Parking*, including additional technical analysis

Subsequent to the scoping determination from Boston Redevelopment Authority (BRA) on the Project Notification Form, the Proponent will bring individual components of the overall redevelopment program through the City's review process, as required. The transportation components of this study have been developed in cooperation with the Boston Transportation Department (BTD), the BRA, and the community.

■

A2.1.1 Project Description

A full discussion of the existing Project Site as it relates to traffic and transportation is presented in Chapter 3, *Transportation and Parking* and is not repeated here. Table 3-1 of Chapter 3 presents the existing and proposed uses and development program. In summary, the Project includes residential apartments and condominiums, a hotel, a net increase in retail/restaurant space and a net increase in office space. MBTA Haymarket Station access and egress will be integrated into the new pubic plaza on the East Parcel. Approximately 1,159 vehicle parking spaces in the existing garage structure and approximately 850 secure bicycle parking spaces will be provided on-site.

■

A2.1.2 Methodology

In accordance with the BTD's Transportation Access Plan Guidelines (2001) and the BRA Development Review Guidelines (2006), this report describes roadway, pedestrian, and bicycle conditions; transportation issues; parking and loading; and transportation goals for the proposed Project and adheres to the general format requested by BTD.

Section A2.2 includes an inventory of existing (Year 2013) transportation conditions, with roadway capacities, parking, transit, and bicycle and pedestrian conditions.

Long-term transportation impacts are evaluated in Section A2.3 for Year 2028, based on a 15-year horizon from the existing year (2013). Expected roadway, parking, transit, bicycle, and pedestrian conditions are identified. No-Build conditions, which include general background growth and additional vehicular traffic associated with specific planned developments near the Project Site, are presented in Section A2.3.1. Full-Build conditions, which include specific travel demand forecasts for the Project, are presented in Section A2.3.2. Transportation mitigation measures and travel demand management initiatives are presented in Section A2.4.

■

A2.1.3 Study Area

The study area, coordinated with the BTD, is comprised of 36 intersections listed in Chapter 3, *Transportation and Parking*. The study area intersections are mapped in Figure 3.5.

A2.2 Existing Transportation Conditions

Many aspects of the existing transportation conditions in the study area, including site access, transit, parking, and bicycle facilities, were presented in Chapter 3, *Transportation and Parking* and are not repeated here.

The section below presents information on existing roadway conditions, intersection conditions, traffic volumes, crash data, and level of service results for vehicles and pedestrians.

■

A2.2.1 Existing Roadway Conditions

The primary roadways serving and surrounding the Project Site and the six primary intersections that will carry most of the new Project trips are described below. None of these facilities currently provides bicycle accommodations.

The roadways immediately serving the Project Site include the following facilities, which are categorized according to the Massachusetts Department of Transportation Office of Transportation Planning functional classifications

> **Congress Street** is an urban principal arterial roadway under City of Boston jurisdiction. Congress Street runs in a northwest-southeast direction between New Chardon Street at the Project Site and Northern Avenue in the Seaport district. Although Congress Street is considered by many, and noted in much of this report, as starting at the intersection of New Chardon Street at Merrimac Street, it technically does not continue under the Government Center Garage from New Sudbury Street.

Congress Street generally consists of three travel lanes in each direction within the study area, and parking is prohibited.

New Sudbury Street is an urban principal arterial that falls under the jurisdiction of the City of Boston. New Sudbury Street runs one-way northeast-bound between Cambridge Street and the John F. Fitzgerald Surface Road. New Sudbury Street generally consists of three travel lanes. Parallel and diagonal parking is provided along New Sudbury Street; the diagonal parking is generally reserved for the Boston Police Department and the District Attorney.

New Chardon Street is an urban principal arterial that runs northeast–southwest between Cambridge Street and the intersection of Congress Street and Merrimac Street. New Chardon Street falls under the jurisdiction of the City of Boston. New Chardon Street consists of two lanes in each direction. On-street metered parking is generally provided. On weekdays, a portion of the parking spaces along the south side of the roadway, opposite the Brooke Courthouse, are restricted during peak commuter hours.

John F. Fitzgerald Surface Road (Surface Road) is an urban principal arterial roadway under MassDOT jurisdiction. Surface Road runs one-way southeast-bound along the John F. Fitzgerald Expressway between North Washington Street and Purchase Street, and is separated from Atlantic Avenue, which is one-way northwest-bound, by a landscaped median. Surface Road generally consists of two travel lanes at the Project Site but generally consist of three travel lanes further south. Parking is not permitted for its length.

■

A2.2.2 Existing Intersections Conditions

New Chardon Street/Congress Street/Merrimac Street is an oblique four-way intersection. New Chardon Street approaches the intersection from the east and west, while Congress Street forms the northbound approach and Merrimac Street forms the southbound approach. The New Chardon Street eastbound approach of consists of a 12-foot left-turn/through-lane and a 12-foot through/right-turn lane. An exit for the Government Center Garage is located along the New Chardon Street eastbound approach, approximately 40 feet west of the intersection. New Chardon Street westbound consists of a 10-foot exclusive left-turn lane that is sometimes used for U-turns, a 12-foot left-turn/through-lane and a 12-foot through/right-turn lane. Merrimac Street northbound consists of a 10-foot exclusive left-turn lane, also sometimes used for U-turns, two 10-foot through-lanes, and a 17-foot channelized right-turn lane. Merrimac Street southbound consists of an 11-foot shared left-turn/through lane, an 11-foot through lane, a 10-foot through lane, and a channelized yield controlled right-turn lane. Sidewalks are available along all approaches. Crosswalks and pedestrian ramps are provided across each approach, including across the right-turn slip lanes on Merrimac Street. Median refuges are also provided on the Merrimac Street crossings and at the New Chardon westbound approach. Parking is prohibited in the vicinity of the intersection.

Congress Street/New Sudbury Street is a four-leg signalized intersection with three approaches under BTD jurisdiction. The New Sudbury Street eastbound approach consists a 12-foot exclusive left-turn lane of about 100 feet in length, two 11-foot through lanes, and a 10-foot exclusive right-turn

lane. The Congress Street northbound approach consists of two 11-foot through lanes and a 12-foot shared through/ right-turn lane.
The Congress Street southbound approach consists of a 10-foot exclusive left-turn lane with a storage length of about 100 feet, an 11-foot through lane, and two 10-foot through lanes. Angled parking is provided for Boston Police Department vehicles along the north side of the New Sudbury Street eastbound approach.

New Chardon Street/Canal Street is a three-leg signalized intersection with two approaches and is under BTD jurisdiction. The New Chardon Street eastbound approach consists of a 12-foot through lane and a 13-foot through lane. The New Chardon Street westbound approach consists of an 11-foot through lane, a 10-foot through lane, and a 13-foot shared through/right-turn lane. Canal Street consists of one wide travel lane and runs one-way northbound. Metered parking is provided along Canal Street, but parking is not permitted on New Chardon Street in the vicinity of the intersection.

New Chardon Street/North Washington Street/I-93 and Sumner Tunnel Ramps/Surface Road is a five-leg signalized intersection with three approaches. The New Chardon Street eastbound approach is under BTD jurisdiction and consists of two 11-foot through lanes toward I-93 southbound, and a 15-foot right-turn lane towards John F. Fitzgerald Surface Road. The I-93 northbound off-ramp is under MassDOT jurisdiction and consists of a single 40-foot lane that sometimes acts as two travel lanes. The North Washington Street southbound approach is under BTD jurisdiction and consists of two 11-foot shared left-turn/through lanes, an 11-foot shared through/right-turn lane, and a 14-foot exclusive right-turn lane. Parking is not permitted in the vicinity of the intersection.

New Sudbury Street/Surface Road is a five-leg signalized intersection with three approaches. The New Sudbury Street eastbound approach is under BTD jurisdiction and consists of two 13-foot through lanes and a 13-foot exclusive right-turn lane. The Surface Road southbound approach falls under MassDOT jurisdiction and consists of a 12-foot shared left-turn/through lane and a 12-foot through lane. The MBTA Haymarket bus facility southeast-bound approach falls under BTD jurisdiction and consists of a single 24-foot exclusive right-turn lane. Parking is not provided in the vicinity of the intersection.

New Chardon Street/Bowker Street is an unsignalized intersection with three approaches, and falls under BTD jurisdiction. The New Chardon Street eastbound approach consists of one 11-foot through lane and one 15-foot through lane. The New Chardon Street westbound approach consists of a 17-foot through lane and a 13-foot through lane. The Bowker Street northbound approach consists of a single 34-foot travel lane. Bowker Street runs one-way northbound. Parking is provided west of the intersection on New Chardon Street and on Bowker Street. A crosswalk is provided across Bowker Street, but no crosswalks are provided across New Chardon Street at the intersection.

■

A2.2.3 Existing Traffic Volumes

Intersection counts (including vehicles, pedestrians, and bicycles) were collected during the weekday morning (7:00 to 9:00 AM.) and evening (4:00 to 6:00 PM) peak periods. Twenty-one of the study locations were counted in 2011 and the remainder in 2013. To standardize the count data to Year 2013 conditions, a

conservative annual growth factor of 0.5% per year was applied to the 2011 data to estimate Year 2013 volumes. [1]

Intersection turning movement counts are shown in Figure A2.1 and Figure A2.2 for the AM and PM peak hour, respectively.

Traffic count data is contained in the Technical Appendix.

■

A2.2.4 Existing Crash Data

Motor vehicle crash data from the MassDOT Crash Records System were compiled from the available data for the most recent three-year period (2008-2010). Crash rates for the study area intersections were calculated and compared to the district averages for signalized and unsignalized intersections. In MassDOT District 6, where the Project Site is located, the average number of crashes at a signalized intersection is 0.77 crashes per million entering vehicles (MEV). For unsignalized intersections, the average is 0.57 crashes per MEV. Typically, intersections with higher than average crash rates should be studied further by the jurisdictional agency.

None of the intersections studied had an average crash rate greater than the District average. One fatality was reported during the three-year period at the intersection of North Washington Street/Causeway Street (Keany Square) on Saturday, October 16, 2010 at 7:30 PM. A summary of crash data for all locations is included in the Technical Appendix.

■

A2.2.5 Existing Conditions Traffic Conditions

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. The study team calculated average delay and associated level of service at study area intersections using Trafficware's Synchro 6 software, which also evaluates the impact on traffic operations from closely spaced intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2010 Highway Capacity Manual (HCM).

Level of service and delay (in seconds) are based on intersection geometry and available traffic data for each intersection. BTD provided the intersection signal timing and phasing used in this analysis.

Table A2-1 summarizes the delay and level of service thresholds for signalized and unsignalized intersections, as defined in the HCM. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (unacceptable), with significant traffic delay. The threshold at LOS E/LOS F indicates that the intersection, or intersection approach, is theoretically at capacity. LOS D is

▼

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

generally considered below theoretical operating capacity and acceptable in an urban environment, such as downtown Boston.

Table A2-1
Level of Service Criteria (HCM Excerpt)

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

Table A2-2 shows the Existing Conditions capacity analysis summary for study area intersections during the AM and PM peak hours. Due to their length, the detailed capacity analysis tables (with level of service, average delay, volume to capacity ratio, and 95th percentile queue length (feet) for the overall intersection and each approach) and Synchro reports are provided in the Technical Appendix.

Table A2-2
Existing Conditions - Peak Hour Intersection Capacity Analysis Summary

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Signalized				
1. Cambridge Street/ Staniford Street	C	28.5	D	44.6
2. Merrimac Street/ Staniford Street/ Causeway Street/ Lomasney Way (Lowell Sq.)	F	>80.0	D	45.4
3. Causeway Street/Portland Street	A	5.4	A	5.5
4. Causeway Street/Haverhill Street	A	4.1	A	3.7
5. North Washington Street/Causeway Street (Keany Sq.)	D	40.6	D	45.9
6. North Washington Street/Thatcher Street/Valenti Way	C	22.5	F	>80.0
7. Beverly Street/Valenti Way	B	12.4	B	12.8
8. North Washington Street/Beverly Street	B	15.6	C	20.5
9. North Washington Street/Cross Street/Cooper Street	B	14.0	B	10.7
10. New Chardon Street/North Washington Street/Sumner Tunnel Off-ramp/I-93 SB and Callahan Tunnel On-ramps	E	56.6	D	48.8
11. New Chardon Street/Canal Street	A	2.3	A	2.9
12. New Chardon Street/Congress Street/Merrimac Street	C	31.3	D	42.9
13. New Chardon Street/Cambridge Street	F	>80.0	E	64.7
14. New Sudbury Street/Cambridge Street	C	20.3	C	27.0
15. New Sudbury Street/Congress Street	C	27.7	C	33.8
16. New Sudbury Street/Blackstone Street/Surface Road	B	19.1	C	30.0

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
17. New Sudbury Street/Cross Street/I-93 NB On-ramp	B	8.9	B	19.6
18. Hanover Street/Cross Street	B	10.6	B	11.4
19. Hanover Street/Surface Road	B	15.7	B	10.0
20. Hanover Street/Congress Street	A	2.9	A	2.0
21. North Street/Congress Street	F	>80.0	C	22.3
22. North Street/Union Street	C	28.1	B	19.0
23. North Street/Clinton Street	B	14.1	C	32.8
24. I-93 Northbound Off-ramp/Surface Road/North Street	B	16.0	C	23.3
25. I-93 Northbound Off-ramp/Cross Street/North Street	C	20.3	C	24.7
26. I-93 Southbound Off-ramp/Surface Road/Clinton Street	C	31.8	C	21.1
27. Cross Street/Commercial Street	A	1.0	A	1.5
28. Surface Road/Mercantile Street	A	4.7	B	13.0
29. Atlantic Avenue/Mercantile Street/Cross Street	C	29.9	C	21.1
30. Surface Road/Walk to the Sea	A	5.1	A	6.2
31. Atlantic Avenue/Walk to the Sea	A	2.2	A	4.0
32. Surface Road/State Street	B	15.4	B	12.9
33. Atlantic Avenue/State Street	A	8.6	B	16.2
36. New Chardon Street/Garage Exit	B	12.0	D	41.0
Unsignalized*				
34. New Chardon Street/Hawkins Street	A	0.9	A	0.5
35. New Chardon Street/Bowker Street	A	0.6	A	0.6
37. New Sudbury Street/Garage Entrance and Exit	A	2.6	A	1.8

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by an upstream signal.
* For unsignalized locations, the Intersection Capacity Utilization (ICU) LOS and delay are reported for overall operation.
Grey shading indicates LOS E or LOS F.

In the AM peak hour, the following ***signalized*** intersections have an overall operation below LOS D under Existing Conditions:

- The intersection of Merrimac Street/ Staniford Street/ Causeway Street/ Lomasney Way (Lowell Square) operates at LOS F
- The intersection of New Chardon Street/North Washington Street/Sumner Tunnel Off-ramp/I-93 Southbound and Callahan Tunnel On-ramps operates at LOS E.
- The intersection of New Chardon Street/Cambridge Street operates at LOS F.
- The intersection of North Street/Union Street operates at LOS F.

All ***unsignalized*** intersections in the study area currently operate at LOS A in the AM peak hour under Existing Conditions.

In the PM peak hour, the following ***signalized*** intersections have an overall operation below LOS D under Existing Conditions:

- The intersection of North Washington Street/Thatcher Street/Valenti Way operates at LOS F.
- The intersection of New Chardon Street/Cambridge Street operates at LOS F.

All ***unsignalized*** intersections currently operate at overall LOS A in the PM peak hour under Existing Conditions.

■

A2.2.6 Existing Pedestrian Conditions

As directed by the BTD, the study team conducted detailed pedestrian level of service analysis the following intersections adjacent to the Project Site:

- 11: New Chardon Street/Canal Street;
- 12: New Chardon Street/Congress Street; and
- 15: New Sudbury Street/Congress Street.

Pedestrian level of service (LOS) at signalized intersections is determined by assigning a "score," which ranges between 0.00 (LOS A) to 5.00 or greater (LOS F) to each crosswalk at the intersection. The score is based on a variety of factors that affect pedestrian delay, safety, and comfort. The study team calculated pedestrian LOS using Highway Capacity Software, a program that utilizes Transportation Research Board's 2010 Highway Capacity Manual (HCM) to analyze roadway networks.

Pedestrian level of service at signalized intersections is impacted by the following factors:

- Permissive left-turn and right-turn-on-red volumes
- Cross-street motor vehicle volumes and speeds
- Crossing length
- Average pedestrian delay
- Right-turn channelizing island presence

Table A2-3 summarizes the LOS thresholds for pedestrian crosswalks as defined in the HCM. LOS A defines the most favorable condition, with minimum pedestrian delay, crossing distance, and conflicting traffic. LOS F represents the worst condition (unacceptable), with significant pedestrian delay and discomfort. LOS D, under which pedestrians have reasonably fluid flow but will likely encounter friction and interaction with other pedestrians, is considered acceptable for this Project Site.

Table A2-3
Pedestrian Level of Service Criteria (HCM Excerpt)

Level of Service	Score
A	≤2.00
B	>2.00 and ≤2.75
C	>2.75 and ≤ 3.50
D	>3.50 and ≤ 4.25
E	>4.25 and ≤5.00
F	>5.00

Table A2-4 shows the pedestrian level of service summary for the three intersections under Existing Conditions. All crosswalks are operating at LOS D or better, indicating acceptable conditions for pedestrians.

The HCM pedestrian level of service output reports are provided in the Technical Appendix.

Table A2-4
Existing Conditions – Peak Hour Pedestrian Level of Service Summary

Intersection	AM Peak Hour		PM Peak Hour	
	Score	LOS	Score	LOS
11. New Chardon Street/Canal Street				
WB Crosswalk (across Canal Street)	0.8	A	0.8	A
SB Crosswalk (across New Chardon Street)	3.2	C	3.2	C
12. New Chardon Street/Congress Street				
EB Crosswalk (across Congress Street)	3.8	D	3.7	D
WB Crosswalk (across Congress Street)	3.3	C	3.3	C
NB Crosswalk (across New Chardon Street)	3.2	C	3.2	C
SB Crosswalk (across New Chardon Street)	3.0	C	3.0	C
15. New Sudbury Street/Congress Street				
EB Crosswalk (across Congress Street)	3.4	C	3.4	C
WB Crosswalk (across Congress Street)	3.4	C	3.4	C
NB Crosswalk (across New Sudbury Street)	2.7	B	2.7	B
SB Crosswalk (across New Sudbury Street	2.3	B	2.4	B

A2.3 Year 2028 Future Year Transportation Conditions

Standard traffic engineering practice is used to evaluate No-Build conditions (without the Project) and Full-Build conditions (with the Project) and determine to what extent study area traffic operations will be affected. Because the Project will be built in phases over the next 15 years, the Year 2028 has been designated as the future design year.

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A2.3.1 No-Build Conditions

A2.3.1.1 Background Projects

The Year 2028 No-Build traffic forecast were developed based on existing volumes plus new traffic resulting from background growth and other development projects, but without any new development on the Project Site. The general background growth rate accounts for changes in demographics, auto usage and auto ownership. Based on a review of historical and recent traffic counts, and the ability to identify specific development projects that will add to local area traffic levels, a 0.25% growth rate was applied to the existing intersection volumes to account for background growth between 2013 and 2018. Because growth trends beyond 2018 are difficult to predict, a more conservative (higher impact) growth rate of 0.50% was used to estimate background growth between 2018 and 2028. The study team incorporated future traffic increases anticipated from the following planned development projects:

- 121-127 Portland Street - Also known as the Forecaster Building, this BRA board-approved project will add two floors to an existing six-story building. The project calls for approximately 54 loft dwelling units and 42 parking spaces. Trips generated by project were distributed to the study area intersections
- Lovejoy Wharf –This BRA board-approved project, also known as the Hoffman Building, is located at 160 North Washington Street and calls for the reuse of an existing structure of 336,335 square feet. The originally proposed project is expected to include ground floor retail, 250 dwelling units, and restoration of the 40,000-square-foot on-site wharf. Notice of Project Change (NPC) filed in November 2012 calls for a changed program at 160 North Washington Street to accommodate 187,187 sf of office use and 20,543 sf of commercial space, including a 300-seat restaurant. Although the program changed in nature, the new program will not result in a significant change in traffic operations at the study area intersections over No-Build conditions. Thus, the trips generated by the original project were distributed to the study area intersections.
- Massachusetts General Hospital Institutional Master Plan Building for the 3rd Century. MGH is constructing a new ambulatory care building on the Project Site of several former hospital buildings. One phase of the project, the Yawkey Outpatient Center, is already complete and includes a 725-space parking garage. Both the garage and Yawkey Center are operational. A second 150-bed addition, permitted through the Institutional Master Plan, is under construction and is expected to be fully occupied by 2012. No new parking is to be built as part of the second phase. Trips generated by this project were distributed to the study area intersections
- Garden Garage – This site is located on Martha Road and Lomasney Way on approximately three acres of land at Longfellow Place in Boston's West End. According to a Draft Project Impact Report filed with the BRA in Fall, 2011, the proposed project will create two new buildings on the site of the existing above-ground Garden Garage: the West Tower will consist of approximately 190 residential apartment units and approximately 3,000 square feet of ground-floor retail; and the East Tower will consist of approximately 310 residential apartment units. In addition, the existing 650-space garage will be replaced with an 850-space underground parking structure, resulting in a net increase of 200 new spaces.

- Nashua Street Residences – this BRA board-approved project includes the development of a 503-unit residential tower with 3,575 sf of retail space and 219 parking spaces. The change in program from 368 to 503 units will affect peak hour volumes by fewer than 10 vehicles. Therefore, trips generated by the original project were distributed to the study area intersections.
- One Canal Street – This BRA board-approved project calls for approximately 280 units of residential apartment and 15,000 square feet of retail. Delivery of this project is currently projected between 2012 and 2013. Trips generated by this project were distributed to the study area intersections.
- Simpson Housing (The Victor) – This BRA board-approved project located on Beverly Street proposes construction of 284 residential units above 14,910 square feet of ground floor retail, with 142 parking spaces on-site. Trips generated by the project were distributed to the study area intersections.
- The Merano – This project, located between Beverly Street and Medford Street, involves the construction of a new, mixed-use project including 209,000 square feet of office space, a 110-room Marriot Town Place for long-term stays, a 170-room Courtyard Marriot for short stays, and 227 parking spaces on-site. Trips generated by this project were distributed to the study area intersections.
- Suffolk University - 20 Somerset Street – This project involves the demolition of the former Metropolitan District Commission Building and its replacement with an eight-story, 112,000-square-foot building that will include classrooms, studios for art students, and gallery space. Construction began in 2010 and is expected to be complete by 2013. Trips generated by this project within the study area are reflected within the general background growth rate.
- North Bennet Street School – In this project, two City owned buildings at 130-140 Richmond Street and 152 North Street in the North End are being redeveloped as a new home for the North Bennet Street School. Its current building will be reused by the City as expansion space for the Eliot School, a City of Boston public school. The North Street project will comprise about 61,000 of renovated space and 4,000 sf of new construction. Due to a high proportion of transit and walk trips and a relatively low population, there will be minimal added vehicular traffic as a result of the project. Thus, trips generated by this project within the study area are reflected within the general background traffic growth rate.
- One Bromfield Street - Trips generated by this proposed 250-unit residential project located beyond the boundary of the study area are reflected within the general background traffic growth rate.
- Millennium Tower and Burnham Building (former Filene's site) - The 60-story mixed-use project currently proposed will include 600 residential units, between 125,000 and 218,000 sf of office space and between 122,000 and 231,000 sf of retail space, including a health club and restaurant. A total of 550 parking spaces are planned, up to 250 of which would be open to the public. Trips generated by this project beyond the boundaries of the study area are reflected within the general background traffic growth rate.

The Year 2028 No-Build traffic volumes are shown in Figure A2.3 and Figure A2.4 for the AM and PM peak hour, respectively.

A2.3.1.2 Roadway Improvements by Others

Several proposed roadway improvement projects by others are located in the immediate vicinity of the Project. These include the Causeway Street Reconstruction project as part of the City of Boston's Crossroads Initiative; final roadway circulation improvements in the Bulfinch Triangle as proposed with the Central Artery/Tunnel Surface Transportation Action Forum (STAF) recommendations; reconstruction of Cambridge Street as part of the MBTA's improvements to its Government Center station; BTD's signal retiming and sequencing for the Central Artery Traffic Signal Optimization Study along the Rose Kennedy Greenway corridor; and bicycle accommodation (bike lanes) along various corridors by BTD's Boston Bike Network project. All these improvements are assumed to be completed by the time of Project completion and are incorporated into the Year 2028 No-Build analysis.

A2.3.1.3 No-Build Traffic Operations

Table A2-5 shows the Year 2028 No-Build Conditions capacity analysis summary for the AM and PM peak hour.

Due to their length, the detailed level of service tables and Synchro reports are provided in the Technical Appendix.

In the AM peak hour, the following ***signalized*** intersections have worsened from an overall operation of LOS D or above under Existing Conditions to an overall operation below LOS D under No-Build Conditions.

- The intersection of North Washington Street/Causeway Street (Keany Square) worsened from an overall LOS D under Existing Conditions to an overall LOS E under No-Build Conditions.
- The intersection of North Washington Street/Thatcher Street/Valenti Way worsened from an overall LOS C under Existing Conditions to an overall LOS F under No-Build Conditions.
- The intersection of North Washington Street/Beverly Street worsened from an overall LOS B under Existing Conditions to an overall LOS F under No-Build Conditions. .

All ***unsignalized*** intersections in the study area continue to operate at an overall LOS A in the AM peak hour under No-Build Conditions.

In the PM peak hour, the following ***signalized*** intersections have worsened from an overall operation of LOS D or better under Existing Conditions to an overall operation of LOS E or LOS F under No-Build Conditions.

- The intersection of Merrimac Street/ Staniford Street/ Causeway Street/ Lomasney Way (Lowell Square) worsened from an overall LOS D under Existing Conditions to an overall LOS E under No-Build Conditions.
- The intersection of North Washington Street/Causeway Street (Keany Square) worsened from an overall LOS D under Existing Conditions to an overall LOS E under No-Build Conditions.
- The intersection of North Washington Street/Beverly Street worsened from an overall LOS C under Existing Conditions to an overall LOS F under No-Build Conditions.

- The intersection of New Chardon Street/Garage Exit will deteriorate to LOS F under No-Build Conditions.

All ***unsignalized*** intersections in the study area continue to operate at an overall LOS A in the PM peak hour during No-Build Conditions.

Note that during the PM peak hour, the New Chardon/Cambridge Street intersection is forecast to improve from LOS E to LOS D (shaded in black in Table A2-5), although the volumes will increase slightly. This incongruous result is due to the adaptation of a higher peak hour factors under Year 2028 conditions (indicating more uniform distribution of traffic throughout the hour) and can occur even though when volumes increase.

Table A2-5
No-Build Conditions – Peak Hour Intersection Capacity Analysis Summary

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Signalized				
1. Cambridge Street/ Staniford Street	D	46.9	D	54.7
2. Merrimac Street/ Staniford Street/ Causeway Street/ Lomasney Way (Lowell Sq.)	E	58.9	E	73.2
3. Causeway Street/Portland Street	A	7.2	A	7.4
4. Causeway Street/Haverhill Street	B	13.9	B	11.2
5. North Washington Street/Causeway Street (Keany Sq.)	E	79.9	E	72.0
6. North Washington Street/Thatcher Street/Valenti Way	F	>80.0	F	>80.0
7. Beverly Street/Valenti Way	B	13.7	C	23.7
8. North Washington Street/Beverly Street	F	>80.0	F	>80.0
9. North Washington Street/Cross Street/Cooper Street	B	17.8	B	15.1
10. New Chardon Street/North Washington Street/Sumner Tunnel Off-ramp/I-93 SB and Callahan Tunnel On-ramps	F	>80.0	F	>80.0
11. New Chardon Street/Canal Street	A	2.0	A	2.1
12. New Chardon Street/Congress Street/Merrimac Street	C	31.6	D	45.8
13. New Chardon Street/Cambridge Street	F	>80.0	D	44.2
14. New Sudbury Street/Cambridge Street	B	17.8	C	24.2
15. New Sudbury Street/Congress Street	C	28.4	C	30.9
16. New Sudbury Street/Blackstone Street/Surface Road	B	10.6	B	19.3
17. New Sudbury Street/Cross Street/I-93 NB On-ramp	B	11.9	C	30.0
18. Hanover Street/Cross Street	B	10.2	B	12.2
19. Hanover Street/Surface Road	B	13.3	B	11.2
20. Hanover Street/Congress Street	A	3.2	A	1.9
21. North Street/Congress Street	F	>80.0	C	20.6
22. North Street/Union Street	D	41.6	B	18.9
23. North Street/Clinton Street	C	31.1	C	33.1

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
24. I-93 Northbound Off-ramp/Surface Road/North Street	B	15.3	C	20.9
25. I-93 Northbound Off-ramp/Cross Street/North Street	C	21.0	C	25.0
26. I-93 Southbound Off-ramp/Surface Road/Clinton Street	C	33.6	C	20.9
27. Cross Street/Commercial Street	A	0.9	A	1.9
28. Surface Road/Mercantile Street	A	4.3	B	19.6
29. Atlantic Avenue/Mercantile Street/Cross Street	C	26.2	D	37.6
30. Surface Road/Walk to the Sea	A	6.0	A	6.4
31. Atlantic Avenue/Walk to the Sea	A	2.1	A	4.4
32. Surface Road/State Street	B	15.1	B	12.3
33. Atlantic Avenue/State Street	A	7.9	B	18.1
36. New Chardon Street/Garage Exit	B	11.5	F	>80.0
Unsignalized*				
34. New Chardon Street/Hawkins Street	A	0.7	A	0.4
35. New Chardon Street/Bowker Street	A	0.5	A	0.4
37. New Sudbury Street/Garage Entrance and Exit	A	2.7	A	2.0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by an upstream signal.
* For unsignalized locations, the Intersection Capacity Utilization (ICU) level of service and delay are reported for overall operation.
Grey shading indicated a decrease in LOS from Existing Conditions.
Black shading indicates an improvement from Year 2028 No-Build Conditions that bring operations out of LOS E or LOS F.

A2.3.1.4 No-Build Pedestrian Operations

Table A2-6 shows the pedestrian level of service summary under No-Build conditions. All crosswalks are forecast to operate at LOS D or better, with none experiencing a change in level of service compared to Existing conditions. The HCM pedestrian level of service output reports are provided in the Technical Appendix.

Table A2-6
No-Build Conditions – Peak Hour Pedestrian Level of Service Summary

Intersection	AM Peak Hour		PM Peak Hour	
	Score	LOS	Score	LOS
11. New Chardon Street/Canal Street				
WB Crosswalk (across Canal Street)	0.8	A	0.8	A
SB Crosswalk (across New Chardon Street)	3.2	C	3.2	C
12. New Chardon Street/Congress Street				
EB Crosswalk (across Congress Street)	3.9	D	3.8	D
WB Crosswalk (across Congress Street)	3.3	C	3.3	C
NB Crosswalk (across New Chardon Street)	3.2	C	3.2	C
SB Crosswalk (across New Chardon Street)	3.0	C	3.0	C
15. New Sudbury Street/Congress Street				
EB Crosswalk (across Congress Street)	3.4	C	3.4	C
WB Crosswalk (across Congress Street)	3.4	C	3.4	C
NB Crosswalk (across New Sudbury Street)	2.7	B	2.7	B
SB Crosswalk (across New Sudbury Street)	2.3	B	2.4	B

■

A2.3.2 Full-Build Conditions

A2.3.2.1 Site Access and Circulation

A full discussion of site access and circulation was described detail in Chapter 3, *Transportation and Parking* and is not repeated in its entirety here. The proposed conditions site plan is shown in Figure 3.6.

In summary, vehicle access and egress for the Project Site will remain along both New Chardon Street and along New Sudbury Street. Vehicular access along New Chardon Street, however, shifts from within the intersection of New Chardon Street/Merrimac Street/Congress Street intersection to a location along Bowker Street at Hawkins Street. The primary loading dock for the Garage is also moved to a location along Bowker Street to serve as the office loading facility. Bowker Street is changed to two-way operations to facilitate access to both the garage access and office loading dock. The intersection of New Chardon Street at Bowker Street will be signalized and allow pedestrian crossings of New Chardon Street. Vehicular access along New Sudbury remains as it currently operates with the driveway entering the garage closest to Congress Street intersection and the exiting driveway closest to the western edge of the Project Site.

Pick-up/drop-off pull off areas are proposed at key new building entrances and loading docks/loading zones are proposed for primary building uses (Figure 3.6). Pedestrian access/egress for the Project Site will also be at various building entrances and lobbies throughout both the West and East parcels (Figure 3.6). The primary bicycle access to the Project will be along Congress Street where the entrance for the proposed 850-

space shared bicycle parking facility will be located. A Hubway bicycle share station will be located on the East Parcel.

These improvements were incorporated into the Year 2028 Full-Build analysis and described in more detail in Section A2.3.2.3.

A2.3.2.2 Trip Generation, Travel Mode Share, and Trip Distribution

A full discussion of Project trip generation, travel mode share, and trip distribution was presented in Chapter 3, *Transportation and Parking* and is not repeated in its entirety here. For reference, a summary of Project net new trip generation is presented in Table A2-7 below. The net new Project-related vehicle trips added to the study area intersections are shown in Figure A2.5 and Figure A2.6 for the AM and PM peak hour, respectively.

Table A2-7
Net New Trip Generation for Project Site

Time Period		Walk/Bike Trips	Transit Trips	Vehicle Trips
Daily	In	2,412	2,517	1,135
	Out	2,412	2,517	1,135
AM Peak Hour	In	47	875	450
	Out	217	89	136
PM Peak Hour	In	194	91	217
	Out	60	816	421

A2.3.2.3 Full-Build Traffic Operations

To estimate 2028 Full-Build traffic volumes, the Project-generated trips were added to the 2028 No-Build traffic volumes. The Year 2028 Full-Build traffic volumes are shown in Figure A2.7 and Figure A2.8 for the AM and PM peak hours, respectively. The resulting capacity analysis summaries for Full-Build Conditions are shown in Table A2-8.

Certain mitigation elements are included in the Full-Build traffic operations assessment for the four intersections immediately abutting the Project Site:

New Chardon Street/Congress Street/Merrimac Street. Improvements include relocation of the Government Center Garage's existing north parking driveways and the existing loading dock driveways from New Chardon Street and within the intersection to Bowker Street. The signal controller equipment at the New Chardon Street/Congress Street/Merrimac Street intersection will also control the new traffic signal proposed at New Chardon Street/Bowker Street. The Merrimac Street southbound approach will be modified to provide a designated left-turn lane in what is now a shared left-turn/through lane and the two through lanes will remain. The channelized right-turn lane on Merrimac Street lane will remain under yield control at New Chardon Street. Bicycle lanes will be added along Congress Street southbound with sharrows (pavement marking symbols that

indicate bicycle positioning in a travel lanes shared by vehicles and bicycles) provided along New Chardon Street and Merrimac Street.

New Sudbury Street/Congress Street. The New Sudbury Street eastbound approach will be changed from an exclusive left-turn storage lane of about 100 feet in length, two through lanes, and an exclusive right-turn lane to an exclusive left-turn lane, a through lane, a shared through/right turn lane and a bicycle lane. Angled police parking will be removed and relocated into the Project garage to provide adequate width for the associated eastbound approach improvements. The northbound Congress Street approach will be changed from two through lanes and a shared through/right turn lane to two through lanes and a right turn only lane, as it generally operates today. The Congress Street southbound approach will be narrowed from four lanes consisting of an exclusive left-turn lane with a storage length of about 100 feet and three through lanes to an exclusive 100-foot storage left turn lane, two through lanes, and a bicycle lane. A bicycle lane will also be added to Congress Street northbound and New Sudbury Street eastbound leaving the intersection. Associated signal phasing and timing changes will be made at this intersection.

New Sudbury Street/Surface Road. The New Sudbury Street eastbound approach will be changed from two through lanes and an exclusive right-turn lane to one through lane, a shared through/right turn lane, and a bicycle lane.

New Chardon Street/Bowker Street. This intersection will be signalized. The Bowker Street approach will be changed from one-way northbound operations to two-way operations. The two northbound travel lanes will consist of a designated left-turn storage lane and a designated right-turn lane and one southbound lane. New Chardon Street pedestrian crossings will be added to both sides of Bowker Street. Bicycle lanes will be added to New Chardon Street. All parking will be removed from Bowker Street, including police parking that will be relocated to the Project garage. The new traffic signal will be tied into the traffic controller at New Chardon Street/Merrimac Street/Congress Street to provide coordinated traffic flow between intersections.

Due to their length, the detailed level of service tables and Synchro reports are provided in the Technical Appendix.

In the AM peak hour, the following ***signalized*** intersections will worsen from an overall operation of LOS D or better under No-Build Conditions to an overall operation of LOS E or LOS F under Full-Build Conditions:

- The intersection of North Street/Union Street will worsen from an overall LOS D under No-Build Conditions to an overall LOS F under Full-Build Conditions.
- The intersection of North Street/Clinton Street will worsen from an overall LOS C under No-Build Conditions to an overall LOS F under Full-Build Conditions.

All ***unsignalized*** intersections in the study area will continue to operate at an overall LOS A in the AM peak hour under Full-Build Conditions.

In the PM peak hour, the following ***signalized*** intersections will worsen from an overall operation of LOS D or above under No-Build Conditions to an overall operation below LOS D under Full-Build Conditions.

- The intersection of Cambridge Street/Staniford Street will worsen from an overall LOS D under No-Build Conditions to an overall LOS E under Full-Build Conditions.

All ***unsignalized*** intersections in the study area will continue to operate at an overall LOS A in the PM peak hour during Full-Build Conditions. Mitigation measures for impacted intersections are discussed in Section A2.4.

Table A2-8
Full-Build Conditions – Peak Hour Intersection Capacity Analysis Summary

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Signalized				
1. Cambridge Street/ Staniford Street	D	47.4	E	63.2
2. Merrimac Street/ Staniford Street/ Causeway Street/ Lomasney Way (Lowell Sq.)	E	59.6	E	77.7
3. Causeway Street/Portland Street	A	7.2	A	7.4
4. Causeway Street/Haverhill Street	B	13.9	B	11.2
5. North Washington Street/Causeway Street (Keany Sq.)	F	>80.0	E	74.6
6. North Washington Street/Thatcher Street/Valenti Way	F	>80.0	F	>80.0
7. Beverly Street/Valenti Way	B	13.7	C	23.7
8. North Washington Street/Beverly Street	F	>80.0	F	>80.0
9. North Washington Street/Cross Street/Cooper Street	B	18.1	B	15.8
10. New Chardon Street/North Washington Street/Sumner Tunnel Off-ramp/I-93 SB and Callahan Tunnel On-ramps	F	>80.0	F	>80.0
11. New Chardon Street/Canal Street	A	3.0	A	4.4
12. New Chardon Street/Congress Street/Merrimac Street	D	49.6	D	45.8
13. New Chardon Street/Cambridge Street	F	>80.0	D	46.0
14. New Sudbury Street/Cambridge Street	B	18.3	C	25.2
15. New Sudbury Street/Congress Street	C	33.8	D	45.1
16. New Sudbury Street/Blackstone Street/Surface Road	B	14.7	D	45.7
17. New Sudbury Street/Cross Street/I-93 NB On-ramp	B	12.7	D	42.3
18. Hanover Street/Cross Street	B	14.6	B	12.4
19. Hanover Street/Surface Road	B	15.0	B	14.6
20. Hanover Street/Congress Street	A	4.6	A	3.1
21. North Street/Congress Street	F	>80.0	C	20.8
22. North Street/Union Street	F	>80.0	B	19.9
23. North Street/Clinton Street	F	>80.0	C	34.5
24. I-93 Northbound Off-ramp/Surface Road/North Street	B	16.0	B	15.7
25. I-93 Northbound Off-ramp/Cross Street/North Street	C	21.0	C	25.0
26. I-93 Southbound Off-ramp/Surface Road/Clinton Street	D	35.8	C	22.2
27. Cross Street/Commercial Street	A	0.9	A	1.9
28. Surface Road/Mercantile Street	A	4.5	B	19.7

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
29. Atlantic Avenue/Mercantile Street/Cross Street	C	26.1	D	37.5
30. Surface Road/Walk to the Sea	A	5.8	A	6.3
31. Atlantic Avenue/Walk to the Sea	A	2.1	A	4.4
32. Surface Road/State Street	B	15.0	B	12.3
33. Atlantic Avenue/State Street	A	7.9	B	18.1
35. New Chardon Street/Bowker Street	B	16.2	B	15.4
Unsignalized*				
34. New Chardon Street/Hawkins Street	A	0.7	A	0.4
37. New Sudbury Street/Garage Entrance and Exit	A	3.9	A	3.9

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by an upstream signal.
* For unsignalized locations, the Intersection Capacity Utilization (ICU) level of service and delay are reported for overall operation.
Grey shading indicated a decrease in level of service from No-Build Conditions.

A2.3.2.4 Full-Build Pedestrian Conditions

The net new walk and transit trips generated by the Project were presented in Table A2-7 (above). While many of the new transit riders will walk from their transit station/stop to the Project, many will arrive directly to Haymarket Station on the East Parcel (Orange Line Green Line, and buses).[2] The Full-Build pedestrian analysis at the three key intersections accounts for both walk trips and the component of transit trips that will use study area crosswalks.

Based on a distribution of walking paths to/from downtown neighborhoods, major destinations, and nearby transit stations, the new pedestrian trips generated by the Project were assigned to area streets. Table A2-9 shows the resulting pedestrian level of service summary under Full-Build conditions. All crosswalks are forecast to operate at LOS D or better, with none experiencing a change in level of service compared to No-Build conditions. The HCM pedestrian level of service output reports are provided in the Technical Appendix.

[2] It is estimated that 43% of new Project transit riders will arrive at Haymarket Station. Of these, 44% are expected to directly access Project uses on the East Parcel without crossing any streets and the remaining 56% will walk across Congress Street to access land uses on the West Parcel.

Table A2-9
Full-Build Conditions – Peak Hour Pedestrian Level of Service Summary

Intersection	AM Peak Hour		PM Peak Hour	
	Score	LOS	Score	LOS
11. New Chardon Street/Canal Street				
WB Crosswalk (across Canal Street)	0.8	A	0.8	A
SB Crosswalk (across New Chardon Street)	3.2	C	3.2	C
12. New Chardon Street/Congress Street				
EB Crosswalk (across Congress Street)	3.8	D	3.6	D
WB Crosswalk (across Congress Street)	3.3	C	3.3	C
NB Crosswalk (across New Chardon Street)	3.2	C	3.1	C
SB Crosswalk (across New Chardon Street)	3.0	C	3.0	C
15. New Sudbury Street/Congress Street				
EB Crosswalk (across Congress Street)	3.2	C	3.2	C
WB Crosswalk (across Congress Street)	3.1	C	3.0	C
NB Crosswalk (across New Sudbury Street)	2.7	B	2.8	B
SB Crosswalk (across New Sudbury Street	2.2	B	2.3	B

A2.3.2.5 Full-Build Parking Conditions

The Project will retain 1,159 parking spaces of the 2,310 (1,865 commercial public parking and 435 exempt employee) parking spaces currently in the Government Center Garage. A full discussion of Project parking demand, parking supply, and an analysis of shared use parking was developed and presented in Chapter 3, *Transportation and Parking* and is not repeated in its entirety here. For reference, a summary of this Project parking assessment is presented in Table A2.10.

The most efficient use of the parking resource is to "share" parking amongst various Project users rather than have assigned or dedicated parking for each use. As presented in the table above, through the institution of a shared parking management program, the Project will continue to be able to provide parking for current transient and monthly parkers at the Government Center Garage.

Displaced Parking

The City of Boston, through its Environment Department and Transportation Department, has asked that a level of commercial public parking be retained in the Project to serve transient parking; those short-term parkers destined to the surrounding area offices and retail shops. The remaining parkers currently served at the Government Center Garage are monthly leased parking. A full discussion of current parking use at the Government Center Garage was presented in Chapter 3, *Transportation and Parking* and is not repeated in its entirety here. A summary of current weekday, weeknight, weekend, and event parking demand by user type in the Government Center Garage is presented in Table A2.11.

Table A2-10
Project Parking Assessment Summary

Land Use	Size	Parking Demand (spaces)		Shared Parking (spaces)		
		Maximum BTD Guidelines	Proposed Project	Weekday	Weeknight	Weekend Day
Residential Apartments	651 units	651	326	146	326	195
Residential Condominiums	120 units	120	84	65	84	70
Hotel Rooms	204 rooms	82	51	18	51	38
Retail/Restaurant	82,500 sf	33	0	0	0	0
Office	1,303,300 sf	522	391	332	89	89
Total Project Parking Demand		1,408	852	561	550	392
Replacement Police Parking		42	42	42	42	42
Total Parking Demand		1,450	894	603	592	434
Total Parking Supply		1,159		1,159		
Available for Commercial Public Parking		0	265	556	567	725

Table A2-11
Current Parking Demand by User

Time of Day	Transient Parkers	Monthly Leased Parkers
Weekday	220	830
Weekday Night	60	540
Weekend Day	75	450
Event Parkers		
weekday night	225 to 525	
weekend night	325 to 635	

By instituting, a managed shared parking arrangement in the Project garage, all current transient parking and overnight parking use will be able to be accommodated as well as a certain level of monthly leased parking. The transportation analysis for the Project assumes that up to 550 commercial public parking spaces will be available during a typical weekday. Daily and peak hour vehicle trips and pedestrian trips (walking to and from the garage) associated with this level of commercial public parking has been included in the transportation analysis.

Monthly leased parking that cannot be accommodated in the Project garage will have options in the immediate area. A summary of available commercial public parking spaces in eight area parking garages that each supply over 300 commercial public parking spaces is presented in Table A2.12.

Table A2-12
Area Parking Garage Occupancy

Facility	Supply (spaces)	Occupancy	Available Capacity (spaces)
Parcel 7 – MBTA Haymarket Garage	310	85%	50
Garden Garage	710	100%	0
North Station Garage	1,250	50%	625
Center Plaza Garage	586	90%	60
Charles River Plaza Garage	794	95%	25
Clinton Street Garage	597	50%	300
75 State Street Garage	700	95%	35
Pi Alley Garage	600	85%	90
Total	5,518	79%	1,185

With a current total use of about 1,050 spaces in the Government Center Garage, about 500 commuter parking spaces will be displaced. All transient parking and about 330 monthly leases – or commuter parking – can be accommodated in the Project garage, leaving about 500 commuter parkers to find alternative locations. Based on current occupancy rates at area garages there is availability to accommodate all of these displaced commuter parkers.

A2.3.2.6 Full-Build Transit Conditions

To determine the impacts of the Project on transit capacity, several steps were followed. The AM peak hour inbound peak load point capacity and ridership was chosen as the period for impact analysis. (The PM peak hour results will be similar.)

Peak load points for each line and direction were identified and ridership established for each from the most recent available MBTA and Central Transportation Planning Staff (CTPS) data. Then, directional inbound capacity past each load point was established from comparing MBTA train schedules to the number of cars per train and the capacity of each car. According to MBTA procedures, capacity was established in two ways. First, MBTA *policy capacity* accounts for a certain number of seated and standing passengers on each train. Second, *crush capacity* allows for more standees, with an overall average of 1.5 square feet per passenger. Typically, crush conditions are not found on every train during the peak hour.

The net new inbound transit riders generated by the Project during the AM peak hour were assigned to the various transit lines based on the distribution presented in Table 3-12 of Chapter 3, *Transportation and Parking*. The new trips were added to the existing peak load point data to establish future peak ridership. The resulting No-Build and Full-Build conditions peak load point characteristics for policy capacity and crush capacity are shown in Table A2-13 below.

As shown, most of the lines operate well today, even using the more comfortable policy capacity standards. Orange and Blue line service has improved in recent years with the phasing in of six-car trains. On the Red Line, however, the aging fleet has caused reduced headways resulting in trains that are more crowded.

As shown in the table, the Project will add only marginally to existing peak load volumes. The highest increases in AM peak hour inbound ridership will be 249 riders total on all the Green Line branches to the south and 164 new riders on the Orange Line south. The Project will increase AM peak hour ridership on the more heavily burdened Orange Line north and Red Line south by only 40-60 riders, or about one rider per minute. Under crush capacity, these volumes can be handled well within the overall capacity.

A2.3.2.7 Full-Build Bicycle Conditions

The League of American Bicyclists annually examines bicycle usage in the 70 largest cities in the country. In 2009, approximately two percent of all Boston area commuters rode their bicycles to work, compared to one percent in 2001. Improving the commuter bicycle mode share to ten percent is a goal of Boston Bikes. Establishing accommodation of bicycle parking and amenities at new developments, particularly office developments and residential buildings, and improving on-street bicycle accommodations are two of the primary means Boston Bikes has established to accomplishing this goal. A summary of recommended bicycle accommodation by land use for the Project based on current BTD guidelines is presented in Table A2.14.

Table A2-14
BTD Guidelines for Project Bicycle Accommodations

Full-Build Project Use	Employees or Residents	Bicycle Parking for Employees/ Residents	Showers/ Changing Facilities	Bicycle Racks for Visitors
Office (1,303,300 sf)	4,344	391	17	119
Residential Apartments (651 units)	1,451	651	na	130
Residential Condominiums (120 units)	270	120	na	24
Hotel (204 rooms)	146	15	na	4
Retail (67,500 sf)	113	20	na	14
Restaurant (15,000 sf)	33	5	na	3
Total		1,201	17	294

Bicycle Storage and Bicycle Parking

The Project is committed to accommodating and promoting bicycle use and will provide an approximate 850-space shared bicycle parking facility in the garage with primary access from Congress Street. This facility will incorporate employee changing rooms and showers. This centrally located bicycle parking facility will be "shared" between all Project users on-site. This will allow the facility to have the flexibility, for example, to share daytime bicycle parking for employees who commute by bicycle with those Project residents who vacate spaces during the day to commute from the Project's residences by bicycle. Conversely, these Project residents will utilize night and weekend bicycle parking vacated by weekday Project office commuters. The Project will seek a manager/operator for the 850-space, shared bicycle parking facility that will also provide

on-site bicycle repair services. Ideally, this operator will also provide bicycle sales and bicycle accessories sales and operate from a retail store front adjoining the bicycle parking facility along Congress Street. Should the shared bicycle parking facility have excess capacity, the Proponent will offer commuter bicycle parking at a nominal daily fee to riders not directly affiliated with the Project but commuting by bicycle to work in the local area.

The BTD guidelines for bicycle accommodation imply an employee bicycle commuter mode share of about 9%. Assuming that residents who vacate bicycle parking by commuting from the Project Site do so at the same 9%, frees up approximately 155 bicycle spaces to be shared with employee commuters arriving at the Project Site, bringing total bicycle parking needs based on these BTD guidelines to about 1,046. The provision of on-site Hubway bicycle sharing stations will bring down the overall demand for residential bicycle parking, particularly by apartment renters. Although quantifying this reduction is subjective at present, it is believed to be around 50 to 75 bicycle parking spaces per bicycle sharing station. Providing a Hubway station on-site will bring total bicycle parking supply desired to about 971 based on BTD guidelines. The Proponent will work with Boston Bikes to determine the best location on the East Parcel in the vicinity of the new public plaza and the MBTA Haymarket Station for new Hubway installations.

With a proposed 850-bicycle shared parking facility on-site – the largest ever built in the City of Boston – and the addition of a local Hubway station, the Project will meet the intent of BTD and Boston Bikes by establishing strong incentives and amenities promoting bicycle mode as viable transportation alternative. Should demand exceed proposed Project supply, the Proponent will expand its bicycle parking capacity by either expanding the 850-space shared parking facility, adding additional bicycle parking elsewhere on the West Parcel, or expanding Hubway capacity at the Project Site.

Bicycle racks will be readily available for short-term parking by visitors at major building entrances and near public open spaces. Due to the nature of land uses at the Project Site, there is significant opportunity to share both short-term visitor and longer-term employee and resident bicycle parking. It is expected that the shared bicycle parking facility will also be able to accommodate a good number of short-term bicycle parking for visitors and guests, particularly until the commuter bicycle mode share exceeds 9%. The Proponent will work with Boston Bikes and BTD to provide an appropriate number of on-site exterior public bicycle racks for the Project.

Proposed Roadway Bicycle and Safety Improvements

Improvements by the Proponent to the roadways and intersections immediately surrounding the Project Site will be designed to accommodate safe bicycle travel. The Project will add bicycle accommodations on roadway segments adjacent to the Project Site that currently do not have any, including Congress Street, New Chardon Street, and New Sudbury Street. Bicycle accommodations include bicycle lanes where possible, shared lanes, and bike boxes in some locations. These accommodations will provide connections to Cambridge Street, the MBTA Haymarket Station, and downtown Boston, and will further encourage residents, employees, and visitors of the Project Site and the local area to consider riding a bicycle.

Table A2-13
MBTA Subway Operations – Impact during AM Peak Period

Subway Line	Origin	Peak Load Point	Capacity		No-Build Conditions			Build Conditions				
					Peak Load[1] (riders)	Percent Capacity Used		New Project Riders Inbound	Peak Load [1] (riders)	Percent Increase	Percent Capacity Used	
			Policy [2]	Crush [2]		Policy	Crush				Policy	Crush
Orange Line North	Oak Grove	North Station to Haymarket	9,432	16,128	7,590	80%	47%	81	7,671	1.1%	81%	48%
Orange Line South	Forest Hills/Back Bay to NE Medical	Back Bay to NE Medical	9,432	16,128	5,750	61%	36%	164	5,914	2.9%	63%	37%
Green Line West	Boston College, Commonwealth Avenue, Riverside, Heath	Copley Junction to Copley	7,575	18,525	6,650	88%	36%	249	6,899	3.7%	91%	37%
Green Line North	Lechmere, North Station, Government Center	North Station to Haymarket	3,131	18,525	2,285	73%	12%	31	2,316	1.4%	74%	13%
Red Line North	Alewife	Central to Kendall	9,018	14,526	8,690	96%	60%	157	8,847	1.8%	98%	61%
Red Line South	Ashmont, Braintree	Broadway to South Station	9,018	14,526	10,435	116%	72%	44	10,479	0.4%	116%	72%
Blue Line	Wonderland	Maverick to Aquarium	6,840	10,944	5,150	75%	47%	61	5,211	1.2%	76%	48%

Notes:
1) based on CTPS estimates
2) based on MBTA schedules, cars per train, and policy/crush capacity per car.

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A2.3.2.8 Full-Build Loading and Service

As shown in the proposed conditions site plan in Figure 3.6 of Chapter 3, *Transportation and Parking,* the Project will provide five service areas. Of the two off-street service areas on the West Parcel, one will serve the office space and some of the retail space, while the other will serve the residential units and the remainder of the retail space. Deliveries to the office/retail loading area will use Bowker Street and access/egress, while deliveries to the residential/retail loading area will occur from New Sudbury Street.

On the East Parcel, two off-street loading areas will be provided for the hotel/condominium uses and office/retail uses. Both loading areas will be accessed from New Chardon Street. An auxiliary curbside loading zone for the hotel/condominium uses is proposed for the southern curb of New Chardon Street, between Merrimac Street and Canal Street. Use of this curbside zone will be limited to off-peak hours. Design of and time restrictions for this proposed on-street zone will be developed in cooperation with the BTD.

A third loading area on the East Parcel will serve the retail uses located closer to New Sudbury Street. Because of site constraints on the southern side of the East Parcel, an off-street loading area cannot be provided in this area. Retail deliveries will occur via a proposed curbside loading zone on New Sudbury Street, between Congress Street and Surface Road. Use of this curbside zone will be limited to off-peak hours. Design of and time restrictions for this proposed curbside zone will be developed in cooperation with the BTD.

A description of the anticipated loading/ service activity by land use is presented below.

- Residential - Small packages, prepared food, dry-cleaning, move-in/move-out activity, etc.
- Hotel – Linens, food/beverages
- Retail - Merchandise for the specific business
- Restaurant - Food/beverage
- Office – Office supplies and couriers

Delivery trip estimates for all residential, hotel, retail and restaurant uses were based on trip generation rates (per square feet) developed by the Central Transportation Planning Staff for downtown Boston[3]. Delivery trip estimates for office space was based on a recent survey at the John Hancock Tower[4], factored to the square footage estimate for the Project's office space. A summary of anticipated loading/service activity by land use is presented in Table A2-15.

Overall, the Project will generate approximately 90 deliveries per weekday. In general, office, retail, and residential deliveries all occur between 7:00 AM and 1:00 PM. While most deliveries with a food component (hotel and restaurant) also occur during these times, about 10% will occur before 7:00 AM and about 20%

[3] "Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area", Central Transportation Planning Staff, September 1993.

[4] Loading Dock Survey at the John Hancock Tower, Boston, February 8 – 12, 2010. Conducted by HSH Associates.

after 1:00 PM. Based on observations of deliveries at other Boston mixed-use developments, the average duration of a delivery is about 15 minutes. Based on this duration of 15 minutes per delivery, each bay could accommodate up to four deliveries per hour. Given the number of available delivery bays and the projected number of deliveries, sufficient loading capacity is provided in the Project.

Table A2-15
Delivery Location and Activity by Land Use

Loading Location	Number of Loading Bays/Spaces	Number of Deliveries		
		SU 30 [1] or smaller	Larger than SU 30	Total
West Parcel				
Office/Retail Dock *via Bowker Street*	5 bays	55	5	65
Residential/Retail Dock *via New Sudbury Street*	2 bays	8	0	8
West Parcel Total	7 bays	63	5	68
East Parcel				
Office Dock *via New Chardon Street*	2 bays	6	0	6
Hotel/Residential Dock *via New Chardon Street*	2 bays	5	1	6
Retail *via New Chardon* curbside	2 spaces	5	0	5
Retail *via New Sudbury* curbside	4 spaces	5	0	5
East Parcel Total	4 bays + 6 spaces	21	1	22
Total Project	11 bays + 6 spaces	84	6	90

1) SU 30 - single unit truck, 30 feet in length

A2.4 Transportation Mitigation Measures

Intersection mitigation improvement measures are described in this section. A full discussion of Transit Mitigation, Pedestrian Mitigation, Bicycle Mitigation and Travel Demand Management elements are presented in Chapter 3, *Transportation and Parking* and not repeated here.

The following traffic improvement measures were incorporated into a revised analysis of the Year 2028 Full-Build with Mitigation conditions. These mitigation measures are in addition to the Project specific improvements described in Section A.2.3.2.1, as already incorporated into the Year 2028 Full-Build analysis (results shown in Table A2-8).

- 1. Cambridge Street/ Staniford Street – signal timing change
- 21. North Street/Congress Street - signal timing change
- 22. North Street/Union Street - signal timing change
- 23. North Street/Clinton Street - signal timing change

The resulting capacity analysis summaries for Full-Build with Mitigation Conditions are shown in Table A2-16. (Although the improvements were focused on these four intersections, the capacity analysis results for all intersections are presented in thistable.)

In the AM peak hour, the following signalized intersections will improve from an overall operation of LOS E or LOS F under Full-Build Conditions to an overall operation of LOS D or better under Full-Build with Mitigation Conditions:

- The intersection of North Street/Union Street will improve from an overall LOS F under Full-Build Conditions to an overall LOS D under Full-Build with Mitigation Conditions.
- The intersection of North Street/Clinton Street will improve from an overall LOS F under Full-Build Conditions to an overall LOS B under Full-Build with Mitigation Conditions.

All unsignalized intersections in the study area will continue to operate at an overall LOS B or better in the AM peak hour under Full-Build with Mitigation Conditions.

In the PM peak hour, the following signalized intersection will improve from an overall operation of LOS E or LOS F under Full-Build Conditions to an overall operation LOS D or better under Full-Build with Mitigation Conditions.

- The intersection of Cambridge Street/Staniford Street will improve from an overall LOS F under Full-Build Conditions to an overall LOS B under Full-Build with Mitigation Conditions.

Due to their length, the detailed level of service tables and Synchro reports are provided in the Technical Appendix.

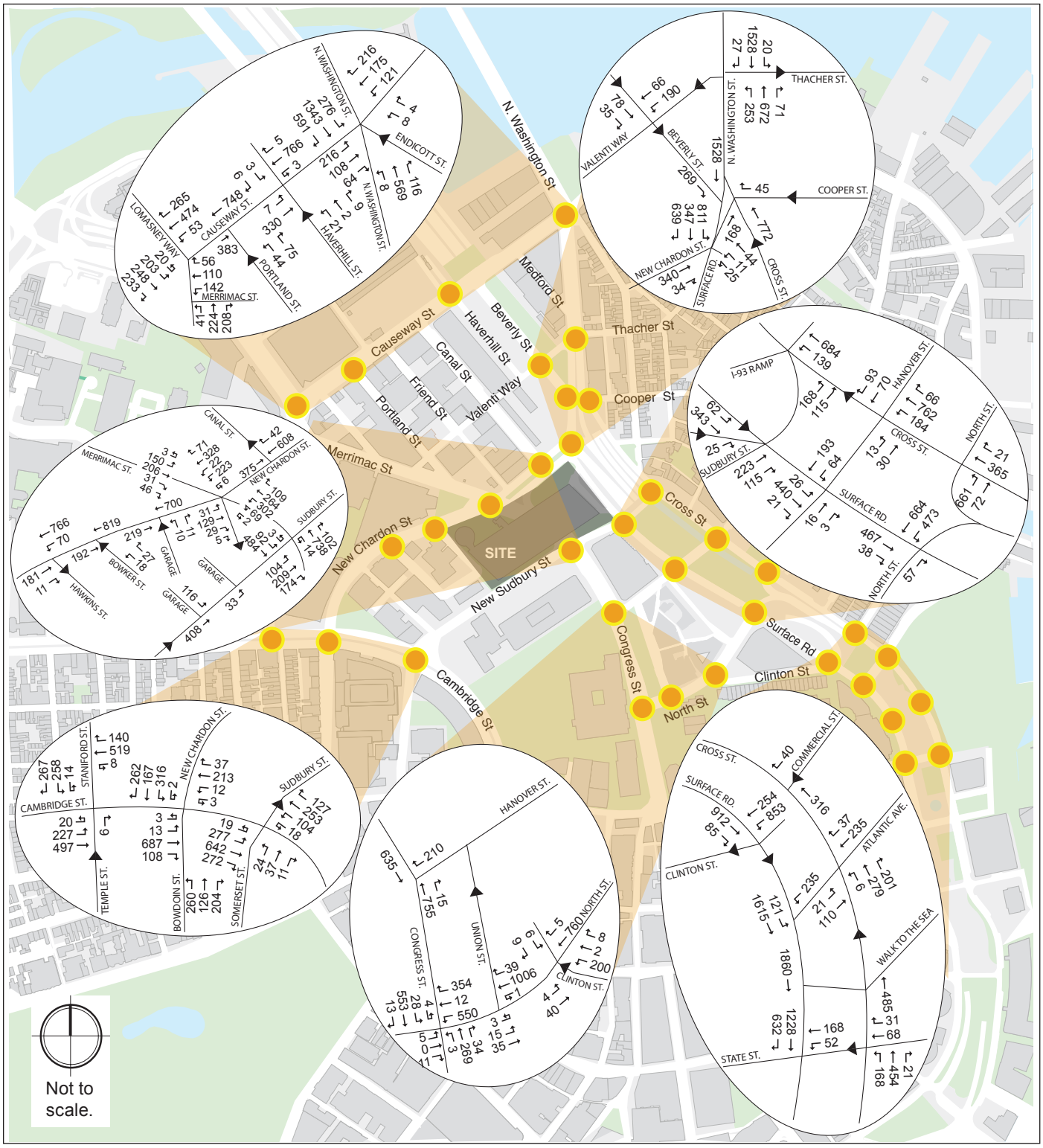
Under Full-Build Conditions, with the Project's traffic mitigation elements (as described in Section A.2.3.2.1) and additional signal timing changes evaluated in this section, all study intersections will operate at the same or better level of service as compared to Year 2028 No-Build Conditions. These results indicate that study area roadways and intersections can satisfactorily accommodate the net new vehicle trips generated by the Project.

Table A2-16
Full-Build Conditions with Mitigation– Peak Hour Intersection Capacity Analysis Summary

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
Signalized				
1. Cambridge Street/ Staniford Street	D	47.5	D	54.9
2. Merrimac Street/ Staniford Street/ Causeway Street/ Lomasney Way (Lowell Sq.)	E	59.6	E	77.7
3. Causeway Street/Portland Street	A	7.2	A	7.4
4. Causeway Street/Haverhill Street	B	13.9	B	11.2
5. North Washington Street/Causeway Street (Keany Sq.)	F	>80.0	E	74.6
6. North Washington Street/Thatcher Street/Valenti Way	F	>80.0	F	>80.0
7. Beverly Street/Valenti Way	B	13.7	C	23.7
8. North Washington Street/Beverly Street	F	>80.0	F	>80.0
9. North Washington Street/Cross Street/Cooper Street	B	18.1	B	15.8
10. New Chardon Street/North Washington Street/Sumner Tunnel Off-ramp/I-93 SB and Callahan Tunnel On-ramps	F	>80.0	F	>80.0
11. New Chardon Street/Canal Street	A	3.0	A	4.4
12. New Chardon Street/Congress Street/Merrimac Street	D	49.5	D	45.8
13. New Chardon Street/Cambridge Street	E	75.0	D	45.8
14. New Sudbury Street/Cambridge Street	B	18.8	C	25.2
15. New Sudbury Street/Congress Street	C	34.0	D	45.2
16. New Sudbury Street/Blackstone Street/Surface Road	B	14.7	D	45.7
17. New Sudbury Street/Cross Street/I-93 NB On-ramp	B	12.7	D	42.3
18. Hanover Street/Cross Street	B	10.3	B	12.4
19. Hanover Street/Surface Road	B	14.6	B	14.6
20. Hanover Street/Congress Street	A	4.9	A	3.1
21. North Street/Congress Street	F	>80.0	B	19.5
22. North Street/Union Street	D	47.1	B	19.9
23. North Street/Clinton Street	B	14.2	C	34.5
24. I-93 Northbound Off-ramp/Surface Road/North Street	B	16.0	B	15.7
25. I-93 Northbound Off-ramp/Cross Street/North Street	C	21.0	C	25.0
26. I-93 Southbound Off-ramp/Surface Road/Clinton Street	D	35.8	C	22.2
27. Cross Street/Commercial Street	A	0.9	A	1.9
28. Surface Road/Mercantile Street	A	4.5	B	19.7
29. Atlantic Avenue/Mercantile Street/Cross Street	C	26.1	D	37.5
30. Surface Road/Walk to the Sea	A	5.9	A	6.3
31. Atlantic Avenue/Walk to the Sea	A	2.1	A	4.4
32. Surface Road/State Street	B	15.0	B	12.3
33. Atlantic Avenue/State Street	A	7.9	B	18.1

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
35. New Chardon Street/Bowker Street	B	16.2	B	15.4
Unsignalized*				
34. New Chardon Street/Hawkins Street	A	0.7	A	0.4
37. New Sudbury Street/Garage Entrance and Exit	A	3.9	A	3.9

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by an upstream signal.
* For unsignalized locations, the Intersection Capacity Utilization (ICU) level of servuce and delay are reported for overall operation.
Black shading indicates an improvement from Year 2028 Full-Build Conditions that bring operations out of LOS E or LOS F.



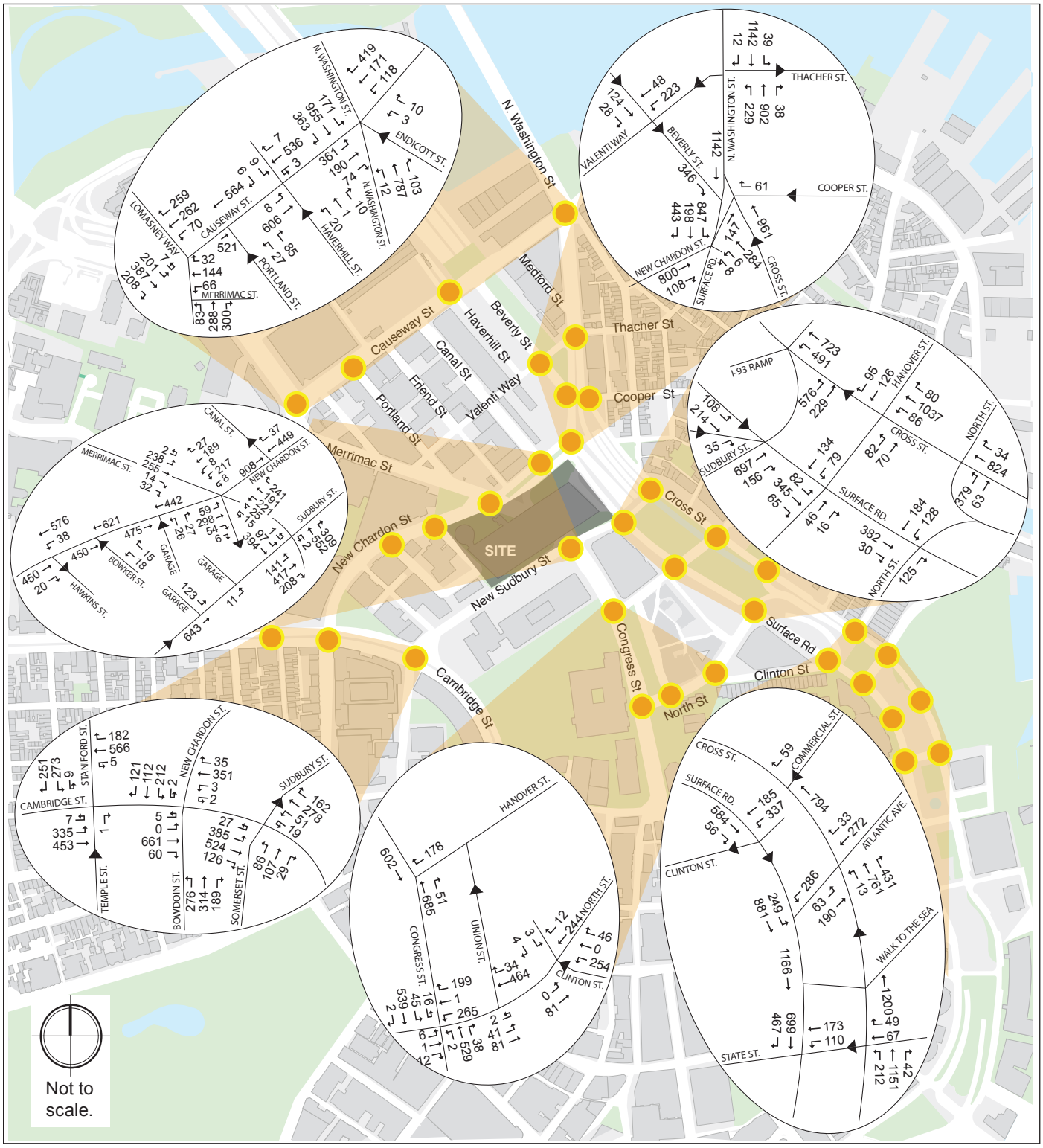
Redevelopment of Government Center Garage
Boston, MA

Figure A2.1

THE HYM INVESTMENT GROUP, LLC

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

Existing Conditions (2013),
Turning MovementCounts,
AM Peak Hour (8:00-9:00 AM)



Redevelopment of Government Center Garage
Boston, MA

Figure A2.2

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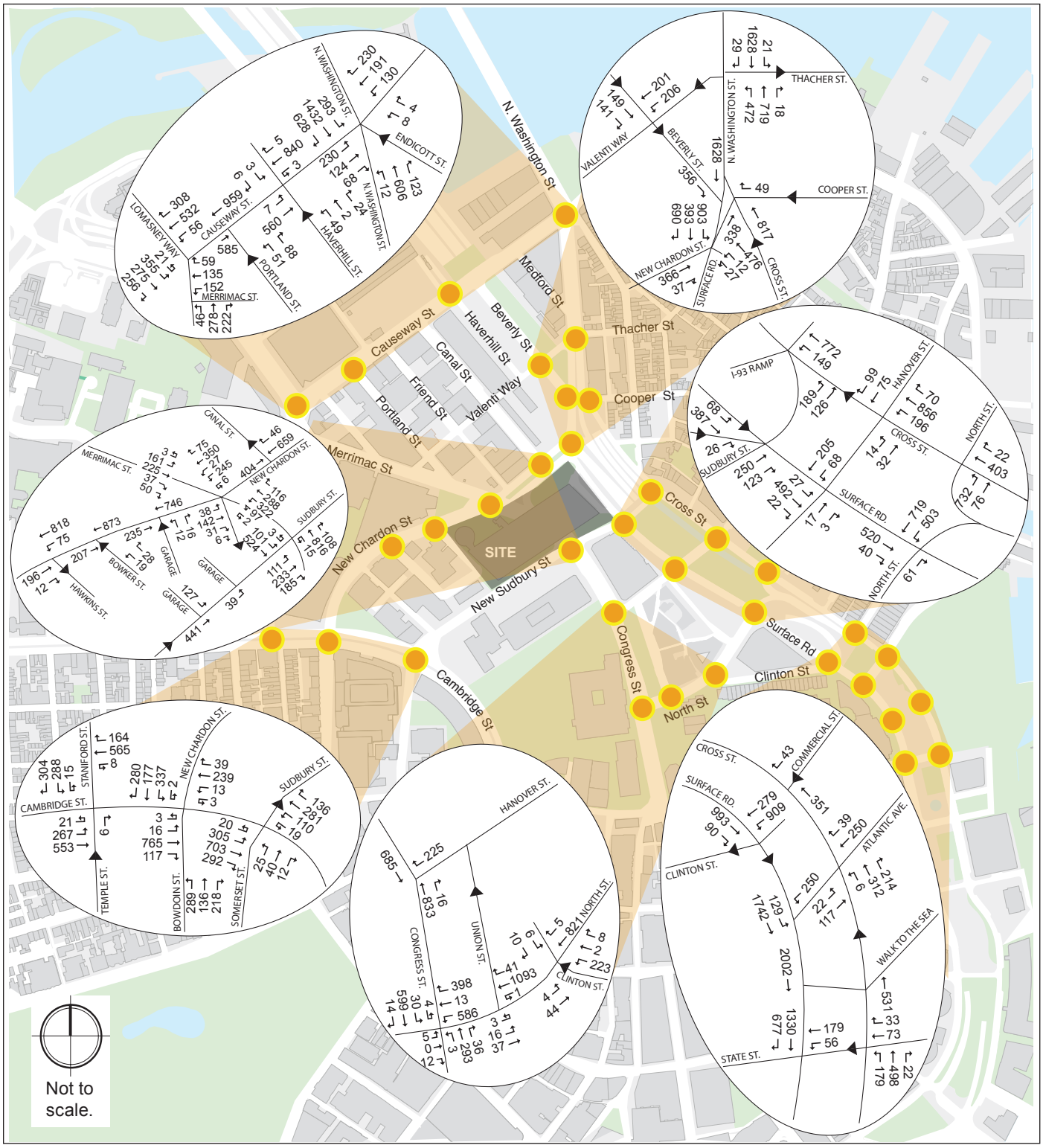
Existing Conditions (2013),
Turning MovementCounts,
PM Peak Hour (5:00-6:00 PM)



Redevelopment of Government Center Garage
Boston, MA

Figure A2.3

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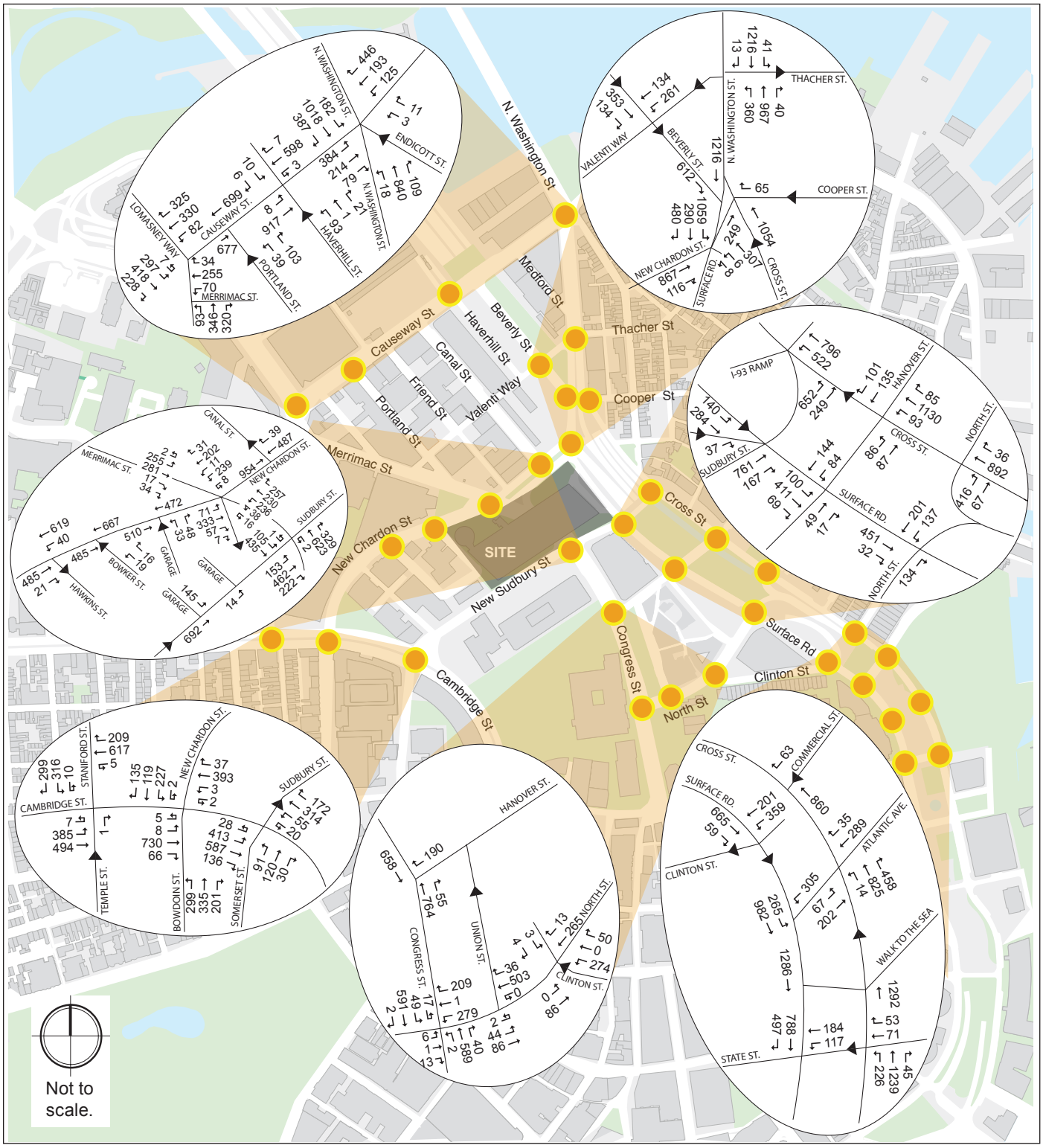
No-Build Conditions (2028), Turning Movement Counts, AM Peak Hour



Redevelopment of Government Center Garage
Boston, MA

Figure A2.4

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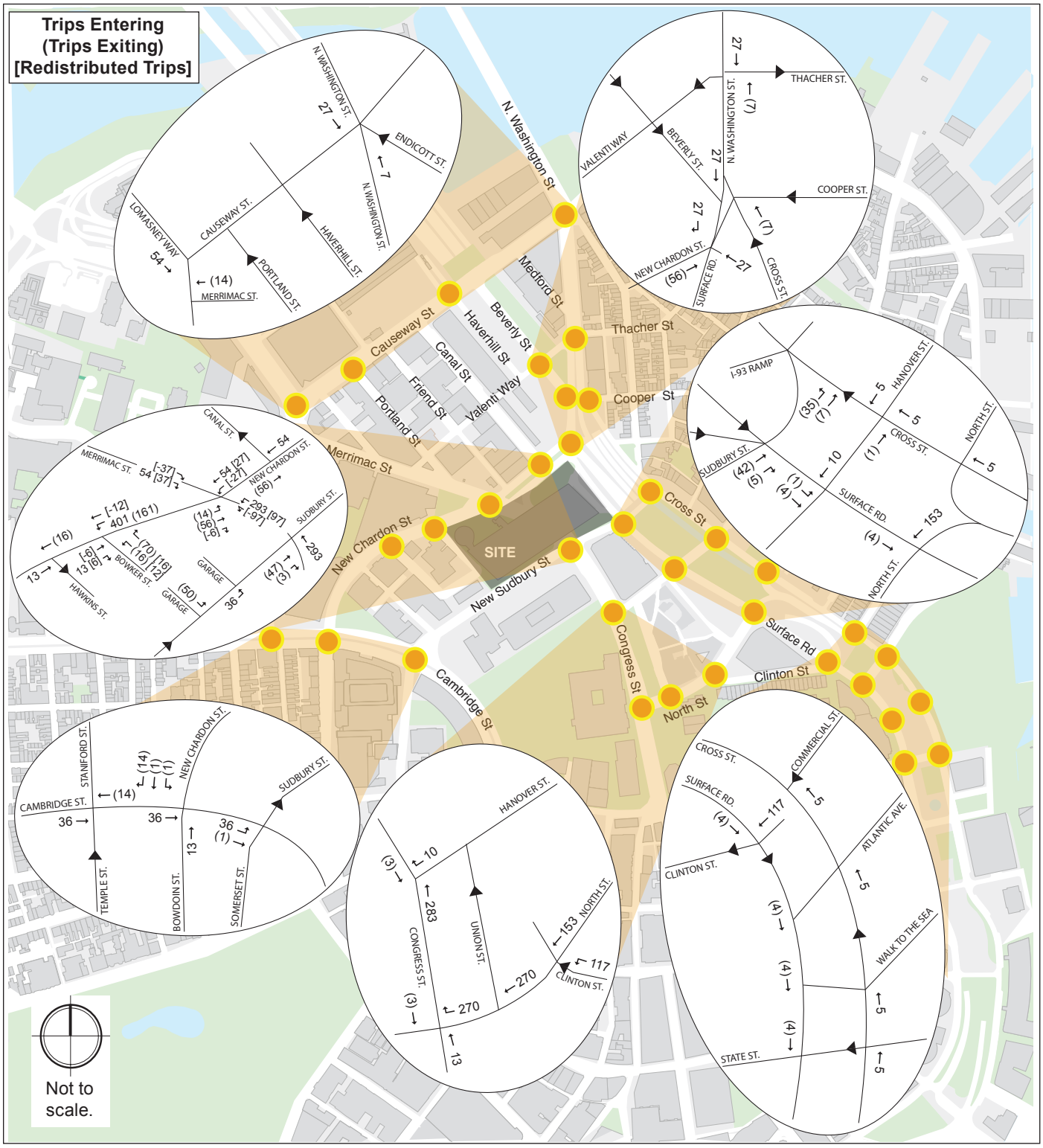
No-Build Conditions (2028), Turning Movement Counts, PM Peak Hour



Redevelopment of Government Center Garage
Boston, MA

Figure A2.5

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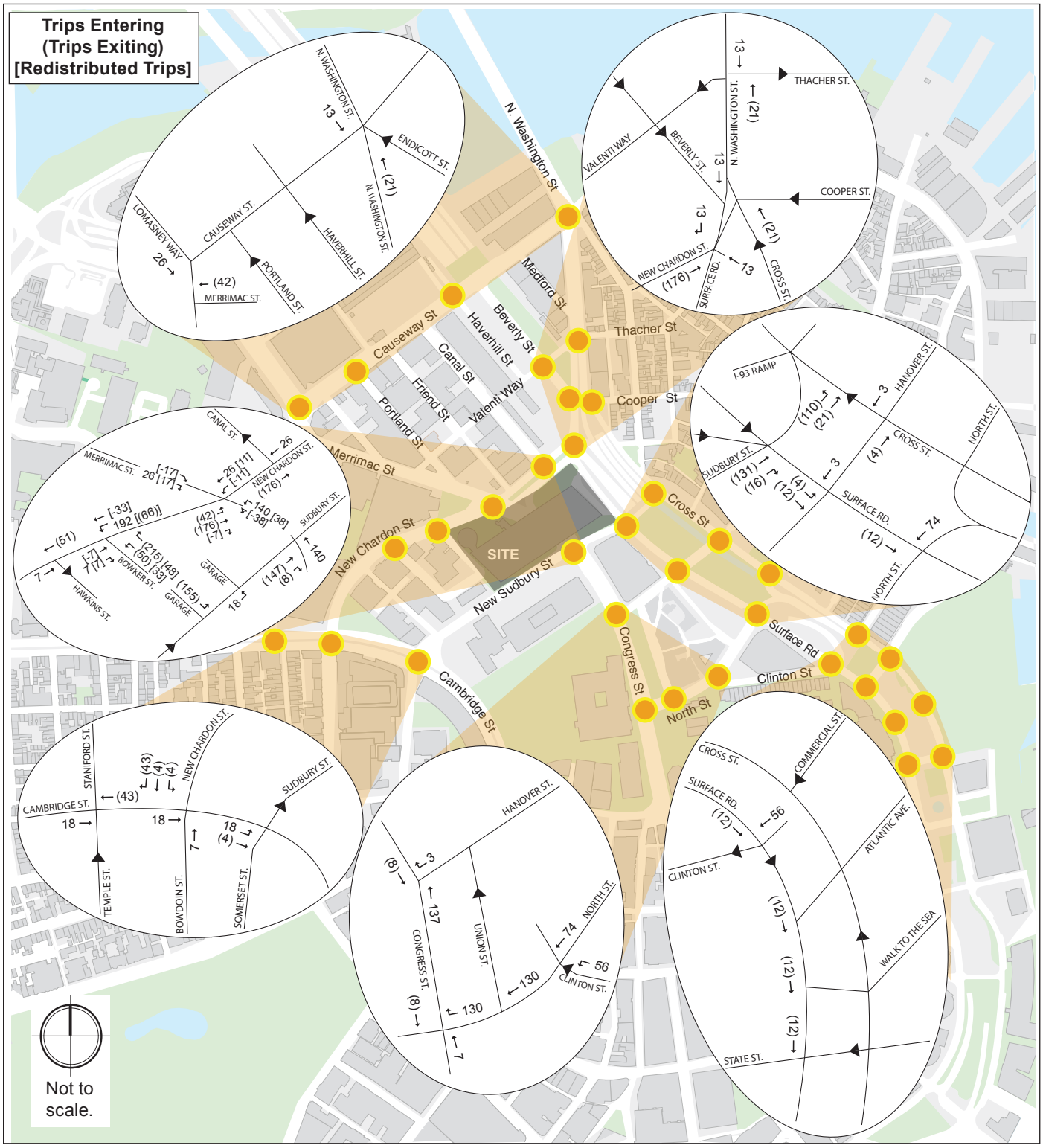
Net New Project Vehicle Trips (2028), AM Peak Hour



Redevelopment of Government Center Garage
Boston, MA

Figure A2.6

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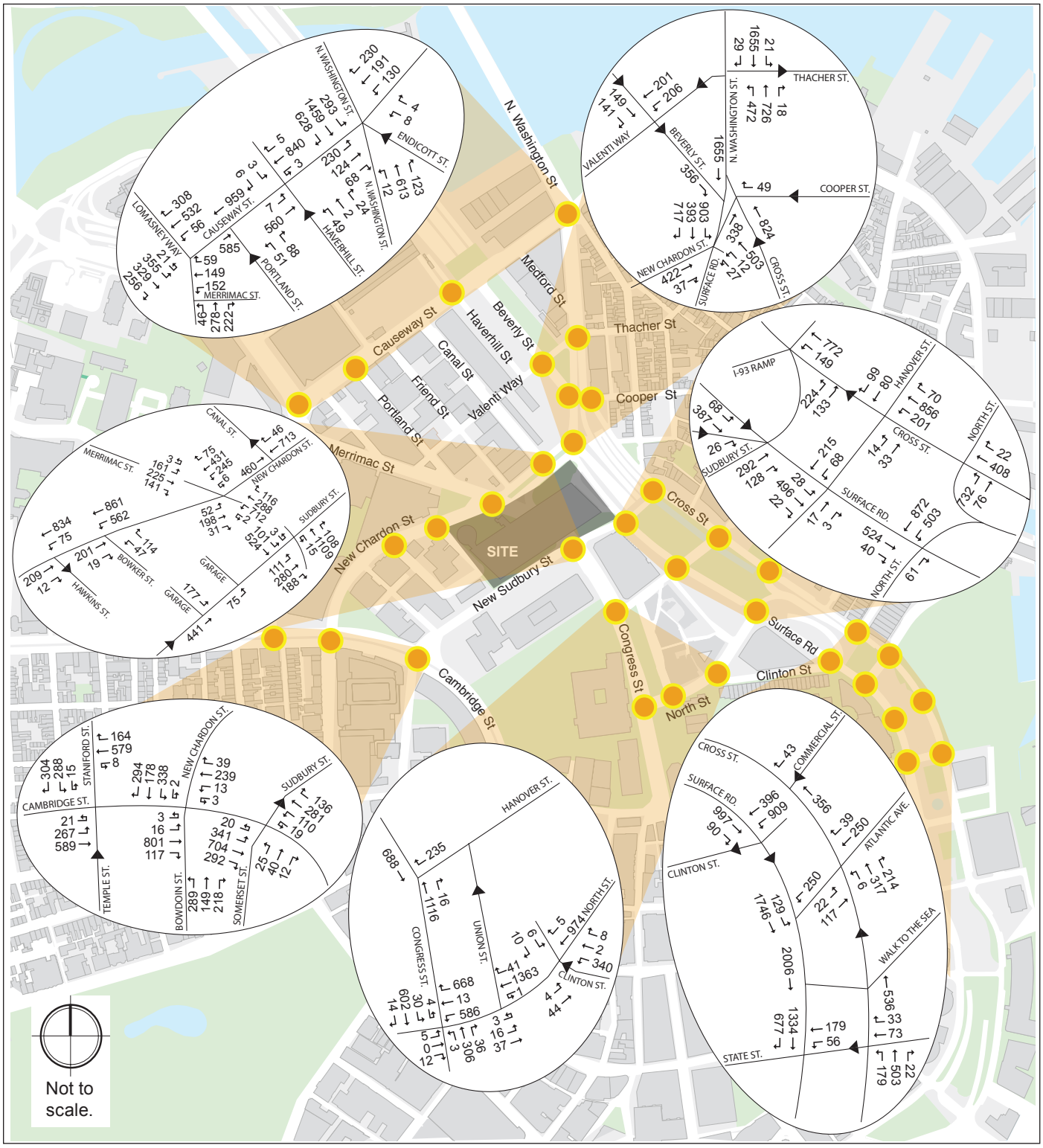
Net New Project Vehicle Trips (2028), PM Peak Hour



Redevelopment of Government Center Garage
Boston, MA

Figure A2.7

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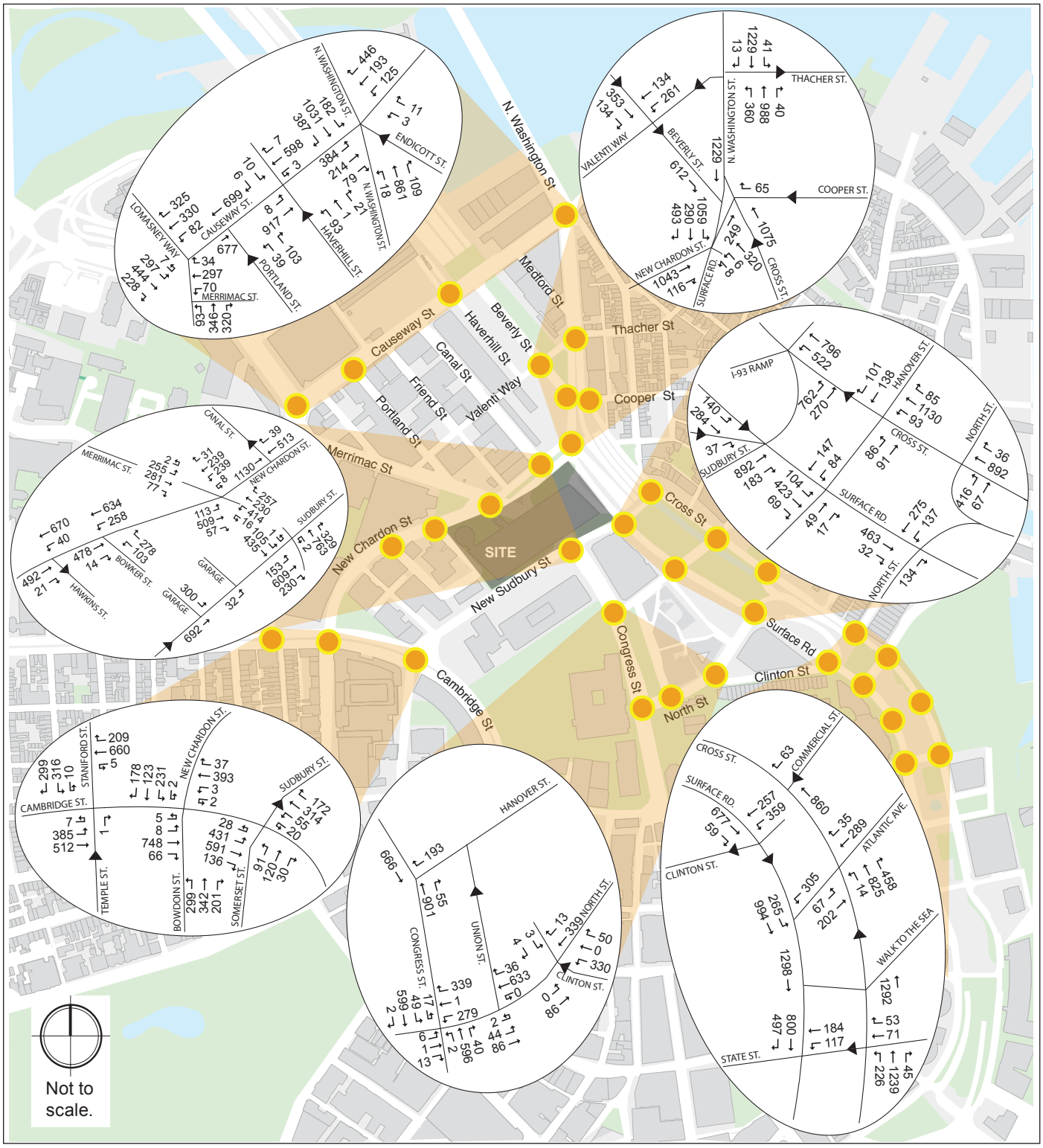
Full Build Conditions (2028), Traffic Volumes, AM Peak Hour



Redevelopment of Government Center Garage
Boston, MA

Figure A2.8

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Full Build Conditions (2028), Traffic Volumes, PM Peak Hour

Attachment 3: Historic Resources Supporting Documentation

	Location on Figure 6.1	Property Name	MHC Inv. No.	National Register Designation	Additional Designations	Address	Year
National Register Districts		Beacon Hill	BOS.BY	NRDIS	NHL, LHD	N/A	N/A
		Quincy Market	BOS.AT	NRDIS	NHL	N/A	N/A
		Blackstone Block Historic District	BOS.AK	NRDIS	LL	N/A	N/A
		Bulfinch Triangle Historic District	BOS.AL	NRDIS	N/A	N/A	N/A
MHC Inventoried Areas		Hanover Street Area	BOS.CR	N/A	N/A	N/A	N/A
		Boston National Historic Park (Freedom Trail)	BOS.AY	N/A	N/A	N/A	N/A
National Register Individually Listed Properties	**1**	Sears Crescent and Sears Block	BOS.1672 and BOS.1673	NRIND	N/A	38-68 Cornhill St	1816-1848
	2	Faneuil Hall	BOS.1712	NRIND	NHL, PR	Dock Sq	1740
	3	Vermont Building	BOS.5474	NRIND	N/A	6-12 Thacher St	1904
	4	Adams, John Courthouse	BOS.1945	NRIND	N/A	Pemberton Sq	1885
	5	Ames Building, The	BOS.1678	NRIND	LL	1 Court St	1889
	6	Old West Church	BOS.4182	NRIND	PR	131 Cambridge St	1806
	7	Union Oyster House	BOS.2102	NRIND	NHL	41-43 Union St	1716
	8		BOS.1948	NRIND	N/A	138-142 Portland St	1896
MHC Individually Inventoried Properties, Outside of North End	**1**	Government Center Parking Garage	BOS.2024	N/A	N/A	50 New Sudbury St	1966
	2	District #1 Police Station	BOS.2023	N/A	N/A	40 New Sudbury St	1968
	3	Boston Edison Substation	BOS.948	N/A	N/A	33 Hawkins St	1927
	4	Overseers of Public Welfare Building	BOS.1783	N/A	N/A	35 Hawkins St	1924
	5	O'Neal Building/ Jewish Family and Children's Services	BOS.1903	N/A	N/A	31 New Chardon St	1967
	6	Royal Globe Insurance Company	BOS.1902	N/A	N/A	25 New Chardon St	1967
	7	R. K. O. General Building	BOS.1782	N/A	N/A	40 Hawkins St	1967
	8	Capital Bank Building	BOS.1614	N/A	N/A	30 Hawkins St	1972
	9	New England Telephone and Telegraph Company	BOS.1575	N/A	N/A	65 Cambridge St	1930
	10	Bulfinch Building	BOS.1901	N/A	N/A	15 New Chardon St	1968
	11	Kennedy, John F. Federal Office Building	BOS.1617	N/A	N/A	15 New Sudbury St	1966
	12	Boston City Hall	BOS.1657	N/A	N/A	1 City Hall Sq	1965
	13	New England Merchants National Bank	BOS.2000	N/A	N/A	28 State St	1969
	14	One Washington Mall	BOS.2106	N/A	N/A	1 Washington Mall	1972
	15	City Bank and Trust Company Building	BOS.1680	N/A	N/A	25 Court St	1967
	16	Scollay Square Under Subway Station	BOS.918	N/A	N/A	Cambridge St	1916
	16	Scollay Square - Government Center Subway Station	BOS.922	N/A	N/A	1 Cambridge St	1898
	17	One, Two and Three Center Plaza	BOS.1645	N/A	N/A	Center Plaza	1965
	18	Suffolk County Courthouse Addition	BOS.1573	N/A	N/A	1 Pemberton Sq	1936
	19	Metropolitan District Commission Building	BOS.1980	N/A	N/A	20 Somerset St	1932
	20	McCormack, John W. State Office Building	BOS.1508	N/A	N/A	One Ashburton Place	1975
	21	Saltonstall, Leverett State Office Building	BOS.1616	N/A	N/A	100 Cambridge St	1965
	22	Temporary Home for Women	BOS.1904	N/A	N/A	40-50 Bowker St	1924
	23	Bowdoin Street Subway Station	BOS.917	N/A	N/A	Cambridge St	1916
	24	Lindemann Mental Health Center	BOS.1618	N/A	N/A	115 Cambridge St	1965
	25	Braman, Dow and Company Building	BOS.1643	N/A	N/A	239-245 Causeway St	1913
	26	Keaney Square Building	BOS.1644	N/A	N/A	249-267 Causeway St	1906
	27	Old Colony Trust Company	BOS.1671	N/A	N/A	17 Court St	1923
	27	Old Colony Trust Company Building	BOS.1679	N/A	MHC eligibility opinion, 1986	17 Court St	1908
	28	United States Trust Co. Building/ New Scollary Square	BOS.1677	N/A	N/A	30-40 Court St	1914
	29	North Station Subway Substation	BOS.930	N/A	N/A	Haverhill St	1931
	29	Boston and Maine Railroad Signal Tower A	BOS.4199	N/A	N/A	North Station	1931
	31		BOS.1867	N/A	N/A	6-24 Medford St	1885
	32	Haymarket Main Line Subway Station	BOS.920	N/A	N/A	New Sudbury St	1905
	32	Haymarket Subway Station - Tremont Street Subway	BOS.923	N/A	N/A	New Sudbury St	1898
	33	Traffic Tunnel Administration - Police Station #1	BOS.5390	N/A	N/A	128 North St	1931
	34	Choate, Rufus Statue	BOS.938	N/A	N/A	Pemberton Sq	1898
	35	Hemenway Building	BOS.2064	N/A	N/A	2-16 Tremont St	1883
	36	Faneuil Hall Greenhouses	BOS.943	N/A	N/A	Clinton St	1976
MHC Individually Inventoried Properties, North End		N/A	BOS.5181	N/A	N/A	2-2 1/2 Baldwin Pl	1890
		N/A	BOS.5260	N/A	N/A	14-16 Cooper St	1892
		N/A	BOS.5261	N/A	N/A	18 Cooper St	1896
		N/A	BOS.5262	N/A	N/A	20 Cooper St	1893
		N/A	BOS.5263	N/A	N/A	22 Cooper St	1902
		N/A	BOS.5264	N/A	N/A	46 Cooper St	1877
		N/A	BOS.5265	N/A	N/A	53 Cooper St	1907

	Location on Figure 6.1	Property Name	MHC Inv. No.	National Register Designation	Additional Designations	Address	Year
		Bunten, Robert House	BOS.5269	N/A	N/A	5 Endicott Ct	1843
		Bunten, Robert House	BOS.5271	N/A	N/A	6 Endicott Ct	1843
		Bunten, Robert House	BOS.5270	N/A	N/A	7 Endicott Ct	1843
		Bunten, Robert House	BOS.5272	N/A	N/A	8 Endicott Ct	1843
		Purity Cheese Grocery Store	BOS.13011	N/A	N/A	55 Endicott St	1938
		N/A	BOS.5273	N/A	N/A	59-61 Endicott St	1892
		Waitt, Henry and Bond, C. H. Building	BOS.5274	N/A	N/A	63-69 Endicott St	1891
		N/A	BOS.5275	N/A	N/A	82 Endicott St	1830
		N/A	BOS.5276	N/A	N/A	84 Endicott St	
		N/A	BOS.5277	N/A	N/A	86-88 Endicott St	
		N/A	BOS.5278	N/A	N/A	87 Endicott St	1905
		N/A	BOS.5279	N/A	N/A	89 Endicott St	1905
		N/A	BOS.5280	N/A	N/A	91-93 Endicott St	1861
		N/A	BOS.5281	N/A	N/A	101-103 Endicott St	1905
		N/A	BOS.5479	N/A	N/A	158 Endicott St	1867
		N/A	BOS.5480	N/A	N/A	160 Endicott St	
		N/A	BOS.5325	N/A	N/A	204 Hanover St	1915
		N/A	BOS.5326	N/A	N/A	208 Hanover St	1915
		N/A	BOS.5327	N/A	N/A	210 Hanover St	1867
		American House Hotel - Hanover Building	BOS.5328	N/A	N/A	212-228 Hanover St	1835
		N/A	BOS.5329	N/A	N/A	213 Hanover St	1895
		U. S. Post Office - Boston North End Branch	BOS.5330	N/A	N/A	215 Hanover St	
		N/A	BOS.5332	N/A	N/A	232 Hanover St	1896
		N/A	BOS.5333	N/A	N/A	234 Hanover St	1875
		N/A	BOS.5334	N/A	N/A	238 Hanover St	1875
		N/A	BOS.5335	N/A	N/A	253-255 Hanover St	1874
		N/A	BOS.5337	N/A	N/A	256-262 Hanover St	1878
		N/A	BOS.5336	N/A	N/A	257-259 Hanover St	1874
		N/A	BOS.5338	N/A	N/A	264-266 Hanover St	1867
		N/A	BOS.5339	N/A	N/A	269-275 Hanover St	1880
		N/A	BOS.5408	N/A	N/A	7 North Hanover Ct	1860
		White, George Robert Health Unit #2	BOS.5379	N/A	N/A	39-41 North Margin St	1923
		N/A	BOS.5410	N/A	N/A	65 North Margin St	1890
		Saint Rocco's Society Chapel and Clubhouse	BOS.5413	N/A	N/A	66 North Margin St	1907
		N/A	BOS.5414	N/A	N/A	68 North Margin St	1894
		N/A	BOS.5411	N/A	N/A	69 North Margin St	1890
		N/A	BOS.5412	N/A	N/A	71 North Margin St	1890
		N/A	BOS.5422	N/A	N/A	18 Parmenter St	1842
		Saint Mary's Episcopal Church	BOS.5423	N/A	N/A	20 Parmenter St	1884
		N/A	BOS.5441	N/A	N/A	113 Salem St	1844
		Boston Engine House #8 and Ladder Company #1	BOS.5442	N/A	N/A	133 Salem St	1868
		N/A	BOS.5443	N/A	N/A	134 Salem St	1867
		N/A	BOS.5468	N/A	N/A	2 Stillman Pl	1830
		N/A	BOS.5469	N/A	N/A	3 Stillman Pl	1830
		N/A	BOS.5470	N/A	N/A	4 Stillman Pl	1830
		N/A	BOS.5471	N/A	N/A	5 Stillman Pl	1830
		N/A	BOS.5472	N/A	N/A	6 Stillman Pl	1830
		N/A	BOS.5473	N/A	N/A	39-41 Stillman St	
		N/A	BOS.5475	N/A	N/A	13-15 Thacher St	1886
		N/A	BOS.5476	N/A	N/A	25 Thacher St	1867
		N/A	BOS.5477	N/A	N/A	27 Thacher St	1870
		N/A	BOS.5478	N/A	N/A	29 Thacher St	1870
		Trade Building	BOS.5417	N/A	N/A	36-40 Thacher St	1900
		N/A	BOS.5492	N/A	N/A	5 Wiget St	1890
MHC Individually Inventoried Properties - demolished		Blackstone Market - DEMOLISHED	BOS.1563	N/A	N/A	72-86 Blackstone St	1860
		Lancaster Theater - DEMOLISHED	BOS.1637	N/A	N/A	73-75 Causeway St	
		Manger Hotel - DEMOLISHED	BOS.1630	N/A	N/A	76-78 Causeway St	1930
		North Station - Boston Garden - DEMOLISHED	BOS.1631	N/A	N/A	84-118 Causeway St	1927
		North Station Industrial Building - DEMOLISHED	BOS.1632	N/A	N/A	146-154 Causeway St	1928
		State Street Trust Company Building - DEMOLISHED	BOS.1659	N/A	N/A	10 Congress St	1924
		Langione, J. A. Funeral Home - DEMOLISHED	BOS.1871	N/A	N/A	58-66 Merrimac St (could not be located on current map)	1951
		Handschumacher, W. F. and Company - DEMOLISHED	BOS.1908	N/A	N/A	46-52 North St	1928
		DEMOLISHED	BOS.1909	N/A	N/A	54-60 North St	1865
		Gerard, Victor Building - DEMOLISHED	BOS.1956	N/A	N/A	151-163 Portland St	1926

Vanasse Hangen Brustlin, Inc.